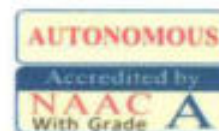




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**7.1.3 Describe the facilities in the Institution for the management of the following types of degradable and non-degradable waste**

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## SOLID WASTE MANAGEMENT

The term solid waste management mainly refers to the complete process of collecting, treating and disposing of solid wastes.

In the waste management process, the wastes are collected from different sources and are disposed of. This process includes collection, transportation, treatment, analysis and disposal of waste. It needs to be monitored so that strict regulations and guidelines are followed.

### Sources of Solid Wastes

- Solid domestic garbage.
- Solid waste material from various industries.
- Solid agricultural waste.
- Plastics, glass, metals, e-waste, etc.
- Medical waste.
- Construction waste, sewage sludge

### DISPOSAL OF WASTE

The process of waste handling and disposal varies in different countries. In India, the processes differ according to the source of solid waste. They can be classified as:

- Hazardous Solid Waste.

Municipal solid waste can further be divided into biodegradable, recyclable and hazardous domestic wastes. The biodegradable waste includes rotten food, vegetable peel and mostly wet kitchen waste. Recyclable waste includes plastic and hazardous wastes include, bulb, batteries, etc.



## EFFECTS OF POOR SOLID WASTE MANAGEMENT

Due to improper disposal of solid waste particularly by waste management organizations, the collected wastes gets heap up and become a problem for both the environment and also for the public.

By dumping of huge garbage, drives biodegradable materials to decay and decompose under abnormal, uncontrolled and unhygienic conditions. After a few days of decomposition, it becomes a breeding ground for different types of disease-causing insects as well as infectious organisms. A foul smell is produced and it also spoils the aesthetic value of the area.

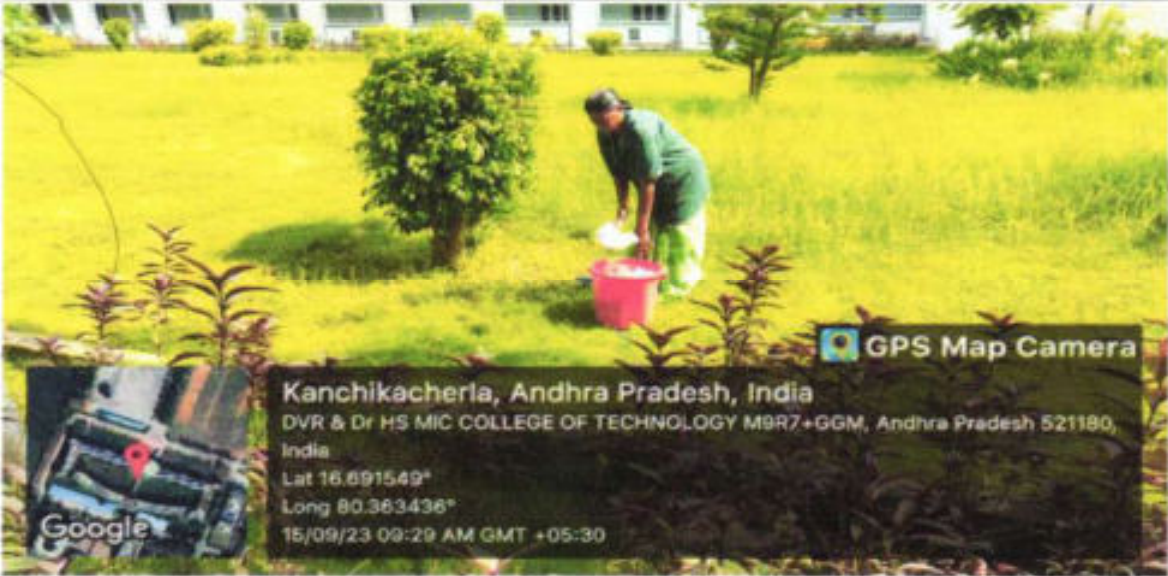
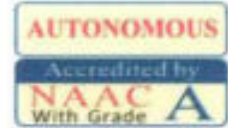


Maintaining of dustbins in the campus



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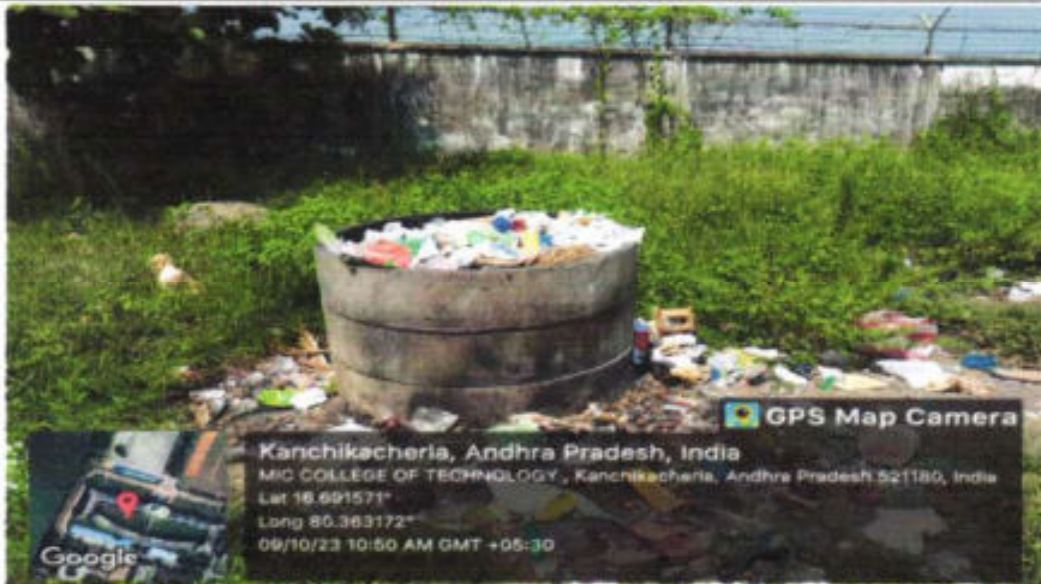
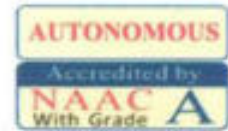


Dustbins in the campus



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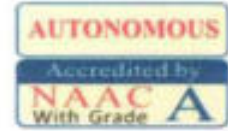


Solid waste composting pits



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## LIQUID WASTE MANAGEMENT

Domestic Waste is waste, which is either solid or liquid generated in residential areas, Commercial settings and institutions. Waste in general terms is defined as an unwanted as it is obviously undesirable. It is nevertheless an inevitable and inherent product of social, economic and cultural life. The indiscriminate disposal of waste, both liquid and solid, adversely affects the immediate human environment by degrading the natural phenomena hence, exerting health risk to exposed population. Health risks may be carried through different vehicles including flies, dogs, rodent and others that scavenge on the waste. In this lecture note, the most practical ways of managing solid and liquid waste at house hold and community levels are discussed in detail. However, considerable emphasis is given to solid waste management systems. The various technologies for proper disposal of solid wastes are listed.

### INTRODUCTION:

A systematic administration of activities that provide for the proper handling, treatment and disposal of liquid waste/waste water or sewage.

### PUBLIC HEALTH IMPORTANCE OF WASTE WATER / SEWAGE

The improper disposal of waste water plays a role in the contamination of surface water, ground water, and the soil thereby posing health problems. These phenomena persisting developing countries and affect almost every one. In Ethiopia, to day, all wastes even in large international cities like Addis Ababa are drained to the side of roads to ultimately join small streams or rivers of low down stream causing water pollution. All the wastes drained in water ways depends on the winter rains for cleaning. Although very high waste water pollution may not be expected in the rural Ethiopia, there are some household sewage (liquid dung, domestic waste water, etc.) generated from kitchens, toilets, barns, and other domestic areas. If household, industrial, or commercial wastes are not properly disposed, then the disease problems caused by pollution will still remain to be persistent in the environment. The disease commonly transmitted through water such as Cholera, dysentery and typhoid are waste related. If waste was safely deposited, or treated and disposed most of the water born diseases would have not been a problem.

### CLASSIFICATIONS OF LIQUID WASTE / SEWAGE

Waste water or sewage that are generated from a home or community including toilet, bath, laundry, lavatory and kitchen-sink wastes, and surface runoff may be classified into four. These are:

- ❖ Sanitary sewage



- ❖ Industrial sewage
- ❖ Storm sewage or Mixed sewage(a mixture of all)

Sanitary sewage also called domestic sewage contains human wastes and wash water from homes, public buildings or commercial and industrial establishments.

N.B. Domestic sewage/ liquid waste here is meant waste from kitchen, barn, bathroom, laundry, etc., which do not contain human excreta or sewage. Industrial sewage is the used water from manufacturing processes, usually carrying a variety of chemical compounds. Storm sewage, or storm water, is the surface run off caused by rainfall, it carries organics, suspended and dissolved solids, and other substances picked up as it travels over the ground.

### WATER RECYCLING SYSTEM

Recycling water allows us to continually reuse one of our most vital resources. Water recycling removes contaminants from wastewater and allows it to be reused on a wash bay several times. Recycling water systems ensure that the water is safe for washing plant and equipment, and other practical uses.

#### **THE BENEFITS OF WATER RECYCLING PROCESS**

Investing in a water recycling system has the dual benefit of reducing costs and expanding revenue. Many industries use large amounts of water during operational and site activities, which can be wasteful and environmentally damaging. Water recycling systems offer companies an opportunity to reduce water-related expenses, as well as market their services to environmentally conscious customers.

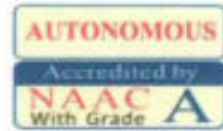
Water recycling is the process of treating wastewater and reusing it. Recycled water can be reused for the same process, for irrigation or as an alternative to mains water in wash-down applications. Water recycling systems will vary according to the quality of wastewater to be treated and the intended application of the water.





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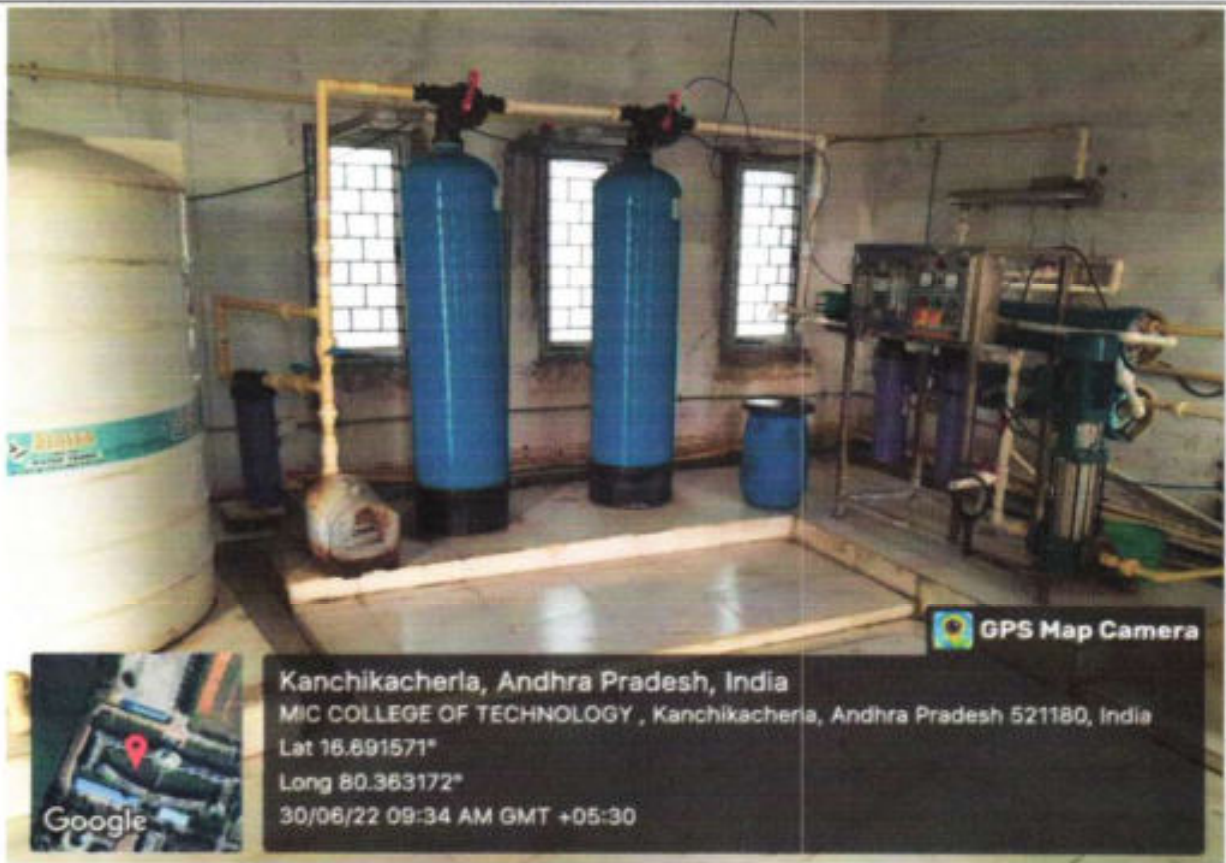
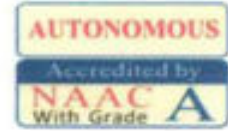
Water Distribution through Water Tankers in the campus

  
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RO Water Plant in the campus

Waste water from the RO water plant is used for plants in the campus through sprinklers.



Sprinkler



### **E-WASTE MANAGEMENT**

Electronic waste, as known as e-waste, is generated when any electronic or electrical equipment becomes unfit for the intended use or if it has crossed its expiry date. Due to rapid technological advancements and the production of newer electronic equipment, the old ones get easily replaced with new models. It has particularly led to an exponential increase in e-waste in India. People tend to switch to the newer models and trending technologies; also, the lives of products get reduced with time.

Consumers are the key to better e-waste management in India. Initiatives such as Extended Producer Responsibility; Design for Environment; (3Rs) Reduce, Reuse, recycle technology platform for linking the market facilitating the circular economy aim to encourage consumers to correctly dispose of the e-waste, with an increased reuse and recycling rates, and also adopt sustainable consumer habits.

In many developed countries, e-waste management is given high priority. In contrast, in developing countries, it is exacerbated by completely adopting or replicating developed countries' e-waste management and several related problems, including a lack of investment and technically skilled human resources. In addition, there is a lack of infrastructure and the absence of appropriate legislation, specifically dealing with e-waste.

### **WHAT IS E-WASTE?**

E-waste poses the huge risk to humans, animals, and the environment. E-waste typically consists of plastics, metals, cathode ray tubes (CRTs), printed cables, circuit boards, and so on. The valuable metals like copper, silver, gold, and platinum can be reused from e-wastes once they are scientifically processed. The presence of toxic substances like liquid crystal, lithium, mercury, nickel, selenium, polychlorinated biphenyls (PCBs), arsenic, barium, brominated flame retardants, cadmium, chrome, cobalt, copper, and lead makes it very hazardous, in case e-waste get dismantled and processed in a crude manner with the rudimentary techniques.

The computers, mainframes, servers, monitors, printers, scanners, compact discs (CDs), copiers, calculators, battery cells, cellular phones, fax machines, transceivers, TVs, medical apparatus, iPods, refrigerators, washing machines, and air conditioners are examples of e-waste when they become unfit for its use. The presence of highly toxic substances and heavy metals like mercury, lead, beryllium, and cadmium pose a significant threat to an environment even in minute quantities.

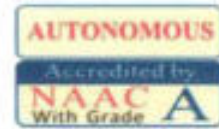
### **CHALLENGES FOR E-WASTE MANAGEMENT**

E-waste recycles in India is predominantly an informal sector activity. There are thousands of poor households eking a living from scavenging materials from waste dumps. The common



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recycling practices for middle-class urban households, particularly for waste paper, plastic, clothing, or metal, is to sell out to small-scale, informal sector buyers often known as 'kabadiwalas,' and they further sort and sell these as an input material to artisanal or industrial processors.

E-waste management in India follows a similar pattern. An informal e-waste recycling sector employs thousands of households in urban areas to collect, sort, repair, refurbish, and dismantle disused electrical and electronic products. However, there is a different situation in advanced countries, and there is no concept in India of consumers voluntarily donating the useless electrical and electronic equipment at formal e-waste recycling centers. Also, there is not a concept of consumers paying for disposal of the e-waste they generate.





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## E – Waste Management





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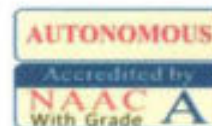


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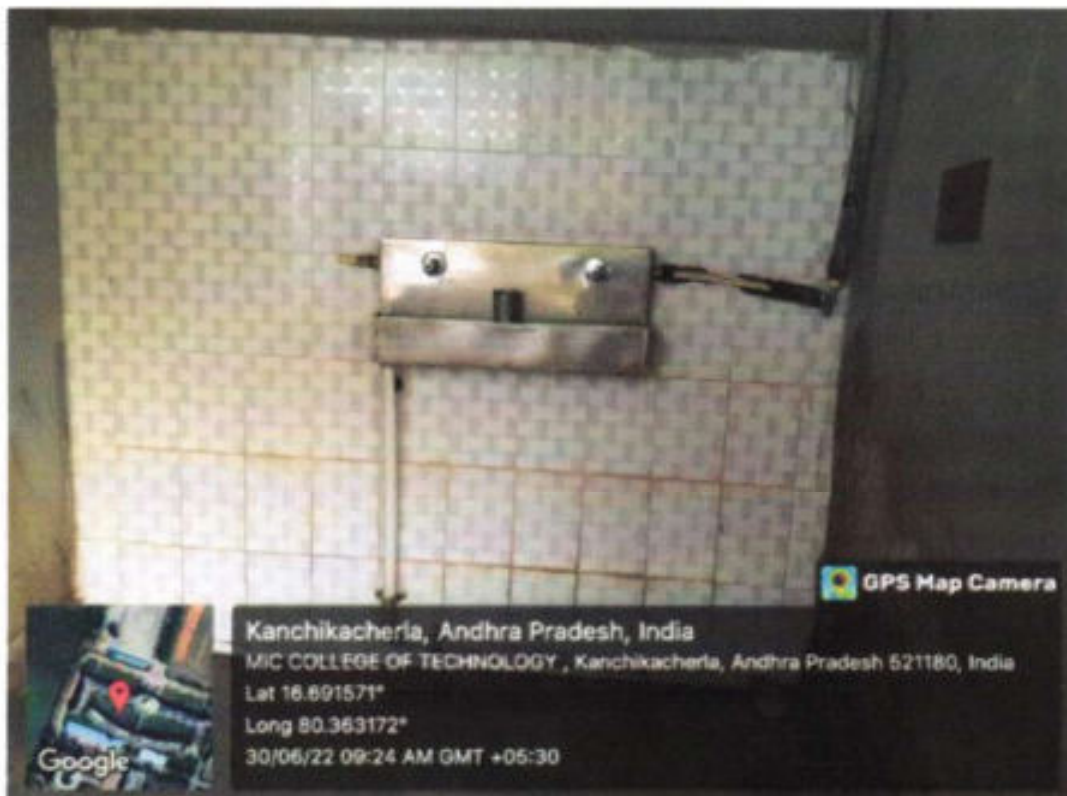


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**Water Supply facility to reduce single use plastic bottles**



  
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