Gokhale Memorial Girls' College

Date: 13/04/2023

To whom it may concern

Subject: Completion of ENVS Project by GEOA 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 (for DVV compliance) as ENVS-GEOA Gr. B with pdf link of their projects stated alongside.

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18/6

CALCUTTA UNIVERSITY

TOPIC -

STUDY OF COMMON PLANTS,INSECTS,FISH,BIRD, MAMMALS AND BASIC PRINCIPLES OF IDENTIFICATION

ACKNOWLEDGEMENT

The success and final outcome of this assignment required a lot of guidance and assistance from many people and we are extremely fortunate to have got this all along the completion of our assignment work. Whatever we have done is only due to such guidance and assistance and we would not forget to thank them.
I respect and thank **DR. MAHUA DUTTA MADAM** for giving us an opportunity to do this assignment work on the topic Study of common plants, insects, fish, birds, mammals and basic principles of identification and providing us all support and guidance which made us to complete the assignment on time, We are extremely grateful to her for providing such a nice support and guidance.
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Professor' s sign

PLANTS

Plants are multicellular eukaryotic organisms with the ability to produce their own food by the process of photosynthesis. (They are autotrophs.) Algae have historically been included with the plants, but they are now classified with the protists. The modern definition of plants includes organisms that live primarily on land (and sometimes in water), excluding algae that live primarily in water.

Another distinguishing characteristic of plants is their type of chlorophyll. **Chlorophyll** is used to absorb energy from the sun during the process of photosynthesis. Plants have chlorophyll *a* and chlorophyll *b*, while many species of algae do not have chlorophyll *b*. Many evolutionary biologists believe that the green algae gave rise to the land plants.

Plants occur in two major groups: nonvascular plants and vascular plants. **Nonvascular plants** do not have specialized tissues to transport fluids, while **vascular plants** do have specialized tissues. The bryophytes (the mosses and liverworts) are the only major group of non vascular plants. There are three large groups of vascular plants: the **seedless vascular plants** (for example, ferns), the **vascular plants with unprotected seeds** (for example, pines), and the **vascular plants with protected seeds** (for example, flowering plants). While animals are classified in phyla, plants are classified in divisions.

The life cycle of plants has both a multicellular haploid and multicellular diploid phase. Because both phases of the life cycle are multicellular, this type of life cycle is an *alternation of generations*. In contrast, animal life cycles have a multicellular diploid phase and a unicellular haploid phase.

The alternating generations of plants are the sporophyte generation and the gametophyte generation. Individuals in the gametophyte generation (often called *gametophytes*) form gametes, or sex cells. Gametes are haploid cells (they contain one set of chromosomes). Haploid gametes fuse in fertilization.

This fusion produces fertilized eggs, which are diploid cells (they have two sets of chromosomes). The plants that develop are diploid plants of the sporophyte generation. Individuals in the sporophyte generation (*sporophytes*) undergo meiosis to produce haploid spores.

Plants produce their gametes in specialized structures. In the nonvascular bryophytes and in the vascular plants, the egg cells are formed in structures called *archegonia* (the singular is *archegonium*). Sperm cells are produced in structures called *antheridia* (the singular is *antheridium*). In some specialized plants, these structures are reduced, and the sporophyte generation is dominant over the gametophyte generation in the life cycle.

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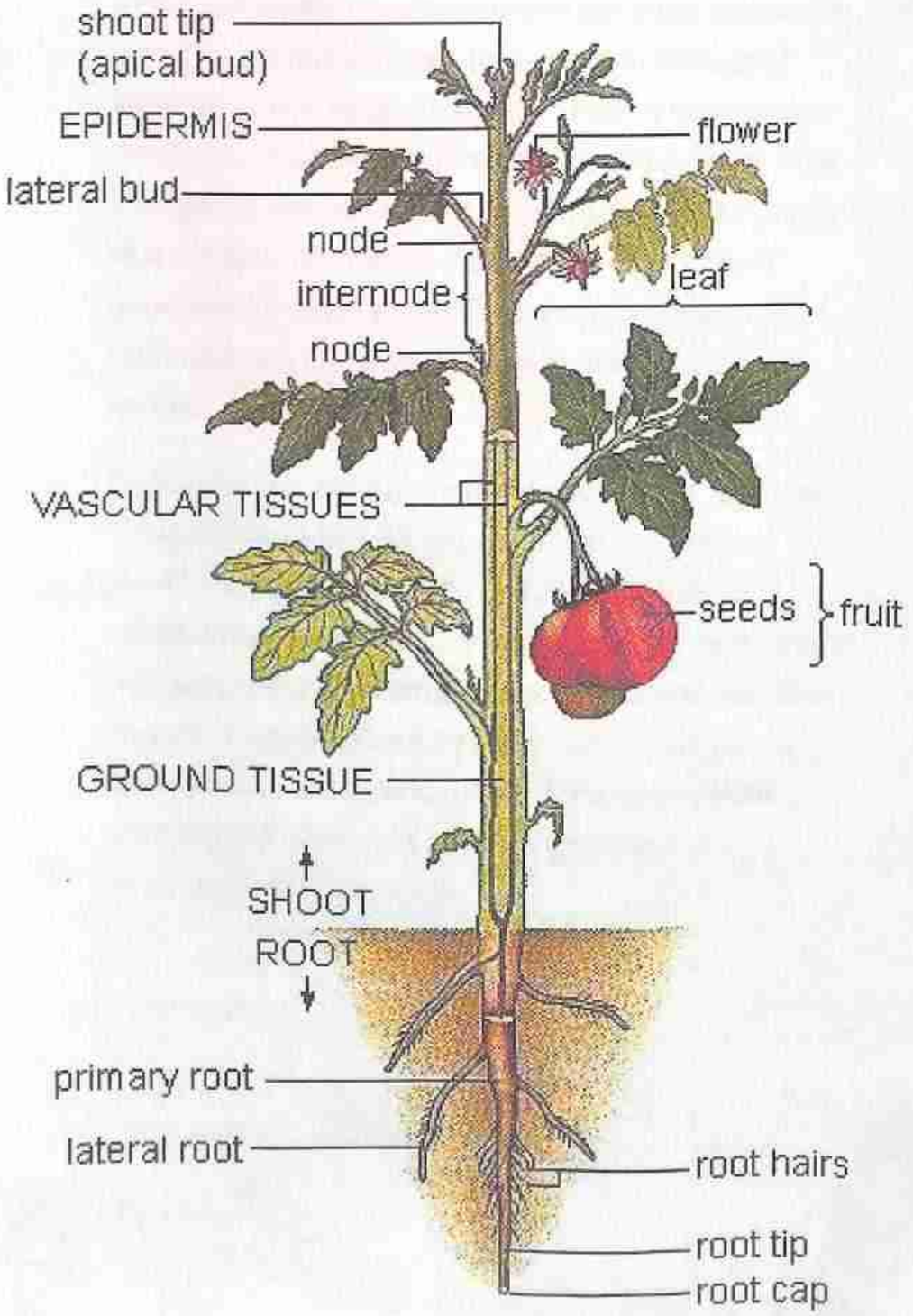
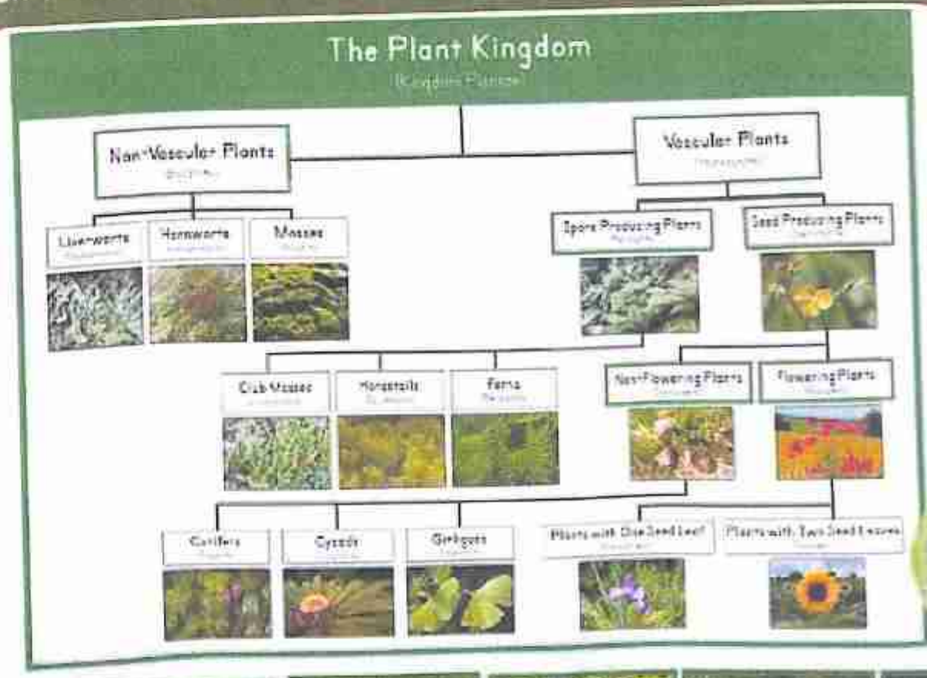
Anatomy of Tomato Plant



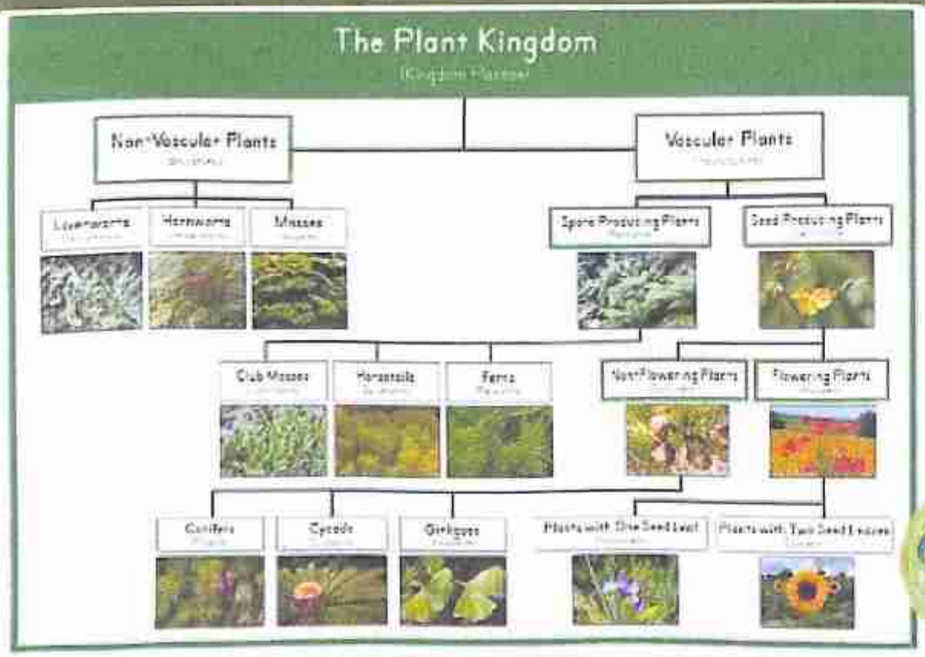
PLANT KINGDOM

3 Part Cards, Charts & Information Cards



PLANT KINGDOM

3 Part Cards, Charts & Information Cards



CONCLUSION

BIRDS

Birds' spatial distributions are directly effected by global warming and subsequently climate change. In general terms it has been stated by the scientific community that the distribution of species have been moving in a poleward trend. Within the realm of our study we found no conclusive evidence to prove or disprove this statement. The evidence that we did find and cited leads us to the conclusion that the distribution of species is infact being altered by climatic change, but we were unable to determine exactly what that change was. This project focused on bird species (as we found they were ideal indicators of species shifts due to the fact that their patterns of movement are already larger and more immediate than other organisms. This and the fact that bird movements and migrations are well documented are the reason we chose to focus our study on birds). Evidence found specifically from birds shows that there is a correlation between bird population characteristics and alterations

in climatic factors such as temperature and precipitation. The change in population characteristics shows that some sort of shift or generally trended movement is occurring.

INSECT

Insects play many important roles in nature. They aid bacteria, fungi, and other organisms in the decomposition of organic matter and in soil formation. The decay of carrion, for example, brought about mainly by bacteria, is accelerated by the maggots of flesh flies and blowflies. The activities of these larvae, which distribute and consume bacteria, are followed by those of moths and beetles, which break down hair and feathers. Insects and flowers have evolved together. Many plants depend on insects for pollination. Some insects are predators of others.

PLANTS

Each plant is characterized by one of the three life histories: haploid (1n), diploid (2n), or the most common haploid-diploid. Within each of these three types, there are also variations. Of the plants with haploid life cycles, most algae lack a dikaryotic phase, while most fungi have a dikaryotic phase. There are also other algae and fungi that are characterized by diploid life cycles. Lastly, plants with a haploid-diploid life history undergo an alternation of generations, either similar or dissimilar. In all of these life cycles, asexual reproduction may occur, but it is sexual reproduction that is responsible for genetic diversity. Due to variations arising separately and at different rates, the evolution of land plants did not follow a linear sequence. Before land plants, algae with mostly haploid life cycles existed, but land plants later originated from a haploid-diploid ancestor.

MAMMALS

Mammals play a vital role in maintaining the atmosphere on the Earth. Through their reproduction pattern and gestation period they come to be together in controlling the pressure of eco-system in the Earthas aa a whole. So, it can't be considered as a common or light problem and should be taken a serious matter to have speculations in a group to come to the state to protect the endangered species. It's not that if the species from one place are extinct, it'll effect to that

particular place only, but it can bring problem in the eco-system of the whole planet. It can lead to unequal distribution of the species. So when any one country is if suffering from such endangered problems the developed countries should take an action towards that and should launch some social programs and some rewarding state so that people can get encouraged to preserve the environment and the whole Earth. It is confirmed that if this method can't be stopped it will lead to the extinction of all the species on the Earth, so we shouldn't hesitate to try our best to save their life.

FISH

Fish are a vital part of our ecosystem. Fish play an important role in nutrient cycles because they store a large proportion of ecosystem nutrients in their tissues, transport nutrients farther than other aquatic animals and excrete nutrients in dissolved forms that are readily available to primary producers. Although the influence of fish communities on food web structures, nutrient recycling, and productivity is well documented, little is known about the effects on the ecosystem of a reduction in the fish species richness. It is therefore of significant importance to evaluate the potential impacts of ongoing decreases in fish diversity.

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Examined

CALCUTTA UNIVERSITY

TOPIC NAME : STUDY OF COMMON PLANTS
INSECTS, FISH, BIRDS,
MAMMALS AND BASIC PRINCIPLES
OF IDENTIFICATION

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TOPIC NAME :-STUDY OF COMMON PLANTS, INSECTS, FISH, BIRD, MAMMALS AND BASIC PRINCIPLES OF IDENTIFICATION.

SUBJECT:- AECC 2 (ENVS PROJECT)

18/6

PLANTS

Plants are one of five big groups (kingdoms) of living things. They are autotrophic eukaryotes, which means they have complex cells, and make their own food. Usually they cannot move (not counting growth).

Plants include familiar types such as trees, herbs, bushes, grasses, vines, ferns, mosses, and green algae. The scientific study of plants, known as botany, has identified about 350,000 extant (living) species of plants. Fungi and non-green algae are not classified as plants.

Most plants grow in the ground, with stems in the air and roots below the surface. Some float on water. The root part absorbs water and some nutrients the plant needs to live and grow. These climb the stem and reach the leaves. The evaporation of water from pores in the leaves pulls water through the plant. This is called transpiration.

A plant needs sùnlight, carbon dioxide, minerals and water to make food by photosynthesis. A green substance in plants called chlorophyll traps the energy from the Sun needed to make food. Chlorophyll is mostly found in leaves, inside plastids, which are inside the leaf cells. The leaf can be thought of as a food factory. Leaves of plants vary in shape and size, but they are always the plant organ best suited to capture solar energy. Once the food is made in the leaf, it is transported to the other parts of the plant such as stems and roots.

The word "plant" can also mean the action of putting something in the ground. For example, farmers plant seeds in the field.

Photosynthesis happens in the leaves on the plant. The leaves are the only parts of a plant that can do this. This is also known as how the plant gets its food.You can make the process quicker by adding more CO2, light and chlorophyll.

TYPES OF PLANTS

Green algae:

- Chlorophyta
- Charophyta

Land plants (embryophyte)

- Non-vascular plants (bryophytes):
  - Liverworts
  - Mosses
  - Hornworts
  - †Horneophytopsida
- Vascular plants (tracheophytes)
  - Lycopodiophyta—clubmosses
  - Pteridophyta: the ferns
    - Pteridopsida: the typical ferns
    - Sphenopsida: the horsetails
    - Marattiopsida: a divergent group of ferns
    - Psilotopsida
    - sister-group to all other ferns
  - †Rhyniophyta—rhyniophytes
  - †Zosterophyllophyta—zosterophylls
  - †Trimerophytophyta—trimerophytes
  - †Progymnospermophyta
  - Seed plants (spermatophytes)
    - †Pteridospermatophyta: the seed ferns
    - Pinophyta: the conifers
    - Cycadophyta: the cycads
    - Ginkgophyta: the ginkgos
    - Gnetophyta: sister group to the Angiosperms
    - Magnoliophyta or Angiosperms (flowering plants)
      - Dicotyledons
      - Monocotyledons
- †Nematophytes

THE PLANT FOOD FACTORY

At least some plant cells contain photosynthetic organelles (plastids) which enable them to make food for themselves. With sunlight, water, and carbon dioxide, the plastids make sugars, the basic molecules needed by the plant. Free oxygen (O_2) is produced as a by-product of photosynthesis.[7]

Later, in the cell cytoplasm, the sugars may be turned into amino acids for proteins, nucleotides for DNA and RNA, and carbohydrates such as starch. This process needs certain minerals: nitrogen, potassium, phosphorus, iron and magnesium.[8]

Plant nutrients[change | change source]

Plant nutrition is the study of the chemical elements that are necessary for plant growth.

Macronutrients:

- N = Nitrogen (Carbohydrates, amino acids & glycolipids)
- P = Phosphorus (ATP and the energy cycle)
- K = Potassium (water regulation, opening and closing of stomata in some plant species)
- Ca = Calcium (transport of other nutrients)
- Mg = Magnesium (major constituent of chlorophyll, activator to various enzymes)
- S = Sulfur (some amino acids)
- Si = Silicon (cell walls)
-

Micronutrients (trace elements) include:

- Cl = Chlorine (osmosis and ion balance)
- Fe = Iron (photosynthesis ans enzyme co-factor)
- B = Boron (sugar transport and cell division)
- Mn = Manganese (building chloroplasts)
- Na = Sodium (various)
- Zn = Zinc (activator to many enzymes)
- Cu = Copper (photosynthesis)
- Ni= Nickel (an enzyme)
- Mo = Molybdenum (enzyme co-factors)

ROOTS

The roots of plants perform two main functions. First, they anchor the plant to the ground. Second, they absorb water and various nutrients dissolved in water from the soil. Plants use the water to make food. The water also provides the plant with support. Plants that lack water become very limp and their stems cannot support their leaves. Plants which specialise in desert areas are called xerophytes or phreatophytes, depending on the type of root growth.

Water is transported from the roots to the rest of the plant through special vessels in the plant. When the water reaches the leaves, some of it evaporates into the air. Many plants need the help of fungi to make their roots work properly. This plant/fungi symbiosis is called mycorrhiza. Rhizobia bacteria in root nodules help some plants get nitrogen.

FOSSILS

The question of the earliest plant fossils depends on what is meant by the word "plant".

1. If by plants we mean phototrophs using chlorophyll, then cyanobacteria in stromatolites are the first fossils, 3,450 million years ago (mya) in the Archaean eon. The remarkable precision is possible because the fossils were sandwiched between lava flows that could be precisely dated from embedded zircon crystals.[17][18]
2. If by plants we include all types of algae, then the earliest known red algae lived 1.6 billion years ago. Fossils of them were recently found in India.
3. If by plants we mean green plants, Viridiplantae, then the first fossils are green algae. This is probably the majority position amongst professional botanists. There is convincing evidence for the monophyly of charophyte green algae and embryophytes. There are still two choices:
    1. Acritarchs (a group of organic-walled microfossils) may be reproductive cysts of green algae. If so, they are present in the Neoproterozoic era, 1000 mya.
    2. Otherwise, there is a large increase in planktonic algae around 540 mya in the Cambrian period.
4. If by plants we mean land plants, the first fossils are in the Silurian. By the Silurian, fossils of whole plants are preserved, including the lycophyte *Baragwanathia*. From the Devonian, detailed fossils of rhyniophytes have been found. Early fossils of these ancient plants show the individual cells within the plant tissue. The Devonian period also saw the evolution of the first tree in the fossil record, *Wattezia*. This fern-like tree had a trunk with fronds, and produced spores.

The coal measures are a major source of Palaeozoic plant fossils, with many groups of plants in existence at this time. The spoil heaps of coal mines are the best places to collect; coal itself is the remains of fossilised plants, though structural detail of the plant fossils is rarely visible in coal. In the Fossil Forest at Victoria Park in Glasgow the stumps of *Lepidodendron* trees are found in their original growth positions.

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.[8]

New species of insects are continually being found Estimates of the total number of species range from 2 million to 30 million.

All adult insects have six legs; and most have wings. Insects were the first animals capable of flight. As they develop from eggs, insects undergo metamorphosis. Insects live all over the planet: almost all are terrestrial (live on land). Few insects live in the oceans or in very cold places, such as Antarctica. The most species live in tropical areas.

Some people call all insects "bugs", but this is not correct. Only some insects are true bugs, which is a particular order of insects. People who study insects are called entomologists.

INSECT BODY

Insects have exoskeletons (skeletons on the outside). Their skeletons are made out of thin, hard pieces or plates, like armour, made of chitin. All together, these pieces make a hard layer around the insect's body. The exoskeleton protects the insect.

The body of an insect has three main parts: a head, a thorax, and an abdomen. On the head are an insect's compound eyes, its two antennae (they feel and smell things), and its mouth.

On the thorax, insects have wings and legs. All insects have six legs (three pairs of jointed legs) and usually four wings (two pairs).

The abdomen is the back part of the insect. Inside the abdomen is the stomach, the heart, and the excretory system where body wastes pass out of the insect. Bees also have a stinger at the back of the abdomen.

BIRD AND PEOPLE

Some birds are eaten as food. Most usually it is the chicken and its eggs, but people often also eat geese, pheasants, turkeys and ducks. Other birds are sometimes eaten are: emus, ostriches, pigeons, grouse, quails, doves, woodcocks and even songbirds. Some species have died out because they have been hunted for food, for example the dodo and the passenger pigeon.

Many species have learned how to get food from people. The number of birds of these species has grown because of it. Seagulls and crows find food from garbage dumps. The feral pigeon (*Columba livia*), sparrows (*Passer domesticus* and starlings (*Sturnus vulgaris*) live in large numbers in towns and cities all over the world.

Sometimes people also use working birds. For example, homing pigeons carry messages. Nowadays people sometimes race them for sport. People also use falcons for hunting, and cormorants for fishing. In the past, people in mines often used a canary to see if there were bad gas methane in the air.

People often have colorful birds such as parrots and mynahs as pets. These intelligent birds are popular because they can copy human talking. Because of this, some people trap birds and take them to other countries to sell. This is not usually allowed these days. Most pet birds are specially bred and are sold in pet shops.

People can catch some bird diseases, for example: psittacosis, salmonellosis, campylobacteriosis, Newcastle's disease, mycobacteriosis, influenza, giardiasis and cryptosporiadiosis. In 2005, there was an epidemic of bird influenza spreading through some parts of the world, often called avian flu.

Some people have birdboxes in their gardens to give birds a place to nest and bird tables where birds can get food and water in very cold or very dry weather. This lets people see some small birds close up which are normally hidden away in bushes and trees.

BIRD ORDERS

The following is a listing of all bird orders:

- Infraclass Palaeognathae
  - Superorder Struthionimorphae
    - Struthioniformes
  - Superorder Notopalaeognathae
    - Rheiformes
    - Tinamiformes
    - Casuariiformes
    - Apterygiformes
- Infraclass Neognathae
  - Superorder Galloanserae
    - Galliformes
    - Anseriformes
  - Superorder Neoaves
    - Phoenicopteriformes
    - Podicipediformes
    - Columbiformes
    - Mesitornithiformes
    - Pteroclidiformes
    - Apodiformes
    - Caprimulgiformes
    - Cuculiformes
    - Otidiformes
    - Musophagiformes
    - Opisthocomiformes
    - Gruiformes
    - Charadriiformes
    - Gaviiformes
    - Procellariiformes
    - Sphenisciformes
    - Ciconiiformes
    - Suliformes
    - Pelecaniformes

- Eurypygiformes
- Phaethontiformes
- Cathartiformes
- Accipitriformes
- Strigiformes
- Coliiformes
- Leptosomiformes
- Trogoniformes
- Bucerotiformes
- Coraciiformes
- Piciformes
- Cariamiformes
- Falconiformes
- Psittaciformes
- Passeriformes

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THE INFORMATIONS PROVIDED IN THIS PROJECT ARE TAKEN FRON THE BELOW MENTIONED WEBSITES AND BOOKS...

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Examined
18/6

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

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Professor's Signature

INTRODUCTION

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. Some of the earliest fossils found have been aged at 3.8 billion years. These fossil deposits show 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 kingdoms Protista, Fung, and Plantae? Most aquatic plants occur in the kingdoms Plantae and Protista.

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 continually being found Estimates of the total number of species range from 2 million to 30 million Insects hove six legs; and most have wings. Insects were the first animals capable of flight. As they develop from eggs, insects undergo metamorphosis Insects live all over the planer: almost all ore terrestrial (live on land). Few insects live in the oceans or in very cold places, such as Antarctica. The most species live in tropical areas.

FISH

Fish is a member of the paraphyletic group of organisms. This consists of gill-bearing aquatic craniates animals with limbs and digits. Most of the fishes are hagfish, cartilaginous, bony fish and lampreys. Fishes are ectothermic, which means cold-blooded. Fish are abundant in most of the bodies of water. Fishes are an important resource for humans worldwide, especially as food because it consists of a lot of minerals, vitamins, and proteins as it stays in water bodies. These are served as religious symbols.

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. As the site is not homogenous for their easy life period so they need movement from one place to other. A good example is Birds of migratory kind. 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

Earth has a large variety of animals living on it. Scientists classify animals into groups based on common characteristics. Mammals are a group of animals (vertebrates) that have Backbones and hair or fur. They are warm-blooded (endothermic), and they have four-chambered hearts. They also Feed their young with milk from the mother's body. The young of most mammals are born alive.

AREA OF STUDY

The area is whole Kolkata, south 24 parganas district of West Bengal in India.

METHOD OF STUDY

Making this project we use Internet collect information about birds, insects and plants.

OBSERVATION

PLANTS

FIVE COMMON PLANTS

MANGOSA

Scientific name: Azadirachtaindicaluss.

Vernacular Name: Neem, Kadu-limb
Source: The leaves, bark, flowers, fruits and seeds are used as a drug
Family & Distribution: Meliaceae, it is native of Burma but grown all over India. In Sangola taluka neem is found in large scale in rural and urban places. Some imporntant places like Narale, Sangala, spinning mill, Hatid, Walegaon, Andhalgaon, Wasteland of Sangola, it is recorded in Garden, School and Colleges, Akola and Mangewadi etc.
Chemical composition: The alkaloids are the main active principles. They are nimbin, nimbinin, nimbidine, nimbosterine and nimbectin etc. fatty acid present in the plant and seed contain 40 to 45% fixed oil.
Uses: The leaves are carminative, expectorant, anthelmintic, diuretic and insecticidal properties. Fresh leat juice with salt given for intestinal worms, jaundice, skin disease and malarial fever. The leaves are applied for boils, chronic ulcers, swelling and wounds. Bark is used for liver complaint, remove round worms. Gum is stimulant, demulcent tonic and used in debility.

ALOE VERA

Scientific Name: Aloe barbadenses Mills.
Vernacular Name: Korphad, Gritakumari
Source: Thick fleshy leaves (Pulp, dried, juice) are used as a drug
Family & Distribution: Liliaceae, it is native of West Indies or Mediterranean region. It grows wild in hot dry valleys of Western Himalayas and southern, Northern part of India. Sangola is the one of the drought regions it is mainly distributed in every place in rural area some of the important places like Waki, Mahud, Chindepir, Rajuri, Sangola, lawala and Gherdi. It is xerophytic plant.
Chemical composition: The main active principal present in Aloe is crystalline glucoside known as barbaloin, other constituent like resin and derivatives like emodin, chrysophanic acid, anthroquinones, emoclin, also it contains glucose, galactose, mannose and galacturonic acid with protein. The plant contains aloesone and aloesin.
Uses: Aloe is chiefly used as purgative, abortificient, anthelmintic, blood purifier, cathartic, cooling, digestive and diuretic, inflammation, painful parts of the body. It is useful in burn, cold cough, jaundice, worms and piles. Aloe is used in preparation of vegetables, pickles, cosmetics, skin blemisars, help to grow new healthy tissue. It is used as hair tonic as it stimulates the growth of hair.

PERIWINKLE

Scientific Name: Catharanthus roseus Don.

Vernacular Name: Sadaphuli, sadabahar

Source: The dried leaves and roots of this plant used as a drug

Family & distribution: Apocynaceae, the plant is pro USA, Europ and Australia as an omamental plant t s probably indigenous to Madagascar. It is cultivated in South Africa, West Indies, S is also cultivated for its medicinal properties, in the garden. In India, it is grown in Nilgiri, Kanyakumari and Kottayam etc. In Sangola it is distributed each and every waste land, domestic places and garden. Plant is obeserved in rural area like Wanichinchale, Medsingi, Walegaon, Kadlas, Sangola, and Andhalgaon.

Chemical composition: Catharanthus mainly consists of glycosides and alkaloids. The alkaloids are present in entire plant but they are found in more proportion in leaves and root. Some important alkaloids are vinblastine, vincristine, other alkaloids present in the plant are ajmalcine, serpentine, lochnerine, tetrahydroalstonine, vindoline, vindolinine and catheranthine.

Uses: It is used in hypotensive, antidibetic action, other dimer indole-indoline used for curing the anticancer activity. The alkaloids vincristine is highly active in treatment of childhood leukaemia. Vincristine proves effective in breast cancer and the leaves are used in dabetes.

INDIAN GOOSEBERRY

Scientific Name: EmblicaofficinalesGaertn.

Vernacular Name: Avala, Dongri Avala, Amla.

Source: Fresh and dried fruit.

Family & Distribution: Euphorbiaceae, Emblica is a small genus of trees, native of India, Srilanka, Malaya and China. It is found in lacal area of Sangola like Watamabare, Hadid, Kole, Methwade, Spining mill, campus of Sangola college and Nazare

Chemical composition: The fruit is the richest source of Vitimin C. The other important constituents are gallic acid, tannic acid, gum, sugar, fat, phyllemblin, minerals Fe, P. Ca. Bark contain tannin and seeds contain faxed oil and essential oil

Uses: Amla fruit which is acrid, cooling refrigerant, diuretic and mild laxative. Fresh fruit used in intestine worms, pulp of fruit used in to cure the jaundice, anaemia, dyspepsia and scurvy. From this fruit famous ayurvedic tonic Chavanprash' and Triphala churn' is prepared. Dried fruit are used in haemorrhage (bleeding), diarrhea, dysentery, cough, it is used as laxative, headache, piles, liver. Seed applied in scabies and itching Fruit juice is used in hair dye and seed oil and fruit juice are used in the preparation of hair oils and shampoos, Leave are used as a fodder. The fruit are also used in preparation of inks.

PURGING CASIA

Scientific Name: Casia fistula Linn.

Vernacular Name: Bahwa, Amaltas.

Source: Pod and bark of this plant used as a drug.

Family & Distribution: Caesalpinaceae, this is an ornamental tree with yellow flowers found throughout India. Grow in valleys upto 1200 m in Himalayas. In Sangola region it is found in proper Sangola, spining mill Sangola and campus of Sangola college.

Chemical composition: 1-8 dihydroxyanthraquinone, Tryptamines, Fistucacidin(3,4,7,8,4,pentahydroxyflavan Oxyanthraquinone, Epincatechin, Procyanidin 82, Biflavanoids, Rhenin, Physcion, Kaempferol, Chrysophanol, Fistulin, Fistulic acid.

Uses: The sweet blackish pulp of the seedpod is used as a mild laxative. The wood is hard and heavy is used for cabinet and inlay work. Roots are astringent, cooling, purgative, febrifuge and tonic. It is useful in skin diseases, burning sensations and syphils. Bark is laxative, anthelmintic, emetic, febrifuge, diuretic and depurative. It is useful in boils, leprosy, rignworms affection, colic, dyspepsia, constipation, diabetes, stranury and. Cardiac problems. Leaves are laxative, antiperiodic and depurative. It is useful in skin diseases, burning sensation, dry cough and bronchitis Fruits are sweet, cooling. Purgative, carminative, anti-inflammatory, diuretic and ophthalmic. It is used in flatulence, colic, dysentery, inflammations and intermittent fever. It is also used in cardiac disorders, strangury, opthalmopathy and general debility. Pulp form fruits called 'Casia pulp' is a well-known laxative. Bark of tree is rich in tannins. Flowers are bitter, acrid, cooling, emollient, and purgative and are useful in vitiated condition of pitta, burning sensation, leprosy, and skin diseases. It is also useful in cardiac disorders, intermittent fever and general debility.

INSECTS

FIVE COMMON INSECTS

INDIAN MEAL MOTH

The Indian meal moth was given its name after an insect scientist found it feeding on corn meal, also known as Indian meal. They typically live from two to six months,

Size: 5/8"

Shape: Elongated, oval

Color: Copper reddish

Legs: 6

Wings: Yes

Antenna: Yes

Common Name: Indian meal moth Kingdom: Animalia

Phylum: Arthropoda

Class: Insecta

Order: Lepidotera

Family: Pyralidae

Species: Plodiainterpuctella.

Diet: Indian meal moths feed on dried fruits, grains, seeds, nuts, chocolate, candies, bird seed, dog food, powdered milk, dried red peppers and candy.

Habitat: Attracted to the light, these bugs are found in bright places where food is stored like restaurants and grocery stores.

Impact: Moths infest foods and can contaminate food products by leaving skin and waste behind.

Prevention: Store food in sealed containers. Discard infested foods in outdoor trash bins. Clean infested cupboards thoroughly with a vacuum and soap and water.

in North America is the opossum. Opossums may give birth to as many as twenty-one babies at one time. However, the mother only has thirteen nipples in her pouch. The first thirteen babies to climb into her pouch and attach to her nipples are the only ones that survive.

PLACENTAL MAMMAL

A placental mammal develops inside its mother's body until its body systems can function on their own. The name of this group comes from the placenta, an organ in pregnant female mammals 11 of 3 materials between the mother and the developing baby. Food and oxygen carried by blood, pass from the mother to the baby through the placenta. Wastes pass from the baby to the mother, where they are eliminated by her body. Most mammals, including humans, are placental mammals.

CONCLUSION

PLANTS

Each plant is characterized by one of the three life histories: haploid (In), diploid (20), or the most common haploid-diploid. Within each of these three types, there are also variations. Of the plants with haploid life cycles, most algae lack a dikoryotic phose, while most fungi have a dikaryotic phase. There are also other algoe and fungi that are characterized by diploid life cycles. Lastly, plants with a haploid-diploid life history undergo an alternation of generations either similar or dissimilar. In all of these life cycles, asexual reproduction may occur, but it is sexual reproduction that is responsible for genetic diversity. Due to variations arising separately and at different rates, the evolution of land plants did not follow a linear sequence. Before land plants, afgo with mostly haploid life cycles existed, but land plants later originated.

INSECTS

Insects play many important roles in nature. They aid bacteria, fungi, and other organisms in the decomposition of organic matter and in soil formation. The decay of corrion, for example, brought about mainly by bacteria, is accelerated by the maggots of flesh flies and blowflies The activities of these larvae, which distribute and consume bacteria, are followed by those of moths and beetles, which break down hair and feathers Insects and flowers have evolved together. Many plants depend on insects for pollination. Some insects are predators of others.

FISH

Fish has a closed-loop circulatory system. They are an omnivorous group because they feed on plants and other small sea animals of water bodies. Fishes excrete nitrogenous and ammonia. Fishes reproduce highly in the open water column only. The eggs have an average diameter of one millimetre only.

BIRDS

We conclude that species spatial distributions are directly effected by global warming and subsequently climate change in general terms it has been stated by the scientific community that the distribution of species have been moving in a poleward trend. Within the realm of our study we found no conclusive evidence to prove or disprove this statement. The evidence that we did find and cited leads us to the conclusion that the distribution of species is infact being altered by climatic change, but we were unable to determine exactly what that change was. This project focused on bird species (as we found they were ideal indicators of species shifts due to the fact that their patterns of movement are already larger and more immediate than other organisms. This one the fact that bird movements and migrations are well documented are the reason we chose to focus our study on birds) Evidence found specifically from birds shows that there is a correlation between birds' population characteristics and alterations in climatic factors such as temperature and precipitation. The change in population characteristics shows that some sort of shift or generally trended movement is occurring.

MAMMALS

Mammals have about six thousand different species, or kinds, of animals in their group or class. Mammals can be divided into three more groups based on how their babies develop. These three groups are monotremes, marsupials, and the largest group, placental mammals.

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GOKHALE MEMORIAL GIRLS COLLEGE

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Acknowledgment-

It is an honour for us to get this opportunity to do this project - and talk about our ecosystem.
It has been a very fruitful task for us as because we could research more about - ecosystem and our environmental aspects.
I would like to express my special thanks and gratitude to our respected principal madam and our professor madam who has given us this opportunity — and has helped us with required facilities.

Content-

The Study of Ecosystem.

The study of ecosystem is called ecosystem. Ecology is the integreted study of living and non living components of ecosystems and their interactions within an ecosystem framework. This science examines how ecosystem work and relates this to their components such as chemicals, bedrock, soil, plants and animals.

Ecology examines physical and biological structure and examines how these ecosystem characteristics interact with each other. Ultimately this help us understand how to maintain how quality water and economically visable commodity production. These includes primary productivity.

Pond Ecosystem.

A pond is a small area of still, fresh water. It is different from a river or a stream because it doesn't have moving water and it differs from a lake because it has a small area and is no more than around 1'8 m deep. Ponds are frequently man-made or expanded beyound their original depth and bounds by anthogenic causes. Apart from their roles as highly biodiverse fundamentaly natural, freshwater ecosystems ponds have had, and still have, many uses, including providing water for agriculture, livestock and communities, aiding in habitat restriction, serving as loading grounds for local and migrating species, decorative components of landscape, architecture, flood control, leasing, general embankization, interception leasing for pollutant and sources and sinks of greenhouse gases.

Ponds are usually by defination quite shallow water bodies with varing abundance of aquatic plants and animals. Depth seasonal water level variations, nutrients fluxes, amount of light reaching the ponds, the shape, the Presence of visiting large mammals, the competition of any fish communities. Foods webs are leased cloth on free-floating algea and upon aquatic plants. There is usually a diverse array of aquatic life, with a few examples including algea, Snails fish beetles, water bugs, frogs, turtles, otters and mustens Top predators may include large fish, herons, or alligators. Since, fish are major precluter upon amphibians, larvae, Ponds that dry up each year, thereby killing resident fish. Provide important refugis for aphibian breeding.

For centuries ponds were an essential part of people's lives and nearly every village and farm in Britain had a pond. The water was used by both humans.

Estuary Ecosystem.

An estuary is a partially enclosed body of water formed where freshwater from the land meets and mixes with saltwater from the Ocean.

Estuaries vary in size and can also be termed bays, lagoons, harbours, inlets, sounds, wet-lands and swamps.

- Estuaries are unique environments to which plants and animals have specially adapted.
- Transition from land to sea and fresh water to salt water.
- Estuaries are protected from ocean forces by reefs, barrier islands, headlands and deltas.
- Estuaries transport and trap nutrients and sediment through the combined action of freshwater flow, wind, waves, and tidal action.
- Some examples of estuaries in New Zealand include the Manukau Harbour, Raglan, Tairua, Avon-Heathcote and the fjords on the west-coast of the South Island.

- Formation of estuaries:-

Sea level has slowly risen over the last 15000 years remaining stable over the last 6000 years. As the sea rose it drowned river valleys and filled glacial troughs. Once, formed, estuaries make good sediment traps, filling with sediment from both the land and the sea. Sediment from the land include muds and clays delivered by rivers while sediments from the sea are usually clean sands pushed into the estuary by waves and tidal currents. Sediment can also come from shoreline erosion, windblown sediment and shell production.

- Estuarine ecosystem:-

These are areas where both ocean and land contribute to a unique ecosystem. A basic feature is the instability of an estuary due to the ebb and flood of the tide. Plant and animals wastes are washed away, sediment is shifted and fresh and salt-water are mixed. Estuaries provide a calm refuge from the open sea for millions of plants and animals. The diversity of habitats enclosed in estuaries support enormous abundance and diversity of species eg. fish, shellfish, lobsters, marine worms, reeds, seagrasses, mangroves, algae, and phytoplankton. Visiting species include birds which roost and feed, Pelagic fish to spawn and use as nurseries. Estuaries are among the most productive environments on earth.

4 times more productive in plant matter than a rye grass pasture and 20 times more productive than the open sea. Extremely rich in organic matter and nutrients. Photosynthesis occurs throughout the water column and on the sediment surface - very productive.

The margins of the estuary contain the food webs important producers e.g. algae, eelgrass, rushes and mangroves providing a huge amount of organic matter. Marshes and mangroves produce up to ten tones of plant detritus per hectare per year. - considered organic factories.

Forest Ecosystem.

Forest-ecosystem are areas of the landscape that are dominated by trees and consist of biologically interregated communities of plants, animals and microbes, together with the locals soils and atmosphere with which they interact. Forests are much more than the present-population or community of trees. Forests that have been recently killed or altered by fire, insects, disease, wind or logging are still forests because of the biological and physical legacies from the previous forest - legacies of forest soil, organic matter, microbes, minor vegetation and animals. Under a regime of sustiable forest management, many or most of these legacies persist during the period between forest-disturbance and the redevelopment of tree cover.

Forest ecosystems are both a stand-level and a landscape phenomenon, the latter being a masaic of stands that vary in age, species composition, structure, function and time since disturbance. Periodic disturbance is a key to attribute of most forest-ecosystems, and maintance of their historical character and values will generally require maintenance of historical disturbance regimes, or the ecological effects thereof.

Because a forest-ecosystem is an integrated biophysical system, a forest is as much as set of ecosystem processes as a set of forest-ecosystem components. Short-term changes in the structure of the forest do not constitute loss of the forest, as long as the process of the forest-ecosystem remain in operation at acceptable levels.

Agro Ecosystem.

An agroecosystem is the basic unit of study in agroecology, and is somewhat arbitarily defined as a spatially and functionally coherent-unit of agricultural activity and includes the living and non-living components involved in that unit as well as their interactions. An agroecosystem can be viewed as a subset of a conventional ecosystem. As the name implies, at the core of an agrosystem lies the human activity of agriculture. However an agrosystem is not restricted to the immediate site of agricultural activity (e.g the farm), but rather includes the regions that is impacted by this activity, usually by changes to the complexity of species assemblages and energy flows, as well as to the net-nutrient balance.

Traditionally an agroecosystem, Particularly one managed intensively, is characterized as having a simpler species composition and simpler species composition and simpler energy and nutrient-flows than 'natural' ecosystem. Likewise, agroecosystems were often associated with elevated nutrient-input, much of which exits the farm leading to eutrophication of connected ecosystems not directly engaged in agriculture.

Conclusion.

Ecology is a scientific approach to the study of the biosphere. Ecosystem are created by the interrelationship between living organisms and physical environmental they inhabit (land, water, air). Ecosystems require a source of energy to make them work and for most, although not all, this is light from the sun.

Human beings are parts of ecosystems, as well as manipulators of ecosystems. As such we are dependent on, as well as responsible for, the ecological health of the ecosystems we inhabit.

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Examined
18/6

ENVIRONMENTAL SCIENCE PROJECT

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CONTENTS -:

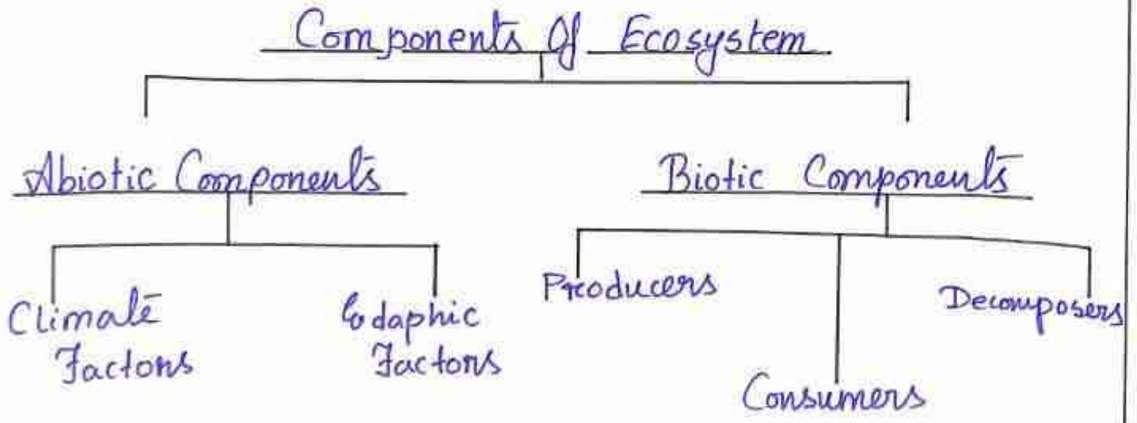
ECOSYSTEM

The term 'Ecosystem' was first used by A.G. Tansley in 1935 but it was coined by Roy Clapham in the year 1930.

According to A.G. Tansley ecosystem refers to - "The system resulting from the integration of all the living and non-living factors of the environment". In simple words, it is a fundamental functional unit on the surface of the earth.

An 'Ecosystem' is a region with a specific and recognizable landscape form such as forest, grassland, desert, wetland or coastal area. The nature of the ecosystem is based on its geo-graphical features such as hills, mountains, plains, rivers, lakes, coastal areas or islands. It is also controlled by climatic conditions such as the amount of sunlight, the temperature and the rainfall in the region. The geographical, climatic and soil characteristics form its non-living or abiotic component. These features create conditions that support a community of plants and animals that evolution has produced to live in these specific conditions. This living part of the ecosystem is referred to as its biotic component.

Components Of Ecosystem



1. Abiotic Components :- The abiotic components include the non-living or the components of physical environment. Abiotic component are mainly of two types.

   ° Climate Factors : It includes rainfall, temperature, light, wind, humidity etc.

   ° Edaphic Factors : It includes soil, pH, topography, minerals oxygen, carbon-dioxide etc.

2. Biotic Components :- The living organisms include; plants, animals and micro-organisms in an ecosystem forms biotic components. It is further classified into 3 main groups.

   ° Producers : Producers or autotrophs are self-feeders, they prepare their own food. They are also known as autotrophs. This process starts when the sunlight is absorbed by chlorophyll. The plants use this energy to combine carbon-dioxide with water to make carbohydrates i.e. suger (glucose), starches and celluloses. Oxygen is given out as a by-product of photosynthesis. The process of photosynthesis can be summarized as

   CARBON DIOXIDE (CO_2) + Water (H_2O) + SOLAR ENERGY → GLUCOSE, OXYGEN

   ° Consumers : Heterotrophs are organisms that feed on autotrophs. Heterotrophs are called consumers which generally feed on other organisms. Consumers are grouped into different categories depending on the food they consume.

   ° Decomposers : These are organisms that live on the refuse and dead organic matter in the ecosystem. Decomposers include scavengers such as crabs and vultures that eat the remains of dead animals and de-composers such as fungi and bacteria that break down plant debris animal droppings and other dead organic matter. They perform the important function of releasing the organic matter in their natural form back to the environment.

STRUCTURE OF ECOSYSTEM :-

A. Energy Flow :-

1. Food Chain :- All ecosystems are made up of food chains that begin with energy i.e. sunlight extracted from the physical environment and converted into organic matter by plants. Herbivores synthesize a portion of the plant material into their bodies. The flesh of herbivore provides nutrition and energy to the carnivores. Thus energy is passed on from one organism to another step by step, thus establishing a link this link together from a food chain. Food chain are also found in the water where zooplanktons survive on phytoplankton.

2. Ecological Pyramid :- Each food chain consists of different levels. The point of energy transfer from the environment to an organism and from one to another defines each level. All food chains have generally three to four level of energy transfer, which is called as Trophic level. When we see the energy transfer through various trophic levels we find that there is relationship between the number of species, biomass and energy availability which is called as Food Pyramid or Ecological Pyramid.

3. Hydrological Cycle :- It is the cycle of water through sea, land and atmosphere. Heat energy from the sun causes water in streams, rivers, seas or lakes to change from a liquid to a water vapor. This is called evaporation. The vapor rises into the air and collects in clouds. Water vapor collects in clouds. As the clouds cool the water vapor condenses into water drops. This is called condensation. These drops fall to the earth as rain and snow. Water falls to the earth from clouds, mainly as rain but sometimes as snow, hail etc. This is called precipitation. A part of water penetrates down into the soil as ground water. This is called Percolation. The remaining water flows over the land joins lakes, rivers, seas and oceans from where again it evaporates. This is called Run-off.

- Natural Ecosystem :- Natural Ecosystems occur in nature and are self-regulatory. They can survive even without human interventions. They are rich in bio-diversity and have complex food webs.

- Man-made Ecosystem :- Artificial ecosystems are made by man and it's depend on human efforts to sustain, thus are not self-regulatory. They are not rich in biodiversity and have simple food webs. They are created for specific purposes by copying the conditions of natural ecosystems. Examples :- Zoos and aquarium for study, tourism, hobby, conservation.

AQUATIC ECOSYSTEM

In aquatic ecosystems; plants, animals live in water. These species are adapted to live in different types of aquatic habitats. The special abiotic features are its physical aspects such as the quality of the water, which includes its clarity, salinity, O_2 content and rate of flow. Aquatic ecosystems may be classified as being stagnant ecosystems or running water ecosystems. The mud gravel or rocks that form the bed of the aquatic ecosystem alter its characteristics and influence its plant and animal species composition. The aquatic ecosystem are classified into fresh water, brackish and marine ecosystems, which are based on the salinity levels.

POND ECOSYSTEM :-

A pond ecosystem refers to the freshwater ecosystem where there are communities of organisms that are dependent on each other and with the prevailing water environment for their nutrients and survival. Usually, ponds are shallow water bodies in which sunlight can reach to its bottom, permitting the growth of the plants that grow there.

On the basis of water depth and types of vegetation and animals there may be three zones in a lake or pond. The different zones are as follows :

i. Littoral
ii. Limnetic
iii. Pro-fundal

i. Littoral Zone : It is the shallow water region which is usually occupied by rooted plants.

ii. Limnetic Zone : This ranges from the shallow to the depth of effective light penetration and associated organisms are small crustaceans, rotifers, insects, and their larvae and algae.

iii. Pro-fundal Zone : It is the deep water parts where parts has no effective light penetration. The associated organism are mussels, crab, worms etc.

PRODUCERS

Phytoplankton literally "wandering plants" are microscopic algae that float in the open water and give it a green appearance. They carry out photosynthesis using 'CO_2' that is dissolved in the water and release 'O_2' that is used by the bacteria and animals in the pond.

Periphytic algae attach themselves to substrates and give the rocks and sticks greenish brown slimy appearance. They produce 'O_2' in the pond. Shore plants grow in wet soil at the edge of the pond. Floating plants float on the surface and rooted on the bottom.

CONSUMERS

Zooplankton are microscopic animals that eat phytoplankton or smaller zooplankton. It floats about in the open water portions of the pond and are important food for some animals. Vertebrates are animals with backbones, include fish, frogs, salamanders and turtles.

DECOMPOSERS

Bacteria and other organisms that break down detritus into material that can be used by primary producers, thus returning the detritus to the ecosystem. As this material decomposes it can serve as a food resource for microbes. During decay microbes living on detritus can pull nutrients from the overlying water thus acting to improve water quality. In the process of breaking down detritus, decomposers produce water and Carbon-dioxide.

RIVER ECOSYSTEM

River ecosystems vary greatly in scale, from head water streams to vast river (Δ) deltas and the relative importance of various types of ecosystem services. River provide water for drinking, food production, energy and for transport and have played a role in the development of human civilization. River valleys and plains provide fertile soils. Farmers in dry regions irrigate their cropland using water carried by irrigation ditches from nearby river. River also used to generate hydro-electricity and useful for navigation and transportation.

- Substrate is the surface on which the river organisms live. It may be inorganic, consisting of geological material from the catchment area such as boulders, pebbles, gravels, sand or silt or it may be organic, including fine particles, leaves, wood, moss and plants.

- Light provide energy for photosynthesis which produces the primary food source for the river. Deep rivers tend to be more turbulent, and particles in the water increasing weaken light penetration as depth increases.

- Temperature in rivers varies with the environment. Water can be heated or cooled through radiation at the surface and conduction to or from the air and surrounding substrate. Climate, shading and elevation all effect water temperature. Species living in these environments are called poikilotherms. Their internal temperature varies to suit their environmental conditions.

- Oxygen is the most important chemical constituent of river systems - most organisms need it for survival. Oxygen is limited if water circulation is poor, animal activity is high or is there is a large amount of organic decay in the waterway.

- Bacteria are present in large number in river waters. They play a significant role in energy recycling. It decompose organic material into inorganic compounds that can be used by plants and by other microbes.

- Birds spend some time of their terrestrial habitats. Fish and water invertebrates are an important good source for water birds. Plants converting light energy into the chemical energy that can be used to fuel organisms activities.

WETLAND ECOSYSTEM

Wetlands are some of the most biologically productive natural ecosystems in the world, comparable to tropical rain forests and coral reefs in their productivity and the diversity of species they support. Aquatic plant life flourishes in the nutrient-rich environment, and energy converted by the plants is passed up the food chain to fish, water fowl and other wild life and to us as well. In addition to the biological productivity of wetlands, an acre of wetland can store 1-1.5 million gallons of flood water. Although wetlands keep only about 5% of the land surface.

Wetland Functions -:

- Absorption and storage of flood waters and ground water recharge in dry periods.
- Protection of coastlines from high energy open ocean waves.
- Slowing of water velocity so sediments may settle out thereby improving water quality.
- Filtering and removal of excess nutrients and toxic by wetland soils and plants.
- Providing nurseries for juveniles of many aquatic species including most commercially harvested fish.
- Providing habitat for many upland species such as racoons and deer as well as habitat for sensitive wetland dependent species like Salamanders.
- Stop-over and nesting sites for migratory birds as well as water fowl habitat. In fact, up to one-half of North American bird species nest or feed in wetlands.

Current Scenario Of Wetlands -:

As per the reported statement, more than 64% of our wetlands have disappeared. In short, there is enormous loss of mangroves, swamps and marshes areas in the world. These losses, could be due to increase in temperature and causing polar ice to melt and sea level to rise.

FOREST ECOSYSTEM

A forest ecosystem is an ecosystem of forests and resources. Forests are renewable natural resources. It is formed by a community of plants that are predominantly structurally defined by their trees, shrubs, herbs, climbers and ground cover. Soil, animals, insects, microorganisms and birds are the most important interacting units of a forest ecosystem. In India, the forests occupy about 18-20% of the total land area. There are two elements of forest ecosystem.

- **Abiotic Elements -:** Among abiotic elements there are various inorganic elements like calcium, phosphorus, oxygen, nitrogen, carbon-dioxide etc are main. Besides there are some organic elements arising from decomposition of dead bodies of animals, trees, vegetation such as human, amino acid etc. Besides, there are natural elements like sunlight, temperature, rainfall etc.
- **Biotic Elements -:**

- Producers -

The main producer of forest is the high quality seed producing trees. Besides there are various types of grass, moss, fern, lyken etc.

- Consumers -

First level Consumers -: Insects, rabbit, deer, small birds; these are herbivores.

Second Level Consumers -: Boa, wolf, fox etc feed on the first level consumers.

Third level Consumers -: Tiger, lion, hawk, vulture etc feed on first and second level consumers.

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CONCLUSION

Ecosystems provide a variety of goods and services upon which people depend. Many ecosystems become degraded through human impacts, such as soil loss, air and water pollution, habitat fragmentation, fire suppression, introduced species and invasive species. These threats can lead to abrupt transformation of the ecosystem. Once the original ecosystem has lost it's defining features it is considered "collapsed". Deforestation affects the ecosystem by rising global temperatures and disrupting the evaporation cycles. Increasing greenhouse gas (O_3, HFC, Mithen) within the atmosphere, which leads to further global warming.

Overpopulation has grown into a epidemic, human consume large amounts of resources for their own needs. Presently, the world produces nearly 300 million tons of plastics yearly. The chemical in the plastics are released in the waters and damage our ecosystems. Organisms such as algae, plants such as seagrass, animals such as fish, snakes, shrimp disappear. The delicate coral reef ecosystems in the South Pacific area at risk.

We must all work together in order to save the ecosystem and the world that we live in from further change. Preserving ecosystems starts at home. Everything we use in our daily life impacts the environment. There are no strict lines on where an ecosystem starts and ends. To start preserving the ecosystem, we have to think about how we interact with our environment. Restoration gives us an opportunity to improve our relationship to the ecosystems we depend on.

WEBLIOGRAPHY

To complete this project I have taken help from the following web sites.

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- Ecosystem | National Geographic Society [www.nationalgeographic.org]
- https://www.researchgate.net/publication/ 260436894_Wetland_ecosystem_services
- Education Resources on the NOAA and EPA websites ESTUARY-NET A Water Quality Monitoring Project
- Environment and Forest [india.gov.in]
- Government OF India INDIAN INSTITUTE OF REMOTE SENSING Indian Space Research Organisation
- Forestry and Ecology Department [iirs.gov.in]

"BIBLIOGRAPHY"

I have taken help from the following books, and other sources -

1. Environmental Geography by Savindra Singh.
2. Environmental Studies by Prof. R.K. Datta and Rishi Baukim Chandra
3. Environmental Studies by Prof. P.R. Das
4. "পরিবেশ বিদ্যা" - ড: শ্রীধরন কুমার দ্বারা রচিত
5. "পরিবেশ" - ড: অমিত চট্টোপাধ্যায়

Acknowledgement-

Special Thanks to my college professor, for making the task easier. I respect DR. Mahua Dutta madam for giving us an opportunity to do this assignment work on the topic "Ecosystem".

Examined 18/6

GOKHALE MEMORIAL GIRLS' COLLEGE

NAME- MANALISHA BARUA

SEM-II

PROJECT- ENVIRONMENTAL SCIENCE

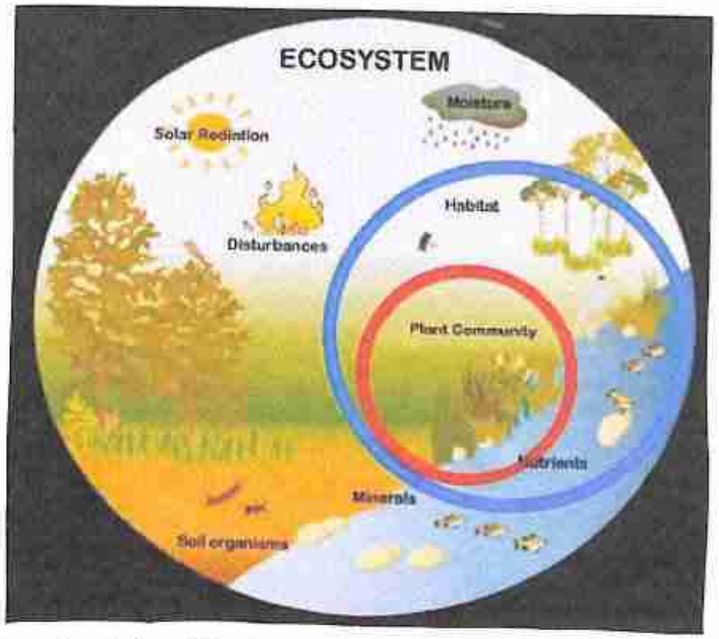
COLLEGE ROLL NO- 21|BSCH|0175

C.U ROLL NO. 213013-11-0085

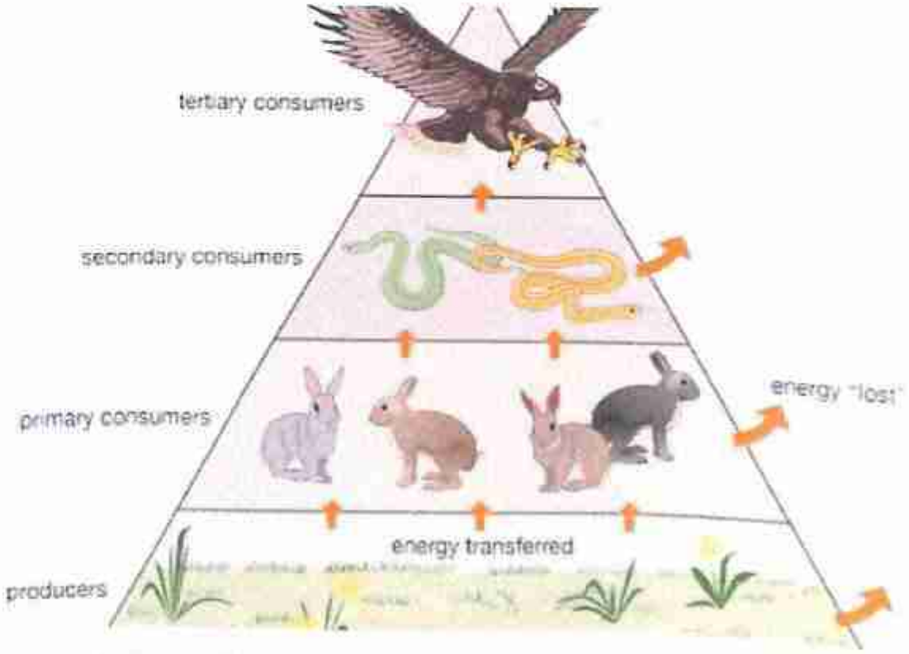
C.U. REG NO. 013-1212-0191-21

THE STUDY OF ECOSYSTEM

The study of Ecology is called ecosystem. Ecology is the integrated of living and non-living components of ecosystems and their interaction within an ecosystem formwork. This science examines how ecosystems work and relates this to their components such chemicals, rock, soil, plants and animals.



Ecology examines physical and biological and examines how these ecosystem characteristics interact with each other. Ultimately this help us understood how to maintain high quality water and economically production. These includes primary productivity.



Ecosystems are classified into aquatic and terrestrial ecosystems. The aquatic ecosystems are water-borne and the terrestrial ecosystems are land-based. Based on the quality of water involved, the aquatic ecosystems are further classified into fresh water and marine types. Being potable and pure, fresh water is mostly used for domestic, agricultural and industrial consumption. In addition to natural water bodies, artificial reservoirs and Dams are constructed to preserve the freshwater, without letting them into seas or natural lakes. Freshwater ecosystems deal with both running and standing water bodies and their life. Lentic ecosystems and lotic ecosystems are the names given to standing and flowing water bodies, respectively. Almost all ecological factors like temperature, light, pH, dissolved gases and salts of water, turbidity, alkalinity, salinity, depth and areal distribution play an active role in controlling the habitat of these ecosystems. In this episode, the ecological characteristics of the lotic ecosystems like a river are going to be discussed. The following are the modules included: 1. River as an ecosystem 2. Limiting Factors and structure 3. Characteristics of Lotic adaptations 4. Life along rivers. 5. Longitudinal zonation. This documentary film is with UGC-CEC-New Delhi.

ENERGY FLOW IN ECOSYSTEM:

The energy flow in the ecosystem is one of the major factors that support the survival of such a great number of organisms. For almost all organisms on earth, the primary source of energy is solar energy. It is amusing to find that we receive less than 50 per cent of the su

Most of the sun's radiation that falls on the earth is usually reflected back into space by the earth's atmosphere. This effective radiation is termed as the Photosynthetically Active Radiation (PAR).

Overall, we receive about 40 to 50 percent of the energy having Photosynthetically Active Radiation and only around 2-10 percent of it is used by plants for the process of photosynthesis. Thus, this percent of PAR supports the entire world as plants are the producers in the ecosystem and all the other organisms are either directly or indirectly dependent on them for their survival.

The energy flow takes place via the food chain and food web. During the process of energy flow in the ecosystem, plants being the producers absorb sunlight with the help of the chloroplasts and a part of it is transformed into chemical energy in the process of photosynthesis.

This energy is stored in various organic products in the plants and passed on to the primary consumers in the food chain when the herbivores consume (primary consumers) the plants as food. Then conversion of chemical energy stored in plant products into kinetic energy occurs, degradation of energy will occur through its conversion into heat.

Then followed by the secondary consumers. When these herbivores are ingested by carnivores of the first order (secondary consumers) further degradation will occur. Finally, when tertiary consumers consume the carnivores, energy will again be degraded. Thus, the energy flow is unidirectional in nature.

Moreover, in a food chain, the energy flow follows the 10 percent law. According to this law, only 10 percent of energy is transferred from one trophic level to the other; rest is lost into the atmosphere. This is clearly explained in the following figure and is represented as an energy pyramid.

CHARACTERSTICS FEATURES OF THE FOLLOWING:

FOREST ECOSYSTEM: An ecosystem refers to a functional unit of nature in which living organisms interact among themselves as well as with the surrounding physical environment. Ecologists look at the entire biosphere as a global ecosystem. Besides, the forest ecosystem is a part of the terrestrial ecosystem.

It, however, may vary largely in size i.e. from a small pond to a sea or a large forest. Usually, these are self-sustaining. We can divide the ecosystems into two broad categories, namely, terrestrial ecosystem and aquatic ecosystem. A forest ecosystem is a functional unit or a system which comprises of soil, trees, insects, animals, birds, and man as its interacting units. A forest is a large and complex ecosystem and hence has greater species diversity.

Also, it is much more stable and resistant to the detrimental changes as compared to the small ecosystems such as wetlands and grasslands.

A forest ecosystem, similar to any other ecosystem, also comprises of abiotic and biotic components. Abiotic components refer to inorganic materials like air, water, and soil. Biotic components include producers, consumers, and decomposers.

These components interact with each other in an ecosystem and thus, this interaction among them makes it self-sustainable.

Structural Features of the Forest Ecosystem

The two main structural features of a forest ecosystem are:

1. **Species composition:** It refers to the identification and enumeration of the plant and animal species of a forest ecosystem.
2. **Stratification:** It refers to the vertical distribution of different species which occupy different levels in the forest ecosystem. Every organism occupies a place in an ecosystem on the basis of source of nutrition. For example, in a forest ecosystem, trees occupy the top level, shrubs occupy the second and the herbs and grasses occupy the bottom.

Components of a Forest Ecosystem

The components of a forest ecosystem are as follows:

1.Productivity

The basic requirement for any ecosystem to function and sustain is the constant input of solar energy. Plants are also the producers in a forest ecosystem.

There are two types of productivity in a forest ecosystem, primary and secondary. Primary productivity means the rate of capture of solar energy or biomass production per unit area over a period of time by the plants during photosynthesis

It is further divided into Gross Primary Productivity (GPP) and Net Primary Productivity (NPP). GPP of an ecosystem is the rate of capture of solar energy or the total production of biomass. However, plants also use a significant amount of GPP in respiration.

Thus, NPP is the amount of biomass left after the utilization by plants or the producers. We can hence say that NPP is the amount which is available for the consumption to herbivores and decomposers. Secondary productivity means the rate of absorption of food energy by the consumers.

2. Energy flow

Energy flows in a single direction. Firstly, plants capture solar energy and then, transfer the food to decomposers. Organisms of different trophic levels are connected to each other for food or energy relationship and thus form a food chain.

Energy Pyramid is always upright because energy flows from one trophic level to the next trophic level and in this process, some energy is always lost as heat at each

3. Nutrient Cycling

Nutrient cycling refers to the storage and movement of nutrient elements through the various components of the ecosystem. There are two types of Nutrient cycling, gaseous and sedimentary.

For Gaseous cycle (i.e. nitrogen, carbon), atmosphere or hydrosphere is the reservoir whereas for the sedimentary cycle (i.e. phosphorus) Earth's crust is the reservoir.

POND ECOSYSTEM:

The ecosystem is a basic unit in ecology, formed by the interaction of plants, animals and microorganisms forming biotic factors with their physical environment or the abiotic factors. A pond ecosystem refers to the freshwater ecosystem where there are communities of organisms that are dependent on each other and with the prevailing water environment for their nutrients and survival. Usually, ponds are shallow (hardly 12 – 15 feet) water bodies in which sunlight can reach to its bottom, permitting the growth of the plants that grow there. On the basis of water depth and types of vegetation and animals there may be three zones in a lake or pond.

Types of Pond Ecosystem

There are the following types of pond ecosystems:

1. **Garden pond ecosystems:** These are man-made artificial pond ecosystems that comprise ornamental plants and animal species exported from all over the world.
2. **Salt pond ecosystems:** These ecosystems are naturally formed at the seaside and contain brackish water. These are formed due to waterlogging. These can also be found in rocky areas on the beach called rock pools. Since it contains brackish water, it can accommodate sea plants and animals.
3. Freshwater pond ecosystems: These ecosystems are naturally formed due to rainfall or soil water saturation due to continuous rain. Moreover, they can also be formed due to the flow of river water into a large and deep depression. These ecosystems serve as a home to freshwater fishes, amphibians, crustaceans, and many other kinds of wildlife.
4. **Venereal pond ecosystems:** These are seasonal ponds that are temporarily formed during the heaviest rainfall due to the accumulation of water in the depressions in the ground. With the change in the season, they often turn into desert land.
5. **Mountain pond ecosystems:** Naturally formed ponds are found in the mountain regions. These are formed due to the shifting of rocks and snow melting. They accommodate rare or endangered aquatic species.

Characteristics of Pond Ecosystem:

The following are the main characteristics of the pond ecosystem:

The water in the pond ecosystem is stagnant.

1. Either natural or artificial boundaries surround the pond ecosystem. The biotic components of the pond ecosystem occupy different levels in the pond ecosystem, therefore, avoid the competition for survival. Scavengers and decomposers occupy the bottom level, and fish occupy the middle level. The plants enclose the pond's boundaries and provide shelter to small animals and insects.
2. Pond ecosystems show a wide range of variety in their size.

Stratification in the Pond Ecosystem

Different factors such as distance from the shore, penetration of light, depth of water, plant and animal species, etc. determine the following zones found in the pond ecosystem:

1. **Littoral zone**: It is the zone closer to the shore. It contains shallow water and allows easy penetration of light. Rooted plant species occupy it. Animal species include reeds, crawfish, snails, insects, etc.
2. **Limnetic zone:** The limnetic zone refers to the open water of the pond with an effective penetration of light. This zone is dominated by phytoplankton. Animal species mainly include small fishes and insects.
3. **Profundal zone:** The region of a pond below the limnetic zone is called a profound zone with no effective light penetration. Some amphibians and small turtles occupy it.
4. **Benthic zone:** The bottom zone of a pond is benthic and is occupied by a community of decomposers. The decomposers are called benthos.

• The level at which water flows in a river is called as the river stage.

• The velocity of water flowing in a stream is not uniform along the longitudinal profile, also within their

cross sections.

• A river is a powerful geological agent. It has the capacity to erode, transport and deposit the sediments.

These are called as river alluvium.

• The alluvial deposits, clay and silt of a river are the materials preferred for different activities.

2. LIMITING FACTORS AND STRUCTURE: The major abiotic factors controlling the lotic ecosystems are a) Slope and geomorphic conditions including the nature of substratum b) Physico-chemical properties of water. Tempertaure, color, alkalinity, pH and dissolved oxygen c) Flow velocity and quantity d) Type and amount of suspended and bed-load sediments e) Turbidity f) Thickness of water column and the depth of light penetration g) The climatological factors like atmospheric temperature, humidity, sun shine hours, evapotranspiration and wind. Depending upon the temperature of water, streams are classified into iso-thermal and non-isothermal streams. In all the rivers, most of the abiotic parameters vary both in space and time.

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wind.

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ESTUARIES:

An estuary is a partially enclosed body of water formed where fresh water from land meets and mixes with salt water from the ocean

Estuaries come in all shapes and sizes and can be called bays, lagoons, harbours, inlets, sounds, wetlands and swamps.

Introduction

- Estuaries are unique environments to which plants and animals have specially adapted.
- Transition from land to sea and fresh water to salt water
- Estuaries are protected from ocean forces by reefs, barrier islands, headlands and deltas.
- Estuaries transport and trap nutrients and sediment through the combined action of freshwater flow, wind, waves and tidal action.
- Some examples of estuaries in New Zealand include the Manukau Harbour, Raglan, Tairua, Avon-Heathcote and the fjords on the west coast of the South Island.

Estuarine ecosystems

These are areas where both ocean and land contribute to a unique ecosystem.

A basic feature is the instability of an estuary due to the ebb and flood of the tide.

Plant and animal wastes are washed away, sediment is shifted and fresh and salt water are mixed.

Estuaries provide a calm refuge from the open sea for millions of plants and animals.

The diversity of habitats enclosed in estuaries supports enormous abundance and diversity of species e.g. fish, shellfish, lobsters, marine worms, reeds, seagrasses, mangroves, algae, and phytoplankton.

Visiting species include birds which roost and feed, pelagic fish to spawn and use as nurseries.

Estuaries are among the most productive environments on earth.

4 times more productive in plant matter than a rye grass pasture and 20 times more productive than the open sea. Extremely rich in organic matter and nutrients.

Estuarine habitats

estuaries enclose a diverse range of habitats from subtidal areas to intertidal areas. These include:

- sheltered upper estuary mangroves, seagrass beds and marshes
- highly energetic beaches on the ocean side of the estuary
- rocky reefs
- wave built bars in estuary mouths
- deep estuarine channels where swift tidal currents flow
- shallow open salt water and fresh water
- river deltas
- tidal pools
- muddy fringing marshes
- mid-estuary sand banks
- intertidal flats
- estuarine beaches

ACKNOWLEDGEMENT:

I would like to express my special thanks to my teacher 'MAHUA DUTTA' for their able guidance and support to complete my project.

And also thanks to my classmates who helped me a lot in finishing this project work. It helped me a lot to increase my knowledge and skills.

Professor's signature

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Have taken help from Environmental science books like:

1.Basu, R.N. Environment. University of Calcutta.

2.Bela Krishnamoorthy, Environmental Management.

Examined
10/2016

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INTRODUCTION

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. Some of the earliest fossils found have been aged evidence at 38 billion years. There fossil deposits show of photosynthesis. So plants on 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 was once Considered "Plants" are divided into several kingdoms: Protista. Fungi, and Plantae? Most aquatic plants occur in the Kingdoms Plantae and Protista.

INSECTS

Insects, are a class in the phylum Antho - poda. They are have small terrestrial invertebrates which a hand exoskeleton. Insects are the largest group of animal on earth by far: about 926.400 different Species have been described. They more than half of all known living species. They may be over 90%of animal species on Earth Neo Species of insects are continually being found Estimates of the total number of species range from a million to 30 million. Insects have six legs, and most have wings. Insects were the first animals capable of flight. As they develop from eggs, insects undergo metamorphosis. Insects live all over the planet: almost all are terrestrial (live and land). Few insects live in the oceans on in very cold places, as Antarctica. The most species live in tropical areas.

FISH

Fish is a member of the paraphytelle group of organisms. This consists of gill-hearing aquatic ema niates animals with limbe and digits. Most of the fishes are hagfish, cartilaginous, bony fish and lampreys. Fishes are eclothemic, which means cold-blooded. Fish are abundant in most of the bodies of water. Fisheries are an important resource for human worldwide, especially food because it consists of a lot of as minerals,

vitamins, and proteins as it stays in water bodies. These are served as staligious Symbols.

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 particularity for their food and reproduction. As the site is not homogenous for their easy life period so they need movement from one place to other. A good example is Birds of migratory kind. In our West Bengal, Storks and Siberian Cranes, 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

Earth has a large variety of animals living on it. Scientists classify animals in to groups common characteristics. Mammals are a common group of animals (vertebrates) that have backbones and hair or fur. They are warm blooded (endothermic), and they have four-chambered hearts. They also feed their young with milk from the mother's body. The young of most mammals are born alive.

AREA OF STUDY

The area is whole Kolkata, South 24 Parganas district of West Bengal in India.

METHOD OF STUDY

Making this project we use internet to collect information about birds, insects and plants.

OBSERVATION

PLANTS

FIVE COMMON PLANTS

1. MARGOSA

MARGOSA TREE

- **Scientific Name:** Azadirach la indica Juss. Vernaculan.
- **Name:** Neem, kadu-limb.
- **Source:** The leaves, bark, flowers, fruits and seeds are usedas drug.
- **Family & Distribution:** Meliaceae. It is native of Burma but grown all over India. In Sangola Taluka neem is found in large scale in moral and urban taluka places. Some important places like Narate. Sangola, spinning mill. Hatid, Walegaon. Andhalgaon, Waskland of Sangola, it is recorded in garden, School and colleges, Akola and Mangewadi ele.
- **Chemical Composition:** The alkaloids are the main active print ples. They are nimbin and rumbestimnim birin, nimbidine, nimbostenineetc. Fatty acid present in the plant and deed contain 40% fixed oil.
- **Uses:** The leaves are carminative, expectorant anthelmintic, diuretic and Insecticidal properties. Fresh leaf Juice with salt given for intestinal worms, jaundice, skin disease and malarial fever. The leaves are applied for boils, chronic ulcers, swelling and wounds. Bark is used for liver Complaint. Remove round worms. Cum is stimulant, demcelcent tonic and used in debility.

2. ALOE VERA

ALOE VERA

- **Scientific Name:** Aloe barbadenses Mills.
- **Vernacular Name:** Korphad. Gitakumari.
- **Source:** Thick fleshy leaves (Pulp, dried, juice) are used as a drug.
- **Family as Distribution:** Lilliaceae, it is native West Indies or Mediterranean region. It grows old in hot day valleys of western Himalayas and Southern, Northern part of India. Sangola is the one of the drought region it is mainly distributed in every places in rural some of

the important places like waki, Mahud, Chindepin, Rajuri, Sangola, Tawala and Gherdi. It is xenophytic plant.

- **Chemical Composition:** The main active principle present in Aloe is Crystalline glucoside known as barbaloin, other Constituent like resin and derivatives like emodin, chrysophanic acid, anthroquinones, emoclin, also it contain glucose, galactose, mannase and galacturonic acid with protein. The plant Contain aloesone and aloesin.
- **Uses:** Aloe is chiefly used as pungative, abortificient, blood purifier, Cathartic, Cooling, digestive and diuretic, inflammation, and painful parts of the body. It is useful in bum, cold cough, jaundice, worms and piles. Aloe is used in preparation of vegetables, pickles, cosmetics, Skin blemisars, and help to grow new healthy tissue. It is used as hair tonic as it stimulates the growth of hair.

3. PERIWINKLE

- **Scientific Name:** Cathamanthus roseus Don
- **Vennacular Name:** Sadaphuli, Sadabahar.
- **Source:** The dried leaves and roots of this plant used as a drug.
- **Family & Distribution:** Apocynaceae, the plant is probably indigenous to Madagascar. It is cultivated in South Africa, West Indies, and Srilanka, India, U.S.A. Europe and Australia as an ornamental plant. It is also cultivated for its medicinal properties, in the garden. In India it is grown in Nilgiri, Kanyakumari and Kottayam etc. In Sangola it is distributed each and every domestic places and garden. Plant is observed in rural area like waniahinchale, Medsingi. Walegon, Kadlas, Sangola and Andhalgaon.
- **Chemical Composition:** Cathananthus mainly consists of glycosides and alkaloids. The alkaloids are present in entire plant but they are found in more pro portion in leaves and root. Some important alkaloids are Vinblastine, vincristine other alkaloids present in the plant core ajmalcine, sapentine, lochnerine, tetrahydrostonine and vindolin, Catheranthine.
- **Uses:** It is used in hypotensive, antidibetic action, other dimen indole-indoline used for curing the anticancer activity. The alkaloids vincristine is highly active in treatment of childhood Ceukaemia. Vincristine proves effective in breast cancer and the leaves are used in diabetes.

PERIWINKLE

4. INDIAN GOOSEBERRY

INDIAN GOOSEBERRY

- **Scientific Name:** Emblicaofficinales Gaertn
- **Vernaculan Name:** Avala, Dongri Avala, Amla
- **Source:** Fresh and dried fruit.
- **Family is Distribution:** Euphorbiaceae, Emblica is a small genus of trees, native of India, Srilanka. Malaya and China. It is found in local area of Sangola like watamabare, Hadid, kole, Methwade. Spining mill. Campus of Sangola College and Nazare.
- **Chemical Composition:** The fruit is the richest source of vitamine C. The other important Constituents are garlic acid, tannic acid, gum, sugar. Fat, phyllemblin, minerals Fe, P, Ca, Bark contain tanin and seeds contain fixed all and essential oil.
- **Uses:** Amla fruit which is acid, cooling refrigerant, diluretic and mild laxative. Fresh fruit used in intestine worms, pulp of fruit used in to come the jaundice, anaemia, dyspesla and scurvy. From this fruit famous ayurvedic tonic "Chavanprash" and "Triphala" 'Churn' is prepared. Dried fruit are used in haemorhage (bleeding). Diarrhea, dysentery, coughs. It is usedas Taxative, headache, piles, Liver. Seed applied in Scabies and itching. Fruit juice is used in hair dye and seed oil and fruit juice and used in the preparation of hair oils and Shampoos. Heaves are used as a fodder. The fruit are also used in preparation of inks.

5. PURGING CASSIA

PLUNGING CASIA

- **Scientific Name:** Casia fistula linn
- **Vernacular Name:** Bahwa, Amaltas
- **Source:** Pod and bark of this plant used as a drug.
- **Family & Distribution:** Caesalpinaceae. This is an ornamental tree with yellow flowers found throughout India. Grow in valleys upto 1200m in Himalays. In Sangola region it is found in proper Sangola, Spining mill fangela and campus of Sangola College.
- **Chemical composition:** 1-8 dihydro xyanthra quinone, Trypta mines, Fistu Cacidin (3,4, 7, 8,4) Pentahydroxyfilavan oxyanthraquinone, Spincatechin, Procy oxide B2, Biflavanoids. Rhenin, Phystion, kaempferol, Chrysophanol, Fistulin. Fistulic acid.

North America is the opossum. Opossums may give birth to as one only many twenty as babies at one time. However, the mother has thirteen nipples in her pouch.

3. PLACENTAL MAMMAL

A placental mammal develops inside it's mother's body until its body systems can function their own. The name of this group comes from the placenta, an organ in pregnant female mammals that pass materials and food between the mother and the developing baby. Food and oxygen carried by blood, pass from the mother to the baby through the placenta. Wastes pass from the baby to the mother. Where they are eliminated by her body. Most mammals including humans are placental mammals.

CONCLUSION

PLANTS

Each plant is characterized by three life histories; haploid (1N), diploid (2n). or the most common haploid-diploid within each of these three types, there are also variations of the plants with haploid life cycles, most algae Lock a dikonyotic phase. While most fungi have dikcanyotic phase. There are also other algaes and fungi that are characterized by diploid life Cycles. Lastly, plants with a haploid-diploid life history undengo an alternation of generations, either similaror dissimilar. In all of these life cycles, asexual reproduction may occur, but it is sexual reproduction that is responsible for genetic diversity. Due to variations arising separately and at different rates, the evolution of land plants, did not fellow a linear sequence. Before land plants, alga with haploid life cycles, but land plants later originated.

INSECTS

Insect play a very important role in nature. They aid bacteria, fungi and other organisms in the decomposition roles in decomposition of organic matter and in soil formation. The decay of carrion for example, brought about mainly by bacteria accelerated by the moggots of flesh files and Blow filer. The activities of these larvae, which distribute and Consume bacteria, are followed by those of moths and beetles, which break down hair and feathers. Insects and flowers have evolved together. Many plants depend on insects for pollination. Some insects are predators of others.

FISH

Fish has a closed-loop circulatory system. They are Omnivorous group because feed on plants and other small sea animals of Water bodies. Fishes excrete nitrogenous and ammonia. Fishes reproduce highly in the open water column only. The eggs have an average diameter of one millimetre only.

BIRDS

We conclude that species spatial distribution directly affected by global warming and subsequent Climate change. In general terms it has been started by the scientific community that the distribution of species have been moving in a pole

ward trend, within the realm of our study we have found evidence to prove or disprove this statement. The evidence that we did find and cited leads us to the conclusion that the distribution of species is in fact being altered by Climatic change, but we were unable to determine exactly what that change it was. This project focused on bird species. Evidence found specifically from birds Shows that there is a Correlation between bird population characteristics and alteration in climatic factors such as temperature and precipitation. The Change in population characteristics shows that some sort of shift generally trended movement isoccurring.

MAMMALS

Mammals have about six thousand different species, or kinds of animals in their group or class. Mammals can be divided into three groups based on groups are how their babies develop. These three groups are monotrems, marsupials and the largest group, placental mammals.

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Professor's Signature

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ENVS PROJECT

INTRODUCTION

PLANTS

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Insects, are a class in the phylum Antho-poda. They are small terrestrial invertebrates which have a hard exoskeleton. Insects are the largest group of animal 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 continually being found Estimates of the total number of species range from 2 million to 30 million. Insects have six legs; and most have wings. Insects were the first animals capable of flight. As they develop from eggs, insects undergo metamorphosis. Insects live all over the planet; almost all are tennestial (live and land). Few insects live in the oceans or in very cold places, such as Antarctica. The most species live in tropical areas.

FISH (Sub H)

Fish is a member of the paraphyletic group of organisms. This consists of gill-bearing aquatic craniates animals with limbs and digits. Most of the fishes are hagfish, cartilaginous, bonyfish and lampreys. Fishes are ectothemic, which means cold-blooded. Fish are abundant in most of the bodies of water. Fishes are an important resource for human worldwide especially as food because it consists of a lot of minerals, vitamins, and proteins as it stays in water bodies. These are served as religious symbols.

BIRDS (Sub H)

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. As the site is not homogenous for their easy life period so they need movement from one place to other. A good example is Birds of migratory kind. 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 (Sub H)

Earth has a large variety of animals living on it. Scientists classify animals in to groups based on common characteristics. Mammals are a group of animals (vertebrates) that have backbones and hair or fur. They are warm blooded (endothermic), and they have four-chambered hearts. They also feed their young with milk from the mother's body. The young of most mammals are born alive.

AREA OF STUDY (Sub H)

The area is whole Kolkata, South 24 parganas district of West Bengal in India.

METHOD OF STUDY (Sub H)

Making this project we use internet collect information about birds, insects and plants.

OBSERVATION (H)

PLANTS (Sub H)

FIVE COMMON PLANTS (Sub H)

1. Mangosci

Scientific Name : Azadirachta indica Juss.

Vernacular Name : Neem, kadu-limb.

Source : The leaves, bark, flowers, fruits and seeds are used as drug.

Family & Distribution : Meliaceae, it is native of Burma but grown all over India. In Sangola taluka neem is found in large scale in rural and urban places. Some important places like Nanale, Sangola, Spinning mill, Hatid, Walegaon, Andhalgaon, Wasteland of Sangola, it is recorded in garden, School and colleges, Akola and Mangewadi etc.

Chemical Composition : The alkaloids are the main active principles. They are nimbin, nimbinin, nimbidine, nimbosterine and nimbectin

etc. fatty acid present in the plant and seed contain 40 to 45% fixed oil.

Uses : The leaves are carminative, expectorant, anthelmintic, diuretic and insecticidal properties. Fresh leaf juice with salt given for intestinal worms, jaundice, skin disease and malarial fever. The leaves are applied for boils, chronic ulcers, swelling and wounds. Bark is used for liver complaint, remove round worms. Gum is stimulant, demulcent tonic and used in debility.

2. Aloe Vera

Scientific Name : Aloe barbadenses Mills

Vernacular Name : Korphad, Gritakumari

Source : Thick fleshy leaves (Pulp, dried, juice) are used as a drug.

Family & Distribution : Liliaceae, it is native of west Indies on Mediternanean region. It grows wild in hot dry valleys of western Himalayas and Southern, Northern part of India. Sangola is the one of the drought region it is mainly distributed in every places in rural area some of the important places like waki, Mahud, Chindepin, Rajwi, Sangola, Jawala and Ghendi. It is xerophytic plant.

Chemical Composition : The main active principle present in Aloe is crystalline glucoside known as barbaloin, other constituent like resin and derivates like emodin, chrysophanic acid, anthroquinones, emodin, also it contain glucose, galactose, mannase and galacturonic acid with protein. The plant contain aloesone and aloesin.

Uses : Aloe is chiefly used as purgative, abortificient, blood purifier, cathartic, cooling, digestive and diuretic, inflammation, painful parts of the body. It is useful in burn, cold cough, jaudice, worms and piles. Aloe is used in preparation of vegetables, pickles, cosmetics, skin blemisars, help to grow new healthy tissue. It is used as hair tonic as it stimulates the growth of hair.

3. Periwinkle

Scientific Name: Catharanthus roseus Don

Vernacular Name: Sadaphuli, Sadabahar.

Source: The dried leaves and roots of this plant used as a drug.

Family & Distribution: Apocynaceae. The plant is probably indigenous to Madagascar. It is cultivated in South Africa, West Indies, Srilanka, India, U.S.A. Europ and Australia as an ornamental plant. It is also cultivated for its medicinal properties, in the garden. In India it is grown in Nilgiri, Kanyakumari and Kottayam etc. In Sangola it is distributed each and every waste land, domestic places and garden. Plant is obesenved in rural area like Wanichinchale, Medsingi, Walegon, Kadlas, Sangola and Andhalgaon.

Chemical Composition: Catharanthus mainly consists of glycosides and alkaloids. The alkaloids are present in entire plant but they are found in more proportion in leaves and root. Some important alkaloids are vinblastine, vincristine other alkaloids present in the plant are ajmalcine, sepentine, lochnerine, tetrahydroalstonine, vindolinine and catheranthine.

Uses: It is used in hypotensive, antidibetic action, other dimen indole-indoline used for curing the anticancer activity. The alkaloids vincristine is highly active in treatment of childhood leukaemia. Vincristine proves effective in breast cancer and the leaves are used in diabetes.

4. Indian Gooseberry

Scientific Name: Emblicaofficinales Gaertn

Vernacular Name: Avala, Dongri Avala, Amla

Source: Fresh and dried fruit.

Family & Distribution: Euphorbiaceae, Emblica is a small genus of trees, native of India, Srilanka, Malaya and China. It is found in local area of Sangola like watamabare, Hadid, kole, Methwade, Spining mill, Campus of Sangola college and Nazare.

Chemical Composition: The fruit is the richest source of vitamine C. The other important constituents are gallic acid, tannic acid, gum, sugar, fat, phyllemblin, minerals Fe, P, Ca, Bark contain tanin and seeds contain fixed oil and essential oil.

Uses: Amla fruit which is acid, cooling refrigerant, diluretic and mild laxative. Fresh fruit used in intestine worms, pulp of fruit used in to cure the jaundice, anaemia, dyspepsia and scurvy. From this fruit famous ayurvedic tonic 'Chavanprash' and 'Triphala' churn' is prepared. Dried fruit are used in haemorrhage (bleeding). diarrhea, dysentery, cough. It is used as laxative, headache, piles, liver. Seed applied in scabies and itching. Fruit juice is used in hair dye and seed oil and fruit juice and used in the preparation of hair oils and shampoos. leave are used as a fodder. The fruit are also used in preparation of inks.

3 Blue Magpie Rolein

Common English Name : Blue Magpie-robin

Bengali Name : Doyel

Scientific Name : Copsychus Saularis

Distribution : In all parts of plain.

Characters : Quiet and calm a bird chirps during dawn or dusk.

Vegetation Spectrum : Tnemaorientalis, Bamusa sp, Mangiferaindica, Tinosporaconfolia, Ficus sp., Pbdhossp, phyllanthusreticulatus, Adinacordifolia, Mangiferaindica, Casuarinaequisetifolia, Ravanalamddagascariensis, Plumeriarubra, Tabernemontadivericata, etc.

4 Indian Ring Necked Parrot

Common English Name : Indian ring-necked parrot

Bengali Name : Tiya.

Scientific Name : Psittacula krameri manillensis.

Distribution : Indian sub continent. All parts of plain.

Characters : very punctual about them.

Vegetation Spectrum : Michelia champaca, Seraca asoka, Terminaliaarjuna, Ficusbengalensis, F. Religiosa, Disoxylum sp, Bonassusflabelliferetc.

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Examined
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AECC2 ENVS PROJECT

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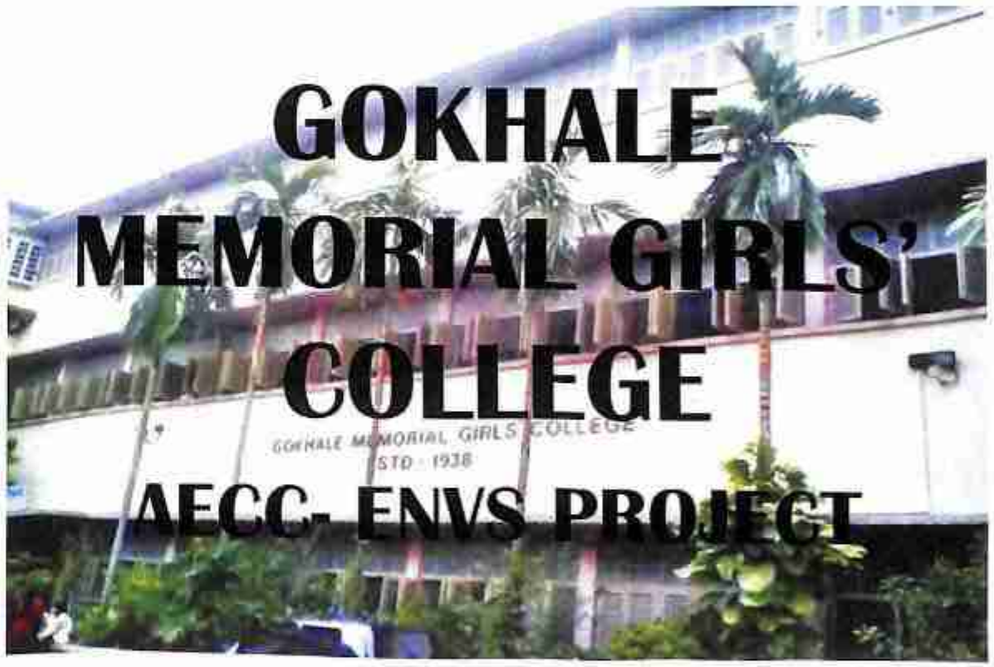

AECC- ENVS PROJECT

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

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Common English name: Common Bulbul

Bengali namr: Bulbuli

Scientific name: Pscnotus Cafer

Distribution: In all parts of plain and even in low altitudes of hilly area.

Characters: clever and very intelligent.

Vegetation Spectrum: meliaazadirachta, , meliaa- zadirachta, stephaniahernandi-folia, mikaniascandens, tremaorientalits, bamusa sp, mangiferaindica, trinosporacordifolia, sapoda, inga, dulcusecte.

3. Blue Magpie Robin

Common English name: Blue Magpie Robin

Bengali name: Doyel

Distribution: In all parts of India.

Characters: Quiet and calm, the bird chirps during dawn or dusk.

Vegetation Spectrum: - zadirachta, stephaniahernandi-folia, mikaniascandens, tremaorientalits, bamusa sp, mangiferaindica, trinosporacordifolia, montadivericata, etc.

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Common English Name: Indian ring-necked parrot

Bengali name: Tiya

Scientific name: Psittacula kramerri manillensils

Charaters: very punctual about them.

Vegetation spectrum: - zadirachta, stephaniahernandi-folia, mikaniascandens, tremaorientalits, bamusa sp, mangiferaindica, trinosporacordifolia, disoxylum sp, borassusflabelliferete, etc.

5. Rock Dove

English name: Rock Dove (Female and Male)

Bengali name: Payra

Scientific name: columba livia

Distribution: Indian sub-continent. All parts of plain.

Characters: can be used as pets

Vegetation spectrum: in rice field and in fallow land. Plants with seeds of chrozophraplicata, crotonbonplandianum,brassica nigra, lathyrus sativa,etc are common for the birds like rock dove and common dove.

MAMMALS

THREE COMMON MAMMALS

1. Monotremes

Monotremes are mammals that lay eggs. They only monotremes that are alive today are the spiny anteater or any echidna and platypus. They live in Australia, Tasmania and New Guinea. These mammals are really different from other mammals. Their body temperature is lower than most warm-blooded animals, a feature that has more in common with

from the mother to the baby through the placenta. Wastes passed from the baby to the mother where they are eliminated by her body. Most mammals including humans are placental mammals.

CONCLUSION

1. PLANTS

Each plant is characterized by one of the three histories haploid, diploid or the most common haploid -diploid. Within each of these three types there are also variations of the plant with haploid type cycles most algae lock a dikaryotic phase. While most fungi have dikaryotic phase. There are also other algae and fungi that are characterized by diploid lifecycles. Lastly plans with a haploid diploid life history undergo an alternation of generations either similar or dissimilar in all of these life cycles are asexual reproduction may occur but it is it is sexual reproduction that is responsible for genetic diversity. Due to diversions arising separately at different rates the evolution of land plans did not follow a linear sequence before land plants algae with haploid lifecycle but land plants later originated.

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Fish has a closed loop circulatory system They are an omnivorous group because they feed on plants and other small sea animals of waterbodies. Fishes extract nitrogen and ammonia. Fishes reproduce highly in the open water column only. The eggs have an average diameter of 1 millimeter only.

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We conclude that species spatial distribution is directly affected by global warming and subsequently climate change. In general terms it has been started by the scientific community that the distribution of species has been moving in a poleward trend. Within the realm of our study, we found no conclusive evidence to prove or disprove this statement. The evidence that we did find and sited leads as to conclusion that the distribution of species is infant being altered by climatic change. But we were unable to determine exactly what that change was. This project focus on bird species evidence found specifically from birds shows that there is a correlation between bird population characteristics and alteration in climatic factors such as temperature and precipitation. The change in population characteristics show that some sort of shift our generally trended movement is occurring.

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ENVS PROJECT

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COLLEGE ROLL NO :
21/13/AH/0004

196

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

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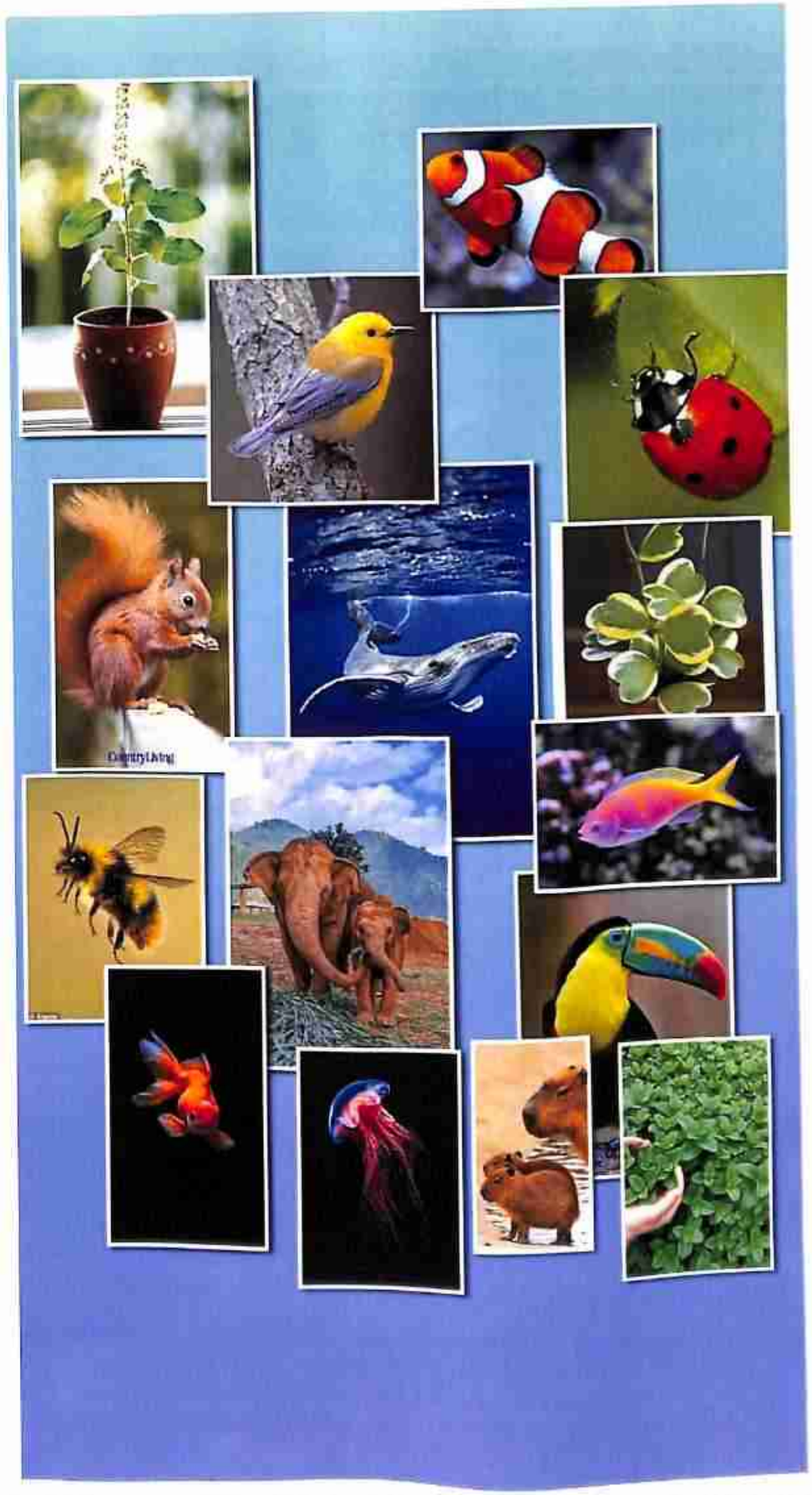

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OBSERVATION

PLANTS

FIVE COMMON PLANTS

MANGOSA

SCIENTIFIC NAME : Azadirachta indica Juss.

VERNACULAR NAME: Neem, Kadu-limb.

SOURCE : The leaves, bark, flowers, fruits and seeds are use as drug.

FAMILY AND DISTRIBUTION : Meliaceae, it is native of Burma but grown all over India. In Sangola taluka neem is found in large scale in rural and urban places. Some important places like Narale, Sangola, Spinning mill, Hatid, Walegaon, Andhalgaon, Wasteland of Sangola, it is recended in garden, school and Colleges. Akola and Mangewadi etc.

CHEMICAL COMPOSITION :- The alkaloids are the main active prireiples. They are nimbin, nimbinin, nimbidine, nimbosterine and nimbectin, etc. fatty acid present in the plant and seed contain 40 to 40 % fixed oil.

USES :- The leaves are carminative, expectorant, anth-
-elmintic, diuretic and insecticidal properties.
Fresh leaf juice with salt given for intestinal worms, jaundice, skin disease and malarial fever.
The leaves are applied for boils, chronic ulcers, swelling and wounds. Bark is used for liver complaint remove round worms. Gum is stimulant, demulcent tonic and used in disability.

MANGOSA

2. ALOE VERA

SCIENTIFIC NAME :- Aloe - barbadneses Mills.
VERNACULAR NAME :- Korphad, Gritakumari
SOURCE :- Thick fleshy leaves (Pulp, dired, juice) are used as a drug.
FAMILY AND DISTRIBUTION :- Liliaceae, it is native of West Indies or Mediterranean region. It grows wild in hot dry valleys of Western Himalayas, and Southern, Nor-thern part of India. Sangola is the one of the drought region it is mainly distributed in every places in rural area some of the important places like Waki, Mahud, Chindapir, Rajuri, Sangola, Jawala and Gherdi. It is xerophytic plant.
CHEMICAL COMPOSITION :- The main active principle present in Aloe is crystalline glucoside known as barbalion, other constituent like resin and derivates like emodin, chrysophanic acid, anthroquinones, emoddin, also it contain glucose, galactose, mannase and galacturonic acid with protein. The plant contain aloesone and aloesin.
USES :- Aloe is chiefly used as purgative, abortificient, blood purifier, cathartic, cooling, digestive and diuretic, inflammation, painful parts of the body. It is useful in burn, cold cough, jaundice, worms and piles. Aloe is used in preparation of vegetable, pickles, cosmetics, skin blemisars, help to grow new healthy tissue.

It is used as hair tonic as it stimulates, the growth of hair.

3. PERIWINKLE

SCIENTIFIC NAME: Catharanthus roseus Don

VERNACULAR NAME: Sadaphuli, Sadabahar.

SOURCE: The Dried leaves and roots of this plant used as a drug.

FAMILY AND DISTRIBUTION: Apocynaceae, the plant is probably indigenous to Madagascar. It is cultivated in South Africa, West Indies, Srilanka, India, U.S.A, Europe and Australia as an ornamental plant. It is also cultivated for its medical properties, in the garden In India it is grown in Nilgiri, Kanyakumari and Kottayam etc. In Sangola it is distributed each and every waste land, domestic places and garden. Plant is observed in rural area is like Wanichinchale, Medsingi, Walegon, Kadlas, Sangola and Andhalgaon.

CHEMICAL COMPOSITION:- Catharanthus mainly consists of glycosides and Alkaloids. The alkaloids are present in entire plant but they are found in more proportion in leaves and root. Some important alkaloids are vinblastine, vincristine other alkaloids present in the plant are ajmalcine, sepentine, lochnerine, tetra-hydroalstonine, vindolin and catheranthine.

USES:- It is used in hypotensive, antidibetic action, other dimer indole- indoline used for curing the anticancer activity. The alkaloids vincristine is highly active in treatment of childhood leukaemia. Vincristine proves effective in breast cancer and the leaves are used in diabetes.

4. INDIAN GOOSEBERRY

SCIENTIFIC NAME :- Emblica officinales Gaertn

VERNACULAR NAME- Avala, Dongri Avala, Amla

SOURCE - Fresh and Dried Fruits

FAMILY AND DISTRIBUTION :- Euphorbiance, Emblica is a small genus of trees, native of India, Srilanka, Malaya and China. It is found in local area of Sangola like watamabare, Hadid, Kale, Methwade, Spinning mill, Campus of Sangola College and Nazare.

CHEMICAL COMPOSITION :- The fruit is the richest source of vitamine C. The other important constituents are gallic acid, tannic acid, gum, sugar, fat, phyllemblin, minerals Fe, P, Ca, Bark contain tanin and seeds contain fixed oil and essential oil.

USES - Amla fruit which is acid, cooling refrigerant, diuretic and mild laxative. Fresh fruit used in intestine worms, pulp of fruit used in to cure the jaundice, anaemia, dyspepsia and scurvy. From this fruit famous ayurvedic tonic 'chavanprash' and 'Triphala' 'churn' is prepared. Dried fruit are used in haemorrhage (bleeding). diarrhea, dysentry, cough. It is used as Taxative, headache, piles, liver, Seed applied in scabies and itching. Fruit juice is used in hair dye and seed oil and fruit juice and used in the preparation of hair oils and shampoos.

5. PURGING CASIA

Scientific Name - Casia fistula linn.

Vernacular Name - Bahwa, Amaltas.

Scourse - Pod and bark of this plant used as a drug.

Family and Distribution - Caesalpinaceae, this is an ornamental tree with yellow flowers found throughout India. Grow in valleys upto 1200m in Himalays. In Sangola region it is found in proper Sangola, Spinning mill Sangola and Campus of Sangola College.

Chemical Composition - 1-8 dihydroxyanthraquionene, Tryptamines, fistucacidin (3, 4, 7, 8, 4) pentahydroxy flavan oxyanthraquinone, Epicatechin, Procyanidin B2, Biflavanoids, Rhein, Physcion, Kaempferol, Chrysophanol, Fistulin, Fistulic acid.

Uses - The sweet blackish pulp of the seedpod is used as a mild laxative. The wood is hard and heavy is used for cabinet and inlay work. Roots are astringent, cooling purgative, febrifuge and tonic. It is useful in skin diseases, burning sensation and syphilis. Bark is laxative, anthelmintic, emetic, febrifuge, diuretic and depurative. It is useful in boils, leprosy, ringworm affection, colic, dyspepsia, Constipation, diabetes, stranury and cardiac problems, leaves are laxative, antiperiodic and depurative. It is useful in skin diseases burning, sensation dry cough and bronchitis.

INSECTS

FIVE COMMON INSECTS

1. INDIAN MEAL MOTH

The Indian meal moth was given its name after an insect scientist found it feeding on corn meal, also known as Indian meal. They typically live from two to six months.

Size : 5/8"
Shape : Elongated, oval
Colour : Copper reddish
legs : 6
Wings : Yes
Antenna : yes
Common Name : Indian meal moth
Kingdom : Animalia
Phylum : Arthopoda
Class : Insecta
Order : Lepidotera
Family : Pyralidae.
Species : Plodia interpuctella.

DIET → Indian meal moths feed on dried fruits, grains, seeds, nuts, chocolate, candies, birdseed, dog food, powdered milk, dired red peppers and candy.

HABITAT →

Attracted to the light, these bugs are found in bright places where food is stored like restaurants and grocery stores.

IMPACT -

Moths infest foods and can contaminate food products by leaving skin and waste Behind.

PREVENTION -

Store food in sealed containers.
Discard infested foods in outdoor trash bins.
Clean infested cupboards thoroughly with a vacuum and soap and water.

2. MOSQUITOES

There are abat 170 different Kind of Mosquitoes in North America alone. These pests are part of the same family as houseflies and fruit flies, because they all have two clear veined wings. Best known as a summer past. Mosquitoes can develop from egg to adult in 10 to 14 days.

Size - 1/4" to 3/8"
Shape - Narrow, Oval
Colour - Pale brown with whitish stripes across abdomen.
Legs - 6.
Wings - Yes.
Antenna - Yes.
Common Name - Mosquito.
Kingdom - Animalia.
Phylum - Anthropoda.
Class - Insecta.

Order - Diptera
Family - Culicide
Species - Varies

DIET.

We usually say "I have been bitten by a mosquito", but this is not completely true. Mosquitoes do not bites. Female mosquitoes feed on plants nectar and blood. They need the protein to reproduce. To get to the blood, they pierce our skin with their proboscis and suck our blood. Male mosquit-es feed exclusively on plant nectars. Mosquitoes are buisest at night and will fly up to 14 miles for a blood meal. They hunt for food by detecting body heat and carbon dioxide that gas we breathe out.

⇒ HABITAT.

Mosquitoes breed in soft, moist soil or stagant water sources such as storm drains, old tires, children's wading pools and birdbaths.

⇒ IMPACT.

Mosquitoes spread diseases such as West Nile Virus, Malaria and Dengue fever.

⇒ PREVENTION.

- Replace all stagnant water at least once a week.
- Remove trash from around any standing water.
- When sleeping outdoors or in areas where mosquito populations are heavy, surround your bed with 'mosquito netting'.

3. DUST MITE

The dust mite is nearly impossible to see without magnifi-cation. A typical matress can contain tens of thousands of dust mites. Nearly 100,000 mites can live in a single square yard of carpet!

Size - 1/75"
Shape - Flat, broad, oval.
Colour - off white to tan.
Legs - 8.
Wings - No.
Antenna - No
Common Name - Dust mite.
Kingdom - Animalia.
Phylum - Arthopoda.
Class - Arachnida
Order - Acariformes.
Family - Pyroglyphidae.
Species - Dermatophagoides farina

⇒ DIET → Dust mites primarily feed on dead skin shed by human and other animals. They can also absorb moisture from the air.

⇒ HABITAT → Dust mites are most often found in beds. They may also be found living in carpet, furniture, and clothing.

⇒ IMPACT.

Dust mites are harmless to most people. They carry small foreign proteins can cause allergic reactions in people by triggering the immune system to over react.

⇒ PREVENTION.

Change yours sheets often.
Vaccum frequently.
Use a Vaccum cleaner with a HEPA filter.
If dust mites are a real problem in your home. call a pest mangement professional.

4. PILL BUG

. The pill bug is the only crustacean that can spend its entire life on land. Their shells looks like armor and they are known for their ability to roll into a ball. sometimes children call them rollie-pollies. Most pill-bugs live for upto two years. They are most active at night.

Size: 3/4"
Shape: Oval.
Colour: Dark brown to black.
Wings: No.
Antenna: Yes.
Common Name: Pill bug.
Kingdom: Animalia.
Phylum: Arthopoda.
Class: Malacostraca.
Order: Isopoda.
Family – Armadillidiidae dulgare.
Species – Armadilium vulgare.

Diet →

Pill bugs mostly eat rotting vegetables like vegetables

Habitat →

Pill bugs live in wet locations. They are found when damp object or in organic garbage. If pill bug enters a building, they will often dry out and die.

Impact → Pill bugs do not spread diseases or contaminate food.

Prevention → Keep your homes and the areas around your home clean and dry.

Eliminate food source such as vegetables or plant debris.

5. EARWIGS

Earwigs get their name from the myth that they crawl into sleeping people's ears and tunnel into the brain. They do not really do that! They are 22 types of Earwigs in the United States and there are over a 1,000 different species all over the world.

Size – 1"
Shape – long, Narrow.
Colour – Dark Brown.
Legs – 6.
Wings – No.

Antenna - Yes.
Common Name - Earwig.
Kingdom - Animalia.
Phylum - Arthropoda.
Class - Insecta.
Order - Dermaptera.
Family - Forficulidae.
Species - Forficula auricularia.

DIET →

Earwigs feed on on leaves, flowers, fruits, mold and insects.

HABITAT →

Earwigs hide during the day and live outdoors in large numbers. They can be found under piles of lawn clippings, compost or in the tree holes. They enter buildings through cracks in the walls.

IMPACT →

They do not spread disease but they can be scary to look at.

PREVENTION →

Remove leaf piles, compost piles or other vegetation from around your home.

Seal cracks and crevices in the walls of your house.

FISH

FIVE COMMON FISH

1. SIAMESE FIGHTING FISH

SCIENTIFIC NAME:- The scientific name of Siamese fighting fish is known as Betta splendens.

FAMILY AND HISTORY:- This fish is classified under the classification of betta. It is an aquarium fish. It belongs to a family of the Gourami Trey Krem. They can mingle with other fish the body length of the fish is seven centimeters and its appears in colours of red, green, opaque, albino, Orange, yellow, and blue etc.

LIFESPAN:- The life span of this fish is abut 2 years only. Water temparature must be around 23° and 24° degrees.

2. COMMON CRAP

SCIENTFIC NAME- The Scientific name of Common Crap is cyprinus capio. This kind of fish is found in a planting gorge reservior lake Mohave, Aral Sea, and more place.

FAMILY AND HISTORY – It is classified under Cyprinus. The body mass of this fish is about 2-14 kilograms. These are grown in freshwater lakes. Mostly found in water bodies in Asia and Europe. They can tolarate low oxygen levels.

These are omnivorous. It can lay up to 300,000 eggs in a single spawn. This fish is taken as food by Humans all over the world.

LIFESPAN – The life span of common carp is until 47 years.

3. GOLD FISH

SCIENTIFIC NAME : The scientific name of gold fish is Carassius auratus. It is classified under the higher classification of Carassius. It is mostly found in Utah Lake.

FAMILY AND HISTORY : It is an aquarium life.

4. OSCAR

SCIENTIFIC NAME : The scientific name of oscar is Astronotusocellatus. It is classified under the higher classification of Astronotus. Other names of oscar are tiger oscar, marble cichlid and velvet cichlid.

FAMILY AND HISTORY : These species are found in South America, Australia, the United States and China. It is seen as aquarium fish. The body length of Oscar is about 36 cm and the mass of the body is 1.4 Kg. They grow quickly and are carnivores.

5. WELL CATFISH

SCIENTIFIC NAME– The scientific name of wells catfish is siluruglanis. It is classified under the classification of silurus. It is also called as sheat fish..

FAMILY AND HISTORY :- This fish is mostly found in Lake Constance. These also found in basins of Baltic, black and ~~Cat~~ Caspian sea. Size of this fish is about 13 feet that is of 4m. Maximum weight is about 400kg. These are mostly found in fresh -water place. They feed on other animals which live in water bodies.

BIRDS

FIVE COMMON BIRDS

1. BAYA WEAVER

COMMON ENGLISH NAME — Baya Weaver.

BENGALI NAME — Babui.

SCIENTIFIC NAME — Ploceus Phillippinus.

DISTRIBUTION — In plain with low altitude; found in India to Indo-China via Malaya.

CHARACTERS — Chirping and roosting more-time, movement very swift.

VEGETATION SPECTRUM — Strychnosnux-vomica, Meliaa-zadirachta, stephaniahernandi-folia, Mikaniascandens, Tremaorientalis, Bamusa Sp, Mangiferaindica, Tinosporacordifolia, Ficus sp., Pothos sp, Phyllanthusreticullatus etc..

2. COMMON BULBUL

COMMON ENGLISH NAME: Common Bulbul.

BENGALI NAME :- Bulbuli

SCIENTIFIC NAME :- Pycnonotus Cafer.

DISTRIBUTION :- In all parts of plain and even in low altitude of hilly areas.

CHARACTERS :- Clever and very intelligent.

VEGETATION SPECTRUM :- Meliazadirachta, Morindaan-gustifolia, Holoptelaintegrifolia, Stephaniahernandifolia, Mikaniascandens, Tremaorientalis, Bamusa sp, Mangiferaindica, Tinosporacordifolia, Ficussp, pothos sp, Phyllanthusreticullatus, Meril-caraspoda, Inga, dulluscte, etc.

3. BLUE MAGPIE ROBIN

COMMON ENGLISH NAME : Blue Magpie - robin
BENGALI NAME : Doyel
SCIENTIFIC NAME: Eopsychus Saularis
DISTRIBUTION: In all part of plain

CHARACTERS: Quiet and ~~clam~~ calm bird and chirps during dawn and dusk.

VEGETATION SPECTRUM :- Tremaorientalis, Bambusa Sp, Mangiferaindica, Tinosporacordifolia, Ficus Sp., Podhossp, phyllanthusreticulatus, Adinacordifolia, Mangiferaindica, Casuarinaequisetifolia, Ravanalamdagascariensis, Plumeriarubra, Jabernemontadivericta, etc.

4. INDIAN RING-NECKED PARROT

COMMON ENGLISH NAME → Indian ring-necked parrot

BENGALI NAME → Tiya.

SCIENTIFIC NAME → Pisittacula, Krameri manillensis.

DISTRIBUTION → Indian Sub-continent. All parts of plain.

CHARACTERS → Very Punctual about them.

VEGETATION SPECTRUM → Michelia champaca, Vera-caasoka, Terminaliaarjuna, Ficusbengalensis, F. Religiosa, Disoxylum Sp, Borassusflabellifer etc.

5. ROCK DOVE

English Name → Rock Dove [Male and Female]

Bengali Name → Payra.

Scientific Name → Columba Livia.

Distribution :→ Indian sub-continent.
All parts of the plains.

Characters → Can be used as pets.

Vegetation Spectrum → In rice field and in fallow land. Plants with seeds of Chrozophoraplicata, Crotonbonplandi-anum, Brassica nigra, Lathyrus, Sativa, Triticumaestivum, Secale, etc, are common for the birds like rock dove and common dove.

MAMMALS

THREE COMMON MAMMALS

1. MONOTREMES

Monotremes are mammals that lays eggs. They only monotremes that are alive today are the **Spiny Anteater**, or **Echidna**, and the **platypus**. They live in Australia, Tasmania and New Guinea. These mammals are really different from other mammals. Their body temperature is lower than most warm blooded animals, a feature that has more in common with reptiles. Their name comes from the fact that they have only one body opening for both wastes and eggs to pass through. **Echindras** have sharp spines scattered throughout their hair. They look like a spiky ball. The female Anteater lays usually one leathery-shelled egg directly into the pouch on her belly. The egg hatches after only ten or eleven days. The newborn baby is tiny, about the size of a lime. After the baby hatches it stays in the pouch for several weeks and continues to develop.

PLATYPUS

2. MARSUPIAL

Marsupial mammals give birth to babies that are not completely developed. The babies are very tiny. The babies then crawl up the fur on the mother's belly into a pouch on the outside of mother's abdomen. The babies drink milk from the mother and continue to develop inside the pouch. Koalas, Kangaroos, Wallabies, and Opossums, are some of the better-known marsupials. Today marsupials are found mostly in Australia, New Guinea, and South America. There are only marsupials in North America is the Opossum. Opossums may give birth to as many as twentyone babies at one time. However, the mother has only thirteen nipples in her pouch. The 1st thirteen babies to climb into her pouch and attach to her nipples are the only to survive.

KANGAROOS

3. PLACENTAL

A placental mammal develops inside its mother's body until its body systems can function on their own. The name of this group comes from the placenta, an organ in pregnant female mammals that pass materials between the mother and the developing baby. Food and oxygen, carried by blood, pass from the mother to the baby through the placenta. Wastes pass from the baby to the mother where they are eliminated by her body. Most mammals, including humans, are placental mammals.

CONCLUSION

PLANTS

Each plant is characterised by one of the three life histries; **haploid (1n), diploid (2n),** or the most common **haploid - diploid.** Within each of these three types, there are also variations of the plants with haploid life cycles, most algae lack a dikaryotic phase. While most fungi have a dikaryotic phase. There are also other algae and fungi that are characterized by diploid life cycles. Lastly, plants with a haploid - diploid life history undergo an alternation of generations, either similar or dissimilar. In all of these life cycles, asexual reproduction may occur, but it is sexual reproduction that is responsible for genetic diversity. Due to variations arising separately and at different rates, the evolution of land plants didn't follow a linear sequence. Before land plants, alga, with haploid life cycles, but land plants later originated.

(PURGING CASIA) →

INSECTS

Insects play many important role in nature. They said bacteria, fungi, and other organisms. in the decomposition of organic matter and in soil formation. The decay of carrion, for example, brought about mainly by bacteria, is accelerated by the maggots of flesh files and blow flies. The activities of these larvae, which distribute and consume bacteria are followed by those of moths and bettles, which break down hair and feathers. Insects and flowers have evolved together. Many plants depend on insects for pollination. Some insects are predators of others.

FISH

Fish has a closed-loop circulatory system. They are an omnivorous group because they feed on plants and other small sea animals of water bodies. Fishes excrete nitrogenous and ammonia. Fishes reproduce highly in the open water columns only. The eggs have an average diameter of one millimeter only.

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18/6

ENVS

AECC-2

Topic - study of common plants, insects, fish, birds, mammals and basic principles of identification

Name – Bristi Ghosh

C.u. registration no - 013-1214-0128-21

C.u. roll no – 213013-11-0092

College roll no – 21/BSCH/ 0009

18/6

INTRODUCTION

PLANTS

Plants are critical to other life on this planet because they form the basis of all food webs. Most plants a autotrophic cheating their Carbon dioxide, and light through photo synthesis. Some of the earliest fossils have been aged at 38 billion years. There fossil deposits show evidence photosynthesise, so plants or the plant-like 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 Considered to be a plant. Now, what were Once considered "plants" are divided into several kingdoms: Protista, Fungi, and plantae : Most aquatic plants occur in the kingdom plantae and protista.

INSECTS

Insects, are a class in the phylum Anthopoda. They are small terrestrial invertebrates which a hard exoskeleton. Insects are the largest group of animal on earth far : about 926,400 different Spices have been described. They more than half of all known living species. They may be over 90% of animal species on earth. New species of insects are continually being found Estimates of the total number of species range from 2 million to 30 million. Insects have six legs; and most have wings. Insects were the first animals capable of flight. As they develop from eles, insects undergo metamorphosis. Insects live all over the planet; almost all are terrestrial (live and land). Few insects Live in the ocean on in vey cold places, Antarctica. The most species live in tropical.

FISH

Fish is a member of the paraphyletic group of organisms. This consists of gill-bearing aquatic craniate animals with limbs and digits. Most of the fishes are hagfish, cartilaginous, bony fish and lam preys. Fishes are ectothermic, which means cod-blooded. Fish are Fishes are abundant in most of the bodies of water. Fishes are an important resource for human world wide, especially as food because it consists of a lot of al minerals, vitamins, and proteins as it stays in water bodies. Those are served as religious Symbols.

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. As the site is not homogenous for easy life period so they need movement from one place to other. A good example is Binds of migratony kind. In our Cranes west bengal, Storks and siberian crane's 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 a period to hatch and eggs carry good number of off Springs during their back journey.

MAMMALS

Earth has a large variety of anyone living on it. Scientist classify animals into groups based on common characteristics. Mammals are a group of animals (vertebrates) that have backbone and hear or they are warm blooded (endothermic) and they have four chambered heats. They also feed their young with milk from mother's body. The young of most mammals are born alive.

AREA OF STUDY

The area is whole Kolkata, south 24 parganas district of west bengal in India.

METHOD OF STUDY

Making this project we use internet collect information about birds, insects and plants.

OBSERVATION

- ## PLANTS

Five Common Plants

1. Mangosa :

Scientific Name: Azadinach ta indica Juss.

Venna culan Name: Neem, kadu-Limb.

Sounce: The leaves, bank, flower fruits and seeds are used as drug.

Family & Distribution: Meliaceae, it is native of Burma but grown all over India. In Sangola taluka neem is found in large scale in rural and urban places. Some important places like Navale, Sengola, spinning mill, Hatid, Walegaon. Andhalgaon, wastland of Sangola, it is recorded in garden, School and colleges, Akola and Mangewadi etc.

Chemical Composition: The alkaloids are the main active principles. They are numbin, numbinin, minbosterine and nimbectin etc. fatty acid present in the plant and seed Contain 40 to 40%. fixed oil.

Uses :The leaves Carminative, expectorant anthelmintic, diuretic and insecticidal properties. Fresh leaf Juice with salt given for intestinal Worms. jaundice, skin disease and malarial fever. The leaves are applied for boils, celcers, swelling and wound. Bark is used for liver complaint, remove sound worms. Gum is stimulant, demulcent tonic and used in de debility.

2. Aloe Vera :

Scientific Name: Aloe barbadenses Mills

Vernacular Name: konphad. Gritakumari

Source: Thick fleshy leaves (pulp, dried, juice) are used as a drug.

Family and Distribution: Liliaceous, it is native of west Indies or Mediterranean region. It grows wild in hot day valleys of western Himalayas and Southern, Northern part of India. Sangola is the one of the drought region it is mainly distributed in every places in rural area some of the important places like waki, Mahud, Chindepir, Rajuri, Sangola, Jawala and Gherdi. It is xerophytic plant.

Chemical Composition : The main active principle present in Aloe is Crystalline glucoside known as barbaloin, other constituent like rusin and derivates like emodin, chrysophonic acid, anthroquinones, emodin, also it contain glucose, galactose, mannase and galacturonic acid with protein. The plant Contain aloesone and aloesin.

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Aloe vera

3. Periwinkle:

Scientific Name: Catharanthus roseus Don.

Vernaculan Name: Sadaphuli, Sada bahar

Source: The dived leaves and roots of this plant used as a drug.

Family & Distribution: Apocynaceae, the plant is probably indigenous to Madagascar. It is cultivated in South Africa, West Indies, Sri Lanka, India, U.S.A., Eunop and Australia as an Ornamental plant. It is also cultivated for its medicinal properties, in the garden. In India, it is grown in Nilgiri, Kanyakumari and Kottayam etc. In Sangola it is distributed each and every waste land, domestic places and garden. Plant is obeserved in rural area like wanichinchale, Medsingi. Walegon, kadlas, Sangola and Andhalgaon.

Chemical Composition: Catharanthus mainly consists of glycosides and alkaloids. The alkaloids are present in entire plant but they are found in more proportion in leaves and root. Some important alkaloids are Vinblastine, vincristine other alkaloids present in the plant are ajmalcine, sapentine, lochnerine, tetrahydroalstonine, vindolinine and Catheranthine.

Uses: It is used in hypotensive, antidibetic action, other dimen indole-indoline used for curing the anticancer activity. The alkaloids vincristine is highly active in treatment of childhood leukaemia. Vincnistine proves effective in breast Cancer and the leaves used in diabetes.

Periwinkle

4. Indian Gooseberry:

Scientific Name: Emblicaofficinales Groertn

Vernaculan Name: Avala, Dangni Avala, Amla

Source: Aresh and dried fruit.

Family is Distribution: Euphorbiaceae, Emblica is a small genus of trees, native of India, srilanka, Malaya and China. It is found in local area of Sangola like watamabare, Hadid. Kole, Methwade. Spining will, Campus of Sangola college and Nazare.

Chemical Composition: The fruit in the richest source of vitamine C. The other important Constituents are gallic acid, tannic acid, gum, Sugar, fat, phyllemblin, minerals Fe, P, Ca, Book contain tanin and seeds contain fixed all and essential oil.

Uses: Amla fruit which is acid, cooling refrigerant, diuretic and mild laxative. Fresh fruit used in intestine worms, pulp of fruit used in to cure the jaundice, anaemia, dyspepsia and scurvy. From this fruit famous ayurvedic tonic "Chavanprash" and "Triphalachurn" is prepared. Dried fruit used in haemorrhage (bleeding). diarrhea, dysentery, cough. It is used al laxative, headache, piles, Liver. Seed applied in Scabies and itching. Fruit juice is used in hair dye and seed oil and fruit juice and used in the preparation of hair oils and Shampoos . Heave are used as a fodden. The fruit are also used in preparation of inks.

Indian Gooseberry

5. Purging Casia :

Scientific Name: Casia fistula linn.

Vernacular Name: Bahwa , Amaltas

Source: Pod and bark of this plant used as a drug

Family & Distribution: Caesalpinaceae, this is an ornamental thee with yellow flowers found - throughout india. Grow in valleys upto 1200m in Himalays. In Sangola region it is found in proper sangola, spining mill sangola and campus of Sangola college.

Chemical composition: 1-8 dihydroxyanthraquinone, Tryptamines, Fistucacidin (3,4,7,8,4) pentahydroxyfilavan oxyanthiraquinone, epincatechin, Procy anidin B2, Biflavanoids, Rhenin, Physction, kaempferol Chrysophanol, Fistalin. Fistulic acid.

Uses: The Sweet blackish pulp of the seedpod is used as a mild laxative. The wood is hard and heavy to used for cabinet and Inlay work. Roots are astringent, Cooking pargative, felrifuge and tonic. It is useful in skin diseases, burning sensation and Syphilis. Bark is laxative, anthelmintic, emetic, febrifuge, diuretic and depurative. It is useful in boils, leprosy, rignwormis affection, colic, dyspepsia, Constipation, diabetes, stranury and Cardiac problems leaves are laxative, antiperiodic and depuratlve. It is useful in skin diseases, burning, sensation dry cough and bronchitis.

Purging Casia

Vegetation spectrum: Micheliachampaca, seracaasoka, Terminaliaarjuna, Ficusbengalensis, F. Religiosa, Disoxylum sp, Borassusflabelliferete.

Indian Ring-Necket parrot

5. Rock Dove:

English Name: Rock dove (Female and Male)

Bengali Name : payera

Scientific Name: Columba livia.

Distribution: Indian Sub-Continent. All parts of plain.

Characters: Can be used as pets.

Vegetation Spectrum: In rice field and in fallow land. Plants with Seeds of chrozophoraplicata, crotonbonplandianum, Brassica nigra, lathyrus sativa, Triticumaestivum secale etc. are CoCommofor the bind & like rock dove and common dove.

Rock Dove

- MAMMALS

Three Common Mammals

1. Monotremes:

Monolrems are mammals that lay eggs. They only monotnemes that are alike to day are the spiny anteater, on echidna, and the platypus. They live in Australia, Tasmania, and New Gulnea. These mammals are really different from other mammals. Their body temperature is tower than most warm blooded animals, a feature that has more in common with reptiles. Their name comes the fact that they have only one body opening for both wastes and eggs to pass through. Echindnas have sharp spines scattered throughout their hair. They look like a spiky ball. The female anteaten lays usually leathery-shelled egg directly into one the pouch on her belly. The egg hatches after on eleven days. The newborn baby is tiny, about the size of a dime. After the baby hatches, it Stays in the pouch for several weeks and Continues to develop.

Monotremes

2. Marsupials :

Marsupial mammals give birth to babies not Completely developed. The babies are very tiny. The babies then crawl up the fur outside of the mother's Belly into a pouch on outside of the mother's abdomen. The babies drink milk from the mother and continue to develop inside the pouch. koalas, Kangaroos, Wallabies and opossums are some of the better known marsupials. Today marsupials are found mostly in Australia, New Guinea and South America. The Only maosupial in North America is the opossum. Opossums may give birth to as many ar twenty

One babies at one time. However, the mother only has thirteen nipples in her pouch. The first thirteen babies to climb in to her pouch and attach to her nipples are the only one who survive.

Marsupials

3. Placental Mammal :

A placental mammal develops inside its mother's body until its body systems can function on their own. The name of this group comes from the placenta, an Organ in pregnant female mammals that pass materials between the mother and the developing body. Food and oxygen, carried blood, pass from the mother to the baby through the placenta. Wastes pass from the baby to the mother, eliminated by her body. Most mammals, including humans, are placental mammals.

Placental Mammal

CONCLUSION

- **Plants**

Each plant in characterized by one of the three life histories haploid(1n) diploid (2n) or the most common haploid-diploid within each of these three types, there are also variations of the plants with haploid life cycles, most algae lock a dikaryotic phase.There are also other algae and fungi that are characterized by diploid life Cycles. Lastly, plants with a haploid-diploid life history undergo an alternation of generations, either similar on dissimilar. In all of these life cycles asexual re production may occur, but it sexual reproduction that is responsible for genetic diversity. Due to variations arising separately and at different states, the evolution of land plants did not follow a linear sequence. Before land plants, alga with haploid life cycles, but land plants later originated.

- **Insects**

Insect play many important role in nature. They aid bacteria, fungi and other Organisms in the decomposition of organic matter and in soft formation. The decay of carrion for example. brought about mainly by bacteria is accelerated by the maggots of flesh files and blow flies. The activities of these larvae, which distribute and consume bacteria are followed by those of moth and beetles, which break down hair and feathers. Insects and flowers have evolved together. Many plants depend on Insects for pollination. Some insects are predators of others.

- **Fish**

Fish has a closed – loop circulatory system. They are an omnivorous group because they feed on plants and other small sea animals of water bodies. Fishes excrete nitrogenous and ammonia. Fish reproduce highly in the open water column only. The eggs have an average diameter of one millimetre only.

- **Birds**

We conclude that species spatial distribution are directly effected by global warming and subsequent climate changes. In genaral terms it has been started by the scientific community that the distribution of species have been moving in a pole ward trend within the realm of our study we found no conclusive evidence to prove or disprove this statement. The evidence that we did find and cited leads us to the conclusion that the distribution of species is infact being altered by climate change, but we were unable to determine exactly what that change was. This project from birds shows that there is a correlation between birds population characteristics and alterations in climatic factors such as temperature and precipitation. The change in population characteristics shows that some sort of shift or generally trended movement is occurring.

- **Mammals**

Mammals have about six thousand different species or kind of animals in their Group or class. Mammals can be divided into three more groups based on how their babies develop. These three groups are monotremes, marsupials and the largest group, placental mammals.

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made us to complete the assignment on time, We are extremely grateful to her for providing such a nice support and guidance.

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Professor's
Signature

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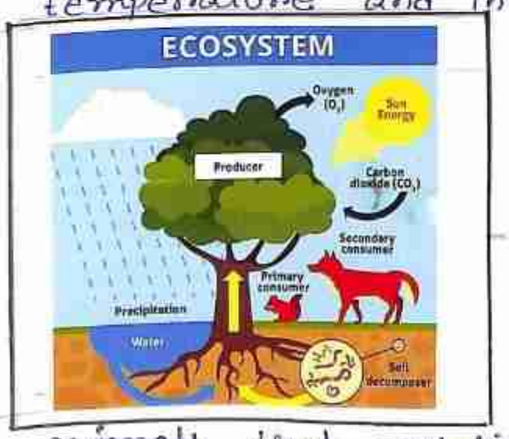
ENVS PROJECT

16

CONTENT

STUDY OF ECOSYSTEMS

The term 'ecosystem' was first used by A.G. Tansley in 1935 who defined ecosystem as a particular category of physical systems, consisting of organisms and inorganic components in a relatively stable equilibrium, open and of various sizes and kinds. An 'Ecosystem' is a region with a specific and recognizable landscape form such as desert, grassland, forest, wetland or coastal area. The nature of ecosystem is based on its geographical features such as mountains, plains, river, lakes, coastal areas or islands. It is also controlled by climatic conditions such as the amount of sunlight, the temperature and the rainfall in the region.



The geographical, climatic and soil characteristics form its non-living component. These features create conditions that support a community of plants and animals that evolution has produced to live in specific conditions. Ecosystems are divided into land-based ecosystem, aquatic ecosystem in water.

The living community of plants and animals in any area together with the non-living components of the environment such as soil, air and water, constitute the ecosystem.

PROPERTIES:

Ecosystems are characterized by the following basic properties:

Ecosystem of any given space time unit represents the sum of all living organisms and physical environment.

It is a composed of three basic components - energy, biotic and abiotic components.

It occupies certain well defined area on the earth-spaceship.

It is viewed in terms of time unit.

It is an open system which is characterized by continuous input and output of matter and energy.

It is powered by energy of various sorts but the solar energy is the most significant.

TYPES:

Ecosystems may be identified and classified on various bases, with different purposes and objectives as outlined below:

i) On the basis of habitat

ii) On the basis of ecolines

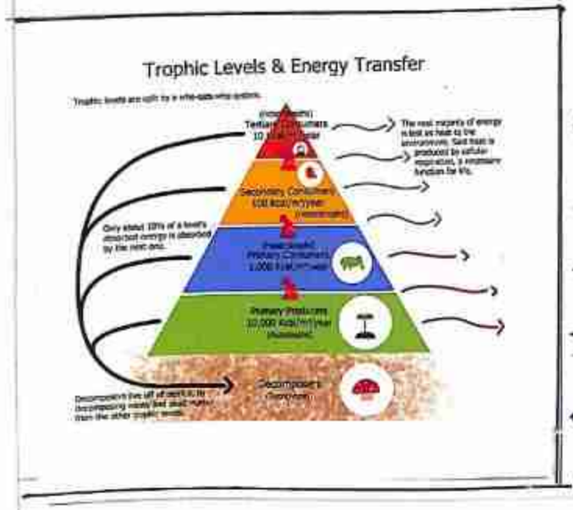
iii) on the basis of spatial scales

iv) on the basis of uses

v) on the basis of source and level of energy

vi) on the basis of stages of ecosystem development

vii) on the basis of stability on instability

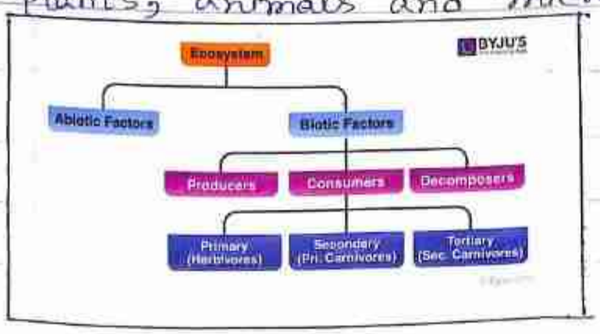


The factors responsible for stability or instability for ecosystem should always be viewed in terms of ecosystem resilience. If the environmental changes exceed the ecosystem resiliences, ecosystem instability is caused.

COMPONENTS:

There are three major components of ecosystems.
i) energy component ii) abiotic or physical component
iii) biotic component.

The abiotic components comprises land and soils, water, air and sunlight. The biotic components represent plants, animals and micro-organisms.

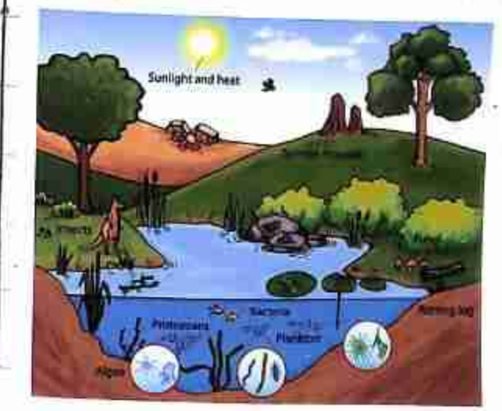


POND ECOSYSTEM

An ecosystem is a dynamic complex of plant, animal, and microorganism communities and the non living environment, interacting as a functional unit. Remember that the organisms living in an ecosystem are broken down into categories: producers, consumers, decomposers.

PRODUCERS:

Phytoplankton, literally "wandering plants", are microscopic algae that float in open water and give it a green appearance. Submerged plants grow completely under the water.



CONSUMERS:

Zooplankton are microscopic animals that eat Phytoplankton or smaller Zooplankton. Invertebrates include all animals without backbones.

DECOMPOSERS:

Animal waste and dead and decaying plants and animals from detritus on the bottom of the pond. Decomposers, also known as detritovores. As the material decomposes it can serve as a food resource for microbes and invertebrates.

TYPES OF POND ECOSYSTEM:

Ponds can come in many different forms, and they all have their own differentiating characteristics. Below, here is a discussion of some of the types of pond ecosystem.

1. Salt Ponds: Salt ponds contain brackish water and can occur close to the sea side where waterlogged ground creates natural pools. Salt ponds can also occur in rocky areas on the beach.

2. Granden Ponds: These artificially created ponds can contain ornamental plant and animal species that come from all over the world.

3. Freshwater Ponds: Freshwater ponds can from anywhere inland either from rainfall or from the presence of water saturating the soil.

4. Vernal Ponds: Vernal ponds are seasonal pond. They form in depressions in the ground, but only during certain types of the year when the rainfall is heaviest. These type of pond ecosystem referred as 'ephemeral pools'.

5. Undergrounds Ponds: Ponds can also form underground, in the rocky environment of caves. Here, a surprising amount of life can be found, including fish, different bacteria, lichens and so on.

CHARACTERISTICS:

There are several things that mark pond ecosystems out from other types of ecosystems. Below, a list of some of the main features of these ecosystems.

1. Still waters: Pond ecosystems are lentic ecosystem - they involve stagnant or standing water.

2. Surrounded by banks: by defination, pond ecosystems are surrounded by either artificial or natural banks.

3. Wet: these ecosystems are wet and humid ones.

4. Different levels: distinct communities of creatures will live at different levels of pond.

5. Variable in size: Some pond ecosystems can be very small whilst birds and blooming plants may live towards the surface.

IMPORTANCE:

Pond ecosystem are very important, and for this reason it is vital that we take steps to protect and nature them.

1. Biodiversity: Pond ecosystems are very important habitats for so many different types of fish, birds, Plants and crustaceans as well as insects such as drangonflies etc.

2. Ubiquity: Pond ecosystems can be found on every continent on the planet.

3. Abundance: Pond ecosystems are very abundant. Not only can they be found almost everywhere, they can be found plentifully, That again, makes them a key habitat for many different species.

RIVER ECOSYSTEM

River ecosystems are flowing waters that drain the landscape, and include the biotic interactions amongst plants, animals and micro-organisms, as well as abiotic physical and chemical interactions of ity many parts. River ecosystems part of larger watershed networks or catchments, where smaller headwater streams drain into mid-size streams, which progressively drain into larger river networks. The major zones in river ecosystems are determined by the river bed's gradient or by the velocity of the current.

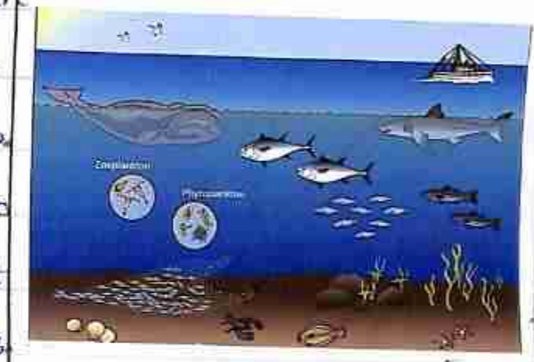
River ecosystems are prime examples of lotic ecosystems. Lotic refers to flowing water, from the Latin lotus, meaning washed. Lotic ecosystems can be contrasted with lentic ecosystems.

FOOD CHAINS:

A food chain is a linear system of links that is part of a food web, and represents the order in which organisms are consumed from one trophic level to the next. Each chain link in a food chain is associated with a trophic level in ecosystem.

PRIMARY PRODUCERS:

Primary producers start every food chain. Their production of energy and nutrients comes from the sun through photosynthesis. Algae contributes to a lot of the energy and nutrients at the base of the food chain along with terrestrial litter-fall that enters the stream or river. Primary producers are consumed by herviborous invertebates that acts as the primary consumers.



PRIMARY CONSUMERS:

Primary consumers are the invertebrates and macro-invertebrates that feed upon the primary producers. They play an important role in initiating the transfer of energy from the base trophic level to the next. They also transport and retain some of those nutrients and materials.

SECONDARY CONSUMERS:

The secondary consumers in a river ecosystem are the predators of the primary consumers. This includes mainly insectivorous fish. Depending on their abundance, these predatory consumers can shape an ecosystem.

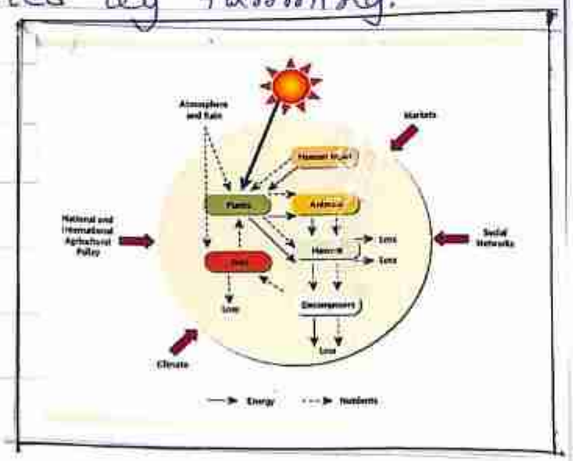
CLASSIFICATION:

Each region has a unique set of agroecosystems that results from local variations in climate, soils economic relations, social structure and history. In tropical environments it is possible to recoghize seven main types of agricultural systems.

1. Shifting cultivations systems.
2. Semi-permanent cultivation systems.
3. Permanent cultivation systems.
4. Arable irrigation systems.
5. Perennial crop systems.
6. Grazing systems
7. Systems with regulated ley farming.

RESOURCES:

Norman (1979) grouped the mix of resources commonly found in an agroecosystems into four categories-



1. Natural Resources: Natural resources are the given elements land, water, climate and natural vegetation. The most important elements are the area of the farm, including its topography, soil depth, chemical status etc.
2. Homan Resources: The human resources consist of the people who live and work within the farm and use its resources for agricultural Production.

Capital Resources: Capital Resources are the goods and services created, Purchased or borrowed by the people associated with the farm to facilitate exploitation of natural resources for agricultural production.

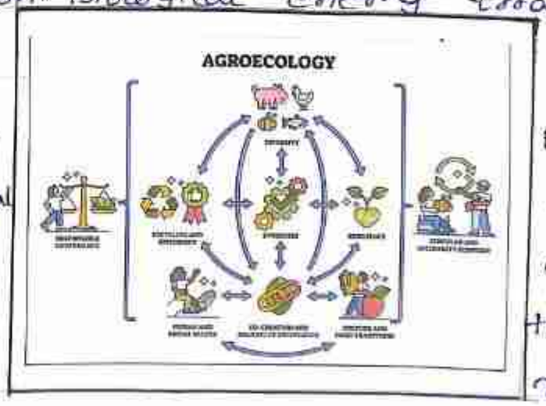
Production Resources: Production resources include the agricultural output of the farm such as crops and livestock. These become capital resources when residues ore nutrient inputs are reinvested in the system.

ECOLOGICAL PROCESSES:

Every farmer must manipulate the physical and biological resources of the farm for production. Each processes can be evaluated in terms of inputs, outputs, transformations.

Energetic Processes: Energy enters an agroecosystem as sunlight and under goes numerous physical transformation. Biological energ transfers into plants by Photoshynthesis.

Biochemical Processes: The major bio-chemical inputs into an agroecosystem ore the nutrients released from the soil, fixation by legumes, non-symbiotic nitrogen fixing, fertilizens. The important outputs consumed from the farm mainly.



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