# KERALA PUBLIC SCHOOL, KADMA

# ENVIRONMENTAL APPLICATION (STUDY MATERIAL)

## SESSION :2020-‘21

## CLASS : IX

## TEACHER : SHUBHA CHOUBEY

# UNIT 1 : Our Main Environmental problems
# Ch.1: Understanding ecosystems – threats and conservation measures

# Threats to Ecosystems

Anything that attempts to alter the balance of the ecosystem potentially threatens the health and existence of that ecosystem. Some of these threats are not overly worrying as they may be naturally resolved provided the natural conditions are restored. Other factors can destroy ecosystems and render all or some of its life forms extinct. Here are a few

## Habitat Destruction

Economic activities such as logging, mining, farming and construction often involve clearing out places with natural vegetative cover. Very often, tampering with one factor of the ecosystem can have a ripple effect on it and affect many more or all other factors of that ecosystem. For example, clearing a piece of forest for timber can expose the upper layers of the soil to the sun's heat, causing erosion and drying. It can cause a lot of animals and insects that depended on the shade and moisture from the tree to die or migrate to other places.

## Pollution

Water, land and air pollution all together play a crucial role in the health of ecosystems. Pollution may be natural or human-caused, but regardless they potentially release destructive agents or chemicals (pollutants) into the environments of living things. In a lake, for example, it can create havoc on the ecological balance by stimulating plant growth and causing the death of fish due to suffocation resulting from lack of oxygen. The oxygen cycle will stop, and the polluted water will also affect the animals dependent on the lake water.

## Eutrophication

This is the enrichment of water bodies with plant biomass as a result of the continuous inflow of nutrients particularly nitrogen and phosphorus. Eutrophication of water fuels excessive plant and algae growth and also hurts water life, often resulting in the loss of flora and fauna diversity. "The known consequences of cultural eutrophication include blooms of blue-green algae (i.e., cyanobacteria, Figure 2), tainted drinking water supplies, degradation of recreational opportunities, and hypoxia.

## Invasive species

Any foreign species (biological) that finds its way into an ecosystem, either by natural or human introduction can have an effect on the ecosystem. If this alien has the ability to prey on vulnerable and native members of that ecosystem, they will be wiped out, sooner or later. One example is of exotic plant, The Kikar or Prosopis juliflora, which was brought to Delhi from Mexico by the British,and became invasive. It wiped out most of the native plants and animals along which once used to roam in the ridges. With its deep roots, it had also wrecked havoc on city's groundwater.

## Overharvesting

Fish species, game and special plants all do fall victim from time to time as a result of over-harvesting or humans over-dependence on them. Overharvesting leads to the reduction in populations, community structures and distributions, with an overall reduction in recruitment. Lots of fish species are known to have reached their maximum exploitation level, and others will soon be. “For example, Oreochromis karongae is one of the most valuable food fishes in Malawi, but populations collapsed in the 1990s due to overfishing, and it is now assessed as Endangered.”

## UV Radiation

The sun’s rays play an important role in living things. UV rays come in three main wavelengths: UVA, UVB and UVC, and they have different properties. UVA has long wavelengths and reaches the earth’s surface all the time. It helps generate vitamin D for living things. UVB and UVC are more destructive and can cause DNA and cell damage to plans and animals. Ozone depletion is one way that exposes living things to UVB and UVC and the harm caused can wipe lots of species, and affect ecosystems members including humans.

## Poverty

In much of the world, those living in poverty suffer due to, lack of education, unemployment & basic resources for sustainence of life. In such conditions they are left with few options for survival, that is the natural resources available in their immediate surroundings and on which they depend upon for food, shelter, fibre and to generate an income. Unfortunately due to increased use of natural resources, many ecosystems around the world are becoming stressed and cannot sustain such intensive use.

## Overpopulation

Rapid population growth puts strain on natural resources, which results in the degradation of our environment. More population simply means more demand for food, clothes & shelter. This results in deforestation thereby destroying ecosystems.

## Landfills

Landfills come within the city due to the large amount of waste generated by households, industries, factories & hospitals. These pose a great risk to the health of the environment & the people who live there. Landfills produce a foul smell when burned and cause substantial environmental degradation.

## Deforestation

Deforestation is the cutting down of trees to make way for homes & industries. It contributes to global warming as decreased forest size puts carbon back into the environment.

## Natural calamities

Natural disasters like avalanches, earthquakes, tidal storms & wildfires can totally crush nearby animal & plant groups to the point where they can no longer survive in those areas.

## FOREST COVER IN INDIA

***The India State of Forest Report*** (ISFR), the biennial (Once in two years) assessment – conducted by the **Forest Survey of India (FSI)** and released by the **Ministry of Environment, Forest and Climate Change (MoEFCC)**

- According to ***2019*** report, the total forest cover of the country is 712,249 square kilometres (**21.67 percent** of India's total geographical area) which is slightly up from 708,273 sq. km (**21.54 percent**) in 2017.
- Nearly **25 percent (one fourth) of India's total land area is now under forest and tree cover.** However, there is still a long way to go – more than a decade, admits the government – before India reaches its **target of having 33 percent of its total area under forest and tree cover.**
- While the overall forest and tree cover marked an increase on a national level, the report highlighted a **decrease in the forest area in the country's northeast region.** The current assessment showed a decrease of forest cover by 765 sq. km. compared to 2017 data.

- The report noted that the gain in forest cover or improvement in forest canopy density may be attributed to better conservation measures, protection, afforestation activities, tree plantation drives and agroforestry whereas, loss in forest cover and impairment of forest canopy may be attributed to shifting cultivation, forest fires, felling of trees, natural calamities and developmental activities.
- As per the ISFR 2019, the top five states in terms of increase in forest cover are Karnataka (1,025 sq. km.), Andhra Pradesh (990 sq. km.), Kerala (823 sq. km.), Jammu & Kashmir (371 sq. km.) and Himachal Pradesh (334 sq km).

## FOREST COVER IN THE WORLD

- Forests cover 31 percent of the global land area.
- The total forest area is 4.06 billion hectares, or approximately 5 000$m^2$ (or 50 x 100m) per person, but forests are not equally distributed around the globe.

# RATE OF DESTRUCTION OF FORESTS IN INDIA

*Annual loss of primary forest cover and tree cover for India by year. All area figures are in hectares (ha)*

| Year | Primary forest | Tree cover (30%) |
|---|---|---|
| 2001 | | 62,441 |
| 2002 | 11,718 | 53,035 |
| 2003 | 10,846 | 47,782 |
| 2004 | 19,166 | 74,217 |
| 2005 | 15,148 | 74,217 |
| 2006 | 15,126 | 67,494 |
| 2007 | 17,208 | 73,976 |
| 2008 | 20,702 | 86,045 |
| 2009 | 17,112 | 79,339 |
| 2010 | 11,361 | 51,384 |
| 2011 | 16,287 | 88,585 |
| 2012 | 18,804 | 95,181 |
| 2013 | 14,399 | 80,943 |
| 2014 | 21,942 | 139,241 |
| 2015 | 20,997 | 116,374 |
| 2016 | 30,936 | 175,478 |
| 2017 | 29,563 | 189,677 |
| 2018 | 19,310 | 132,429 |
| **Primary loss 2002-2018** | 310,624 | |
| **Tree cover loss 2001-2018** | | 1,625,397 |
| **Primary loss/ Total tree cover loss** | 19.1% | |
| **Percent loss** | 3.0% | |

# FACTS ON FORESTS

1. The northeastern region of India comprises eight states – Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura – and is **one of the 17 biodiversity hotspots of the world.**
2. **Brandis** was regarded as the "**father of tropical forestry**;" he worked with the British Imperial Forestry Service in colonial India for nearly 30 years, and served as Inspector General of Forests in India from 1864 to 1883.
3. **Madhya Pradesh** has the **largest forest** cover in **India**.
4. **Haryana** has only 1,588 sq km of **forest**, the **lowest** among all **Indian** states.
5. **Mizoram** is the **greenest state** in India.
6. **Gandhinagar**, the capital **city** of Gujarat, is the **greenest** capital **city in Asia**.
7. **The Amazon** is the **largest** rainforest in the **world**. It covers approximately 2.2 million square miles.
8. **The Taiga** is the **largest forest** in the **world** and stretches through the far northern reaches of Europe, Asia, and North America.
9. **Kakamega forest** in Kenya, Africa is the smallest forest in the world and is just under 90 square miles..
10. **Qatar** is rich; **Qatar** is safe; **Qatar** owns the world's greatest airline, and **Qatar** is home to a large number of skyscrapers. But sadly, this opulent country has no trees and is a **true desert.**

## EFFORTS UNDERTAKEN BY THE GOVERNMENT TO SAVE THE FORESTS

1. **The Indian Wildlife Act** was passed by the government in 1972 for the protection of plants and animal species.
    - The Act banned hunting and poaching of animals and provided legal protection to their habitats.
    - The central and state governments have established many wildlife sanctuaries and national parks in order to protect forests and wildlife.
    - Various projects regarding the conservation of endangered species such as tiger and one-horned rhino have been initiated by the government.
    - The government, through the introduction of a joint management programme, has involved local communities in the management of forests.

2. **Compensatory Afforestation for Forest Conservation**

   In 2016, **Compensatory Afforestation Fund Act (CAMPA), 2016** was passed by Parliament to ensure expeditious and transparent utilization of the **fund of about Rs. 49,000 crore.**

3. **The National Mission for a Green India (GIM)**, one of the eight Missions under the National Action Plan on Climate Change aims at protecting and enhancing India's forest cover.

4. **National Air Quality Index**

   Launched on October 17, 2014 to monitor the quality of air in major urban centres across the country on a real-time basis.

5. **National clean air programme (NCAP)**

   Overall objective of the NCAP is comprehensive management plan for prevention, control and abatement of air pollution besides augmenting the air quality-monitoring network across the country.

6. **Green skill development programme(GSDP)**

   The Green Skill Development Programme developed by the Ministry of Environment, Forest and Climate Change (MoEFCC),is a new initiative to skill youth in environment, forest and wildlife sectors and enabling them to be gainfully employed or self-employed.

## SOME ORGANISATIONS INVOLVED IN ENVIRONMENT CONSERVATION

### 1. Wildlife Trust Of India (WTI)

It was formed in November 1998 at **Noida, Uttar Pradesh**, to conserve wildlife and its habitat and to work for the welfare of individual wild animals.

### 2. Wildlife Institute Of India (WII)

It was founded in 1982. It is an autonomous institution under the **Ministry of Environment Forest and Climate change,** Government of India, based in **Dehradun.** It aims to nurture the development of wildlife science & promote its application in conservation.

### 3. Agency for Non Conventional Energy and Rural Technology (ANERT)

It is an autonomous organization established by the **Government of Kerala**. Its objective is to gather and disseminate useful knowledge in various fields of Non Conventional Energy, Energy Conservation & Rural Technology.

### 4. Centre for Science and Environment (CSE)

It was established in 1980 with headquater in New Delhi. Its objective is to develop into an excellent resource centre with information, printed and visual — on **sustainable development issues**, which is possibly the best in India.

### 5. National Green Corps (NGC)

It is a programme of the Ministry of Environment and Forests of **Government of India**. NGC Programme aims at building cadres of young children working towards environmental conservation and sustainable development.

### 6. The Energy and Resource Institute (TERI)

Established in 1974 with its headquater in New Delhi. It was formerly known as **Tata Energy and Resource Institute**. As the scope of its activities widened, it was **renamed The Energy and Resources Institute in 2003.** It works towards global sustainable development, creating innovative solutions for environment conservation.

## International Organizations that Help Conserve Biodiversity and Ecosystem

1. World Wildlife Fund **(WWF)**
2. Fauna & Flora International **(FFI)**
3. United Nation Environment Programme **(UNEP)**
4. **Conservation** International
5. International Union For Conservation of Nature **(IUCN)**

## SUCCESS STORY OF CONSERVE

# Conserve

**Established When and by Whom:** In 1998, when the Delhi government launched the **Bhagidari campaign**, asking its citizens to participate in civic initiatives, the conservationist, Anita Ahuja and her IIT-alumnai husband Shalabh rose to the challenge and launched Conserve. It is an **NGO**.

**Objective:** To counter the issue of **plastic bags**.(Recycling)

## Key Functions:

- Anita and Shalabh Ahuja founded Conserve India as an NGO to recycle the waste in their neighborhood that wasn't being managed by local authorities.

- They quickly realized that **plastic bags** pose the biggest problem, not only because there are so many of them but also because they could not be **recycled locally**.

- After much **experimentation,** the team at Conserve India realised that the **solution lay in upcycling the bags into** sheets of plastic that could be reinvented as fashion accessories. They named this material **Handmade Recycled Plastic.**

- Shalabh and Anita combined his expertise in **engineering** and her creative talents to get the most out of their solution to this huge problem.

- As well as cleaning Delhi's streets, they have worked to provide hundreds of jobs for some of the **poorest people living** in their city. The income they generate by **selling products** made from **Handmade Recycled Plastic, is then spent on social welfare projects.**

- Today they continue to realise their vision. Conserve India bags are being sold around the world. The proceeds of this work are put to good use.

- Firstly, better wages for Conserve employees – a **ragpicker** collecting bags for **Conserve** earns on average three times more selling to us than they would earn elsewhere.

- Secondly, **training opportunities** for all staff at Conserve India so that they can get more skilled jobs either within the organisation or elsewhere.

- Thirdly, a school in the slum where many of the **ragpickers** we work with live. Finally, loans for **Conserve workers** to develop their own start-up businesses, and most recently a health clinic for the entire workforce.

## SUCCESS STORY OF EFI

### Environmentalist Foundation of India (EFI)

**Established** When and by Whom: Started in 2007 and registered in 2011

**Headquarter:** Chennai, Hyderabad, Puducherry and Coimbatore

**Objective:** Wildlife conservation and habitat restoration

**Key Functions:**

- The organisation is known for its work in cleaning and scientific restoration of lakes in India for biodiversity.
- The organisation and its efforts grew from that one pond in Chennai to include over 39 lakes and 48 ponds in Tamil Nadu, Kerala, Karnataka, Andhra Pradesh, Telangana, Pondicherry and Gujarat in the last 10 years (2007 to 2017)
- EFI is also involved in the setting up of herbal biodiversity gardens at schools and special interest zones. The idea behind the herbal gardens are to increase people's interest in green cover and live healthy with native Indian herbs.
- EFI's "Clean for Olive Green" is a beach clean up project that is organised every year in the months of December to May to keep Chennai's beaches clean for the nesting Sea Turtle Mothers.

## EXERCISE

**I Short answer type questions:-**

1. What does the natural environment consist of ?
2. Define ecosystem.
3. What do you mean by ecosystem destruction ?
4. What are the major threats to ecosystem ?
5. What is the extent of forest cover in India & in the World at present ?
6. State four human activities leading to the destruction of forests .
7. Name any two each of national & international organizations working for the conservation of forests.

**II Long answer type questions :-**

1. "Forests are the lungs of the Earth". Explain.
2. Discuss any four steps taken by the government to save forests.
3. Explain how pollution causes destruction of ecosystems.

**********