**Pollution**

**Introduction**

* Pollution is making the environment unclean. It is due to the production of large quantities of wastes.
* Two primary factors are the **size of the population** and **technological development** which invents new forms of pollution.
* Pollution began when human populations became so concentrated that the waste materials produced by them could not be assimilated by nature as fast as they were produced.
* Pollutants, the elements of pollution, can be foreign substances or energies or naturally occurring; when naturally occurring, they are considered contaminants when they exceed natural levels.

A pollutant is a waste material that pollutes air, water or soil. Three factors determine the severity of a pollutant:

1. **Its chemical nature**
2. **the concentration and**
3. **the persistence.**

**5.2 Pollution**

Any undesirable change in the Environmental quality is called Environmental Pollution.

Pollution is therefore any undesirable **change in** **the physical, chemical or biological**

**characteristics of air, water and soil that may affect the life or prone to be causing potential health hazard.**

**5.3 Types of Pollution**

Based on the nature and the **component of the environment affected**, pollution is classified into :

a). Water Pollution

b). Air Pollution

c). Soil Pollution

d). Noise Pollution

e). Marine Pollution

**5.3.1 Water Pollution**

. Water is said to be polluted when it is unfit for its designated use. The different uses of water are drinking, cooking, bathing, cleaning, washing and other domestic purposes,

irrigation, industrial usage and for fisheries, etc.

**Water pollution can be defined as change in the physical, chemical or a biological factor harmful to aquatic life and to the health of the consumer.**

**5.3.2 Sources of Water Pollution**

They may be pollutants of natural sources or man-made sources.

Natural sources

1. during precipitation entrainment of gases and dust particles
2. during surface run-off suspended impurities and bacteria are carried along and
3. during infiltration, dissolution of salts takes place.

Man-made sources :

**Domestic sewage** : Sewage is the liquid waste from a community contains around 99 % water and 1% solids. Of the solids present in sewage, 70% are organic and 30% are inorganic in nature.

Out of organic constituents 65% are carbohydrates, 25% proteins and 10% fats.

In most cases, the domestic sewage either treated (partially or wholly) or untreated is discharged into water bodies as rivers resulting in pollution problems

**Agricultural wastes** : Agricultural run-off has several agrochemicals, fertilizers, pesticides, etc..

**Industrial wastes** : Industrial wastes have a great potential of polluting receiving waters.

Characteristics depend upon the type of industry and the raw materials used in the process, type of process, treatment and extent of recovery done.

**Effects**

**Oxygen Demanding Wastes:-** Lower D.O may be harmful to animals especially fish population.

Oxygen depletion helps in release of phosphates form bottom sediments and causes

eutroptication.

**Pathosens:-** Many waste waters especially sewage contain many pathogenic and non-pathogenic micro-organisms and many viruses.

**Toxic Compounds:-** Pollutants such as heavy metals, pesticides, cyanides and many other

organic and inorganic compounds are harmful to aquatic organisms.

**Control of Water Pollution:-**

(i) Judicious use of agro chemicals like pesticides and fertilizers which will reduce their surface run-off and leaching. Avoid use of these on sloped lands.

(ii) **Use** **of nitrogen fixing plants** to supplement the use of fertilizers.

(iii) **Adopting integrated pest management** to reduce reliance on pesticides.

(iv) Prevent ran-off of manure. Divert such ran-off to basin for settlement.

(v) **Separate drawing of sewage and rain water should provided** to prevent overflow of sewage with rain water.

(vi**) Planting trees** would reduce pollution by sediments and will also prevent soil erosion.

**Air Pollution**

Air Pollution is the presence of one or more pollutants **like dust, smoke etc**, in the atmosphere, in larger quantities and duration as to be injurious to health of men, plant or animal life or to property which interfere with their comfort.

Air Pollutants are broadly classified into two categories :

1. Primary pollutants and
2. Secondary pollutants.

* Primary pollutants are those that are emitted directly from sources such as Smoke, Dust, Fumes, SO2, Oxides of Nitrogen, CO, CO2, etc.
* Secondary pollutants are those that are formed in the atmosphere by chemical interaction among primary pollutants and atmospheric constituents.
* Eg: Ozone, PAN (Peroxy acetyl nitrate), Ketones, aldehydes, are some secondary pollutants.

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**5.3.4 Sources of Air Pollution**

The air pollutants emitted into the atmosphere are divided into two types

1. from natural sources and
2. from man-made sources.

* Natural sources **include forest fires, volcanic eruptions, wind blown dust, pollen grains,** etc.
* Man-made sources can be sub-divided into four categories :

1. Industrial sources ,
2. Domestic sources,
3. Automobile sources and
4. Agricultural sources.

**Industrial sources** : Due to combustion of fossil fuels a variety of pollutants such as SO2, NOx ,CO and particulates are produced.

**Domestic sources** : Burning of **wood, dung, coal and crop residues in open fires** or in stoves for cooking produce smoke, **SO2, NOx , CO** and particulate matter.

**Automobiles** : Automobile pollution includes 70 % exhaust emissions and 20 % crankcase

emissions and the remaining 10% consists of evaporation from carburetor & fuel tank . The

principal pollutants emitted from automobiles are CO, NOx, HC’s.

**Agricultural sources** : Ploughing of fields leads to dust pollution and odours. Field refuse burning gives smoke, soot, CO2, etc, into the atmosphere.

**Effects Air Pollution:-**

1. **Effects On Human Health:-** Smaller particles by the hairs and sticky muscus in the lining of nose years of expose to air pollutants adversely affect these natural defences and can result in lung cancer, asthma, empty sema.

2. **Effects On Plants:**- Air **pollutants** affect plants by entering through stomata, destroy

chlorophyll and affect photosynthesis. Pollutants also erode waxy coating of the leaves called

cuticle.

3. **Effects On Aquatic Life:**- Air pollutants mixing up with rain cause high acidity(lower ph) in fresh water lakes. This affects aquatic life especially fish.

4. **Effects On Materials:-** Because of their corrosiveness, particulars can cause damage to

exposed surfaces. Ozone in the atmosphere can cause cracking of rubber.

**CONTROL OF AIR POLLUTION:-**

Siting of industries after proper environmental impact assessment studies.

Using low sulphur coal in industries.

Removing sulphur from coal.

Removing NOx during the combustion process.

Using mass transport system, bicycles, etc…

Shifting to less polluting fuels.

Planting more tress

Using biological filters and bio-scrubber.

**Soil Pollution**

Soil is the upper layer of the earth crust which is former by weathering of rocks. Dumping of

various types of materials causes soil pollution.

Soil pollution is defined as the build-up in soils o**f which persistent toxic compounds, chemicals, salts, radioactive materials and disease** **causing agents**, have adverse effects on plant growth and animal health.

**Sources of Soil Pollution**

The sources of soil pollution differs from air and water pollution in the respect that the pollutants remain in direct contact with the soil for relatively long periods.

Soil pollution mainly results from :

Industrial wastes

Urban wastes

Radioactive pollutants domestic wastes= biological+urban

Agricultural practices

Biological agents

**Industrial wastes** : It is estimated that 50% of raw materials used in Industry ultimately become waste products. Industrial wastes mainly consist of **organic compounds along with inorganic complexes and non-biodegradable materials.** Such pollutants affect the chemical and biological properties of soil.

**Urban wastes** : The components of refuse are garbage, rubbish, ashes, dead animals and street sweepings. They also contribute to soil pollution.

**Radioactive pollutants** : Radioactive substances that result from the explosion **of nuclear devices, atmospheric fall-out and radioactive wastes penetrate** into the soil and create soil pollution.

**Agricultural practices** : Fertilizers and pesticides are agrochemicals used in modern agriculture.

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**Biological agents :** The excremental materials of human, animal and bird origin contributes the principal sources of soil pollution.

**EFFECTS OF SOIL POLLUTION**

Sewage and industrial effluent which pollute soil ultimate affect human health.

Strontium-90 insects of Ca gets in the bones and tissues. The bones become brittle and prone to fracture.

* Radioactive isotopes which attach with the clay become a source of radiations in

environment

* Nitrogen and phosphorous from fertilizers in soil reach nearly water bodies with

agricultural run off and cause Eutrophication. Chemicals or their degradation products from soil may percolate and contaminate ground water resources.

**CONTROL OF SOIL POLLUTION:-**

i) Effluents should be properly treated before discharging them on the soil.

ii) Solid waste should be properly collected and disposed off by appropriate method.

iii) From the wastes, recovery of useful products should be-------

iv) Biodegradable organic waste should be used for generation of biogas.

v) Cattle during should be used for methane generation nige soil can also used in biogas

plant to produce inflammable methane gas.

vi) Microbial degradation of biodegradable substance is also one of scientific approach for

reducing soil pollution.

**Noise pollution:**

Noise is unwanted sound and noise pollution can be defined as unwanted or offensive

sounds that unreasonably intrude into our daily activities.

**Sources of Noise:**

**Road traffic:** of all the sources of noise pollution, road traffic is the most prevalent and perhaps

the most damaging sources of noise pollution. More people are exposed to noise from motor

vehicles than any other single sources of noise and thus the impact of traffic noise are a major

factor in human society. The impact of road traffic noise on the community depends on various factors such as road location and design, land use planning measures, building design, vehicle standards and driver behavior.

**Air traffic:**

In the early days of arration, the effect of noise were primarily considered in terms of

their influence on an aircrafts passengers and crew. However, airline travel has since become

much more common and widely available, resulting in an increased amount of air traffic and thus an increased number of people who are affected by aircraft noise both as passenger and members of communities located near airports. Noise from supersonic aircraft is of particular concern due to its intensity.

**Railways: R**ailways like road traffic are a source of surface transportation noise. The level of

noise associated with rail traffic is related to the type of engine or rolling stock used, the speed of

the train and track type and condition. the majority of noise emitted by trains is produced by the

engines or by the interaction of the wheels with the track. Other sources of noise is railways

include warning signals at crossings, whistles and horns and railways include warning signals at

crossings, whistles and horns and railroad construction and maintenance equipment.

**Industry:** The four main categories of industrial activity that are particularly relevant to the

study of noise of the following.

1. Product fabrication

2. Product assembly.

3. Power generation

4. Processing.

**Construction:** Construction noise, a major source of noise pollution, is emitted by construction

equipment. Like industrial equipment, construction equipment tends to produce more noise in the

lower end of the frequency spectrum. But unlike industrial equipment, which emits noise that

primarily affect workers within a facility, construction equipment tends to be used outdoors and

thus affects many other people other than the workers at the site.

**Measurement of Noise:**

Noise intensity is measured in decibel units. The decibel scale is logarithmic, each 10-

decibel increase represents a tenfold increase in noise intensity. Human perception of loudness

also conforms to a logarithmic scale, a 10-decibles increase is perceived as roughly a doubting

loudness. Distance diminishes the effective decibel lever reaching the ear. Thus, moderate auto

traffic at a distance of 30m rates on the sidewalk, the same traffic rates about 50 decibels. To that

is, it sound 4 times louder. At a distance of 600m, the noise of a jet take-off reaches about 110

decibels, approximately the same as an automobile horn only 1m away.

**Effects of noise:**

Subjected to 45 decibels of noise, the average person cannot sleep. At 120 decibels the

ear registers pain, but hearing damage begins at a much lower level, about 85 decibels. The

duration of the exposure is also important. A part from hearing loss, noise can cause lack of

sleep, irritability, heartburn, indigestion, ulcers, high blood pressure and possibly heart disease.

In addition noise induced stress creates severe tension in daily living and contributes to mental

illness.

1. The most direct harmful effect of excessive noise is physical damage to the ear and the

temporary or permanent threshold shift may cause. i.e. hearing loss.

2. Hearing to excessive noise causes a loss of hearing ability from which there is no recovery.

Which is usually called Noise-Induced permanent threshold shift (NIPTS).

3. A sound level of 150 db or above can physically rupture the human ear drum.

4. In addition to excessive sound levels can cause harmful effects on circulating system by

raising blood pressure and altering pulse rates.

5. Noise cause emotional or psychological effects such as irritability, anxiety, stress, lack of

concentration and mental fatigue.

6. As noise interferes with normal auditory communities it may mask auditory warning signals

and hence increases the rate of accidents. It may head to lowered worker efficiency and

productivity and higher efficiency and productivity and higher accident rates of job.

**Noise pollution control:**

T**he sources path receiver concept:** Noise pollution could be controlled by either reducing the noise at the source or by preventing its transmission or by protecting the receiver.

**At the source:** the first step in the prevention of noise pollution is to control the noise at the

source itself. The following examples illustrated the above concept.

1. Lubrication of machines generally reduces the noise produced.

2. Tightening the loose nuts.

3. Reducing the eccentricity generally reduces vibration and noise.

**In the path:** if we are not able to control the noise at its source the step is to try to

prevent its transmission. The following are few examples of instances in which the noise

pollution is controlled by modifying the path of transmission.

4. Keeping the noisy machine covered in an enclosure so that the sound does not escape and

reach the receiver.

5. Construction of noise barriers on roadsides for the benefit of the nearly residential

communities.

6. Sound-proof the building, use heavy curtains on the windows, acoustical tile on the

ceiling and walls, rugs on the floors. Seal all air leaks to reduce the noise coming in from

outside.

**Receiver:** if we are not able to bring down the noise levels to the desired levels through sources

modifications or by preventing the transmission path, then the only alternative is to provide

earplugs in noisy places.

The following general measures may be taken to reduce noise pollution in a community.

1. Create a demand for quieter appliances.

2. Get organized.

3. Become knowledgeable.

4. Be persistent, you can reduce the noise.

5. Turn down the volume of stereos, especially those with handphones.

6. Tell your friends about the hazards of noise.

7. Purchase the least noisy air conditioner or vacuum cleaner.

8. Keep conversation and rest areas in the home away from sources of noise.

9. Don’t use horns except in an emergency, keep auto and truck engines, air conditioners

and appliances in good condition.

**Nuclear hazards:** The radio active substance are in nature in the beach sands, rocks etc. they

under go natural decay emitting energy in which unstable isotopes spontaneously give out fast moving particles, with high energy radiations of till a stable isotopes is formed.

The isotopes release energy either in the form of gamma rays (high energy

electromagnetic radiation) or ionization particles i.e. alpha particles and beta particles charged positively and negatively respectively.

**Sources of radio activity:** Various sources of radio activity can be grouped into

1. natural sources
2. anthropogenic sources.

**i). Natural Sources: Cosmic rays** originate in nature like **radon 222** which contaminates soil,water & rocks. Sometimes the low radioactive sands containing **Zircon illuminate** and **other rare** **earth will** emit radiation.

**ii). Anthropogenic sources:** The human activity like \_\_\_\_\_ use of the radioactive materials as

* U239 (Uranium) is one of the major sources of nuclear pollution. The ore mining, fuel

improvement, the process storage of uranium is some of the sources of radioactive material in

water, soil and air.

* The wars leading to the use of atomic bombs release lot of energy and radioactive substances.
* In addition the accidents that occur will release the nucleosides into atmosphere which travel transcontinental and influence the areas.

**Effects of radiation:** The nuclear radiation effects are **invisible** and they are exhibited only after a later period. The damage sometimes extends to generations and lead several health problems and disease. The energy released acts on the organisms and sometimes enters the food chains which is accrued by organism and causes disease like blood cancer, throat, liver, bone etc.

1. **Somatic damage:** The somatic damage refers to the effect on the cells including skin

where it is limited and restricted to individual. The loss of pregnancy, cataract, cancer to

Brest, lungs, thyroid etc.

2. **Genetic damage:** The gene is the smallest unit of heredity in humans which carries the

food prints of the past generations. The genes having four chemicals ‘Adenosine’,

Thymine cytosine & guanine in different combination and sequences are responsible for

the characteristics which posses. For example the free earlobe of man and attached

earlobes are commonly seen in humans is due to genes. The genetic code will alter due to

high ionic radiation in which a sequence may be lost or added, or altered which is called

mutations. The mutations may lead to the variants in species and some times loose certain

characteristics. The damage is often seen in the following generations which is expressed

as a recessive character.

The common belief in scientists is that only above the threshold limit of the

radiation will cause damage to the genes while other group believes that even a small dose of

radiations over a period of time may cause adverse effects. The group feels the tolerable

levels of radiation should be decreased further. The damage caused by different types of

radiations depends on the penetration powered the available source within or externally. The

Alpha particles cannot penetrate the skin to reach internal organs where as beta particles can

damage the internal organs. The radio-isotopes with intermediate half-lives cause damage as

they have sufficient time to enter the human body. Radio isotopes enter the environment

during mining of various radio active minerals like uranium. The isotopes also gain into

environment during the nuclear accidents and fall on the soil and enter the ecosystem.

Sometimes the fall out will be for sever thousands of kilomerters and it may lead to trans

continental migration. Radio nuclides enter the water bodies or plants through soil and water

and later into food links. This may lead to various types of cancers in the organisms. Radio

active iodine (I-131) accumulates in thyroid grand and causes cancer. Similarly strontium -90

accumulates in bones leading to leukemia or cancer of bone marrow.

**Pollution Case Studies**

**TAJ MAHAL AND MADHURA REFINERY**

The Tajmahal is one of the eight wonders of the world. Now it is facing the danger of

being destroyed by the constituents of polluted atmosphere, especially due to the pollutants

released from nearby Mathura Refinery.

The refinery emits about 25 to 30 tons of sulphur dioxides daily. The emitted SO2 results

in acidic precipitation, under condition of low wind speeds combined with humidity in the

surrounding area. The other sources of pollutants, which also contribute to acidic precipitation, are two thermal power stations near Agra (now shut-down) and heavy traffic with automobile pollution.

To save the magnificent historical monument, the Government has taken many steps,

such as development of a green belt of 1 to 5 km around the Tajmahal, ordered to close down

two thermal plants, cleaning the emissions, from the stacks of the Mathura refinery, providing an outer road to restrict traffic and establishment of pollution monitoring stations inside the Taj and between Mathura and Agra.

**Solid Waste Management**

**Introduction :**

Waste is an unwanted substance. Waste (also known as rubbish, trash, refuse, garbage, or junk) is unwanted or unusable materials. Wastes are invariably produced during day to day activities.

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* Depending on their physical state they are classified as

Solid wastes,

Liquid wastes and

Gaseous wastes.

* Refuse sanitation or **Solid Waste Management** is the process of **collection**, **transport** and **disposal of solid waste in a systematic, economic and hygienic manner**.

**Classification of Solid Waste**

Refuse is the discarded solid waste arising from human activities. Rural solid wastes are

homogenous. Urban wastes are quite heterogonous. Solid wastes can be classified based on their origin or based on physical nature.

**Classification based on their sources of Origin**

Solid wastes are classified as

(i**) Residential wastes** : Residential wastes are generated from domestic operations in a house as vegetable peels, leftover food, pieces of wornout plastics, rags of clothes, waste papers, ashes, etc.

(ii) **Commercial wastes** : from business establishments as pieces of glasses, metals , ashes and food wastes from restaurants, markets, hotels etc.

(iii) **Institutional wastes** : from schools, colleges, hostels, offices which comprise of paper,

plastics, glasses etc.

(iv) **Municipal wastes** : arising from street cleaning and maintenance of parks. They include

dust, leafy matter, building debris, treatment plant residual sludge and building demolition andconstruction wastes.

(v) **Industrial wastes** : arising due to industrial activities. They vary widely from industry to

industry. They range from inert wastes to hazardous end products.

(vi**) Agricultural wastes** :as agricultural remains, spoiled food grains and vegetable peelings.

**Classification based on Physical Nature**

Depending on their stability or degradability solid wastes are classified as

**Garbage** : Garbage is vegetable or animal residue resulting from cooking, eating and

handling of kitchen and dining hall Wastes. They contain more moisture and tend to degrade with time, Foul smells are produced and are to be disposed of as earlier as possible.

**Rubbish** : It is relatively inert solid waste as papers, plastics, textiles, rubber, leather, wood

leaves, glass, crockery and metallic flakes.

**Ashes and Residues**: Ashes are produced because of burning of coal, wood and paper. Residues are the powdery or granular products of combustion or of daily sweepings of floors.

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**EFFECTS OF SOLID WASTES:-**

Municipal waste heap upon the roads due to improper disposal system. People clean their

own houses and litter their immediate surroundings which affect the community including

themselves. This type of dumping allows biodegradable materials to decomplex under

uncontrolled and unhygienic condition. This produces foul smell and breeds various types of

insects and infectous organisms besides spoiling the aesthetics of site.

**Solid Waste Management :**

For management of solid waste the three R-s are reduce, reuse and recycle.

**REDUCTION:-**

Reduction in use of raw materials will corresponding decrease the production.

**REUSE:-**

The refillable containers which are discarded after it can be reused. Villagers make

casseroles and sibs from waste paper and other waste materials. Because of financial constraits poor people reuse their materials to maximum.

**RECYCLE:-**

Recycling is the reprocessing of discarded materials with new useful products.

Formation of same old type products e.g. old aluminiun cans and glass bottles are melted and

react into new cans.

**The process of reducing, reusing, recycling saves more energy, raw**

**materials, land space and also reduces pollution.**

**Recycling of paper will reduce cutting of trees for making fresh paper.**

**Reuse of metals will reduce mining and melting of ores for recovery of metal from ores and prevent pollution.**

Solid Waste Management is the collection, transport, processing, recycling and disposal of waste materials. An average urban Indian contributes about 0.5 kg of solid waste per day.

To evaluate the management possibilities it is important to consider

(i) Origin of solid wastes : Solid wastes are generated at different stages as

(a) extraction of raw materials i.e mining as in metallurgical processes or crop extraction as

sugar cane cutting in sugar industry or bamboo cutting in paper production. (b) every stage

of operation – converting raw materials into the finished product.

(ii) Reducing quantity of raw materials : It can be achieved by better

techniques as (a) condemning the old machinery whose efficiency is low (b) improving the

output by adopting better technology.

h(iii) Reduction in quantities of solid wastes can be done by reusing or recycling

some of the wastes generated so that the quantity of waste generated is considerably

reduced per tonne of the product produced.

(iv) Segregation and Recovery : Segregate the solid waste to extract valuable

products as metals. Even inferior wastes as "Baggasse" in a sugar mill can be utilized as a

fuel to generate steam in Industrial operation or for the preparation of pulp in paper

making. Fibers of coconut can be used in coir industry.

(v) Salvaging : Food content of organic matter can be effectively used as hog

feed or poultry feed. Similarly good manure can be extracted from domestic solid wastes.

* The activities associated with the management of solid wastes from the point of generation to final disposal can be grouped into 5 operations :

1. waste collection into dust bins
2. on-site handling, storage
3. transport
4. processing and
5. disposal.

**Disposal Solid Waste :**

Land Filling:

A low lying area on the outskirts of the city is selected. Refuse is dumped to a depth of 1 to 2 in

and compacted by moving vehicles. The refuse layer is covered with earth of 150 to 300mm

thickness. The area is left undisturbed for 15d to 30d. Subsequent layers may be laid over.

It is a simple process and can be easily adopted. But leach ate emerging out of garbage shall be

polluting the sources of water near by.

Controlled Tipping:

It is a systematic land filling where in solid waste is graded and laid in layers of 1m and

compacted. Coarse waste should be at the bottom and finer grains at top. It is then covered with a

layer of coarse earth of 150 mm thickness so that the compacted waste gets aerated. After some

time the solid waste undergoes decomposition and the thickness of the solid waste may get

reduced to ½ ti 1/3 of its original thickness. Another layer may be laid over it in the same

manner.

Leach ate may trickle down. Gases as H2S, CO and methane may be given off. Vents may be

provided at some places these off these gases.

Trenching:

When a natural or manmade depression is not available, trenches of 3m wide and a depth of less

than 1m are dug and solid waste is laid in a layer of 150mm. Cow dung or human excreta slurry

is spread over the entire surface of solid waste as a thin horizontal layer of 25 to 50mm thick.

Solid waste layer of 150mm thick is applied over it. This way alternate layers of Municipal solid

waste and cow dung are applied until the trench is filled.

Pulverizing:

Pulverizing is cutting down the solid waste into powdered form. The powder or granular material

is applied on to agricultural land which is a soil conditioner. Otherwise it may be dumped into

deep sea or used to fill low lying areas. It is a costly process and rarely adopted.

Incineration

It is the burning of the solid waste to ashes so that the entire solid waste is rendered ash. Ash is

generally inert and harmless, less in volume and easy to dispose of it is hygienic. But burning is a

costly process involving addition of fuel to the waste to promote incineration.

It is done to dispose of hospital waste and similar wastes full of pathogens. Also to dispose

secret documents this is the ideal method.

Composting:

It is a process of extracting some value out of the waste particularly when the solid waste is rich

in organic matter. It is the process of inducing anaerobic bacterial activity to decompose

carbohydrates, proteins of plants and animal cells to yield energy and leave. Harmless and

products as residue.

Mineral matter and inert matter as plastics etc. is sorted out and the rich organic faction of the

waste is driven to undergo decomposition and decay. At times bacterial culture is added

(inoculated) to hasten the process of composting. It is ideally suited for agricultural wastes of

villages.