Date: 13/04/2023

To whom it may concern

Subject: Completion of ENVS Project by ENGA Gr.B students of Semester II in 2022

The undersigned hereby certifies that the students mentioned in the table given below have completed their AECC 2 - ENVS projects for the University of Calcutta B.A/B.Sc. Semester-II Examination, 2022. These students are mentioned in the modified template of Metric 1.3.2 as AECC 2_ENGA-Gr. B (for DVV compliance) with pdf link of their projects stated alongside.

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9	013-1211-0109-21	21/BAH/0239	AKANSHA SARKAR	ENGA
10	013-1211-0110-21	21/BAH/0240	SNEHA PAL	ENGA
11	013-1211-0114-21	21/BAH/0245	SHALINI CHOWDHURY	ENGA
12	013-1211-0115-21	21/BAH/0246	ANKITA BISWAS	ENGA
13	013-1211-0116-21	21/BAH/0247	ANKALIKA CHAKRABORTY	ENGA
14	013-1211-0118-21	21/BAH/0254	POUSHALI ROY	ENGA
15	013-1211-0121-21	21/BAH/0250	LUTFA BANU CHANDRA	ENGA
16	013-1211-0122-21	21/BAH/0249	POULAMI MAJEE	ENGA
17	013-1211-0123-21	21/BAH/0256	SOUMILI MALLICK	ENGA
18	013-1212-0252-21	21/BAH/0231	RESHMI PAKHIRA	ENGA
19	013-1214-0091-21	21/BAH/0213	RIMA GHOSH	ENGA
20	013-1214-0092-21	21/BAH/0214	SREETAMA DATTA	ENGA
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Gokhale Memorial Girls' College Kolkata

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24

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College roll no.: 21/BAH/0207

C.U. REG. No.: 013-1211-0087-21

Department: ENGLISH HONOURS

Paper Name: ENVS

Semester: 2

Topic: POLLUTION

2/12013-11-0069

INTRODUCTION

Pollution occurs when any form of impurity is introduced into a clean source. It is most often used in an environmental concept like air or water pollution. There are mainly four types of pollution air, water, soil and land. Pollution can come in 4 different types affecting different types of areas in the world. Air pollution affects the air, water pollution affects the water and marine life, land pollution affects the land destroying life and the environment and there is also noise pollution that can affect our hearing. Pollution is dangerous. It effects everything from land to water, air, noise and more. Really pollution is just muck. Harmful substances cause by everything. Pollution kills, so reduce it. China is the most polluted country in the world.

POLLUTION AND IT'S TYPES

There are mainly four primary pollutions:-

- Air pollution.
- Water pollution.
- Noise pollution.
- Soil/Land pollution

AIR POLLUTION

Air pollution is the introduction of chemicals, particulate matter, or biological materials that cause harm or discomfort to humans or other living organisms, or cause damage to the natural environment or built environment, into the atmosphere. Air pollutant is known as a substance in the air that can cause harm to humans and the environment. Pollutants can be in the form of solid particles, liquid droplets, or gases. In addition, they may be natural or man-made. E.g. Sulphur dioxide, Smoke, Fly ash.

Effects

The effects of air pollution on humans are fatal and life threatening. WHO statistics report that over 2 million people succumb to the fatalities attributed to air pollution. Consistent exposure to the pollutants leads to the development of:

1. *Premature mortality*2. *Heart attack* 3. *Asthma* 4. *Difficulty in breathing* 5. *Wheezing and coughing* 6. *Cystic fibrosis* 7. *Chronic obstructive pulmonary disease* 8. *Chronic bronchitis.*

Air pollution has also caused a hole in our ozone layer that allows the ultra-violet rays of the sun to enter the earth's atmosphere that can cause diseases like skin cancer.

Prevention

The first way to reduce pollution is to practice the 3Rs concept namely **reduce, reuse and recycle**. Citizens should reduce the usage of air-conditioners as it will release harmful gases, for instant ozone-depleting chlorofluorocarbons which will result in reducing air pollution. Some ways of preventions are:-

1. Using public transports. 2. Turn off the lights when not in use.3. Recycle and Reuse. 4. No to plastic bags. 5. Reduction of forest fires and smoking. 6. Use of fans instead of Air Conditioner. 7. Use filters for chimneys. 8. Avoid usage of crackers, etc.

WATER POLLUTION

Water pollution is **the contamination of water sources by substances which make the water unusable for drinking, cooking, cleaning, swimming, and other activities.** Pollutants include chemicals, trash, bacteria, and parasites. All forms of pollution eventually make their way to water.

Effects

1) *The food chain is damaged.* 2) *Diseases can spread* via polluted water. This is called microbial water pollution. The human heart and kidneys can be adversely affected if polluted water is consumed regularly. 3) *Acid rain* contains sulfate particles, which can harm fish or plant life in lakes and rivers. 4) Altered water temperatures (due to human actions) can kill the marine life and *affect the delicate ecological balance* in bodies of water, especially lakes and rivers.

Prevention

Some ways to prevent water pollution are:-

1) Pick up litter and throw it away in a garbage can. 2) Blow or sweep fertilizer back onto the grass if it gets onto paved areas. Don't put fertilizer on the grass right before it rains. 3) Mulch or compost grass or yard waste..4) Wash your car or outdoor equipment where it can flow to a gravel or grassy area instead of a street.5) Don't pour your motor oil down the storm drain rather, take it to the nearest auto parts store. 6) Never clean up a spill by hosing it into a storm drain.

A

NOISE POLLUTION

Noise pollution, also known as environmental noise or sound pollution, is the propagation of noise with ranging impacts on the activity of human or animal life, most of them harmful to a degree. The source of outdoor noise worldwide is mainly caused by machines, transport, and propagation systems.

Effects

1) *Deafness*, temporary or permanent, is one of the most prevalent effects of noise pollution. 2) *Fatigue* is another effect of noise. 3) *Lack of concentration.* 4) Noise pollution acts as a *stress invigorator.* 5) Noise pollution indirectly *affects the vegetation.* 6) It *damages the nervous system of the animals.* 7) Noise indirectly *weakens the edifice of buildings, bridges and monuments*

Prevention

We can reduce noise Pollution by following below mentioned Tips:

1)Turn off Appliances at Home and offices. 2)Shut the Door when using noisy Machines. 3) Use Earplugs. 4)Lower the volume. 5)Stay away from Noisy area. 6)Follow the Limits of Noise level. 7)Control Noise level near sensitive areas. 8) Go Green by planning trees.

Keep the noise down or the noise will keep you down

SOIL/LAND POLLUTION

Soil/Land pollution is the action of environmental contamination with man-made waste on land. Americans generate five pounds of solid waste every day, furthermore creating one ton of solid waste each year. In an average day in the United States, people throw out 200,000 tons of edible food and throw 1 million bushels of litter out of their automobiles. The main human contributor to pollution are landfills. Approximately half of our trash is disposed in landfills. Only 2% of our waste is actually recycled.

Effects

Some of the effects of soil/land pollution are listed below:-

1) Exterminates wildlife.2) Acid rain kills trees and other plants. 3) Vegetation that provides food and shelter is destroyed. 4) It can seriously disrupt the balance of nature, and, in extreme cases, can cause human fatalities. 5) Pesticides can damage crops, kill vegetation, and poison birds, animals, and fish.

Prevention

Listed below are a few things that could help in reducing soil pollution:-

1) Reduced Use of Chemical Fertilizers. 2) Chemical fertilizers do more harm than good. 3) Reforestation and Afforestation should be promoted. 4) Recycle and Reuse Products. 5) Get the Locals Involved. 6) Promote Use of Natural Manure.

CONCLUSION

Pollution is a big problem now. A lot of people thinks that they don`t pollute because they don`t throw trash on the floor, but this is just one little part of pollution. Pollution is any damage that we cause to the environment and nobody can live without polluting our planet. In a nutshell, every kind of pollution leaves a huge negative impact on our environment, human lives, animals etc. We, as responsible citizens, must take steps towards a better tomorrow. We must join hands to take various initiatives and fight against this problem. A lot of innocent lives are put in danger due to pollution every day. If we don't do anything from now on or take a stand to make the earth pollution-free, then the doomsday will be upon us very soon.

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15/6/22

25

NAME → UDITA BISWAS

ROLL NO → 21201311-0070

REGISTRATION NO → 013-1211-0066

SUBJECT → E.N.V.S

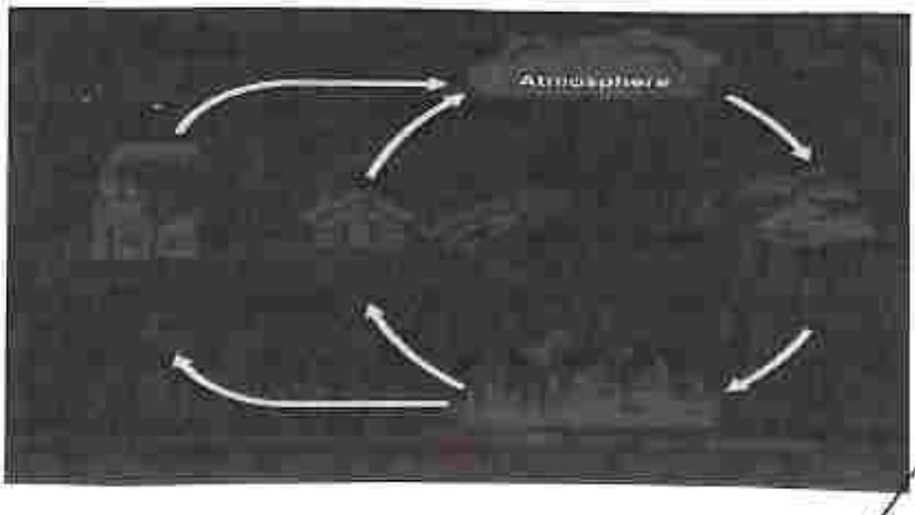
SEM → 2

TOPIC → STUDY OF ECOSYSTEM

FORESTS

ENGA

INDEX:



What Is a Forest:

A forest is a complex ecological system in which trees are the dominant life-form. A forest is nature's most efficient ecosystem, with a high rate of photosynthesis affecting both plant and animal systems in a series of complex organic relationships. Forests can develop under various conditions, and the kind of soil, plant, and animal life differs according to the extremes of environmental influences.Forests account for 75% of the gross primary production of the Earth's biosphere, and contain 80% of the Earth's plant biomass.

Plants provide a protective canopy that lessens the impact of raindrops on the soil, thereby reducing soil erosion. The layer of leaves that fall around the tree prevents runoff and allows the water to percolate into the soil. Roots help to hold the soil in place. Dead plants decompose to form humus, organic matter that holds the water and provides nutrients to the soil. Plants provide habitat to different types of organisms.

TYPES OF FORESTS:

On a global scale, forests are shaped by the amount of solar radiation and precipitation, both of which are influenced by latitude. These climatic conditions determine what organisms can survive in an area and have helped shape the evolution of forests for millions of years. Based on latitude, there are three types of forests: boreal, temperate, and tropical.

1. BOREAL FORESTS

Boreal forests, or taiga, are found between 50- and 60-degrees latitude in North America, Asia, and Europe. Beneath boreal forests is land shaped by glaciers that left a legacy in the geology, hydrology, and soils of the area. Boreal forests' bitter cold climate makes it difficult for life, leading to low species diversity compared to temperate and tropical forests. The plants and animals that do live in boreal forests are specially adapted to cope with short growing seasons and cold temperatures. Due to their vastness and remoteness, boreal forests are important storers of carbon. Boreal forests tend to have shallow, acidic, nutrient-poor soils. Conifers are the most abundant type of tree, although there are some well-adapted deciduous trees, such as willows, poplars, and alders, as well. Prominent species include black and white fir, jack pine, balsam fir, and tamarack.The animals that live in boreal forests are specially adapted to cope with extremely cold temperatures.

2. TEMPERATE FORESTS

Temperate forests are located at mid-latitudes, which gives them their characteristic four seasons. Very few patches of old-growth temperate forest remain; the zone is dominated by secondary forests. emperate forests are home to many endangered species, such as the red wolf. As of 2020, temperate forests accounted for 16% of the Earth's total forest cover.

Temperate forests are inhabited by species adapted for seasonality. Deciduous trees like maples, hickories, oaks, and many others drop their leaves and become dormant in the fall and winter to save energy. Bears, bobcats, squirrels, and deer make their homes in temperate forests and can store food, adapt their diet, or hibernate to cope with the lack of nutritious foods in the winter.They receive an average of 30 to 59 inches of rain per year. Soils are generally fertile, with a thick layer of organic matter from which plants can extract nutrients to grow.

TROPICAL FORESTS

The tropical rainforests are found between latitudes 23.5o N and 23.5o S. The temperatures in these forests range between 68o and 77o Fahrenheit throughout the year. Tropical rainforests boast the great diversity of species of all ecosystems on earth. They don't experience winter and normally receive 100 inches of rain annually.

Decomposition happens at an incredibly fast rate in these forests, thanks to the high temperatures and moist air. High levels of rainfall normally result in leaching of nutrients from the soil. This explains why soils in tropical rainforests are nutrient poor.

The sun hardly reaches the lower levels of the forest, thanks to dense-growing trees that create a thick canopy. So, most animals that inhabit tropical rainforests are adapted to living in the trees. One can find a wide variety of birds, snakes, bats, and monkeys in these forests. Vegetation includes vines, ferns, mosses, orchids, and palms.

IMPORTANCE OF FORESTS:

- Trees add beauty and improve personal health
- Trees reduce air pollution
- Trees fight the atmospheric greenhouse effect
- Trees conserve water and reduce soil erosion
- Trees save energy
- Trees modify local climate
- Trees increase economic stability
- Trees reduce noise pollution
- Trees create wildlife and plant diversity
- Trees increase property values

CONSERVATION OF FORESTS:

1) Regulated and Planned Cutting of Trees:

One of the main reasons of deforestation is commercial felling of trees. According to an estimate, about 1,600 million cubic metres of wood have been used for various purposes in the world. Although trees are considered as perennial resource, when exploited on a very large scale, their revival cannot be possible. Therefore, cutting should be regulated by adopting methods like:

(i) Clear cutting,

(ii) Selective cutting, and

(iii) Shelter wood cutting.

2) Control over Forest Fire:

Destruction or loss of forest by fire is fairly common; because trees are highly exposed to fire and once started it becomes difficult to control. Sometimes, the fire starts by natural process, i.e., by lightning or by friction between trees during speedy winds, while in most cases it is also by man either intentionally or uninten-tionally.In order to save forests from fire, it is necessary to adopt latest techniques of fire fighting. Some of the fire suppression techniques are to develop three metre wide fire lanes around the periphery of the fire, back fires, arrangement of water spray, fire retardant chemicals should be sprayed from back tank and if possible by helicopters.

3) Protection of Forests:

The existing forests should be protected. Apart from commercial cutting, unorganised grazing is also one of the reasons. There are several forest diseases resulting from parasitic fungi, rusts, mistletoes, viruses and nematodes which cause

the destruction of trees. The forests should be protected either by use of chemical spray, antibiotics or by development of disease resistant strains of trees

4) Proper Utilisation of Forest and Forests Products:

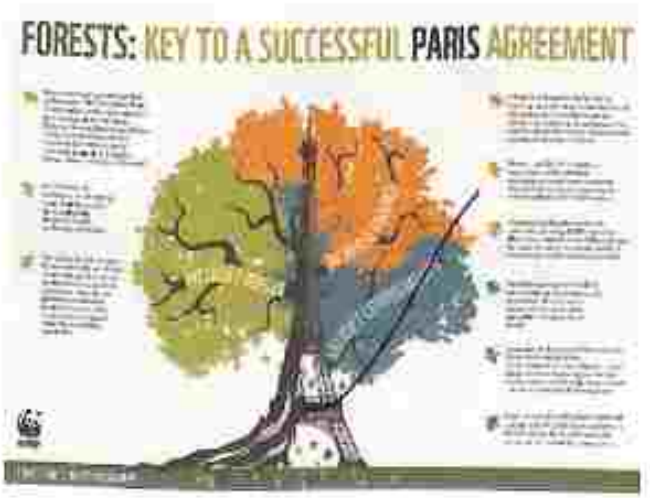
Generally, trees are cut for logs and the rest, including stump, limbs, branches and foliage, etc., is left out as worthless debris. Further waste occurs at the saw mills. There is thus need to utilise this waste material. Today, several uses have been developed and products like waterproof glues, boar r etc., can be obtained.

Similarly, forests can be used or developed as tourist centres. By using them as tourist centres the country can earn substantial foreign exchange.

5) Afforestation

In today's world, the rate at which trees grow naturally in forests is much slower than the rate at which trees in forests are being cut down for production. The increased demand for tree products has put pressure on forests resulting in deforestation. Therefore we should practice afforestation.

Afforestation helps to stabilize the climate of the region and helps in the transformation of arid and semi-arid regions into productive areas. The trees planted in afforestation help in reducing the greenhouse gas effect which helps prevent global warming.

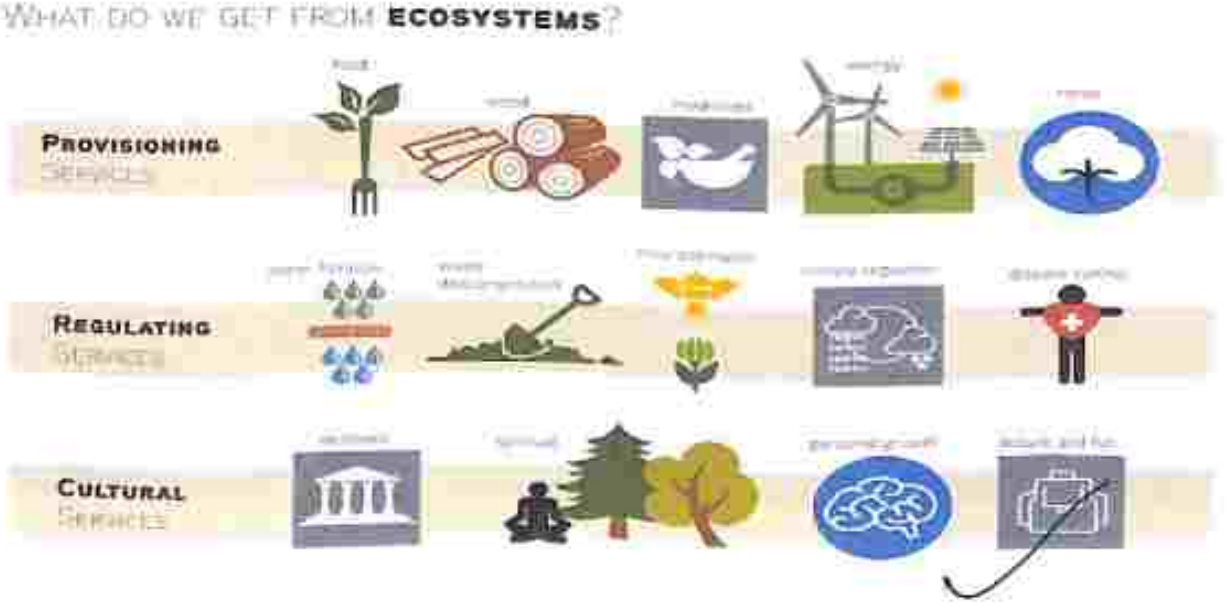


SIGNIFICANCE OF FORESTS IN THE ECOSYSTEM:

The world's forests hold importance for all of their inhabitants as well as for the overall health of the planet. The benefits of forests to society and to the diversity of life make it vital that they be protected from deforestation and other potential negative impacts of civilization.

Forests serve as reserves for the genes of biodiversity. This is because forests carry about 90% of all the earth's species, both plants and animals, thereby making up a diversity of plant and animal life forms in the various forest habitats.

Forests also support biodiversity by offering enabling environments where different plants and animals can easily thrive.Forests play an important role in the purification of the atmospheric air. During the day, trees and plants absorb carbon dioxide for photosynthesis and give out oxygen. As such, they help in the purification of the air that we breathe.

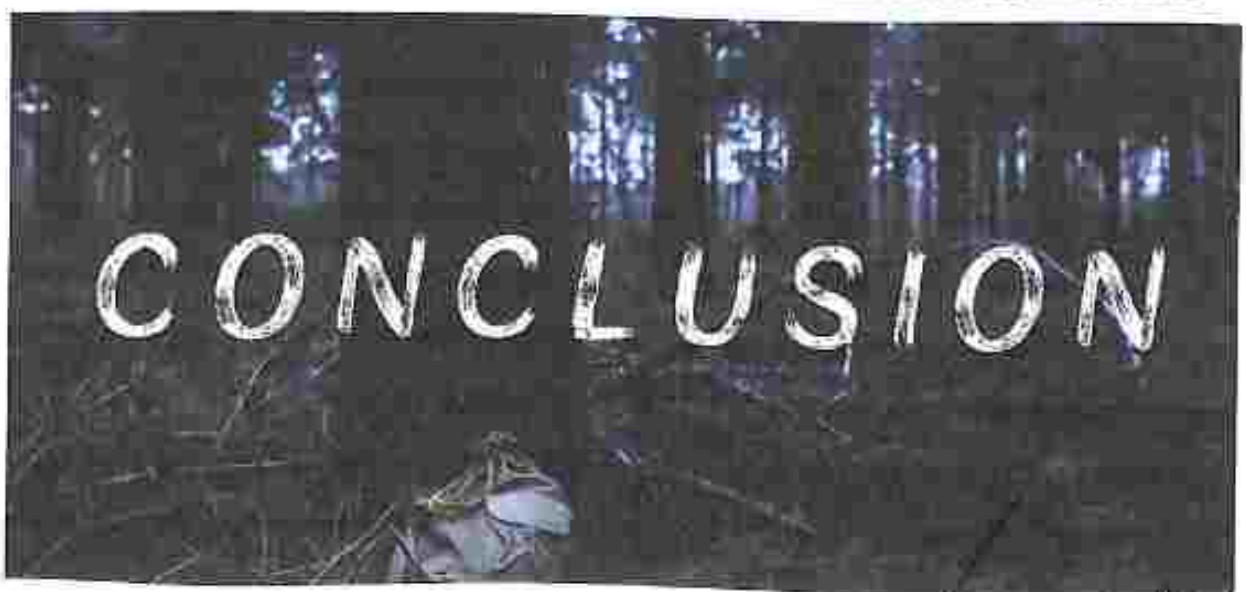


CONCLUSION:

Forest conservation supports life on earth.It maintains quality of water and air, the basic essentials of existence of life.Stability in soil is possible by trees, enables the land based plants and animals to live.From their biodiversity grows wealth in the form of food, medicines, essential for human health.It acts as Carbon sinks absorbing Carbon dioxide and keeps global warning at body.Forests influence climate and educe extremes of temperature.

They conserve soil and regulate moisture and stream flow. Forests prevents soil erosion and floods. They also supply raw materials to so many industries like pulp-paper, news print, saw milling, matches, medicinal herbs.It is the source of wood for use in houses construction and fuel wood.

Forests help in main export items like teak, paper, paper boards, natural resins, seeds helping sustain the balance in economy.Forests are also sources of revenue to the Government in the form of royalty, in the from of forest products.It also provides employment to a large number of people. Thus it is highly nessecary to conserve and protect our forests in order to secure a balanced ecological system.



15/6/22

GOKHALE MEMORIAL GIRLS COLLEGE, KOLKATA

28

ENVIRONMENTAL STUDIES PROJECT

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COLLEGE ROLL NO.: 21/BAH/0211

UNIVERSITY ROLL NO.:

REGISTRATION NO.: 013-1211-0090-21

TOPIC: Study of mammal; Orangutang.

DATE: 25.05.2022

DEPARTMENT: English Department

PAPER: ENVS

SEMESTER: 2

Baby Orangutang
Source: FOUR PAWS INTERNATIONAL

21201311-0072

CONTENT

King Louie's entry in the Jungle Book Movie was indeed a great treat to our young eyes. We were all fascinated by his body flexibility and wit, and the strong command of his battalion of monkeys. However, most of us are unaware that his real-world brothers, the Orangutans (as his species is called) have so much more to be understood about themselves and their artistic lifestyles. Sharing with us the standard biological order Primata, these furry cousins of ours indeed constitute an essential role in the Ecosystem.

Fu Manchu was one of the most notorious escape artists at the Omaha Zoo. But he wasn't a performer, he was an Orangutan. The keepers who locked his enclosure every night were baffled to find him outside the next day; hanging out with friends in a tree, or sunning on the roof. Only after installing cameras did they realise Fu Manchu had been picking the lock with a metal wire that he kept hidden under his cheek pouch.

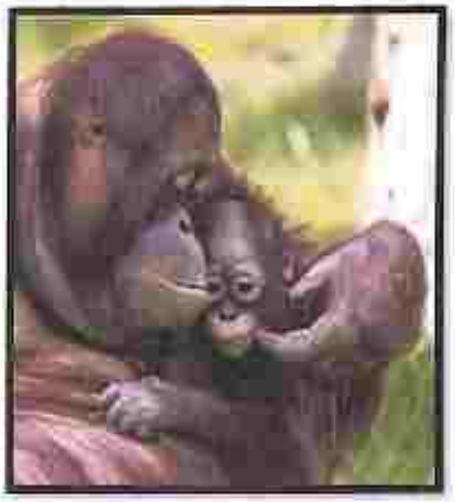
LIFESTYLE

They feast on wild fruits like lychees, mangosteens, and figs, and slurp water from holes in trees. They make nests in trees or vegetation to sleep at night and rest during the day. Adult male orangutans can weigh up to 200 pounds. Flanged males have prominent cheek pads called flanges and a throat sac used to make loud verbalizations called long calls. An unflanged male looks like an adult female. In a biological phenomenon unique among primates, an unflanged male can change to a flanged male for reasons that are not yet fully understood. Orangutans display significant sexual dimorphism; females typically stand 115 cm (3 ft 9 in) tall and weigh around 37 kg (82 lb), while flanged adult males stand 137 cm (4 ft 6 in) tall and weigh 75 kg (165 lb). Compared to humans, they have proportionally long arms, a male orangutan having an arm span of about 2 m (6.6 ft), and short legs. Most of their bodies are covered in coarse hair that is generally red but ranges from bright orange to maroon or dark chocolate, while the skin is grey-black. Though largely hairless, males' faces can develop some hair, giving them a beard. Orangutans have small ears and noses; the ears are unlobed. The mean endocranial volume is 397 cm^3. The braincase is elevated relative to the facial area, which is concave and prognathous. Compared to chimpanzees and gorillas, the brow ridge of an orangutan is underdeveloped. Females and juveniles have rounded skulls and narrow faces while males develop a large sagittal crest and large cheek pads or flanges, which show their dominance over other males. The cheek pads are made mostly of fatty tissue and are supported by the musculature of the face. Mature males also develop large throat pouches and long canines.

SURVIVAL

Along with our other Great Ape cousins; Gorillas, Chimps and Bonobos, they belong to our Hominidae family tree, which stretches back 14 million years. But it's not just their striking red hair that makes them unique among our cousins. As the only Great Apes, Orangutans have adapted to life high in the rainforest canopies. Many of the skills they learn are transmitted through the special bond they have with their mothers. The most extended in the animal kingdom is next to humans. Orangutan mothers usually give birth to one baby at a time, waiting up to 8 years before having another. This gives the young who begin as fully dependent infants plenty of time to learn how to climb and distinguish the hundreds of plants and fruits that make up their diet. Female Orangutans even stay with their mothers into their teen years to learn child-rearing. As they grow up, Orangutans also develop a complex set of cooperative social skills

by interacting with their peers and siblings. The social structure of the orangutan can be best described as solitary but social; they live a more solitary lifestyle than the other great apes. Bornean orangutans are generally more solitary than Sumatran orangutans. Most social bonds occur between adult females and their dependent and weaned offspring. Resident females live with their offspring in defined home ranges that overlap with those of other adult females, which may be their immediate relatives. One to several resident female home ranges is encompassed within the home range of a resident male, who is their main mating partner. Interactions between adult females range from friendly to avoidance to antagonistic. The home ranges of resident males can overlap greatly, though encounters are relatively rare and hostile. Adult males are dominant over sub-adult males, the latter of which keep their distance. Much like ourselves, young orangutans involuntarily mimic the facial expressions and emotions of their playmates with behaviours that closely parallel human smiling and laughter.



SKILLS

Once they finally venture out on their own, orangutans continue to develop their resourcefulness; putting the skill they've learned into practice. Adults build a new nest each night by carefully weaving twigs together, topping them with soft leaves, pillows and blankets. This process requires dexterity, coordination and an eye for design. Orangutans build nests specialised for either day or night use. These are carefully constructed; young orangutans learn from observing their mother's nest-building behaviour. In fact, the nest-building ability is a leading cause for young orangutans to regularly leave their mother. From six months of age onwards, orangutans practise nest-building and gain proficiency by the time they are three years old. The construction of a night nest is done by following a sequence of steps. Initially, a suitable tree is located. Orangutans are selective about sites, though many tree species are used. The nest is then built by pulling together branches under them and joining them at a point. After the foundation has been built, the orangutan bends smaller, leafy branches onto the foundation; this serves the purpose of and is termed the "mattress". After this, orangutans stand and braid the tips of branches into the mattress. Doing this increases the stability of the nest and is the final act of nest-building. Orangutans may add features, such as "pillows", "blankets", "roofs" and "bunk-beds" to their nests. Orangutans also use a variety of tools to make their lives in the jungle easier. They turn branches into fly swatters and back scratchers, construct umbrellas when it rains, make gloves from leafy pads and even use leaves as bandages to dress their wounds. But Orangutan intelligence goes far beyond jungle survival. Research in controlled environments has shown that Orangutans are self-aware, being one of the few species to recognize their own reflections. They also display remarkable foresight, planning and cognition.

Orangutans make their own nests to sleep

In one experiment, researchers taught an orangutan to use a straw to extract his favourite fruit soup from a box. That orangutan was later given the choice between the straw and a grape that can be eaten right away; he chose the straw just in case he was given another box of soup. In another experiment, orangutans figured out how to reach peanuts at the bottom of long tubes by spitting water into them.

While orangutans are able to pass cognitive tests with flying colours, there are certain problems that they need our help to solve.

COMMUNICATION

Orangutans communicate with various vocals and sounds. Males will make long calls, both to attract females and to advertise themselves to other males. These are divided into three parts; they begin with grumbles, climax with pulses and end with bubbles. Both sexes will try to intimidate conspecifics with a series of low guttural noises known collectively as the "rolling call". When annoyed, an orangutan will suck in air through pursed lips, making a kissing sound known as the "kiss squeak". Mothers produce throat scrapes to keep in contact with their offspring. Infants make soft hoots when distressed. Orangutans are also known to produce smacks or blow raspberries when making a nest. Mother orangutans and offspring also use several different gestures and expressions such as beckoning, stomping, lower lip pushing, object shaking and "presenting" a body part. These communicate goals such as "acquire object", "climb on me", "climb on you", "climb over", "move away", "play change: decrease intensity", "resume play" and "stop that"

ENDANGERED SPECIES

Indonesia has the world's highest rate of deforestation and millions of acres of rainforests are burned annually to support the logging and palm oil industries. Deforestation exposes 30,000 orangutans remaining in the wild to poachers. They kill mothers so that the baby orangutans can be sold as exotic pets. But fortunately, the story often doesn't end here. Orphans can be confiscated and given a second chance. In special forest schools, they recover from emotional trauma and continue to develop essential life skills. Against all odds, these orphans demonstrate incredible resilience and readiness to learn.

Bornean and Sumatran orangutans differ a little in appearance and behaviour. While both have shaggy reddish fur, Sumatran orangutans have longer facial hair. Sumatran orangutans are reported to have closer social bonds than their Bornean cousins. Bornean orangutans are more likely to descend from the trees to move around on the ground. Both species have experienced sharp population declines. A century ago there were probably more than 230,000 orangutans in total, but the Bornean orangutan is now estimated at about 104,700 based on the updated geographic range (Endangered) and the Sumatran about 7,500 (Critically Endangered). A third species of orangutan was announced in November 2017. With no more than 800 individuals in existence, the Tapanuli orangutan is the most endangered of all great apes.

In prehistoric times, orangutans inhabited forests as far north as China. Now, due to deforestation and poaching, Bornean orangutans have been restricted to the island of Borneo with their population reduced

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15/6/22

ENVIRONMENTAL STUDIES PROJECT

Topic : Study of ecosystems – pond, river , wetland, forest , estuary and agro ecosystem

Subtopic : Lake Ecosystem

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AECC-2 PAPER

SL.no. **INDEX** **Page :**

ACKNOWLEDGEMENT :

I would like to express my special thanks of gratitude to our Professor , Mr.Raj Kumar Barman for giving me the opportunity to work on this project and for helping me in the successful completion of my project . I have gained a lot of knowledge while working on this project.

I would also like to extend my gratitude to our principal ma'am , Dr. Atashi Karpha for providing me with all the faculty that was needed .

ABOUT THE ECOSYSTEM :

An ecosystem is a system consisting of biotic and abiotic components that function together as a unit. The biotic components include all the living things whereas the abiotic components are the non-living things. Thus, an ecosystem science definition entails an ecological community consisting of different populations of organisms that live together in a particular habitat. Natural sciences like ecology and geography define an ecosystem as a geographic area where organisms, weather, and landscape, work together to form a "bubble of life".

Types of Ecosystems

What are the 4 types of ecosystems?

The four types of ecosystems are terrestrial, freshwater, marine, and artificial. The first three occur naturally in various biomes. The last one is man-made. Ecosystems vary in size — from the micro-ecosystems (e.g. tree ecosystems) to the largest ecosystems such as ocean ecosystems.

anticipating and solving social problems, and in the management of the quality of the environment.

Observation at Rabindra Sarobar lake :

Rabindra Sarobar (formerly known as **Dhakuria Lake**) is an artificial lake in South Kolkata in the Indian state of West Bengal. The name also refers to the area surrounding the lake. It is flanked by Southern Avenue to the

North, Shyamaprasad Mukherjee Road to the West, Dhakuria to the East and the Kolkata Suburban Railway tracks to the south. In the early 1920s, the Calcutta Improvement Trust (CIT), a body responsible for

developmental work in the Kolkata metropolitan area, acquired about 192 acres (0.78 km²) of marshy jungles. Their intention was to develop the area for residential use – improving the roads, raising and levelling some of the adjacent land and building lakes and parks. Excavation work was undertaken with the plan of creating a huge lake. The excavation of the lake was led by CIT's first chairman Cecil Henry Bompass, Kolkata Municipal Corporation's chief-engineer M.R. Atkins and a young bengali passout from Shibpur B.E. College Prabodh Chandra Chatterjee and initially it was known as Bompass Lake. Originally known as Dhakuria Lake, in May 1958, CIT renamed the lake as Rabindra Sarovar, as a tribute to Bengali writer and Nobel Laureate, Rabindranath Tagore. The area around this excavated lake was later developed to build recreational complexes, which included

children's parks, gardens and auditoria. Today the lake and its surrounding areas are one of the most popular recreational areas in Kolkata. 73 acres

Eye-browed Thrush, spotted first time in India at Rabindra Sarovar in 2012 |

Ferruginous Flycatcher | Sourav De

(300,000 m²) are covered by water, while shrubs and trees, some of which are more than 100 years old, occupy the rest of the area. A partial tree census in 2012 recorded 50 different species.

South Kolkata's Rabindra Sarobar lake—termed as one of the two lungs and kidneys of the city— is hosting the first ever open-air photo exhibition of birds at their habitat till January 25. This first-of-its-kind exhibition features photos of some of the rarest bird species spotted around this 192-acre lake, in the heart of a bustling city. The exhibition is seen as a significant step to identify the country's first urban bio-diversity zones.

The Rabindra Sarovar lake, earlier known as the Dhakuria lake, would have remained hitherto unknown, if not for wildlife enthusiasts and the city's amateur birders. A near 3,000 strong gang of birders, who go on social media as 'Biodiversity of Rabindra Sarobar Group', has documented 110 species of rare and migratory birds in the lake area in the last two years.

The birder's group, comprising of the young and old, retired and professionals, has got the support of the Lions Club, the state forest authority and the Kolkata Municipal and Development Authority, to host this photo exhibition of 50 of their rarest clicks. **The green cover has 11,000 trees, of which 7,500 are over 75 years old. This, along with the water bodies, create an ecosystem that attracts local and migratory birds. Till date, 107 species of birds, which is about 8 per cent of the total species found in India, have been recorded. It consists of 69 resident birds, 14 local migrants, 23 long-distance migrants and one summer visitor. The area is a favourite hunting ground for birders and photographers — and they come armed not with guns but cameras and lenses.**

Conclusion:

We often forget how much humans depend on nature. Even city-dwellers living in modern skyscrapers need air to breath ,water to drink and food to eat all of which are provided by nature . True , we can buy bottled water and ready to eat meals in supermarkets, but they were not produced there . Some fruits and vegetables for example, only grow in tropical countries and across the globe in refrigerated containers, to arrive just to local markets . All drinking water ultimately comes from a natural source since we do not have the technology to produce large amounts of water in laboratory . The same applies to the air we breathe ,which is purified and oxygenated by plants .So , when we speak about preserving nature we are also talking about preserving ourselves . Reducing our ecological footprints means placing less demand on nature (The 3RS : Reduce, Reuse and Recycle).
Here are some ways that you can do this:

- Recycle your rubbish and participate in or help organize recycling campaigns.
- Avoid littering and participate in or help organize litter clean-ups.
- Use less plastic by, for example, carrying a reusable water bottle, saying no to disposable straws and cutlery, avoiding plastic toys, and bringing your own shopping bags.
- Swap toys, movies, and books instead of buying new ones.
- Donate, recycle, and repair electricity by turning off lights and electronic devices when not in use, using energy-saving light bulbs, and hanging clothes to dry.

Hence, understanding the importance of nature and biodiversity for our own well-being can really help us to help nature.

ENVS project

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Topic : Visit to a local polluted site (urban)

Introduction

What is pollution?

The term "Environmental Pollution is very common nowadays.

Presence of matter whose nature, location Or quantity directly or indirectly alters characteristics or process of any part of the environment and causes damage to the condition of animals, humans and plants is called pollution. It is something introduced into the environment that is dirty, unclean or has harmful effects

Pollution can occur naturally, for example through eruptions of volcano, Or it can occur as a result of human activities, such as the spilling of oil or disposal of industrial waste. Pollution can be mainly classified into 4 types

1. Air pollution
2. Sound pollution
3. Soil pollution
4. Water pollution

These 4 types of pollution cause a lot of damage to our earth,. They cause damage to human health, plants and wild lives. But they have some preventive measures which can reduce the pollution

The main Topic that this project would address

This project deals with my experience of visiting a local industrial site and analysing the types of pollutions I witnessed there and the preventive measures which can lead to it's reduction

The industrial site is situated in our locality within our vicinity. Southern Generating Station of CESC not only emits tremendous smokes but also acts as a main cause for water pollution in our local canals.

This project would address the types of pollutions I witnessed by visiting the local industrial site and it would also discuss the causes and effects of those pollutions and how to reduce it to safeguard the interests of the environment.

Air pollution

What causes air pollution , the effects and preventive measures

Air pollution is one such form that refers to the contamination of air, irrespective of indoor or outdoor. A physical, biological or chemical alteration to the air in atmosphere can be termed as air pollution. It occurs when any harmful gases, dust, smoke enters into the atmosphere and makes it difficult for humans, plants and animals to survive, as the air becomes dirty

Causes

- Air pollution is caused by these sources
- Sulphur dioxide emitted from Combustion of fossil fuels is one of the major reasons for air pollution
- Manufacturing industries release large amounts of carbon monoxide oxide, hydrocarbon, organic compounds and chemicals into the air
- The industrial site that I visited, emitted a cluster of black smoke containing all these harmful gases which not only polluted the air but also made vegetation and fertility impossible in the nearby areas.
- The whole area suffers from smells of nauseating smell. It affects the elderly and the residents of the vicinity area are hesitant to open windows throughout the course of the day.

Effects

The effects of air pollution are alarming in nature

- Air pollution creates several respiratory and heart problems along with lung cancer and many other fatal diseases
- Children in areas exposed to air pollution are more likely to suffer from pneumonia and asthma
- Along with these heart problems, witnessed by the residents of the nearby area, the pollutants are also responsible for adding to the threat of global warming which would lead to natural catastrophic disasters such as rising sea level, displacement of habitat etc.
- Harmful gases like Nitrogen oxides and Sulphur di oxide are released into the air which not only hampers the air cycle but also leads to possibilities of acid rain.

- Possible depletion of ozone layer is also one of the major threats posed by air pollution The area surrounding the industrial site is thus not at all suitable for healthy habitation or a disease free life

Preventive measures that can be taken to reduce the air pollution

- The public modes of transportation can be reduced in the vicinity area to lesser the burden of pollutants the air around the industrial site is already carrying.

- More plants and trees should be planted surrounding the area of this thermal power plant

- The height of the chimneys producing smoke from the industrial site can be increased so that the local inhabitants are secured from air borne diseases

- Some preventive measure to lessen the introduction of toxic substances into the air should be taken.

Dust pollution along with air pollution

Along with air pollution particles of dust are also contaminating the air around this industrial site. Nuclear vision due to fog like impenetrable blurry air is common around this area.
Moreover the occurrence of breathing trouble due to the presence of floating dust particles in the air is also recurrent in this area.
The uninhabitable condition of the air due to continuous emission of industrial toxic wastes in the air has reduced the immediate locality besides this industrial site into a polluted mess.

Water pollution

Along with air pollution, the excretion process of toxic wastes of the factories is channelled by draining the wastes through pipes into the local waterbodies and even into the river Ganges located nearby. It causes serious water pollution

The presence of harmful or objectionable material in sufficient quantity to measurably degrade water quality is known as water pollution. Over two thirds of earth's surface is covered by water, less than a third is taken up by land. In a sense, our oceans, rivers and other inland water bodies are being poisoned by human activities. So, the water quality becomes poorer which destroys aquatic life.

Causes

- Industries produce large amount of waste which contains toxic chemicals and pollutants. Not having proper waste management system and drainage, they drain the water in fresh water and change the temperature of water
- The sewage and waste water mingles with the fresh water
- Mining activities and several metal wastes and sulphides are released into the water which pollutes it

Effects

- Having poor screening and purification practises, people often get water borne disease outbreaks

- Aquatic life is killed off which causes environmental misbalance

- Water pollution breeds algae growth. This algae attack fishes and other aquatic animals by absorbing and reducing their oxygen supply

Prevention

- Proper industrial waste management systems should be done
- Separate channels should be made to excrete the toxic wastes rather than to damp it in Ganges
- Proper purification if the polluted water should be done by the purification authorities.

Sound pollution

The usage of coal crushes in the industrial power plant not only produces a large number of coal ashes but also generates a cacophonous amount of noise which causes sound pollution

A form and level of environmental sound that is generally considered likely to annoy, distract or even harm other people is sound pollution. It is also known as noise pollution. It takes place when there is an excessive amount of noise or an unpleasant sound that causes temporary disruption in the natural balance.

Causes

- The usage of big machines in Industries, produces a large amount of noise
- Various equipment like compressors, generators, exhaust fans, grinding mills also participate in produce big amount of noise

Effects

- Hearing problems occur due to sound pollution
- Excessive sound pollution causes disruption of sleep, constant stress in local areas
- Hypertension , blood pressure, cardio vascular disease and stress related heart problems occur due to sound pollution
- Sound pollution thus poses harmful effects to both body and mind

Prevention

- Laws a d efforts should be strengthened to limit sound pollution
- Industries and transportation areas can be separated into zones to reduce sound pollution
- Public awareness about the effects of sound pollution should be arisen.

Soil pollution

Soil pollution is the contamination of soil with harmful elements and substances that can adversely affect the quality of the soil and the health of those living on it

Causes

- Industrial activities has been the biggest contributor to this problem in the last century, especially since the amount of mining and manufacturing has been increased
- The coal ashes generated from coal extractors in the Industrial site mingles with the soil and de generates fertility of the local soil


NO Water Life !
SUCIDE
AND FOR U

Effects

- Crops and plants are destroyed
- Fertility of the soil is de generated.
- The death of soil organisms in the soil can lead to alterations in soil structure
- The emissions of toxic dust pollutes the environment and causes serious effects on health of some people

Prevention

- Waste should be disposed of properly to reduce soil pollution
- Waste that is biodegradable should be broken down in a controlled environment before being disposed off

Conclusion

My visit to the industrial site opened my eyes to the various types of pollutions taking place around the locality. It made me think of the multiple other industrial sites and manufacturing factories scattered all over the world and the type of pollution and destruction it causes to our planet earth. It is not possible to eradicate the existence of these industrial sites as they are present to serve human needs and necessities, the amount if pollution caused by them can be for sure trimmed down

Our beautiful earth is subjected to destruction majorly due to human activities. The most important aspect of our earth, that is environment, is also open to destruction and imbalance due to the several types of pollutions. Whereas it is not yet possible to completely erase away the destruction s caused by pollution, for sure it can be restrained and tackled with care by raising awareness.
After all, it is our responsibility to clean and preserve the home that we reside inside.

Bibliography

- From Wikipedia and other internet resources
- Some articles on pollution.

15/6/12

ENVIRONMENTAL STUDIES PROJECT

TOPIC- STUDY OF COMMON PLANT AND BASIC PRINCIPLES OF IDENTIFICATION

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I would also thank the principal for providing me with all the facilities required in order to successfully complete this.

INDEX

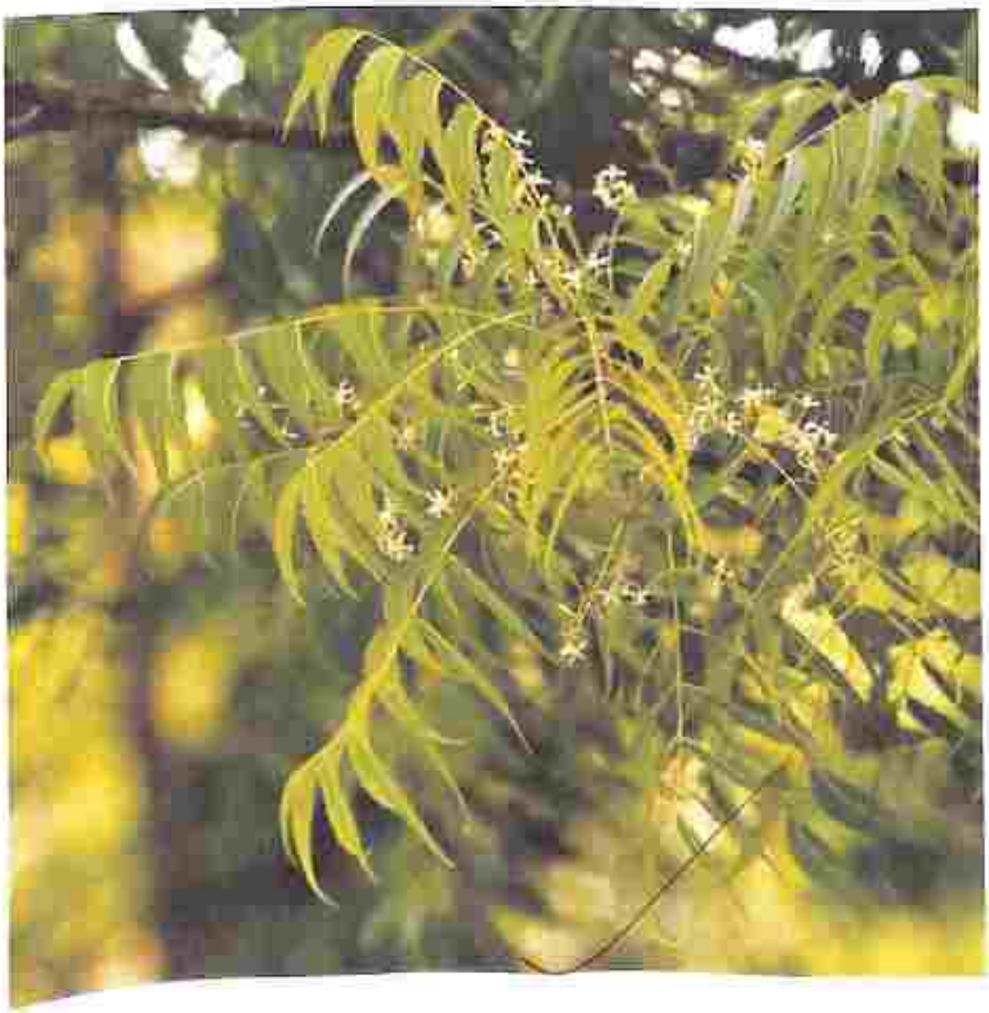
STUDY OF COMMON PLANT (NEEM TREE) AND BASIC PRINCIPLES OF IDENTIFICATION

Location of study: Dhakuria, Kolkata, West Bengal.

Date of study: 27.05.2022

Appliances used: Internet, laptop,camera, Microsoft Word 2013.

Neem (*Azadirachta indica*), also called nim or margosa, is a fast-growing tree of the mahogany family (Meliaceae), valued as a medicinal plant, as a source of organic pesticides, and for its timber. Neem is likely native to the Indian subcontinent and to dry areas throughout South Asia. It has been introduced to parts of Africa, the Caribbean, and numerous counties in South and Central America. The plant has long been used in Ayurvedic and folk medicine and is used in cosmetics and in organic farming applications.



Plant description

Neem trees can reach 15–30 metres (49–98 feet) in height and have attractive rounded crowns and thick furrowed bark. The compound leaves have toothed leaflets and are typically evergreen but do drop during periods of extreme drought. The small fragrant white flowers are bisexual or staminate (male) and are borne in clusters in the axils of the leaves. The fruit is a smooth yellow-green drupe and has a sweet-flavoured pulp.Neem is usually grown from seed but can be propagated from cuttings or root suckers. The plant is hardy and resilient and grows well in poor, rocky soils. Neem tolerates a wide variety of environmental conditions but cannot survive freezing temperatures or being waterlogged.

Uses

Nearly all parts of the neem tree are useful, and many of its medicinal and cosmetic uses are based on its antibacterial and antifungal properties. Neem is commonly used in shampoos for treating dandruff and in soaps or creams for skin conditions such as acne, psoriasis, and athlete's foot. It is also a component in some toothpastes and mouthwashes, especially in the Indian subcontinent, and young twigs are used directly as crude toothbrushes in rural areas. Neem leaves have long been used as a traditional treatment for diabetes, and there is some clinical evidence suggesting that it may help control blood sugar levels. Neem oil and neem bark and leaves are unsafe for consumption by pregnant women and can cause miscarriage.Oil extracted from the seeds can be used directly as an insect and mite repellent, insecticide, and fungicide and is the source of many commercial pesticide products, including dusts, granules, and concentrates. The primary active insecticidal ingredient, azadirachtin, works to disrupt the hormones involved with insect molting, preventing larvae from developing properly into adults, and is a feeding inhibitor. Neem oil can kill soft-bodied insects on contact and decreases mating and reproductive behaviours, reducing pest fecundity. As a fungicide, neem oil is used to control rust, black spot, mildew, scab, anthracnose, and blight. Given that neem oil breaks down quickly with exposure to ultraviolet light, repeated applications are often necessary. Neem-based pesticides generally have low toxicity for mammals and are common in organic farming applications.

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ENVIRONMENTAL STUDIES PROJECT

28

TOPIC- STUDY OF COMMON PLANTS, INSECTS, FISH, BIRDS, MAMMALS, AND BASIC PRINCIPLES OF IDENTIFICATION.

SUBTOPIC- STUDY OF AN INSECT; BUTTERFLY

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INDEX

INTRODUCTION

Insects are an invertebrate animal of the class 'Insecta' of the phylum 'Arthropoda'. Insects are essential for the functioning of the ecosystem. They are found almost on any place and on anything. The study of insects is a science called entomology. Scientists have identified nearly a million different species of insects and expect that there may be many more yet to be discovered. Like other Arthropods, an insect has a large outer covering, a segmented body and jointed legs. Adult insects have wings and are the only flying invertebrates. Most of the time insects are usually referred as pests or disease carrier such as bed bug, mosquito, fleas etc. However, there are many insects which are beneficial for the ecosystem including butterfly, including butterfly, moth etc. Increasing knowledge about the damage done by the insects, and at the same time their role in the environment emphasizes the necessary for correctly identifying the pests and knowing about their life habitats.

AREA OF STUDY

The area is Haldia Township, a town in East Medinipur, a district of West Bengal in India.

METHOD OF STUDY

While making this project, I particularly studied about a group of butterflies and researched about their condition in Haldia and the importance of butterflies in the environment.

BUTTERFLY

Butterflies are a vibrant, beautiful, diverse group of insects belonging to the order 'Lepidoptera' which means 'scaly wings'. Butterflies along with moths, and skippers belong to the group Lepidoptera. Butterflies are found all over the world. There is approximately 20,000 – 25,000 species worldwide, which live in many different habitats from the beach dunes to the mountains. The life expectancy of a butterfly changes depending upon the environmental factors.

Six families of butterflies are present in India.

- Papilionidae – Swallowtail butterflies (84 species)
- Hesperiidae- Skipper butterflies (277 species)
- Pieridae- Yellow and white butterflies (81 species)
- Riodinidae- Punches and judies (16 species)
- Lycaenidae- Blues, hairstreaks and gossamer-winged butterflies (318 species)
- Nymphalidae- Brush-footed butterflies (439 species)

In India, the most common butterflies are:

Common Indian Crow (Euploea Core)

Common Grass Yellow (Eurema Hecabe)

Common Tiger (Danaus Genutia)

Common Jezebel (Delias Eucharis)

Mottled Emigrant (Catopsilia Pyranthe)

IMPACT ON THE BUTTERFLIES

- The number of butterflies seems to have reduced in the town over the years due to increasing urbanisation and pollution levels.
- Since Haldia Township is an industrial zone, the harsh environment created by the industries lowered the survival chance of the butterflies.
- However, after the cyclone 'Amphan' hit West Bengal, it had a huge impact all over the state. Haldia was badly destroyed. Huge trees toppled over and the number of flowering plants, shrubs and herbs reduced. Due to which butterfly breeding also reduced.
- Also, a minor change in the habitat may also lead to migration or local extinction of native butterflies' population.

EXTINCT SPECIES OF BUTTERFLY IN INDIA

Tiger Hopper (Ochus Subvittatus)

Forest Hopper (Asticopterus Jama)

Great Yellow Sailer (Neptis Radha)

SPECIAL CHARACTERISTICS

Butterflies play a crucial role in the ecosystem. Most of the people are unaware of the fact that, how important butterflies are for the environment. All the creatures have some role to play, so do butterfly. So, I particularly choose to make a project on butterflies, to make people aware the importance of butterflies in the ecosystem. Also, the making of this project helped me to gain more knowledge about butterflies. People adore butterfly for its beauty but they don't know its importance. It is very important to make people aware of their potential.

PRECAUTIONARY MEASURES

- Nectar plant and host plants are important for butterfly habitat. So, more and more flower bearing plants and shrubs like hibiscus, sunflower, marigold, petunia should be planted. These are the plants where eggs are laid, larvae, caterpillars and pupa are formed.
- The use of chemical components, insecticides, pesticides should be controlled.
- An initiative should be taken to set up butterfly conservatories in order to conserve the breeding of endangered and threatened species.
- Also butterfly parks should be created to spread awareness about butterflies, their caterpillars, their interactions with plants, and connecting people with insect diversity.

CONCLUSION

Haldia industrial zone has a smaller number of butterflies species. Industrialized area offered a relatively harsh environment to butterflies. So, measures should be taken to keep an eye on the decreasing species of butterflies. The increasing use of chemical components, pollution in the environment has led to decline of butterfly species. So, steps should be taken in order to conserve the endangered species of butterflies and control the declining rate of butterflies. If butterflies go extinct, it would be a tough situation to carry on the day-to-day activities.

28
15/6/22

GOKHALE MEMORIALS GIRLS COLLEGE

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TOPIC: AIR POLLUTION IN KOLKATA

INTRODUCTION.

Pollution is the introduction of harmful materials into the environment. These harmful materials are called pollutants. Pollutants can be natural, such as volcanic ash. They can also be created by human activity, such as trash or runoff produced by factories. Pollutants damage the quality of air, water, and land.

Air pollution is the contamination of air due to the presence of substances in the atmosphere that are harmful to the health of humans and other living beings, or cause damage to the climate or to materials. There are many different types of air pollutants, such as gases including ammonia, carbon monoxide, sulphur dioxide, nitrous oxides, methane, carbon dioxide and chlorofluorocarbons, particulates both organic and inorganic, and biological molecules. Air pollution can cause diseases, allergies, and even death to humans; it can also cause harm to other living organisms such as animals and food crops, and may damage the natural environment, for example, climate change, ozone depletion or habitat degradation or built environment, for example, acid rain. Both human activity and natural processes can generate air pollution.

AIMS & OBJECTIVES OF THE STUDY.

The aim for this study on air pollution is to understand the link between air pollution levels and chemical composition and to investigate and assess the effects of air pollution on the distribution of related health impacts, socio-economics and welfare in Indian cities, such as Kolkata and other countries all over the world as well.

Kolkata being a very crowded city with a high population makes it even worse for air to be fresh as it has high number of vehicles emitting poisonous gases, making it dangerous for people leaving hear to breathe and having serious health issues. Which is why the major objective should be the reduction of these gases by cutting off the private vehicles and instead using the public ones.

And the main objectives is to aware people about the consequences of air pollution and how to prevent air pollution as it affects health of people.

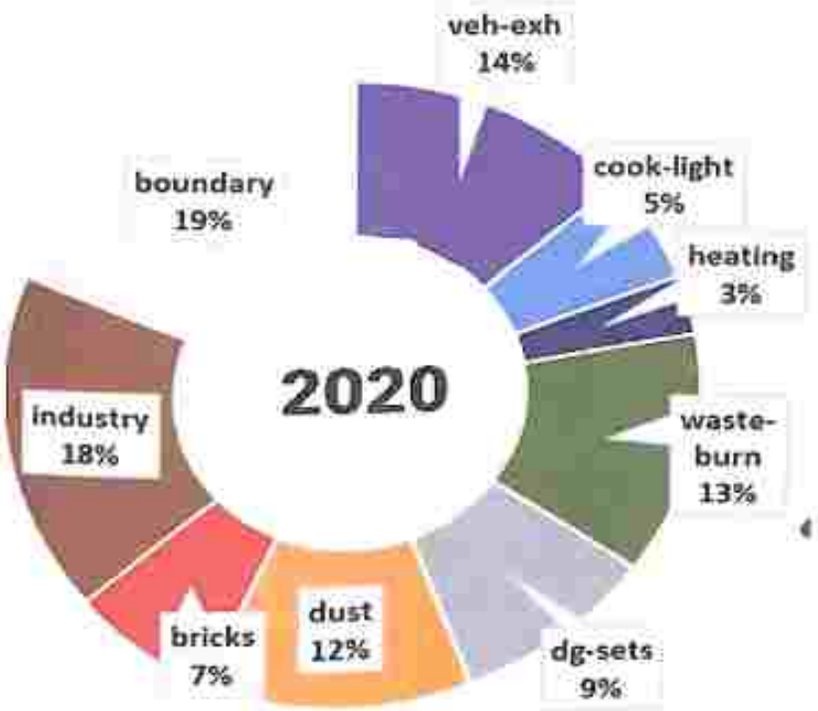
CAUSES.

Several factors cause air pollution in Kolkata and among them the main factor is transportation, where the abundance of poorly-maintained vehicles, use of petrol fuel, and poor controlling are making transportation the major air polluting sector.
Additionally, there are three thermal power plants operating in and around Kolkata, and some small-scale industries which also affects the air quality.

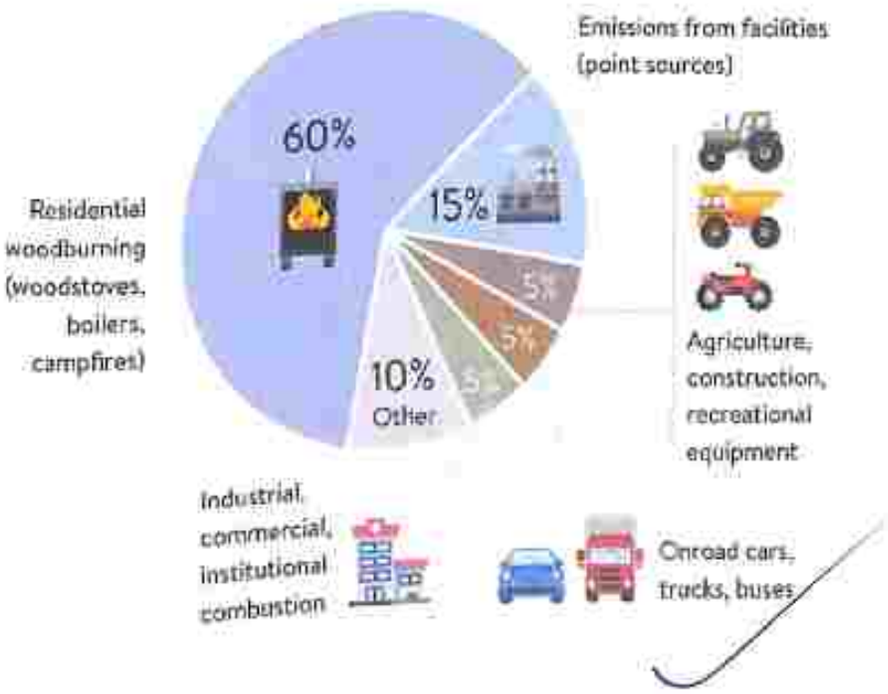
An analysis of different sources of air pollution in Kolkata has revealed that motor vehicles are the leading contributor to air pollution which is followed by industry, waste burn and dust particles, etc. respectively.

The vehicular pollution in Kolkata is attributed to a large number of automobiles plying daily over only 6% available road space, causing congestion which reduces the average vehicular speed and also results in heavy vehicular emission. The number of vehicles has a growth. The vehicular population in Kolkata has increased at an annual growth rate of 4%. Private cars have increased. The heavy concentration of private motor vehicles has been one of the key reasons for congestion, increased travel times, pollution, and accidents.

In terms of available surface road length, Kolkata has the least coverage, with about 1416 km, whereas the vehicular density is one of the highest, nearing 823/kkm.



SOURCES CONTRIBUTING TO AIR POLLUTION.



CONSEQUENCES.

The pollution peaks during night and early morning are higher than the day time peak. Overall pollution levels during night have been five times higher than the standard.

High health risk of people living in Kolkata. According to the Comprehensive Mobility Plan, Kolkata, around 70 per cent of Kolkata's 18 million inhabitants suffer from respiratory problems such as asthma and lung cancer, which are caused by pollution from the city's chaotic transport sector. Studies carried out by Chittaranjan National Cancer Research Institute have found more than 60 per cent children in Kolkata with lung function impairments compared to 24 per cent in cleaner areas. Healthy individuals and non-smokers also show respiratory symptoms and lung function impairment.

Kolkata needs to curb pollution from all sources including industry, trash burning, construction dust, road dust among others to meet clean air target. But vehicles need special attention.

Kolkata is placed among the most air polluted cities in the world with respect to SPM. In the analysis of the air pollution data of city, we also found that the concentration of SPM is much higher than the other pollutants. Much of the pollution, which was discussed in the earlier sections, is due to the economic and industrial development of the city and the appearance of versatile industries, such as the paper and pulp, organic and inorganic

REMEDIAL MEASURES.

1. Using public transports:

Using public transport is a sure short way of contributing to less air pollution as it provides with less gas and energy, even carpools contribute to it. In addition to less release of fuels and gas, using a public transport can also help in saving money.

2. Turn off the lights when not in use:

The energy that the lights take also contribute to air pollution, thus less consumption of electricity can save energy. Use energy saving fluorescent lights to help the environment.

3. Recycle and Reuse:

The concept of recycle and reuse is not just conserve resources and use them judicially but also is helpful for air pollution as it helps in reducing pollution emissions. The recycled products also take less power to make other products.

4. No to plastic bags:

The use of plastic products could be very harmful to the environment as they take a very long time to decompose, due to their material made up of oil. The use of paper bags instead is a better alternative as they decompose easily and are recyclable.

5. Reduction of forest fires and smoking:

The collecting of garbage and getting it on fire in dry seasons or dry leaves catching fires is a huge factor for causing air pollution.

moreover smoking also causes air pollution and causes the air quality to worsen along with obviously damaging one's health.

6. Use of fans instead of Air Conditioner:

The usage of AC's takes a lot of energy and emits a lot of heat which is bad for the environment. AC's also take a lot of power and energy to work as compared to fans.

7. Use filters for chimney:

The gas that is emitted from fireplaces in homes and factories are extremely dangerous for air pollution and harms the air quality severely. The use of filters should be used at least if the consumption couldn't be lessened, this will help to reduce the effect of harmful gases absorbing in the air.

8. Avoid usage of crackers:

The use of crackers during festivals and weddings is sadly one of the biggest contributors to air pollution, leading to a layer of smog which is extremely harmful for health. So, practice of no crackers should be implemented.

9. Avoid using of products with chemicals:

Products that use the chemicals in their usage or smell strongly, like paints or perfumes should be used less or outside the house. There can also be an alternative to use products with low chemical content and organic properties.

10. Implement Afforestation:

Last but not the least, plant and grow as many trees as possible. The practice of planting trees provides a lot of benefits to the environment and helps with the release of oxygen.

CONCLUSION.

While the effects of air pollution on materials, vegetation, and animals can be measured, health effects on humans can only be estimated from epidemiological evidence. Most of the evidence comes from occupational exposure to much higher concentrations of pollutants than the general public is exposed to. Moreover, the health effects of smoking and other lifestyle characteristics and exposures confound the observations of air pollutant effects. Ethical considerations preclude deliberate exposure of human subjects to concentrations of pollutants that might produce adverse effects, so evidence from sources other than epidemiology is virtually impossible to obtain. All of the evidence suggests that air pollutants threaten human health and well-being to an extent that control of these pollutants is necessary.

And considering how polluted Kolkata is getting day by day we definitely need some major measures to protect the health of people living in here such as by cutting down the use of private vehicles and using the public ones.

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Naming few in the following :

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www.wikipedia.com

www.slideshare.net

26

NAME – AKANSHA SARKAR

SEMESTER – II

UNIVERSITY ROLL NO. – 212013-11-0084

REGISTRATION NO. – 013-1211-0109-21

SUBJECT – ENVIRONMENTAL STUDIES

SUBJECT CODE – AECC 2

COLLEGE – GOKHALE MEMORIAL GIRLS' COLLEGE

ENGA

INDEX

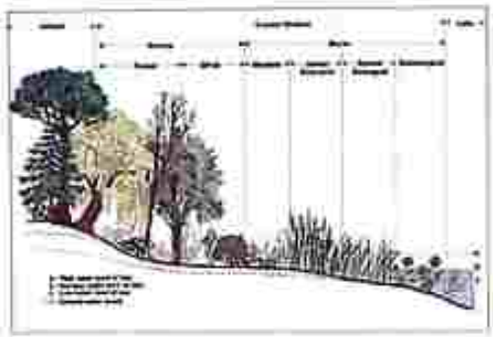
STUDY

OF

ECOSYSTEMS :

(WETLAND)

INTRODUCTION



➢ Wetlands come in different sizes, types, locations. Clockwise from top left: Upland vs. wetland vs. lacustrine zones; Freshwater swamp forest in Bangladesh; Peat bogs are freshwater wetlands that develop in areas with standing water and low soil fertility; A water control structure gauge in a wetland.

A wetland is a distinct ecosystem that is flooded by water, either permanently (for years or decades) or seasonally (for weeks or months). Flooding results in oxygen-free (anoxic) processes prevailing, especially in the soils. The primary factor that distinguishes wetlands from terrestrial land forms or water bodies is the characteristic vegetation of aquatic plants, adapted to the unique anoxic hydric soils. Wetlands are considered among the most biologically diverse of all ecosystems, serving as home to a wide range of plant and animal species. Methods for assessing wetland functions, wetland ecological health, and general wetland condition have been developed for many regions of the world. These methods have contributed to wetland conservation partly by raising public awareness of the functions some wetlands provide.

Wetlands occur naturally on every continent, except for Antarctica. The water in wetlands is freshwater, brackish or saltwater. The main wetland types are classified based on the dominant plants and/or the source of the water. For example, marshes are wetlands dominated by emergent vegetation such as reeds, cattails and sedges; swamps are ones dominated by woody vegetation such as trees and shrubs (although reed swamps in Europe are dominated by

Many ecologically and economically important species call wetlands home for at least part of their lives. For instance, commercially important fishes and shellfish, including shrimp, blue crab, oysters, salmon, trout, and seatrout rely on, or are associated with, wetlands. Wetlands are also critical habitat for migratory birds and waterfowl, including ducks, egrets, and geese. In fact, more than one-third of the species listed as threatened or endangered in the United States live solely in wetlands and nearly half use wetlands at some point in their lives (USEPA 1995). As such, many wetlands are often recognized as important conservation or restoration targets.

While covering only 6% of the Earth's surface, wetlands provide a disproportionately high number of ecosystem services, in addition to maintaining biodiversity. For instance, wetlands also mitigate floods, protect coastal areas from storms, improve water quality, recharge groundwater aquifers, serve as sinks, sources, or transformers of materials, and produce food and goods for human use. When evaluating the economic value of these various functions, Costanza et al. (1997) concluded that the economic value provided by wetland ecosystems exceeded that provided by lakes, streams, forests, and grasslands and was second only to that provided by coastal estuaries.

Increasing recognition of the value and importance of wetland ecosystems over the last century led to the creation of laws, regulations, and plans to restore and protect wetlands around the world. In the US, wetlands protection largely falls under the Clean Water Act of 1972, which requires permits for dredging and filling activities in most US wetlands and monitors water quality standards. Initiatives such as the "no-net-loss policy," which was recommended by the National Wetlands Policy Forum in 1988, aim to limit further wetland loss in the US, requiring wetland creation, restoration, or mitigation to offset wetland losses due to human activity. With mitigation, wetlands are created, restored, or enhanced to offset or replace wetland loss due to development. The Ramsar Convention, an international treaty aimed at conserving wetlands, requires member countries to develop national wetland policies, to establish wetland reserves, and to designate one or more wetlands as an area of international importance. All these efforts are designed to protect or conserve wetlands and the ecosystem services they provide.

Abiotic Factors that Influence Wetland Ecosystems

Water

The movement, distribution, and quality of water is the primary factor influencing wetland structure and function. To be classified as a wetland, the presence of water must contribute to the formation of hydric soils, which are formed under flooded or saturated conditions persisting long enough for the development of anaerobic conditions during the growing season (NRCS 1998). Water conditions in wetlands can vary tremendously with respect to the timing and duration of surface water inundation as well as seasonal patterns of inundation.

In coastal wetlands, tidal influence drives the movement and distribution of water and can range from permanent flooding in subtidal wetlands to less frequent flooding in others, with changes in water level occurring daily or semi-daily. Inland wetlands, which lack daily tidal influences, can also be permanently flooded on one extreme or intermittently flooded on the other extreme, with fluctuations over time often occurring seasonally. It is the balance of water inflows and outflows, or the water budget (Figure 1), as well as the geomorphology and soils that determine the timing, duration, and patterns of flooding in a wetland.

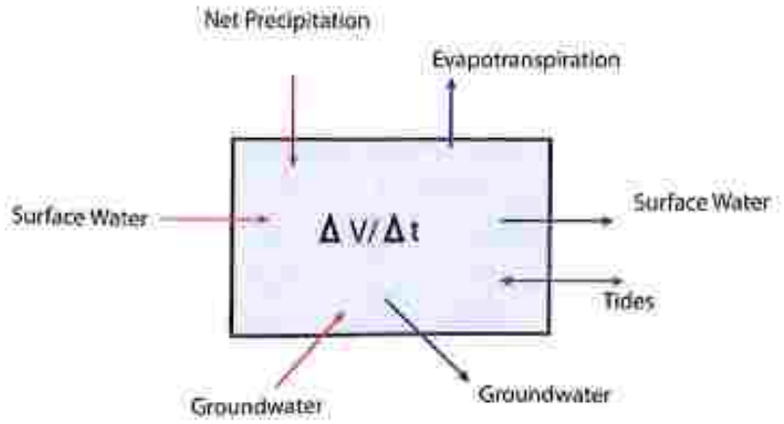
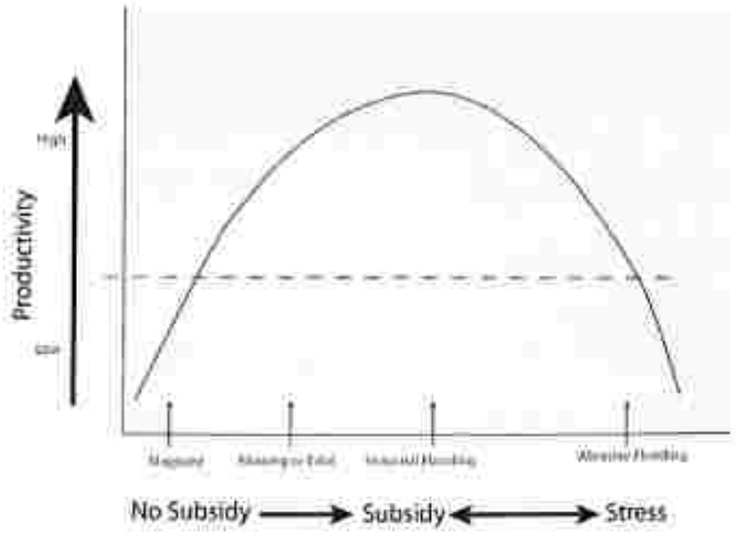


FIGURE 1 : Hypothetical wetland water budget

For most wetlands, the sources of inflows (e.g., precipitation, surface flow, groundwater flow, tides) and outflows (e.g., evapotranspiration, surface flow, groundwater flow, tides) change over time. As such, hydrology is rarely stable but fluctuates over time resulting in pulsing hydroperiods. Hydrologic pulses can alter productivity along a flooding gradient by altering the extent of flood subsidies and stresses in a wetland (Figure 2). When subsidies are high but stress is relatively low, pulses can promote productivity by introducing water, sediments, and nutrients while also removing waste materials and toxins.

Flooding can affect the physiochemistry of wetlands in various ways. Water can introduce or remove sediment, salt, nutrients or other materials from wetlands, thereby influencing its soil and water chemistry. Hydrology also influences the structure and function of wetland

ecosystems through its influence on species richness, productivity, rates of organic matter accumulation, and nutrient cycling. Hydrology may restrict species richness in areas subject to long-term flooding while enhancing it in areas with variable or pulsing hydroperiods. Similarly, productivity is typically lower in permanently flooded, stagnant wetlands, or in drained wetlands than in slow-flowing or seasonally flooded wetlands (Conner & Day 1982). The anaerobic conditions created under these inundated or flooded conditions often limit decomposition rates, thereby promoting organic matter accumulation in soils, and can alter reduction-oxidation reactions controlling nutrient transformations in wetland soils.



➢ FIGURE 2 : Subsidy-stress model illustrating the relationship between ecosystem productivity and wetland hydrology along a flooding gradient

Oxygen Availability

The inundation or saturation of wetland soils by water leads to the formation of anaerobic conditions as oxygen is depleted faster than it can be replaced by diffusion. The rate of oxygen loss in flooded soils can vary depending on other soil conditions, such as temperature and rates of microbial respiration. In most wetlands, small, oxidized layers of soils may persist on the surface or around the roots of vascular plants, but generally, anaerobic, or reduced, conditions prevail.

The prevalence of anaerobic conditions in wetlands has a tremendous impact on their biogeochemistry, with important implications for carbon, nitrogen, phosphorus, iron, manganese, and sulfur transformations. Wetlands can function as sources, sinks, or transformers of these materials, depending on inflows, outflows, and internal cycling rates. One of the most important biogeochemical cycles in wetlands is the nitrogen cycle, and while the

potential transformations are not unique to wetlands, the dominance of anaerobic transformations does set wetlands apart from other ecosystems. One such anaerobic transformation is denitrification, in which nitrate is lost to the atmosphere via conversion to nitrogen gas or nitrous oxide by bacteria (Mitsch & Gosselink 2007). In many wetlands, nutrient availability is dramatically altered by agriculture or other practices that increase nutrient loading, contributing to changes in ecosystem structure and function. Through processes like denitrification and plant uptake, wetlands can help remove some of this excess nitrogen introduced to wetland and aquatic ecosystems.

CONCLUSION

Because of the predominance of water and anaerobic conditions in wetlands, the organisms living there, especially rooted plants, often exhibit remarkable adaptations to deal with the stresses imposed by flooding. These adaptations, including pressurized gas flow, creation of

oxidized root zones, and anaerobic respiration, allow wetland plants to remain productive under otherwise stressful conditions, making wetlands among the most productive ecosystems in the world (Whittaker & Likens 1973). This high primary production, in turn, supports high rates of secondary production, rates that can exceed those of terrestrial ecosystems (Turner 1977).

Wetlands exist along soil-moisture gradients, with wetter soils at lower elevations and drier soils at higher elevations. Wetland plant communities develop in response to this environmental gradient based primarily on their individual abilities to tolerate flooding and anaerobic soils but also in response to biotic interactions with other species. Establishment of plant species along an environmental gradient can contribute to sharp plant zonation patterns, as can be seen in coastal wetlands where species separate out along an elevation gradient in response to differences in flooding and salinity

The development of these productive and often diverse plant communities fuels complex food webs that not only sustain microbial communities through large inputs of detritus to wetland soils but also support diverse communities of animals that utilize wetlands for part or all of their lives. Detritivores, such as shredding insects and crayfish, can utilize dead plant material as their primary energy source, while others (e.g., marsh periwinkle snails) help process organic matter for subsequent use by other organisms. Herbivory of algae by invertebrates and small fish and of plant biomass by some invertebrates, birds, and mammals (e.g., grasshoppers, geese and muskrats) is a significant energy source for primary consumers in many wetlands. Secondary production by these primary consumers supports higher trophic levels, including predatory insects, fishes, reptiles, amphibians, birds, and mammals.

As awareness of wetland ecosystem services and values has increased, wetland ecological research also has increased. Wetland ecologists examine interactions between species and their environment, recognizing the important role that hydrology plays in shaping the physicochemical environment and biological communities in wetlands. Within that framework, ecologists can examine a near-endless array of ecological topics, from the physiology of species coping with flooding stress and anoxia to species interactions, to the impacts of and feedbacks to global climate change. The diversity of wetland types, the biodiversity they support, and the numerous functions they provide make wetlands an exciting and rewarding arena in which to explore fundamental ecological questions. And it is this science that informs efforts to manage, restore, and conserve the wetlands of the world.

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15/6/22

ENVS PROJECT

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Department: ENGA

C.U Roll No:
212013-11-0085

C.U Registration No:
013-1211-0110-21

TOPIC:

NATURAL RESOURCES

INDEX

INTRODUCTION

NATURAL RESOURCES

Natural resources are those commodities that are considered valuable in their natural form and are found in the environment and are developed without the intervention of man. Natural Resources can be part of our natural heritage or protected in nature reserves. Natural resources are usually either renewable or non-renewable.

RENEWABLE RESOURCES: Renewable energy is energy from sources that are naturally replenishing but flow-limited; renewable resources are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time. The major types of renewable energy sources are:

- Biomass
  - Wood and wood waste
  - Municipal solid waste
  - Landfill gas and biogas
  - Ethanol
  - Biodiesel
- Hydropower
- Geothermal
- Wind
- Solar

NON-RENEWABLE RESOURCES: Non- Renewable Resources is a natural resource that cannot be readily replaced by natural means at a pace quick enough to keep up with consumption. It is a natural substance that is not replenished with the speed at which it is consumed. It is a finite resource. Example includes fossil fuel, minerals etc. The following are the natural resources :

- Forest Resources.
- Mineral Resources.
- Soil Resources
- Water Resources.
- Food Resources
- Energy Resources

FOREST RESOURCES

Forest are important renewable natural resources. Trees, Shrubs and herbs dominate forest ecosystem. 33% of the world's area consists of forests lands. Insects, birds and animals live there. Native forests has naturally growing plants and tress Man-made,forests consists of species of shrubs, trees, etc.
Boreal coniferous trees are found in Artic Sea 55 to 6.5" north latitude.
Temperate forests found in either side of the earth 30^0 and 55° latitude north.
Tropical forests are found between 30° north latitude and 30° South latitude.

Causes of Deforestation

The following are the causes of deforestation:

- Over population and Shifting Cultivation resulted in loss of 51 million forests.
- The increase in demand for fuel is another reason. The demand was 200 to 500 million tons in 2001, where it was 65 million tone in 1947.
- Growing needs of food and development of various project.
- Increasing demand for raw materials for industries .About 900 million trees are cut down in a year to supply raw materials for papers.
- Overgrazing, increase of pests, mining, forest fire and construction of dams.

Consequences of Deforestation.

- Soil erosion; 6000 million tons of soils gets eroded every year in India.
- Frequent floods are common occurrence.
- Threatening of wildlife species and their habitat.
- Global Warming, climate and droughts occur.
- Landslides in hilly areas and increase in wind speed occurs.

SOIL RESOURCES

Soil resources are a form of environmental asset providing a range of ecological services. A key factor of soils is their delivery of supporting services including the formation and function of the soil itself, nutrient cycling, water cycling, structural support of vegetation and soil biodiversity. Soil resources therefore form a fundamental part of the environment. They provide the physical base to support the productivity and cycling of biological resources, provide the source of nutrients and water for agricultural and forestry systems and fulfill a complex role against environmental variability.

Environmental Impact

- The rapid increase of population results in demand for limited land resources which are subject to degradation. Land degradation takes place due to natural and induced activities.
- Man induced cause are deforestation, mining, over- irrigation, dam construction and use of mere fertilisers.

Soil Erosion

- Top soil moves from one place to another resulting in loss of fertility of soil. 1/3rd of world's cropland is getting eroded. Two third of which lie in Africa and Asia. Soil erosion takes place due to normal erosion and erosion by deforestation and mining.
- Soil erosion occurs primarily when dirt is left exposed to strong winds, hard rains and flowing water.
- There are two types of agents of soil erosion climatic or through other biotic agent.

Desertification

- Croplands that are converted to desert like lands, this desertification may be moderate, severe or very severe.
- It is land degradation in arid, Semi-arid, and dry sub-humid areas collectively known as dry lands, resulting from many factors, including human activities.

WATER RESOURCES

Water resources are natural resources of water that are potentially useful as a source of water supply. 91% of the water on the Earth in the salt water and only there percent in fresh water; slightly over two thirds of this is frozen in glaciers and polar ice caps. The remaining unfrozen freshwater is found mainly as groundwater, with only a small fraction present above ground or in the air. Natural sources of fresh water include treated wastewater and delineated seawater.

Environmental Impact

- The main climate change consequences related to water resources are increases in temperature, shifts in precipitation patterns, snow cover and a likely increase in the frequency of flooding and droughts.

- Climate change may also markedly change the seasonal variation in river flow and tends to increase the frequency and intensity of rainfall; there may be an increase in the occurrence of flooding due to heavy rainfall events.

- Low water and droughts have severe consequences on most sectors, particularly agricultural, forestry, energy and drinking water provision.

- Groundwater recharge may also be affected with a reduction in the availability of ground water for drinking water in some regions.

- Changes to water resources have a big impact on our world and our lives. Flooding is an increasing issue as our climate is changing. Conversely, drought is also becoming more common.

- The groundwater resources in India is estimated at 395.6 million CU meter, but we use only 10% of this water. The total requirement in India will be 1,422 billion cubic meter.

- The withdrawal of ground water is more than its recharge level, so the sediment in aquifer gets compacted

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5/6/22

27

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SEMESTER:- II

PAPER CODE:- AECC-2

C.U. ROLL NUMBER:- 212013-11-0089

C.U. REGISTRATION NUMBER:- 013-1211-0114-21

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I am very grateful to my Professor Sri Rajkumar Barman for giving me the opportunity to present this project which enabled me to learn a lot about the Common Birds of West Bengal and the ways to preserve them. I am also thankful to my respected Professor for his advice and computation with his guidance and supervision for the completion of this project.

OBJECTIVES

The Objectives of the Project are as follows:-

- To know how many birds live in West Bengal.
- To know their Habitat and Distribution.
- To know the modern threats to Birds & their Conservation.

INDEX

INTRODUCTION

Birds are feathered, winged, two-legged, warm-blooded, egg-laying vertebrates, Modern birds are characterised by feathers, a beak with no teeth, the laying of hard-shelled eggs, a high metabolic rate, a four-chambered heart, and a lightweight but strong skeleton. Birds also have digestive and respiratory system that are uniquely adopted for flight. Some birds, especially corvids and parrots are among the most intelligent animal species culturally transmit knowledge across generations. Many species annually migrate great distances and many more perform shorter irregular movements. Birds are social, communicating with visual signals, call and songs.

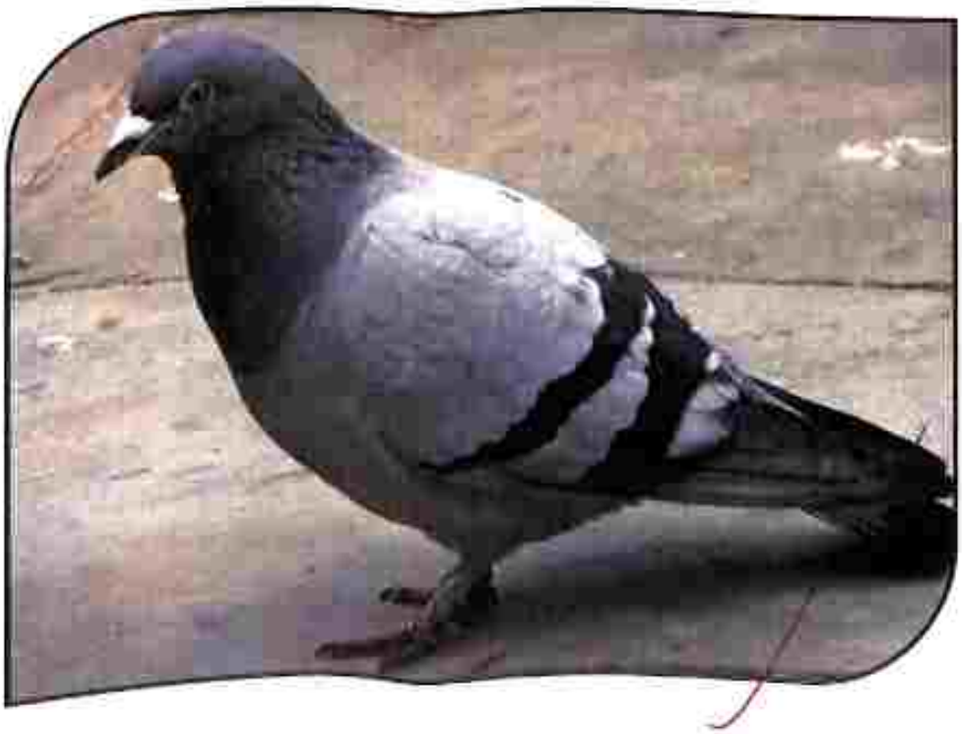
Birds walk, run, hop, swim, perch, cling, fly and even dig. They live in woodlands, open areas, cities, farms lakes, swamps - even the open ocean. They lay their egg and raise their young in holes in the ground, in nests of varying complexity in vegetation or on the ground, in holes in trees, in human-constructed nest boxes and in or on various parts of buildings.

SOME COMMON BIRDS OF WEST BENGAL

INDIAN DOMESTIC PIGEON :-

The Domestic Pigeon is derived from the rock Pigeon. The Rock Pigeon is the World's Oldest Domesticated Bird.

- Scientific Name :- Columba Liviadomestica
- Distribution :- The Rock Dove has a restricted natural resident range in Western and Southern Europe, North Africa and into South-Asia.
- Habitat :- This Pigeon's habitat are natural cliffs, usually on coasts. Its domesticated form, the feral pigeon, has been widely introduced elsewhere and is common, especially in cites much over the world.
- Bengali Common Name :- " Payera"



HOUSE CROW:-

The house crow, also known as the Indian grey-necked Ceylon or Colombo crow, is a common bird of the crow family that is of Asian origin but now found in many parts of the world.

- Scientific Name :- Corvus Splendens.
- Distribution :- It has a widespread distribution in South Asia, being native to Nepal, Bangladesh, India, Pakistan, Sri Lanka, Maldives and Lakshadweep Islands, South-West Thailand and coastal part of Southern Iran.
- Habitat :- Indian House crow are strongly commensally, living in close association with people and relying on food crops and other wastes. They prefer highly disturbed habitats within most types of urban and agricultural landscapes and thrive in small villages. Climatically, house crows are best suited to tropical areas . However, the availability of food scraps is probably a more important influence on abundance and distribution.
- Bengali Common Name :- " Kak "

HOUSE SPARROW :-

The house sparrow is a bird of the sparrow family Passeridae, found in most parts of the world. A small bird, it has a typical length of 16 cm (6.3 in) and a mass of 24–39.5 g (0.85–1.39 oz). Females and young birds are coloured pale brown and grey, and males have brighter black, white, and brown markings.

The house sparrow is strongly associated with human habitation, and can live in urban or rural settings. Though found in widely varied habitats and climates, it typically avoids extensive woodlands, grasslands, and deserts away from human development.

- Scientific Name :- Passer Domesticus.
- Distribution :- All over the world Mainly originated in the Middle-East.
- Habitat :-The House sparrow is closely associated with Human Habitation and cultivation.
- Bengali Common Name :- " Chorai "

COMMON MYNA :-

The common myna or Indian myna , sometimes spelled mynah, is a member of the family Sturnidae native to Asia. An omnivorous open woodland bird with a strong territorial instinct, the myna has adapted extremely well to urban environments.

The Common Myna is brown with a black head. It has a yellow bill, legs and bare eye skin. In flight it shows large white wing patches.

- Scientific Name :- Acridotheres Tristis.
- Distribution :- It is a species of bird native to Asia with its initial home range spanning from Iran, Pakistan, India, Nepal, Bhutan, Bangladesh and Sri Lanka; as well as Afghanistan, Uzbekistan, Tajikistan, Turkmenistan, Myanmar etc.
- Habitat :-This abundant passerine is typically found in open woodland, cultivation and around habitation.
- Bengali Common Name :- " Salikh "

CONSERVATION OF BIRDS OF INDIA

Scientists and Conservation Professionals have developed a number of techiques to protect birds species. These techniques have varying strategies. They are :-

- Caption Breeding
- Reintroduction
- Transications Habitat Protection

and also projects like :-

- Project Great Indian Bustard
- Protection of Migratory Birds.
- Save Our Sparrows.

CONCLUSION

Bird watching also known as birding is one of the fastest growing forms of outdoor recreation in the country. Bird watching is the observation of wild birds rather than caged or domesticated birds. Birding is simply a matter of learning what to look or listen for. Bird watching is a good way for learning the species of birds that live in our specific area and see how they behave. Birds watching is a great reason to visit unique places and thrill to exotic bird species. We find people birding in just about any city, town or country.

IMPORTANCE & MEASURES

Importance of Birds

- Birds occupy many levels of tropic webs, from mid-level consumers to top predators. As with other native organisms, birds help maintain sustainable population levels of their prey and predator species and after death, provide food for scavengers and decomposers.

- Many bids are important in plant reproduction through their services as pollinators or seed dispersers. Birds also provide critical resources for their many host - specific parasites, including lice that eat only feathers, flies adapted for living on birds and mites that hitchhike on birds from plant to plant and even between countries.

- Some birds are considered keystone species as their presence in (or disappearance from) an ecosystem affects other specials indirectly for example, woodpeckers create cavities that are then used by many other species. After the extinction of the dodo, it was discovered that a tree whose fruits had been a primary food item of the dodo was unable to reproduce without its seeds passing through the dodos digestive tracts, which process scarified the seed coat and enabled germination.

Modern Threats in Birds

Birds are often considered to be outstanding indicators of the health of the overall environment. Rather like the proverbial canary in the coalmine, they are readily affected by physical and chemical impacts on their ecosystems, whether these are caused by natural or man-made influences. When communities of birds change which is usually the result of an ecological change. Because many species of birds have become specialized to occupy certain inches and together they inhabit almost every conceivable habitat, they are responsive to a wide variety of environmental changes and can reflect diversity and trends in other animals and plants with which they coexist.

Unlike some other groups of animals that are also good environmental indicators, such as frogs, birds are relatively easy to observe and identify, and most are active during the day.

Birds tell us a lot about changes to the environment, they are easy to see, and at BirdLife Australia there are plenty of people looking out for them. By protecting Australia's birds we are looking after the environment as a whole.

There are many different conservation issues which have an impact on Australia's birds. The nature of these issues is often (but not always) a result of changes to their habitat. There are also many other threats, some of which affect whole communities, and others which may be restricted to a specific site, or may only affect individual species.

Bird Conservation

Bird conservation is a field in the science of conservation biology related to threatened birds. Humans have had a profound effect on many bird species. Over one hundred species have gone extinct in historical times, although the most dramatic human-caused extinctions occurred in the Pacific Ocean as humans colonised the islands of Melanesia, Polynesia and Micronesia, during which an estimated 750-1800 species of bird became extinct. According to Worldwatch Institute, many bird populations are currently declining worldwide, with 1,200 species facing extinction in the next century. The biggest cited reason surrounds habitat loss. Other threats include overhunting, accidental mortality due to structural collisions, long- line fishing by catch, pollution, competition and predation by pet cats, oil spills and pesticide use and climate change. Governments, along with numerous conservation charities, work to protect birds in various ways, including legislation, preserving and restoring bird habitat, and establishing captive populations for reintroductions.

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- www.wildlifepreservation.in

ENVIRONMENTAL STUDIES PROJECT

Topic- Study of Ecosystems- pond, river, wetland, forest, estuary and agro ecosystem.

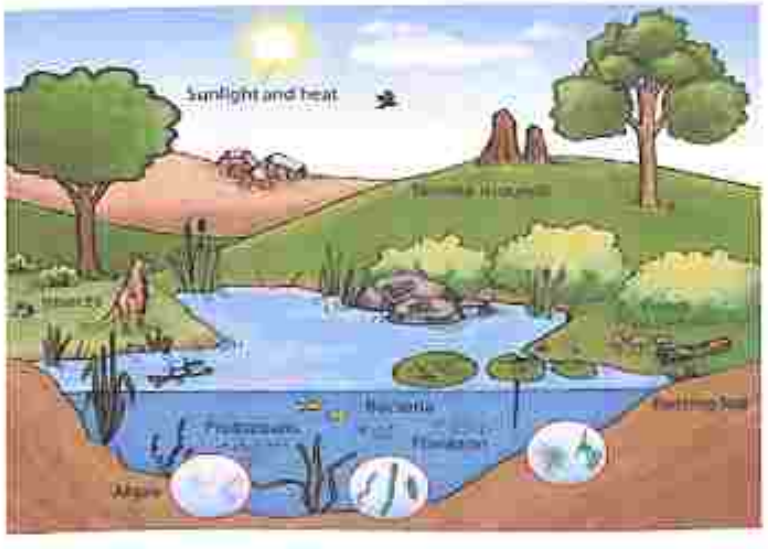
Sub Topic- Estuary Ecosystem

ANKITA BISWAS
SEMESTER 2
ENGLISH DEPARTMENT
CU REGISTRATION NUMBER: 013-1211-0115-21
CU ROLL NUMBER: 212013-11-0090
COLLEGE ROLL NUMBER: 21/BAH/0246
SUBJECT: AECC2 ENVS
COLLEGE: GOKHALE MEMORIAL GIRLS' COLLEGE

Index

Introduction

The term ecosystem was coined in 1935, though ecosystems have been around as long as living things. Eco is a spin-off from the word ecology and describes anything having to do with the environment and our relation to it. You've probably heard of related terms like eco-friendly and eco-warrior. Ecosystems are specific areas of the environment that develop as a result of the interaction between the earth's four spheres. They are characterized by a unique collection of living organisms (plants and animals) that have adapted to their surrounding non-living environment (climate, rocks, soils, and water). The sizes of ecosystems vary. They can be as large as the earth's biosphere itself or the Sahara Desert, or as small as a fishpond. It is important to remember, however, that over time most of the earth's ecosystems have been influenced in some way by the activities of humans, so there are very few ecosystems that remain in their purely natural state.



Estuary ecosystem

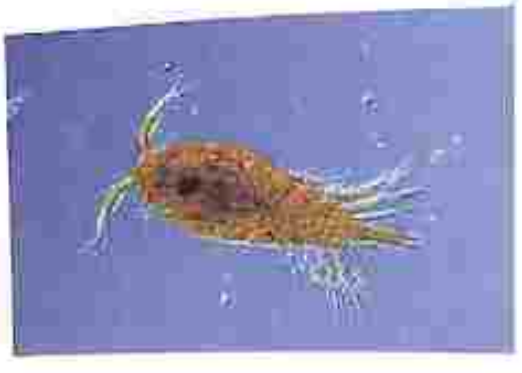
All the rivers and lakes ultimately drain into the sea. However, many rivers develop a highly specialized zone before joining the proper sea. This zone is called an estuary. An estuary is a transitional zone between rivers and sea representing an ecotone possessing unique ecological features and biotic communities. Estuaries are the most productive ecosystems in the world. An estuary is a semi-enclosed part of the coastal ocean containing brackish water that has a free connection with the sea on one side and the other side, it is connected with a river mouth and receives freshwater.

- One of the most important factors in estuary water is oxygen. Since the solubility of oxygen in water decreases with increased temperature and salinity, the precise amount of oxygen in water varies with these parameters. Oxygen is severely depleted in the substrate.

Biota of Estuaries ecosystem

The estuarine community is a mixture of three components: Marine, Freshwater, and Brackish water, but overall estuarine diversity is still lower than that of the river or marine community. This is because of tremendous variation in the estuary's physical environment. Thus, the great productivity of estuaries is built on a narrow base.

The plants of the estuary are of four basic types: i) Phytoplankton, ii) marginal marsh vegetation, iii) mud-flat algae, and iv) epiphytic plants growing on the marginal marsh vegetation. Because of the turbidity in water, phytoplankton is normally uncommon. However, great blooms of certain algae are well known including Spartina and Salicornia. Most of the estuarine algae are of marine origin common general include Ulven, Entrromorpha, Chaetomorpha, and Cladophora. These are often seasonally abundant, disappearing during certain seasons.



The estuarine ecosystem is complex and significant. It is also vulnerable since estuaries have served as conduits for shipping and as sites for cities throughout human history. Estuaries are inhabited by animals that are adapted to a changeable environment, to be sure, but their strategic location has led to a substantially greater, degree of human alterations than in any other ecosystem. Many people look upon estuaries as an area whose greatest value is to be filled and built upon or to serve as dumping grounds for garbage, sewage, and industrial wastes. This is not true and their tremendous productivity can be made to serve as a food source for people - indeed, it is already a very important food source in the far East -and almost all the major marine fisheries of the world are dependent on the estuaries for their continuance, because the-adult fishes often resort to estuaries for laying eggs, i.e., spawning.

Importance of Estuary ecosystem

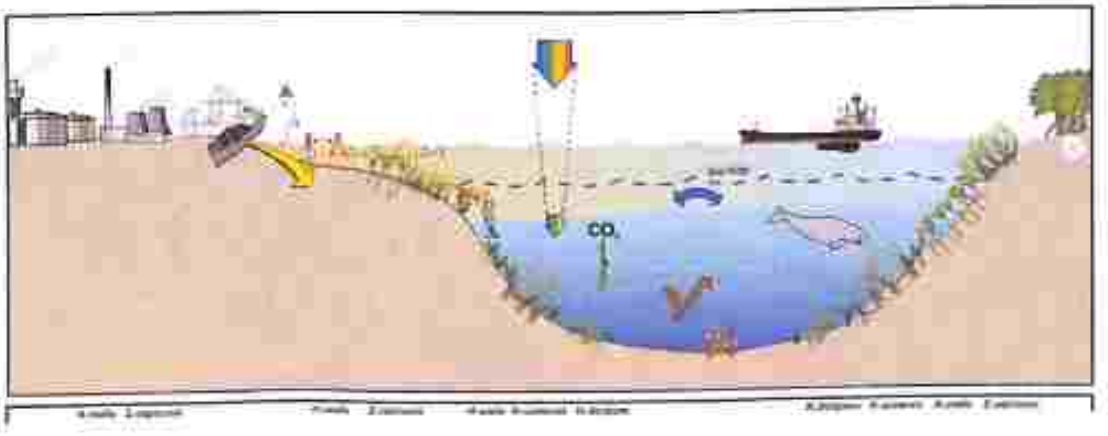
- Estuaries provide us with a suite of resources, benefits, and services. Some of these can be measured in dollars and cents, while others cannot. Estuaries provide places for recreational activities, scientific study, and aesthetic enjoyment.

- Thousands of species of birds, mammals, fish, and other wildlife depend on estuarine habitats as places to live, feed and reproduce. And many marine organisms, including the most commercially-important species of fish, depend on estuaries at some point during their development.

- Estuaries have important commercial value and their resources provide economic benefits for tourism, fisheries, and recreational activities. The protected coastal waters of estuaries also support important public infrastructure, serving as harbors and ports vital for shipping and transportation.

- Estuaries also perform other valuable services. Water draining from uplands carries sediments, nutrients, and other pollutants to estuaries. As the water flows through wetlands such as swamps and salt marshes, much of the sediments and pollutants are filtered out. This filtration process creates cleaner and clearer water, which benefits both people and marine life.

- Wetland plants and soils also act as natural buffers between the land and ocean, absorbing floodwaters and dissipating storm surges. This protects upland habitat as well as valuable real estate from storm and flood damage.



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27

1/5/22

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COLLEGE ROLL NO. - 21/BAH/0247

REGISTRATION NO. - 013-1211-0116-21

ROLL NO. - 212013-11-0091

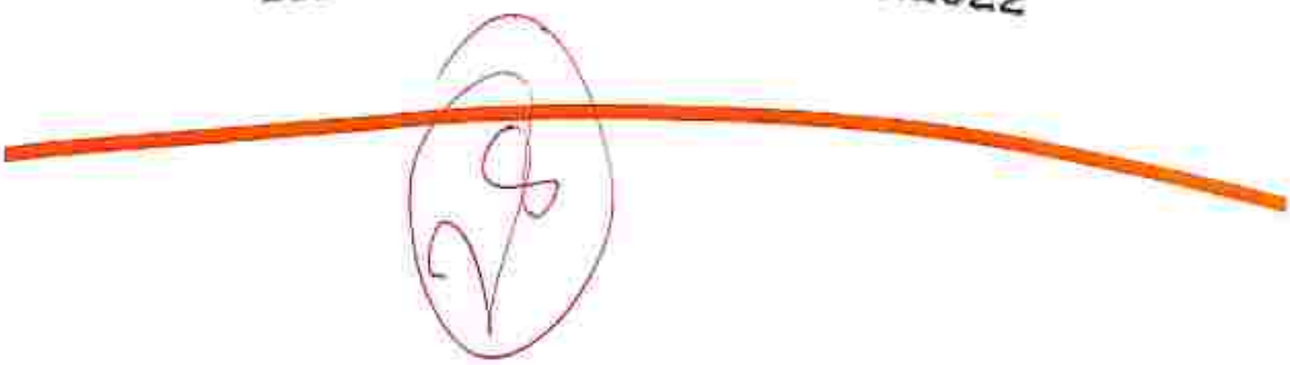
DEPT- ENGA

COLLEGE- GOKHALE MEMORIAL GIRLS' COLLEGE

SUBJECT- ENVS PROJECT

TOPIC- STUDY OF ECOSYSTEM (FOREST)

DATE OF SUBMISSION- 28.05.2022



ACKNOWLEDGEMENT

I would like to express my sincere thanks to Sir **Raj Kumar Barman,** for his valuable guidance and support in completing my project. I would also like to express my gratitude towards our Principal Ma'am **Atashi Karpha** for giving me this great opportunity to do a project on **Study of ecosystem.** Without their support and suggestions, this project wouldn't have been completed.

CONTENTS

Study of ecosystem- Forest

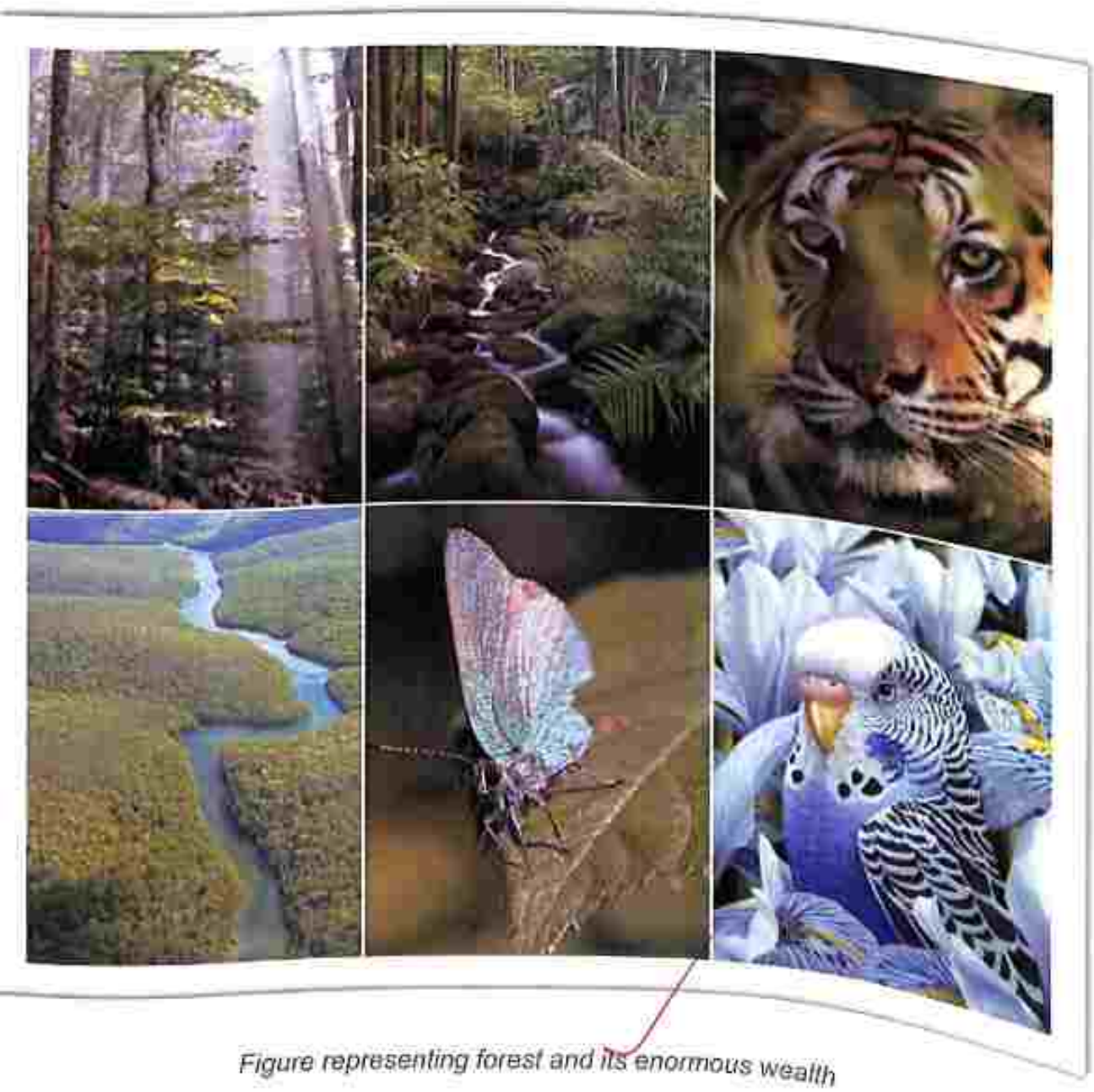


Figure representing forest and its enormous wealth

Ecosystem- Definition and types

What is an ecosystem?

An ecosystem is a system consisting of biotic and abiotic components that function together as an unit. A blend of abiotic components (air, water, wind, sunlight, soil) and biotic components (producers, herbivores, carnivores, decomposes etc.) produces a perfect ecosystem. Ecosystem is the functional unit of nature which combines all the organisms, weather, and landscape together.

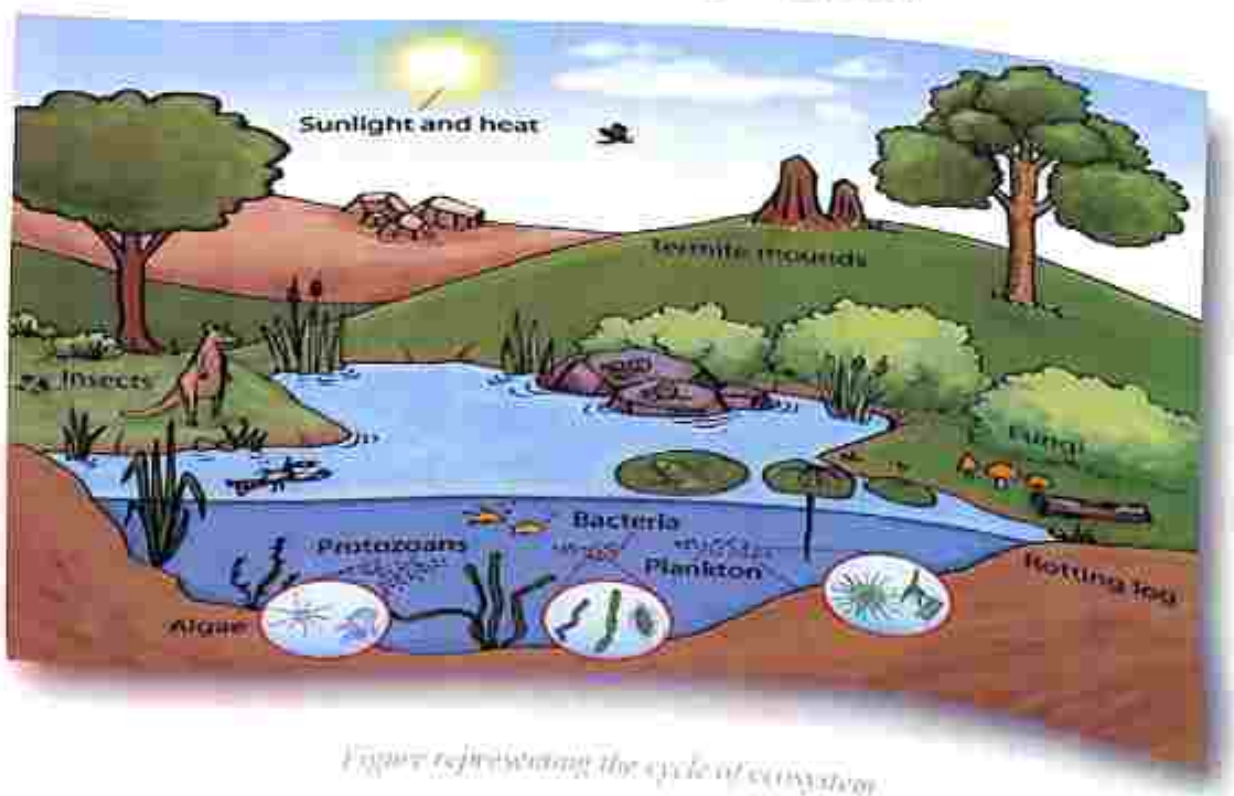


Figure representing the cycle of ecosystem

Types of ecosystem:

There are diverse ecosystems that can be classified accord

Study of major types of forests in India

The natural vegetation of India can be classified into the following categories:

- Tropical Evergreen Forests
- Tropical Deciduous or Monsoon Forest
- Tropical Dry Forest or Tropical Desert Vegetation
- Delta or Tidal (Littoral) Forests
- Mountain Forest

Studying some of them in a detailed way:

Tropical Evergreen Forests- These forests have rainfall more than 250 cm, with average temperature ranging between 25° to 27° C, relative humidity exceeding 77%. Tropical Evergreen Forests are found in regions of heavy rainfall so they are also termed as

rainforests. These forests are dense ones with canopies that obstructs the sunlight from reaching the ground. Due to availability of abundant sunshine some of them even exceed the height of 70 metres. Some of important species are Rosewood, Ebony, Chaplas, Sissoo, Telsur, Gurjan, Toon etc.

Indian Rosewood Tree

Ebony Tree

These forests are found in the western slopes of the Western Ghats, Assam, Meghalaya, Nagaland, Manipur, Mizoram, Lakshadweep Islands, Tripura, West Bengal, and Andaman and Nicobar Islands which receive very heavy rainfall.

Tropical Deciduous or Monsoon Forest- These forests have rainfall ranging between 100 to 200 cm, with average Temperature between 24° to 27°C,relative humidity being 60% to 80%. These trees shed their leaves in March- April in order to conserve water. They occupy larger area than evergreen forests. Some important species are Teak, Sal, Sandalwood, Mahua, Mulberry which yield valuable timber and many other forest products. They are found along the eastern slopes of Western Ghats in the foothills of the Himalayas, Chotanagpur Plateau, Bihar, Uttar Pradesh, North-East states and in Andaman and Nicobar Islands.

Sandalwood Tree

Bethnal green Mulberry tree

Forests as the integral part of environment

Forests play an integral role in moderating the environment. They have been protecting the environment since ages.

- ***Forests sustain climate of the surroundings***- The precipitation, humidity, temperature patterns are affected by the forests in a positive manner.
- ***Trees reduce run-off and increase percolation***- Trees help in greater percolating of water by reducing surface run-off, raising the ground water table.
- ***Purification of air around us***- As we know, trees help in absorbing Co_2, regulating the atmospheric pollution.
- ***Forests habitat fauna***- Trees provide habitation to all species of animals, birds and other forms of wildlife.
- ***Humus enhances fertility of the soil***- The decayed matter in the soil including other decompositions uplifts the fertility of the soil.

Forests as an integral part of the environment

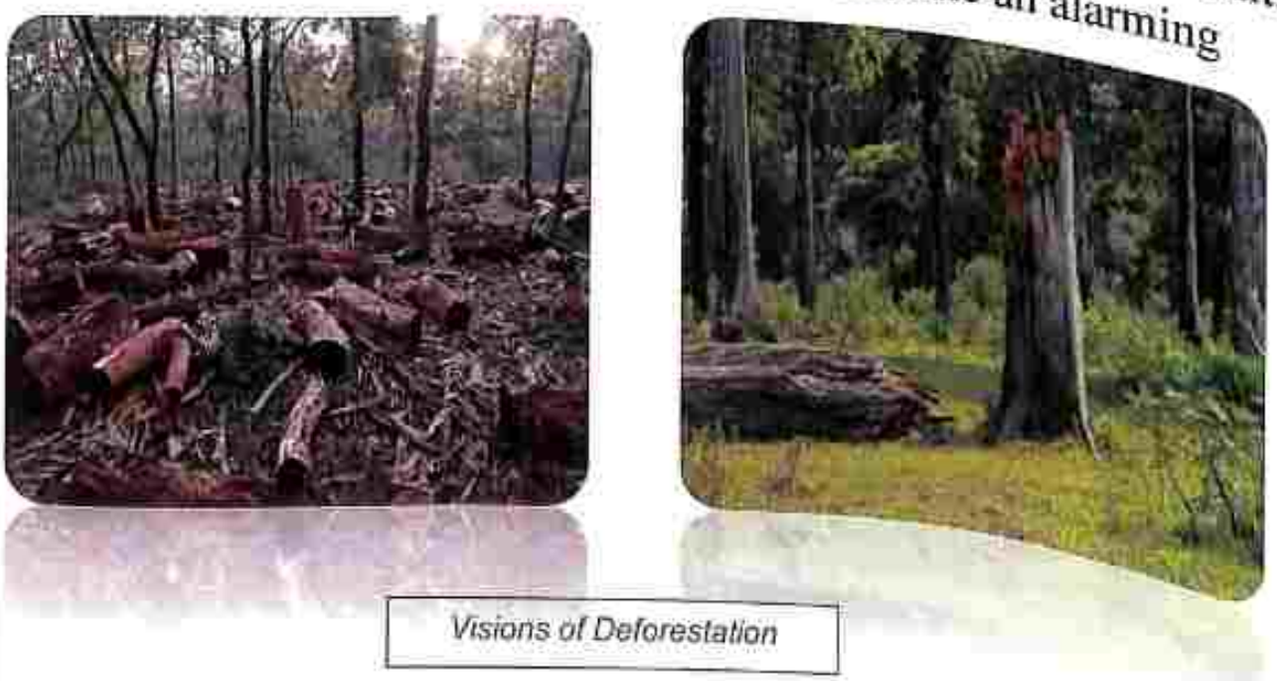
Lungs of the earth- Amazon Rainforests

Amazon Rainforests

Amazon Rainforests are called the " lungs of the earth " because of the personification of the human lungs that inhale Oxygen and exhale Carbon -di-oxide but reversed. Dr Chris Huntingford, a climate modeler with the Centre for Ecology & Hydrology joined a team of scientists from the University of Exeter and the Met Office Hadley Centre to carry out the study. The study came out with results where it can be found that there are year to year variations in the cycle. The climate models that predicted tropical forest dieback under climate change also had a very large variation in Co_2 concentration, while models in which rainforest was more robust to climate change had more realistic variation. However, the tropical forests can suffer climate change if Co_2 doesn't fertilize tree growth as strongly as climate models suggest.

Forest degradation and need for its conservation

Forest degradation is the consistent decrease or diminish in its wealth due to several factors. Forest degradation has become an alarming



Visions of Deforestation

issue which seeks immediate attention but strikingly there's no look up for eliminating the issue though endless campaigns take place. As per the recommendations of the National Forest Policy of India, 1952, 33% of the country's land area must be under the forest cover. Meanwhile India's present cover is less than 24% against the world average of 35%. The rising demand for different forest products are also contributing to strain of the existing forests. Keeping in mind these and many other concerns ,it is very essential to adopt appropriate and effective steps for forest conservation.

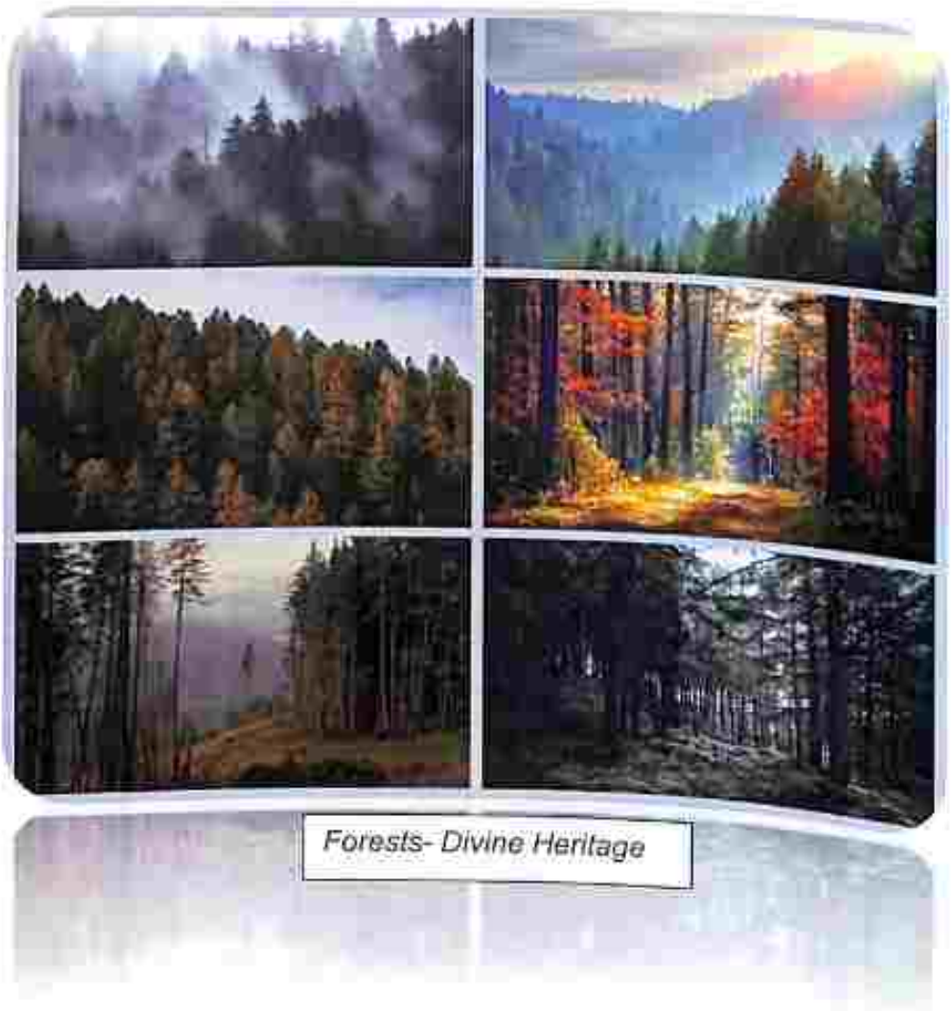
Conclusion

Forests are an essential part of the world and glorified beings. They occupy a very defined place in our ecosystem and are also important in maintaining the balance in the food cycle and the natural equilibrium on the planet. Forests cover almost 31% of the surface of the earth. Man has been harnessing its resources for years without giving back the required development. The climate is changing due to wide deforestation and significant negative impacts are noticed now. The major reason is obviously the urbanization leading to globalization. We as humans are ignorant of the existing situation which is deteriorating everyday with abnormal calamities taking place frequently. Its our duty to conserve the heritage of the planet by afforestation as Henry Cuyler Bunner in his poem, *The Heart of the Tree* says,

"He plants the glory of the plain;

He plants the forest's heritage;

The harvest of a coming age;"



Forests- Divine Heritage

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ENVIRONMENTAL STUDIES PROJECT

TOPIC

"AIR POLLUTION IN KOLKATA"

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English Department
Semester-2
College Roll No. - 21/BAH/0254
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CONTENT

ACKNOWLEDGEMENT

I would like to express my gratitude to the professors for providing support and guidance. I got to learn a lot from this project about the rising air pollution levels in Kolkata. I must also thank my parents and friends for the immense support and help during this project. Without their help, completing this project would have been very difficult.

AIR POLLUTION IN KOLKATA

- Kolkata is in the grip of rising air pollution and multi-pollutant crisis. Official ambient air quality monitoring has shown 61 per cent increase in particulate matter in just four years (2010 to 2013). The levels exceed standards by 2.7 times. NO2 levels exceed by close to two times.

- CSE exposure monitoring provides clinching evidence of alarming dose that an average Calcuttan breathes on a daily basis in different parts of the city – 2 to 3 times higher than the ambient level recorded by official monitors.

- With growing vehicle numbers and resultant congestion, air pollution is a growing concern in the city.

- The city is losing its inherent advantage of dominant commuting practices – use of bus and walking – at the cost of clean air and public health.

- "At Picnic Garden, crude coal furnaces are being used to melt lead plates from discarded batteries. It results in lead ash and fumes that is coating local residents' clothes and lungs all year round."

AIMS AND OBJECTIVES

The main purpose of making this project is to know the most polluted areas in Kolkata, what is the cause of the pollution in that place and what are the problems and solutions for it. To access the status of urban environment in terms of air quality, we need to discuss the causes, source and the level of air pollution in that particular area.

Causes of Air Pollution~

- Several factors cause air pollution in Kolkata and among them the main factor is transportation, where the abundance of poorly-maintained vehicles, use of petrol fuel, and poor controlling are making transportation the major air polluting sector. Additionally, there are three thermal power plants operating in and around Kolkata, and some small-scale industries which also affects the air quality. An analysis of different sources of air pollution in Kolkata has revealed that motor vehicles are the leading contributor to air pollution (51.4%) which is followed by industry (24.5%) and dust particles (21.1%), respectively.

- Burning plastic also releases black carbon, which contributes to driving climate change and the toll taken by air pollution on human health— one that includes 7 million people around the world dying from exposure to air pollutants each year.

- Mining operations are one of the major culprit of air pollution in places like Picnic Garden in Kolkata. Substances are related to the operation that may negatively affect the health of the worker and the people who are nearby.

- Nitrogen Oxides (NOx) and small particles known as Particulate Matter (PMs) – both prevalent in diesel fumes in most of the transports in Kolkata – combine to contribute to up to 36,000 premature deaths a year. Much though car companies would like you to think diesel is the 'green' alternative to petrol, there's no getting away from the fact that burning diesel produces greenhouse gases and worsens global warming. There are also serious questions about the extent to which diesel produces less carbon than petrol when burned, as has long been claimed.

- The ample use of AC in households results in CFC emission. The atmospheric impacts of CFCs are not limited to their role as ozone-depleting chemicals. Infrared absorption bands prevent heat at that wavelength from escaping the earth's atmosphere. CFCs have their strongest absorption bands from C-F and C-Cl bonds in the spectral region of 7.8–15.3 μm—referred to as "atmospheric window" due to the relative transparency of the atmosphere within this region.The strength of CFC absorption bands and the unique susceptibility of the atmosphere at wavelengths where CFCs (indeed all covalent fluorine compounds) absorb creates a "super" greenhouse gas (GHG) effect from CFCs and other unreactive fluorine-containing gases such as perfluorocarbons, HFCs, HCFCs, bromofluorocarbons.

Table 1. Sources of air pollution emissions in Kolkata.

Source Types	Emissions (Tonnes/Year)			Totals	% RPM	% NOx	% SO_2	% Total
	RPM	NOx	SO_2					
Motor Vehicles	16,115	95,452	0	111,567	7.4	44.0	0	51.4
Industry	6571	34,208	12,378	53,157	3.0	15.8	5.7	24.5
Road Dust	45,881	0	0	45,881	21.1	0	0	21.1
Area Sources	6573	0	0	6573	3.0	0	0	3.0
Grand Totals	75,140	129,660	12,378	217,178	34.5	59.8	5.7	100.0

Source: Compiled by Researcher from WBPCB, 2015

CONSEQUENCES OF AIR POLLUTION IN KOLKATA

Effect of air pollution on human health~

Effect of air pollution on human health is very alarming. There are a large number of diseases bring about by the host of potential diseases. It increases the risk of respiratory infections, heart disease and lung cancer. Both the long term and short term exposure to air pollution have been associated with health impacts. More severe impacts affect people who are already ill.

Common diseases seen in Kolkata due to Air Pollution :

1. Asthma
2. Lung Cancer
3. COPD (Chronic Obstructive Pulmonary Diseases)
4. Pneumonia
5. Leukemia
6. Birth Defects
7. Immune System Defects
8. Autism
9. Weakening of lung function
10. Premature death

Effect of air pollution on environment~

Air pollution affects all things. It is harmful to our health and it impacts the environment – reducing visibility, blocks sunlight, causing acid rain and harming forests. Greenhouse gas affects the air badly, causes climatic changes and causes Global warming. Climatic changes and global warming are the two biggest threats to environment and human race among others.

REMEDIAL MEASURES OF AIR POLLUTION IN KOLKATA

- Switching off lights while not in use : The energy radiating from the lights is not good for the environment. By switching off the lights there will be less consumption of energy. Using energy saving lights can lessen air pollution.
- Prevention of using plastic bags and burning of it : Using of plastic bags is really bad for the environment which causes air pollution. Replacing plastics with paper bag is innovative and good for environment as paper bags take very short time to decompose. Burning of plastics and other similar materials release poisonous gases in the atmosphere which worsens the condition of the air.

- Avoid Air Conditioners and Use Fans: The heat released by the air conditioner into the atmosphere is greater than the heat it absorbs from the room. This greater heat released into the air causes global warming. The freon gas which is used as a refrigerant causes the depletion of ozone layers which prevents the harmful ultraviolet rays from reaching the surface of the earth. CFCs should be prevented. There are many other remedies like this.
- Use of public transport instead of private transport: Public transportation can convey many more people in much less space than individual automobiles, which in turn reduces air pollution from idling vehicles and helps riders avoid the stress that may come from daily driving in highly congested areas.
- Use of LPG and CNG: These are eco-friendly gas and causes no harm to the environment. CNG releases less greenhouse gas, while LPG releases carbon dioxide, but is still cleaner than gasoline. In the case of a spill, CNG quickly dissipates, whereas LPG will settle on the ground.
- Avoid using of crackers: Limit the worst kind of firecrackers, for example, snakes and PulPul. These are especially popular with children, who are most vulnerable to the problems. Burst crackers in open spaces will ensure that blowing wind takes away the smoke and pollutants thus decreasing the concentration.
- Afforestation: Plants are human's greatest friend. Planting more trees is one of the significant ways to reduce air pollution. Afforestation is a much-needed action to protect our planet from further damage as trees conserve energy.

Steps taken by government to reduce air pollution in Kolkata

➢ Kolkata is making serious efforts to improve air quality. Some of the challenges that faces on the road towards successful policy-making are human migration, coal burning industries, diesel driven vehicles, legislation harmonisation and harmonisation of databases, standards, researches and methodologies.

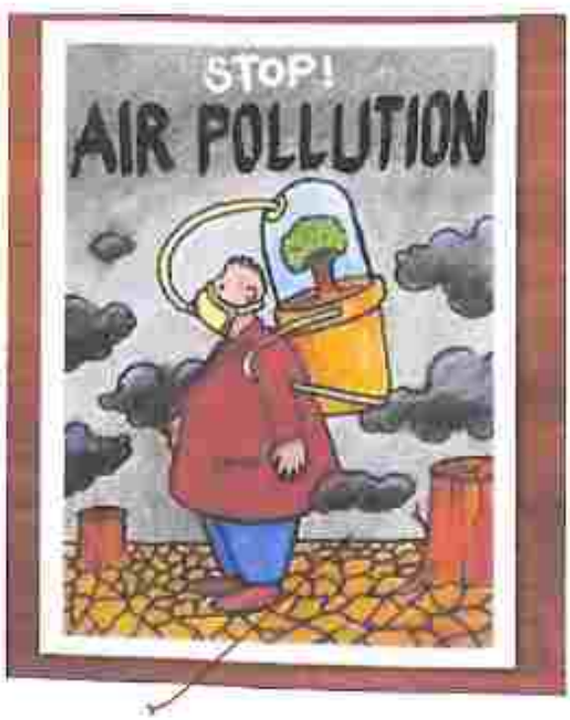
➢ In 2004, the WBPCB carried out a large number of inspections at firework manufacturing facilities during October and November and seized a large number of prohibited ones.

➢ The same happened during the actual festival season. The WBPCB also established a monitoring network for ambient air quality measures of main air pollutants.

➢ Another action to improve the air quality in Kolkata was the
conversion of coal-fired boilers to oil fired under the India Canada Environment Facility (ICEF) project.

CONCLUSION

Air pollution is an issue that requires to be resolved as soon as possible so a healthy life can be assumed on the planet. It is very crucial to care for the purity of air since all living beings depend on it. People should do their part to carb this problem and government should also take the required steps to rectify the situation. Much is being done to control, maintain and prevent the damages done by pollutants. The problems are diverse and only some of them are being recognized but it is important to keep a close control over pollutants. We should try to maintain the environment in an acceptable condition for future generations.



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NAME: LUTFA BANU CHANDRA

ENVIRONMENTAL STUDIES PROJECT

COLLEGE ROLL NUMBER: 21/BAH/0250

COLLEGE REGISTRATION: 013-1211-0121-21 ROLL NUMBER: 212013-11-0096

GOKHALE MEMORIAL GIRLS COLLEGE

- Aims and Objectives: To study the cause and effects of various types of pollution at the polluted site.

- Introduction: Pollution occurs from a variety of sources at the polluted site. Air pollution due to smoke, gases, pesticides, water pollution by chemicals, solid waste released from urban and industrial area which affect the biodiversity of the local area.

- Preparation: A few groups of students were made to observe the source of pollution and to identify the effects of pollution at the site. A hand map was made the field – work purpose.

- Requirement: Note book, Pen, Pencil, Eraser, Hand lens, camera, water, monitoring kit etc.

- Procedure: A place was selected near our college for the field-work.

Name of the site: Sonarpur

Observation: Components in the garbage, polluted water body , industrial chimneys.

- Solid waste – garbage dump.
- Polluted water of the river
- Gaseous effluent/ smoke coming out of the industry etc. were observed and recorded.
- Degradable waste [which are easily decomposed by microorganisms]: Food wastes, plant material, animal carcasses etc.
- Non degradable wastes [which are not easily decomposed by micro-organisms] plastic, glass iron etc.
- Toxic waste [which are poisonous and cause long term effects on plants and animals : Chemicals , paints , sprays etc.

A. Garbage dumps: One of the environmental problems sites is a garbage dumping area. It is a location that has been prepared for the purpose of dumping waste, rubbish or debris. Before the land is

used to store waste, diggers are used to give it a suitable shape and it is covered with an artificial water-resistant coating to prevent the rubbish from contaminating the soil. The law states that landfill sites must be located away from inhabited areas, as well as areas used for farming or drinking water.

B. Household: The garbage which is generated in the homes is termed domestic waste, while a community's waste is referred to as the municipal waste. This is classified as kitchen waste, which is degradable, and non-biodegradable home waste consisting of plastic, glass and metal. Rich people are responsible for production of maximum amount of non-biodegradable solid waste due to their life style.

C. Agriculture: Agriculture waste consists of biomass including farm residues such as

rice-husk, straw, bagasse, etc. Which are used for generating power of production of paper. Waste material from fields consists of fertilizers and pesticides which have bad effects on aquatic animals and plants.

D. Industries: Industries also discharge organic and inorganic wastes into the water causing water pollution. For instance, fertilizers, dyes, pesticides, soaps etc. released as wastes from industries mix with water and pollute it. Noise from generators, electric drills and constructions causes noise pollution.

E. Hospitals: Pollution from the health sector can take many forms. Hospitals and pharmaceutical companies are the largest drivers of emissions, the impact of medical waste, unsustainable materials and anaesthetics used in surgery, which are

greenhouse gases have serious and toxic effects on the environment.

USE OF WATER IN THE LOCALITY

Agriculture: (i) Irrigation 77%

(ii)Livestock 01%

(iii)Power.... 13%

(iv)Industries 3%

Municipal and rural water : 6%

- Source of Contamination of water :
  - (i) Domestic waste
  - (ii) Industrial waste
  - (iii) Agriculture waste
  - (iv) Run –off water from urban areas
  - (v) Soluble effluents
  - (vi) Leaching
  - (vii) Septic
  - (viii) Garbage

- Inference: If it's found that the area is polluted due to the waste product of health centre, household and small industries. Absence of autoclave or incineration in Health Centre is a threat to the environment. People should be aware about the contamination, otherwise diseases will be spread rapidly in the locality.
- Refernce

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NCERT biology.

LUTFA BANU CHANDRA
21/BAH/0250

ENVIRONMENTAL STUDIES PROJECT

TOPIC- STUDY OF COMMON ANIMALS BIRDS, MAMMALS, FISH, INSECTS AND BASIC PRINCIPLES OF IDENTIFICATION

SUBTOPIC- STUDY OF BIRDS, PINK HEADED DUCK

POULAMI MAJEE

ENGLISH DEPARTMENT

SEMESTER2

COLLEGE ROLL: 21/ BAH/ 0249

CU REG NO: 013-1211-0122-21

CU ROLL NO: 212013-11-0097

SUBJECT: AECC2 ENVS

COLLEGE: GOKHALE MEMORIAL GIRLS COLLEGE

INDEX

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Poulami Majee

English department

INTRODUCTION

Birds are ready visitors that visit frequently from place to place even from continents to continent. A good number of birds visit different sites due to change of environment particularly for their feed and reproduction. As the site is not homogenous for their easy life period so they need movement from one place to another. They are an organization of Aves-class warm-blooded vertebrates characterized by wings, hard-shelled egg-laying, toothless beaked jaws, an increased metabolic rate, a heart with four chambers, and a powerful yet light skeleton. The bird's scientific name is AVES. Birds are found worldwide and vary in measurement from the bee HUMMINBIRD 5.5CM (2.2IN) to the OSTRICH 2.8M (9FT 2IN) .

In the bird background, there are approximately ten thousand life forms, of which more than half are passerine or perching birds. Birds possess feather whose development varies by species; the extinct moa and elephant birds are the only known group with no wings. In 1676 volume Ornothologiae, the very first classification was created by FRANCIS WILLUGHBY AND JOHN RAY. To devise the taxonomic birds classification scheme currently in use, Carl Linnaeus updated the work in 1758. Birds species are classified in Linnaean taxonomy as the biological class Aves. Aves is classified or bird classification in the dinosaur clade Theropoda is done by Phylogenetic taxonomy.

- AREA OF STUDY: THE GANGETIC PLAINS OF INDIA, PARTS OF MAHARASHTRA, BANGLADESH,

- METHOD OF STUDY: THROUGH DIFFERENT MAGAZINES AND WEBSITES

SUB TOPIC: PINK HEADED DUCK

~ Conservation status: Critically endangered

~ Species: R. Caryophyllaceae

~ Order: Anseriformes

~ Family: Anatidae

~ Class: Aves

~ Phylum: Chordata

~ Genus: RHODONESSA; REINCHENBACH,1853

~DESCRIPTION AND IDENTIFICATION

the pink-headed duck is an extraordinary beautiful bird. Its characteristic rose-pink head, neck, and bill contrast sharply against the rich brown body plumage. A brown stripe extends up the neck to the base of the lower bill. The white – edged wings have a reddish speculum with a white band.

The pink coloration is dull in females. Young birds are almost white-headed, altogether lacking the distinctive pink coloration in the head and neck region.

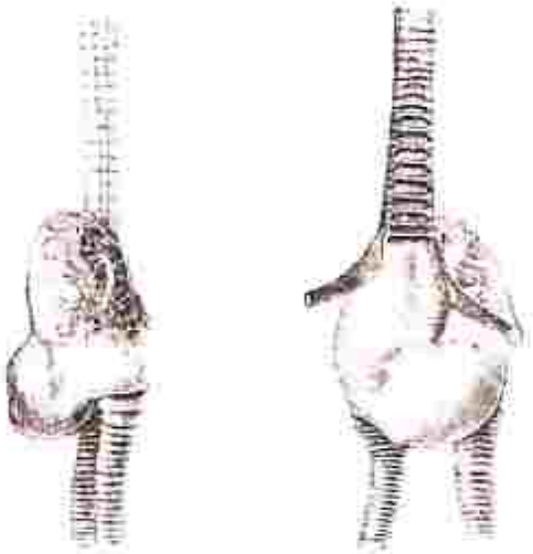
It is a medium-sized duck with an elegant physique. The neck is slender, and the body plump and oval-shaped. It has a flat forehead and long bill. Its short legs are slate greyish-black, and it has webbed feet with spurs on hindfoot.

1. CALL AND COMMUNICATION The male pink-headed duck is believed to produce a mellow, almost metallic sounding dual-note ring, as well as a wheezy whistling mating call. The female is known to have low-pitched quack.
2. NAMING AND ORIGINS

   The pink headed duck was initially included among the anas genus – the dabbling ducks. Upon closer inspection, they were found to bear distinctive traits, and the *RHODONESSA* genus was created for the species. The further studies reflect that they are closely related to the red-crested pochard, *NETTA RUFINA*.
3. FEEDING AND DIET

   this species appears to have an omnivorous diet. Findings from a dead specimen included aquatic weeds and mollusk shells. It is unknown what food types they prefer, but the pink in their plumage may provide a clue since the carotenoid pigments are typically dietarily derived. Pink-headed ducks feed at the surface dabbling, and they upend to search for food below- typical of diving ducks

FEATURES



THE SWELLING AT THE BASE OF THE TRACHEA IN MALE

Head of *R. cerypholaca.*

HEAD OF THE RED HEADED DUCK

WHAT ARE THE THREATS?

Even before the species decline, the pink-headed duck was always a shy and secretive bird by nature. And research reflects that they may have always had a small population size.

Due to its rarity, the pink-headed duck became a coveted bird among sports hunters during colonial times. The bird among sport hunters during colonial times. The birds were also sold in market in Kolkata. They were kept ornamentally due to their exquisite appearance and coloration. Pink-headed ducks were never poultry birds as their meat was thought inferior.

The cause for their decline is still somewhat a mystery. The main threat to the species is believed to have been the destruction of its habitat for agricultural land. The impact of invasive water hyacinth may have also been a contributing factor.

WHY THEY ARE RARE?

The pink-headed duck was always considered rare, but it has been conclusively seen in the wild since 1949 in India and is known from Myanmar from only two individuals. Unconfirmed reports of pink-headed ducks sightings in 2006 spurred conservationists to continue to look for it and also capture a live photograph, unsuccessfully. In addition to pink head and neck found on male ducks, these birds lay spherical eggs and likely live in tall, thick elephant grasslands, swamps and floodplains.

In 2017, the pink headed duck eluded a search for lost species expedition team in Kachin state in Myanmar. The team's interview with locals suggest that the bird likely spent time at INDAWGYI LAKE more recently than the last record of the species in Myanmar in1910, maybe as recently as 2010.

THE MAIN CAUSE OF EXTINCT

- DEFORESTATION
- ENVIORNMENTAL POLLUTION
- LARGE SCALE HUNTING
- COMPETING AMONG EACH OTHER
- LOSS OF HABITAT
- AND MANY OTHER HUMAN ACTIVITIES

LOST BUT NOT FOUND

The reason for its disappearance was probably habitat destruction. It is not known why it was always considered rare, but the rarity is believed to be genuine (and not an artefact of insufficient fieldwork) as its erstwhile habitat was frequently scoured by hunters in colonial times. The pink-headed duck was much sought after by hunters and later as an ornamental bird, mainly because of its unusual plumage. Like most diving ducks, it was not considered good eating, which should facilitate the survival of any remnant birds. The last specimen was obtained in 1935 in Darbhanga, Bihar, India by C. M. Inglis.[46] Some birds were also kept in the aviaries of Jean Théodore Delacour in Clères (France) and Alfred Ezra at Foxwarren Park (England) where the last known birds lived in captivity. The only known photographs of the species were taken here and include one of a pair taken around 1925 by David Seth-Smith.

CONCLUSION

Extinction is a natural part of evolution and happens for many reasons, but biders can be part of responsible environmental stewardship and take steps to minimize the risk of more bird species going unnecessarily extinct. While our world is changing and not all bird's species going unnecessarily extinct. While our world is changing and not all birds are able to change along with it, understanding the causes of extinction and how to help birds overcome those hazards is a great way to promote bird conservation before more species vanish. Of the nearly 10,000 bird species in the world, more than 10 percent are officially classified as threatened or endangered. Understanding how many birds are at risk to become extinct is first step toward raisings awareness of how to lower the risks of extinction for the birds that need the most intervention and conservation help.

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27

THANKYOU

15/6/22

ENVIRONMENTAL STUDIES

PROJECT ON

STUDY OF PLANT

(ALOE-VERA)

NAME : SOUMILI MALLICK

SEMESTER : II

COLLEGE ROLL NO. : 21/BAH/0256

CU ROLL NO. : 212013-11-0098

CU REGISTRATION NO. : 013-1211-0123-21

COLLEGE NAME : GOKHALE MEMORIAL GIRLS' COLLEGE

DEPARTMENT : ENGA

INDEX

STUDY OF PLANT : ALOE-VERA

INTRODUCTION:

The Aloevera plant has been known and used for centuries for its health ,beauty ,medicinal and skin care properties . The name Aloe vera derives from the arabic word "alloeh" meaning "shining bitter substance ," while "vera" in latin means "true".2000 years ago , the greek scientists regared Aloe vera as the universal panacea. The egyptians called aloe "the plant of immortality".today , the aloe vera plant has been used for various purposes in dermatology.

PLANT:

The botanical name of the Aloe Vera is Aloe Vera is Aloe barbadensis miller .It belongs to Asphodelaceae (Lilliceae)family and is scrubby or arborescent , perennial ,xerophytic succulent , pea –green color plant .

DISTRIBUTION:

Aloe Vera is considered to be native only to the south –east . Arabian Peninsula in the Al Hajar Mountains in north-eastern Oman .However , it has been widely cultivated around the world , and has become naturalized in North Africa , as well as Sudan and neighboring countries , along with the Canary Islands , Cape Verde and Madeira Islands. It has also naturalized in the Algarve region of Portugal , and in wild areas across southern Spain , especially in the region of Murcia .

The Species was first introduced to China and various parts of southern Europe in the 17th century . It is widely naturalized elsewhere ,occurring in arid template , and tropical regions of temperate continents .

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https://www.ncbi.nlm.nih.gov

15/6/22

Gokhale Memorial Girls' College

Project 1

ENVIRONMENTAL STUDIES

Topic – Study on Plants; Aloe Vera

Reshmi Pakhira

Semester–**2nd**

College Roll No.- 21/BAH/0231

CU Roll No. - 212013-11-0124

CU Registration No. - 13-1212-0251-21

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I would like to express my sincere thanks to **Dr. Atashi Karpha (Principal of ourcollege)** for giving mean encouragement, guidance and opportunity for passing the project in this college. Without yours' valuable ideas and suggestions I cannot complete my project report.

This project could not been completed without the able guidance and support of all the teachers of my department, especially **Prof. Rajkumar Barman (Head of the Department)**. Last but not the least I would like to thank my classmates, family members and all those people who helped me for the competition and deeper understanding of the concept of performance appraisal.

Work on the project has proved to be an enlightening experience for me.

Thanking You.

Reshmi Pakhira

.... Signature of teacher Signature of Student

INDEX

StudyofPlant

: Introduction :

PLANTS

Plants are article to other life on this planet because they form the basis of all food webs. Most plants are autoirophic, creating their own food using water, CO2, and light through a process called photosynthesis. Some of the earliest fossils found have been aged at 3.8 billion years. These fossil deposits so evidence of photosynthesis. So plants, or the plant – like ancestors of plants, have lived on this planet longer than most other groups of organisms. At one time, anything that was green and that wasn't an animal was considered to be a plant. Now, what were once considered "plants' are divided into several kingdom: Protista, Fungi, and Plantae? Most aquatic plants occur in the kingdoms Plantae and Protista.

ALOE VERA

Aloe Vera

Common English Name : Aloe Vera

Local Name : Gritakumari

Scientific Name : *Aloe barbadenses miller*

About Aloe Vera

The Aloe vera plant has been known and used for centuries for its health, beauty, medicinal and skin care properties. The name Aloe vera derives from the Arabic word "Alloeh" meaning "shining bitter substance," while "vera" in Latin means "true." 2000 years ago, the Greek scientists regarded Aloe vera as the universal panacea. The Egyptians called Aloe "the plant of immortality." Today, the Aloe vera plant has been used for various purposes in dermatology.

Anatomy

The plant has triangular, fleshy leaves with serrated edges, yellow tubular flowers and fruits that contain numerous seeds. Each leaf is composed of three layers: 1) An inner clear gel that contains 99% water and rest is made of glucomannans, amino acids, lipids, sterols and vitamins. 2) The middle layer of latex which is the bitter yellow sap and contains anthraquinones and glycosides. 3) The outer thick layer of 15-20 cells called as rind which has protective function and synthesizes carbohydrates and proteins. Inside the rind are vascular bundles responsible for transportation of substances such as water (xylem) and starch (phloem).

Plant

The botanical name of Aloe vera is *Aloe barbadensis miller*. It belongs to Asphodelaceae (Liliaceae) family, and is a shrubby or arborescent, perennial, xerophytic, succulent, pea- green color plant. It grows mainly in the dry regions of Africa, Asia, Europe and America. In India, it is found in Rajasthan, Andhra Pradesh, Gujarat, Maharashtra and Tamil Nadu.

Active components with its properties: Aloe vera contains 75 potentially active constituents: vitamins, enzymes, minerals, sugars, lignin, saponins, salicylic acids and amino acids.

- ***Vitamins***: It contains vitamins A (beta-carotene), C and E, which are antioxidants. It also contains vitamin B12, folic acid, and choline. Antioxidant neutralizes free radicals.
- ***Enzymes***: It contains 8 enzymes: aliiase, alkaline phosphatase, amylase, bradykinase, carboxypeptidase, catalase, cellulase, lipase, and peroxidase. Bradykinase helps to reduce excessive inflammation when applied to the skin topically, while others help in the breakdown of sugars and fats.
- ***Minerals:*** It provides calcium, chromium, copper, selenium, magnesium, manganese, potassium, sodium and zinc. They are essential for the proper functioning of various enzyme systems in different metabolic pathways and few are antioxidants.
- ***Sugars:*** It provides monosaccharides (glucose and fructose) and polysaccharides: (glucomannans/polymannose). These are derived from the mucilage layer of the plant and are known as mucopolysaccharides. The most prominent monosaccharide is mannose-6-phosphate, and the most common polysaccharides are called glucomannans [beta-(1,4)-acetylated mannan]. Acemannan, a prominent glucomannan has also been found. Recently, a glycoprotein with antiallergic properties, called alprogen and novel anti-inflammatory compound, C-glucosyl chromone, has been isolated from Aloe vera gel.
- ***Anthraquinones:*** It provides 12 anthraquinones, which are phenolic compounds traditionally known as laxatives. Aloin and emodin act as analgesics, antibacterials and antivirals.
- ***Fatty acids:*** It provides 4 plant steroids; cholesterol, campesterol, β-sisosterol and lupeol. All these have anti-inflammatory action and lupeol also possesses antiseptic and analgesic properties.
- ***Hormones:*** Auxins and gibberellins that help in wound healing and have anti-inflammatory action.
- ***Others:*** It provides 20 of the 22 human required *amino acids* and 7 of the 8 essential amino acids. It also contains salicylic acid that possesses anti-inflammatory and antibacterial properties. Lignin, an inert substance, when included in topical preparations, enhances penetrative effect of the other ingredients into the skin. Saponins that are the soapy substances form about 3% of the gel and have cleansing and antiseptic properties.

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15/6/22

27

Name: Rima Ghosh

Class: 2nd SEM

Subject: Environmental studies Project

Topic: water pollution

Department: English Honours

Year: 1st (2021-22)

College Roll No: 21/BAH/0213

University Roll No: 212013-11-0116

University Registration No: 013-1214-0091-21

Date: 28th May 2022

Contains

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I would like to express my special thank of gratitude to my professor Mr. Rajkumar Barman who gave me the golden opportunity to do this wonderful project of Environmental studies .

Who also helped me in completing my tutorial work. I came to know about so many things and without any argument he helped us. I am really thankful.

Secondly , I would also like to thank my parents and friends who helped me a lots of various information.

Rima Ghosh

(BA,2nd SEM)

Context

Water(H20) is the most essential element that makes life on earth possible. Without water there would be no life . A comment said by John Todd which is 'Our liquid planet glows like a soft blue sapphire in the hard -edged darkness of space. There is nothing else like it in the solar system. It is because of water.' Although 71% of the Earth's surface is covered by water, only a tiny fraction of this is available as freshwater. About 97% of the total water available on earth is found in the oceans and is too salty for drinking or irrelevant. The remaining 3% is fresh water. Of this , 2.997% is locked in ice caps and glaciers. Thus, only 0.003% of the Earth's total volume of water is easily available to us as soil moisture, groundwater, water vapour and water in lakes, streams, rivers and wetlands.

Water Pollution observation on Kolkata

Cause of pollution

A 2003 report released by the Federation of Consumer Associations (FCA) found that much of the drinking water in Kolkata was polluted with human waste. According to this report, 87% of reservoirs supplying water to residential buildings were contaminated with human excrement. There were significant traces of faucal matter in 63% of faucets, and 20% of the water samples collected from various city hospitals were also found to be contaminated. The study reported that approximately one-fifth of the deep water wells and hand pumps operated by

the Kolkata Municipal Corporation were polluted with human waste. The former director of the All India Institute of Hygiene and Public Health blamed the ongoing water pollution on a leaky sewer system and water pressure abnormalities. There are few main points are:

•Industrial effluents

A wide variety of both inorganic and organic pollutions are present in effluents from breweries,

tanneries, dying textile, paper and pulp mills, steel industries, mining operations etc. The pollutants include oils,greases, plastic plasticizers, metalic wastes, suspended solids , phenols, toxins ,acids,salts etc.many of which are not readily susceptible to degradation and thus cause serious pollution problems.

•Agriculture discharges

The sources of municipal waste water are domestic, industrial, storm water and by ground water seepage entering the municipal sewage network . The possible sources of water pollution in Kolkata are as following: In the eastern part of Kolkata near Tangra-Topsia- Tiljala, leather

industries are located and the industrial effluents released from the tanneries causes serious environmental hazards through polluting the bheries (fishing pond), wetlands and agricultural fields. The manufacturing of leather in these industries produce large quantities of waste which is discharged into the natural .

• Eutrophication

Due to addiction of domestic waste ,phosphates , nitrates etc from their decomposition products in water bodies they become rich in nutrients, specially phosphates and nitrates . Thus with the

Conclusion

There ,water pollution is indeed a very serious concern because it not only has an impact on health and but also can have negative effects on various industrial and agriculture. It is therefore highly important to devise methods to reduce the level of water pollution that we are currently facing. Water pollution stems from many sources and causes, only a few of which are discussed here. While the foremost necessity is prevention, setting up effluent plants to treat waste can reduce the pollution load in the recipient water. The treated effluent can be reused for gardening or cooling purposes, where possible. A few years ago , a new technology called the root zone process was developed by Thermax. This system involves running contaminated water through the root zones of specially designed reed beds. The reeds, which are essentially wetland plants, have the capacity to absorb. Oxygen from the surrounding air through their stomatal openings. The Oxygen is pushed through we porous stem of the reeds into the hollow roots where it enters the root zone and creates conditions suitable for the growth of numerous bacteria and fungi. These microorganisms oxidize impurities in the waste wait so that the water which finally comes out is clean.

ENVS PROJECT

TOPIC: STUDY OF FOREST ECOSYSTEM

COLLEGE: GOKHALE MEMORIAL GIRLS' COLLEGE

NAME: SREETAMA DATTA

COLLEGE ROLL NO: 21/BAH/0214

REGISTRATION NO: 013-1214-0092-21

ROLL NO: 212013-11-0117

ENGLISH DEPARTMENT (ENGA)

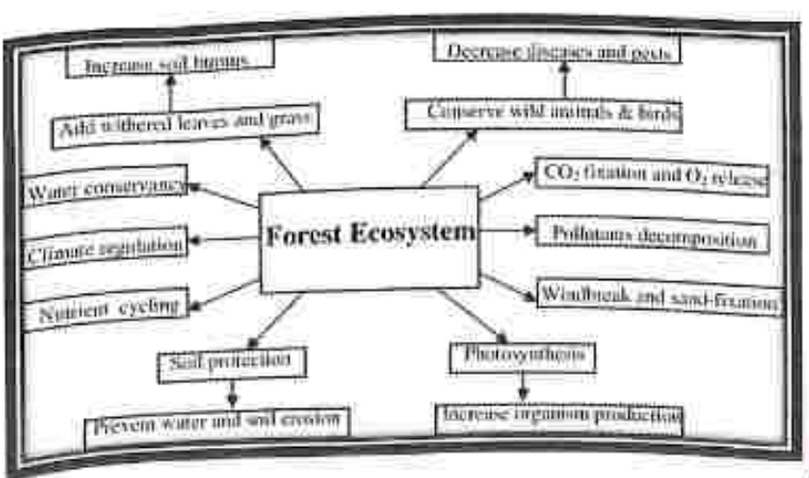
CONTENTS

ABOUT FOREST ECOSYSTEM

A forest is a large area of land covered with trees. Forest is among the most complex ecosystems in the world and they exhibit vertical stratification. However forest can be classified into many types some of which are the mixed temperate forest with both coniferous and deciduous trees, the temperate forests, the subtropical forest and the equatorial forest. The trees that make up the forest create a special environment which, in turn, affects the kind of animals and plants that can exist in the forest. Large and small animals such as the stags, deer, wild boars, foxes, badgers, martens and squirrels live in the forest.

➢ Characteristics of forest ecosystem

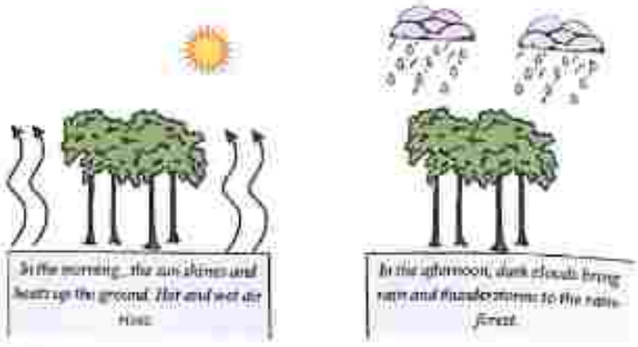
- Forests are characterized by warm temperature and adequate rainfall.
- The forest maintains climate and rainfall
- The forest supports many wild animals and protects biodiversity.
- The forest ecosystem is home to huge variety of insects.
- Forest provides most favorable conditions to various species of birds.
- The soil of forest ecosystem varies in terms of fertility. For example, the soil of temperate and tropical deciduous forest is very fertile enriched with nutrients while on the other hand the soil of boreal forest is mostly acidic due to fall of conifer needles on the forest floor.



TROPICAL FOREST

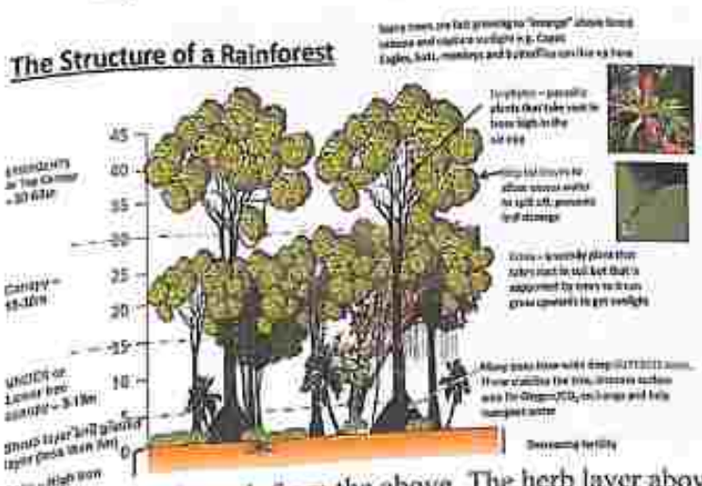
➢ Climatic conditions of tropical rainforests

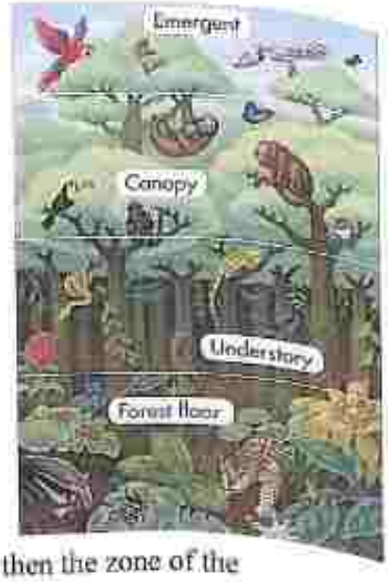
The climate in tropical rainforest is warm and moist all the year round creating ideal conditions for the growths of plants. Trees and other forest plants grow almost incessantly in an endless competition for light. Some plants put all their resources into growing towering trunks while others are adapted for survival in partial shade. As a result of these different growth patterns the forest is clearly divided into defined layers. The sun is always hottest at the Equator causing water to evaporate and form rain clouds. The clouds results in lots of rainfall which helps the rainforest to flourish. Huge trees with broad-like roots, vines, tigers, apes and poisonous frogs are found in these rainforests.



➢ How many layers does a rainforest have?

Layers in rainforests are growth zones which are determined by the height of the plants growing there. There are five layers in the rainforest. The soil or root layer contains roots as well as tiny animals and algae. On the forest floor, leaf litter is food for some very small animals as well as support for plants and saplings that grow where the sufficient light filters through from the above. The herb layer above it contains mosses and ferns and the shrub layer above that has shrubs and young trees with a height of about 5m. This is followed by a zone of the 'small trees' which is the canopy where copious light combined with the emergent results in continuous layer of branches and lush foliage up to 20m.This layer feeds or harbours most of forest's animal life and then the zone of the

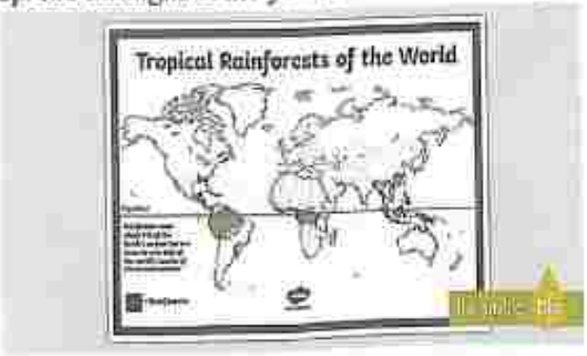




treetops which reaches a height of around 40m.The highest layer consist of giant, isolated trees called emergent. These provide net sites for predatory birds and feeding platforms for monkeys. This zonal pattern is characteristic of lowland rainforest. At higher altitudes, the trees are lower and the layers are more compressed. Soil is also an important factor in shaping the forest. In some parts of the tropics, such as Rio Negro region of South America, infertile sand results in the growth of stunted trees with leathery leaves.

➢ Where are the tropical rainforests found?

Tropical rainforests are found in wide area along the Equator: In Central Africa, in Central and South America. Tropical rainforest is found where annual rainfall exceeds 2.5m and is evenly spread throughout the year. Seasonal Forest grows on either side of the Equator.



➢ Life in Tropical Rainforest

All great apes threatened with extinction live in the wet forests of the tropics or in its bordering areas. The western Gorillas live in the dense forests of the Central African countries, the mountain gorillas live only in small volcanic mountain region at the borders of Uganda, Rwanda and the Democratic Republics of Congo. The chimpanzees and bonobos also live in Africa.

The colorful poison arrow frogs of Central and South America secrete a poisonous toxin through their skin which paralyses the muscles and can lead to death within 20 minutes in humans. They are called poison-arrow frogs because these toxins have been used by Native Americans in poisoning of their arrows to kill animals quickly. Poison-arrow frogs frequently spawn in the water-filled leaf funnels of plants which are located high up the trees

TEMPERATE FOREST

➢ How do deciduous plants survive in winter?

Temperate forests grow in regions that have wide range of climates. In some, winters are cold and summers are cool, in others, the winters are cold and summers are cool while in some winters are relatively mild and the summer heat rivals that in the tropics. The places where winters are cold, temperate forest trees are usually deciduous, slow their growth and shedding their leaves in winter to reduce water loss and growing a new set in spring, in warmer regions many trees keep their leaves throughout the year.

➢ Life in deciduous forest

Few tree species are found in temperate deciduous forest however the maximum are found in some forests of eastern North America. Nevertheless temperate forest trees are powerhouses of life. Large oak trees for example can produce over a quarter of million leaves a year enough to sustain the army of weevils, gal wasps and moth caterpillars that feed rapidly in spring and early summer while the leaf crop is at its freshest and most nutritious. Oak, Birches, Chestnuts, Aspens, Maple, Cedar are the dominating trees in mid-latitude deciduous forest.

Wild Boar digs up leaf litter with their snouts feeding on animals, nuts and roots.

In most conditions of the forest floor, bungles salamanders can absorb oxygen through their skin.

➢ Life in Evergreen forest

Described by the botanists as sclerophyllous (hard leaved) forest, this habitat is found in several widely scattered regions of the world, including parts of California and western South America, the Mediterranean region in Europe, and large areas of eastern and southwestern Australia. In some of the places, the forest is low-growing, but in Australia where eucalyptus is dominant species it includes the tallest broadleaved trees in the world. Temperate evergreen trees usually have open crowns, which mean that vertical layers are usually less pronounced than they are in forest in cooler regions. And plenty of light is able to reach the forest floor. As a result these forests are rich in ground based wildlife, and warmth-loving animals such as lizard and butterflies which are usually associated with higher levels. The open structure also makes it easy for birds such as kookaburras and other forest kingfishers, rollers and hoopoes to swoop down on animals moving about on the ground. Hoopoes swoop down from the canopy to catch animals on the ground.

Koalas live in the forest canopy but also walk across the ground to reach isolated clumps of trees.

White's tree frog has exceptionally thick skin which minimizes moisture loss and enables it to cope with the dry conditions in evergreen forest.

➢ Hibernation

In autumn, many insect-eating birds migrate to warmer climates leaving the forest's remaining animals to face the winter cold. Animals that store food can remain active throughout this difficult time of year, but others use a very different survival strategy: to hibernate, living on the fat6 reserves they have built up during the summer months. How long and how deeply an animal hibernates depends on where it lives.

In the forest of northwest Europe, hedgehogs may hibernate for upto six months.

In eastern North America, woodchucks or groundhogs typically hibernate from October to February; their wanderings early in the year are a traditional sign that spring is not far off. Some hibernating animals, such as common dormouse hardly ever interrupt their winter break, even if they are picked up.

CONIFEROUS FOREST

➢ Why are mixed forests healthier than coniferous forest?

The purely coniferous man-made forests of Middle Europe grow mainly spruces for the wood industry. The shallow-rooted plants fall over easily in strong storms and are prone to harmful creatures like the destructive bark beetle. The low level of sunlight in the spruce forest does not allow small shrubs to grow on the forest floor. On the other hand, such undergrowth is found in plenty in the mixed forests. The deciduous trees in the mixed forests allow sunlight to reach the ground so that water-storing moss and berry shrubs can sprout. This attracts the animals that live on beechnuts, berries and acorns. The deep-rooted deciduous trees also protect the forest against storms.

MOUNTAINS

➢ Which animals and plants live in the mountains?

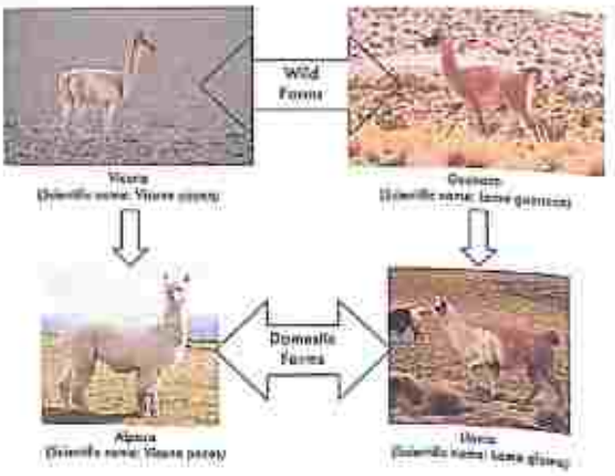
Steep slopes with very little soil cover, rugged rocks, snow, ice are the habitat in high mountains. Although the plant cover above the tree-line is scanty, you can still find animals living there. In Alps, we find the climbing chamois, ibexes and groundhogs. In the South American Andes, we find animals such as Andean condor, a large species of vultures and small camels that cannot be found in Europe at all. Animals are even found in Himalayas, the highest mountain chain of the world.

➢ What is tree-line?

The term tree-line describes the height above which trees can no longer grow in mountains. The main reason for this is due to very low temperature in these places. If we climb a mountain, we find a temperature drop of about 6 degree Centigrade for every kilometer. In addition, the temperature fluctuations between day and night as well as summer and winter are very high. The soil cover is thin so the roots of the trees do not get a firm hold.

➢ Are there camels in Andes?

There were two wild species of camels in the highlands of South American Andes: vicunas and guanacos. Contrary to their south Asian and African counterparts, the two-humped Bactrian camel and the single-humped Arabian camel respectively, vicunas and guanacos do not have any humps and are also much smaller. Guanacos live in open grasslands at a height of upto 4000m, and vicunas live in higher regions. About 5000 years ago, humans started breeding animals in Andes, which gave rise to the species of lama and alpaca. The smaller alpacas provide very soft wool.



➢ How do animals protect themselves against cold

Penguins have a thick plumage and thick layer of fat. In addition, their body shape have a lot of mass with the smallest possible surface ensures that the animals lose very little of their body heat. Polar bears protect themselves with the help of a layer of fat, but they also have another heating mechanism. Individual hairs of their fur are hollow and conduct the little sunlight available to the skin. Therefore, the polar bear is able to survive even the freezing cold of the Arctic.

CONCLUSION

➢ How can we protect the rainforests?

It is not easy to protect rainforests. However, the choices we make when buying various things of daily use can indirectly protect and conserve the rain forests. For example, we should buy only those wooden products that carry seals or labels mentioning that the material used for manufacture is not hazardous to rainforests.

➢ How can we protect nature?

We need to live close to nature, animals, plants, soils, water are all important for our well-being. We must seek ways to protect nature. For example, we should adopt 'ecological agriculture' to produce grains and vegetables and should use alternative eco-friendly forms of energy. Each one of us can contribute towards saving the environment by avoiding food grown with the help of pesticides and choosing fuel-efficient means of transport.

Waste plastic products are separated from garbage and 'recycled' to produce new plastic objects. However, this process consumes a lot of energy. In fact, we can better protect the environment by not buying things made of plastic instead we should use bags made of jutes.

➢ Why are national parks and zoos important?

Zoos play an important role in the protection of the near extinct and endangered species by conducting breeding programs. Earlier, only exotic animals were kept in zoos and very little thought was given to improving their surroundings. Today, most zoos are making special efforts to conserve and breed rare species. National parks also contribute to the preservation of species. Areas that are especially worthy of protection are designated as UNESCO World Heritage Sites. The habitat of Giant Panda is threatened by ongoing deforestation. Unfortunately it is very difficult to breed it in captivity. Conservation of species is important not only because it restores the Earth's biodiversity but also for the healthy evolution of life on Earth.

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GOKHALE MEMORIAL GIRLS' COLLEGE

KOLKATA

BACHELOR OF ARTS

SEMESTER 2

SUBJECT : EVS PROJECT

AECC2

Topic :***STUDY OF COMMON PLANTS, INSECTS, MAMMALS AND BIRDS.***

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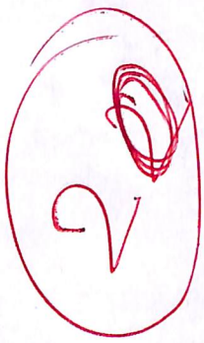

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STUDY OF COMMON PLANTS ,INSECTS, MAMMALS AND BIRDS

Introduction

Several plants , insects , birds , and other animals can be seen around an urban or rural setting where there is somevegetion . Each and every species of animals and plants has a definite role in the ecosystem . It is very interesting to observe the behavioural nature of the animals , their feeding and breeding habit etc.

Plants : Plants are critical to other life on this planet because they form the basis of all food webs . Most plants are autotrophic , creating their own food using water , carbon dioxide , and light through a process called photosynthesis .

Insects: Insects , are a class in the phylum Arthropoda . They are small terrestrial invertebrates which have a hard exoskeleton . Insects are the largest group of animals on earth by far : about 926,400 different species have been described . They are more than half of all known living species . They may be over 90 % of animal species on Earth . New species of insects are ontinually being found Estimates of the total number of species range from 2 million to 30 million.

BIRDS: Birds are ready visitors that visit frequently from place to place even from continent to continent . A good number of birds visit different sites due to change of environment particularly for their feed and reproduction .In our West Bengal , Storks and Siberian Cranes are common even in Lake Chilka of Odisha a large number of Pelicans and Flamingos are vivid examples of that kind . They come to thrive there for a temporary period to hatch eggs and carry a good number of off springs during their back journey .

Mammals: Mammals are a well-known class of vertebrates, including many familiar domesticated species and pets, as well as our own species Homo sapiens. All mammals are warm-blooded, and all female mammals possess mammary glands (mammae), which are used to suckle the young with milk.

Observations

plants insects Birds reptiles mammals use identified and their position in the ecosystem and food chain who are marked and noted. I gave some details about some insects, birds, plants and mammals in my project.

Insects :

Common name	Scientific name	Type	Relation with human	Pictures
House fly	Musca Nebula.	Harmful insect.	Spreads disease Like typhoid, cholera etc.	
Honey bee	Apisindica	Useful insect.	Produces honey, wax.	
Cockroach	Penplaneiaamericana	Harmful insect.	Spreads disease and destroys clothes, papers.	
Mosquito	Anopheles sp. Culex sp. Ades sp.	Harmful insect.	Causes malaria, file area, etc.	
Rice bug	Leptocorisaacuta	Harmful	Destroy. Rise.	
Moths	Bombyxmori	Useful insects, primary consumer.	Produces silk.	

Birds:

Name	Scientific name	Identifying characters	Feeding habit	Pictures
House Sparrow.	Passer domesticus	Black throat and grey crown.	Insects, grain seeds.	
Parrot	Psittaculakrameri	Green with red bill.	Fruits, vegetables.	
Pigeon	Columba livla	Blue Grey body, multi colour Sheen on neck, dark streaks on wings.	Seeds, insects, grains.	
Dove	Streptopelia sp.	Light brown and grey colour sign of peace.	Grains and seeds.	
Cuckoo	Heirococcyxvarius	Ash grey coloured brown and white patches on the underside.	Greens, insects and larva.	
Kingfisher	Alcedo sp.	Large beak found near water bodies.	Feed small fishes tadpools.	

Plants:

Name of the species	Scientific name	Identifying characters	Group	Current status	Picture
Silk cotton tree.	Bombaxceiba	Deciduous tree.	Tree	Rare	
Banyan tree.	Ficusbenghalensis	Deciduoustree with prop route Pillar-like branches.	Tree	Common.	
Mango.	Mangiferaindica.	Evergreen plant.	Tree.	Rare	
Black plum	Syzigiumcumini	Deciduous plant.	Tree	Rare	
Coconut.	Cocosnicifera	Deciduous plant	Tree	Rare	
Tulasi	Ocimum sanctum	Weak stem	Herb	Abundant	
Aparajeeta	Clitoriaternatea	Climber stem with tendrils	Herb climber	Abundant	
Thankuni	Centellaasiatica urban	Perennial herbicious plant with hollow internodes and flexible stem	Herb climber	Abundant	

References:

Reference books include dictionaries, encyclopedias, almanacs, directories, manuals, handbooks, and much more. Such as:

- The Book of Indian bird. (Salim Ali.)
- The Book of Indian Animal. (Parter S.H.)
- The Book of Indian common trees-(bole and vaghani)

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