

S.5 GEOG P250/2 NOTES

- **Tourism**
- **Desertification**
- **Pollution**
- **Famine**
- **Environmental degradation**
- **Renewable and Nonrenewable resources**

TOURISM

Tourism refers to the travel from one area to another for adventure, education, leisure or to simply fulfill one's curiosity.

There are many features or activities that attract people to certain areas and these are referred to as tourist attractions. Some are natural e.g. Wild-game, Vegetation, Relief features etc. while others are human e.g. Historical sites, towns and amusement centers a rich cultural heritage, etc.

Tourism many times is referred to as an invisible export or trade since it doesn't involve tangible products compared to minerals, agriculture produce etc. but brings in too much forex to a country

TOURISM IN SWITZERLAND

It's one of the countries that have developed due to the tourism sector. It's a small land locked country found in central Western Europe receiving over 15million tourists per year. Switzerland has various attractions including the Alps Mountains with their various glacial features e.g. pyramidal peaks, U-shaped valleys, Arêtes, Cirques etc. Various rivers and Lakes which are used for various activities e.g. Sport -fishing, Swimming, Boat- riders etc. Rivers like Rhine, Rhone, Inn, Ticino Aare, Reus, etc. with lakes like Zurich, Geneva, Bern, Lugano, Constance, Maggiore etc. The country also has various towns which attract tourists e.g. Zurich, Basel, Geneva, Davos etc. together with a rich cultural heritage comprising of diverse cultures like Italian, French, German and the Swiss culture.

The winter games of skiing and skating together with mountain climbing are also major attractions and the major tourist resorts of the country include Geneva, Zurich, Bern, Davos, Zermatt, Basel, St. Moritz, Gstaad, Vevey etc.

FACTORS THAT HAVE FAVOURED TOURISM IN SWITZERLAND

1. The favorable **climatic conditions** of Switzerland have led to the development of the tourism sector. Switzerland has a temperate type of climate though has been modified due to locational factors. This type of climate has four major seasons e.g. winter, summer, spring and autumn. Winter and spring are mainly for the games of skiing and skating due to too much snow and ice. Summer mainly for Sun bathing, Swimming in the clear blue lakes, Mountain climbing and all other outdoor events i.e. Picnics, Camping etc. All these have therefore attracted millions of tourists from different parts of the World into Switzerland.
2. The presence of a large **variety of wildlife** has also led to the growth of the tourism sector. Switzerland is endowed with various wild animals as well as bird species that have attracted plenty of tourists into the country e.g. Bears, Elk, Deers, Foxes, Reindeers, Marmots (Squirrels) and the bird species include the Bearded vultures, Golden eagles, Parrots etc which are located in various national parks and nature reserves like the Swiss National Park founded in 1914 located in the east of the country. Others include Parc Ela, Espace de Coubertin, Gantrisch Nature Park, Parc promenade de la treil etc. Parc Ela is a newly declared and Switzerland's largest nature reserve.
3. The presence of various **drainage features** has also led to the development of tourism in Switzerland. These features include various lakes like Constance in the North East, Geneva in the South West, Neuchatel in West, Lugano and Maggiore in South, Bern and Zurich in the Central etc. The country also has various Rivers like Rhino, Rhone, Aare, Inn, and Ticino etc. Many people are attracted to such drainage features for sightseeing and also to engage in various activities like spot fishing, sun bathing, swimming in the clear blue lakes, boat riders, scuba diving, snorkeling etc. and that why many tourist resorts are found near such water bodies.
4. The **varied relief** of the country has also led to the development of tourism. The country is a mountainous one comprising of the Alps which are the source of many European rivers like R. Rhine, R. Rhone, and Inn etc. These mountains have various glacial features like pyramidal peaks like the Matterhorn, arêtes, cirques etc. These mountains also attract tourists for mountain climbing in summer as well as skiing and skating in winter. The country also has various U-shaped valleys like the Lauterbrunnen valley,

hanging valleys, V-shaped valleys in mountain passes etc. All these have attracted tourists into the country.

5. Switzerland also has various vegetation types' e.g. temperate coniferous forest, temperate **deciduous forests**. Alpine grasses and meadows and many other types of vegetation. Some of the temperate tree species include Spruce, Birch, Elm, Beech, Firs, and Pines etc. Such vegetation has attracted plenty of tourists for research and study purposes. Sight-seeing and some of them make good camping grounds and picnic sites leading to the growth and development of the tourism industry.
6. Switzerland also has a **rich cultural heritage** due to the diverse nationalities of the people in the country e.g. the Southern parts are mainly occupied by people of Italian origin; the Western Parts by People of French origin while the Northern parts by people of German descent. This therefore has created a diverse culture in way of dressing, social functions and activities, traditional Cuisine etc. all of which attract people to the country.
7. The favorable **government policy** of Switzerland has also led to the development of tourism sector. Government provided security to the nationals as well as visitors, it has set up basic infrastructures e.g. roads and railway lines as well as other transport modes like cable cars and chair lifts, government advertises the sector through the Swiss tourism board using various media like International airlines. It has also made visa applications easy and online together with computerized booking of all tourist facilities and hotels. All this has led to the development of the tourism sector.
8. Availability of an **efficient transport network** has also led to the development of tourism in Switzerland. The country's efficient system comprises of road, air railway and inland water transport. In addition to the conventional means of transport the country has other transport means so as to reach formerly inaccessible areas due to the rugged relief e.g. chairlifts, funicular trains, cable cars, underground trains etc. The country also has numerous International air ports like at Bern, Zurich, Geneva, Basel, etc. leading to efficient transportation of tourists both within the country and from other countries.
9. The efficient **accommodation facilities** have also led to the growth and development of the tourism industry. Switzerland has various types of accommodation of International standards e.g. five-star hotel chains like the Grand Meridian hotels, Regency hotels, Hyatt, ITT Sheraton hotels etc. In addition to those hotels, there are various motels and other forms of accommodation like holiday apartments, camping sites and Swiss host families which offers efficient accommodation making tourists feel at home while in the country.

10. The **political stability** of Switzerland has also led to the development of the tourism sector in the country. Switzerland has been politically stable for a long period of time mainly due to its policy of neutrality. This therefore has endeared the country to many tourists from all over the World since they are assured of their safety together with that of their properties. This stability has also attracted massive investments in form of International hotels and amusement centres hence leading to the development of the tourism sector.
11. Availability of **capital** has also led to the development of tourism in the country. Capital has been provided by the government through advancing loans to potential entrepreneurs. Foreign investors e.g. from USA, Germany, France and other countries together with financial institutions like the Swiss Credit Bank. This capital has been used to preserve and conserve the existing tourist attractions, set up efficient transport services, carrying out advertisement as well as pay the skilled workers and all this has led to the development of the tourism sector.
12. Availability of **skilled labour** has led to the development of the tourism industry. The country has a large body of skilled workers comprising of drivers, interpreters, waiters and waitress, researchers and all other types of workers who are greatly skilled at handling people making them more comfortable while in the country.
13. The **Multi-lingual nature** of Switzerland has also led to the development of tourism. Switzerland has three national languages ie. French, Italian and Germany. In addition to these, there are other languages used in the country due to the different nationalities e.g. English, Arabic, Spanish etc. making it a very multi lingual country. This therefore makes communication between the tourists and the local people as well as the guides relatively easy making tourists feel at home when in Switzerland.
14. The **organization of group tour packages** has also led to the development of tourism. This is a process whereby many tourists travel to certain areas in groups rather than individually. This arrangement helps to lower down the cost of accommodation, transport, feeding guide fees etc. since the costs are shared by the whole group and in many cases discounts are offered to such groups therefore this has made tourism very affordable to a great number of people both nationals and those from other countries.
15. The presence of **alternative accommodation** other than international hotels has also led to the development of the tourism sector. International hotels tend to be expensive and therefore out of reach to the ordinary tourist. Therefore, other forms of accommodation were created for the average and low-class tourists e.g. camping sites, holiday apartments, host families and simple wooden houses known as chalets which offer cheaper and more

affordable accommodation thereby attracting plenty of tourists in the country leading to the development of tourism sector.

16. The development of a highly **developed banking sector** has also led to the tourism in Switzerland. The country has many international banks offering efficient banking services to the tourists e.g. money transfers from their home accounts, use of ATMs together with the use of credit cards (internationally recognized) like VISA, Master card etc. This makes tourists feel secure since they do not move with hard cash and also makes tourism highly convenient and efficient.
17. The **hospitality** of the Swiss people has also led to the development of tourism. The Swiss people are highly hospitable, accommodative and warm, which makes tourists more at home and appreciated while in the country. This therefore has attracted millions of tourists from different parts of the World to come and tour Switzerland.
18. The extensive **advertisement** carried out by the Swiss tourism board has also led to the development of tourism. Switzerland's attractions are highly advertised using various international media e.g. International Tv Stations like CNN, Aljazeera, BBC, Sky, RT, France 24 etc., Radio stations i.e. BBC, VOA, Deutschwelle etc. Advertising is also carried out on the internet, inflight magazines of international airlines like Swiss air, KLM, British Air ways, Lufthansa, Air Italia etc., Magazines, and Brochures. Through such persuasive advertising many people have been attracted to the country leading to the development of the tourism sector.
19. The **strategic location of Switzerland** in the middle of developed Western Europe has led to the development of tourism. The country is located amidst developed countries like Germany, France, Italy, Netherlands, Austria, Belgium, which countries possess a large affluent class of people and thus able to carry out tourism leading to the development of the tourism sector.
20. The use **modern technology** has also led to the development of the tourism sector in Switzerland. All major tourist activities are computerized right from Visa application through hotel accommodation as well as transport arrangements. In addition, they also use modern weather warning systems so as to detect sudden weather changes especially in the Alps region like avalanches and severe storms. Modern technology is also exhibited in the non-conventional means of transport like the use of chair lifts and cable cars making tourism highly efficient and convenient.
21. The presence of a **large affluent class of people** in Switzerland has also led to the development of tourism. The Swiss people earn higher disposable

incomes thereby creating a large affluent (middle class) of people that can afford tourism. Such a large affluent class has promoted local tourism even before international tourists' jet into the country.

22. The presence of the **headquarters of many International Organizations** has also led to the development of the tourism sector. Switzerland due to its neutrality policy has attracted many headquarters of International Organizations like the Red Cross and Crescent, International labour Organization (ILO), WHO, Federation of International Football Associations (FIFA), World Trade Organization (WTO), International Organization of migration (IMO), World Intellectual Property Organization. Generally the country has over 150 headquarters. Many people from all over the World go to such headquarters for meetings, workshops etc. and usually after such meetings, they tour different parts of the country as part of their travel program.
23. **Continuous research** carried out on tourist activities has also led to the development of tourism in Switzerland. Research is carried out on the likes and dislikes of various tourists from different parts of the world leading to provision of tailor-made packages that suit every tourist. Through such research the tourism sector has become more efficient thereby attracting many tourists from all over the World.
24. The presence of **vast free land** has also led to the development of tourism in the country. Switzerland has a low population of about 7million people which has created plenty of idle land especially in its mountainous parts i.e. Alps and Jura regions. Such land has been converted into nature reserves as well as national parks thereby attracting plenty of tourists into the country.
25. The presence of various historical monuments and sites have also led to the development of tourism. These include ancient castles and palaces like chillon castle, Aigle, Thun. Roman city of Augusta near Basel, Lion of Lucerne (monument in memory of thousands of Swiss soldiers killed during reign of French revolution of 1792),Einstein house in Bern, leaning tower of St Moritz, Fort Vallorbe etc. All these attract tourists.
26. Availability of power has also favoured development of tourism. This includes HEP from over 400 power stations, nuclear, natural gas, thermal etc. this is used for lighting, transportation, heating, cooking and computerization of all tourist activities.
27. Availability of many industries and industrial cities has also led to tourism development. These include watch making, precision instruments, textiles, pharmaceuticals, food processing, heavy machinery iron and steel. The major industrial towns with many attractions include; Zurich, Basel, St Gallen,

Geneva, Bern, and Neuchatel. Many tourists visit industries and centres to see various attractions.

28. The various recreational and sporting activities have also led to the development of the tourism sector. These include skiing and skating, mountain climbing, paragliding, hiking, football, athletics, scuba diving, motor racing and others at leisure and competitive levels. They attract many people to the country.

IMPORTANCE OF TOURISM

1. **Foreign exchange** is acquired from the millions of tourists who visit the country every year and such foreign exchange has been used to expand the tourism sector and also to develop other sectors of the economy e.g. Agriculture, Industry.
2. Tourism has offered **employment opportunities** to a great number of people in Switzerland as tour guides, drivers, interpreters, waiters and waitresses, managers of tour companies etc. This makes them earn a disposable income thereby improving on their living standards.
3. Government obtains **revenue** by taxing the various tourists as well as people employed in the tourism sector. This therefore makes the government able to provide various social services to the people e.g. Health, Education, Recreation etc. and such revenue is also being used to conserve and preserve the various tourist sites.
4. Tourism has also helped to **diversify the Swiss economy** making the country to depend on a number of sectors for forex earning as well as economic growth and development e.g. It depends on the industrial sector, mining, agriculture and the tourism sector inclusive.
5. Tourism has led to **growth of towns** and urban centers in areas that were formally rural and under developed e.g. the Alps Mountains of the South were highly inaccessible with limited settlements and thus underdeveloped. However due to tourism various towns and urban centers have come up in the area starting off as small tourist Resorts but are now major towns with developed social and economic infrastructures. Such towns include Davos, St. Moritz, Lugano, Geneva, Bern, Zermatt, and Lausanne.
6. Tourism has led to the **development of transport and communication** routes e.g. roads, railway lines, and inland water transport together with numerous air ports. Such transport means have been set up to connect different tourist resorts to other parts of Switzerland e.g. From Bern to Zurich,

Zurich to Geneva, Davos to Lugano, etc. This has led to efficient transport and communication in the country.

7. Tourism has also stimulated **agricultural development** in Switzerland. The many tourists who visit the country provide market to the country's various agriculture products thereby leading to the development of the agriculture sector. In addition to the market some farmers are employed as local guiders making them earn an extra income.
8. The sector has also **stimulated industrial growth** and development as various industries have been set up especially cottage industries (home based industries) e.g. art and craft work. Pottery industries (porcelain), watch making industries etc. That produces various artifacts or ornaments that are usually bought by the tourists as souvenirs.
9. Tourism has **promoted international relations** between Switzerland and other countries especially where the tourists come from or from where the foreign investors come from. Through such relations, there has been increased trade activities and co-operation not only in the tourism sector but also in other sectors of the economy.
10. Tourism has helped in promotion of **environmental conservation** as different parts of the country have been gazetted as national parks and game reserves due to their significance or importance as major tourist sites. Therefore, most of the environment has been conserved and preserved due to the development of the tourism sector.
11. There has been **development and provision of social services and facilities** e.g. health centers, Schools, recreation centers etc. have been put in the various parts of the country either to serve the tourists or the local people using revenue generated from the tourists.
12. Tourism has led to **improvement in technology** as technological transfers have been made possible due to the development of tourist activities. Here modern techniques have been brought into the country from other developed countries either by the tourists who visit the country or by official technology transfers from such countries to Switzerland.
13. Through tourism, Switzerland has been able to **market its various products** to other parts of the World. When the tourists visit the country, they purchase various Swiss products and also get to know the different products and services that the country offers. This helps to widen the market for the Swiss products and services.
14. Tourism has helped to **put to use areas of Switzerland** which would have been left idle and wasted due to their physical nature e.g. the ragged mountainous parts of Southern Switzerland comprising of the Alps mountains which do not favor agriculture and settlement and their tourism

is the best form of land use in the area through various activities like mountain climbing, skiing and skating, paragliding etc. leading to its development.

15. Tourism has promoted education and research in Switzerland. Ecological, botanical, environmental and other field studies have been carried out in national parks and nature reserves of the country by researchers and students at various levels of learning.
16. Tourism has led to attraction of foreign investments into the country as investors from USA, Germany, Japan, Britain, France and others have constructed hotels, amusement centres, trains etc. They have also invested in other sectors of the economy.

NEGATIVES

1. Tourism has led to **introduction of foreign cultures** in to the country leading to moral degeneration e.g. prostitution, homosexuality, and bestiality etc. vices. This is due to the high number of people coming into the country from different parts of the World and its more during the peak tourism i.e. in summer.
2. There has been development of towns as **tourist resorts with their associated problems** e.g. increased rural to urban drift, high crime rates, growth of slums, congestion etc. Such resorts include Zurich, Bern. Geneva, Davos etc.
3. **Destruction of the natural environment** through setting up of various tourist sites e.g. hotels and motels, amusement centers, camping sites etc leading to environmental degradation many temperate forests in the Alps region have been dared to pave way is the construction of various tourist sites as well as roads leading to such sites.
4. **Regional imbalances in economic growth** and development as areas with plenty of tourist attractions and sites (resorts) have developed at a faster rate compared to those areas which are less endowed with such attractions.
5. Tourism has led to pollution as many tourists who visit particular tourist sites usually leave behind polythene paper, beer cans, soda cans etc. unwanted materials which cause **site pollution**. In other cases, some tourist light bon-fires leading to air pollution since toxic gases like carbon monoxide and carbon dioxide are released into the lower atmosphere.
6. Tourism has **promoted international espionage** (spying) as many spies move into the country disguised as tourists which puts the country's security at risk.

7. Tourist centers and facilities like national parks and game reserves **occupy too much land** which would have been used for other land uses or economic activities e.g. agriculture and settlement.
8. There is **profit repatriation** since some of the tourist investments like hotels, amusement centers etc, are owned by foreigners or foreign corporations. This therefore makes Switzerland lose revenue which would have been used to develop other sectors of the economy.
9. At times animals in gazetted areas like national parks and game reserves stray **out of** their confines leading to destruction of people's property and at times causing death.
10. **Accidents** are common during various tourist activities e.g. Mountain climbing, swimming, skiing and skating, paragliding etc. together with avalanches which lead to death of many people especially in the Alps region. At times traffic accidents especially road and railway also claim a large number of tourists which scares away other tourists.
11. Although less common these days, tourists used to **cause wild fires** and this was mainly through the lighting of bon fires during camping, cooking as well as cigarette smoking. This always led to destruction of vegetation as well as death of wild life.
12. Diversion of labour and capital from other sectors of the economy to the tourism sector. Many people prefer to work in the sector compared to others which are considered more demanding and risky. Same applies to investments.

TOURISM IN EGYPT

Egypt is another country that has developed as a result of tourism. The country's tourist sector has been growing gradually over the years and today its one of the major forex earners of the country. The country has various attractions which include different types of climate e.g. desert, Mediterranean and montane climate, various desert land forms and features like rock pedestals, sand dune, the sandy plains, oasis etc. The country is also blessed with various drainage features, including R. Nile and the artificial water channel (canal) known as the Suez Canal. It also has lakes like Lake Nasser and the great bitter lake.

There are various coastal features and land forms especially along the Mediterranean coast and the Red Sea coast e.g. sandy beaches, cliffs, caves lagoons, stacks, blowholes etc. The ancient pyramids are Egypt's number one attraction with the most spectacular being those at Giza. The country also has plenty of wildlife comprising of various birds, hyenas, lions, Ostriches, Deers,

leopards and the Nile crocodiles. The country also has a rich cultural heritage of the Bedouin Arabs and earlier civilizations e.g. the Romans and the Greeks. The major tourist resorts of Egypt include Alexandria, Cairo, Port Suez, Port Said, Aswan, Luxor, Ismailia and plenty of resorts along the Red Sea coast, like Sharm-el-Sheikh, Dahab, Nuweiba, Taba.

FACTORS FOR THE DEVELOPMENT OF TOURISM IN EGYPT

1. Egypt has various **climatic conditions** or types which attracts different groups of tourists from far and wide e.g. desert climatic conditions with their hot sunny conditions that attract sun bathers especially by tourists from the temperate latitudes. Mediterranean climate experienced along the Mediterranean coast and this also provides sunny and cool conditions which are good for sun bathing, swimming in the open sea and plenty of outdoor activities.
Egypt also has a montane type of climate experienced on Mountain Sinai and this also attracts plenty of tourists in the country. Such climatic conditions have also made tourism to be an all year-round activity.
2. The presence of **various drainage features** in the country has also led to the development of tourism in Egypt. River Nile is the longest river in the World together with its many distributaries in the Delta region has attracted many tourists for site seeing, boat rides, scuba diving, snorkeling etc. Egypt also has the Suez Canal which is a major attraction as its one of the wonders of the World. The country also has one of the largest manmade lakes eg. Lake Nasser stretching to over 500km into Sudan.
3. The presence of **various relief features** has also led to the development in the country. The country has various features comprising of Mt. Sinai in the East, various desert relief features e.g. Rock pedestals, Sand dunes, Oasis, and deflation hollows e.g. the Qattara Depression, Yardangs etc. All these attract plenty of tourists unto the country.
4. The presence of **various vegetation** types that has also led to the development of tourism in Egypt. Such vegetation types include Mediterranean scrub and wood land, desert vegetation with spectacular cactus and Euphorbia plants as well as date palms etc. All these have attracted plenty of tourists to the country.
5. The presence of a **rich cultural heritage** has also favored tourism in the country. Egypt comprises of difference races as well as descendants of earlier inhabitants i.e. the Greeks and Romans. Though the majority of people are the Bedouin Arabs with their various dances, way of dressing, the Bedouin tents, architectural types as well as traditional cuisine.

6. The presence of **various wildlife**. Various wild animals as well as birds are found in the country e.g. desert lions, leopards, desert snakes, deers, ostriches etc. all these are found in various national parks like Giftun Island, Ras muhamad and Almahmeya.
7. The presence of **various historical sites** e.g. the Egyptian museum of antiquities in Cairo, the Abu simbel pillars which was curved out of sandstones, Pompeys pillar at Alexandria, Cairo tower, King Farouk's palace, the Nubian museum of Aswan etc.
8. The **strategic location of Egypt** has also led to the development of tourism. Egypt is located in N. Eastern Africa which location makes it easily accessible to tourists as well as investors from Western Europe, the Middle East and North African countries and all this has led to the development of the tourism sector.
9. Presence of **vast free land** has also led to development of tourism. Egypt is a vast country with plenty of land uninhabited. This has led to the setting up of various national parks as well as other amusement centres in the country.
10. Availability of **capital** which has been provided by the government to potential investors, commercial banks, local entrepreneurs, as well as foreign investors and the capital has been used to set up hotels, preserve tourist sites, pay the skilled workers and also carry out research.
11. The well-**developed accommodation facilities** comprising of international hotels like the Sheraton hotels, Hilton hotels, Regency hotels, the Grand meridian etc. There are various motels, Lodges, Holiday apartments etc. which offer excellent accommodation to the tourists making them feel at home.
12. The **efficient transport and communication** has also led to the growth and development of tourism in the country. The country has modern transport systems comprising of roads and railway lines connecting major tourist resorts and centres like Cairo, Alexandria, and Luxor e.g. it has air-conditioned express trains called Abela Egypt and international air ports like at Alexandria, Cairo, Aswan and Port Said together with inland water transport along R.Nile and the Suez Canal. This has led to easy travel by the tourists to different parts of the country.
13. Availability of **skilled labour** has also led to the development of tourism in Egypt. The country has a large stock of skilled workers comprising of tour guides, drivers, interpreters, waiters and waitresses etc. Such skilled workers make tourists feel at home leading to efficient tourist activities and thus attracting more tourists into the country.
14. The **availability of organized group tour packages** has also favoured tourism in the country. The Egyptian tourism board organizes tour packages

aimed at attracting groups of tourists rather than individual tourists. Thru such packages, the country has attracted plenty of tourists as it becomes cheap since the costs are shared by the group of tourists.

15. **Persuasive and intensive advertisement** using various mass media has also favoured tourism in Egypt. The Egyptian tourism board persuades tourists thru intensive advertising using international television stations e.g. CNN, BBC, Sky, Aljazeera etc. together with inflight magazines of international air lines, the internet, radios, brochures etc. This therefore has attracted plenty of tourists from different parts of the World.
16. The **hospitality** of the Egyptians has also aided tourism development in Egypt. Egyptians are highly hospitable and accommodative which attributes make many tourists feel at home while in the country and thus attracting millions more into the country.
17. The **multi- lingual nature of Egypt** has also led to the development of tourism. The country has many international languages being used and spoken e.g. Arabic, English, Italian, French, Spanish etc. which makes communication between the tourists and the local people relatively easy and thus making tourist feel more at home while in the country.
18. The **political stability** of Egypt has also led to the development of tourism. Egypt has been relatively politically stable for a long period of time save the Egyptian-Israel wars of the 1960s and 70s and the recent 2011 revolution. Such a long period of stability has attracted plenty of tourists since they feel more secure for their life and property while in the country. It has also attracted massive investments in the tourism sector.
19. The **favorable government policy** of Egypt has also led to the development of tourism. Government policy has advanced loans to potential investors, set up basic facilities e.g. roads and railway line, preserved the various tourist sites, and maintained stability together with extensive advertisement of the tourism sector. All this has led to the development of tourism in the country.
20. Availability of **a large affluent class of people** in Egypt has also led to the development of tourism. This affluent class (the middle class) has high disposable incomes which enables them to engage in tourism thereby leading to the growth of local tourism even before the international tourist's jet into the country.
21. The presence of a **developed banking sector** has also led to the development of tourism sector. Egypt has a well-developed banking sector comprising of many international banks that can aid money transfer from the original countries to the tourists. In addition, there are various automated teller machines in different parts of the country where people can with draw

money in case of need. The country also uses international credit cards like VISA and Master Card which makes tourists feel safer while in the country since they do not have to move around with wads of cash.

22. Egypt being the **political capital** of the Arab World with the headquarters of many Arab Organizations and Corporation has also aided tourism development. Many officials from Arab countries usually visit Egypt for various conferences and workshops and usually after such official business, they tour the country as part of their program leading to the development of the tourism sector.
23. The use of **modern technology** in tourism has also led to the development of tourism. Visa applications and all bookings are made online together with computerization of all tourist activities. This therefore has made tourism highly efficient and also convenient leading to attraction of many tourists of different parts of the World.
24. Continuous **research** on tourist activities has also led to the development of tourism in Egypt. Research is carried out on the likes and dislikes of particular tourists, modern techniques of tourist handling etc. leading to the provision of tailor-made packages to various groups of tourists and thus leading to the development of the tourism sector.
25. Availability of power has also favoured development of tourism. This is mainly HEP, thermal and solar power used in cooling, lighting, cooking, transport and communication etc leading to efficient tourist activities.
26. The various industries and industrial centres of Egypt have also favoured tourism development. These include cairo , Alexandria, port suez, Ismailia, port said and others.

CONTRIBUTIONS

POSITIVES:

1. Forex from the millions of tourists who visit the country e.g. in 2008 12.6 million tourists visited the country and 11 billion dollars were realized.
2. Employment opportunities to Egyptians as drivers, waiters, waitresses, tour guides, interpreters etc. leading to improved standards of living. The sector employs 12% of the working population.
3. Growth of towns and urban centers as major tourist resorts e.g. Alexandria, Luxor, Cairo, Sharm-el sheikh, Nuweiba, Dahab and Taba.
4. Growth of social and economic infrastructures i.e. Hotels, recreation centers, hospitals, etc. which have been put up by the government and tourist entrepreneurs.

5. Diversification of the economy i.e. the country can now depend on a number of sectors for growth and development i.e. Industry, agriculture, mining and tourism sector inclusive.
6. Growth of other sectors e.g. agriculture and the cottage industry especially art and craft.
7. Development of the communication routes e.g. roads and railway lines together with air transport as various air ports have been put up to efficiently transport the tourists.
8. Optimum usage of land which would have been left idle and wasted e.g. the sandy desert lands
9. Preservation and conservation of the environment e.g. thru gazetting national parks and game reserves where flora and fauna has been preserved and conserved.
10. Strengthening international relations between Egypt and other countries where the tourists come from or where the foreign investors come from e.g. USA, France, Britain, Saudi Arabia, etc.
11. Attraction of foreign investments into the country in form of hotels, amusement centres and many others leading to the country's growth and development.

NEGATIVES:

1. Moral degeneration e.g. prostitution.
2. Growth of towns and associated problems e.g. high crime rate etc.
3. Tourist centers like National Parks e.g. Ras Muhamad' and Giftun Island National Parks cover too much land which would have been used in other activities.
4. Regional imbalances as the eastern and North Eastern parts of the country are more developed as a faster rate compared to the western parts of the country with open sandy desert.
5. Profit repatriation as some of the tourist investments are owned by foreigners and foreigners from USA, France, Saudi, Britain etc.
6. RUM and its consequences as many people have left the rural areas to come and stay in urban centres that have come up as a result of tourism.
7. Increase in international espionage as well as terrorism as they come into the country disguised as tourists e.g. 58 tourists were killed in 1997 Luxor massacre and most tourists were killed in 200s in Cairo due to terror attacks.
8. Accidents leading to death and destruction of property.

TOURISM IN USA

USA is another country with a highly developed tourism sector. The country is endowed with plenty of attractions including diverse climatic types, drainage features e.g Lakes and rivers, various vegetation types, a rich cultural heritage of the indigenous tribes and migrants, various wild life in the numerous National Parks and game reserves, amusement parks like Walt Disney and Never land, a range of recreation facilities and sports like wrestling, boxing, American football. Various coastal land forms on both the Atlantic and Pacific Oceans, various cities and conurbations e.g New York, Miami, Las Vegas, Holly wood etc. Historical sites like the statue of liberty, the independence bell and hall etc. All these have attracted plenty of tourists into the country. The major tourist resorts include New York, Las Vegas, Los Angeles, Chicago, Boston, Holly wood, Florida etc. found in the 50 states that make up the country.

FACTORS THAT HAVE FAVOURED TOURISM IN US

1. Presence of **different climatic types** ie. Temperate climate with its four major seasons of summer, autumn, winter and Spring. Continental temperate climate, Mediterranean climate, desert climate, Alpine climate (montane) with their distinct tourist attractions.
2. Presence of **various drainage features** comprising of lakes and rivers e.g the Great Lakes and man-made lakes through damming of the various rivers. Rivers include Ohio, Mississippi, Columbia, Colorado, Missouri these attract tourists for site seeing, sport fishing, swimming, diving, boat rides etc.
3. Presence of **various relief features** comprising of mountains, U-shaped valleys, V-shaped valleys, plains etc. e.g Mt. McKinley(Denali) in Alaska is Americas highest mountain, others being Appalachian mountains, the coastal ranges, rocky mountains, Sierra Nevada mountains etc. It also has the world's deepest gorge ie. The Grand canyon formed by river Colorado in North Arizona. It is one mile deep.
4. USA is also **endowed with plenty of wild life** e.g the grizzly bears, wolves, Dall sheep, mountain goats, reindeer, bison, elk and plenty of bird species e.g. Eagles, Parrots, vultures, Horn bills, Shoebills etc. These are found in national parks and game reserves like; yellow stone national park found in Wyoming, Montana and Idaho which is Americans oldest National Park established in 1872. Others include Denali in Alaska, Yosemite in California, Glacier NP in Montana, Grand Canyon NP in Arizona etc.
5. The country has **various vegetation types** comprising of temperate coniferous forests, temperate deciduous forests and trees, the prairie

grasses, montane vegetation etc. which attract plenty of tourists into the country.

6. USA has various coastal features on both the Pacific and Atlantic coasts e.g sand beaches, cliffs, caves, stacks, blow holes which are major attractions.
7. The **strategic location** of USA in between the Pacific and the Atlantic making it attract tourists and investors from all over the World e.g across the Atlantic from Britain, Germany, France, Netherlands, Norway, Denmark etc and across the Pacific from Japan. China, Malaysia, Singapore etc.
8. USA has **a rich cultural heritage** comprising of the indigenous Indians and other groups together with migrant communities like the Spanish, Chinese, Russians, French etc including their way of dressing, traditional cuisine, cultural ceremonies etc.
9. The **presence of numerous historical** sites e.g the statue of liberty on liberty Island in New York, the empire state building, the Independence hall in Philadelphia, Pennsylvania where the declaration of independence was signed on 8th July 1776, the liberty bell is also found in Pennsylvania, various castles found in different states of the country the most prominent being castle Clinton, which was the nation's major immigration portal. Other historical buildings include the white house, Pentagon, Navajo sandstone monument etc.
10. Availability of **capital** to set up various amusement parks like Disney World, Neverland etc, pay the skilled workers, preserve the various tourist sites, conduct research on tourist activities and also provide security to the tourists.
11. The well-developed **accommodation facilities** comprising of International hotel chains like the Regency hotels, the Grand Meridian hotels, the Hilton hotels etc. offering excellent accommodation to tourists.
12. **Efficient transport and communication** systems comprising of number of high ways connecting different tourist attractions, the transcontinental railways moving from the Atlantic coast to the pacific coast and over 150 international air ports found in the different states of the country.
13. Availability of **skilled labor** e.g. tour guides, waiters, waitresses, drivers, interpreters, managers of tour companies etc.
14. **Political stability** of the country which has attracted plenty of tourists and also tourism investments in the form of hotels, amusement parks, film studios etc.

15. **Intensive advertisement** using various media e.g Tvs. Like CNN, Fox, Aljazeera, V.O.A etc. together with radios, the internet, magazines, brochures etc. which has attracted plenty of tourists in the country.
16. The **multi-lingual nature** of American society where many international languages are widely spoken and used e.g English, Spanish, French, German, Russian, Italian, Japanese, Chinese, Arabic etc.
17. The presence of a **large affluent class of people** in USA has also led to the development of tourism sector. The country has a large class of high income earners who can afford tourism and thus leading to the promotion of the local tourism even before international tourists jet into the country.
18. The **supportive good policy** of USA of preserving various tourist attractions e.g national Parks, monuments etc. setting up the basic infrastructures, maintaining stability and financing tourism research.
19. The **continuous research** carried out on tourism activities leading to discovery of the likes and dislikes of various tourists and thus organizing tailor made packages that can suit every group of tourists.
20. Use of **modern technology** on tourist activities e.g online Visa bookings, computerization of all tourist activities, installation of weather warning systems, spy cameras being installed in different tourist centers etc. leading to efficiency and convenience.
21. **Hospitality** of the Americans which has attracted plenty of tourists into the country since they feel more at home while in the country.
22. The **developed banking sector** which enables money transfer from home accounts, use of international credit cards especially Visa and Master Cards., ATM, being found in almost every part of the country etc which makes tourism more convenient.
23. Availability of **other types of accommodation** other than international hotels e.g holiday apartments, outdoor camping sites, host families as well as cheaper motels and local hotels. This has made tourism affordable and cheap.
24. The **organization of group package tours** or group travel where tourists visit different areas of interest in groups other than as individuals making tourism more affordable since costs are shared and thus attracting more tourists.
25. Availability of power for lighting, cooling, heating, transport etc,
26. Plenty of recreational and sporting activities like wrestling, athletics, boxing, motor racing, tennis, golf etc which attract many people.

Attractions in California:

- Relief ie. Mountains, coastal ranges and Sierra Nevada mountains with U-shaped and V-shaped valleys.
- Drainage i.e like R. Sacramento and San Joaquin, Lakes; Mead, Shasta, Tahoe, Goose..
- Vegetation i.e temperate coniferous trees of forests, desert scrub, Mediterranean woods, montane vegetation, Prairie grasses.
- Climate i.e temperate, Mediterranean and desert climate, montane climate.
- Coastal features along the Pacific coast i.e beaches, different caves, stacks, blow holes etc. River estuaries.
- Wild life e.g Bison, Bears, Deers, Wolves, Mountain goats, Dall sheep, Elks and plenty of birds ie. Eagle, Parrots, Hornbills in national parks and animal sanctuaries like zoos ie. Los Angeles Zoo.
- Other attractions Golden gate bridge a suspension bridge found in San Francisco and marine county completed in 1937, amusement parks e.g Walt Disney, film studios e.g Universal studios, cities , holly wood, Los Angeles, San Diego, Santa Barbara.

TOURISM IN SOUTH AFRICA

- Relief – Drakensberg, Cape ranges, table mountains
- Coastal features along the Indian ocean and Atlantic sea comprising of caves , sheltered bays, sandy beaches, cliffs, stacks, head lands e.g. Cape peninsular
- Climate e.g. subtropical climate, Mediterranean and temperate.
- Vegetation Mediterranean vegetation ie. Woodlands and grasses, temperate pastures, temperate grasses known as Veld and montane vegetation.
- Wild life e.g. Elephants, Sharks, Dolphins, Leopards, Lions, Buffalos, Rhinos, ebras, Antelopes, Kobs etc. found in National parts like Kruger National park being the biggest in Africa. Golden gate highlands NP , Table Mountains NP, Karoo national park Isimangaliso, Kgalagadi.
- Rich cultural heritage comprising of the Zulu Kingdom and their cultural identity, the Tswana, Xhosa, Sotho, Ndebele, khoikhoi, Boers, Indians etc.
- Historical sites ie. Robben Island Prison where Mandela was imprisoned, his birth place Qunu, Voortrekker monument in pretoria, Union buildings, Castle of good hope, Apartheid museum, Nelson mandela museum, Isandlwana battle field, Major towns;
- Cities with recreational and amusement centres like sun city, Cape Town, Johannesburg, Pretoria, Durban, Port Elizabeth, East London etc. Vine lands, mining areas e.g the rand for gold, diamonds at Kimberly.

TOURISM IN KENYA

- Relief features; Mtns e.g Kenya, Longonot, Satima, Elgon, Marsabit, Nyika plateau, Kenya highlands, East African rift valley.
- Drainage features; lakes like Victoria, Nakuru, Elementeita, Naivasha, Baringo etc, rivers e.g Tana, Galana, Athi, Kerio, Nzoia.
- Wildlife e.g elephants, lions, cheetahs, buffaloes, zebras, leopards in national parks like; Tsavo east, Marsabit, Nairobi, Masai Mara, Amboseli, Tsavo west, Meru, Lake Nakuru, Aberdare, Hells Gate.
- Climate; Tropical, Montane, Semi-arid
- Coastal features along the Indian Ocean like; sand beaches, stacks, cliffs, caves, coral reefs.
- Rich cultural heritage of; Kikuyu, Masai, Turkana, Luo, Kalenjin, Kamba, Nandi, Coastal arabs.
- Historical sites; Fort Jesus, Ohinga Archaeological site, Lamu old town, Meru museum, Nairobi railway museum etc.
- Major tourist resorts; Mombasa, Malindi, Nairobi, Eldoret, Nakuru, Kisumu, Kisii.

TOURISM IN TANZANIA

- Relief features eg Mtns like; Kilimanjaro, Usambara, Uluguru, Meru, Uzungwa, Hanang, Loleza, Rungwe, Ol-Doinyo-Lengai. East African rift valley, Ngorongoro crater.
- Drainage; lakes include; Victoria, Tanganyika, Malawi, Manyara, Natron, Rukwa, Eyasi. Major Rivers include; Rufiji, Ruaha, Pangani, Kagera, Ruvuma, Kilombero, Malagalasi, Songwe, Wami.
- Climate; Tropical, Semi-arid and Montane.
- Vegetation; Tropical forests, Savannah grasslands and woodlands.
- Wildlife; lions, elephants, leopards, zebras, buffaloes, antelopes, birds in national parks like; Serengeti, Tsavo, Kilimanjaro, Uzungwa, Tarangire, Mikumi, Arusha, Marine national park.
- Coastal features along Indian Ocean like sand beaches, cliffs, coral reefs, caves, stacks.
- Rich cultural heritage of Sukuma, Chagga, Nyamwezi, Masai, Coastal Arabs and Zanzibari's.
- Historical sites of Tanzania; Olduvai Gorge, Kaole ruins, Mikindani, Nasera rock shelter, Mumba cave, Laetoli fossils, Engaruka irrigation furrows, Ngorongoro.
- Major tourist resorts; Dar es Salaam, Dodoma, Arusha, Mwanza, Tanga, Tabora, Mbeya, Zanzibar city,

TOURISM IN THE CARIBBEAN REGION

The tourism sector is the most important sector of the economies of many Island states which form the Caribbean region and at times they are referred to as the West Indies. The region comprises of many small Island states e.g. Bahamas, Barbados, St. Lucia and Vicent, Antigua and Barbuda, Dominican Republic, Trinidad and Tobago, St. Kitts and Nevis, Haiti, Puerto Rico, Jamaica etc. Tourism in the region started in the 19thC when some wealthy Americans and Europeans started taking holidays in the area but rapid development of the area begun after the end of WW II. Today many of these Islands states depend on tourism as the major sector of their economies.

FACTORS FOR THE GROWTH OF TOURISM IN THE CARIBBEAN REGION

1. Favourable climate conditions e.g. the humid subtropical climate which keeps the waters of the sea generally warm and therefore attracting plenty of tourists from all over the World for swimming, sun bathing, camping, picnics etc.
2. The presence of various relief features comprising of volcanic mountains some of which are still active, plains, valleys etc which are found in states like Barbados, Barbuda, Jamaica, Puertorico etc.
3. The presence of many beaches with different types of sand ranging from pink to white as well as surgery e.g Negril's 7 miles beach, treasure beach and doctors cave beach all in Jamaica, Palm Beach, Eagle beach in Aruba, Elba beach is Barbados together with Puntacana and Barahona which are found in the Dominican republic. Such beaches are excellent sites for sun bathing, nature walks, swimming in the open sea and plenty of other outdoor activities.
4. Presence of many historical sites especially slave trade market centers, slave prisons slave trading ships, and any other slave trade e.g. shackles.
5. Presence of a rich heritage of the natives of the Caribbean's including way of dressing, head gears, language ie. Patio English and pidgin (patois) and very interesting carnivals which attract a large number of tourists to these Island states.
6. The presence of a rich and diverse fauna comprising of animals like Buffalos, antelopes, lions, Zebras, plenty of sea animals like sting rays, octopus, Dolphins, Sharks etc.

7. The presence of varied vegetation types including the tropical rain forests, savannah woodlands and grasslands as well as mangrove forests found at the coastal areas many of these Island states.
8. The presence of various drainage features including rivers and lakes flowing from the mountainous parts of the countries and are being used for various tourist activities like boat cruises, swimming, sport fishing, diving etc.
9. Strategic location of the Island states whereby they are found in between North and Southern America as well as Western Europe making them easily accessible by air or by water. Therefore this has attracted tourists from North America, South America, and Western Europe etc. The location has also attracted massive investments in the area.
10. Political stability of these Island states as they have been stable for a long period of time and this has attracted many tourists and also a number of investments e.g international hotels.
11. Efficient transport and communication. Comprising of various international air ports in Island states of Bahamas, Jamaica, and Dominican Republic etc. and in addition to air transport, the Island states have efficient road and railway transport networks.
12. Efficient accommodation facilities comprising of international Hotel chains like Sheraton hotels, inter-continental hotels, Hilton hotels Grand meridian hotels, Regency etc. together with various hotels and lodges.
13. Intensive advertisement carried out by the Island states on international media stations like Tvs e.g CNN, BBC, Aljazeera, Sky, fox VOA etc. together with International radios and the internet. Inflight magazines of international air lines have also been used to advertise the sector e.g. Emirates, KLM, Air France, British Air ways etc.
14. The organization of group package tours for various tourists coming in from different parts of the World. This has led to affordability of tourism and thus attracting more into the country.
15. Supportive policy of many of the Island states e.g advertising the tourism potentials, maintaining stability, setting up infrastructures e.g roads and railway lines etc.
16. Availability of capital from the Banks, rich foreign investors from USA, UK, France etc. for setting up hotels, amusement centres and preserving of tourist sites.
17. Availability of skilled labour in the Island states e.g tour guide, waitresses, waiter and interpreters, drivers etc.
18. The multi-lingual nature of these Caribbean Islands since they took up the language of the former colonial masters e.g. Dutch, French,

Germany, English, Portuguese, Spanish etc which makes communication between the tourists and the local people relatively easy.

19. The presence of developed banking sector ie. Many international banks are found in the countries and this aid in many transfers from the home accounts to the tourist, use of credit cards, Visa and master cards as well as American express. Use of ATMS etc which makes tourism more convenient.
20. Continuous research on tourism activities e.g the likes and dislikes of different groups of tourists, modern and conventional ways of handling tourists etc. studies which keeps them abreast with what trending in the tourism world.
21. The coming up of an affluent class of people in the Island states with higher disposable incomes making them afford local tourism and thus leading to its development even before international tourist jet in.
22. The use of modern technology in tourist activities e.g. online Visa application and hotel bookings, Geo-mapping of the different tourist sites as well as installation of modern weather warning systems e.g cyclones, hurricanes etc.

Qn Account for the growth and development of the tourism sector in either Republic of South Africa or Switzerland

2. To what extent have physical attractions led to the development of the tourism industry in either Egypt or California?
3. Examine the significance of the tourism industry to the economic development of either East Africa or the Caribbean region.
4. Explain the problems faced by the tourism industry in either USA or Kenya.
5. Why is the tourism industry of Switzerland more developed than that of East Africa?

FAMINE

Famine refers to a situation of prolonged food shortage and it arises when the available food supplies or sources can no longer satisfy the available populations' food requirements. Famine can be seasonal or periodical as well as persistent ie. Food shortage can occur for the short period of time within a year or it can be persistent ie. Occurring every year. Persistent famine results into decline in the

living conditions of the people, diseases, starvation, death and massive exodus of people.

The occurrence of famine has been rampant in Africa, Asia and Russia especially since the beginning of the 19thC. In Africa, famine has occurred in the following countries; Ghana in 1983, Angola in 1984 and 86, Mozambique in the 80_s, 90_s and present, Somalia from the Sahel Belt and the horn of Africa. In sub-Saharan Africa, various countries have also undergone famine e.g. Zimbabwe, Botswana, Zambia and the Republic of S. Africa. In Asia famine has occurred in various countries e.g. in Cambodia in 1984, China in 1902 and the 90_s, Bangladesh in 70_s, 80_s and 90_s .Northern Korea in 80_s, 90_s and present, India in 1940_s as well as 70_s together with Russia.

In East Africa, Kenya, Uganda and Tanzania have undergone famine though it's always seasonal famine, South Sudan is facing persistent famine of recent.

CAUSES OF FAMINE

The occurrence of acute food shortages is attributed to a number of factors and they are both physical as well as human factors.

Physical Factors

1. Prolonged droughts are a major cause of famine. The abnormal shortage of rainfall or prolonged shortage of water below the required measurements often leads to famine and this has been the major cause of famine in the Sahel regional Africa, the horn of Africa and Central Africa. During periods of drought, crops cannot grow because of limited water and the hot temperatures as usually. Lead to high evaporation rates which causes withering and eventual drying up of the crops.
2. Floods are also a major cause of famine and famine and floods usually occur due to too much rainfall leading to bursting of the River banks, Lake Shores and destruction of farm lands. In Africa various rivers are known to flood due to too much rainfall e.g. R. Niger, Senegal, Zambezi, the Nile orange, and Volta etc. In Asia, various rivers also flood leading to destruction of farm lands and thus famine in the long run. E.g. Ganges, Indus, Brahmaputra etc. causing famine in Bangladesh, Pakistan, India, Afghanistan etc. During flood times, there is massive destruction of crops, displacement of people and at times massive death leading to a reduction in human labour which causes famine in the long run.
3. Poor soils are also major cause of famine. Arable farming requires fertile soils but in many countries of Africa, the soils are infertile. Africa's soils are generally made up of sand and lateritic soils which erode easily and hold less water than

the clayey and humus rich soils to the temperate regions. Again Africa's soils have high iron and aluminum content which makes it turn hard on exposure to the sun and air and thus hard to cultivate leading to periodical and persistent famine in many African countries.

4. Harsh climatic conditions are also a major cause of famine. In some parts of the World, there are harsh climate conditions that cannot favor crop cultivation e.g the hot desert with very hot temperatures and very low amounts of rain fall e.g Sahara, Namibia, Kalahari. Arabian, Atacama, Gobi etc that why some of these areas undergo famine. On the other hand, some countries are too cool to sustain plant life e.g the cold deserts of North Siberia as well as the Arctic and Antarctic regions.
5. Pests and diseases are also major causes of famine. Insect pests and diseases limit food production in a number of ways. They scare away cultivators, destroy the crops and caused death of livestock e.g Cassava mosaic has led to food shortage in many countries where cassava is a major food crop e.g Chad, Senegal, Uganda, Kenya, Tanzania etc. Locusts have also always destroyed crops e.g in Somalia, Chad and Ethiopia. Tsetse flies causing sleeping sickness in human as well as Nagana in livestock which leads to massive exodus of pastoralists as well as death of livestock. Other crop pests include army worms, banana wilt disease etc.
6. Lack of surface drainage is another major cause of famine in many parts of Africa and the world. In many countries where harsh climatic conditions occur, it's the artificial supply of water through irrigation that can help. However, many areas lack surface drainage in form of Lakes, rivers and swamps where irrigation water could be sourced from e.g most of North Africa has no surfaced drainage and where it's found it's seasonal ie. In terms of rivers that cannot be relied upon to carry out irrigation farming.
7. Relief is another major cause of famine. Many areas are mountainous and ragged and others are full of rocky out crops that favours agriculture. This is so as such areas usually have acceleration. Limit agriculture mechanization and usually tend to have cold temperatures that cannot sustain crop growth therefore this leads to famine in such areas. Another influence of relief is the formation of lee ward side and wind ward side of the mountains. Wind ward side which receive little or no rain fall being in the rain shadow and hence famine in such areas.

Human Factors

1. Rapid population growth or increase is a major cause of famine. This rapid population increase has also mounted pressure on the existing land resources leading to land fragmentation and once this happens, mechanization of

agriculture becomes impossible and the land deteriorates easily due to constant usage. This will therefore lead to reduced yields and famine in the long run.

2. Poor transport systems are also major causes of famine. These limit food distribution and marketing. Meaning that even if food is in plentiful supply in a particular area of the country. It cannot be easily distributed to other areas with food shortages due to the poor transport and communication. E.g in Sudan, Chad as the Himalayas of Asia.
3. Political instabilities are also major causes of famine e.g prolonged wars in Somalia, Chad, South Sudan, Afghanistan, Mozambique, Burundi etc has led to food shortage in such countries. This is so as people are always on the run for their lives together with destruction of infrastructure and farm lands due to political instability. In other areas, the able bodied who can practice agriculture ie. Young and youth are either killed or sucked up by the instabilities resulting into food shortages e.g Somalia has had persistent famine for the last 30years due to instabilities.
4. Food hoarding is also a major cause of famine. In many countries like Pakistan, India and Bangladesh etc. Business people usually hoard food stuff such that it remains scarce and therefore they can sell at a higher price so as to realize abnormal profits. Therefore people go without food for a longer period of time as they cannot afford expensive food stuff and thus leading to famine.
5. The uneven distribution of food aid also leads to persistent famine in many countries. In many parts of Africa and Asia most of the agencies or organizations that offer food aid have various interests and therefore their food aid tends to be attached with these various strings offering it only to those people or countries that serve their interest better leaving out these countries which do not serve their interest undergoing famine.
6. Poor technology is another major cause of famine. Many developing countries have poor techniques of food production since the agriculture sector is more dominated by subsistence forms of food production. These employ simple and rudimentary tools like hoes, pangas, digging sticks, sickles etc. In addition, most of the farmers do not apply fertilizers so as to replenish soil fertility thereby leading to low yields which cause persistent famine.
7. Inadequate research is another major cause of famine in many developing countries. In many countries, Agriculture research is very inadequate and in others it's completely lacking therefore people are still stuck with techniques of production as well as poor varieties of seeds and breeds of animals. This therefore results into low yields which are even of poor quality leading to inadequate food supply and famine in the long run.
8. Poor storage facilities are also major causes of famine. Post-harvest handling in many African and Asian countries is very poor due to lack of storage facilities

and this results into wastage of food especially after bumper harvests therefore during times of scarcity people have nothing to eat. Where silos and granaries have been constructed they aren't enough and others are in a sorry state leading to wastage of the harvested produce.

9. Poor marketing strategies are also responsible for the famine problem. It's not rare to areas within the same country undergoing famine simply because of the poor marketing techniques employed in such a country. In other words some areas are not aware of the availability of food in certain areas.
10. Emphasis on cash crops is another major cause of famine. Cash crops were mainly introduced in Africa and Asia by the colonialists as well as white settlers so as to get raw materials for their home industries. After their introduction people abandoned food production to grow cash crops thereby limiting the amount of food available in the area. This eventually led to famine e.g Ghana has been producing more cocoa and palm oil same applies to Nigeria, Kenya has been producing mainly tea, Brazil produces coffee and other crops and many other countries therefore such countries have undergone seasonal persistent famine as farmers have been producing more cash crops than food.
11. Rural Urban Migration is also a major cause of famine. The strong and able bodied youth usually leave the rural areas to come stay in urban areas. This therefore reduces the labour force in the rural areas like the young and old are left behind are too feeble/ weak to carry out meaningful cultivation.
12. Poor national food policies are also causes of famine. Many countries especially in Africa and South America lack national food policies and where they are, they are usually poor and many times on paper (theoretical). National food policies are usually undertaken to ensure self-sufficiency in food production through supervising food production as well as the available food stock. But in many countries of Africa and S. America, such policies are inadequate which has resulted into famine.
13. An imbalance in labour distribution is also a major cause of famine. In many developing countries of Asia, Africa and South America, most of the skilled workers want to stay in urban areas or town where there are services, industries as well as developed social and economic infrastructures leading to better Standards of living. This leaves the country side with inadequate labor which is unskilled and they cannot do much as far as scrub cultivation is concerned.
14. Cultural taboos and restrictions have also led to persistent famine in many parts of Asia and Africa. In some societies certain foods aren't eaten and begging is also a taboo e.g most pastoral communities do not eat fish while those regions that profess the Islamic faith do not eat pork. In some societies it's because of conservatism arising from cultural rigidities that people refuse to adopt new

and modern methods of cultivation e.g nomadic groups of the Sahel region which has resulted into famine.

15. Inadequate capital is also major cause of famine. Some countries cannot modernize their agriculture stems from a subsistence level to a modern commercial level due to lack of capital or its inadequate food supply which leads to famine in the long run.
16. Weak regional co-operation of integration is another major cause of famine. Many parts of Asia, Africa as well as S. America do not co-operate and where they tend to co-operate it's in other sectors rather than in agriculture of food production. Therefore it's common to find one country undergoing famine while another has plenty of food but it cannot give food to the famine shaken neighbouring countries.
17. Overdependence on food aid is another major cause of famine. Countries that have become accustomed to being given food aid are always looking forward to receiving other way that can improve on food production as they always feel that they will be given food aid thus leading to persistent famine in such countries.

EFFECTS OF FAMINE

1. Loss of national pride is one of the major effects of famine. Countries that have experienced famine especially persistent famine and thus are heavily dependent on food aid tend to lose their national pride as they usually go on begging sprees to other countries so as to get enough food and with time they become labeled international beggars.
2. Massive death is another major effect of famine e.g in the Ethiopian famines 1983-1985. Over one million people died in Somalia from 2010-2012 over 400,000 people died. Many countries of the Sahel e.g Mali, Chad, Niger, Mauritania, Ethiopia etc have lost many people due to persistent famine.
3. Migrations also occur when famine strikes. Many people are used to migrate to areas where they expect some relief e.g the famine problem in West Africa led to migrations as many people moved from Chad, Senegal, Benin, Mauritania etc. into Nigeria, Ghana, etc and these usually bring up migration problems to the place of destination e.g increase in crime rates, unemployment, occasional fights etc.
4. Increased importation of food is another major effect of famine. Many countries which undergo famine tend to import more food from other countries so as to replenish the food stocks in the country, In so doing, plenty of forex is spent and this tend to impact on the economic growth and development of the country.

5. Persistent famine leads to stunted economic growth and development as all resources of the country undergoing famine tend to be channeled towards food importation as well as measures to combat famine thereby limiting resources allocation to other sector of the economy and this stunts the country's economic growth and development.
6. Rise in food prices is another major effect of famine. Many countries undergoing famine tend to have a phenomenal increase in prices of food as demand exceeds supply and this leads to more food shortage as businessmen hoard the food so as to make abnormal profits.
7. Starvation also results from famine. In 1992, one of the worst drought ever recorded in living memory occurred in South Africa destroying all the crops and grazing lands. This therefore threatened millions of people with starvation as regular means couldn't be afforded and people had to resort to 1meal a day or in some case few meals a week.
8. Diseases are also common during times of famine. This is so as people become malnourished which reduces their level of immunity making them prone to disease attack. This usually leads to death in the long run.
9. Cannibalism is another effect of famine and this has been witnessed in several countries to persistent famine as man turns to fellow man for food. Usually the young, old and disabled are eaten by the strong bodied leading to loss of lives.
10. Political instabilities and riots are also major effects of famine. In many countries with famine problems, political and civil strife become rampant as most people tend to blame the current government for the famine problem. Therefore they become rebellious and in some cases they rise up in arms against such governments leading to loss of lives and destruction of property e.g in Somalia, Chad, South Sudan, and some West African countries like Niger etc.

POSITIVES

1. Famine checks on rapid population growth through massive death.
2. Famine encourages hard work so as to produce enough food and avoid being labeled international beggars
3. It stimulates research either by the government or individuals with the major aim of looking for solutions to solve the famine problem.
4. Famine also brings about innovations and inventions as people strive to stay alive during such trying times.

ENVIRONMENTAL DEGRADATION

Environmental degradation refers to the ways in which the environment is destroyed. It's also defined as the deterioration of the environment leading

to its loss in quality and productivity. Environment refers to man and his surroundings e.g air, water, vegetation, living organisms, land or soil. The misuse or overuse of these surroundings is leading to environmental hazards like accelerated erosion, desertification, pollution, floods, droughts, etc.

CAUSES OF ENVIRONMENTAL DEGRADATION

1. Poor farming methods are one of the major causes of environmental degradation. Such methods include monoculture practices, overgrazing which is a result of over stocking of animals, ploughing up and down the slopes etc. Monoculture results into soil exhaustion since some nutrients are always removed from the soils for a longer period of time. Over stocking is more common in pastoral areas and this results into overgrazing e.g Masai land of Kenya, Karamoja area of Uganda, Fulani lands of West Africa etc. removal of the vegetation cover making the soils vulnerable to agents of erosion especially wind and running water which results into loss of soil fertility as top soils are usually washed away, destruction of underground water sources and increased drought.
2. Deforestation is also a major cause of environmental degradation. Massive clearing of forests has taken place in countries like Brazil and Indonesia being some of the countries with a high annual deforestation rate. This is basically as a result of increased population as well as increase in demand for timber and wood fuel. The loss of the forests has led to reduced rainfall amounts, increase in soil erosion and unreliable water supply.
3. Increased swamp reclamation is also a major cause of environmental degradation. large scale reclamation of swamps is carried out in many developing countries due to increase in population and lack of land for settlement and agriculture. This has taken place in countries like Uganda, Sudan, China, Rwanda, Kenya, Nigeria etc. When swamps are cleared, there is serious water shortage as the immediate consequence. There claimed land may become arid and unproductive and it also lowers down the water table. Swamps are also habitats to wildlife e.g the crested crane and these are forced to migrate due to swamp reclamation.
4. Increased pollution is also another cause of environmental degradation. This is mainly due to increasing industrial activities. Industries release toxic gases e.g sulphur dioxide and carbon monoxide into the lower atmosphere leading to air pollution. Increased use of automobiles also causes severe air pollution due to the emission of harmful gases like carbon monoxide from their exhaust pipes. Noise is also caused by industrial machinery, automobiles as well as planes which distributions the natural serenity of certain areas. Increased

pollution has led to body irritations, deafness, inhabited visibility as well as death of plants and animals leading to degradation.

5. Rapid population increase is another major cause of environmental degradation and this is common in many developing countries. The increase in population leads to increased demand for land for settlement, agriculture and other land uses. This has resulted into clearing of the forest cover, destruction of marginal lands, land fragmentation etc together with their various consequences and this evidenced in countries like China, Rwanda, India, Indonesia etc
6. Over fishing is another major cause of environmental degradation. The uncontrolled exploitation of fish resources in the various fishing grounds both in land and marine has also led to degradation. This practice of over fishing has been so much evidenced in the international waters being exploited by many fishing countries e.g The Pacific Ocean being shared by Japan, China Russia and Korea and the Atlantic being shared by many countries like Norway, Sweden, France, UK and Netherlands etc. This is due to the increased demand for fish and use of indiscriminate methods like trawling. This has led to the reduction of the fish stock and also depletion of some species like blue fin, Tuna in Japan, Alaskan Pollack in Canada and Bonito in Peru.
7. Mining and quarrying activities are also major causes of environmental degradation. Extraction of minerals ores in many parts of the World e.g in the Ruhr region of Germany, parts of USA, Manchuria region of China, the Witwatersrand and region of South Africa etc has led to degradation. Mining and quarrying destroys the scenic beauty of the environment leads to exhaustion of the ores since most of them are non-renewable, causes pollution especially air and noise and after the minerals have been exhausted it leads to formation of derelict land.
8. Poaching in another major cause of environmental degradation. The illegal hunting and killing of wild game has exposed fauna and flora to threats of depletion. This is so especially in natural parks and game reserves and some of the countries where poaching has escalated include Kenya, Uganda, Zimbabwe etc. In Kenya the elephants have decreased tremendously due to the increased demand for elephant tusks, the Rhino population in Uganda has also reduced due to increasing demand for its valuable horn. Other animals are poached for meat and this reduces on their number.
9. The increasing use of fertilizers especially chemical fertilizers has also caused environmental degradation. Man uses chemical fertilizers so as to increase soil fertility however, the increase use of such chemical fertilizers leads to death of some soil organisms and at times increases loss of fertility in some

soils due to over usage. When it rains these chemicals are washed down into streams/ nearby rivers leading to water pollution and death of aquatic life. The chemicals also seep underground leading to contamination of underground water sources.

10. Construction activities are also a major cause of environmental degradation. This is mainly due to increased demand for houses and other infrastructures. Through such activities there is grading of steep slopes, under cutting of highlands or rocky areas, noise pollution, deforestation as well as destruction of the scenic beauty of environment leading to environmental degradation.
11. Political instability is also a major cause of environmental degradation. When instability occurs, there happens to be degradation e.g. deforestation takes place so as to flush out rebels, burning of vegetation together with various gases and chemicals which are produced by the numerous weapons e.g. bombs and artillery. These cause air pollution as well as death of humans or maiming which reduces man's productivity.
12. Climatic hazards are also a major cause of degradation. Although many climatic hazards are due to man and his activities, others may come as up as events of the natural routine of climate e.g. Heavy rainfall amounts being received in certain seasons e.g. El Niño, prolonged droughts, hail storms, cyclones, hurricanes etc. All these result into environmental degradation e.g. death of people, destruction of vegetation and property etc.
13. Pests and diseases are also a major cause of environmental degradation. Locusts, crickets, tsetse flies, caterpillars, army worms and other types of worms often destroy crops and existing vegetation e.g. Locusts have caused the destruction of plant cover in the Sahel region of Africa leading to low food productivity and hence famine. The spread of Nagana and other cattle diseases like East coast fever, foot and mouth diseases, Bovine pneumonia etc. has led to loss of animals and their productivity. Human diseases like Ebola, covid-19, tuberculosis, malaria, sleeping sickness, HIV etc also reduces the productivity of man thus causing degradation.
14. Natural calamities or catastrophes are also a major cause of environmental degradation. Volcanic eruption, landslides earthquakes etc usually destroy vegetation, animal life and also disfigure landscapes when they occur which leads to degradation of such areas e.g. the 1979 violent eruption occurred in the Cameroon highlands leading to death of people and also cutting off the boarder road between Nigeria and Cameroon. Landslides are common in highland areas e.g. East and South West Uganda, Brazil, Nepal etc and all these lead to degradation.

15. Bush fires especially wild bush fires are also a major cause of degradation. These usually occur in semi-arid areas as well as temperate regions especially during summers. Such fires cover extensive areas and destroy anything found within their passage. E.g. they are common in Australia, California and the Sahel region of Africa leading to destruction of vegetation, and death of people as well as destruction of properties.
16. Poor soils are also a major cause of environmental degradation. Some areas have naturally poor infertile soils which cannot allow growth of vegetation so as to cover the ground and limit the effect of soil erosion in such areas, wind erosion is very common resulting into accelerated soil erosion and thus degradation of environment through air pollution as well as reduction in fresh air.
17. Limited surface drainage e.g. Lakes, Rivers and Swamps as well as other sources especially inland areas has also led environmental degradation. Some areas naturally lack surface water drainage e.g. Lakes and Rivers and therefore such areas become barren with poor sandy soils that are easily eroded, limit growth of plants and usually cannot attract people for settlement. This leaves the areas under influence of agents of erosion that degrade the areas the more.
18. The sinking of bore holes as well as construction of valley dams is another major cause of degradation. Drilling of bore holes in semi-arid areas usually lowers down the water table making plant roots unable to reach underground water and this results into wilting and drying up of the vegetation. This makes such areas lack vegetation cover and thus increasing the effect of wind erosion which leads to environmental degradation.
19. Strong winds especially those experienced in areas with harsh climatic conditions like deserts and semi-deserts have also led to environmental degradation. such winds like the Harmattan, sirocco, khamsin as well as the North East trade winds and South East trade winds increase over transpiration from the few plants which are found there leading to desiccation and erosion resulting into drying up of all vegetation and thus increasing erosion which are all manifestations of environmental degradation.
20. Poor government policies especially on conservation of the environment are also a major cause of environmental degradation. Most governments in developing countries haven't supervised conservation policies aimed at restoring the environment. Therefore, this has led to massive deforestation, swamp reclamation and many other activities leading to misuse of the environment leading to environment degradation.
21. Limited environmental awareness or ignorance is a major cause of degradation. In many parts of the developing world, people are not aware of

the danger of various activities like over grazing, swamp reclamation poaching, high birth rates etc. It's mainly due to low levels of education leading to high illiteracy rates and little awareness. This leads to continued degradation.

22. Poverty is another major cause of environmental degradation. In some areas people are so poor due to lack of access to opportunities. This makes them turn to the natural environment to milk out a living resulting into deforestation, swamp reclamation, poaching etc.

EFFECTS OF ENVIROMENTAL DEGRADATION

1. Loss of soil fertility due to over cropping and misuse of the land.
2. Deterioration of underground water sources and prolonged drought.
3. Accelerated soil erosion leading to low crop yields and formation of ugly landscapes (bad lands)
4. Serious water shortage due to reduced rainfall amounts
5. Flooding due to the cultivation of the river banks leading to loss of property and life.
6. Loss of flora and fauna especially through poaching
7. Decline in tourist activities leading to los of forex.
8. Excessive pollution and its adverse effects
9. Increase in surface temperature
10. Slowing down the rate of soil formation
11. Decline in crop yields
12. Decline in fish catch and fishing activities
13. Migration of some species from one area to another
14. Loss of livestock and gradual decline of the livestock industry.
15. Generally causing unhealthy, poor and unfavourable living conditions leading to under development.

MEASURES TO CONTROL ENVIRONMENTAL DEGRADATION

1. Use of modern methods of farming e.g terracing, crop rotation, agro-forestry, mulching etc.
2. Carrying out of afforestation and re-afforestation programmes so as to conserve vegetation cover.
3. Use of alternative sources of energy other than wood fuel e.g solar energy, wind energy.
4. Control of overstocking outlawing it.
5. Controlling swamp reclamation

6. Sensitizing the masses about environmental degradation and other environmental concerns.
7. Treatment of industrial and other types of waste by dumping or disposal.
8. Laws should be enacted spelling out the details of environmental degradation and the penalties of each.
9. Reallocating excess population to sparsely populated areas.
10. Undertaking agro forestry replanting of trees intermixed with crops so as to cover the ground and reduce erosion.
11. Regulating the rate of exploitation of forests, fisheries, minerals so as to solve the problem of over exploitation
12. Refilling of trenches and gulleys in these areas affected by accelerated erosion.

POLLUTION

Pollution refers to any process that leads to contamination of the natural environment. The substances that pollute the environment are referred to as pollutants. There are various types of pollution like water, air, noise, soil as well as radiation pollution. Each of these forms or types has its own causes and effects and some are caused by similar events that may almost have similar consequences.

Pollution also has some hidden dimensions i.e. In Some cases it useful especially to plants and organisms e.g a high concentration of carbon dioxide in the atmosphere is harmful to animals but useful to plants as it helps in the process of photosynthesis.

FORMS, CAUSES AND EFFECTS OF POLLUTION

WATER POLLUTION

This refers to the contamination of water bodies. e.g lakes, rivers, oceans, aquifers and underground water. It occurs when pollutants are directly or indirectly discharged into water bodies without adequate treatment to remove harmful compounds. Polluted water is unsafe for use by both man and other organisms. Severely polluted areas are those near the coast, lake-shores as

well as some river valleys like the Nile, Niger, Congo, Indus, Ganges, Volga, and Rhine etc.

Causes of water pollution

1. Solid wastes are major causes of water pollution. Biological wastes from large cities, municipalities and large areas tend to cause water pollution. This happens when solid and industrial wastes are dumped into rivers and streams and sometimes when it rains, rain water seeps thru garbage heaps and joins water bodies. In countries like Netherlands, France, Germany and others where factory farming and zero grazing are common, animals create plenty of biological waste which tend to be dumped into the nearby water bodies.
2. The extensive use of soil additives e.g. chemical fertilizers so as to maintain soil fertility has also led to water pollution. When it rains, water dissolves the fertilizers and other chemicals which percolate into the deeper layers of the soils and thus contaminating underground water sources. When these chemicals dissolve they form acids or bases that eventually run into water sources like rivers and lakes.
3. Oil spills are also major causes of water pollution. Marine accidents as well as oil trucks accidents are often cited as causes of water pollution. When such oil tankers are involved in accidents the oil spills into oceans, lakes, rivers etc. other spills are due to the bursting of oil pipelines or leakages from underground oil mining centers as well as pipelines like what happened in the gulf of Florida (USA) due to the bursting of oil pipelines owned by shell B.P leading to the contamination of the waters of the Atlantic Ocean for a very wide area.
4. Industrial wastes are also major causes of water pollution. Such wastes which are untreated before dumping have caused pollution in many countries. Some of it is solid waste and others are in liquid form and when these are dumped into nearby water bodies like rivers and lakes, they cause pollution. This is so because such industrial wastes contain pollutants like lead, mercury, sulphur, asbestos, nitrate etc. These toxic chemicals have the capability to change the colour, smell and other properties of water. Countries that are highly industrialized have therefore led to increased water pollution in the industrialized areas. E.g. New York, London, Calcutta, Bombay. In Kenya, sugar molasses and other wastes from Mumias sugar refinery have heavily polluted River Nzoia.

5. River deposition is another major cause of water pollution. Cultivation along river banks and the location of industries along the banks of rivers has led to contamination of the rivers. Sandy soils, garbage and all other types of wastes usually fall into the river channel either accidentally or deliberately and thus contaminating such rivers the rivers then transfer the pollutants to the oceans and seas.
6. Agricultural chemicals used in gardens and on farms in both developed and developing countries are also a major cause of water pollution. These chemicals are majorly sprayed on animals, crops as well as in the air e.g herbicides, pesticides, insecticides etc. Rain water dissolves such chemicals leading them to the nearby water channels or sources E.g Rivers and lakes and hence contaminating them.
7. Nuclear tests especially those done by developed countries like USA, Russia, UK, France especially in water bodies like seas and oceans often contaminate these waters. Such nuclear tests release harmful toxic substances into the water bodies like the Pacific and Atlantic oceans thereby contaminating such water e.g USA and China usually carry out nuclear tests in the southern pacific which has contaminated such waters.
8. Water weeds are also major causes of water pollution. These weeds usually regenerate and multiply very fast thereby covering large water surfaces and this hinders the penetration of oxygen and light into such water and when the weeds decompose in the water, they contaminate it by changing its taste, smell and colour.
9. Volcanic eruptions are also major causes of water pollution. Some oceans have under water volcanoes which are still active and therefore they continue to erupt. e.g the Atlantic Ocean, the Caribbean Sea and the Pacific ocean. When such volcanoes erupt they increase the water temperature and also release ash, pyroclastic material and chemicals into the water causing water pollution. At other times the volcanoes are on land but after erupting materials like ash, lava and others are spewed into nearby water bodies.
10. Algae blooms are also major causes of water pollution. Such blooms are caused by excess nutrients from algae cell death and decomposition. This changes the colour of the water to green and also other properties of water like smell and taste.

Effects of water pollution

1. Spread of water-borne diseases like typhoid, dysentery, cholera etc and this has been a major problem in many big cities especially in developing countries.
2. Reduction of safe drinking water since most of the water sources are polluted.
3. Increasing costs of water treatment so to make it safe for human consumption.
4. In the process of purifying contaminated water, useful mineral salts contained in underground water are lost especially iron and magnesium yet these salts are so important in the growth and development of the human bones.
5. Loss of marine life especially plankton and other aquatic life due to contamination of the waters and at times pollution also affects the breeding patterns of fish and aquatic life.
6. Navigation is affected due to water pollution e.g when sediments accumulate at the harbor they limit anchorage of bigger vessels and also cause corrosion on the vessels which call for constant repairs.
7. The scenic beauty is affected or destroyed as the once clear blue lakes change colour and develop foul smells due to water pollution. This pushes away tourists leading to reduction in tourist revenue.
8. Agriculture is also affected as the contaminated river silts are usually deposited off the river banks and these contaminate the soils leading to a reduction in crop yields.
9. Chemical substances dumped in water bodies react and corrode irrigation pipes, water pipes, and sewerage disposal systems etc. all of which cause rusting and high maintenance costs.

Measures to combat water pollution

1. Treatment of industrial and domestic waste before disposal as to reduce the degree to toxicity and harm caused to water and other organisms.
2. Strengthening pollution legislation such that punitive/ harsh punishments are given out to people who cause pollution.
3. Oil spills should be cleared as well as solid wastes from the waters together with clearing heaps of municipal garbage.
4. An integrated management system should be put in place spelling out the average levels of water pollution and what should be done to the offenders.

5. There should be an agreeable way of disposing off wastes at regional and international levels by various countries as water pollution cuts across international borders.
6. Effective protection of water sources should be done e.g River sources, catchment areas etc.
7. Constant dredging to remove the silt and other solid wastes from the water bodies.
8. Combating soil erosion as its one of major causes of water pollution through terracing, construction of cover crops etc.
9. Alternative sources of energy should be used so as to reduce on the demand for oil products which tend to be major pollutants.
10. Water weeds should be removed from the water bodies using any means available so as to reduce on their harmful effects
11. Government should become more vigilant in supervising industries and other sources of pollution so as to reduce water pollution
12. The use of chemical fertilizers should be restricted and farmers taught how to make and use farm yard manure and other less harmful fertilizers.

AIR POLLUTION

Air pollution refers to the contamination of air through discharge of smoke, dust, fumes, pollen and other particles into the atmosphere. Smoke e.g may contain sulphur dioxide which is a poisonous gas that affects plants and animals. The emergence of global warming, acid rains as well as body irritations and cancers are true manifestations of air pollution.

Causes of air pollution

1. The increasing use of fossil fuels e.g coal, natural gas, oil has led to air pollution. Such fossil fuels are used in industrial complexes, automobiles, generators etc. These fuels emit into the atmosphere huge quantities of smoke containing carbon dioxide as well as carbon monoxide gases which pollute the air.
2. Increased use of auto mobiles in big cities and countries has also contributed to air pollution. Many people own cars and these contribute greatly to releasing of carbondioxide and carbon monoxide from their exhaust pipes as the end result of combustion using such fuels like diesel , petrol etc.
3. The burning of municipal waste in urban centres by city authorities or by town dwellers has also led to emission of gasses like carbon dioxide, carbon monoxide, sulphurdioxide etc into the atmosphere causing air pollution.

4. Increased industrialization also contributes to air pollution. This is because of the heat and gas emissions from such industries and that's why major industrial regions of the world like the Great Lakes of USA, the Ruhr region of Germany, Tokyo-Osaka conurbation of Japan etc. are heavily polluted areas.
5. Extensive bush burning especially by nomadic pastoral groups as well as subsistence farmers is another cause of air pollution. Bush burning leads to emission of carbon monoxide as well as carbon dioxide into the atmosphere which causes air pollution. The smoke itself inhibits visibility leading to accidents as well as choking after inhalation.
6. Nuclear tests especially by developed countries like France, USA, UK, China etc. have also led to air pollution. Through the testing of nuclear weapons, various gases like Sulphur dioxide, carbon dioxide etc. are released into the atmosphere leading to its contamination and hence causing air pollution.
7. Improper disposal of both solid and liquid wastes especially in urban areas and open waters or on the ground. When the sun rays directly heat such areas, the solid wastes and liquids emit foul smells due to evaporation caused by the sun.
8. Winds especially from desert areas are also major causes of pollution. These winds from the deserts sweep dust and deposit it in the surrounding areas. They also cause dust storms thereby inhibiting visibility, causing eye irritations as well as dirtying of clean surfaces and objects.
9. Mining and quarrying also cause air pollution. Opencast mining as well as drilling are major causes of air pollution. This is so because open cast mining raises dust and other gases into the atmosphere e.g. carbon monoxide and carbon dioxide gases and blasting by use of explosives also releases various gases into the atmosphere.
10. Volcanic eruptions are major causes of air pollution as volcanic mountains release dangerous gases as well as ash into the lower atmosphere. This ash can travel for thousands of Kilometres far away from the source e.g. Volcanic Mountains in Iceland which often erupt releasing tones of ash that affect Western Europe and spreads to as far as New Zealand and Japan.

Effects of air pollution

1. Inhibited visibility due to the dust particles which settle in the lower atmosphere as a result of air pollution. This impacts on air transport and other transport modes since visibility is low and thus accidents are common during such times.

2. Air-borne diseases i.e these diseases which usually spread through air e.g pneumonia, covid-19, tuberculosis, bronchitis, silicosis, rhinitis and plenty of allergies which affect people and at times lead to death.
3. Heavily polluted atmospheric air reacts with limestone and sulphur emissions forming severe fog and when these compounds react with iron sheets they cause rusting as well as discoloration of vehicles and buildings etc.
4. Acid rains are also caused by air pollution. They are due to high levels of sulphur and nitrogen which combine with water to form acids and these acids fall as precipitation on the ground. Some of the cities which usually receive acid rains include New Delhi, Karachi, Calcutta, Cairo, Mexico City etc.
5. Increased contamination of the air by dust and dust particles causes a reduction of isolation by between 15 to 20%. This s due to the blanket cover created by pollutants which reduce or limit the sun rays from reaching the ground.
6. Fresh air becomes scarce as levels of pollution increase and this creates a great need for air conditioning which is also costly.
7. Global warming which is a consequence of greenhouse gases like carbon dioxide, ethane, chloro fluoro carbons (CFCs). These destroy the Ozone layer such that direct rays of the sun some of which are ultra- violet reach the surface leading to an increase in surface temperature as well as skin cancers and irritations.
8. There will be loss of plants and animal life due to increased levels of pollution.

Measures to control air pollution

1. Change from fossil fuels to alternative sources of energy e.g. wind energy, HEP. Energy, solar power etc so as to reduce on the amount of carbon dioxide and carbon monoxide gases being released into the atmosphere.
2. Improvement in the combustion systems of vehicles such that less toxic exhaust fumes are given off by the auto-mobiles.
3. Chimneys from industries and households should be re-designed into long ones and filled with pollutant absorbers to reduce on the toxicity of the fumes.
4. Bush burning and forest fires should be controlled and monitoring systems put into place to detect fire outbreaks so that action can be taken before it spreads out of control.
5. Regular garbage collection and disposal must be undertaken by urban authorities.

6. Increasing use of personal cars should be discouraged and large automobiles should be introduced e.g. buses trains.
7. Regional and International co-operation should be encouraged since air pollution transcends borders and therefore a concerted effort by all countries is needed so as to arrest it.
8. Penalties and harsh punishments should be given out to vehicle owners and industries who release excessive carbon monoxide.
9. There should be increased use of masks and nose guards by workers in factories so as to prevent them from inhaling smoke and dust particles.
10. There is a need to create industrial zones far away from residential areas so as to keep humans from harm.
11. Afforestation and Re-afforestation should be under taken in many areas especially industrial areas so as to trap the dust from major industries and also make use of carbon dioxide gases from such industries by the trees.

SOIL POLLUTION (LAND POLLUTION)

Land pollution refers to the contamination of soils through dumping of various pollutants e.g. inorganic elements like heavy metals that are highly toxic to both animals and plants, It results into loss of fertility as well as pollution of underground water sources with its negative effects.

Causes of soil pollution

1. Excessive use of farm chemicals e.g. pesticides, herbicides etc which add toxic substances to the soil eventually making it contaminated e.g. the increasing use of Dichloro Diphenyl Trichloro ethane (DDT) which is one of the most effective but highly toxic pesticide that has far reaching effects to the soil.
2. The increasing use of fertilizers so as to increase crop yields has also contributed to soil pollution. Fertilizers like nitrates, potassium, phosphorus, etc contain toxic and basic components that affect the soil leading to infertility of the soil in the long run.
3. The dumping of industrial wastes also leads to soil pollution. Fuels e.g. oil, dyes liquids, residues etc when dumped on the land surface increase the toxicity of such land which reduces its capacity to take in water and hence reduces its productivity.
4. The improper disposal of human and animal wastes is also another cause of soil pollution. Very often sewerage pipes burst and take long before being prepared. Therefore fecal matter accumulates on land, and decomposes and mixes with soil. In other areas people do not use toilets and so dispose of human wastes anywhere leading to soil pollution which reduces the productivity of such soils.

These human and animal wastes increase the concentration of uric acids, ammonia etc in the soils.

5. Acid rains also contribute to soil pollution. This is so because acid rain itself is polluted and contaminated and therefore on reaching the ground surface, it contaminates the soils making them more acidic and thus less productive.
6. Large scale irrigation projects also lead to soil pollution. Such irrigation projects lead to the accumulation of bases especially magnesium, potassium, iron and manganese on the top layers of the soil. These bases with time affect the fertility of the soils making them less productive since they are contaminated. This has happened at Gezira irrigation scheme in Sudan, Richard toll irrigation Scheme in Senegal, the Awash valley irrigation scheme in Ethiopia.
7. Poor garbage disposal systems especially in urban areas is also a major cause of soil pollution. Hospital garbage is usually very harmful because it contains dangerous chemicals from drugs as well as human body parts removed during operations. Municipal garbage in many developing countries isn't properly collected and disposed of leading to the accumulation of garbage heaps in cities like Kampala, Nairobi, Khartoum, Dakar in Senegal, Rawalpindi etc such garbage usually rots and decomposes from the area where it's dumped and with time mixes up with soil leading to its contamination.
8. Mining and smelting operations are also major causes of soil pollution. Mining operations in countries like Liberia, DRC, Rep. of South Africa, Zambia etc makes the ore to dissolve either wholly or partially with the aid of rain water. The substance formed later percolates into the soils leading to their contamination. Refuse or waste from smelting plants is often heaped up in nearby areas e.g. cobalt refuse has been heaped up in the surrounding areas of Kilembe as a result of copper mining so when it rains, water runs through the heaps of cobalt and finally percolates into the soils leading to their contamination.
9. Nuclear accidents and leakages at nuclear sites are also major causes of soil pollution such accidents have occurred in Japan e.g at Fukushima and Kobe leading to contamination of the soils and usually after such accidents nothing grows in such areas due to the contamination. The worst nuclear accident to date occurred at Chernobyl in Russia where nuclear refuse and other substances heavily polluted the surrounding soils making them barren or infertile for the growth of crops.
10. Domestic waste is also major cause of soil pollution. If this waste accumulates without either being burnt or disposed of. It rots on land and therefore contaminates the surrounding soils. At times when it rains water seeps through the garbage forming harmful substances which contaminate the soil. One of the major components of domestic waste is polythene which isn't biodegradable (doesn't rot). And therefore wherever it is dumped, the soils

underneath are mostly affected as rain water cannot seep through the soil and therefore soil forming processes are hindered.

Effects of soil pollution

1. The productivity of land is mainly affected by the soil additives and turns originally fertile land into barren or infertile land.
2. Solid wastes offer good breeding grounds for disease causing agents with the major diseases being cholera, malaria as well as cancer.
3. Soil pollution causes contamination of underground and surface water making such water harmful to humans as well as plant life.
4. Dangerous substances in the soils affect plants by either causing withering or complete drying up of the plants especially uric acids and ammonia.
5. The process of cleaning up contaminated land surfaces due to nuclear or industrial wastes is very costly as it requires use of advanced technology.
6. Corrosion of metal objects is very common in areas that are heavily polluted e.g water pipes and other farm equipment resulting into high maintenance costs.
7. Famine can also result from the decline in the soil fertility and thus leading to its negative consequences.
8. There might be loss of plant and animal life as well as human life when crops grown in contaminated soils are taken by humans, thereby affecting their lives and at times leading to their death e.g yams grown in contaminated soils usually contain a higher concentration of lead or lead substances which are harmful to man.

Measures to combat soil pollution

1. Burning of waste material so as to reduce decomposition and percolation of acids into the soils.
2. Construction of garbage pits in homesteads for proper disposal of domestic waste.
3. Minimize the use of insecticides ie chemicals and chemical fertilizers
4. Abolish the use of DDT due to its marked effect on the growth of organisms which contribute to soil development.
5. There should be increased use of fertilizers e.g mulches and farm yard manure instead of chemical fertilizers.
6. Fuel wastes and other industrial waste should be treated before being disposed on land.
7. Nuclear tests and operations should be completely abolished and where nuclear accidents have occurred, clean up exercises should be undertaken.

8. Irrigation water should be de-salinized so as to fight the accumulation of salts especially of magnesium and calcium.

NOISE POLLUTION

Noise pollution is the excessive, disturbing or annoying levels of sound to the ear that may harm the normal activities of both human and animal life. It is mainly experienced in every country developing or developed and it's a major pollutant particularly in urban as well as industrial regions. Noise is measured using a sound meter and the units of measurement are called decibels (db). Zero (0) decibel is the quietest sound that a human ear can detect and similarly sounds of more than 80 decibels are harmful to the ear.

Causes of noise pollution

1. Heavy traffic movement especially in urban areas and along high ways. The movement of traffic comprising of Lorries, trucks, buses, motorcycles etc creates noise production and this is due to the sound coming out of their revving engines or from their exhaust pipes and the vibrating caused by the movement of such automobiles. Areas near air ports also experience too much noise pollution due to the taking off and landing of aircrafts.
2. The playing of loud music on open trucks especially during campaigns, sales promotions and public functions. When too much music is played during such events it affects the human ear leading to deafness and at times psychological disorders.
3. Military conflicts especially those involving bombing and artillery gun fire are also major causes of noise pollution. During war bombs are dropped and blasted

and artillery rockets are fired at enemy positions. Such weaponry results into noise and causes noise pollution.

4. Industrial development is another major cause of noise pollution. Factories and manufacturing industries give off excessive noise through their machine operations and the people nearby always face noise pollution even making communication difficult in such a noisy environment.
5. Workshops e.g furniture, black smiths and other small scale workshops are also major causes of noise pollution. This is so mainly due to the clutter, banging, hitting and all other types of activities carried out from such workshops as people try to make different products.
6. Excitement especially at leisure activities e.g football matches, wrestling, boxing and all other types of games is another cause of noise pollution. During such recreational activities, people make too much noise as a way of motivating their teams or by celebrating wins. This type of noise made is at times deafening noise which results into noise pollution.
7. Mining and quarrying operations are also major causes of noise pollution. During mining, noise is given off through blasting of the mineral bearing rocks by use of explosives so as to loosen them for easy transportation and processing. Therefore noise is given off during such operations resulting into noise pollution.
8. House hold activities and gadgets are also major causes of noise pollution e.g juice blenders, vacuum cleaners, washing machines, drillers etc when being used they give out noise which is irritating to the human ear and thus leading to noise pollution.
9. Poor urban planning is another major cause of pollution. In some developing countries many urban centres lack well laid out plans resulting into haphazard growth where by residential areas and industrial centers are in same environs or where residential areas are near airports or recreational centres. This leads to people who stay in such areas to usually experience noise due to the, recreational activities and landing of aeroplanes leading to air pollution. Constant constructions and repairs of roads, buildings, etc also cause pollution.
10. Natural disasters or calamities are also known to cause deafening or irritating noise. Earthquakes, volcanic eruptions, hurricanes, thunderstorms, tornadoes often cause noise pollution wherever they happen.

EFFECTS OF NOISE POLLUTION

1. Noise many cause loss of sleep especially if it's too much and sleep deprivation is a leading cause of traffic accidents.
2. Through research, medical doctors have discovered that too much noise may cause permanent deafness or hearing loss as the ear drums get

affected and this has been proven among combat soldiers especially those who use heavy weapons like artillery (RPGs)

3. Too much noise also leads to headaches and can trigger off migraines.
4. Communication problems also results from too much noise since noise pollution hinders speech and listening. This causes communication problems since people cannot communicate freely.
5. Too much noise also leads to nervous disorders as a person who is a victim of noise develops nervous feelings and anxiety about noise which may lead to psychological disorders like hallucinations.
6. Too much noise also leads to annoyance and it's a major cause of domestic violence.
7. Too much noise also leads to cardiovascular issues as it raises the blood pressure levels leading to cardio-vascular diseases like stroke and heart failure because it increases the heart beat rate which disrupts normal blood flow.
8. Noise pollution also has several effects on wildlife e.g in wild animals too much noise increases the risk of death by altering predator-prey detection and avoidance. Animals heavily depend on sound for their survival and therefore if they cannot hear warning calls from other members of the same family, they are likely to be eaten by predators hence reduction in their numbers.

Sounds also interfere with the reproduction system of animals especially wild animals since mating calls won't be heard thereby reducing on the rate of reproduction and hence a reduction in their numbers

9. Some animals require sound waves to echo locate and find their way when migrating from one area to another. Therefore if there is too much noise being experienced in an area, such sound waves won't be picked by these animals thereby getting lost easily.
10. Noise pollution basically reduces the natural quiet in any environment making it unsuitable for human habitation since it leads to emotional imbalances as well as making living conditions in such areas unbearable.

Measures to combat noise pollution

1. Strengthening the silencing fitting of vehicle exhaust pipes so as to reduce on the amount of noise being given off by such vehicles.
2. Buildings in urban areas, industrial cities and near airports should be made soundproof and this be done by plastering their inner walls with sound proof materials.

3. People working in noisy environments especially factories should wear ear plugs so as to reduce on the noise in-take which tend to injure their ear drums.
4. Night clubs and other recreational facilities emitting noise shouldn't be allowed in residential areas but should be set up in completely gazetted areas or industrial areas.
5. Playing of music in the open especially at higher volumes during sales promotions and campaigns should be outlawed. A maximum decibel level should be set beyond which the culprits are heavily fined or imprisoned.
6. Sound barriers can be put beside high ways, air ports and other noisy areas e.g by putting up soil embankments, or vertical concrete walls to reduce on the high way noise.
7. Use of double planed windows and doors in residential houses so as to limit the amount of noise coming in from the outside.
8. Planting of vegetation especially trees and bushes around residential areas since they absorb sound.
9. Relocation of sound sources to different areas e.g generators far away from the homes, air conditioners etc.
10. Turning off electronics and other home appliances when not needed.
11. Cancelling out noise by creating peaceful sounds around yourself e.g. by putting up hanging wind chimes, turning on a fan or running a small water feature.
12. Regularly cleaning your ears as large amounts of wax can cause an annoying ringing sound in your ears called tinnitus.

Visual sight radiation pollution

This type of production is mainly caused by harmful rays from the sun, fires, smoke and radioactive material. Radiation of about 0.1 Rads is harmless but more than that becomes harmful.

Visual pollution is caused by seeing unwanted material or material that is too destructive to look at e.g too many colorful bill boards being put up in one area or a large heap of garbage which destructs or hinders some good mountainous view.

Causes of radiation pollution

1. Natural radiation is one of the major causes of visual or radiation pollution. This occurs due to the cosmic rays that reach the surface from space and also due to terrestrial radiation from radioactive elements present in the earth's crust.

Such radioactive elements include Radium 224, Uranium 235, Uranium 238, Carbon 14, which occurs in rocks, soil and water.

2. Mining and refining of plutonium and Thorium. This is mainly through production of nuclear power as well as weapons. Explosions from nuclear weapons as well as power plants also lead to radiation pollution.
3. The production of nuclear weapons and their testing also causes radiation pollution since large amounts of radioactive materials like uranium 238, Iodine 131, Cesium 137 and others are transformed into gases and fine particles which are carried to distant places by wind. When rain falls, the particles fall on the ground and are referred to as nuclear fallout from the soil, these radioactive substances are taken by plants there by reaching humans and animals through the food chain.
4. Atomic reactors are also major causes of radiation pollution. Waste from reactors (nuclear waste) when dumped anywhere creates inert gases and halogens which escape as vapour and cause pollution. At other times accidents occur at the reactors resulting into radiation explosions like it has occurred at Fukushima and Kobe in Japan, Chernobyl in Russia.
5. Radio isotopes mainly used in scientific research are also major causes of pollution. Waste water from different scientific research studies which contains radiation elements usually reach lakes and rivers and later they are taken up by man through the food chain e.g eating fish which contains radiation.
6. X-rays and radiation therapy are also major causes of radiation pollution. Usually people are advised to carry out diagnostic x-rays as well as radiation therapy so as to treat certain cancers. In so doing, humans are exposed to more radiation leading to various diseases.
7. People working in nuclear power plants, fuel processors, nuclear reactors or living near such areas are always vulnerable to radiation exposure thereby resulting into various cancers and other diseases.
8. Dumping of radioactive materials or waste either on the ground or in water bodies also leads to radiation pollution since in one way or another such radiation finds its way into man or crops as well as animals through the food chain.
9. Excessive sunshine during peak times as well as light from the sun's rays which affects sight causing visual pollution and might lead to partial or total blindness.
10. Excessive smoke especially from factories, forest fires as well as from vehicles. This causes visual pollution as it irritates the eyes and at times lead to radiation pollution.

11. Increasing use of computers, TVs especially CRTs (cathode ray tubes), mobile phones especially in dark areas also causes visual pollution.

Effects of visual/ sight pollution

1. Exposure to uranium and other radioactive elements may cause skin burns and cancers as it destroys the skin cells together with the intestinal lining, bone marrow as well as embryos.
2. Short range effects include;
Loss of hair, nails as well as change in the number and proportion of blood cells together with continuous bleeding.
3. Long range effects include; Genetic changes, mutations, shortening of lifespans for humans and animals as well as cancers.
4. Loss of natural appeal/ serenity of an area.
5. Partial or total blindness.
6. Eye irritations.

Measures to control

1. Leakage of radioactive materials from reactors, industries and nuclear labs should be stopped.
2. Radioactive waste disposal must be made safe i.e. It can be changed into a harmless form so that it can decay.
3. Preventive measures should be taken such that natural radioactive materials should not rise above permissible limits.
4. Shutting down nuclear reactors and stopping the use of nuclear energy.
5. Putting on protective goggles so to reduce on the impact of the sun's rays from reaching people's eyes.
6. Putting on sun visors on computers, TV screens and other light emitting electronic appliances to reduce on the glare which might affect the eyes.

REVISION QNS.

1. Account for the increasing levels of environmental pollution in either Western Europe or Western Africa.
2. What are the causes of air and water pollution in either USA or Egypt?
3. Examine the consequences of air and water pollution in either Germany or Republic of South Africa.
4. a). Account for the occurrence of pollution in either republic of South Africa or Japan.
b). Assess the effects of pollution on the environment in the country chosen above.

5. (a) Examine the causes of noise pollution in either India or Nigeria.
(b) What is being done in any one country above to reduce noise pollution?

DESERTIFICATION

Desertification is a type of land degradation where by a relatively dry land or region becomes increasingly arid by losing its bodies of water as well as vegetation and wild life.

OR.

Desertification can be defined a process where fertile land gradually transforms into desert land as a result of deforestation, drought or poor agriculture systems.

An area experiencing desertification starts receiving reducing rainfall amounts and reliability, increase in environmental temperatures, loss of water retentiveness in the soils leading to low levels of soil moisture, rising levels of salination especially in areas with irrigated fields, higher incidences of soil erosion and excessive blowing of dusty winds. Such areas become unproductive, barren to plants and incapable of supporting livestock.

Areas near to the deserts are at a greater risk of desertification and that's why desertification is more permanent in the Sahel region of north Africa comprising of countries like Senegal, Mali, Niger, Northern Nigeria, Mauritania, Burkina Faso, Chad, South Sudan, Ethiopia etc. in South Africa areas bordering the Kalahari and Namib deserts are also at great risk of desertification like Botswana, Zimbabwe, Zambia and the south African republic.

Other countries of Africa far away from the deserts are also experiencing desertification like Uganda, Kenya, Tanzania and Rwanda. Desertification is a result of several factors some are physical while others are human but all in all human factors or man-made factors are more responsible for the expansion and extension of desert like conditions in areas that were formally productive.

CAUSES OF DESERTIFICATION

Physical factors;

1. **Harsh climatic conditions** are a major cause desertification. Formerly productive areas like Sahel region of Africa have started experiencing desert like conditions like reduced rainfall totals and hot surface temperatures. This is manifested through the prolonged drought being experienced in some countries of the Sahel like Mali, Chad and Niger which used to get little seasonal rainfall but of recent they have become barren of vegetation cover, rivers and streams have dried up as well as increased soil erosion especially by wind leading to dust storms.
2. **Ocean currents** are also responsible for desertification. Cold ocean currents like Benguella and canary currents cause cooling of the on-shore blowing winds resulting into formation of rainfall off-shore. The winds continue to the mainland as dry winds and these sweep the mainland taking even the little moisture found there. This has been the major cause of aridity in North West Africa. These winds transfer desert like conditions from such arid lands to the neighboring lands which were formerly productive.
3. The **influence of hot dry winds** like Harmattan, sirocco and khamsin which blow from the Sahara desert to West Africa between December to February and the khamsin blows towards the Mediterranean lands. These wither plants through causing high evaporation rates as well as evaporation of water surfaces. Therefore, areas become barren of vegetation and are characterized by dry dusty winds.
4. **Lack of surface drainage** in form of lakes and rivers especially in Africa is also a major cause of desertification. Such surface water bodies usually modify the climate of the areas where they are found through evaporation leading to formation of convectional rainfall. However where they are lacking like in the Sahel region and in other areas of Africa, the areas remain cloudless resulting into increased insolation and hot surface temperatures which are all characteristics of desertification.
5. The **relief** of some areas has also led to desertification. Some areas of Africa are generally flat with no major highlands which would have acted as obstacles to rain bearing winds. This might have increased rainfall amounts but due to the flatness of such areas, rain bearing winds simply speed by leaving the areas more dry with limited rainfall and increased surface temperatures. Other areas are on the lee ward side of mountains which puts them in the rain shadow and therefore limited rainfall and reliability like south west parts of Ethiopia which are in the rain shadow of the Ethiopian highlands.
6. The **presence of poor soils** in certain parts of Africa is also responsible for the extension of desert like conditions into such areas. Such poor soils do not favour vegetation growth whether natural or planted and therefore areas are

denied the influence of vegetation on climate modification which makes them drier with conditions similar to those of desert areas.

7. **Pests and diseases** are also responsible in the extension of desert like conditions to areas which were formerly productive. Pests like locusts destroy vegetation whether natural or planted resulting into increased wind erosion, hot surface temperatures and low rainfall amounts which are also unreliable.
8. The **influence of wild animals** especially heavy grazers like giraffes, elephants, antelopes which destroy large expanses of vegetation and at times cause drying of the trees by eating away their barks. This has caused massive deforestation in the Serengeti plains as well as Masai Mara areas of Kenya and Tanzania.
9. **Distance from the sea** or continentality is another major cause of desertification. Areas of the Sahel like Chad, Niger, Mali etc are far away from the coast and as such they aren't influenced by coastal factors like land and sea breeze as well as the influence of on-shore rain bearing winds. Therefore they have a continental type of climate mainly affected by local factors and these are further hampered by man's activities like deforestation, over grazing. Therefore, desert like conditions easily extend into such areas or countries due to their far distance from the sea

10.

Human factors

1. **Deforestation** is a major cause of desertification. Man cuts down trees in his quest for firewood, timber for various uses as well as for settlement. This reduces the rate of evaporation and increases carbonic acids in the atmosphere. This results into cloudless skies, low humidity and also increases erosion by wind leaving behind infertile lower soil layers that bake in the sun and become unproductive hard pans.
2. **Land reclamation** in various parts of Africa is also another major cause of desertification. When swamps are reclaimed, the water table is lowered beyond the reach of vegetation and with time it leads to the drying up of such vegetation making formerly productive areas become barren with limited rainfall amounts and increasing surface temperature.
3. **Global warming** especially due to pollution is another major cause of desertification. Industrial production involves the discharge of carbonic compounds in the atmosphere. This has led to acid rains which further pollute the soils making them unproductive and also lead to reduced rainfall amounts in the areas.
4. **Poor farming methods** are also a major cause of desertification. Such methods include over grazing, over cultivation, shifting cultivation, monoculture etc leading to exhaustion of the soils. This makes them loose

and therefore prone to agents of erosion especially wind and running water. Poor methods of farming therefore cause remarkable reduction in the total rainfall received as well as increasing surface temperature.

5. **Extension of farmlands** into marginal lands as a result of increase in population is also another major cause of desertification. The increase in population increases the demand for food and food products. When farmlands are extended into marginal lands especially swamps and semi desert areas it results into deforestation leading to increased soil erosion especially by wind.
6. **Environmental degradation** or destruction is another major cause of desertification. Man has destroyed the environment through practices like deforestation, industrialization, settlement etc. as a result of this, there has been changing weather patterns of particular areas manifested by reduction in rainfall totals and reliability, loss of water retention in the soil as well as higher incidences of soil erosion in different parts of Africa.
7. The **sinking of many bore holes** especially in pastoral semi-arid areas has also led to desertification. When boreholes are sunk or drilled, they lower the water table making plants unable to reach and get water from underground. This also leads to drying up of the area resulting into desertification.
8. **Political instabilities** which lead to wars are also a major cause of desertification. The bombs and artillery pieces used in war lead to destruction of vegetation, death of man and also release toxic gases into the atmosphere. All these interfere with the weather conditions leading to reduced rainfall amounts and hot surface temperatures.
9. **Poor government policies** are also a major cause of desertification. Many governments in Africa do not have well laid out conservation policies aimed at conserving and preserving the natural environment. Therefore, man is left on his own especially in semi desert areas which have led to increased rates of deforestation, overgrazing, swamp reclamation etc which are detrimental to the environment leading to extension of desert conditions.
10. **Poverty** is another major cause of desertification. Many African countries are poor and the Sahel region comprises some of the poorest nations on earth. Therefore the lack of access to and opportunities by people in such countries has made them turn to the natural environment so as to milk out a living. Therefore deforestation, overgrazing and swamp reclamation are carried out by man due to his poverty levels and these have increased the expansion of desert like conditions in such areas.
11. **Ignorance and high levels of illiteracy** is another major cause of desertification. Many farmers and inhabitants of semi-arid lands or areas like Sahel region of Africa are ignorant of the effects of their activities onto the

natural and human environment. Therefore, they cut trees, overgraze the available swamps and carry out bush burning activities which have led to environmental degradation and also extended desert like conditions in such areas.

EFFECTS OF DESERTIFICATION

1. **Scarcity of water** due to prolonged drought as well as reduced rainfall amounts. Water for domestic, industrial, irrigation and many other activities becomes scarce and people have to trek long distances so as to get water. This scarcity of water is the major cause of death of animals and people mainly in the pastoral areas of the Sahel in countries like Mali, Chad, South Sudan and Ethiopia.
2. **Scarcity of food** is another major effect of desertification. In many countries undergoing desertification, massive crop failure has been realized as plants wither and dry up and the soils loose the little water there is to sustain plant life. Therefore, this has led to famine especially persistent famine in such areas leading to death.
3. **Loss of soil productivity** due to the loss of water retentiveness as well as loss of top fertile soils as a result of continuous erosion. Therefore this leads to reduction in the productivity of such soils.
4. Desertification results into **accelerated erosion** due to massive deforestation or drying up of the trees and plant cover which leaves the soils exposed to agents of erosion especially wind and running water.
5. **Scarcity of pastures** which leads to movement by nomads from one place to another and at times leads to death of their animals. This is due to the drying up of all plants in such areas like the Fulani and Tuaregs constantly move in different parts of north and West Africa as they look for pastures for their animals.
6. **Poverty** is another consequence of desertification as people can no longer depend on the agricultural sector due to desertification. Animals also die off leaving people with no major source of income and thus leading to the vicious cycle of poverty.
7. **Massive migrations** are another consequence of desertification. People tend to migrate from areas undergoing desertification to go and settle in other areas which are not having such problems. Of recent many people are migrating from the Sahel countries of Senegal, Mali, Chad, Niger, Mauritania and South Sudan to go and settle in neighboring areas or countries which are not undergoing desertification.
8. **Increased importation** of food since the agricultural sector can no longer produce enough food for such country's food requirements and this usually

impacts on other sectors of such countries since funds are diverted from such sectors to go and import food.

9. **Scarcity of fuel wood** due to massive deforestation and drying up of the trees and this is a major problem in many Sahel countries like Mali, Senegal, Chad and Niger and this has made such people resort to cow dung as a source of fuel.
10. **Malnutrition and starvation** is another consequence of desertification. With massive crop failure being experienced in many countries undergoing desertification, people cannot afford regular meals and in some cases they resort to one meal a day which leads to malnutrition as the body can no longer get all the nutrients it requires and this leads to starvation as well as death.
11. **Instabilities** are also a major consequence of desertification. In many countries undergoing desertification, riots and civil strife are a common occurrence as people tend to blame their governments for their situations. In other instances due to massive migration of people from one area to another, large expanses of land are usually left with no major authority over them turning them into safe havens for terror groups and other wrong doers who tend to cause havoc in such areas. Many parts of the Sahel are now inhabited by various terror groups as well as other wrong doers like kidnappers.

MEASURES TO CONTROL DESERTIFICATION

1. Maintaining the carrying capacity of land so as to reduce overgrazing which is one of the major causes of desertification. This can be done by regular supervision of pastoralists or setting up known land carrying capacities of particular areas.
2. Undertaking afforestation and re-afforestation programs in areas which have undergone massive deforestation so as to replace the forests and plant cover and thus reduce on the extension of the desert.
3. Environmental awareness and education should be encouraged so as to sensitize the masses on the effects of desertification so as to reduce degradation of the environment by such people.
4. Out lawing swamp reclamation and at the same time promoting irrigation projects so as to increase the plant cover and thus solve the desertification problems
5. Developing and using other sources of energy other than wood fuel, solar power and HEP so as to reduce on the deforestation as people look for wood fuel.

6. Planting of fast growing varieties of trees which are also drought resistant like the Neem trees which have been planted in various parts of Africa especially in Mali inland delta.
7. Planting drought resistant grass such that there is continuous vegetation cover on the earth's surface and thus reducing on the rates of erosion and desertification.
8. Resettling of pastoral nomadic groups such that they live a settled way of life and in so doing reduce overstocking and overgrazing.
9. Family planning measures should be undertaken so as to check on the rate of population growth which is one of the major causes of environmental degradation that leads to desertification.
10. Agro forestry should be encouraged i.e the planting of trees together with crops such that there is continuous vegetation cover which also helps to check on erosion.
11. Shelter belts or wind belts can be put up. These are mainly trees planted in an extensive area so as to check on the speed of wind and thus reduce wind erosion in the area. This has been successful in some Sahel countries like Mali, North Chad etc. which face severe wind erosion.
12. Regional cooperation and integration of environmental policies especially by neighboring countries so as to check on the expansion of desert-like conditions to their areas e.g the Economic community of west African states (ECOWAS), the South African development and the Inter-governmental alliance for development and cooperation (IGAD). This helps to check on the expansion of desert like conditions as a regional block.

REVISION QUESTIONS

1. Account for the increasing rates of desertification in the Sahel region of Africa.
2. To what extent is man responsible for the spread of desert like conditions in many parts of Africa?
3. Examine the causes and effects of desertification either in California or Botswana.
4. Explain the measures that are being taken in any one country of the Sahel to counter the spread of desertification.
5. (a) what are the consequences of desertification in either Mali or Ethiopia
(b) What is being done in any one country above to reduce the expansion of the desert?

RENEWABLE AND NON RENEWABLE RESOURCES

Renewable resources are also known as **infinite resources**. These are resources that can be used by man without getting exhausted. They are replenished or replaced by the environment over relatively shorter periods of time. Such resources include vegetation, both natural and planted, animal life, water, fish soils etc. like trees used for timber, cotton used for clothes; food crops can be replaced and re-grown after harvesting. Animals are also bred and rebred. Renewable resources also include energy resources like;

- a) Wind energy or power where turbines use wind to generate electricity without generating pollutants.
- b) Biomass: plant matter and animal waste are used to create electricity.
- c) Solar energy: solar panels or collectors turn sunlight into electricity.
- d) Hydroelectric power. Here the flowing water is used to turn turbines which generate electricity.

Renewable resources continue being renewable as long as they are adequately monitored protected and conserved.

Non-renewable or **finite resources** are those that are not easily regenerated by the environment after being used. The best examples are minerals since the earth cannot regenerate them in a usable timeframe. Minerals take millions of years of heat and pressure to form deep underground the earth's crust. Non-renewable resources also include energy sources like crude oil, natural gas, coal and nuclear fuels.

CAUSES OF INCREASED DEPLETION OF RENEWABLE AND NON RENEWABLE RESOURCES

Renewable and non-renewable resources are increasingly becoming depleted the world over and this is mainly due to a number of factors or causes as explained below.

1. Rapid population increase is one of the major factors leading to the depletion of renewable and non-renewable resources. When the population increases, forests are cut down for a number of uses, there is increasing demand for minerals, fisheries resources are also over exploited which has led to rapid depletion of such resources.

2. Deforestation has led to the depletion of renewable natural resources especially natural forests. This is mainly due to increasing population as well as the increasing demand for timber and other forest products like in Brazil, Democratic Republic of Congo, Indonesia and other parts with large expanses of natural forests many of them are being cleared by man.
3. Rapid industrial development which has increased the demand for various raw materials like forest raw materials, minerals, agricultural produce, fish. This has led to over exploitation of such resources so as to meet the industrial demands.
4. Poor government policies are also responsible for the increasing depletion of both renewable and non-renewable resources. In many developing countries governments have not come up with proper policies as regards supervision, monitoring and conservation of natural resources and this has made people over exploit such resources leading to their near depletion.
5. Ignorance and illiteracy are also major causes of the depletion of both renewable and non-renewable resources. Some people over use natural resources to near depletion because they are not aware of the dangers of over exploiting such resources like farmers cut down trees and over graze their lands not knowing that it will cause severe climatic changes.
6. Poverty also leads to misuse of both renewable and non-renewable resources. Many people are so poor especially in developing countries and therefore they turn to the natural environment leading to its degradation like forests are cleared, soils are exhausted, and fisheries resources are also exhausted.
7. Over fishing especially in international waters has led to over use and near depletion of this renewable resource. This is mainly due to increasing demand for fish and use of indiscriminative methods of fishing like trawling. This has led to depletion of some species like whales, blue fin, tuna as well as tilapia mainly found in inland shared fishing grounds.
8. Pollution from various sources but most especially from industries has also led to near depletion of the renewable natural resources. Pollutants from industries are emitted into the atmosphere, others in nearby water bodies and some dumped on soil. This leads to contamination and death of both plants and animal life.
9. Poor farming methods like monoculture, cultivation up and down the slope and over grazing leading to exhaustion of the soil as a major renewable resource. At times the soils are made loose due to monoculture and thus easily eroded by wind or running water.

10. Poaching and this has led to death and reduction of wildlife as animals are hunted for their beef and other products like tusks from the elephants, horns from rhinos, hides and skins.
11. Over use of chemicals like fertilizers so as to replenish soil fertility leading to contamination of both surface and underground water sources.
12. Swamp reclamation leading to lowering of the water table and thus drying up of vegetation as well as death of wildlife that uses such swamps as their habitats like crested cranes, otters etc.
13. Mining and quarrying leading to exhaustion of minerals like copper in the Bwana Mkubwa mine in Zambia, Iron ore at Bomi hills in Liberia.
14. Political instabilities leading to death of man, destruction of vegetation and death of wild life.
15. Climatic hazards like floods, prolonged droughts, strong winds, hailstorms leading to destruction of vegetation, plants, animals and human life.
16. Pests and diseases like locusts, rinder pest, HIV, cancer, Ebola, bovine pneumonia, east coast fever leading to death of both animal and human life as well as destruction of vegetation.
17. Natural calamities like volcanic eruptions, earth quakes and landslides leading to death of humans, animals and destruction vegetation, fish etc.

MEASURES THAT CAN BE TAKEN TO ENSURE SUSTAINABILITY OF BOTH RENEWABLE AND NON RENEWABLE RESOURCES

1. Controlling population growth rate since its one of the major causes that fuel demand for a number of resources like land, minerals, fisheries and forest resources and this is so especially in the developing world. This can be done through
 - Educating the girl child
 - Provision of free family planning services
 - Introducing fines to large families
2. Carrying out afforestation programs in those areas where no forests existed before so as to increase on the forest cover and its added advantages like modification of climate, control of erosion and protection of catchment areas.
3. Gazetting of various forest reserves and their surrounding areas can also help to preserve the existing forests and also to increase the forest cover in such areas thereby generating the forest resources.

4. Re- afforestation programs should also be undertaken especially those areas where the forest resources have been exhausted. This is mainly through replanting of such areas with forests so as to ensure sustainability of the forest resource.
5. Sensitization of the masses about the environmental degradation and use of the available resources can be carried out especially in those areas where there is massive over use of both renewable and non-renewable resources. This will help to create awareness and thus optimal use of resources.
6. Game sanctuaries as well as wild life protection areas should be put up so as to safe guard those species threatened with extinction like elephants, rhinos, parrots and crested canes.
7. Alternative sources of fuel other than fossil fuels like oil, natural gas and coal should be used and this will help to reduce on the rate of pollution and also check on the over use of both renewable and non-renewable resources. Instead people should use solar power, HEP, Geo thermal power sources that are less pollutive.
8. Research into fast growing tree species should be carried out such that there is continuous regeneration of forests in various areas. Such trees include neem trees, coniferous, pines etc and these can do well in a number of environments.
9. Fishing should be controlled especially where shared fishing grounds are involved like international water bodies like seas and oceans as well as lakes and rivers. This can be attained through regular patrols along such fishing grounds as well as formation of regional bodies to oversee fishing operations.
10. Treatment of industrial wastes before dumping should be carried out such that the toxicity of such waste is reduced and therefore that will help to reduce on the effects of dumping such waste on land, water bodies or any other areas.
11. Restocking of over exploited fishing grounds with fish can also be carried out so as to ensure sustainable fisheries as its being done in some fishing grounds of North America and Northern Europe especially by restocking of salmon since it's the most sought fish species.
12. Fish farming can also be carried out and encouraged as this will help to reduce the pressure on the natural fishing grounds like lakes, rivers and oceans and also employ a number of people.
13. Controlled hunting should also be carried out especially in gazetted hunting areas that various species of wild animals that are threatened with extinction because of hunting are protected.

14. Regular patrols of all major resources should be carried out like fishing grounds, national parks, mining areas and forests. This helps to instill fear among people who would have carried out irregular activities that might lead to the extinction of such resources.
15. Better farming methods should be taught to farmers so as to maintain soil fertility like terracing in highland areas, intercropping, crop rotation and agro forestry.
16. Soil conservation measures should also be undertaken like mulching, use of composite manure so as to replenish soil fertility and also reduce loss of soil moisture.
17. Spraying both ground and aerial should be carried out so as to kill off pests that usually attack vegetation as well as animals and thus ensuring sustainability of such resources.
18. There should be controlled fertilizer and chemical use so as to reduce on their side effects and in cases where fertilizers are needed, organic manure should be used since it is less pollutive.
19. Recycling of waste both domestic and industrial such that there is continuous usage of such waste and also the reduction in the demand for various raw materials which will reduce the rate of exploitation of both renewable and non-renewable natural resources.
20. Setting up of environmental pressure groups as well as protection agencies with a major aim of conserving and ensuring sustainable use of resources like NEMA, Save the environment projects, Green belts, Go green campaigns, These will help sensitize the people about the environment and also protect the resources.
21. Enactment of sound government environmental policies aimed at conserving the environment and this should be in form of laws and punishments aimed at people over exploiting the natural resources.
22. Improvement in technology which reduces on the demand for various raw materials like in the Ruhr region, improved technology has led to a reduction in coal demanded and thus sustaining coal as a non-renewable resource. In other countries other raw materials are being got to replace natural ones i.e artificial rubbers are being used to reduce on the over exploitation of natural rubber trees.
23. Use of hybrid car varieties that do not need energy in form of fossil fuels like electric powered cars, solar powered aircrafts being used instead of those that use oil and petrol.
24. Rural electrification especially in developing countries with a major aim of making people turn to HEP as a major source of fuel instead of fire wood and charcoal.

25. Regional cooperation and integration such that the major environmental concerns like the over exploitation of resources, degradation are fought against by all countries within a given region since such problems tend to transcend borders.
26. Improvement in medical care through regular checks, treatment, immunization so as to ensure good health.

END