MODULE 7

SANITATION WASTE DISPOSAL
AND PEST CONTROL
Objectives:

By the end of this module, participants should be able to:

(a) Describe the sanitary conditions in which the informal food sector operates

(b) List the main diseases caused by inadequate sanitation, waste disposal and pest control

(c) Describe measures to be taken to improve sanitation

(d) Describe simple waste disposal measures applicable to the sector

(e) Describe simple pest control measures appropriate for the sector

(f) Describe how these measures could be adapted to the local context
7.1 DEFINITION OF TERMS

The Environment: Environment is defined as all the factors which are in our immediate surroundings and which influence the physical, mental and social developments of individuals.

Sanitation: Sanitation is a latin derivative of the word “SANISTAS” meaning hygiene and simply means measures which promote cleanliness in order to promote a healthy state.

Environmental Sanitation (also referred to as Environmental Health): Environmental sanitation or health relates to the control of all physical, chemical and biological factors within our environment that can affect health of human beings or the state of the environment itself, i.e., the natural ecosystem.
These factors are illustrated in Figure 1 below and include:

**Figure 1 : Factors controlling environmental sanitation**

Environmental health or sanitation activities are oriented towards:

- Preventing land, water and air pollution
- Improving housing conditions
- Ensuring proper disposal of solid, liquid and gaseous wastes
- Promoting food hygiene
- Controlling disease vectors within residential, recreational, institutional, industrial, commercial and agricultural zones in order to protect the environment, health and well-being of human beings.

### 7.2 SANITATION

Food handlers, especially street-food vendors, must always ensure that food is prepared and sold in the best sanitary conditions by applying
practical measures to make environmental conditions favourable to health and also for the preservation of public health.

**STREET FOODS** have been defined as «ready to eat» foods and beverages prepared and/or sold by vendors in streets and other public places.

### 7.2.1 Conditions in which the informal food sector operates

There are many concerns about the sanitation of street vending operations:

| Stands and carts used by the vendor are often of crude construction. |
| Running water is seldom available at the stands. |
| Hand, dish and utensils washing is normally done in one or more buckets or pans of water (sometime without soap) and disinfection is rarely done. |
| Waste water is usually discarded in the street or in obstructed canals and garbage is sometimes dumped nearby providing attraction food and harbourage for insects, rodents and other pests. |
| Foods are ineffectively protected from flies and other contaminants. Safe food storage temperatures are difficult to maintain. |
| Toilet and lavatory facilities are not readily available which force vendors to eliminate their body waste in nearby secluded areas and they often do not properly wash hand afterwards |
| Foods are either prepared in these itinerant places or in the home of the vendor which may also lack sanitary facilities. To make the situation |
worst sometimes the vendors sleep in these food stalls.

The situation described above are typical of informal food processing in many places of the SADC countries.

### 7.2.2 Location of informal food sector businesses

First of all, the place where food is prepared and/or sold should be located in areas, which are free from objectionable smoke, dust or other contaminants and are not subject to flooding. In other words, food street businesses should not be found near public toilets, sewerage plants, dumping ground, stone crushing plants, etc. Government, local authorities etc should be persuaded to provide food kiosks with all sanitary amenities like toilets, running water supply, washing facilities, sewerage system, waste collection and rodent control service.

Unfortunately, with the great number of food vendors governments and local authorities with all their good intention cannot build food kiosks for all food vendors. Individual food stalls and food carts will continue to exist.

### 7.2.3 Design and structure of food stalls

The construction materials of the stalls/sheds and carts should be free of cracks and crevices. The walls and roof of the food stalls should preferably be of impervious material that can be washed and painted. There should not be any leakage when it rains.

The floor should be of concrete that can be easily washed. A slight slope is advisable for proper drainage. The use of wood in the food stall should
be limited as wood cannot be wet cleaned and sanitised. There should be no exposed wood, including wood pallets, in the food processing area. If a cart is used for selling food, it should preferably be made of metal (aluminium) and can be easily washed and cleaned. The place where food is cooked should be made fly-proof; i.e. all openings should be screened with wire gauze and the door should not be left open to prevent the ingress of flies inside.

- The vendor must keep the stall or any part of the premises in such a condition as to prevent the ingress of flies, rats, mice, dogs, cats or other animals that may contaminate any food for sale. The premises must be properly ventilated and lighted.

7.2.4 Preparation and storage of food

- Food should be kept in closed containers or in glass cases when exposed for sale.

- No container and no food must be kept on the floor. It is advisable to keep everything on shelves so that sweeping and cleaning may be done easily.

- No place where food is prepared, kept or sold, should communicate with sleeping room, bathroom, toilets or place where animals are kept.

Water supply

- Any food business and irrespective of its size needs the provision of a safe and chlorinated water supply which is most important for the promotion of sanitary practices. The water supply should be from a reliable source. Generally only potable water should be used in food
processing. Potable water is water that has been filtered and chlorinated. If water passes through a water tank, the tank should not be rusty and it should be provided with a tight fitting cover. The tank should be cleaned and disinfected regularly. If water is fetched from a public fountain, the water vessel should be clean and necessary steps should be taken to protect it from contamination. No water should be taken from where there is risk of contamination. If water is drawn from a well or from a river, the water must be boiled sufficiently to make it safe and potable.

**Handwashing facilities**

- Every food stall must be provided with a wash hand basin, which must be provided with
  
  (a) adequate running water supply
  (b) soap or other detergent
  (c) a nail brush and
  (d) suitable means for hand drying.

- The wash hand basin and wash basin in kitchen must be kept clean and in good repair and must not be a source of nuisances.

**7.3 WASTE DISPOSAL**

All food processing generate waste, be it liquid or solid. The waste has to be properly disposed of otherwise sanitary nuisances are caused which can affect the food and the health of the people. The environment is also affected.
Waste management refers to the storage collection, conveyance and treatment of solid, liquid or gaseous wastes prior to their release or disposal in the external environment so as to prevent land, water and air pollution.

### 7.3.1 Solid Waste Management

**Solid Wastes**

The term Solid Wastes include any garbage, refuse, sludge and other discarded materials resulting from residential, recreational, industrial, institutional, commercial or agricultural activities.

**Categories of solid wastes**

Solid wastes can be categorised as per their nature in being:

- Biodegradable e.g. food, leaves, plants, dead animals
- Non-biodegradable e.g. construction debris such as concrete, metal scraps
- Hazardous e.g. pathological wastes, radiological wastes

They can also be categorised as per the source from which they are generated i.e.:

- Commercial solid wastes
- Industrial solid wastes
- Agricultural solid wastes
- Institutional solid wastes
- Residential solid wastes
**What is Solid Waste Management ?**

Solid waste management involves the storage, collection, segregation, maceration, compaction, treatment or disposal processes which in turn entail various activities such as forecasting amount of wastes generated; deciding on mode of treatment or disposal; planning and routine collection; provision of equipment such as bins, compactors, compacting trucks and facilities such as transfer stations, segregating stations and disposal sites or systems.

Solid waste management is a complex process to which we must have recourse to contain environmental problems associated with mishandling of solid wastes.

It is to be pointed out that indiscriminate dumping of solid wastes inevitably give rise to problems such as odours, flies, rats, stray animals, excessive bird density, fire, smoke which dispel any doubt of the importance of proper solid waste storage, collection and disposal.

**Common and recommended methods of treatment and disposal of solid waste**

Figure 2 illustrates the common and recommended methods of treatment and disposal of solid waste.
Solid Waste Storage

Prior to solid wastes being collected and conveyed to a treatment and disposal site, it is very important to store solid wastes generated at source in bins of adequate size and fitted with tight covers. Depending on the frequency of collection, bins full up of biodegradable solid wastes e.g. food left-overs from food stalls, restaurants or catering units, might be stored at low temperatures to minimise degradation.
Types of bins

- Self-closing lidded bins – used in kitchen and toilets
- Pedal operated bins – used in kitchen, toilets and catering units
- Communal bins – used in municipal or rural areas
- Hand operated bins – used for domestic purposes

Recommended practices in solid waste storage

- Always put the solid waste into a biodegradable plastic or waxed paper before placing same in bin
- Keep the bins properly covered at all times
- Always wash and disinfect the bin once it is emptied

7.3.2 Liquid Waste Management

Wastewater – A disease hazard

Improper disposal of sewage is one of the major factors affecting the health and comfort of individuals in areas where satisfactory municipal, onsite, or individual facilities are not available.

This is so because very large numbers of different disease causing organisms can be found in the faecal discharges of ill and apparently healthy persons. Knowing that numerous chemicals, organisms causing various types of diarrhoea, bacillary dysentery, amoebic dysentery, infections, hepatitis, Salmonella infection, and many other illnesses found in sewage, it becomes obvious that all sewage SHOULD be considered presumptively CONTAMINATED beyond reasonable doubt.
Consequently, proper disposal of sewage and other wastewaters is necessary not only to protect public health and contamination of surface and ground waters, but also to preserve fish and wild life populations and to avoid the creation of conditions that could detract from the attractiveness of a community, tourist establishment, resort and recreation area.

**Category of liquid waste**

Like solid waste, liquid waste have been categorised as biodegradable and non-biodegradable.

Furthermore liquid wastes have also been sub categorised as follows:

<table>
<thead>
<tr>
<th>Sullage</th>
<th>Liquid waste generated from kitchen, bathrooms, wash hand basins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewage</td>
<td>Liquid waste generated from sanitary facilities, generally, but now regarded as including other domestic liquid wastes also</td>
</tr>
<tr>
<td>Wastewater</td>
<td>A general term used to include all types of liquid wastes</td>
</tr>
</tbody>
</table>

**Criteria guiding wastewater disposal**

There are six basic criteria to be satisfied in the design and operation of a wastewater disposal system and they are as follows:
1. Prevention of pollution of water supplies and contamination of shellfish intended for human consumption
2. Prevention of pollution of bathing and recreational waters
3. Prevention of unsightliness and unpleasant odours
4. Prevention of human wastes coming into contact with man, animals and food or being exposed on the ground surface accessible to children and pets
5. Prevention of fly and mosquito breeding; exclusion of rodents and other animals
6. Strict adherence to standards for groundwater and surface waters, compliance with local regulations governing wastewater disposal and water pollution control

Wastewater disposal systems include:

- Cesspools
- Pit systems such as improved pits, ventilated improved pits
- Leaching fields in soil
- Discharge at sea
- Discharge in surface waters e.g. rivers

Wastewater must be treated in compliance with statutory standards before disposal in the external environment i.e. at sea or in river courses or soil. Wastewater management is also a complex process.

All wastewater emanating from food processing activities like cooking, washing and cleaning should be discharged in the public sewer, if available, or into an absorption pit which should be made as follows:
(a) Excavate a pit of four feet by four feet to a depth of not less than six feet until the permeable layer is reached
(b) Fill the pit with stones at the bottom and one foot layer of one-inch macadam at the top.
(c) Construct a masonry or concrete edge to stand six inches above ground level all round the pit to exclude surface waters.

It is advisable not to let suspended matters, like rice, noodle, bits of vegetables, etc, in the waste waters go into the absorption pit as these suspended matters will not only attract rats but will block the absorption pit. The wastewater should be made to pass through a piece of fine wire gauze to retain all suspended matters. The wire gauze should be cleaned everyday.

If the wastewater contains a lot of fat, it is imperative to pass it through a grease trap before allowing it to go into the absorption pit otherwise the absorption pit would be blocked rapidly.