

IMPACT OF ENVIRONMENTAL DEGRADATION

PRESENTATION BY

PROF.(DR.) SANJAY KUMAR

(PROFESSOR AND HOD)

P.G. DEPARTMENT OF GEOGRAPHY

MAHARAJA COLLEGE, ARA

UG SEM. VII

UNIT-III



WHAT IS ENVIRONMENT ?

- **Environment is the surroundings of an organism/ human with which it comes into contact/ interact.**

IMPACT OF ENVIRONMENTAL DEGRADATION

In Geography , Environment (natural and cultural environment) is the immediate surroundings that include all living and non- living components that co-exist.



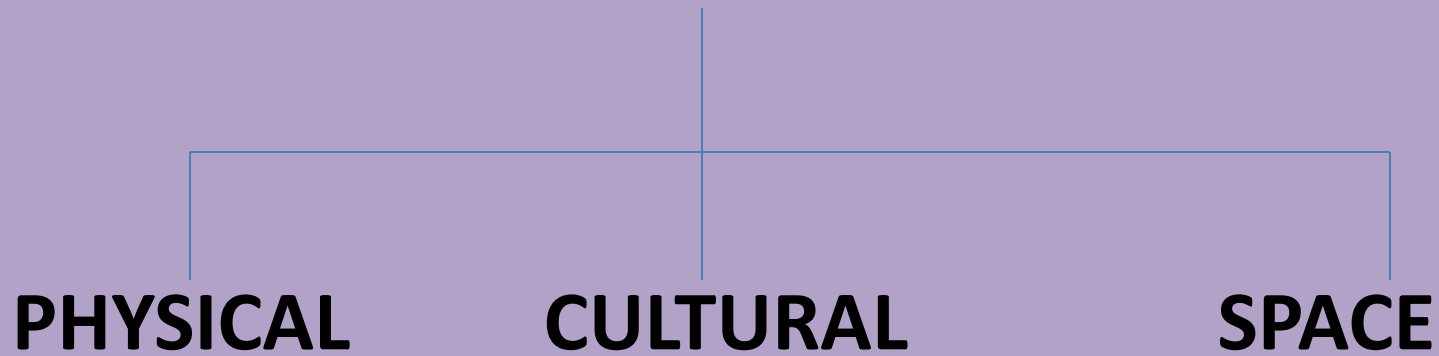
natural



cultural

TYPES OF ENVIRONMENT

Types of Environment



Beauty of Nature



Beauty of Nature



Beauty of Nature



WHY BIODIVERSITY IS IMPORTANT?

- THE COMBINATION OF THE VARIETY OF LIVING SPECIES OF ORGANISM ,LIKE PLANT AND ANIMAL COMMUNITY is called Bio-Diversity.
- DIFFERENT ECOSYSTEM HAVE DIFFERENT SET OF BIO-DIVERSITY.
- THE TERM BIO-DIVERSITY WAS FIRST COINED BY WALTER G. ROSEN IN 1986.
- SIMPLY THE TERM CAME FROM BIOLOGICAL DIVERSITY.
- Biodiversity includes terrestrial, marine and desert ecosystems.
- It provides us clean air, fresh water, good quality of soil and crop pollination in natural way to sustain our healthy life.

WHY BIODIVERSITY IS IMPORTANT?

- Every single organism(Bacteria and viruses) play an important role in food chain of an ecosystem .
- Living organism interact in dynamic ecosystem.
- The disappearance of any single organism / one species can have certain and negative impact over the food chain.

BIODIVERSITY

- Bio-Diversity Type

- 1. GENETIC BIO-DIVERSITY
- 2. SPECIES DIVERSITY
- 3. ECOSYSTEM OR HABITAT DIVERSITY

Increasing Population Pressure



ENVIRONMENTAL DEGRADATION

- WILD FIRE
- CONSTRUCTION AND DEMOLITION WORK
- BURNING OF FOSSIL FUEL
- BURNING OF GARBAGE IN OPEN
- AFFLUENT AND EMISSION FROM FACTORIES AND INDUSTRIES
- OVER EXPLOITATION
- HABITAT DESTRUCTION
- OTHERS

ENVIRONMENTAL DEGRADATION

The change in climate has affected the aspects of natural environment. They are:

- a. Change in sea level
- b. Increase in the storms and cyclonic activities
- c. Increase in extreme heat condition
- d. Increase in events of heavy precipitation
- e. Shrinking glaciers and icebergs
- f. **Negative impact over Bio -Diversity**

- At global level, some element of climate has been changing.
- Sometime scientists says that we are moving towards global warming and sometimes they say that we are marching towards global cooling.
- These are two extreme conditions but where we are marching is still unknown. But it is the fact that the climatic conditions are changing at present.
- Urbanisation, industrialisation, deforestation, and misuse of resources are responsible for environmental problems.
- Favourable climate is essential for the plants, animals and human existence.
- These days, we are facing some consequences of climate change not only at global level but at local level too.

- It has threatened the safety and well-beings, economy and heritages too.
- Climate helps in shaping and maintaining the ecosystem. When climate changes, the whole ecosystem changes as well.
- Rising temperature creates a warmer ocean which generates warmer and wetter ocean breezes. These factors give rise to frequent tropical storms and destructive cyclones.
- India herself has witnessed several cyclones during last five years. As per Indian Meteorological Department (IMD) India could witness many other pre-monsoon cyclones in the coming years.
- March 2022 making the hottest month in 122 years since record began.
- **According to scientists, accumulation of green-house gases in atmosphere is contributing temperature rise.**
- Scientists have said that temperature has risen national records in India for the month of April 2024.
- Maximiliano Herrera, an expert on world weather extremes said that the highest reliable April temperature in India is 48.3degree C, set in Barmer in NW India in 1958.
- Arabian Sea, hit 50.2degree C four years ago. This record, possibly the highest temperature ever recorded worldwide in April.

- **The increasing temperature will ultimately increase the sea level and causes the submergence of much of Bangla Desh and parts of India that border and may lose vast tracts of coastal land.**
- **Some tracts of low lying Sundarbans has already submerged.**
- The interference of human activities into nature has led to its destruction.
- Rivers do extinct due to excess sedimentation and dryness of climate. Ghaghar river of Rajasthan is such type of river.
- Now a days, river Ganges is changing her course near Patna and shifting towards north. In future, it will certainly become serious threat to the Patna and its environs.
- Climate change is occurring at unprecedented rate because huge quantities of CO₂, methane, and other greenhouse gases are being releasing/ emitting into the atmosphere.

- The 20th century has been the warmest century in the past 600 years and 14 of the warmest years since the 1860's occurred in the 1980s and 1990s. Temperature in 1998 was higher than the mean temperature for the 118 years on record.
- Since 1980s, the winter temperatures of sea water north of 45 degree latitude have risen by 0.5 degree C.
- The sea ice in the Grand Bank Shipping lane has declined and in 1999 for the first time since the sinking of the Titanic in 1912, the International Ice Patrol did not reported any single iceberg south of 48 degree N. latitude.
- The concentration of CO₂ in the atmosphere has risen from 280 ppm in 1760 to 360 ppm in 1990 and is expected to reach 600 ppm in 2100.
- The islands of Kiribati, a nation of atoll spread over two million sq. miles in the Pacific Ocean have submerged. These islands are the first victims of global warming.
- It was estimated that by 2025 About 900 million people in about 100 countries are affected by desertification and drought problem. This number will be double and 25 per cent of the earth's land area will be degraded. Land degradation has manifold impact over settlement.

- **Landslides** are common due to unscientific cutting of vegetation cover resultant into increase in wasteland area.
- **Bird species and mammal species are threatened** with extinction all over the globe.
- **Climate change or global warming has affected** all the human economic activities.
- **Water crisis & health risk** are increasing.
- **Negative impact over bio-diversity of the earth.**

Evidences of Climate Change

- Whatever be the reason of climate change, it is clear that climate change have been happening on the earth.
- There are lots of evidences available for climate change. This evidence of climatic change can be divided into four parts.
 - A. Geological Evidences
 - B. Historical Evidences
 - C. Biological Evidences
 - D. Modern Evidences
- The geological history of the earth especially paleontologists have suggested that each era of geological history had different types of climate. From Azoic to Paleozoic, Mesozoic and Cenozoic; climatic condition never remains the same.

Geological Evidences:

- The geological evidences are associated with the thickness, structure, nature, age and forms of rocks. Some of these evidences are as follows:

A. Coal reserves : The formation of coal on this earth is said to be the age of Carboniferous of Paleozoic era, nearly 150 million years ago. The formation of coal refers to hot and humid tropical climate. But today, most of the coal reserves are found in temperate region countries like U.S.A, Canada, England, Germany, Russia, China and Japan. Besides this, some coal reserves are also found in South Africa, India and under the ice cap of Antarctica. It proves that all these regions and countries have gone through the process of climate change.

B. Carboniferous Age Rocks:

In India, we found the deposits/ layers of three types of rocks under Carboniferous age rocks. It includes- Glacial agglomerates, coal deposits and sand stone.

Gondawana System of India

- Gondawana system of India is very popular amongst geologist, Paleo botanists and climatologists as it presents the evidence of climatic change for shorter period of time at local level.
- The Gondawana System of India especially in Damodar valley region, such evidences still found, Here three types of rocks - coal, sand stone and rounded boulders are deposited.
- Here, rounded boulder bed of Upper Carboniferous period is found in the lowest layer which represents the climate like cold situation. Above this, angular sand stone rocks are found representing the age of Triassic with hot and dry climate.
- Above all, Coal seems are found in abundance which represents the age of Jurassic period when hot and humid climate was prevailing.
- Therefore, the Damodar basin of Gondawana system in India gives the evidences of successive climate change for three (3) times at local level at short interval of time.

Pleistocene Glaciation

Pleistocene glaciation comes to an end near about 15000 years ago.

Pleistocene glaciation proves that during this age, whole earth's climate became very cool but some warm periods also came during such said period, popularly known as 'Interglacial period'.

Such warm period were known as Gunj, Mindal, Riss and Wurm.

Glacial Periods

- The geological history of the earth suggests that the climate of the earth never remains the same but, it changes with time.
- Some evidences are there which shows that glacial period occurs every 215 million years.
- The first glacial period on the earth occurred/ recorded in Proterozoic era nearly 750 million years ago.
- After that evidences indicates that the second glacial period was during lower Cambrian era, nearly 500 million years go.
- The third glacial period occurred in Permo-Carboniferous nearly 260 million years ago.
- The last known glacial period was in Pleistocene era, nearly 15000 years ago. These evidences show the changes in earth's climate at every 200 million years..

Some Modern Evidences

- All the above said evidences of climate change represents the evidences of past time.
- In modern era too, we have some evidences of climate change. Some of the major signs/ evidences are here been simply described as follows:

i. Scientists have suggested that the temperature of the earth is increasing. This phenomenon is called Global Warming. The main reason behind this is the increasing concentration of carbon dioxide in the atmosphere.

According to a study, in 1760 the concentration of CO₂ in atmosphere was 280 ppm (part per million) which became 360 ppm in 1990.

ii. Due to global warming, earth temperature has risen 10 degree Celsius since the late 19th century. Most of the warming occurred in the past 40 years. The year 2018 and 2021 are tied for the warmest year on record.

iii. The temperature of the earth's atmosphere is increasing. It has resultant into melting of glacier /ice sheet and increase in sea level.

Some islands have gone under water and some are under threat. Kiribati an atoll island situated in Pacific Ocean has already gone under sea water. Some islands in Western Atlantic have also loss their existence.

iv. During Antarctica survey in 1987, it has been found that the ice of 175 kms long, 40 kms wide and 230 meter thick melted during recent past.

v. Due to change in climate, about 30% of the earth's fauna species have become extinct. Global warming has caused damage to colors of some historical buildings and monuments.

vi. About 900 million populations of 100 countries are affected by desertification and drought problem.

vii. Strontium is a natural and commonly occurring element. Rocks, soil, dust, coal, oil, surface and underground water, air, plants, and animals all contain varying amounts of strontium. Strontium compounds, such as strontium carbonate, are used in making ceramics and glass products, pyrotechnics, paint pigments, fluorescent lights, medicines, and other products. Stable and radioactive strontium compounds in the air are present as dust. Increasing strontium in human body by breathing, eating, or drinking the substance, or by skin contact.

viii. The group of scientists has suggested that the temperature has raised 5.80°C in 20th century which may cause an increase of sea level by 8.8 cm by 2100.

ix. The climate change has increased the problem of skin cancer in human beings.

x. The depletion of ozone is directly associated with climate change.

xi. No iceberg has been seen south of 48° N. latitude after 1912. It is another evidence of climate change.

Several other evidences are being coming in front of us regarding global climate change.

IMPACT OF ENVIRONMENTAL POLLUTION ON BIO-DIVERSITY

MASS EXTINCTION OF BIODIVERSITY

- ❖ ORDOVICIAN- 444 m.y.a – 25% all FAMILIES
- ❖ DEVONIAN – 370 m.y.a – 19 % all FAMILIES
- ❖ PERMIAN -250 m.y.a – 54 % all FAMILIES , 90% of species extinct
- ❖ TRIASSIC – 210 m.y.a – 23 % all FAMILIES , 50 % of species extinct
- ❖ CRETACEOUS- 65 m.y.a – 17 % all FAMILIES, 50 % of species extinct
- ❖ QUARternary – PRESENT- estimated that $\frac{1}{3}^{\text{rd}}$ TO $\frac{2}{3}^{\text{rd}}$ of all species will be extinct, if present trend continue.

Humans begin to replace wood and other biomass fuels with readily available fossil fuels.

Oil and gas join the arsenal of high-energy fossil fuels, spurring rapid global land, sea, and air transport; total energy consumption worldwide experiences unprecedented growth.

French mathematician and physicist Jean Baptiste Joseph Fourier first hypothesizes that the atmosphere plays a significant role in mediating temperature on earth.

Status of Past 200 Years: Some literature describes that the moisture level was high indicating more rainfall condition between 1st to 4th century.

After that aridity started after this period and continued till 950 AD.

During 950 AD to 1250AD, temperature was so suitable that people started inhabiting in Greenland.

The period of 1450 to 1880 AD, temperature was much cooler than present time. Temperature recorded little increase by 0.2degree C to 0.4degree C during 1880 to 1920 AD.

The temperature regularly increased during 1921 to 1945. After 1945 rapid increased in temperature has been observed in northern hemisphere in comparison to southern hemisphere.

The change in climate has affected the different aspects of natural environment.

RECENT TRENDS OF BIO-DIVERSITY LOSS

Causes:

- ✓ Social factors
- ✓ Economic factors

Environmental changes are based on many factors including;

- ✓ Urbanization.
- ✓ The population explosion
- ✓ Intensification of agriculture
- ✓ Increase in energy use
- ✓ Increase in transportation

Social Factors Are:

- ✓ **Population Pressure:**

- ✓ The force exerted by a growing population upon its environment resulting in loss of plant and animals.
- ✓ Deforestation causes a range of serious problems such as flooding, less of biodiversity, soil erosion, and climate change.
- ✓ Desertification means that the land is becoming increasingly dry and therefore like a desert this means will be hard to grow food.

HUGE BIO DIVERSITY of INDIA

India is rich in bio-diversity. In sanatan dharma, 84 lakh yoni term came. According to my opinion this represents the concept of 84 lakh bio-diversity. THE MAIN REASONS of HUGE BIO DIVERSITY IN INDIA-

1. Variations in Land features
2. Variations in Soil
3. Presence of different types of forest
4. Variations in amount of sunlight
5. Variations in Precipitation
6. Presence of Coastal features
7. Presence of different water bodies
8. Presence of hot and cold deserts .

BIO DIVERSITY IN INDIA

- ❖ In Ayurveda, some 2000 plants have been described.
- ❖ Out of these 2000 plants , 500 are in regular use.
- ❖ The world conservation union's Red list named 352 medicinal Plants of which 52 plants are critically threatened and 49 endangered.
- ❖ India is also rich in wild life.
- ❖ 89000 animal species are found here.
- ❖ We have 1200 species of Birds.
- ❖ 2500 fish species are found in India.
- ❖ About 5-8 per cent of the world's mammals, amphibians and reptiles are found.
- ❖ We get support from these creatures in the form of food, transport, pollination, agriculture etc.

BIO-DIVERSITY IN INDIA

- The Elephant, One horned Rhinoceros, Wild Ass, Camels , Indian Bison, Nilgai, etc. and several species of monkeys are prominent creatures found in India.
- In India, both lion and tiger are found.
- Ladakhi Yak and Arunachali Mithun are unique animals found in India.
- Crocodiles and Gharials (elegators) are both found in India.
- Other than this , several species of birds like Peacock, Parrots, Myna, Cranes, Ducks, Pigeon etc. are found here.



I clean the
air you breathe.

I can do that for
your children too.

"If you let me live"

saytrees.org

say

BIO-DIVERSITY LOSS

Red data book includes color –coded information sheet categorises based on the risk extinction faced by numerous species and sub species.

- **Black – species that are confirmed to be extinct**
- **Red- denotes critically endangered species**
- **Yellow/ Amber – Vulnerable species**
- **Orange – endangered species**
- **White- rare species**
- **Green- out of danger species**
- **Grey- species that are endangered , vulnerable, or rare but have insufficient information (not evaluated).**

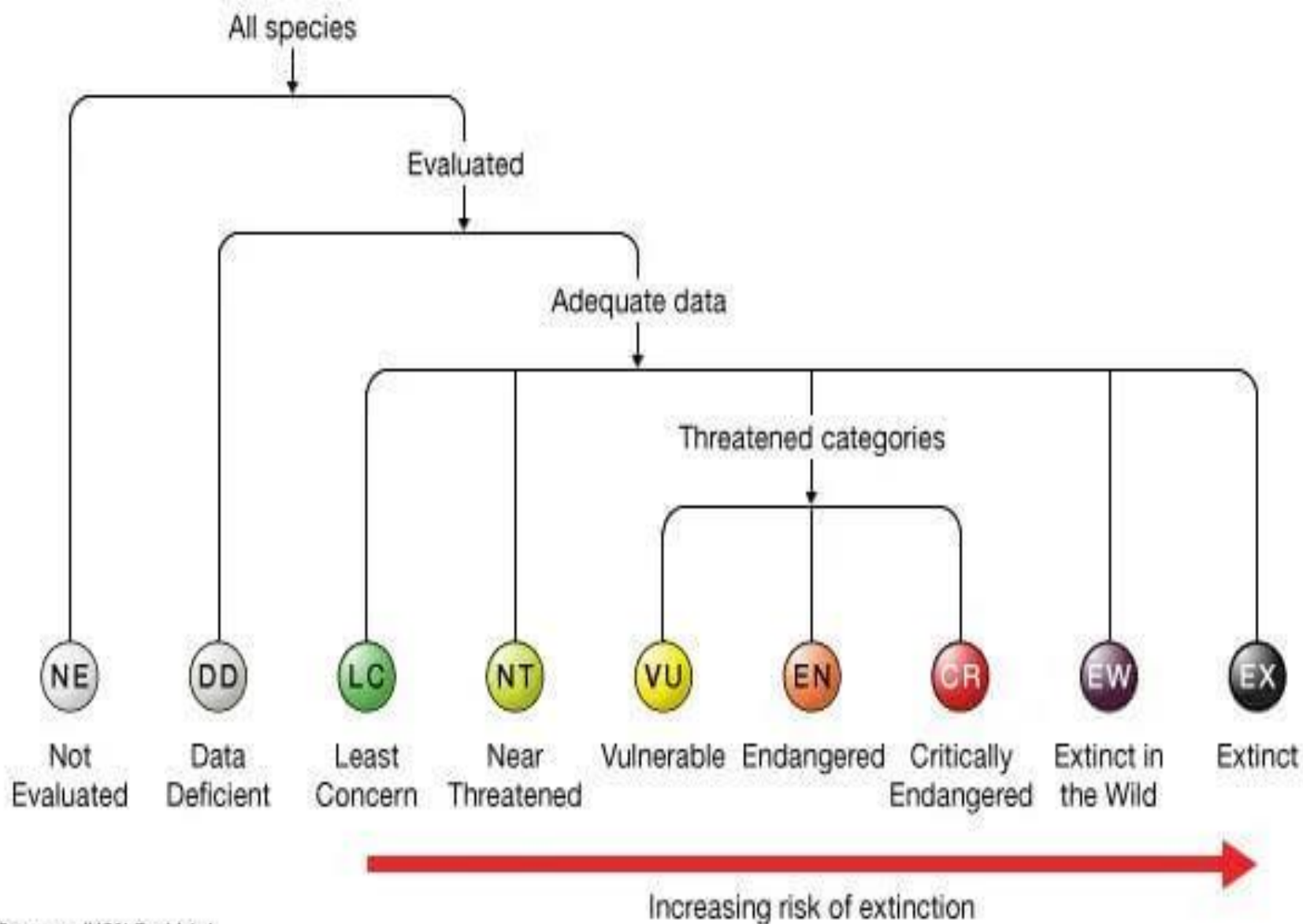
BIO-DIVERSITY LOSS

What is red data book?

- The book that contains a list of all the endangered and vulnerable species. All threatened species of plants, fungi, and micro organism are listed in the book.
- It helps in identifying species that are close to extinction and gives an opportunity to conserve them.
- Then, such species are transferred to National Park and Wildlife Sanctuary.

Indian Scenario

- **The International Union for Conservation of Nature (IUCN) is involved in maintaining the Red Data Book since 1964. Its headquarters is in Gland, Switzerland.**
- **In India, Red data book list is being prepared by Botanical Survey of India.**
- **Bengal Tiger, Asiatic Lion, Snow Leopard, One horned Rhinoceros, Black Buck, Lion tail Macaque, Resplendent Tree Frog, Kashmiri Red Stag, Nilgiri Tahr (goat), Indian Bison are some notable animals of India.**



Source : IUCN Red List

Reality?

- ☐ As we all know man can sustain 3 weeks without food, 3 days without water and 3 minutes without air.
- ☐ 70 lakh people died of polluted air last year at world level.
- ☐ Carbon, dust particles, toxic gases, and low oxygen level are responsible for this.
- ☐ It creates health problems.
- ☐ Every person needs 550 litres of oxygen on daily basis . It provides by 11000 litres of fresh air.
- ☐ Cancer cell doesn't need oxygen for its growth.

What we can do?

1. Minimise the use of AC and coolers.
2. Make space in home to create more space for fresh air at home.
3. Make home airy and open all the window and door during day time.
4. One litre diesel or petrol consumes 10000 litre of air, so try to use public transport .
5. Concentrate on sapling of oxygen producing plants even in pots around you but never spray pesticides on it.
6. Increase the sapling of oxygen giving plants like Peepal , Neem, Tulsi, Banyan, Arjun, Ashoka, Jamun, Sandalwood, Rubber plant, Areca palm, Jade plant, Spider plant , Snake plant etc.
7. Concentrate on making terrace garden.
8. Try to Create jungle around you.
9. Take the help of District Atlas .

10. Prevent in creating any type of pollution in and around your village or Panchayat.
11. Prevent poaching any type of animal/ birds.
12. Provide healthy food to pet animals.
13. Planation of at least five trees should be made mandatory to every household till attain the coverage of 40-50 per cent of your village or Panchayat geographical area.
14. Award / Reward provisions to the family , village and panchayat for sapling of maximum number of oxygen producing plants and trees.
15. Appoinment of Nadi Mitra(worker) to prevent the pouring of garbage and polluted water in the near by river and ponds.
16. Aware the farmers for using only organic manures.

THE END



THANK YOU

HAVE A NICE DAY.