

**TNPSC GROUP I MAIN – 2021**  
**MODEL EXAM II**  
**PAPER - III**

Time: 3 hours

Total marks: 250

**SECTION A**

**UNIT- I: Geography of India with special reference to Tamil Nadu**

3 x 10 = 30

Answer any three questions. Answer not exceeding 150 words each

1. Explain the different types of Rainfall.

பல்வேறு வகையான மழைப்பொழிவுகள் பற்றி விளக்குக

**Types of rainfall:**

Rising of moisture-laden air is essential for condensation and rainfall. The air rises due to three different processes. Based on these processes, we have three types of rainfall.

1. Convectonal rainfall      2. Orographic rainfall      3. Cyclonic rainfall

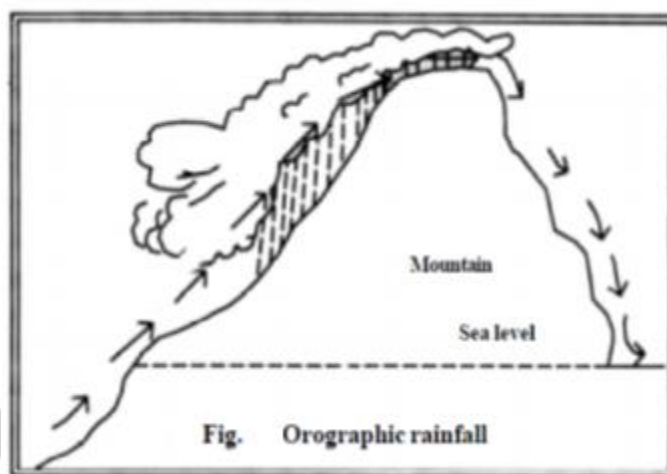
**1. Convectonal Rainfall**

We get heavy rainfall associated with thunder and lightning during the afternoons of summer season. Such rains occur for a short duration only. The rainfall thus caused by rising air mass due to excessive heating of the Earth's surface is known as convectonal rainfall. A large proportion of rainfall that occurs over the Earth's surface is of the convectonal type prevalent in equator region.

**2. Orographic rainfall:**

The moist air when rising along the windward slope of the mountain, gives very heavy rainfall. By the time, the air crosses the mountain peak, it has given away all its moisture and become dry. This dry air, when it descends along the leeward slope of the mountain, thus the leeward side of the mountain remains dry.

The Western Ghats lie along the western coast of India in a North - South direction. The Southwest monsoon wind which blows from the Arabian sea is full of moisture. This moisture- laden air is blocked and forced to rise up along the western slopes of the Western Ghats. Hence, the western slopes of the Western Ghats receives very heavy rainfall during the Southwest monsoon. By the time, the monsoon wind crosses to the other side of the Western Ghats, it becomes dry. The dry air that blows along the eastern slopes of the Western Ghats does not give any rainfall. Thus the Deccan plateau that lies to the east of the Western Ghats, is called as the Rain shadow region.



### 3. Cyclonic rainfall:

If an area is heated, the air that lies above that area gets heated and moves upward. Hence a low pressure develops in that area. The region adjacent to the low pressure area is having comparatively a high pressure. The air from the surrounding high pressure rushes to the low-pressure area. Due to the Earth's rotation, the wind gets deflected and a circular motion of winds develops. At the low pressure centre, the air rises upward in the form of a funnel.

The rising air gets cooled and condensation takes place. This brings heavy rainfall to the areas adjacent to the low pressure centers. This is known as cyclonic rainfall.

2. Differentiate Himalayan Drainage System from Peninsular Drainage System. (ap)

இமயமலை வடிகால் அமைப்பு மற்றும் தீபகற்ப வடிகால் அமைப்பு – வேறுபடுத்துக

**Distinction between Himalayan Rivers and Peninsular Rivers**

Himalayan Rivers	Peninsular Rivers
The Himalayan rivers like Indus, Ganga and Brahmaputra originate from the snow - covered mountains.	The Peninsular rivers like Mahanadi, Godavari, Krishna, Kaveri, Narmada and Tapi
These rivers have large basins and catchment areas.	These rivers have small basins and catchment areas.
These rivers flow through deep, nearly I - Shaped valleys.	These rivers flow through broad and shallow valleys.
These rivers are perennial in nature and receive water both from the monsoons and the melting of snow.	These rivers are seasonal as they receive water only from the monsoon rains.
Due to their perennial nature, these rivers are very useful for irrigation.	Due to the seasonal nature, these rivers are not very useful for irrigation.
These rivers are suitable for navigations as they flow over plain areas.	These are not suitable for navigation as they flow over uneven land in the plateau region
These rivers form large deltas near their mouth like the Ganga-Brahmaputra delta.	The west flowing rivers mostly form estuaries and the form smaller deltas.

3. Discuss the Forest Conservation Measures in India (man 13)

இந்தியாவில் காடுகள் பாதுகாப்பு நடவடிக்கைகள் பற்றி விவாதி

**Agro forestry**

Agroforestry is an integration of trees, crops and livestock on the same plot of land. The main objective is on the interaction among them. Example: intercropping of two or more crops between different species of trees and shrubs, which results in higher yielding and reducing the operation costs. This intentional combination of agriculture and forestry has varied benefits including increased bio-diversity and reduced erosion.

Some of the major species cultivated in commercial Agroforestry include Casuarina, Eucalyptus, Malai Vembu, Teak and Kadambu trees which were among the 20 species identified as commercial timber. They are of great importance to wood-based industries.

**Benefits of agroforestry**

- ❖ It is an answer to the problem of soil and water conservation and also to stabilize the soil (salinity and water table) reduce landslide and water run-off problem.

- ❖ Nutrient cycling between species improves and organic matter is maintained.
- ❖ Trees provide micro climate for crops and maintain O<sub>2</sub> - CO<sub>2</sub> balanced, atmospheric temperature and relative humidity.
- ❖ Suitable for dry land where rainfall is minimum and hence it is a good system for alternate land use pattern.
- ❖ Multipurpose tree varieties like Acacia are used for wood pulp, tanning, paper and firewood industries.
- ❖ Agro-forestry is recommended for the following purposes. It can be used as Farm Forestry for the extension of forests, mixed forestry, shelter belts and linear strip plantation.

### Rehabilitation of degraded forests and recreation forestry

The production of woody plants combined with pasture is referred to silvopasture system. The trees and shrubs may be used primarily to produce fodder for livestock or they may be grown for timber, fuel wood and fruit or to improve the soil.

This system is classified into following categories.

- i. **Protein Bank:** In these various multipurpose trees are planted in and around farmlands and range lands mainly for fodder production.

Example: Acacia nilotica, Albizzia lebbek, Azadirachta indica, Gliricidia sepium, Sesbania grandiflora.

- ii. **Livefence of fodder trees and hedges:** Various fodder trees and hedges are planted as live fence to protect the property from stray animals or other biotic influences.

Example: Gliricidia sepium, Sesbaniagrandiflora, Erythrina spp., Acacia spp..

### Social forestry

It refers to the sustainable management of forests by local communities with a goal of climate carbon sequestration, change mitigation, depollution, deforestation, forest restoration and providing indirect employment opportunity for the youth. Social forestry refers to the management of forests and afforestation on barren lands with the purpose of helping the environmental, social and rural development and benefits. Forestry programme is done for the benefit of people and participation of the people. Trees grown outside forests by government and public organisation reduce the pressure on forests.

In order to encourage tree cultivation outside forests, Tree cultivation in Private Lands was implemented in the state from 2007-08 to 2011-12. It was implemented by carrying out block planting and inter-crop planting with profitable tree species like Teak, Casuarina, Ailanthus, Silver Oak, etc. in the farming lands and by a free supply of profitable tree species for planting in the bunds. The Tank foreshore plantations have been a major source of firewood in Tamil Nadu. The 32 Forestry extension centres provide technical support for tree growing in rural areas in Tamil Nadu. These centres provide quality tree seedlings like thorn / thornless bamboo, casuarinas, teak, neem, Melia dubia, grafted tamarind and nelli, etc. in private lands and creating awareness among students by training / camps.

### Major activities of forestry extension centres

- ❖ Training on tree growing methods
- ❖ Publicity and propaganda regarding tree growing
- ❖ Formation of demonstration plots
- ❖ Raising and supply of seedlings on subsidy
- ❖ Awareness creation among school children and youth about the importance of forests through training and camps.

### FOREST CONSERVATION

- Forests comprise a unique gift of nature to man and constitute one of the prized assets of a nation. They play a significant role in the national economy of a primarily agricultural and developing country like India. The agricultural and industrial progress of the country is not only stabilized but accelerated by a proper conservation and utilization of forest resource.
- Our increased demand for forests products has led to increasing destruction and degradation of our forests which is causing heavy erosion of top soil, erratic rainfall and frequent devastating floods. In short, depletion of forests has a chain reaction in ecosystem. Though it is a renewable resource, it takes its own time to regenerate. We have been destroying our forest resources so ruthlessly and so quickly that large forest tracts of yesteryears are now devoid of any forest cover. India's woods, once dark and deep, are now a living example of man's ravage and destruction.
- The saying that man finds forests but leaves deserts could not be more true to India. Over the past four decades, about 25 million hectares of land that originally had tree cover has been laid bare for agriculture and other purposes. The latest reports of the National Remote Sensing Agency (NRSA) indicates that the country is losing about 1.3 million hectares of forest cover every year. This will be detrimental to our national interest. Nature never forgives the abuse of her gifts. Hence, the urgent need for conservation of forests.
- **Van Mahotsava** was launched in 1950 to make people aware of the importance of planting trees. Chipko movement is a living example of general public awareness about forests.

### The year 2011 has been declared as the International Year of Forests.

- Forests have to be developed and worked for obtaining various raw materials and for providing an effective means of flood control, checking soil erosion, for regulating the flow of water in streams and for conserving moisture in the soil. Therefore, a carefully coordinated scientific policy for conservation of forests should be the first step in any scheme of national planning of the country.
- The Forest (Conservation) Act, 1980 enacted to check indiscriminate deforestation/diversion of forest lands was amended in 1988 to make it more stringent by prescribing punishment for violations. Guidelines have been prepared for working plans. Some salient features are: (i) working plans should be up-to-date and stress

conservation; (ii) preliminary working plan should have multi-disciplinary approach; (iii) tribal rights and concessions should be highlighted along with control mechanism; (iv) grazing should be studied in detail and specific prescriptions should cover fodder propagation; (v) shifting cultivation and encroachments need to be controlled; (vi) clear-felling with artificial regeneration should be avoided as far as possible and clear-felling blocks should not exceed 10 hectares in hills and 25 hectares area in plains and (vii) banning all felling above 1000 metre altitude for a few years should be considered to allow these areas to recover. Critical areas in hills and catchment areas prone to landslides, erosion, etc. should be totally protected and quickly afforested.

### People's Participation in Conservation of Forests

People's participation is vital in forest conservation, especially those living in them or close to the forest. This is referred to as Community forestry, which varies widely in legal, political and cultural settings and the term covers a wide range of experiences and practices.

The Bishnois, who are known conservators of their forest, were inspiration to many people's participatory movements for Environmental protection in India. The **Chipko movement** resisted the destruction of forests of India in the 1970s. **Sunderlal Bahuguna** was the leader of this movement. People in the movement hugged the trees, and prevented felling of trees by contractors.

The Indian Constitution also stresses on the importance of the role of the People in protecting their environment.

### National Forest Policy, 1988

#### 4. What is meant by Global Navigation Satellite System (GNSS)? Explain GNSS with reference to India and write its applications. (man 13)

உலகளாவிய ஊடுருவல் செயற்கைகோள் அமைப்பு என்றால் என்ன? GNSS-ஐ இந்தியாவுடன் தொடர்புபடுத்தி விளக்குக மற்றும் அதன் பயன்பாடுகளை எழுதுக.

### Global Navigation Satellite System (GNSS)

GNSS refers to the collection of the world's global satellite based positioning systems. It includes GPS (United States) GLONASS (Russia) GALILEO (European Union) BEODOU (China) IRNSS (India) QZSS (Japan). GNSS can provide centimeter level accuracy with a low-cost receiver, if an error correction technique is used. GNSS are recognized to be the systems of choice in outdoor environments and, to a great extent, one of the most accurate source of position (and precise timing) information when it is available.

The first satellite navigation system was Transit, a system deployed by the US military in 1960's. Transit's operations were based on the Doppler Effect: the satellites travelled on well-known paths and broadcast their signals on well-known radio frequency. The received frequency will differ slightly from the broadcast frequency because of the movement of the satellite with respect to the receiver. The satellite broadcast signals that contains orbital data (from which the position of the satellite can be calculated) and the

precise time, the signals is transmitted. There are multiple constellations of GNSS satellites orbiting the earth. GNSS satellites' orbit situated about 20,000 km above the earth's surface. They are moving very fast, several kilometers per second. The latest generation of GNSS satellites (Block IIF) weight over 1,400 kg.

**GPS (United States)**

**GLONASS (Russia)**

**GALILEO (European Union)**

**BEIDOU (China)**

**Japan Aerospace Exploration Agency (QZSS Japan)**

**IRNSS (Indian Regional Navigational Satellite System)**

IRNSS is an autonomous regional satellite navigation system being developed by ISRO (Indian Space Research Organization). It is designed to provide geospatial positioning information within the Indian sub-continent. It enables users to map out their location (altitude, longitude and latitude). The objective of developing IRNSS was to cut down India's dependency on foreign navigation satellite systems.

It provides location information service to users in India and the region extending for up to 1,500 km from the Indian boundary. This is the primary service area of IRNSS information service to users in India and the region extending up to 1500 km from Indian boundary.

IRNSS aims to provide the following services:

1. Standard Positioning Service (SPS) for civilian, research & commercial use,
2. Restricted Service (RS) for authorized users. For example in defense, IRNSS is used for ground, aerial and marine navigation, disaster management, mobile phone integration, mapping and visual & voice navigation for drivers, among others.

## **Applications of GNSS**

GNSS applications are widely used to get the quick information about a particular field. Some of the commercial applications are Consumers, Transportation, GIS, Machine Control Port Automation, Precision Agriculture, Construction, Marine Mining, Unmanned Vehicles Surveying, Defence, and Aerial Photogrammetry, etc.

### **Consumer**

GNSS technology has been adopted by the consumer market, in an ever-increasing range of products. GNSS receivers are now routinely integrated into smart phones, to support applications that display maps showing the location of and best route to stores and restaurants.

## **Transportation**

In rail transportation, GNSS is used to track the location of locomotives and rail cars, maintenance vehicles and wayside equipment, for display at central monitoring consoles. Knowing the precise location of rail equipment reduces accidents, delays, and operating costs, enhancing safety, track capacity, and customer service. In aviation, GNSS is being used for aircraft navigation from departure, en route, to landing.

## **Port Automation**

Using GNSS, shipping hubs can improve their operating efficiency by tracking the movement and placement of containers about their yards. Many cranes are equipped with GNSS based steering devices that determine the crane's position and keep it travelling in the desired path, improving accuracy and productivity as well as the safety of operators and workers on the ground.

## **Machine Control**

GNSS technology is being integrated into equipment such as bulldozers, excavators, graders, pavers and farm machinery to enhance productivity in the real-time operation of this equipment, and to provide situational awareness information to the equipment operator.

## **Precision Agriculture**

In precision agriculture, GNSS-based applications are used to support farm planning, field mapping, soil sampling, tractor guidance, and crop assessment. More precise application of fertilizers, pesticides and herbicides reduces cost and environmental impact.

## **Surface Mining**

GNSS information is being used to efficiently manage the mining of an ore body and the movement of waste material. GNSS equipment installed on shovels and haul trucks provides position information to a computer-controlled dispatch system to optimally route haul trucks to and from each shovel.

## **Survey**

Using GNSS, it is possible for a single surveyor to accomplish in one day what might have taken a survey crew of three people a week to complete. Determining a new survey position once required measuring distances and bearings from an existing (known) survey point to the new point.



பிரிவு - ஆ  
SECTION - B

- குறிப்பு : i. ஒவ்வொரு வினாவிற்கும் 250 சொற்களுக்கு மிகாமல் விடையளிக்கவும்.  
Answer not exceeding 250 words each.
- ii. ஒவ்வொரு வினாவிற்கும் பதினைந்து மதிப்பெண்கள்  
Each question carries *fifteen* marks.
- iii. கொடுக்கப்பட்டுள்ள நான்கு வினாக்களில் எவையேனும் மூன்று வினாக்களுக்கு மட்டும் விடையளிக்கவும்.  
Answer any three questions out of four questions.
- (3 × 15 = 45)

5. What is watershed? Highlight the importance of watershed in conserving the natural resources.

வடிகால் அமைப்பு என்றால் என்ன? இயற்கை வளங்களைப் பாதுகாப்பதில் நீர்நிலைகளின் முக்கியத்துவத்தை எடுத்துரைக்க.

**Watershed management and its importance**

Watershed is a geographical area drained by a stream or a system connecting stream in which water from all over an area flow under gravity to a common drainage channel. A watershed system delivers water through rills, gullies and streams to a larger body of water.

Watershed management is proper utilization of land and water resource for optimum production with minimum hazards to natural resources. It relates to soil and water conservation proper land uses, promote afforestation and sustainable farming practices, conserve farmland and pastureland, maintaining soil fertility, proper management of local water for farming, drainage, construct small dams for flood protection, improving individuals standard of living and thereby promote ecological balance.

**Key steps in watershed management**

Watershed plans should first identify the characteristics of the watershed and inventory the watershed's natural resources. The first steps in watershed management planning are to:

- Delineate and map the watershed's boundaries and the smaller drainage basins within the watershed.
- Map and prepare an Inventory of resources in the watershed.
- Prepare an Inventory and map the natural and manmade drainage systems in the watershed.
- Prepare an Inventory and map land use and land cover.
- Prepare a soil map of the watershed.

- vi. Identify areas of erosion, including stream banks and construction sites.
- vii. Identify the quality of water resources in the watershed as a baseline; and
- viii. Prepare a map and Inventory of pollution sources, both point sources (such as industrial discharge pipes) and nonpoint sources (such as municipal storm water systems, failing septic systems, illicit discharges).

### **Watershed Management in India:**

Watershed development project in the country has been sponsored and implemented by Government of India from early 1970s onwards. Various watershed development programs like Drought Prone Area Program (DPAP), Desert Development Program (DDP), and river Valley Project (RVP), National Watershed Development Project for Rain-fed Areas (NWDPR) and Integrated Wasteland Development Program (IWDP) were launched subsequently in various hydro-ecological regions. Entire watershed development programs primarily focused on soil conservation and rainwater harvesting during 1980s and before.

### **6. Give a detailed account on the major tribes of India**

இந்தியாவின் முக்கிய பழங்குடிகள் பற்றி விரிவாக தொகுத்து எழுதுக

#### **Tribal in India**

India is the home to large number of indigenous people, who are still untouched by the lifestyle of the modern world. With more than 84.4 million, India has the largest population of the tribal people in the world. These tribal people also known as the adivasis are the poorest in the country, which are still dependent on hunting, agriculture and fishing. Some of the major tribal groups in India include Gonds, Santhals, Khasis, Angamis, Bhils, Bhutias and Great Andamanese. All these tribal people have their own culture, tradition, language and lifestyle. There are more than 50 tribal groups in India. Most of the tribal belong basically to the Negrito, Australoid and Mongoloid racial stocks.

#### **Bhils**

Bhils are popularly known as the bow men of Rajasthan. They are the most widely distributed tribal groups in India. They form the largest tribe of the whole South Asia. Bhils are mainly divided into two main groups the central or pure bills and eastern or Rajput Bhils.

#### **Gonds**

The Gonds are the tribal community mostly found in the Gond forests of the central India. They are one of the largest tribal groups in the world. Gonds have been largely influenced by the Hindus and for the long time have been practicing the Hindus culture and traditions.

#### **Santhals**

Santhals are the third largest tribe in India. They are mostly found in the states of West Bengal, Bihar, Odisha, Jharkhand and Assam. They belong to the pre- Aryan period and have been the great fighters from the time of the British.

## **Munda**

Munda tribe mainly inhabit in the region of Jharkhand, although they are well spread in the states of West Bengal, Chhattisgarh, Odisha and Bihar. Munda generally means headman of the village. Hunting is the main occupation of the Mundas tribe.

## **Khasi**

Khasi tribe is mainly found in the Khasi Jaintia hills in Meghalaya and in the states of Punjab, Uttar Pradesh, Manipur, West Bengal and Jammu and Kashmir. They form the large part of the population in the state of Meghalaya.

## **Angami**

Angami tribe belongs to the extreme north eastern part of the country, in the state of Nagaland. The total population of the Angamis is around 12 million. They are quite popular for their woodcraft and artwork. Sekrenyi is the main festival celebrated among the Angamis in Nagaland.

## **Bhutia**

Bhutia tribes are of the Tibetan origin. They migrated to Sikkim around 16th century. In the northern part of the Sikkim they are known as the Lachenpas and Lachungpas. Bhutias forms 14% of the total population of Sikkim. Losar and Losoong are the main festivals celebrated among the Bhutia tribes.

## **Chenchu**

Chenchu inhabit in the Nallamalai hills, which have been the part of the Nagarjuna Segar Tiger Sanctuary for centuries in Andhra Pradesh, India. They are mainly found in the districts of Mahabubnagar, Nalgonda, Praksham, Guntur, and Kurnool.

## **Great Andamanese**

Great Andamanese is the Negrito tribe inhabitant in the Andaman group of Islands. They form the largest population among the other tribes found in these islands. According to the census the population of Great Andamanese is now limited to few individuals.

### **7. What is ITCZ? Explain the role of ITCZ in Indian Monsoon. Also discuss the Factors influencing the onset of SW monsoon.**

ITCZ என்றால் என்ன? இந்திய பருவமழையில் ITCZ இன் பங்களிப்பு பற்றி விளக்கு. மேலும் தென்மேற்கு பருவமழையின் தொடக்கத்தை பாதிக்கும் காரணிகள் பற்றி விவாதிக்கவும்.

ITCZ: Inter Tropical Convergence Zone is a low-pressure zone located at the equator where trade winds converge. In July, the ITCZ is located around 20°N-25°N latitudes, called as Monsoon trough. Due to shift of ITCZ, the trade winds of the southern hemisphere cross the equator between 40° and 60° E longitudes and start blowing from southwest to northeast due to Coriolis force. It becomes southwest monsoon. In winter ITCZ moves

southward, and so the reversal of winds from northeast to south and southwest, takes place. They are called northeast monsoons.

### THE INDIAN MONSOON

The climate of India is strongly influenced by monsoon winds. The Arabs, who had also come to India as traders named this seasonal reversal of the wind system as 'monsoon'

The monsoons are experienced in the tropical area roughly between 20° N and 20° S. To understand the mechanism of the monsoons, the following facts are important.

- The differential heating and cooling of land and water creates low pressure on the landmass of India while the seas around experience comparatively high pressure.
- The shift of the position of Inter Tropical Convergence Zone (ITCZ) in summer, over the Ganga plain (this is the equatorial trough normally positioned about 5°N of the equator. It is also known as the monsoon-trough during the monsoon season).
- The presence of the high-pressure area, east of Madagascar, approximately at 20°S over the Indian Ocean. The intensity and position of this high-pressure area affects the Indian Monsoon.
- The Tibetan plateau gets intensely heated during summer, which results in strong vertical air currents and the formation of low pressure over the plateau at about 9 km above sea level.
- The movement of the westerly jet stream to the north of the Himalayas and the presence of the tropical easterly jet stream over the Indian peninsula during summer.

### 8. Explain the factors responsible for the origin of ocean currents. How do they influence regional climates, fishing and navigation?

கடல் நீரோட்டங்களின் தோற்றத்திற்கு காரணமான காரணிகளை விளக்கவும். பிராந்திய காலநிலை, மீன்பிடித்தல் மற்றும் கடற்பயணம் ஆகியவற்றை கடல் நீரோட்டங்கள் எவ்வாறு பாதிக்கின்றன?

#### Ocean currents

Large mass of moving water from one part of the ocean to another in a definite direction is called as ocean current. The movement is produced due to earth's rotation, temperature difference of ocean water, salinity, density and some extent due to air pressure and winds. Ocean currents can be classified on the basis of mode of origin, volume and velocity and boundaries.

Ocean currents are the general movement of a mass of surface water in a fairly defined direction.

In other words, an ocean current may be defined as any persistent, dominantly horizontal flow of the ocean water. The ocean currents, like rivers, flow with certain velocity along a certain path. There are two types of ocean currents: warm and cold currents. Warm currents originate from low latitude drifts towards poles; whereas cold currents originate from high latitudes and move towards equator.

There are many factors that influence the generation of ocean currents are:

- ✓ Differences in temperature;
- ✓ Density of ocean water (salinity);
- ✓ Winds and Atmospheric pressure;
- ✓ Coriolis force;
- ✓ Gravitational force;
- ✓ Precipitation and evaporation; and
- ✓ Melting of snow and ice.

In the order of velocity ocean currents can be classified as drifts, currents and streams.

**Drifts** are movement of surface water of low velocity influenced by prevailing winds.

**Currents** are movement of oceanic water in definite direction and greater velocity.

**Streams** are larger mass of water moving in a definite direction and much greater velocity than the drifts and currents. Ocean currents are distinguished by the temperature they possess.

When ocean currents originate from equator it is termed as warm current. Likewise, when a current starts from polar region it is termed as cold current.

Vertical circulation of ocean water takes place due to difference in salinity and temperature between the surface and the water deep below. Upwelling is an oceanographic phenomenon that involves movement of dense, cooler, and usually nutrient-rich water towards the ocean surface, replacing the warmer, usually nutrient-depleted surface water. Down welling is the process of accumulation and sinking of cold high saline water beneath warmer or fresher water.

These currents make up the other 90% of the ocean. Deep Ocean currents are less influenced by the Coriolis effect and generally travel at a much slower speed when compared to surface currents. Besides the landscape of the ocean floor, especially ridges and basins, impede the flow of deep-water currents. One complete circuit of this flow of seawater is estimated to take about 1,000 years.

Seas around Japan and the eastern coast of North America are such examples. The areas where a warm and cold current meet also experience foggy weather making it difficult for navigation. The mixing of warm and cold currents help to replenish the oxygen and favour the growth of planktons, the primary food for fish population. The best fishing grounds of the world exist mainly in these mixing zones.

**The areas where the warm and cold currents meet provide the best fishing grounds of the World.**

### **The significance of Ocean Currents**

1. Ocean currents play an important role in the earth's climate. They distribute energy and nutrients within the ocean.
2. Fog is formed where warm current and cold current meet. For example, when the Gulf Stream and Labrador Current meet near New Found land one of the densest fogs is formed.
3. The warm ocean current increases the temperature of an area where it flows to and Cold Ocean current decreases the temperature of the area.
4. The warm current brings heavy rainfall when the wind blows over it becomes warm while the cold current brings drought when the wind blows over it becomes cold and dry. For example, the wind blowing over the Peru Current is cold and dry causing the formation of the Atacama Desert located on the west coast of Peru.
5. It regulates the global temperature. It gives free navigation. The Gulf Stream keeps ports & harbours of Russia and Scandinavia navigable throughout the year. The Kuroshio Current makes ports on Japan navigable during winter.
6. It distributes minerals and pollution added to it becomes highly diluted and later negligible.
7. It helps in growth of juveniles of certain fish and its distribution to other countries - from its place of origin. Some up welling and down welling are due to currents which bring minerals to photic zone used by phytoplankton. Major fishing grounds are located in the zones where cold current and warm current meet.

அலகு - II  
UNIT - II

பிரிவு - அ  
SECTION - A

- குறிப்பு : i. ஒவ்வொரு வினாவிற்கும் 150 சொற்களுக்கு மிகாமல் விடையளிக்கவும்.  
Answer not exceeding 150 words each  
ii. ஒவ்வொரு வினாவிற்கும் பத்து மதிப்பெண்கள்.  
Each question carries ten marks.  
iii. கொடுக்கப்பட்டுள்ள நான்கு வினாக்களில் எவையேனும் மூன்று வினாக்களுக்கு மட்டும் விடையளிக்கவும்  
Answer any three questions out of four questions.

(3 × 10 = 30)

9. Describe the major threats to Biodiversity.

உயிரிய பல்வகைமையின் முக்கிய அச்சுறுத்தல்கள் பற்றி விளக்குக

**Major Threats to Biodiversity**

**1. Habitat Loss**

Development of human society is inevitable. Natural habitats are destroyed for the purpose of settlement, agriculture, mining, industries and construction of highways. As a result species are forced to adapt to the changes in the environment or move to other places. If not, they become victim to predation, starvation, disease and eventually die or results in human animal conflict.

Over population, urbanization, industrialization and agricultural advancements require additional land, water and raw materials every year. This is made possible only through fragmentation or destruction of natural habitats by filling wetlands, ploughing grasslands, cutting down trees, forest, desilting rivers, constructing transport ways, caving mountains, extracting, ores, changing the course of rivers and filling of seashore.

The most dramatic example of habitat loss comes from the tropical rainforests 14% of the earth's land surface once covered by these tropical forests, is not more than 6% now. The Amazon rainforest, a vast area, harbouring millions of species, also called "Lungs of the planet" is destroyed and being replaced for agriculture and human settlements. 90% of New Zealand's wetlands have been destroyed and cleared for cultivating soya beans and raising grass for beef cattle. Kodaikanal and Nilgiri hills of Tamil Nadu have been destroyed rapidly for human occupancy. Loss of habitat results in annihilation of plants, microorganisms and forcing out animals from their habitats.

**2. Habitat fragmentation**

Habitat fragmentation is the process where a large, continuous area of habitat is both, reduced in area and divided into two or more fragments. Fragmentation of habitats like forest land into crop lands, orchard lands, plantations, urban areas, industrial estates,

transport and transit systems has resulted in the destruction of complex interactions amongst species, (food chain and webs) destruction of species in the cleared regions, annihilation of species restricted to these habitats (endemic) and decreased biodiversity in the habitat fragments. Animals requiring large territories such as mammals and birds are severely affected. The elephant corridors and migratory routes are highly vulnerable. The dwindling of many well-known birds (sparrows) and animals can be attributed to this.

### **3. Over exploitation:**

We depend on nature for our basic needs such as food and shelter. However, when the need becomes greed, it leads to over exploitation of natural resources. Excessive exploitation of a species, reduces the size of its population to such a level that it becomes vulnerable to extinction. Dodo, passenger pigeon and Steller's sea cow have become extinct in the last 200-300 years due to over exploitation by humans. Overfishing due to population pressure leads too many marine fish (populations) declining around the world.

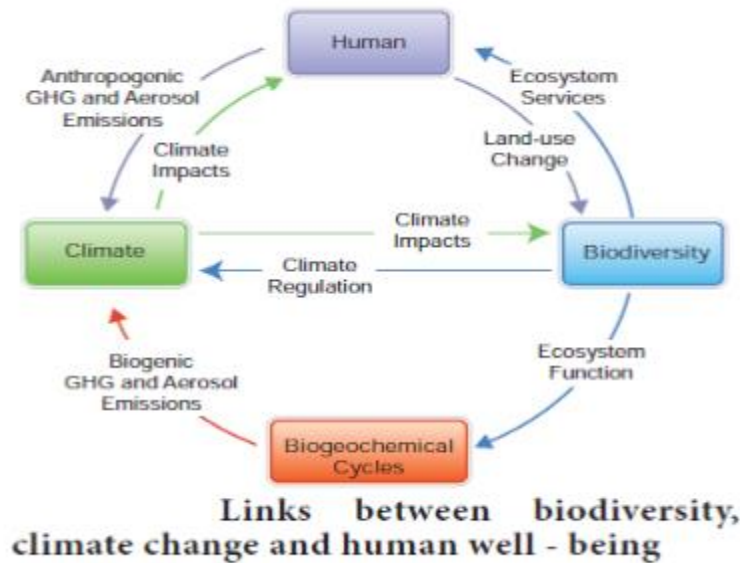
### **4. Exotic species invasion:**

Exotic species (non-native; alien) are organisms often introduced unintentionally or deliberately for commercial purpose, as biological control agents and other uses. They often become invasive and drive away the local species and is considered as the second major cause for extinction of species. Exotic species have proved harmful to both aquatic and terrestrial ecosystems.

### **5. Global Climate changes**

Industrialization is a major contributor to climate change and a major threat to biodiversity. Energy drives our industries, which is provided by burning of fossil fuels. This increases the emission of CO<sub>2</sub>, a GHG, leading to climate change. Due to large scale deforestation, the emitted CO<sub>2</sub> cannot be absorbed fully, and its concentration in the air increases. Climate change increases land and ocean temperature, changes precipitation patterns and raises the sea level. This inturn results in melting of glaciers, water inundation, less predictability of weather patterns, extreme weather conditions, outbreak of squalor diseases, migration of animals and loss of trees in forest. Thus, climate change is an imminent danger to the existing biodiversity.





## 6. Shifting or Jhum cultivation (Slash-and-burn agriculture)

In shifting cultivation, plots of natural tree vegetation are burnt away and the cleared patches are farmed for 2-3 seasons, after which their fertility reduces to a point where crop production is no longer profitable. The farmer then abandons this patch and cuts down a new patch of forest trees elsewhere for crop production. This system is practiced in north-eastern regions of India. When vast areas are cleared and burnt, it results in loss of forest cover, pollution and discharge of CO<sub>2</sub> which in turn attributes to loss of habitat and climate change which has an impact on the faunal diversity of those regions.

## 7. Coextinctions

Coextinction of a species is the loss of a species as a consequence of the extinction of another. (Eg., orchid bees and forest trees by cross pollination). Extinction of one will automatically cause extinction of the other. Another example for co-extinction is the connection between Calvaria tree and the extinct bird of Mauritius Island, the Dodo. The Calvaria tree is dependent on the Dodo bird for completion of its life cycle. The mutualistic association is that the tough horny endocarp of the seeds of Calvaria tree are made permeable by the actions of the large stones in bird's gizzard and digestive juices thereby facilitating easier germination. The extinction of the Dodo bird led to the imminent danger of the Calvaria tree coextinction.

## 8. Pollution

Pollutants and pollution are a major cause for biodiversity loss. Excessive use of fertilisers, pesticides and heavy metals has polluted the land, ground and surface water bodies. There is a tendency of pesticide biomagnification which results in high concentrations at higher trophic levels which has resulted in drastic decline in the population of fish eating birds and falcons. Run off from fertilizer rich fields causes nutrient enrichment of water bodies leading to eutrophication. Mercury, arsenic, cadmium, chromium poisoning has led to depletion of biotic resources in vulnerable ecosystems. Death of vulture population is attributed to the veterinary medicine Diclofenac, which is responsible for the thinning of the egg shells.

## 9. Intensive agriculture:

Spread of agriculture is sometimes at the cost of wetlands, grasslands and forests. Intensive agriculture is based on a few high yielding varieties. As a result, there is reduction in the genetic diversity. It also increases vulnerability of the crop plants to sudden attack by pathogens and pests. There are only few varieties of traditional paddy strains today due to use to hybrid varieties in Tamil Nadu.

## 10. Forestry

There is a tendency to grow economically important and viable trees like Teak, Sandal, Oak, Sal in forests resulting in loss of other forest trees.

## 11. Natural threats

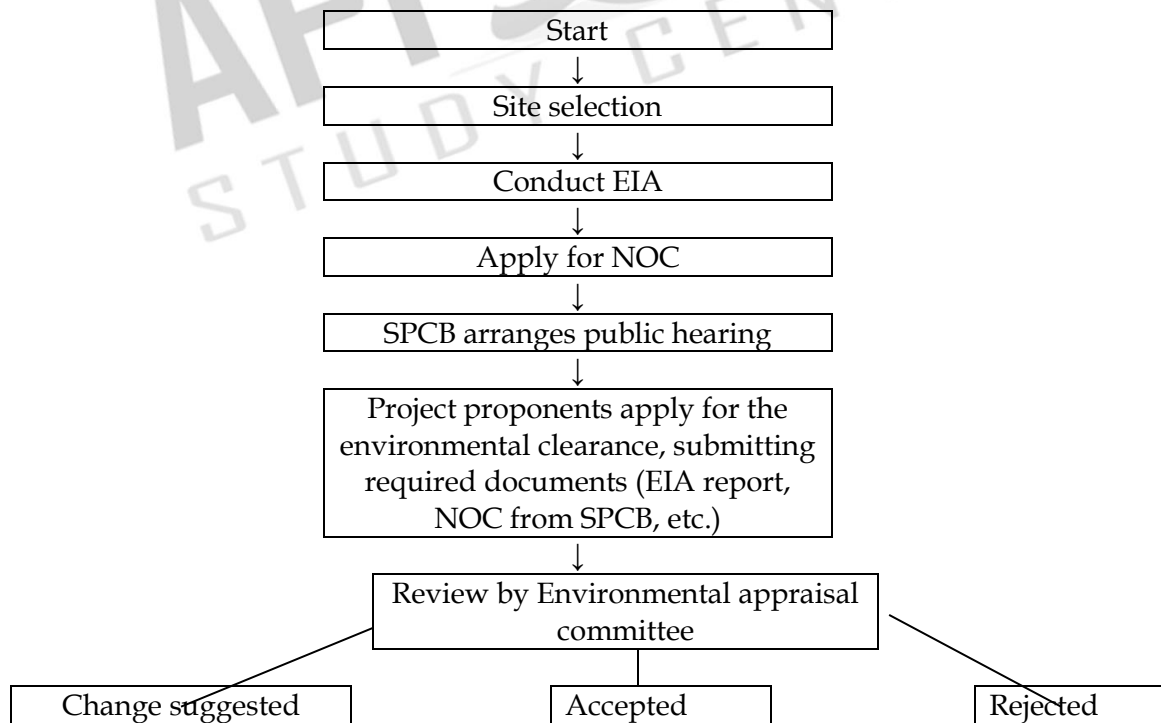
These include spontaneous jungle fires, tree fall, land slide, defoliation by insects or locust attack.

## 10. Elucidate the process of obtaining environmental clearance for projects in India

இந்தியாவில் திட்டங்களுக்கான சுற்றுச்சூழல் இசைவை பெறும் செயல்முறையை தெளிவாக்குக.

### Environmental clearance procedure in India.

Flow chart showing Environmental clearance process India.



Environmental clearance from the central government is an administrative requirement for big projects undertaken by government or public sector undertakings. Initially during 1978 / 79 EIA was carried out for river valley projects and then extended to industrial projects. Ministry of environmental clearance mandatory for expansion or modernization of any activity or for setting up new projects listed in schedule I of the notification.

Environmental clearance a permit issued by the regulatory authority for allowing development of certain types of projects / activities. The environmental clearance process is required for 39 types of project and covers aspects like screening, scoping and evaluation of the upcoming project. The main purpose is to assess impact of the planned project on the environment and people and to try to abate / minimise the same.

**The environmental clearance consists of following steps:**

- Project proponent identifies the location of proposed plant after ensuring compliance with existing siting guidelines. If project site does not agree with the siting guideline, the proponent has to identify other alternative site for the project.
- The project proponent then assesses if the proposed activity/ project falls under the purview of environmental clearance if it mentioned in schedule of the notification, the proponent conducts an EIA study either directly or through a consultant. If the project falls in B category, the project goes to state government for clearance which further categorise into B1 and B2 projects. B2 projects do not require preparation of EIA reports.
- After the EIA report is ready, the investor approaches the concerned State pollution Control Board (SPCB) and the State Forest Department (if the location involves use forestland) The SPCB evaluates and assesses the quality of effluents likely to be generated by the proposed unit as well as the efficacy of the control measures proposed by the investor to meet the prescribed standards. If the SPCB is satisfied that the proposed unit will meet all the prescribed effluent and emissions standards, it issues consent to establish (Popularly known as NOC), which is valid for years.

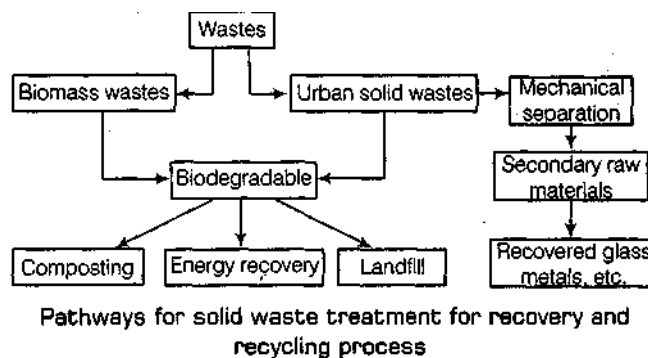
**11. Write a detailed note on Integrated Solid waste Management.**

ஒருங்கிணைந்த திடக்கழிவு மேலாண்மை பற்றி விரிவாக எழுதுக

**Integrated Solid Waste Management**

Integrated Solid Waste Management (ISWM) takes an overall approach to creating sustainable systems that are economically affordable, socially acceptable and environmentally effective. An integrated solid waste management system involves the use of a range of different treatment methods and key to the functioning of such a system is the collection and sorting of the waste.

It is important to note that no one single treatment method can manage all the waste materials in an environmentally effective way. Thus, all of the available treatment and disposal options must be evaluated equally and the best combination of the available options suited to the particular community chosen. Effective management schemes therefore need to operate in ways, which best meet current social, economic and environmental conditions of the municipality.



## 1. Removal of wastes to landfills

The three steps of garbage management of a city corporation are collections, transportation and disposal. However, in most settlements dumping lines are absent. In many places where formal systems of garbage disposal have been introduced, garbage is transported to landfill sites. At these landfill sites, the garbage decays and settles down to fill up the sites. The maximum expenditure in solid waste management is on transportation. If it is not managed properly, the accumulated garbage decays in the cities. This is what is happening in most of the Indian cities.

## 2. Composting

Composting is the common practice for solid waste management. In nature, all dead matter is gradually acted upon by the forces of nature such as the sun, wind, rain and microbes which serve to break complex materials into simple molecules. If such material is left to decay on road sides it begins to decompose and stink and invites many diseases. Instead, the process of decomposition can be used to convert these organic wastes which we generate every day to produce compost which can help us keep our surroundings clean and green. Compost is used as manure to increase the fertility of the soil. The various methods of composting are as follows.

- i. Anaerobic composting is done in the absence of air. It takes a long time of 4-8 months. It was in 1937 a sewage treatment plant employing anaerobic digestion process was set up in Bombay. This generated interest among the scientists and researchers in the field of anaerobic digestion of cattle dung for the production of combustible gas called biogas and rich organic manure in the form of digested slurry. 1 kilo gram of dry animal dung gives about 160 litres of biogas.
- ii. Aerobic composting is done in the presence of air. It is completed in 2-3 weeks. It has very little odour. It must be properly covered and protected. A temperature of 55°C is maintained.
- iii. Vermicomposting is done in the presence of air and earthworms. The reaction is complete and the compost formed by this method is colourless and rich in macro and micro nutrients. It can be dried and stored easily. For this method controlled conditions like moisture and temperature are necessary.

In India, composting for agricultural use is being practised at several places like Baroda and Jaipur.

## 3. Incineration

To get rid of solid wastes easily and immediately, incineration plants are erected in many cities in India. These plants produce heat and electricity during incineration. In Delhi a plant is

constructed to generate heat from solid waste. This is common use all over the world. Recently, fluidized bed incinerator has been developed which burns solid wastes at high pressure producing hot gases which power a turbine and generate electricity. Municipal solid wastes have a heating value (heat per unit mass) about one third that of coal, and a typical we will be able to obtain 10% of its electric power requirements by burning the refuse.

All types of hospital wastes are burnt in controlled air incinerators. With their application in environment is made infection free. Such incinerators must be installed outside the city because when different types of garbage are burnt, the stench emanating will affect the nearby people and temperature of the environment will be increased.

#### 4. Recycling

It is very clear that the resources of the world have been indeed finite. To maintain a stable economic growth and standard of living in the future, it is necessary that we use resources very carefully. For this we have to evolve technologies for recycling wastes and residues and nearby save both resources and energy.

“It is now certain that a nation that will not able to recycle used materials will not be able to sustain itself and there is global realization of the fact that single use of some of the important materials like metals, glass and paper would lead to scarcity of such materials as their feed - stock would get exhausted”.

Papers, clothes, metals, glasses, rubber, plastic etc. are separated from the garbage and are subjected to recycling. Currently recycling of plastics has increased to a maximum. A nonferrous metal like lead are recycled but during recycling environmental pollution is enhanced.

Accumulation of waste is a hazard and the clean Japan centre aims at recycling the waste with dual objective. First, to conserve the resources which are finite; second to keep the country environmentally clean. This centre has done commendable work in developing technologies for recycling a number of organic and inorganic materials including discarded tyres, plastics, chemicals, home appliances etc.

Some of the recycling techniques followed in Japan are:

1. Thermal decomposition technique for recovering organic substances in the form of gas and oil,
2. Food sources from organic wastes to meet the need for livestock feed,
3. Composting
4. Methane fermentation plus residual sludge (60%)
5. Alcohol fermentation
6. Conversion of wood chips and sawdust into solid fuel
7. Melting blast furnace slag for making artificial jewellery and ammoniac alum for synthetic sapphires,
8. Use of garbage incineration heat for generating power and supply of hot water etc.
9. Japan's work on recycling has had most marked effect on automobile industry. Sweden which has been endowed with large forests is now recycling newspaper. In Britain the

watchword is “Rubbish is fuel of the future” and refuse derived fuel (RDF) is becoming common.

## 5. Pyrolysis

- Pyrolysis is the breakdown of solid wastes by heat in the absence of oxygen.
- Pyrolysis is an endothermic process.
- Pyrolysis produces three components from solid wastes. They are gas, liquid and char.
- The gas includes methane, hydrocarbons, carbon dioxide, etc.
- Liquid includes tar, acetic acid, acetone, methanol, etc.
- The char includes carbon.
- The gas, liquid and char have high calorific value.
- It is released by combustion.

## 6. Volume reduction

Before disposing the wastes in land fill sites, their volume can be reduced by

1. Pulverization - Waste size is reduced for land filling
2. Baling - Hydraulic rams are used to compact the pulverized or raw waste
3. Incineration - The waste is burnt under controlled conditions

## 7. Resource recovery (or) Reclamation

Useful components are separated from the mixed waste or they are chemically transformed into a new product. Initial separation is achieved through primary separation comprising

1. wet pulverization - pulverization after wetting
2. wet pulping - the components are pulped
3. dry separation - size reduction through air classification

The secondary separation involves the separation of specific components like ferrous metals which is accomplished through

1. magnetic separation
2. screening
3. minerals - separation by specific gravity
4. hydraulic classifier
5. heavy - media separator

The separated fractions are upgraded through tertiary separation. It helps in the recovery of non-ferrous metals or glass for recycling. It can be through

6. Heavy media separation
7. Electrodynamic separation
8. Electrostatic separation

## 8. Energy recovery

- Wastes can be treated and during this process energy can be generated. It serves a dual purpose in which wastes are treated and energy is also generated. Food industry

wastes are used to produce alcohol, electricity etc. In sugar mills, sugar-cane bagasse can be used to heat the boilers which generate steam. This steam can be employed to run the turbines which produce electricity.

Electricity can be generated by burning cattle dung. Organic wastes like municipal sludge and animal manure can be subjected to anaerobic digestion to produce biogas.

- Wastes are only considered as misplaced wealth and if efficiently recycled, they can be put to use.

## 12. Write in detail about the impact of Environmental pollution on Human Health

கற்றுக்குழல் மாசுபாடு மனிதனின் உடல்நலத்தில் ஏற்படுத்தும் விளைவுகள் பற்றி எழுதுக

### ENVIRONMENT AND HUMAN HEALTH

#### Environmental pollution has direct as well as indirect effects on human health

In general terms a physically fit person not suffering from any disease is called a healthy person. However, there are many other dimensions associated with the state of being healthy. According to World Health Organisation (WHO) health is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". Human health is influenced by many factors like nutritional, biological, chemical or psychological, which are related to environment. These factors may cause harmful changes in the body's conditions called disease, as discussed below:

- Infectious organisms: Disease-causing organisms pose greater environmental threats to health, more severely in the developing countries especially the tropical ones. High temperature and moisture along with malnutrition help many diseases to spread in these countries. Microbes especially bacteria can cause food poisoning by producing toxins in the contaminated food. Some moulds grow on food and produce poisonous toxins.

Infectious organisms can also cause respiratory diseases (pneumonia, tuberculosis, influenza etc.) and gastrointestinal diseases (diarrhoea, dysentery, cholera etc.).

#### WHO Report: 13 Million Deaths Due To Environmental Exposure

The World Health Organisation in its report (2006) has emphasised that diseases can be prevented through healthy environment. More than 33 percent of diseases in children below 5 yrs. are due to environmental exposures. About one quarter of diseases in the world are due to environmental exposures while it is one third in less developed countries.

Malaria and diarrhoea are the world's two biggest killer diseases of childhood. Other such diseases are due to infection of respiratory tract. These diseases can be prevented through better environmental management.

Safe storage of water, better hygienic environment, use of safer and cleaner fuels, increased safety measures at home and workplace and reduction and proper management of wastes and hazardous substances can reduce the environmental disease burden.

It is estimated that 94 percent of diarrhoeal burden of disease comes from unsafe

water, sanitation and hygiene and 41 percent of lower respiratory infections come from indoor and outdoor air pollution.

There are various types of parasites that cause diseases like malaria, schistosomiasis, filariasis etc. Most of these infections take place when the environmental conditions are unclean and unhygienic.

- **Harmful chemicals:** A large number of chemicals are introduced in the environment by anthropogenic activities. Industrial effluents containing various chemicals are of major concern. Chemicals can be divided into two categories i.e. hazardous and toxic chemicals. Hazardous are the dangerous chemicals like explosives, inflammable, or corrosive chemicals. Toxic chemicals (**toxins**) are poisonous chemicals which kill cells and can cause death. There are many chemicals that can cause cancer (**carcinogenic**), affect genetic material (DNA) in cells (mutagenic) or cause abnormalities during embryonic growth and development (**teratogenic**), while there are others that affect nervous system (**neurotoxins**) and the reproductive system. Some of the pesticides and other industrial pollutants may act as hormone analogs in humans and other species. These environmental hormones affect reproduction, development and cause various types of ailments including tumors.

Many chemicals like DDT and other chlorinated pesticides bio accumulate in food-chain and show deleterious effects at the top of the food chain. Many chemical substances present in wastewaters like heavy metals (mercury, cadmium, lead etc.) fluoride and nitrate can also affect human health. The adverse effects of some of these have already been discussed in Chapter 5. Metals can contaminate food while cooking in various types of utensils including alloys like steel. Containers for canned food, especially which are acidic in nature, contaminate the food with lead. Lead also comes in water from the water pipes where it is added for plumbing purposes. Various alcoholic beverages contain lead while tobacco contains cadmium that goes in the body and affects human health.

Various chemicals, gases and particulates laden with chemicals, spewed into the environment from various industries cause air pollution and affect human health. The details of effects of air pollution on human health have already been given in Chapter 5.

- **Noise:** Although human ear is capable of tolerating a range of sound levels, yet if sound levels beyond the permissible level exist for certain duration, it becomes painful and sometimes irreparable damage occurs. Besides hearing damage various types of physiological and psychological changes are induced by noise pollution. The details of effects of noise on human health have already been discussed in Chapter 5.
- **Radiations:** Radiations are known to cause short-term and long-term changes in various organs. Cosmic rays and ultraviolet rays cause harmful effects on human health which may include cancer. The details of ill effects of radiations on human health have already been discussed in Chapter 5.
- **Diet:** Diet has a very important role in maintaining health. Malnutrition makes humans prone to other diseases. There is a strong correlation between cardiovascular diseases and the amount of salt and fat in one's diet. Food contamination can cause



various ill effects. There had been cases of Dropsy in India, a disease which occurred due to contamination of mustard oil with the poisonous seeds of *Argemone mexicana*. Likewise various adulterated pulses, condiments, oils etc. sold in the market to earn profit affect human health.

**Settlement Conditions:** Proper environment, availability of basic necessities of life like, water, sanitation etc. are essential for healthy living. Housing is very important from security point of view. Improper settlement and poor physical environment may cause various psychological problems which affect various vital physiological processes in the body.

### 1. factors affecting human health?

Human health is affected by the following environmental pollutant factors.

#### A. Home environment and human health:

Who defines a home as the residential environment with the physical structure that man uses for shelter and the environment surrounding it. It includes all necessary services, facilities, equipment's and devices needed or desired for the physical and mental health and social well-being of a family.

Home is to some extent responsible for the status of man's health. It is difficult, however, to demonstrate the specific cause and effect relationship because housing embraces so many facets of environment. The following diseases are common due to poor housing.

1. Respiratory infection. Common cold, tuberculosis, influenza, diphtheria, bronchitis, measles, whooping cough, etc.
2. Arthropods, Houseflies, mosquitoes, fleas and bugs.
3. Skin infection. Scabies, ringworm, impetigo, leprosy.
4. Rat infection. Plague.
5. Accidents. A substantial proportion of house accidents are caused by some defect in the house and its environment.

#### B. Slum Environment And Human Health

Slums are pockets of poor houses, poor people and poor environment either in the middle of or at the periphery of a big city. The slum environment is conducive to the spread of several ailments i.e., communicable diseases, malnutrition, mental and physical retardation and behavioural problems. Clean water is not available for drinking and bath. It leads to water-borne diseases.

1. Water-borne diseases. Water-borne diseases are those in which infectious agent remains alive in drinking water i.e. typhoid, para-typhoid, gastro-enteritis etc.
2. Water-washed diseases. Water-washed diseases include infection of the outer body surfaces i.e. trachoma, skin ulcers, scabies and typhus, bacillary and amoebic dysentery and gastroenteritis.
3. Water-based infections. i.e. schistosomiasis, guinea worms. The infection occurs when the skin is in contact with dirty water or through drinking water.
4. Water breeding diseases. Water breeding diseases are caused by mosquitoes or flies living near slums.

5. Indoor air pollution. Indoor air pollution is particularly serious in rural areas and slums due to poor housing. Smoke from wood and other biomass fuels used for household cooking is responsible for about 50 per cent of total human exposure to particulates. Indoor air pollution is especially severe in poorly ventilated homes in the winter when the air is dense with particulates smoke and hazardous organic compounds.

### **C. Hospital and Community Environment**

Some of the hospital environments travel with the patient to the community. Hospital resistant infections if spread by patients to other community members can acquire a dangerous proportion. The community environment can affect the hospital environment.

If there are dangerous pollution zones in the vicinity of a hospital like the thermal plants or great rush of automobiles or industries, it can pollute the environments and the hospitalized clients are much more susceptible to all ill effects of such pollutions. There can be a menace of mosquitoes, if there are breeding places in the vicinity. Open sewerage system. Human and animal excreta and industrial effluents can affect the hospital environment badly and the patients.

### **D. Biomass Fuel Combustion**

Over half of the world population uses the biomass fuels as the only source of domestic energy for cooking and heating. The biomass fuels include a wide range of materials such as rice straw, coconut husk, cotton stalks etc. The most important fuel wood is logs, branches, bark, twigs and leaves. The other forms of biomass are dried dung from cattle, buffalo and camels, scrub plants, weeds and cacti etc.

The biomass combustion produces high quantity of particulates, hydrocarbons and carbon monoxide. The acute effects of biomass smoke inhalation are largely due to asphyxiation and carbon monoxide. It may be life threatening causing rapid death. Chronic exposure produces irritative and inflammatory action on human health.

### **E. Effects of Pesticides On Human Health**

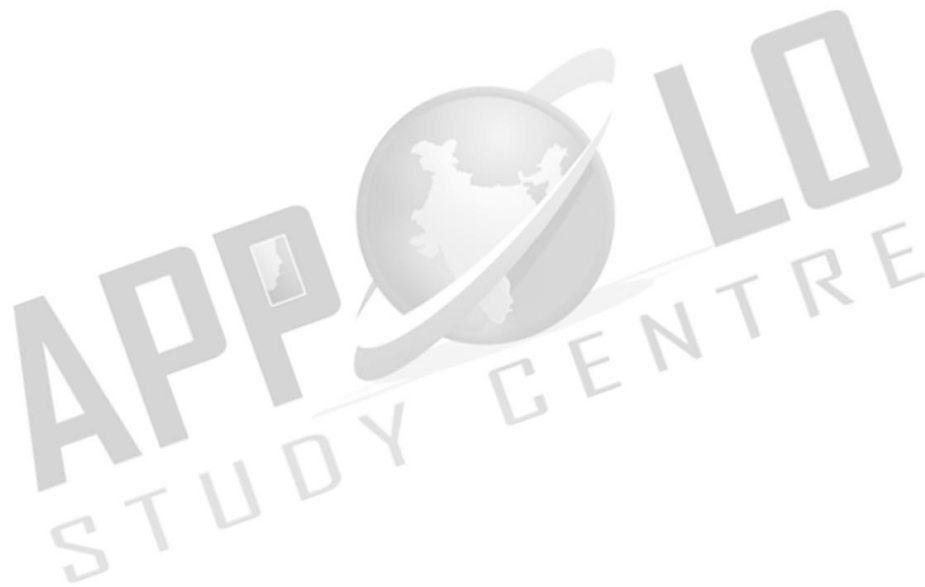
After the Second World War, the use of pesticides increased tremendously. Although their success in controlling pests on a short-term basis cannot be denied but their overall ill effects on human are bad. Certain pesticides which do not disintegrate for long enter human body through the food chain. These pesticides get accumulated in human body as they get easily dissolved in body fats. Toxicants in edible plants and poisonous plants resembling them are important cause of ill health in underdeveloped countries.

### **F. Effects of small-scale industries on human health**

Small-scale industries in industrial sector are generally involved in preparing formulations based on raw or semi-processed materials purchased from larger manufacturers. Air pollution from them is generally confined to fumes, dusts, mists and vapours from solvents and other manufacturing constituents in the work environment with the potential health effects.

## **H. Effects of Food Adulteration on Human Health**

Food adulteration is a crucial problem faced by the people in underdeveloped countries of the world. It poses a major threat to human health. In such countries, food is the major items of consumption and about 80 per cent of the income is spent on it.



பிரிவு - ஆ  
SECTION - B

- குறிப்பு : i. ஒவ்வொரு வினாவிற்கும் 250 சொற்களுக்கு மிகாமல் விடையளிக்கவும்.  
Answer not exceeding 250 words each.
- ii. ஒவ்வொரு வினாவிற்கும் பதினைந்து மதிப்பெண்கள்  
Each question carries fifteen marks.
- iii. கொடுக்கப்பட்டுள்ள நான்கு வினாக்களில் எவையேனும் மூன்று வினாக்களுக்கு மட்டும் விடையளிக்கவும்.  
Answer any three questions out of four questions.

(3 × 15 = 45)

13.

- a. What is Environmental Sustainability and discuss the issues related with environmental sustainability?  
சுற்றுச்சூழல் நிலைத்தன்மை என்றால் என்ன மற்றும் சுற்றுச்சூழல் நிலைத்தன்மை தொடர்பான பிரச்சனைகள் பற்றி விவாதி

## ENVIRONMENTAL SUSTAINABILITY

Perspectives and approaches towards achieving a sustainable environment.

### a. Poverty Eradication and Sustainable Livelihoods

- i. Poverty and a degraded environment are closely inter-related, especially where people depend for their livelihoods primarily on the natural resource base of their immediate environment. Restoring natural systems and improving natural resource management practices at the grassroots level are central to a strategy to eliminate poverty.
- ii. The survival needs of the poor force them to continue to degrade an already degraded environment. Removal of poverty is therefore a prerequisite for the protection of the environment.
- iii. Poverty magnifies the problem of hunger and malnutrition. The problem is further compounded by the inequitable access of the poor to the food that is available. It is therefore necessary to strengthen the public distribution system to overcome this inequity.
- iv. Diversion of common and marginal lands to 'economically useful purposes' deprives the poor of a resource base which has traditionally met many of their sustenance needs.
- v. Market forces also lead to the elimination of crops that have traditionally "been integral to the diet of the poor, thereby threatening food security and nutritional status.
- vi. While conventional economic development leads to the elimination of several traditional occupations, the process of sustainable development, guided by the need to protect and conserve the environment, leads to the creation of new jobs and of opportunities for the reorientation of traditional skills to new occupations.
- vii. Women, while continuing to perform their traditional domestic roles' are increasingly involved in earning livelihoods. In many poor households they are often the principal or the sole breadwinners. A major thrust at the policy level is necessary to ensure equity and justice for them.
- viii. Literacy and a basic education are essential for enabling the poor to access the benefits offered by development initiatives and market opportunities. Basic education is

therefore a precondition 'for sustainable development. A sizeable proportion (about 60 per cent according to some estimates) of the population is not integrated into the market economy. Ensuring the security of their livelihoods is an imperative for sustainable development.

### **b. Changing Unsustainable Patterns of Consumption and Production**

- i. With increasing purchasing power, wasteful consumption linked to market driven consumerism is stressing the resource base of developing countries further. It is important to counter this through education and public awareness.
- ii. In several areas, desirable limits and standards for consumption need to be established and applied through appropriate mechanisms including education, incentives and legislation.
- iii. Several traditional practices that are sustainable and environment friendly continue to be a regular part of the lives of people in developing countries. These need to be encouraged rather than replaced by more 'modern' but unsustainable practices and technologies.
- iv. Development decisions regarding technology and infrastructure are a major determinant of consumption patterns. It is therefore important to evaluate and make development decisions which structurally lead to a more sustainable society.
- v. Technologies exist through which substantial reduction in consumption of resources is possible. Efforts to identify, evaluate, introduce and use these technologies must be made.
- vi. Subsidies often lead to wasteful and unsustainable consumption by distorting the value of a resource. All pricing mechanisms must be evaluated from a sustainable development point of view.

### **c. Protecting and Managing the Natural Resource Base of Economic and social Development**

- i. The integration of agriculture with land and water management, and with ecosystem conservation is essential for both environmental sustainability and agricultural production.
- ii. Environmental perspective must guide the evaluation of all development projects, recognizing the role of natural resources in local livelihoods. This recognition must be informed by a comprehensive understanding of the perceptions and opinions of local people about their stakes in the resource base.
- iii. To ensure the sustainability of the natural resource base, the recognition of all stakeholders in it and their roles in its protection and management is essential.
- iv. There is need to establish well-defined and enforceable rights (including customary rights) and security of tenure, and to ensure equal access to land, water and other natural and biological resources. It should be ensured that this applies, in particular, to indigenous communities, women and other disadvantaged groups living in poverty.
- v. Water governance arrangements should protect ecosystems and preserve or restore the ecological integrity of all natural water bodies and their catchments. This will maintain

the wide range of ecological services that healthy ecosystems provide and the livelihoods that depend upon them.

- vi. Biomass is, and will continue for a long time to be, a major source of fuel and energy, especially for the rural poor. Recognizing this fact, appropriate mechanisms must be evolved to make such consumption of biomass sustainable, through both resource management and the promotion of efficient and minimally polluting technologies, and technologies which will progressively reduce the pressures on biomass, which cause environmental degradation.
- vii. The traditional approaches to natural resource management such as sacred groves and ponds, water harvesting and management systems, etc., should be revived by creating institutional mechanisms which recapture the ecological wisdom and the spirit of community management inherent in those systems.

#### **d. Sustainable Development in a Globalizing World**

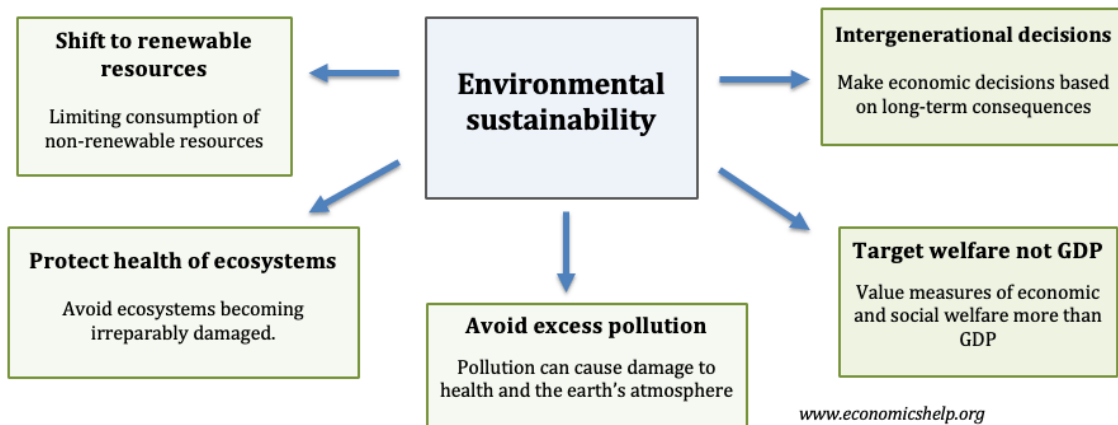
- i. Globalization as it is taking place today is increasing the divide between the rich and the poor. It has to be steered so that it serves not only commercial interests but also the social needs of development.
- ii. Global business encourages and imposes, high levels of homogeneity in consumer preferences. On the other hand, for development to be locally appropriate and sustainable, it must be guided by local considerations which lie in cultural diversity and traditions. Therefore, recognition at the policy level, of the significance of diversity, and the need to preserve it, is an important precondition for sustainable development.
- iii. In an increasingly globalizing economy, developing countries, for want of the appropriate skills, are often at a disadvantage in negotiating and operating multilateral trade agreements. Regional cooperation for capacity building is therefore necessary to ensure their effective participation in all stages of multilateral trade.
- iv. Globalization is driven by a vast, globally spread, human resource engine involving millions of livelihoods. Their security is sometimes threatened by local events causing global distortions. Mechanisms to safeguard trade and livelihoods, especially in developing countries, must be evolved and negotiated to make globalization an effective vehicle of sustainable development.
- v. War and armed conflict are a major threat to sustainable development. It is imperative to evolve effective mechanisms for mediation in such situations and to resolve contentious issues without compromising the larger developmental goals of the conflicting parties.

#### **e. Health and Sustainable Development**

- i. Human health in its broadest sense of physical, mental and spiritual well-being is to a great extent dependent on the access of the citizen to a healthy environment. For a healthy, productive and fulfilling life every individual should have the physical and economic access to a balanced diet, safe drinking water, clean air, sanitation, environmental hygiene, primary health care and education.
- ii. Access to safe drinking water and a healthy environment should be a fundamental right of every citizen.
- iii. Citizens of developing countries continue to be vulnerable to a double burden of diseases. Traditional diseases such as malaria and cholera, caused by unsafe drinking

water and lack of environmental hygiene, have not yet been controlled. In addition, people are now falling prey to modern diseases such as cancer and AIDS, and stress-related disorders.

- iv. Many of the widespread ailments among the poor in developing countries are occupation-related, and are contracted in the course of work done to fulfil the consumption demands of the affluent, both within the country and outside.
- v. The strong relationship exists. Between health and the state of the environment so greater emphasis should be on preventive and social medicine and on research in both occupational health and epidemiology.
- vi. Basic health and educational facilities in developing countries need to be strengthened. The role of public health services must give preventive health care equal emphasis as curative health care. People should be empowered through education and awareness to participate in managing preventive health care related to environmental sanitation and hygiene.
- vii. Most developing countries are repositories of a rich tradition of natural resource-based health care. This is under threat, on the one hand from modern mainstream medicine, and on the other from the degradation of the natural resource base. Traditional medicine in combination with modern medicine must be promoted while ensuring conservation of the resource base and effective protection of IPRs of traditional knowledge.
- viii. Developing countries should also strive to strengthen the capacity of their health care systems to deliver basic health services and to reduce environment-related health risks by sharing of health awareness and medical expertise globally.



### Issues of environmental sustainability

Environmental sustainability is concerned with issues such as:

- Long-term health of ecosystems. Protecting the long-term productivity and health of resources to meet future economic and social needs, e.g. protecting food supplies, farmland and fishing stocks.
- Intergenerational decision making. When making economic decisions, we should focus on implications for future generations, and not just the present moment. For

example, burning coal gives a short-term benefit of cheaper energy, but the extra pollution imposes costs on future generations.

- Renewable resources: Diversifying into energy sources that do not rely on non-renewable resources. For example, solar and wind power.
- Prevent the consequences of man-made global warming. Policies to ensure the environment of the planet does not deteriorate to a point where future generations face water shortages, extreme weather events, excess temperature. – All factors that could make living in parts of the world very difficult if not possible.
- Protection of species diversity and ecological structure. Sometimes medicines require elements within specific plant species. If some species go extinct, it limits future technological innovation.
- Treating environmental resources as if they have intrinsic rights and value. In other words, we shouldn't just rely on a monetary value, i.e. we should protect rainforests because they deserve to be protected rather than using a cost-benefit analysis of whether we gain financially from protecting rainforests.
- Targetting social welfare/happiness and environmental sustainability above crude measures of progress such as GDP. Measures of economic welfare

**b. How do nutrients move in an ecosystem? Explain the Nitrogen Cycle**

ஊட்டச்சத்துகள் சூழல் மண்டலத்தில் எவ்வாறு நகர்கின்றன? நைட்ரஜன் சுழற்சியை விளக்குக

**Biogeochemical cycle (Nutrient cycle)**

Exchange of nutrients between organisms and their environment is one of the essential aspects of an ecosystem. All organisms require nutrients for their growth, development, maintenance and reproduction. Circulation of nutrients within the ecosystem or biosphere is known as biogeochemical cycles and also called as 'cycling of materials.' There are two basic types,

1. Gaseous cycle - It includes atmospheric Oxygen, Carbon and Nitrogen cycles.
2. Sedimentary cycle - It includes the cycles of Phosphorus, Sulphur and Calcium - Which are present as sediments of earth.

Many of the cycles mentioned above are studied by you in previous classes. Therefore, in this chapter, only the carbon and phosphorous cycles are explained.

**Nitrogen Cycle**

Nitrogen is the important nutrient needed for the survival of all living organisms. It is an essential component of proteins, DNA and chlorophyll. Atmosphere is a rich source of nitrogen and contains about 78% nitrogen. Plants and animals cannot utilize atmospheric nitrogen. They can use it only if it is in the form of ammonia, amino acids or nitrates.

Processes involved in nitrogen cycle are explained below.

**Nitrogen fixation:** Nitrogen fixation is the conversion of atmospheric nitrogen, which is in inert form, to reactive compounds available to living organisms. This conversion is done by a number of bacteria and **blue green algae** (Cyanobacteria). **Leguminous plants** like pea



and beans have a symbiotic relationship with nitrogen fixing bacteria *Rhizobium*. *Rhizobium* occur in the root nodules of leguminous plants and fixes nitrogenous compounds.

**Nitrogen assimilation:** Plants absorb nitrate ions and use them for making organic matter like proteins and nucleic acids. Herbivorous animals convert plant proteins into animal proteins. Carnivorous animals synthesize proteins from their food.

**Ammonification:** The process of decomposition of nitrogenous waste by putrefying bacteria and fungi into ammonium compounds is called ammonification. Animal proteins are excreted in the form of urea, uric acid or ammonia. The putrefying bacteria and fungi decompose these animal proteins, dead animals and plants into ammonium compounds.

**Nitrification:** The ammonium compounds formed by ammonification process are oxidised to soluble nitrates. This process of nitrate formation is known as nitrification. The bacteria responsible for nitrification are called as nitrifying bacteria.

14. Write a short note on the following

பின்வருவனவற்றிற்கு சிறுகுறிப்பு வரைக

a. Bioremediation (5 marks)

நுண்ணுயிரேற்றம்

**Bioremediation:**

This is another rapidly developing clean up technology. Cleaning the environment with biological options such as microbes and plants is called bioremediation. Some naturally occurring bacteria and other microorganisms have the capability to degrade or absorb or detoxify the wastes such as heavy metals. Many plant materials are successfully used as adsorbents for xenobiotics (phytoremediation). Genetically Engineered Microorganisms (GEMS) are currently produced in large scale to remove the hazardous radionuclides and heavy metals such as mercury, chromium, cadmium etc. Certain plants such as *Gibberella fusarium* were able to breakdown cyanide and reduce it to a non-toxic form. The bacteria *Pseudomonas*, nicknamed as 'super - bug' are capable of degrading variety of toxic compounds and also degrade oil.

b. Eutrophication (5 marks)

மிகை உணவுட்டம்

**Eutrophication**

When run-off from land containing nutrients reaches water bodies like lakes, it results in dense growth of plant life. This phenomenon is called Eutrophication. Natural aging of lakes also leads to nutrient enrichment of its water. In a lake, the water is cold and clear (oligotrophic stage), supporting little life. With time, streams draining into the lake introduce nutrients such as nitrates and phosphates, which encourage the growth of aquatic organisms. Aquatic plants and animal life grow rapidly, and organic remains begin to be deposited on the lake bottom (mesotrophic stage).

Pollutants from anthropogenic activities like effluents from the industries and homes can radically accelerate the aging process. This phenomenon is known as Cultural or Accelerated Eutrophication.

Nutrients stimulate the growth of algae, water hyacinth and can cause clogging of canals, rivers and lakes as well as, displacing native plants. It causes unsightly foam and unpleasant odours, and deprives the water of dissolved oxygen.

**c. Biomagnification (5 marks)**

உயிரிய உருப்பெருக்கம்

**BIOMAGNIFICATION**

Biomagnification is the increase in contaminated substances due to the intoxicating environment. The contaminants might be heavy metals such as mercury, arsenic, and pesticides such as polychlorinated biphenyls and DDT (Dichloro Diphenyl Trichloro ethane). These substances are taken up by the organisms through the food they consume. When the organisms in the higher food chain feed on the organisms in the lower food chain containing these toxins, these toxins get accumulated in the higher organisms.

**Causes of Bio-magnification**

Following are the major causes of bio-magnification:

- The agricultural pesticides, insecticides, fertilizers and fungicides are very toxic and are released into the soil, rivers, lakes, and seas. These cause health issues in aquatic organisms and humans.
- Organic contaminants cause adverse impact on the health of humans, animals, and wildlife.
- Industrial activities release toxic substances which enter into the food chain leading to bio-magnification.
- Mining activities generate a large amount of sulphide and selenium deposits in water. These toxic substances are absorbed by the aquatic organisms in the food chain.

**Effects of Bio-magnification**

Following are the effects of bio-magnification on living organisms and the environment:

- It has more impact on humans causing cancer, kidney problems, liver failure, birth defects, respiratory disorders, and heart diseases.
- It also affects the reproduction and development of marine organisms
- The destruction of coral reefs affects the lives of many aquatic animals.
- The chemicals and toxins which are released into the water bodies disrupt the food chain.

**15. Discuss the Environmental Policy, Laws and Treaties of India**

இந்தியாவின் சுற்றுச்சூழல் கொள்கை, சட்டங்கள் மற்றும் உடன்படிக்கைகள் பற்றி விவாதி

**Policy**

National Environment Policy 2006

National Forest Policy 1988

**Laws**

Environmental Protection Act 1986

Wildlife Protection Act, 1972

Water Pollution Act, 1974

Air Pollution Act, 1981

Biological Diversity Act, 2002

NGT Act, 2010

**Treaties**

COP 21 - International Solar Alliance

Kyoto Protocol

Montreal Protocol

CBD

Basel, Rotterdam and Stockholm Convention

Ramsar Convention

**16.**

**a. Examine the National Disaster Management policy.**

தேசிய பேரிடர் மேலாண்மை கொள்கையை விவரித்து எழுதுக.

**National Policy on Disaster Management**

**Approach and Objectives**

**Vision**

To build a safe and disaster resilient India by developing a holistic, proactive, multi-disaster oriented and technology driven strategy through a culture of prevention, mitigation, preparedness and response.

**Disaster Management**

A disaster refers to a catastrophe, mishap, calamity or grave occurrence from natural or man-made causes, which is beyond the coping capacity of the affected community. DM involves a continuous and integrated process of planning, organising, coordinating and implementing measures which are necessary or expedient for:

- Prevention of danger or threat of any disaster.
- Mitigation or reduction of risk of any disaster or its severity or consequences.
- Capacity building including research and knowledge management.
- Preparedness to deal with any disaster.
- Prompt response to any threatening disaster situation or disaster.
- Assessing the severity or magnitude of effects of any disaster.
- Evacuation, rescue and relief.
- Rehabilitation and reconstruction.

A typical DM continuum comprises six elements; the pre-disaster phase includes prevention, mitigation and preparedness, while the post-disaster phase includes response, rehabilitation, reconstruction and recovery

A legal and institutional framework binds all these elements together (Diagram).

### DISASTER MANAGEMENT CONTINUUM



### Approach

A **holistic** and **integrated** approach will be evolved toward disaster management with emphasis on building strategic partnerships at various levels. The themes underpinning the policy are:

- Community based DM, including last mile integration of the policy, plans and execution.
- Capacity development in all spheres.
- Consolidation of past initiatives and best practices.
- Cooperation with agencies at national and international levels.
- Multi-sectoral synergy.

### Objectives

The objectives of the national policy on disaster management are:

- Promoting a culture of prevention, preparedness and resilience at all levels through knowledge, innovation and education.

- Encouraging mitigation measures based on technology, traditional wisdom and environmental sustainability.
  - Mainstreaming disaster management into the developmental planning process.
  - Establishing institutional and techno-legal frameworks to create an enabling regulatory environment and a compliance regime.
  - Ensuring efficient mechanism for identification, assessment and monitoring of disaster risks.
  - Developing contemporary forecasting and early warning systems backed by responsive and failsafe communication with information technology support.
  - Promoting a productive partnership with the media to create awareness and contributing towards capacity development.
  - Ensuring efficient response and relief with a caring approach towards the needs of the vulnerable sections of the society.
  - Undertaking reconstruction as an opportunity to build disaster resilient structures and habitat for ensuring safer living.
  - Promoting productive and proactive partnership with media in disaster management.
- b. **Highlight the salient features of National Disaster Management Act, 2005**  
தேசிய பேரிடர் மேலாண்மை சட்டம், 2005-இன் சிறப்பு அம்சங்களை வெளிக்கொணர்

### **Disaster Management Act 2005**

The national Disaster management acts of 2005 provides for a proactive, holistic and integrate approach towards disasters, It provides for institutional bodies at national, state and district levels as national disaster management Authority, and district disaster management authority headed by prime minister chief minister and distrait management magistrate respectively.

The act is consisting of 11 chapters and 79 sections.

The Act has defined the following terms:

#### **a. Terms used in Disaster Management Act (2005)**

**Disaster:** It is defined as a catastrophe, mishap calamity or grave occurrence in any area, arising from either natural or man-made causes, or by accident or negligence which results in substantial loss of human life: damage and destruction of property and degradation of environment.

**Disaster management:** It it's defined as a continuous and integrated process of planning, organizing, coordinating and implementing measures which are necessary or expedient to prevent danger or threat of any disaster.

#### **b. Objectives of the Act:**

It has the following objectives:

- i. To ensure the efficiency and effective management of natural and man-made disasters.
- ii. To reduce the risk or severity or consequences of any disaster.
- iii. To strengthen the communication process during disasters.
- iv. Speed up relief, rehabilitation and reconstruction process after disaster.

### **c. Decision Making Authorities**

A number of decision making bodies have been constituted for disaster management.

**National Disaster Management Authority:** The union cabinet and concerned ministry will decide and review the steps being taken during disaster. There will be a national executive committee which will prepare a national plan for disaster management.

The National Disaster Management Authority (NDMA) is to recommend guidelines for affected areas during disasters.

- i. **National plan:** The national plan shall include the integration of mitigation measures in the development plans. Second, the role and responsibilities of government department and ministries in implementing and capacity building to effectively respond to any threatening national disaster situation.
- ii. **National calamity contingency fund:** The objective of the fund is to meet the expenses for emergency response, relief and rehabilitation in accordance with the guidelines laid down by the central government in consultation with the National disaster management Authority.
  - a. **State Disaster Management Authority:** The state disaster management Authority by physical and financial resources in the case of disaster.
  - b. **District disaster management authority:** A District Disaster Management Authority is to be set up and district Magistrate as its chairman. The Authority will include seven members. The District Magistrate will follow the guidelines laid down by the National Disaster Management Authority and State Disaster management Authority. The district disaster Management Authority will act as the disaster management planning.

### **d. The role of Media:**

The National Disaster Management authority/State Disaster Management of District Disaster Management is empowered to recommend the governments to give direction to any authority/person in control of any audio or audio - visual media or such other means of communication to carry any disaster.

அலகு - III  
UNIT - III

பிரிவு - அ  
SECTION - A

குறிப்பு : i. ஒவ்வொரு வினாவிற்கும் 150 சொற்களுக்கு மிகாமல் விடையளிக்கவும்.

Answer not exceeding 150 words each.

ii. ஒவ்வொரு வினாவிற்கும் பத்து மதிப்பெண்கள்  
Each question carries ten marks.

iii. கொடுக்கப்பட்டுள்ள ஐந்து வினாக்களில் எவையேனும் நான்கு வினாக்களுக்கு மட்டும் விடையளிக்கவும்.

Answer any four questions out of five questions.

(4 × 10 = 40)

17. Explain the need of PPP in infrastructure development of India.

இந்தியாவில் உள்கட்டமைப்பு மேம்பாட்டில் PPP இன் தேவை பற்றி விளக்குக

The Public Private Partnership (PPP) Vertical is actively working towards deepening the reach of public-private partnerships as the preferred mode for implementation of infrastructure projects. It seeks to create timebound world-class infrastructure and attract private-sector and institutional capital in infrastructure.

**Appraisal of Central Government PPPs by Public Private Partnership Appraisal Unit (PPPAU)**

During 2020-21(1 April 2020 to 31 March 2021), 125 PPP projects, with a total cost of Rs 1,72,314 crore, were appraised by the Vertical. This includes 123 Central Government projects and two State projects. The sector-wise distribution of the PPP projects (including the projects under the VGF scheme) appraised is given in the table below:

S. No.	Project Appraised	No. of Projects	Total Cost (Rs. In Crores)
1	Roads	69	63,279
2	Ports	12	3,359
3	Eco Tourism	10	2,232
4	Silos	1	401
5	Petroleum Reserves	4	27,728
6	Ropeway	1	996
7	Telecom	9	29,199
8	Railway Stations	6	7,600

9	Railway Passenger Trains	12	30,099
10	Metro	1	7,420
	<b>Total</b>	<b>125</b>	<b>1,72,314</b>

## Major Projects

### 1. National Programme on Advance Chemistry Cell Battery Storage

NITI Aayog has formulated the contours of the National Programme on Advance Chemistry Cell Battery Storage. The programme pertains to the provision of suitable fiscal incentives and a single-window framework to facilitate investment into 50 GWh of the domestic advance cell manufacturing industry. India's accelerating progress in EVs and renewable energy deployment necessitates the facilitation of investments in such giga factories to indigenise battery production and partake in a sunrise industry. This will also enable less import dependence and secure the future of energy and transport sectors in India. The Union Cabinet recently approved the PLI scheme for 10 sectors. ACC battery was one of the sectors identified for inclusion in the PLI scheme for enhancing India's manufacturing capabilities and exports under the vision of 'Aatmanirbhar Bharat'.

### 2. Redevelopment of Railway Stations through Public-Private Partnership

NITI Aayog has been working closely with the Ministry of Railways in fast-tracking the railway stations' redevelopment programme across the country. As part of this endeavour, consultations have been undertaken with various stakeholders for evaluation and redressal of challenges. A self-sustainable PPP-based model for development of world-class stations has been finalised and approved. NITI Aayog helped the Ministry of Railways to finalise the concession terms and bidding documents for the same, based on which bidding processes for 10 stations were initiated in FY2020-21.

### 3. Passenger Train Operations by Private Sector through Public-Private Partnership

NITI Aayog, along with the Ministry of Railways, is spearheading landmark reforms in the passenger train operations' space through the PPP mode. Private participation in sourcing and operation of modern technology trains for better passenger experience is one such initiative. NITI Aayog supported Railway Ministry in the end-to-end process for the project, including conceptualisation, transaction structuring, finalisation of concession terms, preparation of bid documents, and stakeholder consultations. Pursuant to such efforts, the bidding process for 12 clusters on 109 origin destination pairs involving 150 trains has been initiated.

### 4. Eco-Tourism Facilities through Public-Private Partnerships



As part of NITI Aayog's initiative for holistic development of islands, the bidding process for the development of sustainable eco-tourism projects in seven islands of Andaman and Nicobar and Lakshadweep has been undertaken. Several other islands have also been identified for development under the second phase of the project. To effectively facilitate development of such eco-tourism facilities, a model concession agreement has been formulated that can be suitably adopted for such projects. During the last fiscal, the bidding process for eco-tourism facilities for four islands in Andaman and Nicobar was undertaken. The vertical provided the required support to the UT administration in engaging consultants through competitive bidding for holistic master planning of the islands and timely structuring of PPP transactions.

### **5. Redevelopment of Jawaharlal Nehru (JLN) Stadium on PPP Mode**

During 2020-21, NITI Aayog worked closely with the Ministry of Youth Affairs and Sports in finalizing the strategy for redevelopment of the JLN stadium in Delhi. The project is to be executed through PPP by leveraging the mixed-use/real-estate development potential available around the stadium. The key objectives of this project are to promote the holistic development of the stadium and develop the unutilised/underutilised spaces for complementary commercial activities to maximise revenue streams. NITI Aayog, along with the Ministry of Youth Affairs and Sports, undertook pre-feasibility analysis of the project to assess viability and initial feasibility through the PPP mode. NITI Aayog is assisting the Ministry of Youth Affairs and Sports in the preparation for the launch of the transaction.

### **6. Setting up Integrated Schools for Sports and Academics at Sports Authority of India (SAI) Centres through Public-Private Partnerships**

During 2020-21, NITI Aayog supported the Ministry of Youth Affairs and Sports to develop a PPP framework for establishing and operating integrated schools for sports and academics for students from classes 6-12 at select centres of the Sports Authority of India. SAI operates several schemes for identification and development of young talent. Under the existing schemes and arrangements, students who undergo rigorous coaching in sports find it challenging to balance academics and sports in the traditional education system. The existing educational curriculum and systems do not provide enough flexibility to balance sports and academics. Hence, there is a need to integrate sports and education to encourage and nurture students who can achieve academic goals while also getting trained and pursuing excellence in sports. Such integrated schools will create a vibrant student community by offering an academic system built around sports, with the objective of all-round development of students. A concept note has been developed by NITI Aayog detailing the PPP framework, which is under consideration of the Ministry.

### **7. Development of Serviced Hostels at SAI Centres under Public-Private Partnership Mode**

During 2020-21, NITI Aayog worked with the Ministry of Youth Affairs and Sports in developing a PPP framework for setting up serviced hostels with three-star facilities for Sports Authority of India. SAI operates several schemes to support and nurture sporting talent and provides athletes with the requisite infrastructure, coaching and competition exposure. As part of these efforts, SAI is in perennial need for boarding and lodging

services. With a view to provide best-in-class boarding and lodging facilities, SAI wants to undertake the development of fully serviced, purpose-built hostel complexes within the campuses of its training centres through PPPs. A concept note has been developed by NITI Aayog detailing the PPP framework, which is under consideration of the Ministry.

## **8. Ropeway-Based Public Transportation System on PPP Mode**

NITI Aayog commissioned pre-feasibility studies for the development of ropeway-based public transport systems in Gangtok and Aizawl through the PPP mode during 2020–21. Scarcity of land in urban centres of hilly areas, along with steep road gradients limiting road expansion, is a major constraint in the development of public transport infrastructure. This creates pressure on the public transport system, with most commuters relying on taxis or private vehicles to commute. A need for a planned public transport system was felt for cities such as Gangtok and Aizawl. Citing this need, NITI Aayog undertook pre-feasibility studies to assess the viability and initial feasibility through the PPP mode. NITI Aayog also prepared a model concession agreement for the development of ropeway projects through the PPP mode. Pursuant to these efforts, the Gangtok project was structured on PPP mode.

## **9. Scheme for Inviting Private Investment in Medical Education**

To address the shortage of qualified medical professionals, general practitioners as well as specialists, a scheme for attaching an existing district hospital and developing a medical college through the PPP mode has been developed by the vertical. The unique PPP framework allows for synergy between the private and public healthcare sectors, capitalizing on their respective strengths. The public sector has functional hospitals with rich clinical material, but lacks adequate resources, infrastructure and faculty base required for a medical college. The private sector on the other hand has investible capital, resources, required infrastructure and faculty, but lacks functional hospitals with the requisite clinical material (required as per the extant regulations). Accordingly, a PPP framework has been formulated that combines a Government District hospital with an affiliated academic institution developed by the private partner. Under the proposed model, the District hospital also gets augmented into a teaching medical college as per the Government of India's stipulated medical education regulatory norms with private sector investment. The combined project is to be operated and maintained by the private partner, as per the applicable norms, governed by a detailed concession agreement. The Vertical has developed the model concession agreement and model RFP for medical education during the last fiscal, a copy of which can be accessed from the NITI Aayog website.

## **10. Enhancement in Viability Gap Funding for Social Sector**

Social infrastructure projects face viability concerns. Therefore, to boost private investments in social sector infrastructure such as schools and hospitals, enhancement in VGF allocation for social sector projects was approved by the Ministry of Finance in the last fiscal. The PPP vertical worked in close coordination with DEA, Ministry of Finance, in revising the guidelines as part of this strategic revamp of the VGF scheme. Under the scheme, the PPP projects will be proposed by Central Ministries, State Governments, and statutory entities, and VGF of up to 30%, revised from the earlier limit of 20%, will be provided under the scheme for social sector infrastructure projects. This path-breaking reform will benefit PPP projects and provide a boost to private sector investment in social sector infrastructure

creation. The revised guidelines for the scheme have been issued by DEA to the various Ministries and States in the last fiscal.

### **11. Structuring of BharatNet on PPP Mode**

During 2020–21, NITI Aayog, along with Department of Telecommunications (DoT) finalised the strategy for implementing the BharatNet project through PPP mode. Phase I of the project has already been implemented, while Phase II, which is currently under various stages of implementation, is proposed to be completed through PPP. This will enable leveraging of infrastructure already created by the Government, while capturing the private sector efficiencies, quality and investment for incremental development and impact. NITI Aayog, along with DoT, undertook detailed analysis of various aspects of the project to arrive at an optimal and commercially viable PPP structure. The structure was then deliberated upon and finalised based on inputs of various committees, investor interactions and stakeholder consultations. Bid documents have been prepared and finalised with support from NITI Aayog. The project, which is proposed to be awarded through a single-stage competitive bidding process, has been submitted for PPPAC approval.

### **12. Public-Private Partnership in Space Sector**

Opening up of the space sector to substantial private sector participation was recently approved by the Union Cabinet. During 2020–21, NITI Aayog engaged with the Department of Space for exploring PPP models for an accelerated roll-out of new space infrastructure and technologies. Various self-sustainable structures for building and maintenance of satcom assets through private sector participation were conceptualised by NITI Aayog. These have been shared with the Department of Space for further deliberations/inputs. Recommendations for institutionalizing appropriate PPP policies, extensive participation of entities like New Space India in such models and suitable handholding of the Department for undertaking these projects have been ensured. Leveraging the private sector's reach, funding and capabilities reduces Government support for expansion of the space sector while ensuring innovations, global arrangements, flexibility, and efficiency.

### **13. Development of Strategic Petroleum Reserve Facilities (Phase II) on Public Private Partnership Mode**

During 2020–21, NITI Aayog supported the Indian Strategic Petroleum Reserves Limited (ISPRL) for implementing phase II of the strategic petroleum reserve through PPP. ISPRL is developing the strategic petroleum reserve of 6.5 million metric tonne at Chandikhol in Odisha and Padur in Karnataka. The project will augment India's energy security and serve as a cushion during any supply disruption. Phase I of the facilities have already been implemented, while phase II is now proposed to be taken up through PPP. NITI Aayog has actively worked with ISPRL and MoPNG for structuring and launching the project on PPP mode for bidding.

### **14. Asset Monetisation Programme**

Investment-led growth is central to the economic agenda of the Government. One of the prerequisites of such growth is capital and asset recycling. In this context, asset recycling

and monetisation holds the key to value creation in infrastructure – by unlocking value from public investment and tapping into private-sector efficiencies in delivering infrastructure.

NITI Aayog is steering the recycling and monetisation of various core infrastructure assets. Continuing the progress achieved during FY20, during the last fiscal, further ground was covered in creating an asset pipeline and rolling out infrastructure assets through structured transactions. Notable achievements during the period are as under:

In the first phase, six AAI airports were successfully awarded at no financial implication to the Government Exchequer, leading to enhanced revenues to AAI.

Toll-Operate-Transfer-based concessions were successfully bid out, with an encouraging response from the market. Two bundles have been awarded successfully. The structure has been appreciated by the market and has seen active interest and participation from infra-funds, along with developers.

InvITs have emerged as preferred investment structures for long-term institutional investors. Monetisation of public toll roads as well as transmission towers is in advanced stages of planning through InvIT-based structures.

Railways launched the strategic foray into PPP for private participation in running of passenger trains. The first batch of clusters envisages private train operations on 109 pairs of routes structured as 12 clusters with a targeted private investment of Rs 30,000 crore.

The station redevelopment programme of the Railways has seen significant scale and progress with the launch of RfQ for 10 stations. Extensive stakeholder consultations have been taken up to bring clarity in the project structure and formulation of the model bid documents.

So far, a pipeline of core assets, comprising over 100 falling in 31 broad asset classes, mapped to 10 Ministries/CPSEs and tentatively valued at Rs 5 lakh crore, has been developed. NITI Aayog has sought information from the ministries to create a four-year monetisation pipeline. Some of the potential asset classes that have been identified are toll road bundles, ports, cruise terminals, telecom infrastructure, oil and gas pipelines, transmission towers, railway stations, sports stadium, warehouses, and commercial complexes. Consultations with the respective ministries on possible investment structures are being undertaken.

## **15. Review of National Infrastructure Pipeline (NIP) Projects**

The Government had launched the National Infrastructure Pipeline, envisaging Rs 111 lakh crore investment in infrastructure between 2020–25. In this regard, the Hon'ble Finance Minister approved the constitution of a taskforce, of which NITI Aayog is a member. The taskforce interacted with various stakeholders, including Central line ministries, departments, agencies, CPSEs and State-level organisations to understand and collate information regarding the future investment pipeline in infrastructure. NITI Aayog steered the interaction with State Governments and made recommendations for various structural reforms required to facilitate investment into infrastructure. During 2020–21, the final report of the taskforce was launched. As part of the final report, the taskforce on NIP

recommended many reforms in the areas of general contract and project management. As part of the committee of secretaries, NITI Aayog actively oversees the progress of projects enlisted in NIP and provides policy-level guidance on issues from time to time.

**18. Who releases the financial stability report? Bring out the important features of 22<sup>nd</sup> Financial stability Report**

நிதிநிலைத்தன்மை அறிக்கையை வெளியிடுவது யார்? 22வது நிதி நிலைத்தன்மை அறிக்கையின் முக்கிய அம்சங்களை வெளிக்கொணர்

### FINANCIAL STABILITY

The Reserve Bank released the 22nd issue of the Financial Stability Report (FSR), which reflects the collective assessment of the Sub-Committee of the Financial Stability and Development Council (FSDC) on risks to financial stability, and the resilience of the financial system in the context of contemporaneous issues relating to development and regulation of the financial sector. The release of FSR was rescheduled to incorporate the first advance estimates of national income for 2020-21 that were released by the National Statistical Office on January 7, 2021.

#### Highlights:

- ❖ In the initial phase of the COVID-19 pandemic, policy actions were geared towards restoring normal functioning and mitigating stress; the focus is now being oriented towards supporting the recovery and preserving the solvency of businesses and households.
- ❖ Positive news on vaccine development has underpinned optimism on the outlook, though it is marred by second wave of the virus including more virulent strains.
- ❖ Policy measures by the regulators and the government have ensured the smooth functioning of domestic markets and financial institutions; managing market volatility amidst rising spill overs has become challenging especially when the movements in certain segments of the financial markets are not in sync with developments in the real sector.
- ❖ Bank credit growth has remained subdued, with the moderation being broad-based across bank groups.
- ❖ Performance parameters of banks have improved significantly, aided by regulatory dispensations extended in response to the COVID-19 pandemic.
- ❖ The capital to risk-weighted assets ratio (CRAR) of Scheduled Commercial Banks (SCBs) improved to 15.8 per cent in September 2020 from 14.7 per cent in March 2020, while their gross non-performing asset (GNPA) ratio declined to 7.5 per cent from 8.4 per cent, and the provision coverage ratio (PCR) improved to 72.4 per cent from 66.2 per cent over this period.
- ❖ Macro stress tests incorporating the first advance estimates of gross domestic product (GDP) for 2020-21 released on January 7, 2021 indicate that the GNPA ratio of all SCBs may increase from 7.5 per cent in September 2020 to 13.5 per cent by September 2021 under the baseline scenario; the ratio may escalate to 14.8 per cent under a severe stress scenario. This highlights the need for proactive building up of adequate capital to withstand possible asset quality deterioration.
- ❖ Network analysis reveals that total bilateral exposures among entities in the financial system increased marginally during the quarter-ended September 2020. With the inter-bank

market continuing to shrink and with better capitalisation of banks, the contagion risk to the banking system under various scenarios declined as compared to March 2020.

**19. What is GST? Discuss the significance and advantages of GST**

சரக்கு மற்றும் சேவை வரி என்றால் என்ன? சரக்கு மற்றும் சேவை வரியின் முக்கியத்துவம் மற்றும் நன்மைகள் பற்றி விவாதி

**Goods and Services Tax (GST)**

**Introduction:**

GST is a consumption-based tax levied on sale, manufacture and consumption of goods & services at a national level. State GST (SGST) is one, which is levied by State. Integrated GST (IGST) is levied by provide revenue for the government. The GST is paid by consumers, but it is levied and remitted to the government by businesses selling the goods and services.

**Meaning & Definition of GST:**

Goods & services Tax in India can be defined as “A comprehensive multi-stage, destination-based tax that will be levied on every value addition”. To understand this, we need to understand the concepts under this definition. Let us start with the term “Multi-stage”. Now, there are multiple steps an item goes through from manufacture or production to the final sale. Buying of raw materials is the first stage. The second stage is production or manufacture. Then, there is the warehousing of materials. The next stage is sales of the product to the retailer and in the final stage, the retailer sells to the end consumer the product completing its life cycle.

**Importance of Goods and Services tax**

Currently, the Indian tax structure is divided into two namely, Direct Taxes and Indirect Taxes. Direct Taxes are levies where the liability cannot be passed on to someone else. An example is Income Tax where you earn me income and you alone are liable to pay the tax on it. In the case of Indirect Taxes, the liability of the tax can be passed on to someone else. This means that when the shopkeeper must pay VAT on his sale, he can pass on the liability to the customer. So, in effect, the customer pays the price of the item as well as the VAT on it so the shopkeeper can deposit the VAT to the government. This means that the customer must pay not just the price of the proc. -but he also pays the tax liability, and therefore, he has a higher outlay when he buys an item.

This happens because the shopkeeper has paid a tax when he bought the item from the wholesaler. To recover that amount, as well as to make up for the VAT he must pay to the government, he passes the liability to the customer who has to pay the additional amount. Earlier there was no other way for the shopkeeper to recover whatever he pays from his own pocket during transaction and therefore, he had no choice but to pass on the liability to the customer. Goods and Services Tax addresses this issue. It has a system of Input Tax Credit, which is allowing sellers to claim the tax already paid, so that the final liability on the end consumer is decrease.

## Operating Mechanism of GST

A nationwide tax reform cannot function without strict guidelines and provisions. The GST Council has devised a fool proof method of implementing this new tax regime by dividing it into three categories, which are as below:

1. **CGST:** Where the revenue is collected by the central government.
2. **SGST:** Where the revenue is collected by the state governments for intra-state sales.
3. **IGST:** Where the revenue is collected by the central government for inter-state sales

## GST Law in India

France was the world's first country to implement GST Law in the year 1954. Since then, 159 other countries have adopted the GST Law in some form or other. In many countries, VAT is the substitute for GST, but unlike the Indian VAT system, these countries have a single VAT tax, which fulfills the same purpose as GST. In India, the discussion on GST Law was flagged off in the year 2000, when the then Prime Minister Shri. Atal Bihari Vajpayee brought the issue to the table.

## History of GST in India

The idea behind having one consolidated indirect tax to subsume multiple currently existing indirect taxes is to benefit the Indian economy in a number of ways:

1. It will help the country's businesses gain a level playing field.
2. It will put us on par with foreign nations who have a more structured tax system.
3. It will also translate into gains for the end consumer who need not have to pay cascading taxes any more.
4. There will now be a single tax on goods and services.

In addition to the above, The Goods and Services Tax Law aims at streamlining the indirect taxation regime. As mentioned above, GST will subsume all indirect taxes levied on goods and service, including State and Central level taxes. The GST mechanism is advancement on the VAT system, the idea being that a unified GST Law will create a seamless nationwide market. It is also expected that Goods and Services Tax will improve the collection of taxes as well as boost the development of Indian economy by removing the indirect tax barriers between states and integrating the country through a uniform tax rate.

## Advantages of Goods and Services Tax

The Goods & Service Tax is one of the biggest fiscal reforms in India since Independence. All businesses, small or large, will be impacted by this new indirect tax regime. GST will be levied on both goods and services and will subsume and replace the current indirect taxes such as excise, VAT, and service tax. Some of the benefits of GST to the Indian economy are listed below

- a. Removing cascading tax effect.
- b. Higher threshold for registration.
- c. Composition scheme for small business.

- d. Online simpler procedure under GST.
- e. Lesser compliances.
- f. Defined treatment for e-commerce.
- g. Increased efficiency in logistics.
- h. Regulating the unorganized sector.
- i. Simplicity at its best.
- j. Boosting of revenue.
- k. Boosting investment

1. **Removing Cascading Tax Effect:** An important benefit of the introduction of GST is the removal of the cascading tax effect. In simple words, "Cascading Tax Effect" means a tax on tax. Under the previous tax system, the service tax paid on input services cannot be set off against output VAT. Under GST, the input tax credit can be availed smoothly across the spectrum of goods and services, thus reducing the tax burden on the end user and removing cascading effect. Let's take the following example to understand how removing the cascading effect will reduce taxes.

**Under Previous Tax System:** A trader buys office supplies for ₹ 20,000 paying 5% as tax. It charges 15% service tax on services of ₹ 50,000. Currently, he has to pay ₹ 50,000 × 15% = ₹ 7,500 without getting any deduction of ₹ 1,000 VAT already paid on stationery.

**Under GST (assuming GST= 18%)**

	₹
GST on Services of ₹ 50,000@ 18%	9,000
Less: GST on Office Supplies ₹ (20,000 × 18%)	3,600
Net GST to Pay	5,400

Hence, under GST the tax burden is reduced by an amount of ₹2,100 (i.e. 7,500 - 5,400). This will be especially beneficial to industries that involve both goods and services (like restaurant business) and pay both VAT & Service Tax under the current regime.

2. **Higher Threshold for Registration:** As per the current VAT structure, any business with a turnover of more than 5 lakh (in most states) is liable to pay VAT (different rates in different states). Similarly, for service tax, service providers with turnover of less than ₹ 10 lakh are exempted. Under GST this threshold has been increased to ₹20 lakh thus exempting many small traders and service providers.
3. **Composition Scheme for Small Businesses:** GST also has an optional scheme of lower taxes for small businesses with turnover between ₹ 20 to 50 lakh. It is called the composition scheme. It has now been proposed to be increased to ₹75 lakh. This will bring respite from tax burdens to many small businesses.
4. **Simpler Online Procedure under GST:** The entire GST process - starting from registration to filing returns and payment of GST tax - is online. Startups do not have to run around to tax offices to get various registrations under excise, VAT, service tax, etc.



5. **Lesser Number of Compliances:** Also, the previous tax regime has excise, VAT, and service tax, each of which have their own returns and compliances. GST will unify all these, thereby reducing the number of returns and the time spent for tax compliances. There are about 11 returns under GST, out of which 4 are basic returns, which apply to all taxable persons under GST. There are fears that the number of returns will increase after GST. But the main GSTR-1 will be manually populated. But GSTR-2, GSTR-3, GSTR-4 will be auto-populated.

6. **Defined Treatment for E-commerce:** Many Indian businesses provide goods and services through the Internet. Earlier, there were no specific provisions for treatment of the e-commerce sector. Currently, states have variable VAT laws for this sector. For example, online websites (like Flipkart and Amazon) delivering to Uttar Pradesh have to file a VAT declaration and the registration number of the delivery truck. Tax authorities can sometimes seize goods when there is a failure to produce documents.

Again, these e-com brands are treated as facilitators or mediators by states like Kerala, Rajasthan, and West Bengal, which do not require them to register for VAT. All these differential treatments and confusing compliances will be removed under GST. For the first time, GST clearly maps out the provisions applicable to the e-commerce sector and since these will apply all over India, there should be no complication regarding inter-state movement of goods anymore.

7. **Increased Efficiency in Logistics:** The logistics industry in India had to maintain multiple warehouses across states to avoid the CST and state entry taxes on inter-state movement. Most of the times, these warehouses were forced to operate below their capacity thus increasing their operating costs. Under GST, these restrictions on inter-state movement of goods will be lessened and the logistics sector might start consolidating warehouses across the country. As an outcome of GST, warehouse operators and e-commerce players have already shown interest in setting up their warehouses at strategic locations such as Nagpur, which is the zero-mile city of India, instead of every other city on their delivery route. Reduction in unnecessary logistics costs will increase profits for businesses involved in supply of goods through transportation.

8. **Regulating the Unorganized Sector:** Certain industries in India like construction and textile are largely unregulated and unorganized. GST has provisions for online compliances and payments, and availing of input credit only when the supplier has accepted the amount, thereby bringing accountability and regulation to these industries.

9. **Simplicity at its Best:** Goods and Service Tax replaced the existing form of indirect tax in the nation. It will prove a substitute for the 17 indirect laws pertaining to the nation and will subsidize it with the new GST Tax. That shall come across as a simpler term to envision.

10. **Boosting of Revenue:** With the new GST in the nation, there won't be more of an evasion as what is happening with the previous tax laws. Such simpler term of

taxation will make more suppliers in a mood to pay the tax amount, which in turn marks the boost in revenue levels.

11. **Boosting Investment:** As per the previous tax laws in India, no input credit on capital goods was allowed. But with the new GST Tax laws, one can avail input tax credit on the capital goods. That way, the investment might surge up quite a bit with an expected 6% increase.

## Conclusion

There is no doubt that GST is aimed at increasing the taxpayer base by bringing SMEs and the unorganized sector under its purview. This will make the Indian market more competitive than before and create a level playing field between large & small enterprises. Further, Indian businesses will be able to better compete with foreign countries such as China, Philippines, and Bangladesh.

## 20. Write a short note on the following

பின்வருவனவற்றிற்கு சிறுகுறிப்பு வரைக

- a. EXIM Policy 2015-20 (5 marks)

ஏற்றுமதி இறக்குமதி கொள்கை 2015-20

### Export and Import Policy

The Government of India, Ministry of Commerce and Industry announced New Foreign Trade Policy on 01st April 2015 for the period of 2015-2020.

### Salient Features of "EXIM POLICY (2015-2020)"

The new EXIM policy has been formulated focusing on increasing in exports scenario, boosting production and supporting the concepts like Make in India and Digital India.

- Reduce export obligations by 25% and give boost to domestic manufacturing supporting the "Make in India" concept.
- As a step to Digital India concept, online procedure to upload digitally signed document by CA/CS/Cost Accountant are developed and further mobile app for filing tax, stamp duty has been developed.
- Repeated submission of physical copies of documents available on Exporter Importer Profile is not required.
- Export obligation period for export items related to defence, military store, aerospace and nuclear energy to be 24 months.
- EXIM Policy 2015-2020 is expected to double the share of India in World Trade from present level of 3% by the year 2020. This appears to be too ambitious.

- b. Differentiate between Demonetization and Devaluation

பணமதிப்பு இழத்தல் மற்றும் பண மதிப்பைக் குறைத்தல் - வேறுபடுத்துக

### Meaning of Demonetization

Demonetization is the withdrawal of a particular form of currency from circulation. It is a process by which a series of currency will not be legal tender. The series of currency, which will not be legal tender, will not be accepted as valid currency. In other words, it is the act of stripping a currency unit of its status as legal tender. Demonetization is necessary whenever there is a change of national currency. The old unit of currency must be retired and replaced with a new currency.

### **Devaluation**

Devaluation means deliberate reduction of the official rate at which domestic currency is exchanged for another currency. In other words, devaluation refers to a reduction in the external value of a currency in the terms of other currencies. For instance, instead of 70 ₹ per US\$, making ₹ 80 per US\$. A country with fundamental disequilibrium in the balance of payments may devalue its currency in order to stimulate its exports and discourage imports to correct the disequilibrium. Devaluation makes exports cheaper and imports dearer. That means making Indian goods cheaper for foreigners and foreign goods costlier for Indians.

### **21. Discuss the salient features of Indian Economy**

இந்திய பொருளாதாரத்தின் சிறப்பு அம்சங்கள் பற்றி விவாதி

### **Features of Indian Economy**

#### **1. India has a mixed economy**

Indian economy is a typical example of mixed economy. This means both private and public sectors co-exist and function smoothly. On one side, some of the fundamental and heavy industrial units are being operated under the public sector, while, due to the liberalization of the economy, the private sector has gained importance. This makes it a perfect model for public – private partnership.

#### **2. Agriculture plays the key role**

Agriculture being the maximum pursued occupation in India; it plays an important role in its economy as well. Around 60% of the people in India depend upon agriculture for their livelihood. In fact, about 17% of our GDP today is contributed by the agricultural sector. Green revolution, ever green revolution and inventions in bio technology have made agriculture self-sufficient and also surplus production. The export of agricultural products such as fruits, vegetables, spices, vegetable oils, tobacco, animal skin, etc. also add to forex earning through international trading.

#### **3. An emerging market**

India has emerged as vibrant economy sustaining stable GDP growth rate even in the midst of global downtrend. This has attracted significant foreign capital

through FDI and FII. India has a high potential for prospective growth. This also makes it an emerging market for the world.

#### 4. Emerging Economy

WORLD NATIONS IN G _ 20			
1. Argentina	6. European Union	11. Italy	16. South Africa
2. Australia	7. France	12. Japan	17. South Korea
3. Brazil	8. Germany	13. Mexico	18. Turkey
4. Canada	9. India	14. Russia	19. United Kingdom
5. China	10. Indonesia	15. Saudi Arabia	20. United States

Emerging as a top economic giant among the world economy, India bags the seventh position in terms of nominal Gross Domestic Product (GDP) and third in terms of Purchasing Power Parity (PPP). As a result of rapid economic growth Indian economy has a place among the G20 countries.

#### 5. Fast Growing Economy

India's economy is well known for high and sustained growth. It has emerged as the world's fastest growing economy in the year 2016-17 with the growth rate of 7.1% in GDP next to People's Republic of China.

#### 6. Fast growing Service Sector

The service sector, contributes a lion's share of the GDP in India. There has been a high rise growth in the technical sectors like Information Technology, BPO etc. These sectors have contributed to the growth of the economy. These emerging service sectors have helped the country go global and helped in spreading its branches around the world.

#### 7. Large Domestic consumption

With the faster growth rate in the economy the standard of living has improved a lot. This in turn has resulted in rapid increase in domestic consumption in the country. The standard of living has considerably improved and life style has changed.

#### 8. Rapid growth of Urban areas

Urbanization is a key ingredient of the growth of any economy. There has been a rapid growth of urban areas in India after independence. Improved connectivity in transport and communication, education and health have speeded up the pace of urbanization.

#### 9. Stable macro economy

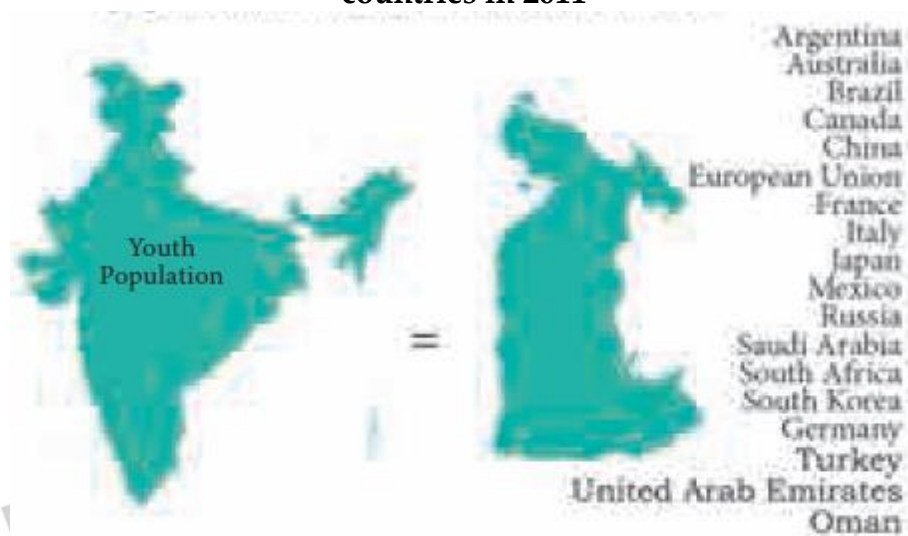
The Indian economy has been projected and considered as one of the most stable economies of the world. The current year's Economic survey represents the

Indian economy to be a “heaven of macroeconomic stability, resilience and optimism. According to the Economic Survey for the year 2014-15, 8%-plus GDP growth rate has been predicted, with actual growth turning out to be a little less (7.6%). This is a clear indication of a stable macroeconomic growth.

## 10. Demographic dividend

**232 million**

**Youth Populatin of India is nearly equal the total Populatin of 18 western asian countries in 2011**



The human capital of India is young. This means that India is a pride owner of the maximum percentage of youth. The young population is not only motivated but skilled and trained enough to maximize the growth. Thus human capital plays a key role in maximizing the growth prospects in the country. Also, this has invited foreign investments to the country and outsourcing opportunities too.

அலகு - III  
UNIT - III  
பிரிவு - B  
SECTION - B

குறிப்பு : i. ஒவ்வொரு வினாவிற்கும் 250 சொற்களுக்கு மிகாமல் விடையளிக்கவும்.

Answer not exceeding 250 words each.

ii. ஒவ்வொரு வினாவிற்கும் பதினைந்து மதிப்பெண்கள்  
Each question carries fifteen marks.

iii. கொடுக்கப்பட்டுள்ள ஐந்து வினாக்களில் எவையேனும் நான்கு வினாக்களுக்கு மட்டும் விடையளிக்கவும்.

Answer any four questions out of five questions.

(4 × 15 = 60)

22. Critically analyse the social infrastructure of Tamilnadu and discuss how the Dravidian model accelerated economic growth and structural transformation in Tamilnadu  
தமிழ்நாட்டின் சமூக உள்கட்டமைப்பு பற்றி ஆராய்க மேலும் தமிழகத்தின் பொருளாதார வளர்ச்சக்கும் அடிப்படை கட்டுமான மாற்றத்திற்கும் ஊக்கசக்தியாக அமைந்தது திராவிட மாதிரியே - விவாதி

**Health**

**Institution for**

- Primary Health care
- Secondary Health care
- Tertiary Health Care

Tamilnadu Health System Project

Tamilnadu Health System Reform Program

Emergency Services - 102, 104, 108

Schemes for Pregnant Women and lactating mothers - Muthulakshmi Maternity Benefit Scheme

Role of Medical Service Corporation

**Education**

Six levels of Education - Infrastructure

1923 - Mid day meal scheme - 1956

1982 - MGR Nutritious Meal Program

Higher Education - GER - First in India

Infrastructure for higher education

Scholarship for First graduate, women in higher education

Reservation policy of Tamilnadu Government

**23. Land reforms are a major instruments of social transformation but had limited success in India. critically examine**

நிலசீர்த்திருத்தங்கள் சமூக மாற்றத்தின் ஒரு முக்கிய கருவியாகும், ஆனால் இந்தியாவில் அது குறைவான வெற்றியையே பெற்றது என்பதனை பகுத்தாய்க.

**Objectives**

The land reform measures contemplated to achieve these objectives were as follows:

- ✓ Abolition of intermediaries
- ✓ Tenancy legislation
- ✓ Ceiling on land holdings; and
- ✓ Co-operative farming.

The basic objective of land reforms in India has been the creation of a system of peasant proprietorship. "**Land to the Tiller**" has been the motto.

**The main objectives of the land reforms are as below:**

- To make redistribution of land to make a socialistic pattern of society. Such an effort will reduce the inequalities in ownership of land.
- To ensure land ceiling and take away the surplus land to be distributed among the small and marginal farmers.
- To legitimize tenancy with the ceiling limit.
- To register all the tenancy with the village panchayats.
- To establish relation between tenancy and ceiling.

The land reform legislation was passed by all the State Governments during the fifties touching upon these measures.

**Reasons for Low Progress of Land Reforms:**

The task force on agrarian relations set up by the Planning Commission to appraise the progress and problems of land reforms, identified the following reasons for the poor performance of land reform measures:

- 1) Lack of Political Will: In the context of the socio-economic conditions prevailing in the country, no tangible progress can be expected in the field of land reforms in the absence of requisite political will.
- 2) Absence of Pressure from Below: Except in a few scattered and localized pockets, practically all over the country, the poor peasants and agricultural workers are passive, unorganized and inarticulate.

- 3) **Negative Attitude of the Bureaucracy:** Towards the implementation of land reforms, attitude of bureaucracy has been generally lukewarm and indifferent.
- 4) **Legal Hurdles:** Legal hurdles also stand in the way of land reforms. The task force categorically states:
- 5) **Absence of Correct and up-to-date Land Records:** The absence of correct and complete land records further added a good deal of confusion. It is because of this that no amount of legislative measures could help the tenant in the court unless he could prove that he is the actual tenant. This he could only do if there were reliable and up-to-date records of tenants.
- 6) **Lack of Financial Support:** Lack of financial support plagued the Land Reform Act from the beginning. No separate allocation of funds was made in the fifth plan for financing land reforms.

24. **Discuss the major poverty alleviation and employment generation programmes in India**  
இந்தியாவின் முக்கிய வறுமை ஒழிப்பு மற்றும் வேலைவாய்ப்பு உருவாக்கத் திட்டங்கள் பற்றி விவாதி

#### POVERTY ALLEVIATION AND EMPLOYMENT GENERATION PROGRAMMES

Employment programmes are mainly of two kinds; the first one seeks to **promote self-employment**, by providing the poor with productive assets, financed by subsidy and credit. The second one seeks to provide **wage-employment**, and in the process create community assets. Of these two types of programmes, the later seems to be more popular and the impact is very encouraging on the other hand, self-employment schemes do not score better, as the poor do not know much about these programmes.

#### **Integrated Rural Development Programme (IRDP) (October 1980):**

The concept of an **Integrated Rural Development Programme** was first proposed in the central budget for 1976-77, and a beginning was made in this regard. This programme was intended to assist rural population to derive economic benefits from the development of assets of each area.

The programme with some modifications was introduced on an expanded scale in **1978-79**, beginning with 2,300 blocks, of which 2000 were under common coverage with SFDA, DPAP and CADP, with another 300 blocks added up during 1979-80. **Its coverage was extended to all the blocks of the country since October 2, 1980.**

Besides the smaller and marginal farmers, this programme was more specific in regard to agricultural workers and landless labourers, and additionally brought within its purview rural artisans also. The programme emphasized the family rather than the individual approach in the identification of the beneficiaries.



### **Training of Rural Youth for Self Employment (August 1979):**

It is a centrally sponsored programme, supporting component of the IRDP. It aims at providing technical and entrepreneurial skills to rural unemployed youths in the age group of **18 - 35 years** from families below the poverty line to enable them to take up **income generating schemes**. It has been merged with SJGSY since April 1999.

### **National Rural Employment Programme (NREP)**

The Food for work programme was restructured and renamed as National Rural Employment Programme from October, 1980. It is a centrally sponsored scheme on 50:50 sharing basis with the State with the three fold objectives of:

- a. generating additional gainful employment opportunities;
- b. creation of durable community assets; and
- c. raising the nutritional standards of the rural poor

### **The Rural Landless Employment Guarantee Programme (RLEGP)**

It was launched on 15<sup>th</sup> August, 1983. It has two basic objectives:

- a. to improve the employment opportunities for rural landless with a view to providing guarantee of employment to at least one member of landless labour household up to 100 days in a year;
- b. to create durable assets for strengthening rural infrastructure which will lead to higher growth of rural economy. Preference in employment is given to landless labourers, women, Scheduled Castes and Scheduled Tribes. The programme is funded by the Central Government on 100 per cent basis.

### **Jawahar Rozgar Yojana (April 1989):**

This centrally sponsored scheme was started by merging the National and Rural Employment Programme (NREP) and Rural Landless Employment Guarantee Programme (RLEGP). The main objective of the programme is the generation of additional gainful employment for unemployment and underemployed persons, both men and women, in rural areas through the creation of rural economic infrastructure, community and social assets with the aim of improving the quality of life of the rural poor.

This seeks guarantee employment to at least one person in rural family living below poverty line. This scheme is being implemented through the village panchayats. The special feature of this scheme is that 30 per cent of the employment generated will be reserved for women.

### **Nehru Rozgar Yojana**

While, Jawahar Rozgar Yojana is scheme of employment generation in rural areas, Nehru Rozgar Yojana is the scheme for the urban areas. This is operating since October

1989. This scheme aims at creating **one million jobs** annually, by affording opportunities for self-employment and also wage-employment. This scheme is intended for urban poor living below poverty line.

### **Indira Awas Yojana (IAY)**

This scheme was implemented since 1985-86 under Rural Landless Employment Guarantee programme (RLEGP) to provide **houses free of cost** to the members of SC/ST and freed bonded labours. From 1989-90, the scheme has been continued under JRY. From 1993-94, the scheme has been extended to the poor categories, besides SC/ST, as well. From 1985-86 to 1994-95, total expenditure under Indira Awas Yojana component stood at Rs. 2,197.5 crores resulting in the construction of 1843190 houses expenditure per house worked to Rs. 11922.

### **Employment Assurance Scheme (EAS) (October 1993):**

It was started on **October 2, 1993** in 1778 backward blocks in drought prone, desert, tribal and hill areas. It was expanded to cover all the 5,488 rural blocks of the country. It gave wage employment to the rural poor. **In September 2001, it was merged into new Sampoorna Gramin Rozgar Yojana along with Jawahar Gram Samridhi Yojana.**

Initially it has been launched in selected blocks of drought prone, desert and hill areas, and later, extended to all rural blocks with effect from April 1997. The main objective of EAS is to provide about **100 days of assured** casual manual employment during the lean agricultural season, at statutory minimum wages, to all persons above the age of 18 years and below 60 years who need and seek employment on economically productive and labour intensive social and community works.

### **Swarna Jayanthi Sahakari Rozgar Yojana: (SJSRY)**

The SJSRY, substituted in December 1997 the various programmes operated earlier for poverty alleviation. This is funded on **75:25 basis** between the Centre and the States. During the three-year period (1997-98 and 1999-2000), a total of Rs. 353 crores were spent generating 21.8 million man days of employment.

### **Jawahar Gram Samridhi Yojana (JGSY)**

The Jawahar Rozgar Yojana (JRY, 1989) has been recast as the Jawahar Gram Samridhi Yojana (JGSY) with effect from **01.04.1999** to impart a thrust to creation of rural infrastructure. While the JRY resulted in creation of durable assets, the overriding priority of the programme was the creation of wage employment.

The primary objective of JGSY is creation of **demand driven community village infrastructure** including durable assets at the village level and assets to enable the rural poor to increase the opportunities for sustained employment. The secondary objective is

generation of **supplementary employment for the unemployed poor** in the rural areas. The wage employment under the programme is given to Below Poverty Lines (BPL) families.

### **Swarna Jayanthi Gram Swarozgar Yojana: (SGSY)**

This programme was launched on April 1, 1999 as a single **self employment programme** for the poor. It replaces the earlier self-employment and allied programmes- IRDP, TRYSEM, Development of Women and Children in Rural Areas (DWCRA), Supply of Improved Tool-kits to Rural Artisans (SITRA), Ganga Kalyan Yojana (GKY) and Million Well Scheme (MWS). It aims at establishing a large number of the micro-enterprises in the rural areas. It will target at least **50 per cent SC/STs, 40 per cent women, and 3 percent disabled**. This is a credit-cum-subsidy scheme. Funds under the SGSY will be shared by the Central and State Governments in the ratio of 75:25. Upto December 31, 2006, 24.38 lakh self-Help Groups (SHGS) have been formed and 73.25 lakh swarojgaries have been assisted with Rs. 16,444 Crore.

### **Sampoorna Grameen Rozgar Yojana: (SGRY)**

This scheme was launched in September 2001. The schemes of Jawahar Gram Samridhi Yojana (JGSY) and Employment Assurance scheme (EAS) have been fully integrated with SGRY. The objective of the scheme is to provide **additional wage employment** along with **food security creation** of durable community, social and economic assets and infrastructure development in the rural areas. In 2005-06, 82.18 crore person days of employment were generated under the programme.

### **Food for Work Programme:**

The Food for Work Programme was started in **2000-01** as a component of the EAS in eight notified drought - affected states of Chattisgarh, Gujarat, Himachal Pradesh, Madhya Pradesh, Orissa, Rajasthan, Maharashtra and Uttaranchal. The programme aims at augmenting food security through wage employment. Food grains are supplied to states free of cost.

### **Pradhan Mantri Gram Sadak Yojana: (PMGSY)**

This was launched on 25<sup>th</sup> December 2000. This is a programme providing **road connectivity through good all-weather roads** to 1.60 lakh unconnected habitation with a population of 500 persons or more in the rural areas by the end of the tenth plan period (2007) at an estimated cost of Rs. 60000 crores. The programme is being executed in all the States and six Union Territories. The Programme aims at connecting all panchayat headquarters and places of tourists interest, irrespective of population size.

### **Pradhan Mantri Gramodaya Yojana: (PMGY)**

This scheme was launched in 2000-01 in all the States and the UTs in order to achieve the objective of **sustainable human development** at the village level. The PMGY envisages allocation of additional central assistance to the States and UTs for selected basic minimum services in order to focus on certain priority areas of the government. PMGY initially had

five components, viz., **Primary Health, Primary Education, Rural Shelter, Rural Drinking Water and Nutrition. Rural Electrification** has been added as an additional component from 2001-02.

### **Jawaharlal Nehru National Urban Renewal Mission (December 2005)**

The objectives of this mission are: 1. Economically productive, efficient, equitable, and responsive cities, 2. Improved economic and social infrastructure of cities, 3. Ensuring basic services to the urban poor including security of tenure at affordable prices, 4. To initiate wide ranging urban sector reforms to eliminate legal, institutional, and financial constraints that have impeded investment in urban infrastructure and services, and 5. To strengthen municipality governments and their functioning in accordance with the provisions of the Constitution (seventy-fourth) Amendment Act, 1992.

### **25. Explain the causes of Balance of Payment (BoP) Disequilibrium and measures to correct BoP disequilibrium.**

செலுத்தல் சமநிலையில் ஏற்படும் சமமற்ற நிலைக்கான காரணங்களை விளக்கி அதனை சரிசெய்ய எடுக்க வேண்டிய நடவடிக்கைகளையும் விளக்குக

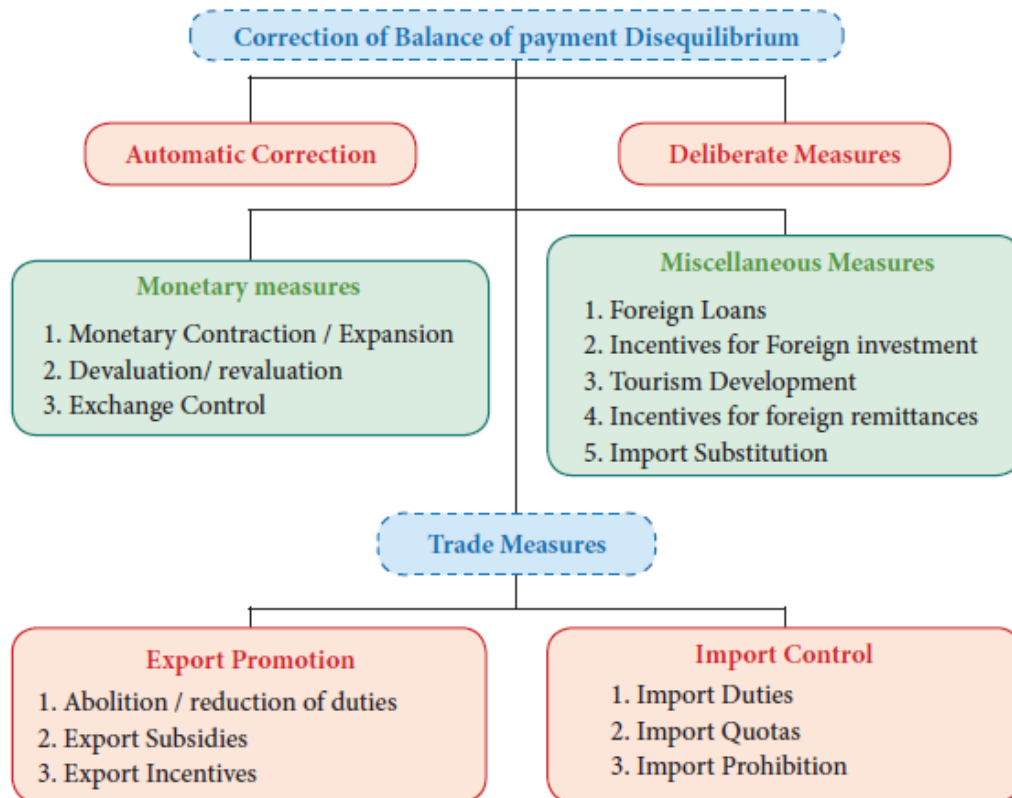
#### **Causes for BoP Disequilibrium**

The following are the major causes producing disequilibrium in the balance of payments of a country.

1. **Cyclical Fluctuation:** Cyclical disequilibrium in different countries is caused by their cyclical fluctuations, their phases and magnitude. World trade shrinks during depression while trade flourishes during prosperity
2. **Structural Changes:** Structural disequilibrium is caused by the structural changes brought by huge development and investment programmes in the developing economies. Such economies may have high propensity to import for want of capital for rapid industrialization, while export may not be boosted up to that extent.
3. **Development Expenditure:** Development disequilibrium is caused by rapid economic development which results in income and price effects. The less developed countries in the early stage of development are not self sufficient. Income, savings and investment are abysmally low. They depend upon developed countries for import of commodities, capital and technology. Export potential is low and import intensity is high. So the LDCs suffer from adverse BoP.
4. **Consumerism:** Balance of payments position of a country is adversely affected by a huge increase in consumption. This increases the need for imports and decreases the capacity to export.
5. **Demonstration Effect:** Deficit in the balance of payments of developing countries is also caused by demonstration effect which influences the people in UDCs to imitate western styled goods. This will raise the propensity to import causing adverse balance of payments. This is good for the developed countries.

6. **Borrowing:** International borrowing and investment may cause a deficit in the balance of payments. When the international borrowing is heavy, a country's balance of payments will be adverse since it repays loans with interest. Servicing of debt is a huge burden. That is why the UDCs are forced to borrow more.
7. **Technological Backwardness:** Due to technological backwardness, the people (Indians) are unable to use the energy (Solar) available with them. As a result they import huge petroleum products from foreign countries, increasing the trade deficit.
8. **Global Politics:** The rich countries (Eg. USA) need to sell their weapons to promote their economy and generate employment. Hence, wars between countries (for example Iran and Iraq, Pakistan and India) are stimulated. In order to win the wars, the poor countries are forced to buy the weapons from weapon - rich countries, using their export earnings and creating trade deficit. Thus UDCs are trapped forever.

### Measures to Correct BOP Disequilibrium



### 26. Discuss the Recent Welfare Programmes of Government of Tamilnadu

தமிழக அரசின் சமீபத்திய நலத்திட்டங்கள் பற்றி விவாதி

- Makkalai Thedi Maruthuvam
- Innuyir kapom thittam
- Namaku Name thittam
- Anna Marumalarchi thittam
- Uzhavar Sandhai
- Samathuvapuram

- Urban wage employment program
- Kalaingar Urban Development Scheme
- Varumun Kapom thittam
- Tamilnadu Urban Habitat Development Board

