PROJECT WORK

VISIT TO A LOCAL AREA TO DOCUMENT ENVIRONMENTAL/ ECOLOGICAL/ BIODIVERSITY ASPECTS

Select any one from the below given (A) to (F) :

- **Visit may be planned to any nearby river, forest, grassland, hill or mountain, depending upon easy access and importance.**

  Write a report based on your observations and understanding about various aspects of environment, ecology and evolution aspects.

  Try to collect the required information for the study and arrive at some important conclusions about the system.

(A) STUDY OF RIVER ENVIRONMENT

1. Background data: Note down the name of the river or tributary, its place of origin and its course or route. Find out whether the river is perennial or seasonal in nature.

2. Water quality observations:

(i) Note down whether the water of the river is clear or turbid.l If it is clear, what do you expect? Penetration of light into thewater would be more, therefore green aquatic plants will be growing better. The primary productivity will be high.

If it is turbid, how would it affect the primary productivity of the river? You know that sunlight penetration is obstructed by turbidity.

(ii) Note the temperature of water with a thermometer or thermoprobe. Also note the temperature of the air.

If the temperature of the river water is quite high (> 5°C than the ambient water temperature), what can be the reason? Find

out if any thermal pollution is occurring in the river due to discharge of effluents from some industry.

Write down the probable impacts of thermal pollution on aquatic life.

(iii) Do you observe any froth and foam or dark coloured or greasy substances in the river?

If yes, then what are these? Find out the likely sources of these pollutants.

(iv) Is there any point along the river stretch under study from where discharge of wastewater (industrial/municipal sewage) is being done into the river? If yes, then look for the visual differences in water

quality at the upstream and downstream sites.

(v) Determine the pH of water using a portable pH-scan. The pH would normally range between 6.5 to 8.5. If the pH is quite low i.e. acidic waters, it indicates pollution by industries. If the pH is quite high i.e. alkaline, it indicates contamination by municipal sewage.

Is your river water of good quality or it is polluted?

3. Observations on aquatic life

(i) Look for different types of life forms. Do you find some free-floating small plants (phytoplanktons) or small animals (zooplanktons)?

Are there some rooted plants seen underneath? Do you observe aquatic

animals like different fishes, tortoise/turtle, crocodile/alligater, water snake etc.? What are the important aquatic birds seen by you?

(ii) Draw a food-web diagram that would be present in the river.

4. Uses: How is the river water used? Prepare a list of the uses.

5. Human impacts: What are the major impacts caused by human beings in your area on the river? Have you learnt of any

major incident e.g. massive fish death or cattle death or skin problems to human beings consuming the water? Try to interpret the same.

(B) STUDY OF A FOREST

(i) Background data: Note down the name of the forest. What type of a forest is it i.e. a tropical rain forest/deciduous forest etc. ? Is

the present forest, a part of some Biosphere reserve or National park or Sanctuary?

If yes, then what are the special features associated with it?

(ii) Forest structure: Note down the salient features of the forest.

What are the dominant trees? Are there any herbaceous climbers or woody climbers? Is

the forest having a close canopy or has open spaces?

Does the forest show a thick/dense growth or it is degraded?

l Is there an understory of shrubs, herbs and grasses of lower height?

Is there a thick or thin forest floor consisting of leaf litter (dry dead leaves), algae, fungi etc.? What is the use of stratified structure i.e. multi-layered structure of vegetation

in the forest?

(iii) Commercial uses: Prepare a list of the various uses of the present forest.

(iv) Ecological utility: Do you feel cooler in the forest? Is it more humid? Is the air more fresh than that in the city? How many types of birds, animals or insects do you see around? Make a list of the ecologi-

cal uses of the forest based on your observations.

(v) Human impacts: Do you observe any anthropogenic activities in the forest e.g. mining, quarrying, deforestation, dam building, grazing, timber extraction etc.?

What would be their probable impacts?

(C) ENVIRONMENTAL ASPECTS OF A GRASSLAND

(i) Background information: What type of grassland is this? Is it perennial or annual? Are there tall grasses or short grasses? Is it

dominated by just a few species or is it a mixed type of grassland? Is it protected i.e. fenced or disturbed?

(ii) Grassland quality observations:

Try to identify the names of some of the dominant grasses or plants. Are these dominant plants having a soft, delicate, juicy

nature with green colour showing good palatability? OR the dominant plants have a coarse, hard texture with spines/

thorns?

Take out a few plants to see what type of roots do they have.

Are there numerous fibrous roots in a bunch, (adventitious roots), runner-type, having rhizomes or there is a single, long tap root?

If the roots are adventitious, they tend to bind the soil particles firmly and help in conserving the soil. If the root is tap root, then it cannot help in binding the soil particles firmly.

What is the condition dominant in the present grassland? Do you observe soil erosion?

(iii) Grazing and Overgrazing: Find out if there is managed grazing on the grassland i.e. only a limited number of livestock (cattle) is being allowed to graze OR there is unmanaged grazing.

Normal grazing is useful for increasing the overall productivity/ yield of the grassland. Overgrazing has several far reaching

consequences. Make your own observations in the present grassland

i.e. whether there is limited grazing or overgrazing?

If you find that good quality grasses/herbs are growing then it is rightly grazed.

If you see denuded areas with little grass cover it shows overgrazing.

If you observe thorny, hard, prickly plants occupying some areas, it indicates degradation of the grassland due to overgrazing.

(iv) Uses: Prepare a list of the utilities of the grassland.

(D) STUDY OF MOUNTAIN/HILLY AREA (ONLY IF VISITING ON YOUR OWN)

(i) Background data: Note down the name of the mountain ranges or the hills. Note down the altitude of the region. Find out the average annual rainfall and temperature in the area.

(ii) Observations on natural vegetation: Make your observations on the forests present on the hill slopes. Do you find dense forests on

the hills or deforestation is observed in some areas? Look for some

dominant tree species and find out their names and uses from local people.

(iii) Landslides: You will come across some regions, where landslide would have occurred recently or in the past. Do you observe any major anthropogenic activity there? What is the condition of forest

growth in the region? Can you establish some links between these aspects? You can gather some information about such aspects from the native people.

(iv) Water-sheds: Try to look for some springs, rivers and channels coming out from the mountains. The land area from which

water drains under gravity to a common drainage channel is called water-

shed.

Gather some information about the water shed in the study area, its uses and its status i.e. whether it is well managed or degraded.

(v) Plantations/Farming: Look for the type of plantations (e.g.tea plantation) or farming (e.g. maize, wheat) done artificially on the

hill slops.

What type of farming is done? Is it shifting cultivation, traditional or modernized? What would be their impacts?

Do you observe terrace farming, contour or strip cropping?

Why is such cropping helpful in hills?

Find out the water and nutrient requirements of these crops.

Do you find these crops/plantations well suited to hill environment OR do you think they can have some damaging effects later on? Discuss with local people.

(iv) How much anthropogenic activities do you observe on the mountain/hill?

These activities usually include mining, quarrying, tourism, construction, hydroelectric projects etc. What major impacts do you observe or predict in future?

(E) VISIT TO SOME LOCAL POLLUTED SITE

Human activities related to urbanization and industrialization have led to large scale pollution of the environment. Agricultural practices have also led to pesticide pollution, water logging and salinization. A visit to

some industrial area or degraded land area will be very useful to obtain first hand information about the same.

(a) STUDY OF AN INDUSTRIALLY POLLUTED AREA

(i) Background data: Note down the name of the industry, its capacity, year of establishment, the type of product and the type of wastes/emissions produced by it.

(ii) Pollution aspects: Look at the stacks (chimneys) in the area which might be giving certain emissions. What are the toxic gases

present in them - are they obnoxious smelling? As the wind blows, do they move in a direction that is towards the city or in other direction?

Do you observe huge heaps of sludge around/outside the factory?

Do you find any trees or other plants growing in such dumping sites?

Find out if there is any Effluent Treatment Plant (ETP) within the industry to treat the wastes before discharging them. You can also see the working of an ETP, with prior permission from the industry people.

(iii) Green belt: Do you observe a green belt planted around the industry? It has now become mandatory for all big industries to plant green trees around the industry.

This is because the tree canopy (leaves) has got an excellent capacity to absorb various pollutants and also reduce noise. They also release oxygen to make the atmosphere pure.

(iv) Health aspects: Try to get information about any serious health impacts in the

people living in the vicinity of the industry. e.g. The water drawn from tubewells/hand pumps may be contaminated with some toxic substances/dyes etc. which on

drinking may cause health ailments.

The toxic gases and suspended particulate matter released by the industry is inhaled by the people living nearby which might

cause skin irritation/allergy/respiratory problems.

(b) STUDY OF A WATER-LOGGED/SALINE LAND

(i) Background information: Visit a water logged or salt-affected land in some rural agricultural area. An area having permanently standing water on the soil is a water-logged soil. You can observe crusts of

white salts on the soil surface making it barren-that is a saline soil.

Gather information from the farmers about its historical back ground i.e. how much irrigation was being done in these areas and for how long? Was the area fertile some years ago and has gradually become water-logged and saline? What was the crop grown earlier? Try to correlate the problem with the irrigation practices followed there.

(ii) Salinity and crop growth:

Find out the salinity level (Electrical conductivity, EC) of the soil. For this you can take 10 grams of soil and dissolve it in

20 ml of water in a beaker. Dip an EC probe into it which will indicate the EC of the soil. The non-saline normal soil has EC < 4 dS/m. If the EC exceeds 4, it is saline. The EC can be

as high as 20-40 dS/m also. But then it would hardly support any vegetation.

Do such soils support any crops? Note down the names of the salt-tolerant and salt-sensitive crops.

(iii) Remediation: Find out what remedial measures are being taken by the farmer to deal with the problem. What measures can you suggest.

(F) STUDY OF COMMON PLANTS, INSECTS AND BIRDS

Biodiversity or the variability among plants, animals and microbes found on this earth is just remarkable and has tremendous potential in terms of its consumptive, productive, social, ethical and ecological value.

It is worthwhile to know about some common plants, insects and birds

of our locality.

(a) Plants: Study the common plants of your locality, including trees, shrubs and herbs. You can study them mainly in relation to their value.

(i) Medicinal plants: Local people often have indigenous knowledge about the medicinal value of various plants. Find out which of

the plants in your locality have medicinal value ?

(ii) Timber wood trees: Note down the important trees of your locality which yield timber wood.

(iii) Miscellaneous: Note down the names of plants which have other uses like producing gum, resins, tannin, dye, rubber, fibre etc.

(b) Insects: Identify some common insects of your locality

(i) which may be spreading diseases.

(ii) Which are crop-pests or animal pests.

(iii) Which help in pollination of ornamental/crop flowers.

(c) Birds: Identify some common birds of your locality. Find out how some of them are useful to us and some cause damage to our crops/fruits. Observe small birds with long beaks pollinating flowers.

Observe the birds in the ploughed fields eating insects/larvae.

Students can also suggest some other topic for the project related to the Course which is being taught, however, they must consult me (Prof.D.K.Sharma) before hand by writing an Application regarding that .

Group of minimum 4-7 students each for a Project.

25-30 Pages excluding Figures, Tables and References.

Font size : 12. Time New Romans

Double Space in between lines

Last date 22nd March 2025.