



# WHY DO WE FALL ILL



BL-13

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## HUMAN HEALTH & DISEASE

Every living organism, may be plant or animal, requires food (nutrition) for its survival, maintenance, growth and development. Nutrition is required in specific amounts. Proper dietary habits lead to sound health and proper mental development. A person is said to be healthy if one:

- \* has no symptoms of disease and anxiety.
- \* has no physical deformity.
- \* has no mental problems and social tensions.
- \* has no psychological tensions.
- \* has all the body organs functioning properly.
- \* has purposeful life.
- \* has sufficient balanced diet.

The most widely accepted definition is (1947) World Health Organization's description that states "Health is a state of physical, mental and social well being and not merely the absence of disease or infirmity".

(a) **Significance of Health :**

Good health is "health body with a healthy mind and healthy attitude". Good health increases our efficiency for doing work. The increased efficiency of a man due to good health contributes to his own progress, the progress of community and the progress of nation as a whole. Good health also make a man happy and cheerful. It allows a person to have the initiative for betterment. It makes living a joyful experience. It keep a person not only happy but also provides cheerfulness to the people. Good health is a condition for our purposeful existence in this world.

(b) **Community and Personal Health :-**

Health of a person depends upon his personal habits as well as his environment. One cannot remain healthy, if his environment is not clean. Good economic condition and job are needed for individual health, so that the person can have balanced diet and be healthy. Social equality and harmony in the community are also important to maintain individual's health. If neighbors of a person are healthy, but possess no civic sense (i.e., they are in the habit of throwing garbage in an open space and there), flies, mosquitoes, and other disease causing microorganisms will grow on the filth (foul matter) thrown by them. These microorganisms will infect nearby foodstuffs thereby spreading diseases. Thus, a person with his clean home, but unclean neighborhood will become sick. Similarly, the health of the whole community depends on the personal habits of various individuals who constitute the community. So community health can be defined as "All the personal health along with the environmental services for the improvement of health of community." It comprises of all efforts for maintaining, protecting and improving the health of the people. WHO is doing remarkable work in community health.

(c) **Difference Between Personal Health and Community Health :**

<b>Personal Health</b>	<b>Community Health</b>
1. The state of physical, mental and social well	1. It is maintenance, protection and improvement of health of the whole
2. Only the individual maintains his/her health.	2. Community. 3. The whole community remains
3. An individual can maintain his health by. (a) Eating balanced diet. (b) Observing personal and domestic hygiene. (c) Consuming clean food, clean water and clean air. (d) Proper exercise, relaxation and good habits.	4. Healthy. 5. Community health can be achieved by. (a) Provision for treated and safe drinking water. (b) Proper disposal of sewage and wastes. (c) Providing medical facilities. (d) Control of communicable diseases. (e) Health education.

The various activities involved in maintaining community health are as follows :

**(i) Maintaining proper sanitation of the environment by :**

- \* Providing cleans and safe drinking water.
- \* Providing good sewage and rain water disposal systems (through underground pipes).
- \* Proper garbage disposal.
- \* Strict enforcement of antipollution laws, management of different types of environmental pollution by Central and State Control Boards.

**(ii) Providing proper facilities for prevention and control of diseases such as :**

- \* Preventive vaccinations against a number of diseases like tuberculosis, diphtheria, whooping cough, tetanus, measles, hepatitis, polio, mumps, etc.
- \* Spraying mosquito and germ killing chemicals (insecticides, pesticides etc.) at regular intervals.

**(iii) Providing health education :** to people about the mode of transmission of diseases and mechanism to control communicable diseases; importance of balanced diet; effects of bad habits Like alcoholism, addiction, etc.

**(iv) Establishment of health care services:** primary Health Centres, District Hospitals, Community Health Centres, Medical Colleges, All India institutes, Regional Hospitals, etc.

**(v) Prevention of food adulteration.**

**(vi) Providing maternity and child care centres:** so that mortality rate among children is reduced to a great extent. Provision of family planning advice and medical care to school going children.

**WHAT IS A DISEASE?**

A disease is a condition of the body or a part of it in which functions are disturbed. Disease may also be defined as morphological (structural), physiological (functional) or psychological disturbance in the body of body parts caused by external agencies which may be nonparasitic e.g. Deficiency of nutrients or may be parasitic e.g. Caused by viruses, bacteria, fungi, etc. The term disease means dis-ease or discomfort or without ease. In short, it can be defined as "disease is disorder of body."

**(a) Distinction Between Healthy and Disease Free :**

The term disease is used when we find a specific and particular cause for discomfort. We may not be knowing the main cause of the discomfort, but still we can use the term disease. A person may not be suffering from any disease but may be in poor health. This is particularly true for social and mental health, where we can be in poor health without there being a cause in the form of an actual disease. This is the reason why, when we think about health, we think about societies and communities. On the other hand, when we think about disease, we think about individual sufferers.

Difference's Between Healthy and Disease Free	
Healthy	Disease Free
1. It is the state of physical, mental and social well being 2. It depends upon the person and one's environment including society. 3. A person can be unhealthy even in the absence of disease.	1. it is the state of absence of any body discomfort. 2. it depends upon the person alone. 3. a person would be disease free in the absence of discomfort.

**(b) Manifestation of Diseases :**

There are number of tissue in the body, which aggregate together to form organ while a number of organs make up an organ system. Each organ system is performing a specific function. Each organ in the organ system also has a specific role to play. For example, in digestive, system, teeth help in mastication, stomach and intestine help in digestion, kidneys take part in excretion, bones and muscles hold the body parts together to form a musculoskeletal system that helps the body to move. When a person is suffering from any disease, then the physiological processes (functioning) or the appearance of organs in organ systems will change. These changes give rise to symptoms and signs of disease. symptoms are evidences of the patient's feeling of being wrong. For example, headache, loose motions or a wound with pus are symptoms which may indicate the occurrence of discomfort. Headache may be due to examination stress, meningitis. The symptoms give an indication of the presence of a particular disease. The physicians will also get laboratory tests done to identify the disease further.

**(c) Acute and Chronic Diseases :**

The manifestations of diseases are different depending upon a number of factors. one of the factor is duration of disease. on the basis of duration serious disease can be acute or chronic.

- \* **Acute disease** : actual disease is the one which has a short duration by relatively severe course. most people with acute illness can expect to return to normal health. a case of cough and common cold is an example of an acute illness which lasts only for a few days. afterwards the patient becomes well without any bad effect, loss of weight, feeling of tiredness or short of breath.
- \* **Chronic disease** : chronic disease is the one which is long lasting is usually slow to develop, often having a major effect on health, reducing the person's ability to do work efficiently, learning in school or doing work. the patient will also weight and feel tired all the time. examples of chronic diseases include tuberculosis, diabetes, asthma, hypertension, kidney disease, depression, etc. in these diseases we can develop a treatment plan to manage symptoms and prevent complications with the help of doctor.

Difference's Between Acute and Chronic Diseases	
Acute Diseases	Chronic Diseases
1. They are short duration diseases of relatively severe course.	1. They are long lasting diseases of debilitating (Weakening) effect.
2. The patient recovers completely after the cure.	2. The patient does not recover completely.
3. There is no loss of weight or feeling of tiredness.	3. There is often loss of weight or feeling of tiredness.
4. There is short duration loss of work and efficiency.	4. There is prolonged loss of work & efficiency.

**(d) Causes of Diseases :**

The various causes of diseases are

**(i) Pathogens** : They are disease causing organism like bacteria, viruses, fungi, protozoans, worms, etc. The pathogens are transferred to human being through air, contaminated food, water, soil and animals. Pathogens are primary cause of infectious diseases. However, every body does not suffer equally from infectious agents. There are some contributory causes that increase the proneness of an individual to catch the disease.



**Table: Various Pathogens and Diseases Caused By Them.**

S.No	Type of pathogens	Common diseases caused by them
1	Viruses	Common Cold, Influenza, Measles, Mumps, Poliomyelitis, Rabies, Small Pox, Chicken Pox, Yellow Fever, Aids Etc.
2	Bacteria	Cholera, Typhoid, Tuberculosis, Tetanus, Diphtheria, Pneumonia, Syphilis, Gonorrhoea, Leprosy Etc.
3	Rickettsiae	Typhus Fever, Tick Fever Etc.
4	Protozoa	Malaria, Amoebic Dysentery, Sleeping Sickness Etc.
5	Fungi	Ringworm, Athlete's Foot Etc.
6	Worms	Filaria, Ascariasis, Cysticercosis, Pinworm
7	mites	Scabies

## EXERCISE

### OBJECTIVE DPP - 13.1

1. Health is.
 

(A) Complete physical well being	(B) mental well being
(C) social well being	(D) all of the above
2. Dislocation is a disease caused by
 

(A) Biological agent	(B) mechanical agent	(C) physical agent	(D) chemical agent
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3. A carrier is a human being that
 

(A) functions as a reservoir of infection	(B) possesses pathogen but is not harmed	(C) contains antibodies sufficient enough to balance the antigen	(D) all of the above
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4. Droplet infection is a mode of.
 

(A) direct transmission	(B) indirect transmission
(C) pathogen spread through mosquitoes	(D)omite transmission
5. Specific defence mechanism against disease comprises
 

(A) physical barrier	(B) lysozme	(C) phagocytes	(D) immune system
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6. The antigen present in pathogen is
 

(A) a specific protein involved in metabolism	(B) polysaccharide synthesized by it in the host	(C) a specific protein or polysaccharide present on its coat	(D) any of the two, A, or B.
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7. Pathogens are destroyed by
 

(A) kidneys	(B) liver	(C) tonsils	(D) lymphatic tissues
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8. A noninfectious unnatural and unusual reaction to a substance or condition is
 

(A) immunity	(B) allergy	(C) infection	(D) toxin
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9. AIDS was first reported in.
 

(A) Russia	(B) France	(C) U.S.A.	(D) Germany
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10. A person has developed interferon in his body. He seems to carry infection of
 

(A) Tetanus	(B) Malaria	(C) Measles	(D) Typhoid
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## SUBJECTIVE DPP - 13. 2

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### VERY SHORT ANSWER TYPE QUESTIONS

1. Define Health.
2. What are communicable diseases ?
3. Define the term disease.
4. Write the name of the vector of the disease malaria.
5. Define the following terms :
  - (a) Acute diseases
  - (ii) Chronic diseases

### SHORT ANSWER TYPE QUESTIONS

6. Define the following :
  - (i) Health
  - (ii) Disease
7. State two conditions essential for good health.
8. What are the two broad types of diseases?
9. Define communicable diseases and give three examples.
10. Define non-communicable and give three examples.

### LONG ANSWER TYPE QUESTION

11. A physician examines a number of sick people daily. But he normally does not fall sick himself. How this happens?



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## INFECTIOUS DISEASES

(a) **infectious Agents :**

The various infectious agents are-bacteria, viruses, protozoans, helminthes (worms) and fungi.

- (i) **Bacteria :** They are unicellular, prokaryotic, microscopic organism. they reproduce very quickly. Some common diseases caused by bacteria are typhoid, cholera, tuberculosis, anthrax, diphtheria, tetanus, etc.
- (ii) **Viruses :** They are submicroscopic organisms. They cannot reproduce by themselves because they do not have their own metabolic machinery. They utilise the metabolic machinery of the host cell and multiply. The various diseases caused by viruses are common cold, influenza, dengue fever, AIDS, measles, mumps, polio, small pox, chicken pox, etc.
- (iii) **Protozoans :** They are microscopic unicellular, eukaryotic organisms. The various diseases caused by protozoa are malaria (caused by Plasmodium), kala-azar (caused by Leishmania), etc.
- (iv) **Helminthes :** Helminthes are multicellular worms which are mostly present in intestine. They cause taeniasis (caused by tapeworm), ascariasis (caused by worm), elephantiasis (caused by filariasis worm, hence also know as filariasis), etc.
- (v) **Fungi :** They are also multicellular, eukaryotic, heterotrophic organisms. They cause ring worm, athlete's foot and other skin infections.

(b) **Reason for Categorization of infectious Agents :**

it is important to categories infectious agents because each group of organisms have some common traits and many similar biochemical pathways. As a result, a drug that blocks one of the biochemical pathways peculiar to one group would be effective against many members. Antibiotics are used for killing bacteria. They inhibit wall synthesis (e.g. penicillin), inhibit ribosome function (e.g. erythromycin, streptomycin) or DNA replication (e.g., ciprofloxacin). However, antibiotics are not effective against viruses. Protozoan infections are treated by different types of drugs. Antifungal drugs are useful against all types of fungi. Vermicides are used for overcoming worm infection.

(c) **Means of Spread :**

Infection diseases are called **communicable diseases** because they can spread from affected persons to a healthy person. The means of communication or spread are different for different pathogens.

- (i) **Direct transmission.** The pathogens are transmitted from an infected person to a healthy person directly without an intermediate agent. It occurs in the following ways:
- (A) **Contact with infected person ;** Diseases like chicken pox, small pox, ring worm are spread by actual contact between infected person and a healthy person. Such diseases are called contagious diseases. The sexual contact is one of the closest physical contacts two people can have with each other. Diseases like syphilis, gonorrhoea (both caused by bacteria) and AIDS (caused by virus) are transmitted by sexual contact from one partner (infected) to the other (healthy).

- (B) Contact with Soil : The infectious agent of tetanus can enter the human body from soil through injuries.
- (C) Animal bites : The rabies virus is injected in the human body by the bite of rabid dog or monkey.
- (D) Transplacental Transmission : The diseases like AIDS, German measles and syphilis can also be transmitted from infected mother to the foetus through placenta.
- (E) Droplet infection : Pathogens spread by way of sneezing, coughing, spitting and talking as in common cold, influenza, diphtheria, tuberculosis, pneumonia etc.
- (ii) **indirect transmission** : They pathogens of some diseases are carried through some intermediate agents. It occurs in the following ways :
  - (A) **Vectors** : They are living organisms which spread their pathogens from an infected person to a healthy person. Usually, a part of life cycle of the pathogen is passed in the body of the vector. Some animals like housefly transfer the pathogen without taking them in their bodies. They are called carriers. Housefly is carrier of cholera, dysentery, typhoid, diarrhoea, etc. Female mosquitoes of many species are vectors of several diseases. They require blood meal in order to obtain nutrients for laying eggs. Female Anopheles spreads malaria while Culex spreads Filaria.
  - (B) **Through contaminated food and water.** Cholera, hepatitis B, diarrhoea, ascariasis, etc. are some diseases which are transmitted through contaminated food and water.
  - (C) **Air borne diseases** : Infectious agents can get transferred from infected person to healthy person through air, dust and droplets (emitted on sneezing, coughing or spitting), e.g., common cold, pneumonia, tuberculosis.
  - (D) **Fomite borne** : Articles coming in contact with patients are a source of infection, e.g., door handles, taps, garments, currency, utensils, crockery.
- (d) **Pathogenicity** :
 

Pathogens can harm their hosts in a number of ways such as by

  - (i) destruction of body tissues and
  - (ii) release of toxins or poisons which may be endotoxins. The entry of the pathogen in the body is called infection. After entering into the body, the pathogens multiply till they produce enough toxins to make the symptoms of the disease appear. The interval between infection and appearance of first symptom of the disease is called incubation period.

## **MANIFEST ATION**

### **(a) Organ or Tissue Specific Effects :**

A microorganisms enters the body through different points like nose, mouth, sex organs etc. Which decides the organ or tissue that micro organism invades. At the same time the signs and symptoms of an infectious diseases also depends upon the tissue being invaded. e.g. If bacteria causing tuberculosis enters through nose, it invades respiratory passage and lungs and its symptoms are cough and breathlessness, but in some cases they may infect other organs also.

### **Common Effects :**

This category includes effects like inflammation in which swelling, reddening and pain in infected area and increase in body temperature occurs. These effects arise due to the active involvement of immune system to provide defence to body by producing some specific chemicals from WBC's, against that microbe and this is not confined to a particular organ or tissue but seen in whole body.

### **(b) Severity of Effects :**

It directly depends upon the no. of microorganisms. if microbes are smaller in number their effects are minor and can be overcome by our immune system in a lesser time but if the number of micro organisms inside the body is very high the effects are more severe and long lasting.



## TREATMENT OF INFECTIOUS DISEASES

The basic concept behind the treatment process is to target the biochemical pathways occurring inside an organism for this certain drugs like antibiotics are prepared to after or stop the biochemical reaction of the microbes at some stage to stop them to produce infections, toxins or to kill them or to check their further growth and multiplication. There are two ways in which these diseases are treated they are :

- (i) **Reducing the symptoms** : By this, infection is not cured but some of the symptoms like fever, pain, aches, inflammation can be reduced to make the patient full comfortable. this is done by medicines like pain killers etc.
- (ii) **killing infectious agents** : this can be done by targeting the biochemical pathways of infectious agents using specific drugs.

(a) **Drugs** :

chemical compounds that targets a particular reaction among the chain of reactions involved in the biochemical pathway by reacting with some substrates of that reaction and resulting in an undesirable product so that reaction cannot proceed further and stop infections and can kill the microbes. they do not affect human cells.

(c) **Antibiotics** :

Antibiotic are chemicals that kill or stop the growth of certain kinds of microbes. They help our body to fight against diseases. The development of antibiotics began with the discovery of penicillin by sir Alexander Flemming in 1928. Flemming noticed that an agar plate inoculated with bacterium Staphylococcus aureus had become contaminated with a mould. He future noticed the presence of a clear zone in the agar plate in which breakdown of the bacterial cells had occurred. Detailed studies led to the isolation of an inhibitory substance from the mould. As the mould was identified as Pencillium, Flemming called the antibiotic penicillin. Soon other antibiotics were isolated. Some well know antibiotics are streptomycin, gramicidin and tetracycline. the antibiotics have been obtained from either bacteria or fungi.

- \* These are the drugs specific for curing bacterial diseases. they either ceases the formation of cell wall or interferes in their metabolic activities like production of proteins. This kills or stops the growth of bacteria.
- \* Antibiotics are not effective for viruses or it is difficult to make antiviral diseases because Viruses are acellular entities which only have nucleic acid and protein but lacks cytoplasm, cell wall and cell organelles they do not have their own metabolic system but they use the host's metabolic machinery to grow & multiply so drugs are not effective for them.

## PREVENTION OF INFECTIOUS DISEASES

Preventive measures are categorized into two distinct groups:

(a) **General preventive measures** :

It includes:

- (i) **Safe drinking water** :Drinking water should be filtered to remove suspended particles And boiled, ozonized and treated with chlorine before drinking to avoid water borne diseases like typhoid, cholera, hepatitis etc.
- (ii) **Proper disposal of waste**: Garbage should not be dumped here and there rather it should be thrown in covered garbage cans and burnt or buried for disposal. Sewage carrying drains should be covered for proper treatment of diseases of stomach and intestine.
- (iii) **Control of vectors** : Growth and breeding of animals like mosquitoes, rats, flies, Cockroaches should be controlled, by keeping surrounding clean, spraying insecticides, removing stagnant water from populated areas.

(iv) **Strong immune system:** It helps to defence our body against invading microbes and can be made strong by proper diet and nourishment.

\* **Immune system:** our body possesses a special type of defence mechanism called immune system. it provides resistance against disease causing microorganisms. immunity is the ability of the body to resist the infections. **Two** specific types of cells are present in our body that provide immunity.

\* They are WBC (leucocytes) in blood and lymphocytes in lymph when any foreign body attacks our body these cells are released to all parts of body, they isolate, engulf, kill and digest the infectious agents and thus defend our body against any type of infection.

(b) Specific Preventive Measures :

This can be done two ways :

(i) **Immunization:** Stimulating the body to produce antibodies by artificial means. our Immune system is misleader, to develop a memory against particular infection by introducing something into the body that mimics the specific microbe. Specific prevention is provided by the immune system. it produces specific molecules called antibodies that fight against the invading microorganism or their products called antigens. Antibodies are pertinacious molecules made by WBC's and lymphocytes to fight against foreign bodies or other harmful chemicals. Antigens are also proteins or other harmful chemicals that are present on surface of invaders. Whenever there occurs attack of a foreign body specific Antibodies are produced corresponding to that antigen and an antigen antibody reaction occurs. it either engulfs and phagocyte it or makes it harmless and then makes them unable to grow and multiply. Besides this immune system also possesses memory. once antibodies are produced they remain in the body and at the second infection they recognize the antigens and show a much faster response.

(ii) **Vaccination:** A vaccine is a suspension of disease- producing micro-organisms which is Modified by killing or wreaking (attenuated) so that the suspension will not cause disease. Rather it stimulates the formation of antibodies upon inoculation. The antibodies remain in blood for long and when the germs of a particular disease enter the body, the antibodies destroy them. This is the basis of immunization.

\* **Some common vaccines :**

\* DPT vaccine, for protection against diphtheria, whooping cough and tetanus

\* BCG vaccine, for protection against tuberculosis

\* Polio (OPV) vaccine \*Typhoid vaccine \*Measles vaccine \*TT vaccine, against tetanus

Schedule of Immunisation			
Beneficiaries	Age	Vaccine	No. of doses
(a) pregnant woman	16-36 weeks	TT	2,at intervals of 4-8 weeks
(b) infants	3-9 months	DPT	3 does at intervals of 1-2 months
		Polio	-do-
		BCG	1
	9-12 months	Measles	1
	18-24 months	DPT	1(booster)
polio		1(booster)	
c)children	5-6 years	Typhoid	2
	10 years	TT	1(booster)
		Typhoid	1(booster)
	16 years	TT	1(booster)
		typhoid	1(booster)

\* **Pulse polio programme:** The aim of this programme it to eradicate polio from our country. it was first held in our country in December, 1995. Polio vaccine called Oral polio vaccine (OPV) is given to children orally (through the mouth), as per the National Immunisation Schedule (NIS),

## NON INFECTIOUS / NON COMMUNICABLE DISEASES

These diseases which remain confined to a person. they are neither present at birth nor spread from one person to another. The diseases are caused due to some specific factors. They may be caused due to improper functioning of an organ (short sighted, hypertension, arthritis), hormonal imbalance (diabetes, dwarfism), allergy, cancer, inadequate diet (anaemia, goitre), etc.

- \* **These diseases are of following types :**
- \* **Deficiency diseases :** caused due to lack of some nutrient materials in our body like Vitamins, minerals, protein etc.
- \* **Degenerative diseases :** caused due to ageing or malfunctioning of any organ or part of Body.
- \* **Allergies :** caused due to hypersensitivity of an organism to certain type of material like Pollen grains, dust etc.
- \* **Uncontrolled growth of cells:** this can cause cancer and tumor.
- \* **Mental disorders**
- \* **Occupational diseases**
- \* **Addiction:** caused due to excessive intake of drugs tobacco, alcohol etc.

## COMMUNICABLE DISEASES

Disease	Causative Organisms	Mode of Transmission	Symptoms	Cure	Prevention
<b>Bacteria</b>					
1. Cholera	Vibrio cholerae	Contaminated food And water	Watery diarrhoea, Vomiting, Dehydration, muscle Cramp, weight loss.	Antibiotics, ORS Or Salt-Sugar solution	Proper sanitation Personal hygiene.
2. typhoid	Salmonella typhi	Contaminated food	Headache, fever in afternoon, slow Pulse, eruption of Spots & rashes on Abdomen, diarrhoea.	Antibiotics	Use of safe drinking Water, TAB vaccine, Proper sewerage System.
3. tuberculosis	Mycobacterium Tuberculosis	Droplet infection	Loss of appetite, Weakness, typical Fever pattern, night Sweat, chest pain Breathlessness.	Antibiotics Antitubercular Therapy (ATT)	Public Awareness, BCG Vaccine.
4. diarrhoea	Salmonella, Shigella	Contaminated food And water	Loss of water, Vomiting, headache, Fever, abdominal Pain.	Antibiotics like Penicillin	Property washed & cooked food, clean surroundings.
5. syphilis	Treponema Pallidum	Sexual contact, From mother to child	Painless ulcers, Swollen lymph Glands and joints, Paralysis, heart Trouble etc.	Antibiotics	Improper and Unhygienic Sex practices should Be avoided.
6. Gonorrhoea	Neisseria Gonorrhoeae	Sexual contact, use Of common toilets	Pus containing Discharge, burning Sensation in sex Organs, arthritis	Antibiotics	Proper cleaned And disinfected Toilets should be Used, improper sex practices should be avoided

Disease	Causative Organisms	Mode of Transmission	Symptoms	Cure	Prevention
Virus 1. Hepatitis A	Hepatitis A virus	Contaminated food And water	High temperature, Headache, joint Pains, dark yellow Urine, fatigue. It is Also called jaundice	Interferon injection, Adequate rest	Use boiled water and Fresh food, Hepatitis Vaccine
2. Hepatitis B	Hepatitis B virus	Infected blood, Inoculation, from Mothers to their Child, sexual route	Progressive liver Disease, chronic Active Hepatitis , Hepatocellular Carcinoma (cancer)	Interferon injection, Adequate rest	Hepatitis B vaccine, Avoiding risky sex Practices, injectable Drugs and direct or Indirect contact with Blood, semen etc. Of Infected person
3. Rabies	Rabies virus	Bite of Dog, Monkey, etc.	High fever, painful Contraction of Muscles of throat And chest. Patient Develops fear of Water so it is also Called hydrophobia.	A course of 5 anti Rabies vaccines at Regular intervals With in 30 days is Given	Pet animals should Be vaccinated with Anti rabies vaccine
4. Influenza	Influenza virus	It is spread from Person to person Contact, Droplet Infection.	Sneezing, fever, Headache, muscular Pains, coughing, Discharge from nose	Amanatadin and Rimantidine are Used	We should try to Keep away from flu Patients.
5. AIDS	HIV Virus [Human immuno Deficiency virus]	1. spreads through Unprotected Sexual contact with An infected Persons 2. Spreads through The transfusion Of blood Contaminated with AIDS virus 3. Spreads through The use of infected Needles for Injection 4. AIDS infected Mother can Transmit the virus	Swollen lymph Nodes, regular fever, Weight loss, loss of Immunity.	--	1. disposable Syringes And needles Should be used. 2. Sexual contact With unknown people Should be avoided 3. Before transfusion Blood should be Tested for HIV virus
<b>Protozoans</b>					
1. malaria	Plasmodium	It spreads though The bite of female Anopheles Mosquito	Headache, Muscularpain, higher fever, feeling cold and shivering, Patient feels weak And becomes anaemic	Quinine should be Used	1. Use proper Arrangement to Avoid mosquito from our houses. 2. Mosquito larvae Should be killed 3. We should not Allow the collection Of water in any Uncovered container.
Amoebiasis	Entamoeba Histolytica	Contaminated food And water.	Diarrhoea	--	--

## NON COMMUNICABLE DISEASES

Cause	Name of Disease	Symptoms
Deficiency		
1. protein (PEM)	Marasmus(infants below 1 year)	Shrivelled appearance, thinning of limbs, Prominent ribs, retarded physical and mental Growth, digestive disorder, repeated diarrhoea.
2. protein(PEM)	Kwashiorkar(1 to 3 year age)	Loss of appetite, stunted growth, bulging eyes, Enlarged stomach, long thin and curved legs.
3. iron	Myrcrocytic anaemia	Become pale, loose appetite, feels tired
4. vitamin B12	Perinicious anaemia	Become pale, loose appetite, feels tired
5. folic acid	Megaloblastic anaemia	Become pale, loose appetite, feels tired
6. Lodine	Goitre	Abnormal enlargement of thyroid, swelling in the Neck, reduced thyroid function, retarded growth.
7.vitamin A	xerophthalmia	night blindness, dryness of comea
8. Vitamin D	Rickets(children), osteomalacia (adults)	Twisted, thin, soft, bent bones, deformed ribs.
9. Vitamin B-1	Beri-Beri	Muscular dystrophy, nervous disorder
10. Vitamin B5	Pellagra	4D' syndrome, dermatitis, diarrhoea, dementia, death.
11. Vitamin - C	Scurvy	Bleeding gums, loosening and falling of teeth, Loss of weight
12. Degeneration	Heart attack, liver failure, kidney failure	Hypertension, liver megaly etc.
13. Hyper sensitivity	Allergy	Sneezing, coughing, watering of eyes, asthma, Hay fever
14. Uncontrolled growth of cells	Cancer and tumour	Loss of weight, person becomes weak, can lead To death or destruction of affected organ

## EXERCISE

### OBJECTIVE DPP - 14 .1

- AIDS day.  
(A) May 1 (B) December 20 (C) June 1 (D) December 1
- Antibodies are.  
(A) lipids (B) genes (C) proteins (D) carbohydrates
- Which of the following statements is correct ?  
(A) Degenerative diseases are non communicable (B) Allergy is caused by droplet infection  
(C) Cholera is a viral disease (D) AIDS can be prevented by vaccination.
- Remain healthy means  
(A) free of infection by pathogen (B) tension free mental status  
(C) Living in a pollution free environment (D) All of the above
- Diseases occurring due to infected articles of a patient are called  
(A) Air borne (B) Water borne (C) Fomite borne (D) Food borne

6. World Health Day Is On.  
(A) 1<sup>ST</sup> May                      (B) 7<sup>TH</sup> April                      (C) 30<sup>th</sup> June                      (D) 5<sup>th</sup> December
7. Which are intimately related.  
(A) Diseases and health                      (B) Body and health  
(C) Body and mind                      (D) Body and spiritual health
8. Pulse polio programme is organised in our country for.  
(A) curing polio                      (B) eradicating polio                      (C) spreading polio                      (D) non of the above
9. Community health aims at.  
(A) better health and family planning                      (B) better hygiene and clean environment  
(C) removing communicable diseases                      (D) all of the above
10. Head quarter of work Health Organisation(WHO) is located at.  
(A) New York                      (B) Geneva                      (C) London                      (D) Paris

### SUBJECTIVE DPP - 14 .2

#### VERY SHORT ANSWER TYPE QUESTIONS

1. Write the name of causative organism of the following diseases.  
(i) Tuberculosis                      (ii) Cholera                      (iii) Hydrophobia  
(iv) Influenza                      (v) AIDS
2. Write the difference between acute and chronic disease.
3. Why do malaria patients suffer from anaemia?
4. Name any three water borne diseases and their causative organisms.
5. Define interferons.

#### SHORT ANSWER TYPE QUESTIONS

6. How are diseases diagnosed by physicians?
7. How are diseases manifested?
8. Name three acute and three chronic diseases.

#### ANSWER TYPE QUESTION

9. Under which of the following conditions are you most likely to fall sick ? Give reasons in support of your answer.  
(i) When you are traveling by bus.                      (ii) When you are talking with your teacher.  
(iii) When you visit a friend who is suffering from measles.

## EXERCISE

### (Objective DPP # 13 .1)

Q	1	2	3	4	5	6	7	8	9	10
A.	D	C	D	A	D	C	D	B	C	C

### (Objective DPP # 14 .1)

Q	1	2	3	4	5	6	7	8	9	10
A.	D	C	A	D	C	B	D	B	D	B



# NATURAL RESOURCES



BL-15

## NATURAL RESOURCES

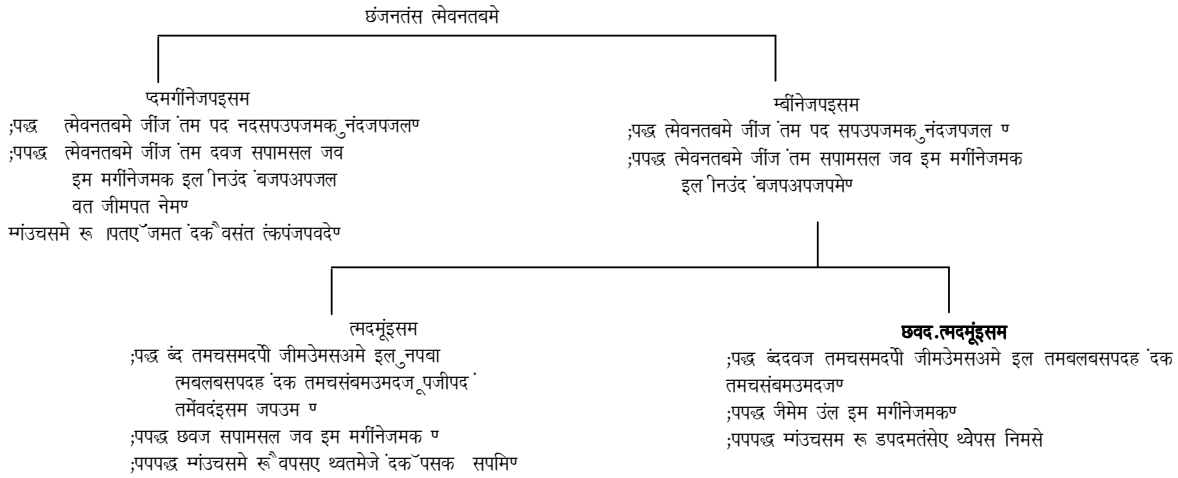
It indicates the potential wealth of a country. The variety of substance that man gets from earth and nature to meet his basic needs are called natural resources. The word resource means a source of supplying a material generally held in reserve. Natural resources are both living and non-living. Some of these resources are found in abundance, while others are found in limited quantities and that too in some restricted parts of our land. For this reason, the natural resource have to be wisely used. However, in reality it is not so. They are being used indiscriminately.

### (a) Types of Natural Resources :

Depending upon the abundance and availability, the natural resources are categorized into two types, i.e.

(i) inexhaustible natural resources

(ii) exhaustible natural resources.



## AIR OR ATMOSPHERE

The multilayered, transparent and protective envelope of gases surrounding the planet earth is called atmosphere. In other words atmosphere is the layer or air above the earth's surface and air is a mixture of several gases. About 95% of total air is present up to the height of 20 km above earth's surface. Remaining 5% is up to the height of 280 km.

### (a) Composition of Air :

Gas	relative percentage / volume
Nitrogen	78.08%
Oxygen	20.94%
Argon	0.9%
Carbon dioxide	0.03%
He, Ne, Kr, Xe, Ch <sub>4</sub> , O <sub>3</sub>	in trace amounts

Besides these gaseous components air also possesses water vapour, industrial gases, dust, smoke particles, microorganisms, pollen grains, fungal spores etc.

**(b) The different zones of Atmosphere or Air :**

- (i) **Troposphere:** It is the basal part that extends about 20 km above the earth's surface. (Upto 8 km on poles), in this layer important climatic events occur like cloud formation, lightening, thundering etc. in this region air temperature gradually decreases with height.
- (ii) **Stratosphere:** It lies next to troposphere and is 30 km high. in this layer temperature rises. there is a formation of ozone layer in this region which can absorb the harmful ultra violet rays coming from sun.
- (iii) **Mesosphere:** It lies next to stratosphere and is 40 km in height. Temperature decreases in this region.
- (iv) **Lonosphere:** It lays upto the height of 300 km above earth's surface. In this layer gaseous components become ionized to sun's energy and remain there as ions.

**(c) Role of Air or Atmosphere :**

- \* It acts as medium for movement of insects, birds etc.
- \* It protects the life on earth from harmful ultra violet rays.
- \* It is a source of oxygen, carbon dioxide and nitrogen required for various metabolic activities of living beings.
- \* It helps in dispersal of spores, pollen, seeds etc.
- \* It maintains temperature on earth required for life.
- \* It transmits sound for communication.
- \* Ionosphere reflects the radio waves back to earth for long distance communication due to presence of ions and free electrons.
- \* Burning (combustion) takes place in presence of oxygen and produces carbon dioxide.
- \* Specific climatic conditions and water cycle is maintained due to circulation of air.
- \* Eukaryotic cells and many prokaryotic cells require O<sub>2</sub> for break down of glucose to get energy through respiration, they release CO<sub>2</sub>.

**(d) The Role of Atmosphere in Climate Control :**

Climate is an average weather of an area. Temperature, light and rainfall are important factors that determine climate of an area. Atmosphere plays a crucial role in its control :

- \* It acts like a blanket covering the whole earth.
- \* It keeps the temperature of earth steady. It acts as bad conductor of heat thus prevents the sudden increase in temperature during the day as well as slows down the escape of heat into the outer space during night.
- \* The role of atmosphere on earth, when compared with moon (with no atmosphere), temperature range varies at moon from - 190<sup>o</sup> C to 110<sup>o</sup>C. Although both lie at same distance from sun.

**(e) Wind :**

Air in called wind. Speed of wind can be determined by :

- \* Heating of air
- \* Formation of water vapour

Atmosphere can be heated from below by radiations, such radiations are reflected back. Convection currents appear in air on being heated. When the air gets hot due to radiations emitted from land or water, it rises. Air over land get heated speedily as compared to air above water bodies because, land gets heat faster. Wind occurs because of horizontal and vertical differences in atmospheric pressure. During daytime in coastal regions, air on lands rises due to heating at faster rate. Air over sea moves into the space of low pressure created due to rising of air above land. This creates wind. During day time, thus air moves from to land. Sea and land both become cool during night hours. Cooling of water is slower than land, thus air above water becomes warmer. Thus air will move from land sea.



(i) **Factors controlling movement of air**

(A) rotation of earth.

(B) in the path of wind, mountain ranges may come across. The general pattern of winds over earth is known as general circulation and specific winds are named for the direction from which they originate (e.g. wind blowing from west to east is westerly). Wind speeds are often classified according to Beaufort scale.

(f) **Rain :**

The warm, moist and rising air cools and forms clouds in the sky. This happens due to heating of water bodies during day time which get mixed with atmosphere. The air rises, it expands and cools. cool air in the atmosphere sinks towards the ground. Due to cooling water vapours present in air get facilitated. These tiny droplets become bigger and bigger due to condensation. When they become heavy, they fall down in the form of rain. Four main types of precipitation are as follows:

(i) **rain.** Precipitation in the form of liquid

(ii) **sleet.** Rain which freezes.

(iii) **snow.** Small ice crystals that form around dust or salt particles.

(iv) **hail.** Frozen rain that is circulated up and down in a cloud until, it is hard frozen ball of ice.

\* Cloudy, wet, changeable weather is common in low pressure zones with rising unstable areas. Such conditions are found at temperate latitudes, where warm air along polar fronts. Here spiraling low pressure cells known as depressions (mid-latitude cyclones) are formed. In India mostly rains are brought by usually southwest or northeast monsoon. Depressions in Bay of Bengal also cause rain at some places of India.

## **POLLUTION**

Any undesirable change in physical, chemical or biological characteristics in the air, water and land which is harmful to the men directly or indirectly through animals, plants, industrial units or raw materials is called as **pollution**. **pollution** is mostly man made. But it can also be natural.

(a) **Pollutants :**

Any material or act of man, or nature which leads to pollution is called as pollutants. The pollution is usually brought about by the addition to the environment of waste products of human activity. When the waste products are not efficiently assimilated, decomposed or otherwise removed by natural, biological and physical processes (recycling) and the system is unable to utilize them properly, so that the balance of the system breaks down. Therefore such type of pollutants can stimulate or inhibit the biological reactions or change in their capacity. Therefore changes also take place in the ecosystem. The amount, numbers and types of pollutants are increasing with the growth of the population.

(b) **Air Pollution :**

Air pollution is caused due to the addition of the unwanted substances or gases. The atmospheric pollution is mainly caused by the activities of man and concentrated to the inhabited and the industrial complexes in cities. There are two main categories of air pollutants.

(i) Gaseous: The gaseous materials include various gases and vapours of volatile substances or the compound with a boiling point below 200°C.

(ii) Particulate: Dust particles, carbon particles, particles of other metals etc.

(c) **Major air Pollutants and Their Effects :**

- (i) **carbon monoxide (CO)** : this is the main air pollutant. Carbon monoxide is a highly toxic as which is colourless and odourless in nature. It combines with hemoglobin of the blood and blocks the transportation of oxygen. Thus, it impairs respiration and it causes death.
  - (ii) **Unburnt hydrocarbons** : Out of them 3, 4 - benzpyrene is the main pollutant. This causes cancer in lungs.
  - (iii) **Ethylene**: The falling of leaves without particular reason, falling buds et. Effects are seen in plants are due to ethylene.
  - (iv) **Oxides of nitrogen**: these oxides form photochemical smog in the atmosphere and release ozone. Ozone causes harm to mucilaginous membrane. The oxide pollutants of nitrogen are nitric oxide (NO), and nitrogen di oxide (NO<sub>2</sub>). These oxides and ozone are very harmful for the plants. The entry of these pollutants causes various diseases in animals like- respiratory trouble such as emphysema, bronchitis, swelling of lungs and lung cancer etc.
  - (v) **smoke** : Many constituents are present in smoke such as **sulphur dioxide(SO<sub>2</sub>)**, Sulphur trioxide (SO<sub>3</sub>), Sulphuric acid (H<sub>2</sub>SO<sub>4</sub>), Ozone (O<sub>3</sub>), Carbon dioxide (CO<sub>2</sub>), PAN (Peroxyacetylene nitrate), Arsenic and Fluoride etc. the distribution area of lichen and mosses are the indicators of SO<sub>2</sub> pollution because lichen and mosses cannot grow in the industrial regions or the regions containing SO<sub>2</sub> pollutants. The higher concentration of ozone produces harmful effects. But normally, ozone layer absorbs U.V. rays which are harmful for the living things.
  - (vi) aerosol : The aerosol like C.F.C. (chloro fluoro carbon) release into the atmosphere from the refrigerators, air conditioners and jet planes deplete or reduce the ozone layer. This thin layer of ozone is also known as ozone hole results in the increase in temperature of the earth.
- (d) Measures to Control Air Pollution :**
- \* Barium compounds should be mixed with petrol which reduce the smoke.
  - \* It is also very essential to check the quality of gases released from the factories.
  - \* Industries should not be established at one place.
  - \* The smoke should be released into the atmosphere after filtration and purification (by cyclone collector or electrostatic precipitators).

## **WATER (HYDROSPHERE)**

It is renewable resource which is essential for sustenance of life. It covers 3/4 th of the earth's surface. Of the total water present in hydrosphere 97% is present in oceans which is not utilizable by living beings. Only 3% water is fresh water. Among this 3%, 72.2% is stored in glaciers and ice caps (frozen), 22.4% is ground water and soil moisture. Remaining 0.36% is found in lakes, rivers, streams and swamps.

- (a) Types of Water Resources :**
- (i) Fresh water resource : It consists of ponds, lakes, large rivers. It can be recycled. It is essential for life on earth as well as for survival. It can be obtained by three different types of natural resources.
- (A) Rain water : India receives 3 trillion m<sup>3</sup>of water from rainfall or precipitation. Its intensity is different in different zones, on this basis zones are classified as :
- \* Wet zone : with very high rainfall \* intermediate zone : with heavy rainfall
  - \* Semi arid zone : with moderate rainfall \* Arid zone ; with low rainfall.
  - \* There are 14 major river systems with plenty of lakes, ponds etc.
  - \* It is the water which percolate into the ground. There is a certain level below the surface where the rocks are saturated with water and this level is known as the zone of saturation. The upper level of the zone of saturation is called the **water table**. **However**, the vertical distance from the surface from the surface of a region of the water table is called the **water level**.
- (ii) **Salt water resource** :It consists of oceans, seas etc. it cannot be used by living beings for drinking.

(b) **Role of Water or Hydrosphere :**

- \* Water is the main constituent of protoplasm.
- \* It is the universal solvent. Through which mineral salts are transported from one part of the plant to the other.
- \* Various metabolic reaction take place in the medium containing water.
- \* It acts as a reactant in numerous metabolic reactions.
- \* During photosynthesis, water releases oxygen.
- \* Turgidity of the growing cells is maintained with water.
- \* Various movements of plant organs like movements in sensitive plant (touch-me-not) are controlled by water.
- \* The growth of the cells during elongation phase is mainly depends upon absorption of water.
- \* Metabolic end product of respiration is water.
- \* It acts as a temperature buffer as its specific heat is highest (only exception – liquid ammonia).
- \* It show the properties of cohesion and adhesion which account for the capillary action of water.

(c) **Water pollution :**

**The water pollution is caused by the addition of organic and inorganic chemicals as well as the biological materials which change the physical and chemical properties of water. This harmful process is called as water pollution. The water pollution is caused by many sources such as sewage matter, industrial wastage, agricultural wastage, domestic wastage, not water of thermal plants and nuclear reactors etc. water pollution can be caused by the following man made sources :**

- (i) **Household detergents :** The household detergents include the compounds of phosphate, nitrate, ammonium and alkylbenzene sulphonate etc. harmful substances which are gathered in water. Alkyl benzene sulphonate (ABS) is not degradable, so that its concentration increases which is harmful for aquatic life.
- \* **Control measures :** For the control of this pollution lime, ferric chloride etc. are used to precipitate the phosphate. Zirconium is considered best for this purpose.
- (ii) **Sewage :** Sewage contains highest amount of carbonic materials and biological materials. These carbonic materials increase the number of decomposers like bacteria and fungus. The rate of reoxygenation reduced as compared to deoxygenation in a water reservoirs. The acceleration of microbial activity increases the BOD of water. BOD is very less in pure water. The higher BOD is the indication of water pollution and the water of polluted reservoir can not be utilized and produces a very bad smell spreading around the locality. The infection or disease also takes place. Daphnia and some fishes are sensitive to water pollution and show the intensity of water pollution.
- \* **Control measures :** To control the water pollution of sewage water it should be left into reservoir after the primary and **secondary treatment**. The big particles are mainly separated in primary treatment through floatation and sedimentation. Micro organisms are used for secondary treatment such as oxidation chamber or activated sludge process. Oxidation chamber is a shallow reservoir in which the sewage is stored. Algae and bacteria grow very well because of the higher amount of carbonic materials in it. Bacteria decomposes the organic materials and produce CO<sub>2</sub> which is utilized by the algae in photosynthesis. Oxygen released by photosynthesis protects the water pollution. Therefore oxidation pond is the example of symbiosis in between algae and bacteria. The infectious bacteria are destroyed during the activity (reactions) in the oxidation pond. So that the simple substances are left after decomposition of organic matter.

- (iii) **Industrial wastes** : the wastes of industries are discharged into the running water, rivers and canals, industrial wastes mainly contain inert suspended particles such as dust, coal, toxins like acid, base, phenols, cyanides, mercury, zinc etc., inorganic materials like-ferrous salts, sulphides, oils and other residues of organic material and hot water. The water polluted by mercury, lead etc. causes disorganization of nervous system. It means it produces insanity. The minamata disease is caused in Japan by eating of mercury polluted fishes. So many people died because of this disease.
- \* **Control measures:** The industrial wastes and toxic components should be made pure before releasing into rivers, lakes, ponds or sea. So that the water pollution of industrial effluents can be controlled by suitable treatment to remove the pollutants.
  - \* **Bioaccumulation of pesticides:** Pesticides like DDT are poisonous chemicals sprayed on crops to protect them from pests and diseases. This increase in concentration of harmful non-biodegradable chemical substances in the body of living organisms at each trophic level of a food chain is called biological magnification.
  - \* **Eutrophication:** the discharge of sewage water and detergents in water bodies promotes excessive growth of phytoplanktons (minute aquatic algae). This excessive growth causes reduction in oxygen level of water. The excessive growth of phytoplanktons brings about a reduction in dissolved oxygen which affects other aquatic organisms. Consequently potential sources of food are highly reduced.

## **LITHOSPHERE**

**Lithosphere is the main life supporting system. Top layer of earth is called soil. It is the main natural resource essential for survival and development.**

(a) **Structure and Formation of Soil :**

Soil is formed due to interaction between weathering of rocks, rain, wind, temperature (physical components) and plants, animals and microbes (biological components). It is formed by combined action of climatic factors such as temperature, rainfall, light etc. and biotic factors such as plants and microbes on earth crust.

(b) **Constituents of Soil :**

**Soil contains:** (a) inorganic constituents of parent rocks (b) organic products of living organisms; (c) living organisms including microorganisms (d) air in the pores. There are four important components of soil. They are

- |                      |                       |
|----------------------|-----------------------|
| (i) Mineral matter   | 50-60%                |
| (ii) Organic matter  | 10%                   |
| (A) Living organisms | (B) decomposed matter |
| (iii) Soil water     | 25-35%                |
| (iv) Soil air        | 15-25%                |

(c) **Types of Soil :**

On the basis of its nature and composition, soil is mainly of six types ----

- (i) Alluvial soil: rich in loam and clay.      (ii) **Black soil-which has clay.**
- (iii) Red soil: which is sandy to loam.      (iv) **Mountain soil-which is a stony and sandy soil.**
- (v) Desert soil- which is sandy.      (vi) **Laterite soil- which has porous clay.**

Outer most layer of earth is called crust. Many types of minerals are found in crust. They provide many types of nutrients to living beings.

**(d) Factors / Processes Responsible for Formation of Soil :**

- (i) **Sun:** rocks get expanded due to heat produced by sun during day time. At night, The rocks cool down and contract. Due to this unequal expansion and contraction of rocks, cracks in rocks appear. This leads to formation of smaller pieces of rocks.
- (ii) **Water :** due to continuous movement of rain and fast flowing river water, rock Pieces collide and break down in still finer particles due to their abrasive effect.
- (iii) **Wind:** wind has abrasive effect on rocks. Finer rock particles are blown away and get deposited at other distant places.
- (iv) **Living organisms :** the step of weathering is brought about by plants and animals. Lichens are first to appear on bare rocks. They produce acids which corrode the rocky surface to produce fine particles. Now plants like mosses can appear on it. In such type of soil, certain microbes, algae, insects and worms appear and die. Organic matter gets accumulated. Roots of some plants grow into the crevices of rocks.

**(e) Soil pollution :**

Soil is also polluted through the polluted water and air. These pollutants are mixed into the soil through the rainy water. Such as  $H_2SO_4$  acid is formed by mixing of  $SO_2$  with rainy water in the air. The fertilizers are used to increase yield of the crops. Various types pesticides and weedicides etc. are sprayed over the crops. All these mixed with soil to produce harmful effects. The growth of plants inhibited or reduced due to this type of pollution and sometimes death also takes place. Excluding to these soil pollution is also caused by the disposal of house hold detergents, sewage, flowing oils, radioactive substances and hot water etc. the main substances of pesticides in soil pollutants are D.D.T. and weedicides 2, 4-D (2,4 di-chlorophenoxy acetic acid) 2,4,5-T (2,4,5, tri-chlorophenoxy acetic acid).

- (i) **Control measures:** soil pollution can be controlled through biological degradation of waste materials. The various carbonic materials are of agricultural waste, cattle dung etc. which can be minimized by the use of biogas plants which can produce energy also. In spite all measures pesticides and weedicides should be used in limited quantity only when they are required. Bhopal Gas Tragedy is the best example of human hazard which took the life of many persons the tank of methyl isocyanate burst during the manufacturing of savin insecticide on 3<sup>rd</sup> **December 1984**.

**(ii) Soil erosion :**

\* Fertility of soil depends on

- (A) Presence of organic matter(humus) and nutrients, (ii) capacity of soil to retain water and air. A loamy soil is the best-suited for plant growth.
- (B) The fertility of soil is threatened due to various activities of humans. The main threat to the fertility of soil is from soil erosion, which is the loss of soil due to wind or water flow.

**(f) Methods of Preventing Soil Erosion :**

Prevention of soil erosion can be brought about by controlling the factors which cause soil erosion. The methods would thus be follows:

- \* Deforestation should be stopped, rather, trees should be planted (afforestation). Afforestation should be undertaken not only in areas already cut, but additional areas should be brought under plantation.
- \* To reduce the effect of strong wind in the fields, the boundaries of the fields should be planted with trees in two or three rows.
- \* To maintain the soil in its natural condition, it is advisable to grow different crops. Crop rotation helps to maintain the fertility of the soil. The water - holding capacity of the soil is also maintained by this method.
- \* Proper drainage and irrigation arrangements should be made in the fields.
- \* On the sloping areas in hills, strip cropping should be practiced, thereby reducing the steepness of the slopes and checking soil erosion.
- \* **Strip - cropping** means the planting of crops in rows or strips to check flow of water.

## EXERCISE

### OBJECTIVE DPP - 15.1

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- Soil is a part of  
(A) atmosphere (B) lithosphere (C) hydrosphere (D) ionosphere
- Maximum air in which we breath is present at  
(A) troposphere (B) stratosphere (C) ionosphere (D) mesosphere
- Biogeochemical cycles are also known as  
(A) sedimentary cycles (B) gaseous cycles (C) material cycles (D) cycles of water
- Which of the following is a free living nitrogen fixing bacteria present in soil ?  
(A) Azotobacter (B) Nitrosomonas (C) Rhizobium (D) pseudomonas
- CO<sub>2</sub> and O<sub>2</sub> balance in atmosphere is due to  
(A) Photosynthesis (B) respiration (C) leaf anatomy (D) photorespiration
- Nitrogen fixation is  
(A) Nitrogen  $\longrightarrow$  Ammonia (B) Nitrogen  $\longrightarrow$  nitrates  
(C) Nitrogen  $\longrightarrow$  Amino acid (D) Both A and B
- Soil erosion can be prevented by  
(A) deforestation (B) afforestation (C) overgrazing (D) removal of vegetation
- A renewable source of energy is  
(A) petroleum (B) coal (C) nuclear fuel (D) trees
- Percentage of nitrogen in air is  
(A) 77.02% (B) 78.09% (C) 76.08% (D) 74.09%
- Ozone layer is present in atmosphere in  
(A) troposphere (B) stratosphere (C) mesosphere (D) thermosphere

### SUBJECTIVE DPP - 15.2

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#### VERY SHORT ANSWER TYPE QUESTIONS

- Define the term biosphere.
- Mention the components of biosphere.
- Name any two inexhaustible and exhaustible natural resources.
- Write about the cause of wind.
- Name three natural resources of water.

#### SHORT ANSWER TYPE QUESTIONS

- Explain the composition of air ? What is the role of atmosphere in climate control?
- Write a short note on wind.
- Write the causes and effects of air pollution.

#### ANSWER TYPE QUESTION

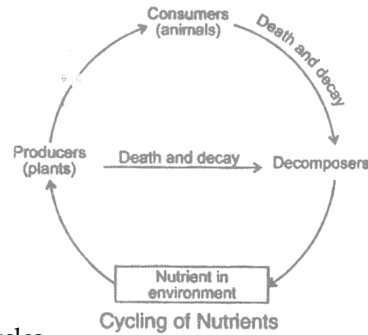
- What is green house effect? Name the different green house gases.

# NATURAL RESOURCES

BL-16

## BIOGEOCHEMIC CYCLES

These are the cyclic pathways through which chemical elements move from environment to organisms and back to the environment. Such cycling is essential as the earth and its environment, with reference to these elements, are considered as closed systems and there is no inflow of such elements from outside the earth and their amount is limited.



- \* Two types of biogeochemical cycles are :
- \* Gaseous cycles

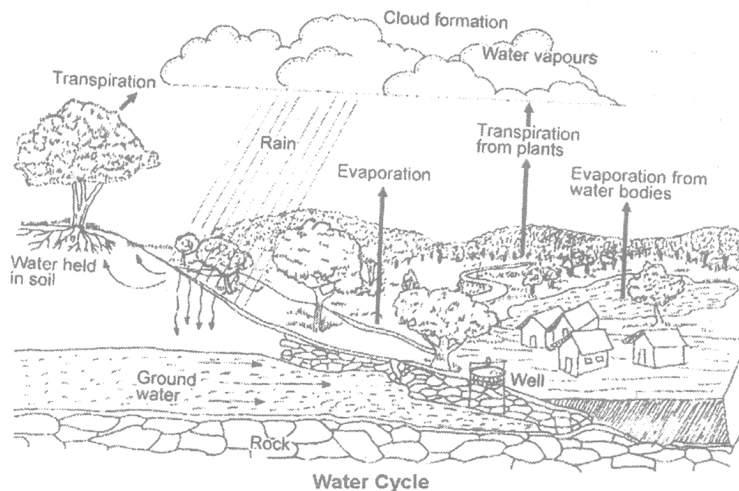
- \* Sedimentary cycles

**Table: Differences between gaseous and sedimentary cycles**

Characters	Gaseous cycles	Sedimentary Cycles
Reservoir pool	Air or water	Rocks
Speed	Faster	Slower
Examples	Carbon, nitrogen and oxygen cycles	Calcium, phosphorous and sulphur cycles.

### (a) Water Cycle :

Water is the most abundant (60-90%) component of protoplasm. It acts as a habitat for hydrophytes and many aquatic animals, a good ionizer, good solvent, temperature buffer and performs transportation of materials. It also helps in digestion of organic compounds and in photosynthesis of plants.



### (i) Types of water cycles are:

- (A) **Global water cycle** : does not involve living organisms and involves the interchange of water between the earth's surface and the atmosphere via the processes of precipitation and evaporation. Ocean is the biggest store house of water. Evaporation involves the conversion of liquid and solid forms of water into vapours and later form the clouds. Precipitation involves the rainfall, hail, snow, etc. energy for global water cycle is provided by sunlight.

(B) **Biological water cycle** : it is the interchange of water between Abiotic and biotic components of environment e.g. the plants absorb water from water bodies and soil while lose most of the water by the process of transpiration, animals consume water from water bodies or the food ingested, while release water via the processes of respiration and excretion.

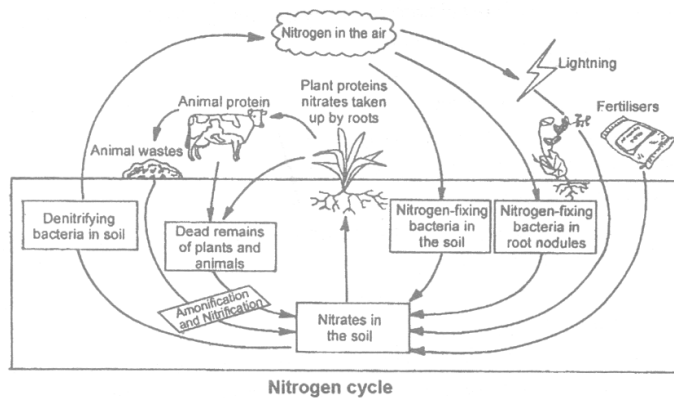
(b) **Nitrogen Cycle** :

Nitrogen is an essential component of amino acids, proteins, enzymes and nucleic acids of the protoplasm. Reservoir pool of nitrogen is atmosphere which contains about 78.08% of nitrogen in gaseous state. But it cannot be used directly and is changed into nitrites and nitrates and then utilized.

(i) **Steps of nitrogen cycle are:**

(A) **Nitrogen fixation:** it involves the conversion of free diatomic nitrogen ( $N_2$ ) into nitrites and nitrates. It occurs in three ways :

- \* Atmospheric nitrogen fixation in the presence of photochemical and electrochemical reactions induced by thundering and lightening.
- \* Industrial nitrogen fixation in the industries at night temperature and high pressure.
- \* Biological nitrogen fixation in the presence of certain living organisms as



- \* **Rhizobium** bacterium in the root nodules of legumes.
  - \* **Azotobacter** bacterium in the soil.
  - \* **Anabaena** (blue green algae) in water in the paddy fields.
  - \* **Azospirillum** bacterium in loose association with the roots of maize, sorghum, etc.
- (B) **Ammonification:** it involves the decomposition of proteins of dead plants and animals to ammonia in the presence of ammonifying bacteria like *Bacillus ramosus*.
- (C) **Nitrification:** it involves the oxidation of ammonia to nitrites ( $NO_2$ ) and nitrates ( $NO_3$ ) in the presence of nitrifying bacteria like **Nitrosomonas** (Ammonia to nitrite), **Nitrobacter** (Nitrite to nitrate), etc. plants absorb the nitrites and nitrates from the soil through their roots and convert them into organic compounds(e.g. proteins) of protoplasm by the process called nitrogen assimilation.
- (D) **Denitrification:** it involves reduction of ammonium compounds, nitrites and nitrates to molecular nitrogen in the presence of denitrifying bacteria like *Thiobacillus denitrificans*.
- (c) **Carbon Cycle** :
- Carbon is the basic component of all the organic compounds like carbohydrates, proteins, lipids, enzymes and nucleic acid of the protoplasm. In atmosphere, it is present as carbon dioxide. It involves two types of processes, one involving  $CO_2$  utilization and another involving  $CO_2$  production. They are expressed as follows:



(i) **CO<sub>2</sub> utilization** : carbon dioxide is utilized by the Photosynthetic organisms like green plants, Photosynthetic bacteria, diatoms and blue green algae In the presence of Photosynthesis, it occurs in the Presence of chlorophyll and radiant energy of Sunlight. Glucose synthesized in photo synthesis is Used to synthesize other organic compounds.

(ii) **CO<sub>2</sub> production** :

\* CO<sub>2</sub> is released during respiration of both producers And consumers.

\* During decomposition of organic compounds of dead Bodies.

\* During burning of fossil fuels like wood, coal, Petroleum, etc.

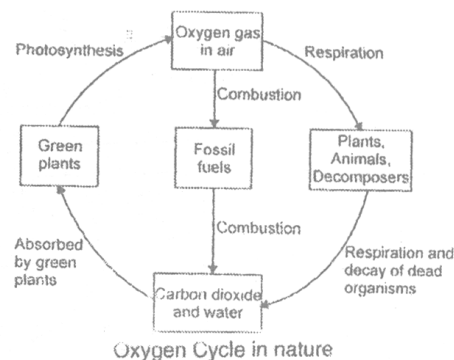
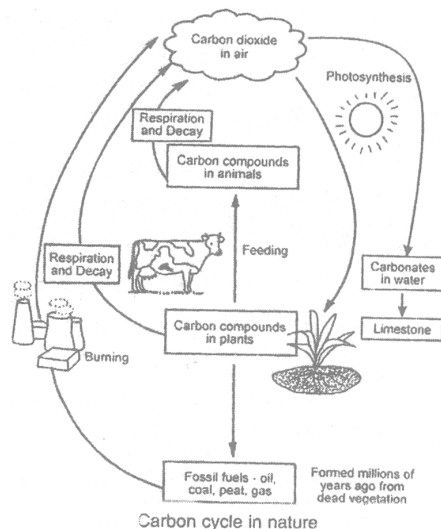
\* Volcanic eruptions and hot springs.

\* During weathering of rocks by acids produced by microorganisms and roots of higher plants.

(d) **Oxygen Cycle** :

Oxygen is present in water and from 20% of air in Atmosphere. All living beings need it for respiration. Oxygen content of atmosphere has remained constant For the last several million years. Most of O<sub>2</sub> lost is Replenished by photosynthesis. During photosynthesis CO<sub>2</sub> is used by plants to form food along with release Of oxygen. The oxides can be reduced both chemically And biologically to produce oxygen.

Microbial oxidation can also occur. Due to burning materials oxygen form carbon dioxide. When oxygen combines with nitrogen, it forms oxides of nitrogen, amino acids, proteins etc. these compounds on breakdown release the oxygen in atmosphere.



### **GREEN-HOUSE EFFECT**

Usually carbon dioxide is not considered as pollutant, but its higher concentration forms the thick layer above the earth surface which checks the radiation of the heat from the earth surface. Because of this the temperature of the earth surface increases. This is called as "Green house effect".

The various green house gases are CO<sub>2</sub> (Warming effect 60%), CH<sub>4</sub> (Warming effect 20%), chlorofluoro carbon or CFCs (14%) and Nitrous oxide (N<sub>2</sub>O 6%) : Even 2-3° C rise in Temperature will lead to melting glaciers and Ice caps of polar regions & consequently Causes floods in rivers, rise in sea level and Changes in cycle of rain. Islands may be Emerged in sea water. The present growth rate Is continued then the amount of CO<sub>2</sub> will be double upto 2020.

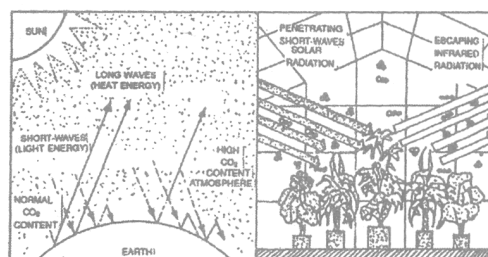


Fig : Green House effect

**(a) Global warming :**

Global warming is the increase in average global temperature due to increase in amount of GHGs in earth's atmosphere.

**\* consequences of global warming :**

- (i) Increase in the sea level :** Global warming will melt polar ice caps. If all the ice on the earth will melt, about 200 feet of water would be added to surface of all oceans. Thus low lying coastal cities like Shanghai, Kolkata, Bangkok, Dhaka, Venice, etc. will be inundated.
- (ii) Increase in global temperature :** If present input of GHGs will be continued, the earth's global temperature will rise.
- (iii) Effect on agriculture :** Grain production will be reduced. India's annual monsoon rains may even cease together. One third of global forest might be swept away. Deserts are likely to increase
- (iv) Chances of hurricanes, cyclones and floods will be more.**
- (v) Increased temperature and humidity caused by global warming will lead to spread of diseases like malaria, filariasis etc. due to spread of vectors. Incidences of respiratory and skin diseases are likely to increase.**

**OZONE DEPLETION**

Between 320 And 26 Km Above The Sea Level It Occurs Ozone Layer And The Part Of Atmosphere Containing It Is Called Ozonosphere (Stratosphere). This layer is established due to an equilibrium between photo-dissociation of ozone by UV-radiation and regeneration of ozone. The thickness of this ozonosphere averages 5km. the ozone layer acts as a shield and absorbs the harmful UV-radiations of the sunlight so protects the earth's biota from the harmful effects of strong UV-radiations. So this layer is very important for the survival and existence of life on earth.

**(a) Causes of Thinning of Ozone Layer :**

The decline in spring-layer thickness is called ozone hole is largest over Antarctica and was just short of 27 million sq.km. during September 2003. main chemicals responsible for destruction of ozone-layer are : chlorofluorocarbons(CFCs), halogens (used in fire extinguishers) methane and nitrous oxide. Out of these, most damaging is the effect of CFCs which are a group of synthetic chemicals and are used as coolants in refrigerators and air conditions; as cleaning solvents, propellants and sterilants etc. these CFCs produce "active chlorine" (Cl and ClO radicals) in the presence of UV-radiations. These active chlorine radicals catalytically destroy ozone and convert it into oxygen.

**\* Nitrous oxide :** It is produced by industrial processes, forest fires, solid waste disposal, spraying of insecticides and pesticides, etc. methane and nitrous oxide also cause ozone destruction.

**(b) Effects of Ozone Depletion :**

The thinning of ozone layer results in an increase in the UV radiation (in the range of 290-320nm) reaching the earth's surface. It is estimated that a 5 per cent loss of ozone results in a 10 per cent increase in UV-radiations. These UV-radiations :

- (i) Increased incidences of cataract and skin cancer.**
- (ii) Decrease the functioning of immune system :** due to killing of melanin-producing cells of the skin.
- (iii) Inhibit photosynthesis in most of phytoplanktons so adversely affecting the food chains of aquatic ecosystems.**
- (iv) Damage nucleic acid of the living organisms.**

**\* Strip-cropping** means the planting of crops in rows or strips to check flow of water.

## EXERCISE

### OBJECTIVE DPP - 16.1

---

- Nodules in the roots of legume plants contain
  - nitrogen fixing bacteria
  - potassium fixing bacteria
  - sulphur fixing bacteria
  - none of the above
- Which gas is mainly responsible for the depletion of ozone layer ?
  - oxygen
  - CFC
  - Nitrogen dioxide
  - All of the above
- Acid rain mainly contains
  - nitric acid
  - Sulphuric acid
  - hydrochloric acid
  - (A) and (C)
- Plants and animals are known as
  - biotic resources
  - Abiotic resources
  - machines
  - none of these
- Coal is an / a
  - exhaustible resource
  - potential resource
  - inexhaustible resource
  - none of these
- Ozonosphere occurs at height of
  - 8-10km above poles
  - 20-26 km above the earth surface
  - 8-10km above equator
  - 11-16km above equator
- Biosphere is made of
  - living beings and their remains
  - living beings, lithosphere, hydrosphere and atmosphere
  - living beings and lithosphere
  - living beings, lithosphere and hydrosphere.
- Soil erosion can be prevented by
  - deforestation
  - afforestation
  - overgrazing
  - removal of vegetation
- Which one of the following is renewable resource ?
  - water
  - Metals
  - Fossil fuel
  - All of these
- Which gas is responsible for the global warming
  - O<sub>2</sub>
  - N<sub>2</sub>
  - H<sub>2</sub>
  - CO<sub>2</sub>

### SUBJECTIVE DPP - 16.2

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#### VERY SHORT ANSWER TYPE QUESTIONS

- Define pollution.
- What is acid rain ?
- Expand CFC and write about its effect on environment.
- What is global warming ?
- Define biogeochemical cycles ?

### SHORT ANSWER TYPE QUESTIONS

6. Write the causes and effects of water pollution.
7. Write a short note on importance of water in biosphere.
8. How is soil formed ? what is the role of human in fertility of soil ?

### LONG ANSWER TYPE QUESTION

9. Give diagrammatic representation of carbon and oxygen cycles.

## EXERCISE

(Objective DPP # 15.1)

Q	1	2	3	4	5	6	7	8	9	10
A.	B	A	C	A	A	D	B	D	B	B

(Objective DPP # 16.1)

Q	1	2	3	4	5	6	7	8	9	10
A.	A	B	D	A	A	C	B	B	A	D



# IMPROVEMENT IN FOOD RESOURCES



BL-17

## INTRODUCTION

food is the combination of various organic and substances which is capable of providing

- (i) energy for the various metabolic activities.
- (ii) materials for repair / replacement of worn-out tissues in the body.
- (iii) materials for growth & reproduction.
- (iv) regulatory substances, body secretions and metabolic activities etc.

**(a) Agriculture :**

(Ager means field ; cultural means cultivation). it is applied biological science which deals with the production of plants raising of animals useful to man, involving soil cultivation, breeding and management of crops and livestock.

**(b) Horticulture ;**

(Hortus-garden ; cultura-cultivation). it is the branch of agriculture and the science of growing vegetables, fruits and ornamental plants.

**(c) Silviculture :**

(Sylvan-wood and trees) Cultivation of wood and trees e.g. -**pine, teakwood, sesamum etc..**

**(d) sources of Food :**

plants provide us foods like cereals, pulses, oil seeds, fruits and vegetables, on this basis plants are classified as follows :

**Table: Classification of crop plants**

Type of crop plant	Examples	Importance
1. cereals	Wheat, Rice, Maize, Minor Millets, Sorghum	Rich in carbohydrates for energy Requirements.
2. pulses	Gram(Chana), Pea (Matar) Black Gram (Moong), Pigeon Pea (Arhar), Lentil (Masoor) Etc.	Rich in proteins that are body Builders.
3. oil seed crops	Soybean, Groundnut Sunflower, Niger, Sesame, Castor, Mustard, Linseed.	Rich in oils and fatty acid
4. root crops	Turnip, Carrot, Turmeric, Sweet Potato & Ginger	It is utilized as the vegetables & medicines
5. sugar crops	Sugarcane And Beet	Important for wine industry.

Type of crop plant	Examples	Importance
6. fibre crops	Jute & Cotton	Important for jute & cotton industry.
7. plantation crops	Tea, Coffee, Coconut And Rubber	Increases case and also called as Case crops.
8. fodder crops	Berseem, Maize, Sorghum And Elephant Grass.	Provide fodder for animals
9. horticulure crops (Fruits and vegetables)	Apple, Banana, Guava, Pomegranate, Pears, Chilies, Coriander, Jeera, Carrot, Raddish, Cabbage, Cauliflower, Spinach, Cucurbit.	Provide vitamins, minerals along with Small three quantities of Carbohydrates, proteins and oils.

**(e) Crop Seasons :**

Different types of crops require different climatic conditions like :

- (i) Temperature (ii) Photoperiod (duration of light)  
(iii) Completion of life cycle

**(f) Depending Upon the Growing Season, there are two Groups of Crops :**

Kharif crop Rainy season crop	Rabi crop/ Winter season drop
(i) Are grown during monsoon/rainy season	(i) Are grown during winter season
(ii) They require warm and wet weather	(ii) They require cold and dry weather
(iii) They are sown in June/ July and harvested in September /October	(iii) They are sown in October/November and harvested in March/ April
(iv) E.g. - Rice, Jowar, Bajra, Cotton, Pea, Groundnut, Urad, Moong etc.	(iv) E.g. - Wheat, Barley, Gram, Mustard, Potato etc.

**IMPROVEMENT IN CROP YIELD**

- (i) Varietals improvement of crop through genetic manipulation.  
(ii) Crop production management. (iii) crop protection management.

\* **Improvement in Crop yield :** in India, there has been a four times increase in the production of food grains from 1960 to 2004. However, cultivable land area has increased by only 24 per cent. the yield of a crop can be increased by adopting number of improved agricultural practices, from sowing to harvesting. the various practices that are followed at various stages of production are as follows :

- |  |   |
|--|---|
| * preparation of soil                    | * Sowing  |
| * Application of manures and fertilizers | * irrigation                                      |
| * weed control                           | * Crop protection                                 |
| * harvesting, threshing and winnowing    | * Storage   |
| * crop improvement                       | * Rotation of crops, mixed and multiple cropping. |

**(a) Varietal improvement of Crops Through Genetic Manipulation :**

The principal aim Varietal improvement is to get many of the desirable & economic characters as possible in one variety.

**(i) Aims of crop improvement are :**

- |  |  |
|--|--|
| (A) Developing high yielding varieties | (B) improved quality                       |
| (C) Early and uniform maturity         | (D) insensitivity to light and temperature |
| (E) Wider adaptability                 | (F) Lodging- resistant varieties           |
| (G) Desirable agronomic characters     |  |

(ii) **Plant breeding**: the technique of producing improved varieties of crop plants by the introduction of several desired characters into them is called as **plant breeding**. Scientists concerned with the improvement of crop varieties are called as **plant breeders**.

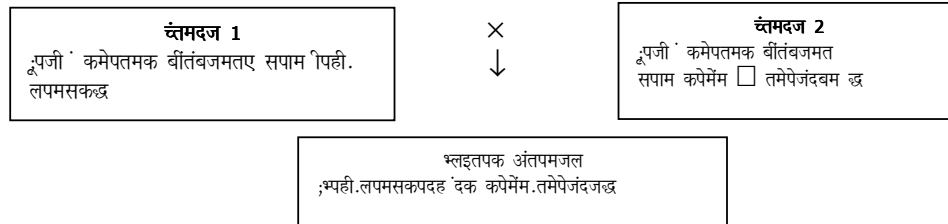
(iii) **Aims of plant breeding** : new varieties of crop plants have :

- (a) higher yield. (b) resistance to heat, frost, drought  
(c) pest resistance (d) early maturing varieties

(iv) **Methods for the genetic improvement of crop plants** :

- (a) introduction (b) selection (c) hybridization

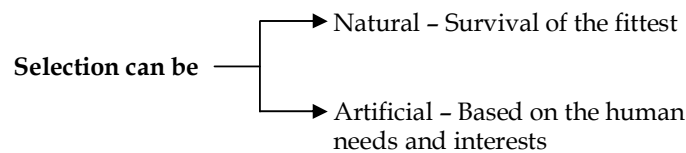
(A) **introduction** : it refers to the taking of superior varieties of crop plants from the place of their natural cultivation to the place where they were never grown earlier.



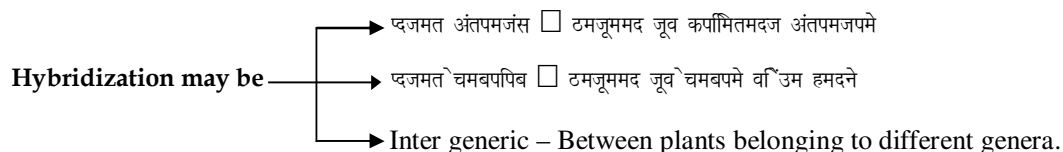
\* **Green revolution** was a process by which India's production of wheat, rice, maize and several other food grains was tremendously increased in the late 1960s and early 1970s. India, which was due to the new agricultural technologies whereby high-yielding varieties of wheat and rice were grown in India. Fertilizers and pesticides were used. Irrigation facilities were improved. Dr. M.S.Swaminathan played a key role in bringing about the 'green revolution'.

\* Padam Vidhuahan Professor, DR.M.S> Swaminathan, FRS(Fellow of Royal Society), is the Father of green revolution in India. he stressed the need for the reorientation of the breeding programme and his work led to the era of dwarf varieties in India. In 1967, he developed a high-yield dwarf variety of wheat, Sharbati Sonara. Being a plant geneticist, he has contributed to the development of agriculture in india. He has held various important positions in India and abroad.

(B) **Selection** : it is the process in which economic plants having best desired characters are picked up from the given population and seeds of such plants are used for future cultivation.e.g. Maize & Cabbage are represented by their cultivated varieties only.



(C) **Hybridization** : it means the process of crossbreeding of two genetically dissimilar varieties of crop plants (each having a specific and better characteristics) to obtain a new crop plant having both the desired characteristics is called as **hybridization**. crop plants produced in this way are called as **hybrid varieties or high yielding varieties**.



(b) **Crop Production Management** :

in order to improve and manage our crop production system, we have to focus on cheaper and farmer friendly approaches. as there is direct co-relationship between the higher yields and input applications.

**\* Successful crop Productions upon :**

- (i) Understanding how crops develop and grow.
- (ii) How various factors affect the growth and development of crops and
- (iii) How each factor can be modified and managed.

**\* Approaches for crop production :**

- (i) Nutrient management                      (ii) irrigation                      (iii) Mixed cropping
- (iv) Inter cropping                              (v) crop rotation

**\* Nutrient management :** Plant nutrients are the mineral elements needed by the plants for their growth, development and maintenance. plants absorb a large number of elements from soil, besides water and air, only 16 elements are essential nutrients for plants, out of 40 elements in plant ash. they are :

- (i) Carbon                                      (ii) iron                                      (iii) hydrogen
- (iv) Manganese                              (v) Oxygen                                      (vi) Phosphorus
- (vii) Nitrogen                                      (viii) Zinc                                      (ix) Phosphorus
- (x) Copper                                      (xi) Potassium                                      (xii) molybdenum
- (xiii) Magnesium                                      (xiv) Chlorine                                      (xv) Sulphur
- (xvi) Calcium

**\* Sources of plant nutrient :** the plants obtain their nutrients mainly from the soil. out of the total 16 nutrients, as many as 13 are absorbed from the soil.

SOURCES OF PLANT NUTRIENTS	
Soil	Nitrogen, Phosphorus, Potassium, Calcium, Magnesium, Sulphur, Iron, Manganese, Boron, Zinc, Copper, Molybdenum, Chlorine
Air	Carbon, Oxygen
water	Hydrogen

**\* Characteristics of an essential plant nutrient :**

- (i) In the absence of such element, the plant is not complete its life cycle.
- (ii) Such element much have a direct influence on the plant nutrition and metabolism.
- (iii) The requirement of such element can be corrected or prevented only by supplying that Nutrient.

**\* Classification of plant nutrients :** On the basis of quantities required 13 mineral nutrients are obtained from soil needed for plant growth have been grouped into two categories.

- (i) **Macronutrients**                                      (ii) **Micronutrients**

<b>Micronutrients</b>	Carbon, Hydrogen, Oxygen, Nitrogen, Phosphorus, Potassium, Calcium, Magnesium, Sulphur,
<b>Micronutrients</b>	Iron, Manganese, Boron, Zinc, Copper, Molybdenum, Chlorine.

out of the sixteen essential nutrients, some are required by plants in relatively large amounts than the others. the nutrients required in relatively large quantities are called macronutrients or major elements, while the ones required in very small quantities or traces are called micronutrients or minor elements. deficiency of the nutrients affects physiological process in plants as well as their reproduction, growth and susceptibility to diseases. to overcome the deficiency of nutrients, the soil can be enriched by adding manures and fertilisers.

**\* Besides these, carbon, oxygen and hydrogen are called framework elements.**



## EXERCISE

### OBJECTIVE DPP - 17.1

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- Which one of the following includes only macronutrients?  
(A) C,N, Ca                      (B) H, Fe, P                      (C) O, K, Cl                      (D) K, S, Zn
- Transfer of seedling from the nurseries to the main field is termed as  
(A) weeding                      (B) sowing                      (C) transplantation                      (D) ploughing
- The unwanted wild plants growing along with the crop plants are called  
(A) weeds                      (B) seedling                      (C) minor crops                      (D) grasses
- Damp grains in storage gets heated due to  
(A) infestation by insects                      (B) decrease in humidity  
(C) decrease in atmospheric pressure                      (D) high moisture content and growth of moulds
- Green manuring refers to  
(A) add green leaves to the soil  
(B) grow young and green crops of leguminous plants along with non leguminous  
(C) add decomposed organic matter to soil  
(D) none of these
- Vermicomposting involves  
(A) earthworm                      (B) cockroach                      (C) leech                      (D) roundworm
- Improved storage structures include  
(A) grain silos                      (B) pusa bin                      (C) pusa kothar                      (D) all of these
- Weedicides among the following are  
(A) 2, 4-D, nitrofen, atrazine                      (B) atrazine, BHC, pyrethrum  
(C) Pyrethrum, EDB, methyl bromide                      (D) 2, 4-D, BHC, EDB
- Which one of the following does not cause plant diseases?  
(A) viruses                      (B) Bacteria                      (C) Protozoa                      (D) Fungi
- EDB is a very effective  
(A) rodent bait                      (B) spraying insecticide  
(C) fumigant for killing insects                      (D) preservative of food grains

### SUBJECTIVE DPP - 17.2

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#### VERY SHORT ANSWER TYPE QUESTIONS

- What do we get from cereals, fruits and vegetables ?
- Define eutrophication.
- What is meant by agriculture ?
- What is meant by crops ?
- Name the two growing seasons for crops in our country also give examples.

#### SHORT ANSWER TYPE QUESTIONS

- What is the use of mixed farming ?
- Why legumes are desirable in crop rotation ?
- Name the two fertilizers supplying N, P, K to crops.

#### LONG ANSWER TYPE QUESTION

- Explain what will happen if in a cultivated field only manures are supplied and in another field only fertilizers are supplied, and keeping all other conditions similar ?



# IMPROVEMENT IN FOOD RESOURCES



BL -18

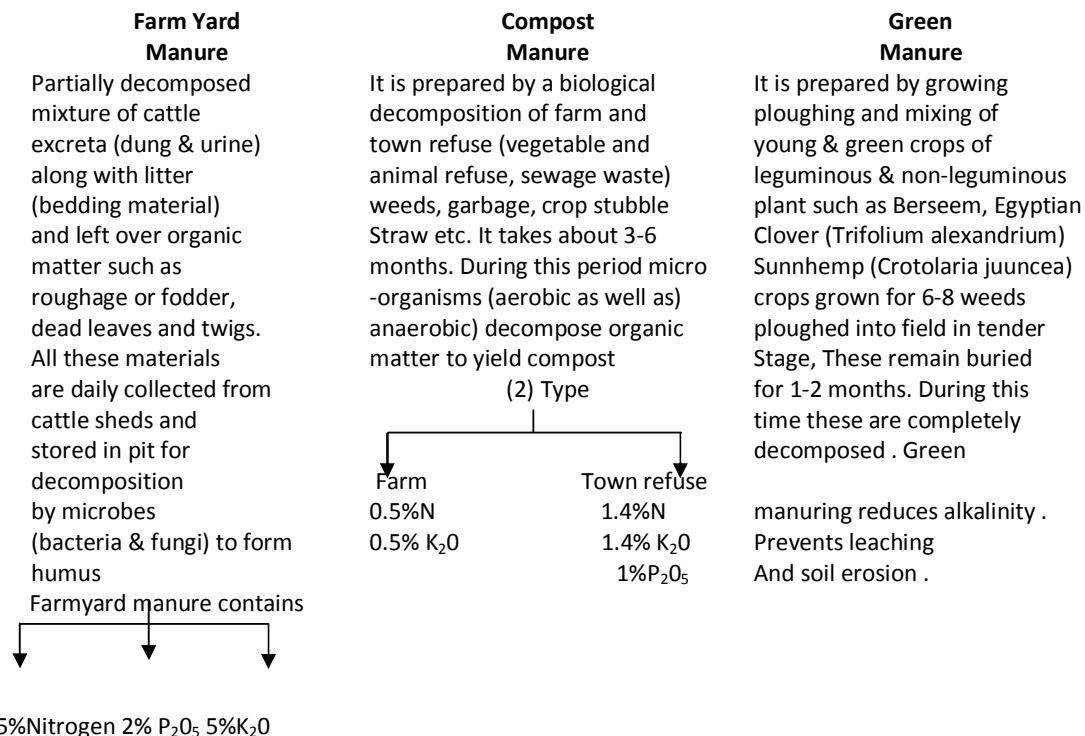
## MANURES & FERTILIZERS

### (a) Manure :

A manure is a mixture of various decomposed organic substances like dead leaves, city garbage, agricultural wastes, animal dung, crop residue etc. through the action of microbes. Manure increases the fertility and productivity of crops. As they contain plenty of organic compounds and almost all the essential elements required by the plants.

#### \* Characters :

- \* Manures are organic substances obtained through the decomposition of plant wastes (like straw) and animal wastes (like cow dung). The decomposition is brought about by the action of microbes.
- \* Manures contain large quantities of organic matter.
- \* Manures contain nutrients in small quantities and therefore are needed to be supplied to crops in large quantities.
- \* Manures are not nutrient - specific. For this reason, manures are not of much help when a specific nutrient is required for a particular crop.
- \* Manures are bulky. So it is not convenient to store and transport manures.
- \* Manures are recycled and do not cause pollution.
- \* They enrich the soil with nutrients.
- \* Being rich in organic matter, manures improve soil texture and soil aeration. Water holding capacity in case of sandy soils and drainage in clay soil is increased.
- \* **Types of Manure :** Manures are of three types.

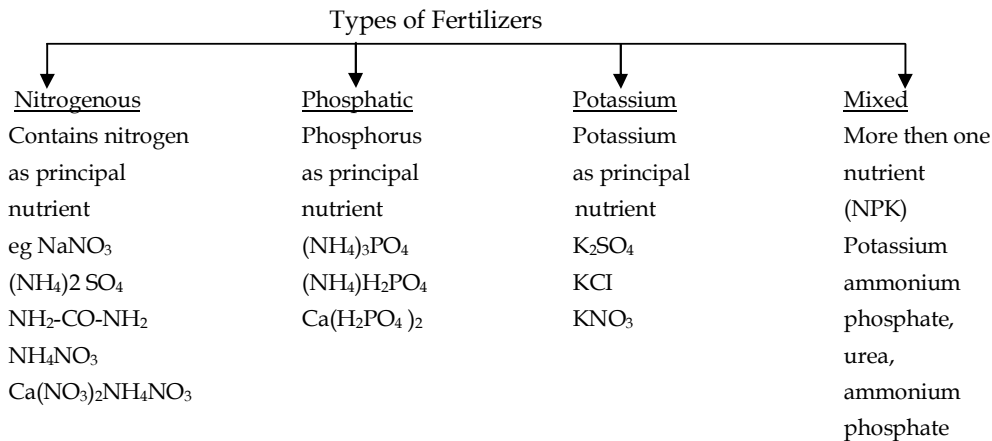


**(b) Fertilizers :**

These are commercially manufactured inorganic salts or an organic compound containing one or more essential plant nutrients like Nitrogen, Phosphorus or Potassium which are used for increasing soil fertility. Fertilizers usually contain higher amount of nutrients than manures hence required in small quantities.

**Characters**

- \* Fertilizers are inorganic or organic compounds containing the necessary plant nutrients.
- \* They contain much higher amount of nutrients in comparison to manures, and are therefore, required in very small quantities.
- \* They are manufactured commercially from chemicals, and are marketed in concentrated form.
- \* They are easy to use, store and transport.
- \* Being soluble in water, they are easily absorbed by the plants.
- \* Fertilizers are generally nutrient – specific i. e. these supply only one or more specific nutrients.



- \* **Hazards of using fertilizers :** Thought use of fertilizers has brought about significant increase in crop yields, however, the continued use affects soil quality and brings about pollution of water bodies.
- \* **Effect on soil quality :** Continuous use of fertilizers leads to a loss of organic matter, a deterioration of soil structure and a decrease in porosity. As a result, the plant roots are deprived of oxygen and can not absorb the salt effectively. Further, the soil is more likely to become dry and powdery and can be blown away by the wind, when not protected by a plant cover.
- \* **Water pollution and eutrophication :** Excessive use of fertilizers, in particular nitrogenous ones, causes build up of nitrates in the soil. From the soil, the nitrates as well as phosphates are washed by rain and carried to lakes, ponds and rivers. Here, they stimulate excessive growth of microscopic plants like algae resulting in the formation of blooms. The algae grow quickly then die and decomposed. During decomposition, the algae deplete the oxygen content of the water body, which ultimately results in the death of fish and other aquatic animals. This excessive growth of algae and the subsequent depletion of oxygen content of water is called eutrophication. Fertilizers, therefore, must be used carefully and judiciously in limited quantity.
- \* **Application of fertilizers :** fertilizers are applied before sowing, during irrigation or sprayed on standing crops. But fertilizers are never applied directly to soil if the crop is standing. It would bring about wilting of crop due to exosmosis because of increase in the osmotic pressure around the roots of the plants.
- \* **Only urea is an organic compound.**

**VERMICOMPOSTING**

Composting with the help of earthworms is called vermicomposting. Earthworms help in breakdown of wastes. This activity along with the excreta of the worms makes the compost rich in nutrients.

**Table: Differences between manures and fertilizers**

S.No.	Manures	Fertilizers
1.	Manures are organic natural substances derived from the decomposition of biological materials (plants and animal residues)	Fertilizers are inorganic or organic substances.
2.	Manures contain organic matter in large quantities.	Organic matter is not present.
3.	Manures contain nutrients in small quantities, and are needed in large quantities.	Fertilizers contain much higher amount of nutrients, and are required in very small quantities.
4.	They are not nutrient - specific.	These are nutrient - specific.
5.	They are prepared in field and villages.	These are manufactured in factories.
6.	Manures are bulky substances. So, these are inconvenient to store, use and transport.	These are available in concentrated form. So these are easy to store, use and transport.
7.	Manures do not cause pollution.	They cause water pollution.

### **BIOFERTILISERS**

Biofertilisers are micro-organisms(like bacteria, algae and fungi used singly or in combination) or biologically active products which are used to enrich soil fertility.

Some of the Biofertilisers are given below :

- (i) Legume - Rhizobium symbiosis
- (ii) Azolla - Anabaena symbiosis
- (iii) Free - living bacteria (Azotobacter) living in soil symbiotically.
- (iv) Cyanobacteria (Anabaena, Nostoc)
- (v) Mycorrhiza (symbiotic association of fungi with roots of higher plants.)

### **ORGANIC FARMING**

Cultivation of land without conserving soil fertility and soil structure would lead ultimately to the development of deserts. Excessive and indiscriminate use of pesticides, fungicides and herbicides as is done in present day agriculture could lead to

- \* changes in biological balance ; population of soil organisms will be affected.
- \* increase in the occurrence of cancer and other diseases.
- \* contamination of water (water pollution) and enrichment of water bodies with nutrients leading to excessive growth of phytoplankton). These are some of the problem due to the adoption of improved agricultural practice in order to increase food production for the ever increasing human population. Scientists are greatly concerned about these problems and attempts have been made to develop alternatives to chemical agriculture. The alternatives consist of adopting “ green or ecofriendly technologies” or “ecologies farming” or organic farming is a farming system in which chemical fertilizers, herbicides or pesticides are minimally used or not used at all. Instead of , manures recycled farm wastes and biofertilisers are used in place of chemical fertilizers. Neem leaves or turmeric are used as biopesticide specifically in case of stored food grains.
- \* Advantages of Organic Farming :
  - (i) Natural ecosystem is not disturbed, as organic farming is in harmony with the natural ecosystem.
  - (ii) Soil fertility is preserved.
  - (iii) Harmful effects of chemicals on the living organisms are avoided.
  - (iv) Pollution of air, water and soil does not take place.
- \* The basic objective of cropping is to achieve insurance against total crop failure under poor rainfall conditions and there by minimizing risk and monetary loses.

## IRRIGATION

Process of supplying water to crop plants growing in the fields by means of canals, reservoir, wells, tube wells etc is known as irrigation. Water requirements of crop plants depends on two factors:-

- (i) Crop-based irrigation : Water requirements of different crop plants varies at different stage of their growth & maturation e.g. paddy crop is transplanted in standing water and also requires continuous water supply whereas this is not so for wheat, gram, cotton, maize crops etc.
- (ii) Soil-based irrigation- irrigation also depends on the nature of soil in which crop is grown e.g. if two wheat crops are grown together one in sandy and another in clay soil, then in sandy more frequent irrigation is needed than clay soil.

### (a) Irrigation systems :

Most commonly used irrigation systems in our country are as follows :

- (i) Canal systems : Canals usually receive water from rivers and usually an elaborate, extensive network of irrigation systems.  
Canal → Branch canal → field channels → then irrigate or a group of fields.
- \* Rotation systems called water bandhi or intermittent water delivery method is followed in canal irrigated areas.
- (ii) Tanks : Tanks are usually small water storage reservoir, constructed at higher elevations in hilly areas. They intercept and store the run off water of small catchments areas.
- (iii) Wells are dug and constructed wherever ground water is exploitable. Wells are of two types:
  - (a) Dug wells : in which water is collected from water bearing strata i.e. bottom below the ground water table. In these wells water from lower strata slowly accumulates. Water from these wells is usually lifted for irrigation purpose by mechanical means such as bullock operated devices.
  - (b) Tube wells : They are dug in the deeper strata much below the ground water table. Deep bore tube-well can supply water continuously. Water from tube-well is pumped up directly from fields through narrow lanes by using diesel or electrical pumps.
- (iv) River valley systems: In southern part of India particularly in Western Ghats, Kerala & Karnataka, the rainfall is heavy but concentrated in 4-5 months of the year. Consequently many steep and narrow river valleys are found in these areas. This results in higher run off and discharge flows in the rivers. To prevent this, several perennial plants ( coffee, rubber, coconut, areca nut & tapioca) are cultivated on the slopes of these valleys. Bottom lands of valley are used for growing single rice crop.
- (v) River lift systems : it is used in the area where either canal flow is insufficient or irregular due to insufficient reservoir water release. In this system, water is directly drawn from the rivers (using pumps) in order to supplement irrigation in the areas adjoining rivers.
- (vi) Sprinkler irrigation systems : it is water efficient systems and is being introduced in the canal irrigation areas of Haryana, Rajasthan and Madhya Pradesh. A device having perforated ring or small stand with a revolving nozzle to which a base is attached for watering crop plants. This system spreads water uniformly over crop plants and fields, required quantity of water is supplied.
- (vii) Drip- irrigation systems : modern systems being encouraged in Maharashtra, Karnataka, Andhra Pradesh, Orissa and Tamil Nadu for fruit crops. Fertigation is an innovative method for applying fertilizers through drip irrigation to maximize farm productivity with available water.

## CROPPING PATTERNS

### (a) Mixed cropping :

It is the practice of growing two or more types of crops simultaneously on the same piece of land. Different crops to be grown are selected in such a way that products & wastes from one crop can stimulate the growth of other crop.

(i) **Crop combinations used in mixed cropping :**

- \* Growing wheat crop + gram
- \* Growing cotton crop + groundnut
- \* Growing groundnut +sunflower
- \* Growing ragi + gram
- \* Growing turmeric + groundnut

(ii) Selection of crops for mixed cropping : Following criteria are taken into account :

- \* Duration of crops
- \* Growth habit
- \* Root pattern
- \* water needs
- \* Nutrient demands

(b) **Intercropping** : improved version of traditional mixed cropping in which two or more crops are grown simultaneously in the same field but in a definite row pattern is called intercropping.

(i) **Criteria to accomplish intercropping :**

- \* **spatial arrangement**
- \* **plant density**
- \* maturity dates of crops
- \* plant architecture

(ii) **Types of intercropping :**

(A) **Row Intercropping** : in this intercropping all crop combination of mixed cropping are used in definite row pattern 1:1, 1 : 2 or 1: 3.

(B) **Strip Intercropping** : growing two or more crops simultaneously in strips, wide enough to permit separate crop production using machines.

(iii) **Advantages**

- (A) Productivity is increased.
- (B) It economises spaces and time of cultivating two or more crops.
- (C) It helps to maintain soil fertility.

TABLE COMPARISON BETWEEN MIXED CROPPING AND INTER CROPPING	
Mixed cropping	Inter cropping
1. Aim is to minimize risk of crop failure.	Aim is to increase productivity per unit area
2. Seed of component crops are mixed Before sowing.	Seed of component crops are not mixed.
3. Sowing is not done in rows.	Sowing is done in rows.

(C) **Crop Rotation :**

Practice of growing different crops on a piece of land in a preplanned succession. Depending upon the duration

(i) Crop rotation may be of three types :

- (A) 1 years rotation : Rice-Wheat, Maize-Mustard
- (B) 2 years rotation : Maize-potato-Sugarcane-Peas
- (C) 3 years rotation : Maize- Mustard- Sugarcane-Methi-Rice-Wheat-Hing- Mustard.  
Sugarcane-Berseem-Cotton-Oat- Sugarcane-Peas-Maize-Wheat.

(ii) Crop rotation confers following benefits :

- (A) All crops do not require the plant nutrients in the same proportion. By growing crops in rotation, the fertility of the soil is utilized more evenly. The soil is not depleted in a particular nutrients.

- (B) When different crops are grown, the operation concerned with the preparation of soil, manuring, sowing, harvesting and other operation are spread throughout the year, thereby reducing the work pressure at any particular time.
- (C) When different crops are grown on the field one after another, the yields of product obtained are greater than the same crops are grown year after year.
- (D) The incidence of weeds, pests and diseases is reduced.

### **CROPPROTECTION MANAGEMENT**

It includes eradication of pests, pathogens, weeds and other organisms that cause harm to the crop plants.

- (i) **Pests** : These are the organisms like insects, rats, mites, weeds, fungi etc. which damage or destroy cultivated plants or plant products and can even make them unfit for human consumption.
- (ii) **Pathogens** : These are disease causing organisms and include bacteria, fungi, virus etc.
- (iii) **Weeds** : These are unwanted plants that grow and live at the expense of main crop.
- (a) **Effective methods to control pests** :

- (i) Pesticides or biocides : Chemicals (poisons) used to kill pests of plants such as insects, fungi, weeds, mites, rats etc. are known as pesticides. They are of following types :
  - (A) Fungicide : To kill fungi
  - (B) Weedicide : To kill weeds
  - (C) Rodenticide : To kill rodents like rats, moles
  - (D) Nematicide : To kill nematodes

**(b) Preventive measures should be adopted instead of using pesticides as :**

- (i) Use of pest & disease resistant hybrid varieties of crop plants.
- (ii) Selection of optimum time of cropping
- (iii) Crop rotation and multiple cropping
- (iv) Clean cultivation
- (v) Summer ploughing
- (vi) Sowing of healthy seeds

**(c) Insect - pest Control :**

Some insects are serious pests of crop plants such as :

- (i) Chewing insects : Locust, grasshopper, caterpillar larva destroy all sorts of crop plants.  
**Control** : By mixing chlorophyriphos in the soil.
- (ii) Sucking insects - Aphids (Aphis), leaf hoppers (Pyrrilla) such cell sap from various plant parts.  
**Control** : By Malathion, lindane & Thiodan
- (iii) Borer insects : sugarcane borer, grain weevil, cotton boll worm. Internal feeders, live inside the parts of crop plants  
\* Control : By metasystox.

**(d) Weed Control :**

It can be done by following ways :

- (i) **Mechanical methods** - By weeding, removing weeds from crop fields by harrow, interculture ploughing, burning & flooding

- (ii) **Chemical methods** – Using chemicals called herbicides or weedicides e.g.2, 4-D, Nitrofen, Atrazine
- (iii) **Biological methods** – Employ living organisms to destroy weeds e.g. :
- (A) Cassia plant prevents the growth of parthenium weed
- (B) Herbivorous fish feed on aquatic weeds.
- \* Advantages of biological method
  - \* It does not cause pollution.
  - \* Organisms are harmless to the main crop.
- (iv) Cultural methods : inclusion.
- (A) Proper seed & bed preparation (B) Timely seed sowing
- (C) Inter cropping (D) Crop rotation
- (D) Mixed cropping

### **STORAGE OF GRAINS**

9.3% food grain in our country are lost due to inadequate & improper storage. Factors responsible for such a great loss during storage are as follows :

- (i) **Biotic (living):** Insects, rodents, birds, mites etc.
- \* Insect – pests
  - \* Common insect- pests include weevils, beetles, locusts, mites, aphids, grasshoppers, bugs and termites.
  - \* Insect – pests damage/ harm the plants in following ways :
  - \* They cut root, stem and leaves.
  - \* They suck the cell sap from various plant parts.
  - \* They bore into stems and fruits.
  - \* They drop falls.
  - \* They eat stored grains.
- (ii) **Abiotic (non-living) :**
- (A) Temperature (B) Moisture
- (C) Humidity (D) Material of container in which grains are stored
- \* The above mentioned factors bring about :
  - \* Infestation of food grains by insects and microorganisms.
  - \* Degradation in quality.
  - \* Loss in weight.
  - \* Poor germination potential of grains.
  - \* Discoloration of product.
  - \* Unpalatable or even toxic food materials.
  - \* Finally poor marketability and lower profits. Thus, it is essential that loss of food grains during storage is avoided. The attack on food grains by insects and micro-organisms is called infestation. A general rise in the temperature of the grain and presence of patches of white powdery material on the bags or on the floor also indicates infestation of grain by insects. Presence of rodents can be detected by the excreta or tell – tale holes in the bags.



**(a) Preventive Measures :**

- (i) Drying before storage
- (ii) Maintenance of hygiene
- (iii) Plant - product treatment
- (iv) Prophylactic treatment
- (v) Improved storage structures

✱ **Control Measures**

- ✱ Pests are controlled by the use of chemicals called pesticides.
- ✱ Fumigation is the most convenient and method of pest control in stored grains inside godowns.
- ✱ Fumigation are volatile (gaseous) chemicals that quickly vaporize and the resultant fumes kill the insects without affecting the grains. Utmost care has to be observed in handling of pesticides as these are equally harmful to humans and domestic animals.

## EXERCISE

### OBJECTIVE DPP - 18.1

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1. The science of vegetable culture is called as  
(A) Agriculture            (B) Horticulture            (C) Olericulture            (D) Floriculture
2. All animals are  
(A) Parasitic            (B) saprophytic            (C) autotrophic            (D) hetetotrophic
3. The principal cereal crop of India is  
(A) wheat            (B) rice            (C) maize            (D) sorghum
4. which is the most important source of food and fodder ?  
(A) Algae            (B) Fungi            (C) Lichen            (D) Cereal
5. The element which is required in largest quantity by plants is  
(A) sulphur            (B) calcium            (C) phosphorus            (D) nitrogen
6. Nodules with nitrogen - fixing bacteria are present in  
(A) mustard            (B) wheat            (C) gram            (D) cotton
7. Application of nitrogenous manure to a plant causes  
(A) vigorous vegetative growth  
(B) early flowering  
(C) early  
(D) growth retardation due to toxicity to  $\text{NH}_3$
8. Rotation of crops is essential for  
(A) getting different kinds of crops            (B) increasing quality of minerals  
(C) increasing quality of proteins            (D) increasing fertility of soil
9. The unwanted plants are known as  
(A) grasses            (B) shrubs            (C) weeds            (D) fodder crops
10. Plants can be made disease resistant by  
(A) breeding            (B) hormones            (C) colchicine            (D) heat

**VERY SHORT ANSWER TYPE QUESTIONS**

1. What are nutrients and how many nutrients are essential for plant growth ?
2. What are macro and micro - nutrients ? Name three of each kind .
3. What is green manuring ? Give examples of green manures.
4. What are fertilizers ? Mention three important features of fertilizers.
5. What are the hazards of using fertilisers ?

**SHORT ANSWER TYPE QUESTIONS**

6. Define intercropping. Mention the advantages of intercropping.
7. How does intercropping differ from mixed cropping ?
8. Define organic farming. Why is organic farming important to us ?

**LONG ANSWER TYPE QUESTION**

9. Explain the different types of nutrients for plants and differentiate between them with examples.

# IMPROVEMENT IN FOOD RESOURCES

BL-19

## ANIMAL HUSBANDRY

Science which deals with the scientific management of farm animals including their feeding, breeding, weeding and heeding (disease control) is called as Animal husbandry. Animal food mainly comes from:

- (i) **Milk** : from cattle such as cow, buffaloes, goat, camel.
- (ii) **Egg** : from birds (poultry).
- (iii) **Meat** : animals like pigs, fishes, poultry etc.
- (iv) **Honey** : from honey bees.

There are four main practices involved in keeping of animals or animal husbandry.

- \* **Breeding** : it is done to obtain animals with desired characters. Through breeding, we can develop high milk - yielding and high meat- yielding cattle.
- \* **Feeding** : it deals with the study of proper food (called feed), mode and time or feeding of different animals
- \* **Weeding** : This concerns with the elimination of uneconomical animals.
- \* **Heeding** : It means the proper care and management of animals.
- \* Most notable effort for dairy development & milk production in India is being carried out by NDDB (National Dairy Development Board) and is called "operation flood" to increase milk production. It has resulted in white revolution in India.

TABLE NUTRITIONAL VALUES OF ANIMAL PRODUCTS

Animal products	Nutrients (%)				
	Protein	Fat	Carbohydrat	Minerals	Water
1. Cow	4.0	3.6	3.5	0.7	87.2
2. Egg	13.0	12.0	Traces	1.0	74.0
3. Meat	21.1	3.6	Traces	1.1	74.2
4. Fish	19.0	2.5	Traces	1.3	77.2

### (a) White Revolution :

Just like the green revolution in case of crop plants, the increase in milk production has been possible just like the green revolution in case of crop plants, the increase in milk production has been possible due to the launching of countrywide programme called 'operation flood' which resulted which resulted in the white revolution in India. This operation involved use of New improved high milk-yielding crossbreeds of milch animals and following the practices of animal husbandry providing them proper feed and health care. Dr.V. Kurien is credited with the designing and implementation of the largest dairy development programme - the operation flood, and sharing in of the white revolution n India. He is know as the father of white revolution and is the founder chairman of the National Dairy, Development Board (NDDB). Silver revolution refers to the tremendous increase in egg production, while blue revolution to the fish production.

**(b) Breeds of Cows :**

- (i) High milk - yielding indigenous ( desi ) breeds.  
(A) Gir                                      (B) Sahiwal                                      (C) Red Sindhi
- (ii) Dual purpose indigenous breeds ( cows for milk and bullocks for draught work )  
(A) Haryana                                      (B) Tharoarkar                                      (C) Deoni
- (iii) The exotic ( foreign ) breeds of cows that have been used for crossbreeding are :  
(A) jersey from USA                                      (B) Brown Swiss from Switzerland  
(C) Holstein - Friesian from Holland

Many high milk-yielding breeds of cows have been developed in India through crossbreeding of desi breeds with exotic breeds in recent years. These include Karan Swiss Friesian -Sahiwal or Frieswal Karan -Fries

- (iv) High milk - yielding indigenous breeds of buffaloes :  
(A) Murrah from Punjab and Haryana                                      (B) Mehsana from Gujrat  
(C) Surti from Gujrat                                      (D) Nili from Punjab  
(E) Jaffarabadi from Gujrat

- \* Cattle like cows and buffaloes are normally housed in sheds, which possess following features
- \* The shed is properly roofed to protect the animals from rain, hat and cold.
- \* The floor of the shed is made sloping to facilitate cleaning, and kep their sitting space dry.
- \* The shed is airy, well - ventilated with adequate sunlight.
- \* The shed is spacious enough to provide sufficient space to each animal. a cow cow requires about six square meter space while a buffalo needs a little more space.
- \* The sheds are provided with feeding passage.
- \* Arrangement for clean drinking water is made.
- \* The sheds have proper arrangement for disposal of excreta.

**(c) various types of animal farming are :**

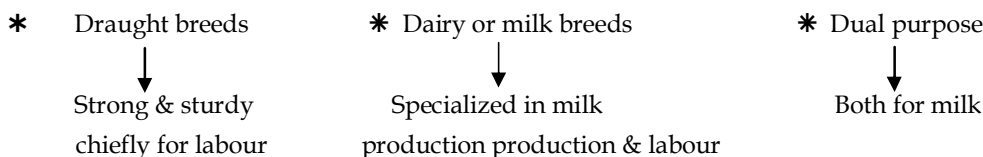
- (i) **Cattle farming** - (Milk producing or milch animals)
- (ii) **Poultry farming** - (Egg yielding animals)
- (iii) **Fish farming** - (Meat providing fishes)
- (iv) **Bee keeping**- (Honey providing bees)

(i) **cattle farming** : Farming of cattle for milk and labour is called cattle farming. it is done for two purposes :

- (A) **Milk** : Milk providing animals are - cows, buffaloes, goats, camels.
- (B) **Draught** : For labour. e.g. ox, camel etc.

cows & buffaloes are main providing animals in India. they are also used for bullock labour cow's milk is highly nutritious, contains large amount of proteins and vitamin A which is best for infants. buffalo's milk is rich in fats, proteins, vitamin E, calcium, phosphorous, contains low Na , K and cholesterol.

**\* Types of breeds of cattle :**



- \* **Cattle food is of two types :**
- \* **Roughage :** rich in fibre content. It includes green fodder, silage, her.
- \* **Concentrate :** rich in all types of nutrients, lack fibre. It includes maize, oat, barley, jowar etc.
- \* **Diseases of cattle**
- \* **Symptoms of diseased animals :** a healthy animal is recognized by its regular feeding, normal posture, a definite body temperature and normal pulse and respiration rates. A sick animal shows following symptoms.
- \* The animal stops eating and becomes lethargic, looks tired and remains isolated.
- \* The animal shivers with high body temperature.
- \* the animal shows excessive formation of saliva which sometimes hangs from the mouth.
- \* Blisters appear on skin surface, eyes turn red, and the animal may have a running nose.
- \* The animal passes loose dung and Coloured urine.
- \* The lips and ears of the animal droop.
- \* Milk - yield, egg-laying capacity or working capacity of the animal is reduced.
- \* Diseases : diseases caused are broadly of three types :
- \* Parasitic                      \* Infections                      \* Non-infectious

Table Diseases of Dairy Animals and their Causal Organism		
S.No.	Causal Organism	Disease
1.	Virus	Foot and mouth disease, pox, Dermatitis
2.	Bacteria	Rinderpest, Anthrax,
3.	fungi	Ringworm

- \* Prevention and control :
- \* Providing proper shelter.
- \* Ensuring animal hygiene (frequent bathing and grooming) and proper disposal of dead animals and animal wastes.
- \* Periodic screening of animals for diseases and immediate isolation of diseased animals.
- \* Providing proper diet and suitable medicines under the advice of a veterinary doctor.
- \* Hygienic handling of all animal products and by products.
- \* Compulsory vaccinations.
- (ii) **poultry farming :** Practice of raising chickens, ducks, geese & turkey for egg & meat. it provides best source of animal protein and fast. egg laying poultry is called egger or layer and poultry raised for meat is called broiler.
- (A) **Indigenous (desi) breeds of hen**
- \* Aseel (Indian game)                      \* Ghagus (kadaknath)
- \* Basra (Burrsa)                              \* Chittagong (Chattisgarh)
- \* Brahma                                        \* Cochin
- (B) **Exotic breeds used in India**
- \* White Leghorn                              \* Rhode island Red
- \* Light Sussex
- \* **Silver Revolution : increase in egg producing at large scale.**

- (C) **improvement of poultry breeds** : It involves :
- \* **Developing of new varieties.** They have following advantages.
  - \* Number & quality of chicks are increased.
  - \* Summer adaptation capacity.
  - \* Low maintenance requirements.
  - \* Dwarf broilers present for commercial chick productions.
- (D) Poultry diseases: These birds suffer from many diseases caused by bacteria, fungi, viruses and parasites along with nutritional deficiencies. These can be prevented by proper cleaning sanitation and spraying of disinfectants.
- \* Poultry farming offers advantages like :
  - \* Investment involved is small,                      \* Area required is small,
  - \* Maintenance is easy, and                              \* Returns are quick.
  - \* The egg - laying poultry birds is called hen (egg layer),while the one groomed for obtaining meat is called chicken or broiler.
- (iii) **Fish farming =Pisciculture** : **Cheap source of animal** protein for human food. Various ways to obtain fishes:-
- \* Capture **farming - From natural resource** :
  - \* Culture **farming** - Fish farming in land water fishes, ponds lakes, marine fishes. Our freshwater edible fish include cat fishes such as wall ago, mystus etc. Indian major carps such as catla, rohu, mrigal (Cirrhina) and exotic varieties such as silver carp and grass carp. Catla is the fastest growing carp of great economic significance.
- (iv) **Bee farming = (Apiculture)** : Rearing of bees for honey is called as apiculture. Different varieties of bees are used for commercial production of honey. They are :
- \* A. indica is called Indian bee
  - \* A. mellifera ( Italian bee) is domesticated in India to increase the yield of honey.

## EXERCISE

### OBJECTIVE DPP - 19.1

1. Murrah, Surti and Mehsana are the indigenous breeds of  
(A) cows                      (B) buffaloes                      (C) poultry                      (D) pigs
2. Inland fisheries is referred to  
(A) culturing fish in fresh water                      (B) deep sea fisheries  
(C) extraction of oil from fishes                      (D) capturing fishes from seas
3. chemical used to kill rats and moles is called as  
(A) fungicide                      (B) nematicide                      (C) rodenticide                      (D) insecticide
4. Cropping pattern involving a definite pattern of rows is called as  
(A) crop rotation                      (B) mixed cropping                      (C) inter cropping                      (D) monoculture
5. cattle food rich in one or more nutrients but lacks fibres is called as  
(A) roughage                      (B) concentrate                      (C) sap                      (D) none of these
6. IR36 and Pusa Basmati are high yielding varieties of  
(A) rice                      (B) wheat                      (C) maize                      (D) mustard

7. Honey bee culture is called as  
(A) pisciculture            (B) apiculture            (C) sericulture            (D) horticulture
8. Hybridization can be  
(A) intervarietal            (B) interspecific            (C) intergeneric            (D) all of these
9. The process of applying fertilizers through drip irrigation is called as  
(A) strip farming            (B) fertigation            (C) fumigation            (D) none of these
10. The specific term for poultry used for meat purpose is  
(A) layers            (B) broilers            (C) growers            (D) none of these

## SUBJECTIVE DPP - 19.2

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### VERY SHORT ANSWER TYPE QUESTIONS

1. Define livestock.
2. differentiate milch breeds and drought breeds of cattle.
3. what are the two main components of cattle feed?
4. Who is called as the Father of white revolution ?
5. What is artificial breeding ?

### SHORT ANSWER TYPE QUESTIONS

6. Describe about artificial insemination.
7. Name two diseases of each of the following :  
(i) Cattle            (ii) Poultry            (iii) Fish
8. Define animal husbandry. What is the need of it ?

### LONG ANSWER TYPE QUESTION

9. What are biofertilizers? Why are they advantageous to be used?

## ANSWER KEY

### (Objective DPP # 17.1)

Q	1	2	3	4	5	6	7	8	9	10
A.	A	C	A	D	B	A	D	A	C	C

### (Objective DPP # 18.1)

Q	1	2	3	4	5	6	7	8	9	10
A.	C	D	B	D	D	C	A	D	C	A

### (Objective DPP # 19.1)

Q	1	2	3	4	5	6	7	8	9	10
A.	B	A	C	C	B	A	B	D	B	B