Module 2
Community Health and Hygiene

State Resource Centre, Kerala
Credits and Copyright
CERTIFICATE IN COMMUNITY DEVELOPMENT

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Abbreviations

CDW   Community development worker
ODL   Open distance learning programme
PRA   Participatory rural appraisal
## Contents

Acknowledgements .............................................................................................................. iii
Abbreviations ...................................................................................................................... iv
About the Module .............................................................................................................. vii
    Module Objectives ........................................................................................................... vii
    Units in the Module ......................................................................................................... viii

### Unit 5: Health, Hygiene and Pollution ............................................................................. 1
  5.1 Introduction .................................................................................................................... 1
  5.2 Learning Objectives ...................................................................................................... 2
  5.3 Concept of Health ......................................................................................................... 2
    5.3.1 What is Health? .......................................................................................................... 2
    5.3.2 Classification of Health ............................................................................................. 5
  5.4 Concept of Hygiene ...................................................................................................... 13
    5.4.1 What is Hygiene? ...................................................................................................... 13
    5.4.2 Classification of Hygiene .......................................................................................... 14
    5.4.3 Domestic hygiene ..................................................................................................... 19
    5.4.4 Community Hygiene ............................................................................................... 22
    5.4.5 Environmental Hygiene ............................................................................................ 26
  5.5 Pollution ........................................................................................................................ 28
    5.5.1 Forms of Pollution, their Causes and Effects ............................................................ 28
    5.5.2 Effects of pollution on human health ......................................................................... 38
    5.5.3 Prevention and Control of Pollution ....................................................................... 39
  5.6 Health Issues in the Community .................................................................................. 40
    5.6.1 Current Local and Global Health Concerns ............................................................. 40
    5.6.2 Determinants/Causes of ill health .............................................................................. 41
    5.6.3 Attitudinal and Behavioural changes ..................................................................... 41
    5.6.4 Global Perspectives ................................................................................................. 42
  5.7 Summary ....................................................................................................................... 43
  5.8 Model Answers to Activities ......................................................................................... 43
  5.9 Unit-end Questions ....................................................................................................... 46

### Unit 6: Eco-Friendly Agricultural Practices and Healthy Food .................................... 47
  6.1 Introduction ..................................................................................................................... 47
  6.2 Learning Objectives ...................................................................................................... 47
  6.3 Impact of Agriculture and Industry on the Environment ............................................. 48
  6.4 Agricultural Practices and Health .................................................................................. 49
  6.5 Food and Health ........................................................................................................... 54
  6.6 Food Safety and Food Security ..................................................................................... 59
  6.7 Changing Food Culture and Health ............................................................................. 61
  6.8 Summary ....................................................................................................................... 63
About the module

Module introduction

A hearty welcome to this module!

This module will give you a comprehensive idea of community health and hygiene.

As you know, the health and well-being of all living things depend on the environment in which they live. Therefore, the health of the community is determined by having a safe environment, healthy lifestyle, and proper food and hygiene. This can be achieved by gaining knowledge on proper nutrition, eco-friendly agricultural practices and pollution control.

The main objective of this module is to equip you with the knowledge and skills you need to help your community to enjoy a healthy life. As you may know, our environment is not in a perfect condition. You may have concerns about the current state of your local environment and want to help but are not sure what changes to make. Well, this module is for you! In this module, you will learn about the components of a healthy environment. We have also included a number of activities, which when completed, will help you identify the advantages and disadvantages of your local environment. Finally, we will equip you with the knowledge you need to be able to plan and organize activities to improve the health and environment in your community.

This module is divided into four units. Unit 5 will discuss health, hygiene and pollution. Unit 6 will explore eco-friendly agricultural practices and healthy food. Unit 7 will introduce you to environmental hygiene and sanitation, and lastly, Unit 8 will give you information on how to deal with pollution based health issues in your locality.

Module Objectives

After going through this module, you will be able to:

- Discuss the concepts of health, hygiene and pollution
- Create awareness on good eco-friendly agricultural and health practices in the community
- Identify good and harmful environmental hygiene and sanitation practices in the community
- Conduct surveys and awareness campaigns on key health issues affecting members of your community.
Units in the Module

Unit 5: Health, hygiene and pollution
Unit 6: Eco-friendly agricultural practices and healthy food
Unit 7: Environmental hygiene and sanitation
Unit 8: Survey of pollution based health issues of the locality
You may have heard the word ‘health’ used in day-to-day conversations. We all use it very often. Sometimes you may say, ’My grandfather is in good health’ or you may use it to describe people, for example, ‘my neighbour has a healthy attitude’ or a ‘healthy relationship’.

You must have heard the saying that ‘a healthy population is the wealth of every nation’. Health is of primary concern to all individuals as well as the community at large. Good health requires certain efforts and cannot be purchased. In this unit, we will start our discussion by looking at the concept of health and its classification and discuss the characteristics of good health and the various factors that go into maintaining it. Next, you will learn about the concept of hygiene. What is hygiene? Hygiene refers to a set of practices adopted by a community that are associated with the preservation of health and healthy living: your own cleanliness and that of those around you. You will also learn about the classification of hygiene.
In addition, we shall look at issues of environmental pollution, and the common causes of pollution in the community. Lastly, we shall identify common health issues in the community. In a nutshell, we can say that this unit addresses health, hygiene, and pollution, “holistically” from the point of view of the family and community. The unit will guide you on the range of actions that individuals can take to protect themselves from the effects of unhygienic and polluted environment. You might require 18 hours to study this unit.

This is going to be a long unit. But you can be sure that after completion of this unit you will definitely gain knowledge that you can apply to improve the health and environment of your community.

5.2 Learning Objectives

On completion of this unit, you will be able to:

- Describe the concept of health and its classification
- Describe the concept of hygiene and its classifications
- Identify the main causes of pollution in your locality and how they can be prevented and controlled
- Discuss global and local health issues and how you can change the attitudes and habits of community members

5.3 Concept of Health

In this section we shall look at the definition of the term ‘health’ and its classification.

5.3.1 What is Health?

What does the word ‘health’ mean? When we think about it, we may say that it means ‘being well’, or feeling ‘happy and at peace’ with the world. Have you experienced sickness? Most of us have and you will agree that you feel entirely different when sick.

When you are sick, you may experience loss of appetite, decreased energy, fatigue and decreased working capacity. These symptoms may lead you to conclude that you are unwell. What then is the meaning of health? It is the state of being well and free from illness.

Does health mean the absence of disease alone? Let us analyse and see. A person can be considered as healthy if he has:

- No sickness
- No physical handicap
- No mental problem
- No social tension
- No anxiety
- No psychological tension
- Enough energy and willingness to be active.

Health is a condition or state of complete well being of both body and mind; and good health is necessary for our happy existence in this world.

While talking about health, Have you heard about ‘WHO’? The World Health Organization (WHO) is an organisation whose aim is to promote health for all, throughout the world. To achieve this goal, one should aim not only to reduce diseases, but also to reduce social tension and mental illness to acceptable levels. WHO defines health as “a state of complete physical, mental and social wellbeing, and not merely the absence of disease or infirmity”. This definition is accepted internationally.

The definition does not only consider the physical, mental and social aspects of health but also other dimensions like spiritual health. The conditions required for good health include the availability of resources to meet basic human needs and protection from all environmental hazards. It also involves a sense of security and wellbeing. If your living or work environment is deficient in some way, it could cause you to suffer from both physical and mental (psychological) problems.

**What is good health?**

The concept of good health differs from person to person. Generally, good health is considered as being free from disease. However, it is much more than the absence of diseases. Good health may enable us to do well at work and in life. Good health involves the proper functioning of all body organs. It also involves a sound state of both body and mind. People enjoying good health are cheerful, free from stress and enjoy life to the fullest and are ready for productive work.

Health is no longer considered the sole responsibility of doctors, nurses and other medical personnel. It is also the responsibility of individuals, families, communities and governments, and multi-national agencies. These groups have the knowledge and power to make changes in their environment and living conditions. Hence, they can influence the health of the population at large. The WHO goal of “Health for all by 2000’ has helped to develop a broader concept of health: that is the achievement of a level of health that will permit people to lead a socially and economically productive life.

You now know that good health increases our efficiency at work and makes individuals happy and cheerful and able to lead a joyful life. Figure 5.1 shows a typical scene of a happy and cheerful village family.
For good health, the following basic conditions need to be met regularly:

1. Consume a safe, healthy and balanced diet
2. The availability of clean air and water
3. Good personal and domestic hygiene.
4. Maintain good habits like avoiding tobacco, smoking, alcohol and drugs.
5. Regular physical exercise.
6. Proper recreation and sleep.

The steps discussed here will help a person remain healthy. Figure 2 presents a pictorial representation of some good practices for ensuring good personal hygiene.

Before you continue reading, complete the following activity.
Activity 5.1

I. Fill in the blanks

1. Health is ............................................
2. Complete physical, mental and social well-being is called..............

II. Tick any two of the following options that help in maintaining good health.

1. Consume too much of food
2. Laugh loudly
3. Consume a safe, healthy and balanced diet
4. Maintain irregular exercise
5. Maintain good habits

III. Match the following.

1. Personal health – Take care of the member of the family
2. Domestic health – Physical health
3. Community health – Health of the community

Good health thus enables an individual to do well at work and in life. Good health involves proper functioning of all body organs. It also involves a sound feeling of both body and mind. People who enjoy good health are cheerful, relaxed and free from stress. Hence we can conclude that a healthy individual possesses a sound mind in a sound body.

Now that you understand the meaning of ‘health’, let us look at its classification.

5.3.2 Classification of Health

Health is generally classified into:

- Personal health
- Domestic or family health
- Community or public health
- Environmental health

Observe Figure 5.3 on the classification of health.
Each one is equally important in keeping the world and its population healthy and each is closely related and inter-dependent. Let us look at each component in turn.

**Personal health**

Personal care means taking care of your health so that you can remain free from disease. A person who is physically, mentally and socially healthy is said to be in a state of optimum or positive health. Achieving this optimum health should be the goal of every human being. Good health enables you to help others and the community.

Physical health, an important component of personal health, includes the health of the physical body i.e., the health of different parts of the body, the internal organs, their proper functioning and maintenance. Mental health, another component of personal health, includes preservation and promotion of good mental stature and prevention of mental illness. A mentally healthy person is cheerful, calm, well-adjusted, self-controlled and satisfied with him or herself as well as with others. The modern concept of personal health also includes social health, which encompasses the healthy attitude and behaviour that enable individuals to lead a healthy and productive life in the society. Thus, personal health is the maintenance of the health of people and that of the society in which the individual lives and the community as a whole.

There are certain requirements which help us keep healthy. These are proper nutrition, elimination of body waste, personal hygiene and care,
healthy habits, right posture, exercise, recreation, rest, sleep, mental health, and domestic and environmental hygiene.

Adequate nutrition is the foundation of good health. Proper elimination of waste from the body is as important as food. Proper functioning of the bowels is essential for the maintenance of optimum health. The proper functioning of the major organs that are involved in the elimination of waste, such as liver, lungs, skin, kidney and intestine is very important. Personal and environmental hygiene has to be maintained in order to keep an individual, his home and surroundings free from disease. Personal health care through immunisation and regular medical checkups is also essential to ensure health. Along with this, people should assume the responsibility for their own health by cultivating clean and healthy habits, and avoiding bad habits like the consumption of liquor, drugs, cigarettes, etc. Health is mainly the result of following a good life style with adequate exercise, rest, sleep and recreation. Attention to one’s posture is also considered as very important to maintain good personal health.

So, now you know what you should do to keep yourself healthy. Now we will consider the health of our home and family.

**Domestic health**

Apart from good personal health, we should take proper care of domestic hygiene too. This includes following hygienic methods of cooking and storing food, and keeping the house and its premises neat and clean. Micro organisms present in the environment can infect and spoil our food. So food should be cooked properly to destroy them. The utensils used for cooking food should always be clean. The food should be covered and stored in a proper place away from the reach of flies and insects.

**Note It**

Everyone should be aware of the fact that good health is the result of personal efforts and habits. Good health is not supplied by others or purchased.

Domestic health includes taking care of the health of each one in the family or home. The efforts taken to promote and maintain the health of human beings, animals and birds that depend on the family for food and shelter comes under this. Proper food, water, fresh air, shelter, attention and care, medical care and personal and environmental hygiene all are important to maintain good domestic health. The physical and mental health of all family members, from the newborn to the oldest, is important and all should have a prominent role in maintaining family or domestic health. Now from domestic health, let us move on to community health.
Community health

The health of a community as a whole depends on the personal habits of the individuals who make up the community. Dirty and unhygienic habits of individuals can therefore create problems for the whole community. This is because some dirty habits of individuals make it difficult to keep the environment clean and healthy.

The WHO Expert Committee (1974), stated that community health refers to the health status of members of the community, the problems affecting their health and the totality of the health care provided for the community. In a community, this implies the integration of curative, preventive and promotional health services. The focus is on three levels:

- The individual
- The home and family
- The community

Community or public health has also been defined as the science and art of promoting health and preventing diseases through the organised efforts of the society, organisations (public and private), communities, families and individuals (Wikipedia). It includes activities undertaken at the government or local organisation level for controlling diseases, maintaining health and thereby prolonging the life span of the people.

Now you can see that personal, domestic and community health are inter-related. Those involved in community health interventions should also focus on personal and family health issues. It is concerned with threats to health, based on population health analysis. The population in question can be as small as a handful of people as in the case of epidemics, or as large as all the inhabitants of several continents as in the case of pandemics.

We often read in newspapers or watch on the television cases of widespread diseases in some areas that require immediate attention. Local or government organisations take steps to control the spread of disease by creating awareness and ensuring adequate supplies of medicines. You must have seen notices and banners put up by the government, giving the dates and time of immunisation programmes or the precautions to be taken against certain diseases. Such awareness is regularly created through nationwide campaigns against the spread of diseases, such as malaria, dengue, cholera, HIV/AIDS, poliomyelitis and hepatitis B. You might also have come across the extensive awareness and educational programmes organised by different agencies to control and prevent lifestyle-related diseases like diabetes, cardiac problems and hypertension. You may have
read in newspapers and watched in different media about the epidemic attack of dengue fever and hepatitis B in Kerala during the rainy season. The disposal of human waste in public places, improper waste management and collection of contaminated non-flowing water were identified as the causes for these infections. The measures taken by the government and other agencies to control these diseases have received a lot of publicity recently. These are all examples of health care measures taken to protect and promote the health of the community.

The focus of public health interventions is to improve health and quality of life through the prevention and treatment of diseases and other physical and mental health conditions, through surveillance of cases and the promotion of healthy behaviours. You might have heard of many such public health measures taken by many agencies in Kerala, such as, awareness programmes on promotion of breast feeding, control of diarrhoea and respiratory diseases, promotion of environmental sanitation, birth control methods, sex education to control the spread of sexually transmitted diseases, and nutrition. The awareness created amongst the public through these programmes is the secret behind the great advancements that Kerala has made in the field of health. Steps have also been taken to promote nutritional awareness among the people to consume safe, balanced and nutritionally adequate food.

The modern concept of public health requires the combined efforts of multi-disciplinary teams of professionals including doctors specialising in public health/community medicine, community health workers, social workers, environmental health officers, nutritionists, health inspectors, veterinarians, public health engineers, public health lawyers, community development workers, communications officers, grass root level agents and others. As a community development worker (CDW), you should be aware of the problems of your community, their causes and possible interventions.

It is time yet again for you to do an activity. This activity will help you identify the health awareness programmes in your locality.

**Activity 5.2**

Collect the list of health awareness programmes conducted in your locality during the previous year along with the agencies involved. Then list down on the table provided in chronological order/date wise, the name of the programmes and the corresponding agencies. You may need about 15 minutes to complete this activity.
The objective of this activity was to enable you to identify the agencies that you can approach when a health problem arises in your locality.

**Environmental health**

After studying personal health, domestic health and community health, let us now look at environmental health. How would you define the word ‘environment’?

The term environment refers to the physical, biological, social and cultural surroundings affecting human life as well as the life of plants and animals surrounding it. It includes both the living and non-living things that surround us. It not only includes air, water and soil, but also the ecological, social and economic conditions under which we live.
The three major components of the environment are:

- **Physical environment:** includes air, water, soil, shelter, waste, radiation, climatic factors, etc.
- **Biological environment:** includes all kinds of vegetation and animals including invisible bacteria and viruses, insects, rodents, the natural resources, the ecosystem, etc.
- **Social environment:** includes habits, culture, customs, income, religion and occupation, i.e., all the social and economic conditions under which man lives.

Environmental health looks at all the three components of the environment and how they affect the health of people. As a CDW, you should be able to identify the environmental activities that help to preserve, conserve and ensure the health of a community. Environmental health is essential for the healthy existence of human lives in the present and future generations. It is very much related to human activities as it sometimes interfere with the environment. Human activities sometimes change our healthy atmosphere by releasing toxic chemicals into the atmosphere. Indeed, activities such as, dumping of waste in public places and throwing away or burning plastic materials harm the physical environment or pollute the atmosphere.

There are also some environmental agents that are directly responsible for causing poor health. These include: ultraviolet rays from the sun that can cause skin cancer and lack of minerals in the soil that can result in nutritional disorders. In such instances, human involvement can reduce or eliminate harmful effects of environmental agents through the use of technology, supplements and education. For example, activities such as organic farming, where chemical fertilizers and pesticides are not used, can help improve environmental health.

Figure 5.5 explains the interactions between human activities, the physical and biological environment and health.

The social environment also has a major impact on health. If people are marginalized because of gender, income status or ethnic/religious interests, they are more likely to be prone to anxiety and depression, and thereby suffer mental illness.

In particular, the status of women in the community is very important. In communities where women face discrimination, they are more likely to suffer both physical and mental illness, which in turn affects the health of the family and thereby that of the community at large. In communities where there is harmony, where they accept differences positively and promote unity, and where there is respect and care for women and children, the people are usually healthy and happy.
**Human activities**

(agriculture, industry, energy production, use and management of water, urbanisation, distribution of income and assets, quality of health and public services, extend of protection of the living, working and natural environment)

**Physical environment:**
(Social and their chemical composition, air and water resources, climate)

**Biological environment:**
(Type and distribution of habitats, flora, fauna including pathogens, reservoirs and vectors)

*Source: Adapted from WHO (1992).*

**Figure 5.5: Interactions between human activities, and the physical and biological environment.**

**Note It**

In short, health implies a sound mind in a sound body living in a sound family and community surrounded by a sound environment. This health is influenced by human activities and the surrounding physical and biological environment.

Before you continue, here is an activity to help you remember what you have learned thus far.

**Activity 5.3**

Now that you know the concept of health and its classification, answer the questions below. You would require 20 minutes to complete this activity.

1. Name any five requirements for maintaining good personal health.
2. 
3. 
4. 
5. 
We hope you now know the meaning of the word ‘health’ and its three main components. Next, let us look at the concept of hygiene.

### 5.4 Concept of Hygiene

The previous section introduced you to the hygiene on good health. Good hygiene helps us keep ourselves free from diseases and achieve good health. In this section, we shall look at the meaning of hygiene and its classification.

#### 5.4.1 What is Hygiene?

Hygiene refers to all those practices that help in maintaining good health and preventing diseases. The word ‘hygiene’ comes from the Greek word ‘hygiene’ which means ‘Goddess of health’. Therefore, we can presume that health and hygiene go hand in hand or that they are interrelated. Hygiene is an old concept related to medicine. Hygiene practices are employed as preventative measures to reduce the incidence and spread of diseases. Also, in industry, in the production of food, pharmaceuticals, cosmetics and other products, adoption of hygienic methods is a key factor in assuring quality of the product. The terms ‘cleanliness’, ‘cleaning’ and ‘hygiene’ are often used interchangeably, which can cause confusion. In general, hygiene means practices that prevent the spread of disease-causing organisms. Cleaning (e.g., hand washing) is the process of removing disease causing germs as well as dirt and soil. It is one of the means of achieving hygiene. You might have heard about body hygiene, personal hygiene, sleep hygiene, dental hygiene, occupational hygiene, domestic hygiene, etc. All these are
terms used in connection with personal and public hygiene. There is a branch of science that deals with the promotion and preservation of health called ‘Hygienics’. Hygiene practices can vary widely between genders, culture, religious groups, and geographical and climatic conditions. What is considered acceptable in one culture might not be acceptable in another. In short, hygiene refers to the practices that help in preserving and promoting health while preventing diseases.

Have you heard of the word Sanitation?. Medical dictionaries describe sanitation as the science of safeguarding health. WHO defines sanitation as ‘the control of all those factors in the physical environment, which exercise or may exercise a deleterious or harmful effect on man’s physical development, health and survival’. Hygiene includes practices followed or perceived by people for healthy living or to maintain health. Hygiene is essential to remove the micro-organisms which may make you ill. However, sanitation is mainly concerned with disposal of waste around us to prevent transmission of pathogenic micro-organisms. Hygiene is more concerned with persons while sanitation focuses more on environment and waste management.

Millions of micro-organisms are present in our homes and they are able to survive on surfaces for long periods, multiplying at an incredible rate in a very short period. Although most of them are not harmful, some normally referred to as germs are harmful and can cause infections, which can make you and your family ill.

Germs can affect people in a number of ways. The most vulnerable groups are people recovering from illness, the elderly, babies under the age of one, children under the age of five and pregnant women. These groups are easily susceptible to all sorts of health problems.

You can control the spread of germs through hygiene. i.e., by cleaning yourself, your home and by following basic hygiene rules that help you and your surroundings to remain clean and healthy. Like health, hygiene can also be classified into four main categories. Let us look at that next.

5.4.2 Classification of Hygiene

Hygiene too can be classified into: personal hygiene, domestic hygiene, community hygiene and environmental hygiene. All these are inter-related and are crucial for the health and well-being of individuals and communities.

Personal hygiene

There are some activities you perform everyday in order to keep yourself clean. These include the care of your skin, hair, teeth, eyes, ears, hands, feet
and the whole body. Figure 5.6 gives a picture of a typical morning scene in a village. People are involved in performing their daily activities. Can you list those activities that promote hygiene?

Figure 5.6: The morning scenes in a village.

The following are some of the personal hygiene activities that we undertake:

- **Taking daily baths**: Bathing regularly and wearing clean clothes. Dirt is a place for germs to grow. So bathing regularly keeps your body free of dirt and germs. This is particularly important in climates that make people sweat a lot.

- **Regular toilet habits**: Regular bowel movements keep us free of wastes generated inside our body. Develop this habit in your children by giving them the right food, plenty of water and by making them do proper exercises.

Figure 5.7: A traditional practice of hygiene.
• **Washing and cleaning our feet when you return home.** This washes off the germs collected from outside. In traditional homes in Kerala, a special vessel filled with water is kept at the doorstep to wash feet thoroughly before entering the home. This is a good practice that ensures domestic and personal hygiene. Washing your feet and drying them, particularly between the toes, before going to bed, and cleaning and regularly clipping the toe nails, helps to keep many germs away from you and your home.

• **Brushing your teeth** in the morning when you get up and at night before you go to bed. After eating food, some food particles may remain stuck to your teeth. These food particles allow germs to grow, which can harm your gums and teeth, and cause bad breath. Brushing your teeth twice daily and rinsing your mouth every time after food prevents these germs from growing.

• **Washing hair, cleaning eyes, nose, ears and nails:** Regular washing and combing of hair helps to prevent dirt accumulation, and keeps germs and lice away. Nails should be clipped and cleaned regularly. Nail biting is unhygienic and must be avoided. Wash your eyes and nose daily with clean cold water. Wash your ear lobes and see that your nose and ears are kept clean always. Avoid inserting objects into your ears to clean or scratch your ears as it is dangerous and can lead to deafness.

• **Respiratory hygiene:** correct respiratory and hand hygiene while coughing and sneezing reduces the spread of germs, particularly during the ‘cold and flu’ season. Carry tissues and use them to cover your mouth and nose when you cough or sneeze. Remember to properly dispose them off as soon as possible. Wash your hands thoroughly using soap. If soaps or disinfectants are not available, you can use affordable mud or ash as an alternative. Figure 5.8 shows the good practices to promote respiratory hygiene.

• **Abstain from bad habits:** such as smoking, chewing of betel nut, pan and tobacco and drinking of alcohol. Such unhealthy habits may lead to health problems such as liver damage, kidney failure, heart failure, cancer, and mental and social problems. So avoid such habits at all costs.
Note It

Figures 5.6, 5.7, 5.8 and 5.9 are to remind you that you should not neglect any of these activities. You should also encourage others to practise healthy habits and be keen to develop these habits in your children through demonstration and practice.

You can be a role model to your children by following these hygienic practices that keep you healthy.

**Hand hygiene:** this is one habit that is taken for granted by many. Though very simple, it is a very important activity that can work wonders in keeping you healthy. Hand washing is considered to be the most important step in maintaining hygiene and protecting health. Always wash your hands before and after handling food. Eating food with dirty hands may make us ill because the dirt in our hands and nails might carry certain disease-causing germs. Teach children to wash their hands thoroughly before and after food, and also after going to the toilet. Washing hands with soap makes them germ free. Use tissues to catch coughs and sneezes, and wash your hands thoroughly afterwards.
Always wash your hands as follows:

- After contact with contaminated items, such as waste bins and washing soiled clothes
- After cleaning the house and utensils
- Before and after preparing food
- Before and after eating
- After using the toilet or clearing up spillages, sinks, waste pipes and toilets
- After handling pets or pets’ items
- After covering your nose and mouth with hands when coughing or sneezing

*How to wash your hands ([www.domestos.co.uk](http://www.domestos.co.uk)):

Step 1: First wash hands with water, apply soap and rub hands together, palm to palm for 15–30 seconds

Step 2: Rub right palm over back of left hand and left hand over back of right hand

Step 3: Next rub palm to palm, fingers interlaced

Step 4: Do not forget to rub the back of your fingers of opposite hands, palms with fingers interlocked

Step 5: Give rotational rubbing of right thumb clasped in left palm and vice versa

Step 6: Continue rotational rubbing, backwards and forwards, with clasped fingers of right hand in left palm and vice versa

The activities given here will help you further assimilate the ideas that have been discussed above.

**Activity 5.4**

1. What is the difference between hygiene and sanitation?
II. How will you keep personal hygiene?

Now we shall move on to domestic hygiene.

5.4.3 Domestic hygiene

What is domestic hygiene?

This addresses hygiene from the point of view of your family and highlights the range of actions the family members need to undertake in order to protect themselves from infectious diseases. This includes: individual hygiene, food and water hygiene, safe disposal of human and other waste, and the hygiene of the home and its surroundings. It also includes home-based healthcare (caring for family members who are infected or at greater risk of infection). If your home environment is dirty, diseases may spread even if the rest of the village is very clean.

The main sources of infection in homes are the people who live there who may be carriers of diseases, infected food (particularly raw food), contaminated water and domestic animals. When houses are of poor quality, with poor ventilation and lighting, health problems like respiratory diseases, allergies, eye problems, etc. may occur.

In addition, places where water collects, such as kitchen sinks, toilets, waste pipes, washing and laundry areas, readily support the growth of germs and can undoubtedly become secondary reservoirs of infection. Effective hygienic measures include thorough cleaning of all these areas and draining the stagnant water. Cleaning these areas with running water helps to remove germs from the surface and washing with soap or
detergent is needed depending on the situation. Antibacterial products or disinfectants can be used when and where necessary.

Here are a few tips that will help maintain domestic hygiene.

The following tips, although common knowledge, are meant to serve as a reminder so that we can practice them regularly.

- **Clean home**: Homes should be kept clean and free from dirt, flies and germs.
- **Food hygiene**: Many health problems arise out of consumption of unhygienic food. You might have read in newspapers about the hospitalisation (even leading to death) of people due to food poisoning, eating food prepared under unhygienic conditions from hotels.

The five key principles of food hygiene, according to WHO are:

1. Prevent contaminating food with pathogens spreading from people, pets and pests
2. Separate raw and cooked foods to prevent contaminating the cooked food
3. Cook food for the appropriate length of time and at the appropriate temperature to kill pathogens
4. Store food at the proper temperature
5. Use safe water and raw materials

- **Clean kitchen**: cooking utensils, plates, cups and other kitchen utensils, and even the stove should be kept clean. You might have heard of or seen the age old practice of applying cow dung paste on the traditional stove or furnace and allowing it to dry after the cooking is over in the evening or night. This had two advantages. Cow dung is a good disinfectant so no germs will enter the stove. Also it conserves heat. Today it is much easier to clean modern stoves and kitchens.

**Note It**

Care should be taken to use hygienic food and safe water always.

- **Fruits and vegetables** should be washed several times in clean water to ensure they are free from germs and pesticides (chemicals sprayed on plants to keep them insect free or to prolong their shelf life) before consumption or cooking. Cleaning them first with plain water, then with water in which a little salt or turmeric powder is added, and again rinsing in plain water was the traditional practice to remove pesticides and chemical residues.
• **Hygiene in cooking:** Food should be prepared in a clean kitchen and in a clean manner. While cooking food, it is important to heat it to the temperature required to kill any germs present. Cooked food should be eaten as soon as it is prepared or stored in a cool place free from flies. It should always be covered. Milk stored in the refrigerator or outside should be boiled again to make it germ free.

• **Water** used for drinking, cooking, bathing and washing utensils, should be from a clean source. Household water treatment and its safe storage ensures the safety of drinking water.

**Keeping the house clean:** The house should be cleaned every day to remove dirt. The furniture must also be wiped and cleaned. Cobwebs from the walls and roof should be cleared at least once a week.

Food hygiene is another very important factor in maintaining individual as well as community health. Contaminated or adulterated food represents one of the greatest health risks in any population and is a leading cause of disease outbreaks and transmission. Food that is kept too long without refrigeration certainly gets spoiled and gets contaminated with toxic chemicals or pathogens. Dirty hands, unclean water, flies and unhygienic surroundings can contaminate foodstuffs that are eaten raw. Improperly prepared food can also cause problems.

Therefore, to promote good health, food should be hygienically prepared and properly stored. It is important that people understand the principles of basic hygiene and know how to prepare and store food safely and hygienically with minimum loss of nutrients. These points should be kept in mind while preparing food for home, a group or in hotels or other food outlets.

You need to focus your cleaning efforts on places that matter most, such as bathroom, kitchen, pet area and garden, and pay extra attention to frequently touched surfaces. Thorough cleaning is important in preventing the spread of fungal infections as mould can live on wall and floor tiles. They can be responsible for infections, cause allergic problems, or may deteriorate/damage surfaces and cause unpleasant odours. Fungal growth is usually associated with damp conditions, poor ventilation and closed air circulation.

**Throwing garbage in dustbins:** What do you do with the garbage in your house? Do you dump it anywhere, bury it or burn it? Do you throw it outside the compound or use it for composting? We shall learn about the different methods of waste management later. However, you should keep one thing in mind: do not throw your household garbage on the roadside. This
makes the streets dirty and allows flies, mosquitoes and other animals to breed. This garbage not only gives a dirty look to the area but also produces a foul smell and may even cause health problems.

Garbage should be placed inside dustbins and disposed of without causing problems to other people or the environment. The bins should also be cleaned after emptying the garbage. Domestic waste can pile up and can cause many health problems.

**Note It**

You can keep your body clean but what will happen if you live in dirty surroundings? You are sure to fall sick. Thus, to have a healthy living, one must live in clean surroundings too. Unclean surroundings may become breeding grounds for flies and germs, and thereby leading to the spread of diseases.

Let us now examine the hygiene of the community.

### 5.4.4 Community Hygiene

Just as domestic hygiene refers to the practices that help keep the home clean and its members healthy, community hygiene refers to those practices that help keep and promote the health of individuals in the community as a whole. Community hygiene pertains to the hygiene practices that prevent or minimise the spread of diseases in the community and in everyday life settings, where people gather, such as social gatherings, public transport, workplace and markets.

Many of these diseases are preventable through simple, non-medical methods, like promotion of healthy behaviours and practices in the community. Figure 5.10 is an example of a bad practice followed in our villages. It is reported that one of the main reasons for the increase in the average life span in the 20th century, is due to the improvements made in the field of hygiene and sanitation. These improvements include chlorination and filtration of drinking water and sewage treatments. They have helped to reduce the mortality rate caused by infectious, water-borne diseases, such as cholera and intestinal diseases like typhoid, diarrhoea, etc.

You will be proud to know that the clean and hygienic practices followed by the people in Kerala have helped the community members to improve their health status, increase their life span and reduce their mortality rate.
Only the community as a whole can undertake some health measures. These include water source protection, proper disposal of solid waste and excreta, wastewater drainage, hygienic animal rearing and market hygiene. Figure 5.11 shows the different areas for community health measures. Individual community members also play an important role in community hygiene and have a responsibility to their neighbours and to the community to promote good health and a clean environment. For example, if everyone in the village starts to keep their houses and compounds clean, there would be no problem at all. But if one house is dirty, then it can affect many conscientious neighbours and contribute to the spread of diseases.

Community leaders can promote cleanliness in the home by regularly visiting village households and by imposing laws and regulations to encourage maintenance of household hygiene.
Markets also pose a health hazard in the following ways:

1. Most of the market slack basic services, such as water supply, sanitation, solid waste disposal and drainage. Ideally, markets should have enough facilities to provide traders and customers with ready access to safe water for drinking, personal washing and cleaning materials. The sanitation facilities should also be adequate considering the number of people visiting the market, with separate facilities allocated for men and women.

2. Foodstuffs for sale may not be stored properly. The country has provisions for daily inspections of the foodstuffs sold at the market by health officials. This is particularly important for meat and fish. They should be inspected before sale to ensure that they have been prepared according to national regulations and that they do not contain pathogens or other contaminants.

3. Markets usually generate a lot of solid waste and it is important to ensure that it is disposed of properly, to prevent vermin such as rats and insects from feeding and breeding among it. You can create awareness among the people about the serious effects of unhygienic conditions in the market and the punishments they will get if they violate the rules. You can also motivate the local leaders to implement the rules strictly to protect the health of the people.

Animal rearing can have negative effects on the health of the community if not practised safely. Animals should always be kept away from households, particularly from cooking areas and drinking water sources, since their excreta contain pathogens that can contaminate food and water. It is preferable to keep the animals in compounds at least 100 metres away from water sources and 10 metres away from households. Animal waste should be disposed of properly, away from homes and water sources, or be used as a fertiliser. Slaughter houses should be kept away from households and water sources, since the waste may cause contamination. Only qualified individuals who follow laws governing slaughtering can operate a slaughterhouse.

**Food from outside home**

Today many people buy or consume food outside the home (cafes, restaurants, canteens, bakeries, etc.). If basic health and safety rules for preparing, storing and handling food are not followed in such eating outlets, these places become a health hazard for customers and may cause serious disease outbreaks.

The most important aspects of food hygiene in these establishments, relate to sanitation, water supply and personal cleanliness. Providing clean water
for washing and drinking, and separate sanitation facilities, away from the kitchen area, for customers, cooks and food-handlers, is essential. The staff should wear clean clothes or uniforms while cooking, serving and cleaning, and should have regular medical check-ups. Food should be freshly prepared daily. Food that is spilled or not used should be disposed of daily. The kitchen, storage place and eating areas, must be kept clean and free from rodents and insects. The place should be well ventilated, with adequate lighting, and have provisions for dealing with fires and accidents.

Most countries have laws and regulations for running eating houses. Health officials should inspect eating outlets periodically, to make sure that they do not pose health risks to the public. If a CDW like you suspects an eating outlet is posing a health hazard, you should request for an inspection by the appropriate local health authorities.

The demand for street food and fast food is very high nowadays and large numbers of people depend on it. Hence it may be necessary to work closely with local health authorities to ensure the safety and hygiene of these places. Similarly, see that the street vendors also follow these rules. They should be encouraged to locate nearby water points, sanitation facilities and clean surroundings where they can keep their hands and food clean and people can eat safely.

CDWs like you can also check with vendors to ensure that food is prepared afresh and served immediately rather than being kept open or unrefrigerated for long periods. You can also try to ensure that the food is stored in clean and closed containers. Figure 5.12 differentiates between an ideal food outlet and an unhygienic polluted food outlet.

![Figure 5.12: An ideal food outlet and an unhygienic polluted food outlet.](image)

Before you proceed any further, here is an activity for you.
Activity 5.5

I. How can you maintain domestic hygiene? Write your answer in the space provided below.

II. Match the following

1. Domestic hygiene – Avoid contaminated/or adulterated food/ or Unhygienic food
2. Food hygiene – Keep ourselves clean
3. Community hygiene – Hygiene of home & its surroundings
4. Personal hygiene – Hygiene of the individuals of the community as a whole

Compare your answers with those provided at the end of this unit. Next, let us learn about environmental hygiene.

5.4.5 Environmental Hygiene

You have already learned the definition of the environment. It is all the external factors and conditions which surround people, affect their lives and the growth of plants and animals. Do you remember WHO’s definition of environmental sanitation? WHO defines, ‘environmental sanitation as the control of all those factors in people’s physical environment’. So what are requirements for good environmental hygiene? They include the following:

- Clean air
- Safe and sufficient water
- Adequate and safe food
- Safe and peaceful settlements
- Stable global environment

In short, the environment relates to the surroundings in which we live or exist, while environmental hygiene refers to the activities which help improve or maintain the standards of our environment. Thus, all the
measures we undertake to keep the human environment safe and healthy, including waste disposal, clean water supplies, food safety controls and good housing, all fall under environmental hygiene.

Many of the health problems throughout the world, particularly in developing and underdeveloped countries, are due to poor environmental hygiene: unsafe water, polluted soil, unhygienic disposal of human excreta and refuse, poor waste management, poor housing, attack of insects and rodents, and unclean surroundings etc. Air pollution is also a growing concern in many places. The high death rate, infant mortality rate, increased morbidity or sickness rate, increasing disability rate, and poor health status, are, in fact, largely due to defective environmental hygiene.

**Safe and wholesome water**

As mentioned earlier, water is the most important factor in safeguarding your health. Water intended for human consumption should be free from disease causing germs and harmful chemical substances. It should be pure and clean with a pleasant taste and not having any colour or odour. Without ample and safe drinking water, we cannot provide health care to the community. Water is also essential for domestic, public, industrial and agricultural uses. Therefore, proper handling and economic use of water is essential to protect our water sources and to conserve it for future generations.

Although we cannot exist without water, it can be harmful if it is used or stored improperly or when it is collected from a stagnant source. Care should be taken to assure the quality of water used for various purposes by avoiding misuse and dumping of all kinds of waste into water sources. Hygienic environments and surroundings too are very important to ensure the quality of water.

By now you have realised that domestic, community and environmental hygiene are all inter-related. Environmental hygiene is closely related to the production and consumption of safe and quality food and water. In addition, good housing conditions and well ventilated houses free from insects, moths, mosquitoes, etc. are also important to maintain environmental hygiene. Pollution-free environments or those with minimum levels of pollution are requisites for maintaining hygiene and safety. We shall study pollution and food safety in detail later.

So far, we have been discussing health and hygiene and its importance in maintaining individuals, families and the community. Now we shall look at pollution and the agents responsible for damaging the health of a community.
5.5 Pollution

Human activities can affect the environment adversely. Development activities produce large amounts of waste that lead to the pollution of air, water and soil. Figure 5.13 illustrates air pollution. Improperly treated waste is a major cause of pollution to rivers and the environment and causes ill health.

![Air pollution](image)

Figure 5.13: Air pollution.

*What is Pollution?*

The media, nowadays, gives a lot of importance to pollution and its effects. So, most of us should be quite familiar with the term ‘pollution’. What does it mean? Let us look at the definition. Pollution is the contamination of air, water, soil and food by harmful or poisonous factors. It is the introduction of contaminants into a natural environment that causes instability, disorder, harm or discomfort, to the ecosystem. Pollution can take the form of chemical substances or energy such as noise, heat or light. Pollutants, the components of pollution, can be either foreign substances or energy or naturally occurring contaminants’ (Wikipedia).

Human activities such as agriculture, industry, transport, energy use and nuclear activity have put immense pressure on the environment. Thus, there are different forms of pollution, each of which has some adverse effect on human health and on our environment in general. Now let us have a look at the different forms of pollution.

5.5.1 Forms of pollution, their causes and effects

In this section, we shall look at the major forms of pollution found in our communities and their causes and effects. These are:
Air pollution
Water pollution
Soil pollution
Noise pollution
Light pollution
Radioactive pollution
Thermal pollution
Other types of pollution

**Air Pollution**

What is air? Air is part of man’s environment and is the basis of all forms of life. Air not only supplies the life-giving oxygen but also serves many other functions for our healthy existence. Air is a mixture of gases. The normal composition of atmospheric air is: Nitrogen-78.1%, Oxygen-20.93%, Carbon dioxide -0.03% giving a total of 99.06% by volume. The balance is made up of traces of other gases known as rare gases like, argon, neon, krypton, xenon and helium. Air also contains water vapour, traces of ammonia and suspended matter such as dust, bacteria, spores and vegetable debris.

The composition of air is naturally maintained constant by the following mechanisms:

- Wind which sweeps away impurities
- Sunlight which maintains temperature, oxidizes impurities and kills bacteria
- Rain which washes away suspended and gaseous impurities and cleans the atmosphere
- Green plants and vegetation which supply oxygen by utilizing carbon dioxide and liberate oxygen in the morning and reversing the process at night.

Examples of natural maintenance of air are shown in Figure 5.14.
When air accumulates excessive concentrations of bad substances, it becomes harmful. This is called air pollution. The term air pollution is applied when there is an excessive concentration of harmful matter in the atmosphere, which are harmful to life and health. The release of chemicals, gases and particulates, into the atmosphere from different sources can pollute the air.

Air pollution is today one of the serious causes of health problems throughout the world. Air pollution results from both natural and man-made sources. The main man-made pollutants found all over the world are combustion, construction, mining, agriculture and warfare (See Figure 5.15).

![Automobile pollution](image)

**Figure 5.15: Automobile pollution.**

**Sources of air pollution**

The main sources of air pollution are:

- Domestic sources (burning of coal, wood, oil, plastics and other wastes)
- Industrial sources (gases and chemicals from factories and industries)
- Transport and motor vehicle exhaust (gases and chemicals from automobiles, motor vehicles, railways). Motor vehicles are one of the leading causes of air pollution. Over 50% of pollution from nitrogen oxides, carbon monoxide, dust, and lead, are from motor vehicles
- Others like nuclear explosion, radioactive contamination, smog, smoke, etc. also contaminate air
- Stationary pollution sources, such as chemical plants coal-fired power plants, oil refineries, petrochemical plants, nuclear waste disposal activity, incinerators, large livestock farms (dairy cows, pigs, poultry, etc.). (Wikipedia)
• Agricultural sources of air pollution are contemporary practices, which include tree felling, burning of natural vegetation, as well as spraying of pesticides and herbicides.

In India, air pollution is believed to cause 5,27,000 deaths a year whereas in the US the figure is 50,000 only!

**Water Pollution**

As you know, water is the most abundant compound on the Earth’s surface, covering about 70% of the planet. In nature, water exists in liquid, solid and gaseous states. It is the only common substance found naturally in all the three common states of matter and is essential for all life on Earth.

![Figure 5.16: Picture showing how water can get polluted.](image)

Water usually makes up 55% to 78% of the human body and is the most abundant substance in plant and animal matter. Life cannot exist without water and an organism will die if it is deprived of water. Water is a tasteless and odourless liquid at room temperature. It is commonly referred to as the universal solvent. Because of this, water in nature is rarely pure and some of its properties may vary slightly from those of the pure substances.

We all need clean water. People need it for drinking, cooking, cleaning, to grow crops, to operate factories and for recreation. Plants, fish, domestic animals and wildlife, depend on it to survive. Water intended for consumption should be pleasant to taste, clear, sparkling, and free from pathogens and harmful chemical substances, colourless and odourless. We say that water is polluted or contaminated if it does not fulfil the above qualities. We get water from different sources: rain water, surface water (rivers, lakes, streams, ponds, tanks, reservoirs, etc.) and ground water (shallow wells, deep wells, bore wells, springs, etc.).
**What is water pollution?**

Water pollution occurs when chemical, physical or biological changes occur in the quality of water, thereby causing a harmful effect on any living thing that drinks, uses or lives in the water. When we drink polluted water it often has serious effects on our health.

Many different pollutants can harm our rivers, streams, lakes and oceans. The three most common pollutants are soil, nutrients and bacteria. Rain washes away soil into streams and rivers. The soil can destroy tiny organisms in water and fish eggs; it can clog the gills of fishes and block sunlight causing water plants to decay. Nutrients, often from fertilizers, cause problems in lakes, ponds and reservoirs. Nitrogen and phosphorus make algae grow and can turn water green. Bacteria, often from sewage spills, can pollute fresh or salt water. This causes the water to become polluted and unfit for consumption.

**What are the major water pollutants?**

There are five major causes of water pollution. These are:

1. Disease-causing agents. These are bacteria, viruses, protozoa and parasitic worms that are found in sewage systems and untreated waste. When they enter into drinking water sources, they cause damage to its quality. Such polluted water causes transmission of water borne diseases like diarrhoea, dysentery, Hepatitis A, etc.

2. The second category is oxygen-demanding waste. This is waste that can be decomposed only by oxygen-requiring bacteria. This large-scale decomposition can decrease oxygen levels in the water and cause other organisms in the water, such as fish, to die.

3. The third category of water pollutants is water-soluble inorganic pollutants, such as acids, salts and toxic metals. Large quantities of these compounds make water unfit to drink and cause the death of aquatic life. Industrial waste from factories is a major source of such pollutants.

4. Another class of water pollutants are nutrients. These are water-soluble nitrates and phosphates that cause excessive growth of algae and other water plants, which decrease the level of oxygen in the water. This kills fish and, when found in drinking water, can even kill or harm babies and young children. Water can also be polluted by a number of organic compounds, such as oil, plastics and pesticides, all of which are harmful to humans, aquatic plants and other living things in the water. A very dangerous category is the suspended sediment, because it reduces water’s light absorption capacity and
the sedimented particles spread dangerous compounds through the water.

5. Finally are water-soluble radioactive compounds, which are very dangerous water pollutants that can cause cancer, birth defects and genetic damage.

Water pollution, mainly contaminated drinking water, causes approximately 14,000 deaths a day in developing countries: an estimated 7,00,000 million Indians have no access to toilets and 1,000 children die of diarrhoea every day. So, you can see why water pollution is viewed as a major health hazard in the world today.

Today, access to water is also becoming a problem. The quality and quantity of water is of serious concern and can lead to several health problems. Water pollution is due to human activities. We can ensure safe water sources, both quantitatively and qualitatively, if we protect our water sources.

**Soil Pollution**

Soil is the ground or the natural life supporting material found on the upper surface of the earth and forms the basis of all agriculture. It is a mixture of humus or decayed organic matter, chemical and physical weathering of rocks, clay, mineral particles, gases, microorganisms, insects, nutrients and water. This natural body is very much essential to the sustainability of our ecosystem. The structure and composition of soil varies with time, climate, geological structure, rainfall, natural, animal and human activity of the area. Consequently, it is subjected to a number of pollutants from industry, agriculture, transport, etc. Soil contamination occurs when chemicals are released by spills or underground leakages. Among the most significant soil contaminants are hydrocarbons, heavy metals, herbicides, pesticides and chlorinated hydrocarbons (Wikipedia). Refuse or litter discarded from houses, street sweepings and commercial, agricultural and industrial operations have a prominent role in polluting soil.

The chemical composition of soil, particularly its metal content, is environmentally very important. High toxic metal concentrations in soil can reduce its fertility and can transmit toxic metals into the food chains, which in turn can lead to accumulation of toxic metals in food stuffs, and ultimately can endanger human health. Because of its environmental significance, many studies to determine the health risk caused by high toxic metal levels in the soil and forest ecosystem have attracted attention in recent years. Lead and mercury have been shown to cause neurological
problems. Heavy metals occur naturally in our earth’s crust and many are biologically essential. However, many have been introduced into aquatic environments by human activities, such as industrial waste, especially, in urban and densely populated cities.

Contaminated or polluted soil affects human health either through direct contact with the soil or via inhalation of vapourised soil contaminants. Potentially greater threats are posed by the infiltration of soil contaminants into groundwater used by people for drinking.

Health consequences from exposure to soil contamination vary greatly depending on the pollutant, pathway of attack and vulnerability of the exposed population. Prolonged exposure to chromium, lead and other metals, petroleum, solvents, and many pesticide and herbicide formulations may cause cancer, congenital disorders or other chronic health conditions. Industrial or man-made concentrations of naturally occurring substances, such as nitrate and ammonia associated with livestock rearing and agricultural operations have also been identified as health hazards in soil and groundwater. Chronic exposure to benzene at sufficient concentrations is known to cause blood cancer. Exposure to mercury causes headaches, nausea, fatigue, eye irritation and skin rashes. A large number of soil contaminants can even cause death by direct contact, inhalation or by their intake through groundwater contaminated by soil pollution. Soil contaminants can have significant harmful consequences for ecosystems too. So, be alert in identifying these symptoms in the community you are working in.

Solid waste management, treatment of waste, recycling of accumulated waste and composting, are the general steps taken to control this type of contamination. There are certain technical processes like aeration, bioremediation and excavation, which are large-scale scientific control measures taken at the government level. Proper waste management and improved agricultural practices carried out regularly at the community level can prevent this contamination to a large extent.

You now know all about soil pollution. Next let us look at noise pollution.

**Noise Pollution**

Noise pollution has recently been identified as a major community health hazard. The wrong sound in the wrong place at the wrong time is considered as noise and when it reaches an intolerable level and time, it can seriously affect health. Noise pollution includes domestic noises, noise from automobiles and railways, aircraft noise, industrial noise as well as high-intensity noises from commercial and construction sites.
Films and other entertainments, improper sound systems in theatres, loudspeakers, publicity programmes, celebrations, loud music from walkmans, mobile phones, etc. are some of the other causes of noise pollution. Noise pollution is known to induce higher incidences of irreversible liver and kidney damage, neuromuscular problems, depression, congenital defects, deformity, etc. It can also cause headaches, affect our ability to concentrate and impair our hearing.

Noise is measured in units known as decibels. The recommended maximum noise level is 85 decibels. The extreme limit of noise that a human being can tolerate is 140 decibels. When we are exposed to noise beyond that limit, it can cause problems like deafness, high blood pressure and physiological changes in the body like stress, mental instability, sleeplessness, speech defects and inability to concentrate. Road and industrial accidents are sometimes also caused by noise pollution. Educating people on the ill effects of noise and the steps to control the noise at its source, using protective measures to safeguard, is recommended. Most countries have laws aimed at controlling noise pollution but community co-operation and awareness are the most important means to control this problem.

**Light Pollution**

This includes light trespass, over-illumination and astronomical interference (Wikipedia).

**Radioactive Pollution**

This includes radioactive contamination, resulting from nuclear power generation, nuclear weapons research, manufacture and deployment. This
type of pollution can cause cancer and genetic defects, which may also affect future generations.

**Thermal Pollution**

This is due to temperature changes in natural water bodies caused by human influence, such as the use of water as coolant in a power plant, and global warming due to deforestation and other human activities.

**Other types of Pollution**

Visual pollution from the presence of overhead power lines, automobile lights, open storage and burning of trash or municipal solid waste are beings all hazardous to the health of human beings and other life on earth. Even overcrowding is found to be a form of pollution that can affect health. Pollution can also be the consequence of a natural disaster e.g., hurricanes and floods. Tsunamis and other natural disasters often result in water, soil and air contamination from sewage or other waste and deaths. Large-scale environmental damages are not uncommon. e.g., petrochemical spills from ships or automobiles or when coastal oil rigs or refineries are involved. Some sources of pollution, such as nuclear power plants or oil tankers can produce widespread and potentially hazardous releases when accidents occur. An example of this is the nuclear pollution that occurred in Japan after the tsunami in 2011 (caused by accidents in the Nuclear Power Plants at Fukushima in Japan following the tsunami).

We can make the ill-effects of the presence of environmental agents milder, both in the physical and biological environment, through the use of technology, supplements, education and co-operative ventures.

**Activity 5.6**

I. Name different types of pollution?
II. Match the following

| a) Air pollution          | Dysentery, diarrhoea |
| b) Water pollution        | Produces deafness    |
| c) Noise pollution        | Burning of coal, motor exhaust, industrial waste |

III. What are the effects of water pollution?

IV. Tick the answer that defines soil pollution

1. Presence of earth
2. Pesticides
3. Chlorinated hydrocarbon
4. Shipping

V. What are the health consequences of soil pollution?

VI. Fill in the blanks

a) Noise is measured in ________________
b) Maximum level of noise a human being can tolerate is _______ decibels.
c) Light pollution includes ________________ , ________________
d) Thermal pollution is due to ________________ changes in natural water bodies.

Compare your answers with those given at the end of this unit.
You now know the various forms that pollution takes, its sources and causes. Next let us look at the effects of pollution on human health.

### 5.5.2 Effects of pollution on human health

Now that you know what pollution is and what the different forms of environmental pollution are, let us define pollutants.

**What is a pollutant?**

A pollutant is any waste material that pollutes air, water or soil. Three factors determine the severity of a pollutant: its chemical nature, its concentration, and its persistence. You have already learned the different causes of pollution or the pollutants that pollute our environment. We will now have a brief overview of the effect these pollutants can have on human health.

Figure 5.18 gives you an understanding of the main effects of pollution on human beings. Table 5.1 also summarises various forms of pollution and the main pollutants. The impact of pollution on human health is depicted in Table 5.2.

![Figure 5.18: Main health effects on humans from some common types of pollution (Mikael Häggström 2014 Wikipedia)](image)

**Table 5.1: Various forms of pollutions with pollutants.**

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Pollutants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water pollution</td>
<td>Bacteria, parasites, chemicals from fertilizers, pesticides, oil, industrial waste, sewage, domestic and community waste, commercial waste, agriculture waste, lead</td>
</tr>
</tbody>
</table>
Community Health and Hygiene

Soil contamination
Chemicals from fertilizers, pesticides, waste industrial waste, sewage, domestic and community waste, commercial waste, agriculture waste, lead, plastic

Table 5.2: Pollution impact on human health

<table>
<thead>
<tr>
<th>Affected organs/people</th>
<th>Impact/Health hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td>Head aches</td>
</tr>
<tr>
<td>Brain</td>
<td>Fatigue, Nerve damage</td>
</tr>
<tr>
<td>Lungs</td>
<td>Respiratory illness and disorders</td>
</tr>
<tr>
<td>Heart</td>
<td>Cardio vascular diseases</td>
</tr>
<tr>
<td>Liver</td>
<td>Hepatitis</td>
</tr>
<tr>
<td>Stomach</td>
<td>Gastroenteritis</td>
</tr>
<tr>
<td>Kidney</td>
<td>Kidney damage</td>
</tr>
<tr>
<td>Excretory organs</td>
<td>Functional damage</td>
</tr>
<tr>
<td>Reproductive organs</td>
<td>Infidelity, sterility, defective children, spontaneous abortion, foetal and infant mortality</td>
</tr>
<tr>
<td>Sense organs</td>
<td>Defective sight, loss of hearing, irritation in eyes, nose and ears skin lesions</td>
</tr>
<tr>
<td>Skin</td>
<td>Skin irritation, skin cancer</td>
</tr>
<tr>
<td>Central nervous system</td>
<td>Pigmentation, allergies, neuromuscular problems</td>
</tr>
<tr>
<td>General</td>
<td>Fatigue, poor health, cancer</td>
</tr>
<tr>
<td>Growing children, aged and other vulnerable population more affected</td>
<td>Sleeplessness, intellectual disability, emotional problems and psychological problems</td>
</tr>
</tbody>
</table>

Note It
So now we know that pollution not only harms the environment but also the living things, particularly human beings. So, think twice before you throw garbage into the river or burn plastic or dump waste onto the streets!

5.5.3 Prevention and Control of Pollution

Pollution control is a term used in reducing pollutants and its evil effects on the environment (air, water and soil) and health of human beings. Without pollution control, the waste products of various human and industrial activities, whether they accumulate or disperse, will degrade
the environment. Beyond control, prevention of pollution and waste minimisation are also recommended. This can be achieved through sensitisation and education of communities and effective monitoring by the authorities. This can be successfully achieved only through the co-operation of every individual in the society along with the relevant authorities. As a CDW, you can play a very important role in this area. Recycling, reusing, reducing, mitigating and preventing are the different measures usually followed in pollution control. Safe and sufficient water and food, clean air, efficient and safe agricultural practices, improved waste management techniques, cleaner industrial processes and transport systems, are a few of the activities envisaged to achieve the target of health for all through a healthy environment.

**Regulation and monitoring**

Many nations have legislation to regulate various types of pollution as well as to mitigate the adverse effects of pollution. Different countries have set their own environmental standards. Local and national policy making and action plans also play a role to ensure the minimising of environmental damage and maximising of health benefits. The entire international community is alarmed at the effects of environmental deterioration and its consequences on the health and well being of the present and future generations. International bodies like the WHO and the UN have been making efforts to address these issues and to develop measures and means to prevent environmental dangers to health.

We hope you now understand about pollution and its effects on health and you are able to educate the members of your community on how to prevent and control it. In the next section you will learn about health issues in the community.

### 5.6 Health Issues in the Community

Health risks and health hazards due to environmental issues are some of the major issues of the modern world. The quality of the environment determines to a large extent, the health of the people and other life forms living in the environment. In previous sections, we also noted that the quality of our environment is affected by human activities with negative consequences on human health. So what are the current health concerns and causes of ill health in the world? Let us explore them next.

#### 5.6.1 Current local and global health concerns

When nations were at the early stages of development, environmental health risks were as a result of inadequate food, unsafe drinking
water, improper sanitation and infections from animals. But industrial development and technological advancement have introduced severe health risks related to pollution (such as air, water, soil, noise and waste), chemical exposures, automobiles and traffic accidents. In many countries, particularly in the developing countries, both traditional and modern health risks exist simultaneously. This has led to the emergence of new diseases, resurgence of old or eradicated diseases, increased spread of drug resistant pathogens, environmental degradation, unsafe food and water, health risks related with changing lifestyle and food habits and so on. These remain as an important health concern throughout the world, drawing the attention of governments, policy makers, and national and international agencies. Managing and controlling the human and environmental health risks and hazards involves preventing and minimising these threats through individual, community and nationwide efforts.

5.6.2 Determinants/causes of ill health

The environment, both inside and outside our homes has substances which affect our overall health. There are varying degrees of risk associated with certain substances found in the air we breathe, the water we drink and the food we eat. Some of these substances pose serious health hazards as they may cause illness and disease. Children, the elderly, and people with heart or lung diseases, may be more vulnerable to certain environmental risks. Besides pollution, personal and community hygiene also plays a very important role in protecting or impairing the health of the people. Hygienic habits of people, especially keeping themselves and the surroundings clean and free from disease causing agents, are major factors determining health. Unavailability of safe food and water, bad food habits, life style without any exercise, fast food habits along with addictions to substances like tobacco, alcohol and other drugs are also a few of the causative factors of severe health hazards.

Now let us see what steps can be taken to control this.

5.6.3 Attitudinal and behavioural changes

The major step that needs to be taken to overcome or reduce the health risks and hazards is to bring about changes in the attitude, behaviour and outlook of people. Community education and outreach programmes are urgently needed. As a CDW, the following activities will help you bring out positive change in the community:

- Raising awareness about harmful situations
- Giving guidance and counselling
• Improving health literacy, particularly to growing children, mothers and the community as a whole, through education programmes, training and interventions through media

5.6.4 Global perspectives

The global perspective includes steps to achieve the Millennium Goals of improving the health of all, bringing up environmental justice, alleviating poverty, and preserving the environment and the life support systems of the earth for sustainable development. To find a sustainable way of living, we need to change our habits, lifestyle, and social and personal values, so that human activities will not harm the ecosystem or human health, or damage the earth or nature but protect and preserve the globe with all its resources for the future. Attempt the activity given below.

Activity 5.7

1. You might have noticed some activities in your locality which you think can affect health adversely. e.g., dumping of waste on the road or washing clothes close to the open well. From your observations, list these activities below.

2. Have you noticed any climatic change due to deforestation? Make a note of it. It will come in handy later when you start working for community development.
You have now come to the end of this unit. Let us review what you have learned.

5.7 Summary

We hope that you are now aware of the importance of maintaining good health. We hope you have seen that community health and personal health are interconnected. We have also noted that man is the main agent of pollution in the environment. It is therefore our duty to save the environment for the future generation as well as for all life on earth. Dream about a clean, healthy, green, environment and try to fulfil that dream in the community where you work.

In this unit, we started by considering the meaning of health and its classification. We then discussed the meaning of hygiene and classified it into personal, domestic and environmental hygiene. Next we explored the issue of pollution and looked at the different forms it takes, its sources, causes and effects. Lastly, we discussed global and local health issues and how we can change the attitudes and behaviour or community members to adopt good health practices. In the next unit, you will learn about eco-friendly agricultural practices and healthy food.

5.8. Model Answer to Activities

Activity 5.1

1. Fill in the blanks

1. Health is **wealth**
2. A complete physical, mental and social well being is called **Health**.
II. Tick any two for maintaining good health.
1. Consume safe, healthy, balanced diet.
2. Maintain good habits.

III. Match the following.
1. Personal health — Physical health
2. Domestic health — Take care of the member of the family
3. Community health — Health of the community

Activity 5.2
The answer for this activity can be gathered through interaction with local people. The information for it can also be collected from local institutions like PRIs, government offices and NGOs.

Activity: 5.3
Now that you know the concept of health and its classification, you will be able to answer the following questions. For this, you may need 20 minutes.

I. Name any five requisites to maintain personal health.
1. Proper exercise
2. Balanced diet
3. Good sleep
4. Recreational facilities
5. Hygiene

II. List our physical environment from the following:
1. Water resources
2. Climate
3. Soil

III. Fill in the blanks
1. The health is mainly classified into Personal health, Domestic health, Environmental health, and Public health.
2. The foundation of good health is adequate nutrition.

Activity 5.4
I. What is the difference between hygiene and sanitation?
Hygiene means the practices that prevent the spread of disease-causing organisms whereas sanitation is the science of safeguarding health to control all these factors in the physical environment on human development.
II. How will you keep personal hygiene?

1. Take bath daily  
2. Wash yourself  
3. Regular toilet habits  
4. Avoid bad habits like smoking, drinking and taking drugs

Activity 5.5

I. How can you maintain domestic hygiene?

1. Homes should be kept clean and free from dirt, flies and germs  
2. Avoid consuming unhygienic food  
3. Use safe water

II. Match the following

1. Domestic hygiene  
2. Food hygiene  
3. Community hygiene  
4. Personal hygiene  
- Hygiene of home and its surroundings  
- Avoid contaminated/or adulterated food/ or Unhygienic food  
- Hygiene of the individuals of the community as a whole  
- Keep ourselves clean

Activity 5.6

I. Name different types of pollutions?

a) Air pollution  
b) Water pollution  
c) Soil pollution  
d) Noise pollution

II. Match the following:

a) Air pollution  
- Burning of coal, motor exhaust, industrial waste  
b) Water pollution  
- Dysentery, diarrhoea  
c) Noise pollution  
- Produces deafness

III. What are the effects of water pollution?

a) Harm our rivers, lakes and oceans  
b) Algae growth, turn water green  
c) Water gets polluted and unfit for consumption

IV. Tick the correct answer for soil pollution

1. Pesticides  
2. Chlorinated hydrocarbon
V. What are the health consequences of soil pollution?

a) Increase the activity of the soil
b) Fertility is diminished
c) Water retention capacity of the soil is reduced
d) Deplete ground water stock

VI. Fill in the blanks

a. Noise is measured in decibels
b. Maximum level of noise a human being can tolerate is 140 decibels.
c. Light pollution includes over illumination, light trespass
d. Thermal pollution is due to temperature changes in natural water bodies.

5.9 Unit-end Questions

From the text you have already read, prepare a list of activities that you understand would promote health and those could affect health adversely. Now, from this list, identify and make a note on a few practices you think contribute to community health and those which destroy health. A Kudumbasree unit or a self-help group in your locality can help you gather information and suggestions on such activities. You can discuss with them to understand in detail how each activity is contributing to promote or destroy community health. These information would help you in your developmental activities for the community.

1. Prepare a note on a few practices in your community that really contribute to community health. For this you can easily approach a Kudumbasree unit or self help group in your locality and request each member to suggest one such activity. Note down the activities and discuss with them how each activity is contributing to promote community health. You will get a lot of information that will help you in your developmental activities.

2. Visit your local market and try locating the main sources of infection, if any. Can you find anything not mentioned in your notes? Note them down and write the different ways in which they can be eradicated.

These two activities will give you an idea of the good practices that need to be encouraged and unhygienic practices that need to be minimised in your locality.
Unit 6: Eco-Friendly Agricultural Practices and Healthy Food

6.1 Introduction

Welcome to Unit 6 in our Module on ‘Community Health and Hygiene’. In the last unit, we discussed the concepts of health, hygiene and pollution. In this unit, we will look at the relationship between health and the food we produce, store and consume. This information will help you initiate and execute healthy and hygienic practices in the community, particularly in the area of food and agriculture.

This unit will start by looking at the impact of agriculture and industry on the environment. From the previous unit, you know that the health of an individual and the community depends on safe and hygienic surroundings and a healthy lifestyle. A healthy life style in turn depends not only on how we live, but also on the food we produce and consume. This unit will equip you with the knowledge and skills to promote safe food production and consumption that in no way affects the health of the people or their environment. You might require 16 hours to study this unit.

6.2 Learning Objectives

After completing this unit, you will be able to:

- Identify eco-friendly agricultural practices that promote food production and the health of people in your community
- Create awareness in the community about the importance of good nutrition, good food habits and healthy lifestyles
- Differentiate between the concepts of food safety and food security
- Describe the changing trends in food culture and food production in your community and their impact on health
6.3 Impact of Agriculture and Industry on the Environment

As we saw in the last unit, pollution poses a serious health problem to our lives today. We know that pollution is mainly caused by human activities like agriculture and industry. Agriculture is an ancient occupation but is currently causing some major health issues.

Agriculture is a human activity which has contributed to reducing food scarcity and improving the health and nutritional status of people, and the economic independence of communities. Problems began to arise when more importance was given to increasing food production by whatever means, without considering the ecological consequences. Today, our production and consumption of food contributes to environmental damage in a variety of ways. The activities of food production, processing, transportation and packaging, all contribute to environmental damage. Clearing land for construction, industry and agriculture especially related to cattle rearing, are major causes of wildlife disturbance and natural habitat destruction in many countries throughout the world.

Here in Kerala, the main problems are from overcrowding. Agricultural production, aquaculture/fish farming, meat production all can have negative ecological consequences too. Use of chemical fertilizers and pesticides in industrial agriculture has resulted in air, soil and water pollution, and damage to many native plant and animal species. Further, “out of season” food is transported over great distances, using large quantities of fossil fuels (petrol and diesel), chemicals and preservatives, leading to greenhouse gas emissions. Unless sustainable and eco-friendly agriculture is promoted, the impact on environmental health can exceed the positive contributions of these activities.

Industrialisation is another human activity essential for economic improvement and development. However, this also has turned out to be a major source of pollution from the routine discharge or accidental release of industrial waste. As industries grow, the chances for industrial pollution as well as depletion of natural resources is also likely to increase. Adapting well planned and timely precautions and advancements in technology can prevent this to a very great extent. As the industry relies heavily on transport, this again can pollute air and water. Noise and other waste pollutants associated with industries can also cause a hazardous impact on the environment and health. Industries create a positive impact such as providing job opportunities, economic development and enhanced standard of living. Yet, industries, particularly small industries, where precautions are not taken properly, bring the adverse impacts of
unscientific waste disposal and environmental pollution directly to the local community with grave consequences. This is one of the areas where a CDW can make a difference.

6.4 Agricultural Practices and Health

In most developing and developed countries, crop cultivation, animal husbandry, forestry and fisheries are the backbone of rural livelihood. You might have heard about the green revolution and its contribution to agricultural production. The Green Revolution of the late 1960s formulated the efforts to increase agricultural productivity to meet the rising demands of the growing population and also to overcome poverty. The White revolution (increased milk production) and Blue revolution (increased fish production) were all attempts to increase food production to meet growing demand. These movements were characterised by the use of new agricultural technologies, such as the application of hybrid seeds, chemical fertilizers and pesticides, and the development of supportive agricultural infrastructure. However, these agricultural revolutions introduced new agricultural practices that affected the ecosystem. e.g., uncontrollable use of chemicals and pesticides has affected the human and environment adversely though production increased. The endosulphan tragedy in Kerala is a best example of environmental pollution. Such practices eventually threatened a sustainable and healthy food supply. Let us now examine some agricultural practices that have turned out to be hazardous.

The wrong use of technology and chemical-based agriculture

While this has increased production, it has also led to the loss of soil fertility. This has caused “land hunger,” where the land gradually becomes more dependent on increasing amounts of chemical fertilizers. Human activity has also indirectly caused climate change, which has had an adverse impact on agriculture and health. Example is the change in climate particularly rainfall due to deforestation. Destruction of forest areas in large volumes and release of harmful chemicals to the atmosphere from air conditioners and other such gadgets, have indirectly contributed to global warming and ozone layer depletion. All these point to the urgent requirement for new practices and approaches to guarantee the development of farming by conserving ecological balance. In many places, farmers have started complaining that in the past, they harvested more food grains than they do now. They also had water in abundance but now they talk about water sources that have dried up. This has been caused by large scale deforestation in highland areas and use of farming methods that deplete the soils.
Large-scale deforestation to pave way for large-scale agriculture

This has affected the ecosystem, climate, populations and caused widespread soil erosion. The damage to the environment has hurt the productive activities of families and reduced the quantity of food produced. General and specific health problems have cropped up among people particularly growing children and other vulnerable groups. According to figures from the United Nations Food and Agriculture Organisation (FAO), two decades ago families produced 80% of their own food but now only produce 60% of what they need.

It is evident that what we need now is to enter into sustainable agriculture which is also environment-friendly. It should contribute to the conservation of land, water, and biodiversity; should not disturb the environment; should be technically appropriate; and economically viable and socially acceptable. As CDWs, you can encourage sustainable and eco-friendly agriculture by creating awareness among people. In the following section, we shall look at eco-friendly agricultural practices in further detail.

Eco-Friendly and Sustainable Agricultural Practices

What is eco-friendly agriculture?

Eco-friendly agriculture is the eco-based farming carried out to ensure that agricultural activities are not disturbing the natural functions of ecosystems. It describes landscapes that support agricultural production and biodiversity conservation. These two work together in harmony to improve the livelihood of rural communities.

The aim of eco-friendly agriculture is to manage the resources of rural communities to improve their welfare, preserve biodiversity and ecosystem services, and develop more productive and sustainable farming systems. The traditional farm practice promotes eco-friendliness in various ways (See Figure 10.1). i.e., it sustains the health of the soil, ecosystems and people. e.g., a system of agriculture is created where the natural soil nutrients and biodiversity structure are maintained but at the same time it is pest resistant, healthy and economic. Thus, farmers will no longer depend on costly chemicals and artificial pest control.

In addition, by reviving local or indigenous seed varieties and agricultural practices, farmers’ dependence on hybrid seeds which are commercially produced by multinational companies can be reduced or even eliminated. This will give farmers the freedom to plant seeds in accordance with local natural conditions at a reasonable cost. Consequently, agricultural
production costs can be minimised and agricultural commodities can be sold at premium prices as organic products, which in turn would improve farmers’ income. Also, agricultural commodities that are free from chemicals and genetically modified organisms are safer and healthier for human consumption and will not harm the environment. This agricultural practice that uses green manure, helps to restore the health of the environment. (See Figure 6.2).

Figure 6.1: *Traditional way of farming in rice fields.*

**Note It**

Eco-agriculture therefore tries to combine conservation of environment with agricultural development. Farmers and rural communities are key factors in conserving biodiversity and ecosystems.

Figure 6.2: *Eco-friendly agriculture using green manure.*
Several agricultural practices, technologies and approaches have been developed throughout the world today for agro-environmental sustainability, focusing both on increased crop productivity and natural resource conservation. Some indigenous technologies supporting healthy environment have also been identified and re-introduced. A brief account of the major eco-friendly farming practices and technologies is given below.

Organic farming is one such form of eco-friendly agriculture that relies on techniques, such as crop rotation, green manure, compost and biological pest control. Organic farming uses fertilizers and pesticides but excludes or strictly limits the use of manufactured (synthetic) fertilizers and pesticides (which include herbicides, insecticides and fungicides), plant growth regulators such as hormones, livestock antibiotics, food additives, genetically modified organisms, human sewage, and sludge.

The International Federation of Organic Agriculture Movements (IFOAM) defines organic farming as “a production system that sustains the health of soils, ecosystems and people. It relies on the use of inputs which do not have adverse effects. Organic agriculture combines tradition, innovation and science, to benefit the shared environment and promote fair relationships and a good quality of life for all involved”. Organic farming thus combines eco-friendly conservation with development.

Organic agricultural methods are internationally regulated and legally enforced by many nations, based largely on the standards set by IFOAM, an international umbrella organization for organic farming organizations, established in 1972.

Thus generally, organic farming practices, both large- and small-scale, fall greatly within sustainable agriculture that does not harm the environment. Green manure is a very good way of increasing the fertility of the soil, and can give huge benefits for farmers. Green manure crops are primarily used in environmentally friendly agricultural practices to reduce the application of chemical fertilizers and herbicides.

A few of the other eco-friendly attempts made throughout the world for sustainable use of natural resources are:

- Soil protection and enrichment for soil productivity
- Crop diversification and quality improvement
- Reforestation and agro-forests
- Integrated farming and pest management
- Biological control of pests and weeds
- Watershed management
Steps have also been taken to conserve traditional varieties of seeds and farming methods. Development of bio fertilizers and bio pesticides with local and traditional knowledge is also encouraged. Eco-friendly waste management is also an important practice associated with agriculture. Composting is a waste control practice adopted in cattle rearing that contributes to agriculture by providing organic manure. Vermi composting and pipe composting are two other eco-friendly measures that do not pollute air, water or soil. You will learn about composting in detail in the unit on waste management.

Community awareness, community participation, enforcement of governmental policies and regulations facilitate the successful implementation of eco-friendly practices. Before you continue, complete the following activities.

**Activity 6.1**

1. What do you understand by the term ‘organic agriculture/farming’?

2. _________________ agricultural practices have led to environmental damage.

3. Name four agricultural practices that help in the sustainable use of natural resources.

   1.

   2.

   3.

   4.

You may require about 15 minutes to complete this activity.
You now know how agricultural practices affect health and what you can do about it. Next let us look at the relationship between food, health and the environment.

### 6.5 Food and Health

We know that all living organisms need food. Food supplies proteins, carbohydrates, fats, vitamins and minerals, all of which are required for our development, growth and health. Both plants and animals are major sources of food for humans. Look at the example in Figure 6.3. We obtain most of our food from agriculture and animal husbandry.

![Figure 6.3: Natural food – Apple.](image)

#### What is food?

Food is one of the basic needs for all human beings. Food is defined as any nutritious edible material of plant or animal origin which when taken into the human body meets the needs of growth, maintenance, tissue repair, work and life. It can also be defined as anything solid or liquid which when consumed, digested and is absorbed in the body to keep it well, efficient and energetic. Also, it is that which removes hunger, nourishes the body, gives satisfaction on consumption and at the same time renews strength too. Food is essential for all living things as it provides vital nutrients that nourish and protect the body.

#### Food and Nutrition

Food items are those substances which when eaten or drunk and are absorbed by the body produce energy, promote growth, repair tissues and regulate these processes. The chemical components of food which perform these functions are called nutrients. They are carbohydrates, proteins, fats, vitamins, minerals, and water. Some food such as milk, cereals and vegetables, supply many nutrients whereas others supply only one. Therefore, it is important that various types of food should be included in our diet. Some nutrients like carbohydrates, proteins and fats,
that are needed in larger quantities form the bulk of our food are often called macronutrients. Other nutrients like vitamins and minerals known as micronutrients, are equally essential, but are only required in smaller quantities.

Water is the other important constituent of food without which we cannot exist. The amount of each nutrient required, and the consistency and quantity of food, varies according to age, sex, size, activity, climate, etc. For example, a growing child needs nutrients for body building, growth and daily activities whereas an elderly person needs nutrients to replace worn out tissues, to protect the body and to perform daily activities.

![Figure 6.4: Food consumption.](image)

**What is a balanced diet?**

As discussed earlier, it is not the quantity of food alone that matters, but the nutritional value of food is also equally important. The food patterns that we follow have a great influence on our health. A good or balanced diet is needed to maintain optimum health. In order to maintain good health, we should eat a ‘balanced diet’. What is a ‘balanced diet’? It is one that contains the required amounts of all the essential nutrients like carbohydrates, fats, proteins, minerals and vitamins and adequate quantities of water to keep a person healthy. A diet which is not balanced causes malnutrition and ill health. A balanced diet provides an individual’s daily requirements of nutrients in adequate amounts and proportions required by the body along with provisions for the body reserves. Thus a balanced diet is adequate quantitatively and qualitatively. It ensures that you receive the correct amounts of all the nutrients like carbohydrates,
proteins, fats, vitamins and minerals, required by the body in the correct proportions, selected judicially from different food groups. If the diet prepared in a family could meet the daily nutrient requirements of all the members of the family irrespective of age, sex and size, we can call it a balanced diet.

A balanced diet is an accepted means to safeguard a population from nutritional deficiencies and malnutrition. As we have seen, we meet our nutrient requirements in many ways. A wide variety of food and meal patterns are available before us to plan a balanced diet. A lot of research has been carried out throughout the world to determine the kind of nutrients and their quantities needed for optimum health. The recommended daily allowance (RDA) for Indians of different age, sex, size, physiological conditions and activities are determined by the Indian Council for Medical Research (ICMR).

In order to supply all the nutrients, the diet should include a variety of foods. Foods are classified into different groups on the basis of the major nutrients present. The food availability and meal patterns vary in different regions and countries. Based on this, food guides are planned to select the right food in the right quantities to meet the RDA. The Food Guide Pyramid is such an accepted nutritional education guide. This is based on the Basic Five Food Groups:

1. Cereals and millets or the energy yielding food
2. Protein-rich foods including pulses, animal foods, milk and milk products
3. Vegetables including protective (green leafy vegetables, yellow and orange vegetables) and vitamin C rich vegetables (lemon, amla, guava, etc.)
4. Fruits – the minerals and vitamins needed are mostly met from fruits and vegetables
5. Oils, fats and sugars mainly supply calories.

The food pyramid reveals how much of each food is needed to meet the recommended daily allowance. Each of these food groups provides some, but not all the nutrients. So foods in one group cannot replace those in another, and for good health one needs food from all groups. Knowledge of the food pyramid helps a family plan every day meals in order to meet the nutrient needs of all and to maintain the health of the family. When each family, the basic unit of a society, attains good health, the health of the community can definitely be guaranteed. Figure 6.5 illustrates a balanced diet. It is adapted from the United States Department of Agriculture.
When the food we consume is supplying insufficient, excessive, or imbalanced amount of nutrients, it may result in malnutrition. Over nutrition is another form of malnutrition in which nutrients are oversupplied relative to the amounts required for normal growth. Specific nutrient deficiencies can also occur when the supply of a nutrient is inadequate to meet the body’s need or the nutrient supplied is not absorbed and thus is not available to the body to perform various functions. This can lead to reduced resistance to infection, diseases and even death.

A person is said to be in a state of optimum nutrition when all the essential nutrients are supplied and utilised to maintain health and well being. Thus a person’s health is directly related to the food consumed. It is not only the amount we eat, but also what we eat and how we eat it that determines our health. Only a healthy environment can produce safe food, which ensures your health and achieves the aim of optimum nutrition to all.

Now complete the following activity to remind yourself what you have covered so far.
Activity 6.2

Now test your memory. Choose the right answer.

1. The chemical components found in food are called.................................
   (vegetables, nutrients, diet)

2. The lack, excess, or imbalance of nutrients in the diet may result in..............
   .............................................. (under nutrition, over nutrition, malnutrition)

3. A state of inadequate supply or availability of essential nutrients to the body
   is........................................................................................ (optimum nutrition,
   nutritional deficiency, proper nutrition)

4. The result of excessive intake of nutrients which disturb normal body
   functions is termed as............................................................... (over
   nutrition, optimum nutrition, nutritional deficiency)

5. Nutrients required in smaller quantities are called........................................
   (macronutrients, micronutrients, proximate principles)

Compare your answers with those provided at the end of this unit.

Activity 6.3

Fill in the blanks.

1. The diet that contains carbohydrates, fats, proteins, vitamins and water in
   adequate quantity and quality is known as ___________________________

2. RDA means _____________________________________________________

3. ICMR means ___________________________________________________

4. IFOAM means ________________________________________________

Compare your answers with those provided at the end of this unit.

You now know the relationship between food and health, and importance
of a balanced diet. Next we shall discuss food safety and food security.
6.6 Food Safety and Food Security

Washing your hands before eating and preparing food, eating clean food, cleaning the cooking utensils and having a clean cooking area are a few ways of maintaining good health.

Healthy eating habits are:

- Eat the right food at the right time
- Keep a regular time for eating
- Chew your food properly and eat slowly
- Do not talk with food in your mouth
- Drink at least 8 glasses of water daily
- Ensure the quality and safety of the food you eat and the water you drink

**Food security**

Food security is another term that is being used frequently today. The world is facing a potential crisis in terms of food security. The challenge is to produce and supply enough safe and nutritious food in a sustainable way for a growing global population. What is food security? The definitions given by Wikipedia and WHO, will give you an idea.

Food security refers to a household’s physical and economic access to sufficient, safe, and nutritious food that fulfils the dietary needs and food preferences of that household for living an active and healthy life (Wikipedia).

The World Health Organization defines food security as having three aspects:

- Food availability: i.e., having sufficient quantities of food available on a consistent basis
- Food access: having sufficient resources, both economic and physical, to obtain appropriate foods for a nutritious diet
- Food use: appropriate use of available food, based on the knowledge of basic nutrition and care, as well as having adequate water and sanitation

Therefore, a community is said to have food security when it produces sufficient quantities of appropriate and safe food, and is able to make the food available for each and every individual of the community. Action at family level, community level and national and international levels is essential to ensure food security to all in this world.
**Food safety**

Food security can only be successfully assured if there is food safety also. Food safety is a scientific approach in the preparation, handling and storage of food in ways that prevent food borne illnesses and health hazards.

Food can transmit diseases from person to person. It also serves as a growth medium for bacteria that can cause food poisoning. In many countries, there are intricate standards for food preparation and storage.

The following are five key principles of food hygiene, according to WHO:

1. Prevent contaminating food with pathogens from people, pets and pests.
2. Separate raw and cooked foods to prevent contaminating cooked foods.
3. Cook foods for the appropriate length of time and at the appropriate temperature to kill pathogens.
4. Store food at the proper temperature.
5. Do use safe water and cooked materials.

Unhygienic cooking, handling and storing of food can cause both chronic and infectious diseases. Food adulteration, contamination by pests and pesticide residues and harmful metals, food poisoning due to poor storage, methods of preservation and use of unsafe preservatives are all agents that cause health risks, which can be fatal. Let us look at the activity given below before we proceed any further.

**Activity 6.4**

I. Match the following.

1. Cereals - Body building
2. Pulses - Vegetable and fruits
3. Protective foods - Energy yields
4. Fruits - Calories
5. Oil and fats - Vitamin C

II. Fill in the Blanks

1. WHO means ________________________________

2. Through ________________ & ________________ we can encourage a healthy population.

Compare your answers with those provided at the end of this unit.
We hope you now understand the difference between food security and food safety. Next let us look at the changes taking place in our food culture and how they influence health.

6.7 Changing Food Culture and Health

Modernisation has brought about many changes in the lifestyles and food habits of people.

Changing food patterns

Development of science and technology and the progress in transport and communication have helped in promoting awareness, accessibility and availability of everything throughout the world. This has hastened the changes from the traditional customs and patterns to a new cosmopolitan culture (See Figure 6.6). The fast changing world culture, the fast life, the overambitious and greedy population, and the vanishing traditional values have all influenced and altered the lifestyle and food culture of the population.

![Figure 6.6: Different food items.](image)

Traditional food culture

As you may know, traditionally each country, region and community, had their own food culture. For example, rice grown in the southern part of India forms the staple food of the people there, whereas wheat grown in the northern part of the country forms the main food of that area. What they produced in each region was consumed and the excess was stored for difficult times or shared with others. The locally grown food was safe and suitable to the regional climatic conditions and the lifestyle of the people living there. Progress in various fields improved the health of the people, their life span and increased the population. But then, the food produced was no longer enough to meet the needs or demands of the growing population. Hence, steps were taken throughout the world to enhance food production. When production exceeded demand, the excess was supplied to other countries where food was scarce. This influenced the food patterns...
of each region. Urbanisation, industrialisation and poverty motivated people to migrate to other places and this has also had an impact on the lifestyle and food culture of the people. Thus, an entirely new food culture, with new tastes and new food patterns, developed. Excess production prompted the invention of new methods for large-scale preservation of food substances.

**Fast Food culture**

The fast life of the modern population has replaced the norm of balanced family meals at home with snacks or light meals. Food patterns and food timings have also changed with this changing lifestyle. Instead of cooking food at home, people have started depending on outside food or convenient foods. Children have been encouraged to depend on snacks, sweets, fast foods and synthetic beverages. Outdoor food units, hotels and restaurants, snack bars and fast food outlets have emerged at every street corner. Commercialism with an eye towards profit has become the norm. This together with the vanishing traditional values and concerns for fellow beings, has paved the way to an unsafe food culture. Food adulteration, liberal use of additives, unsafe preservation techniques and measures to increase taste and appearance, have all made food unsafe, unhealthy, toxic, unhygienic, unsuitable and dangerous. Instead of helping people, the modern fast food culture has ended up being hazardous and risky to their health and life.

**Health problems**

The health problems due to changing lifestyles and food habits are a major issue throughout the world. In fact, much research is being carried out throughout the world to meet the challenges in dealing with lifestyle related diseases such as diabetes, hypertension, cardiovascular diseases, cancer, obesity, liver and kidney diseases, respiratory problems and neuromuscular problems. The shift from vegetarianism to non-vegetarianism, frequent use of animal foods, consumption of plant and animal foods produced using hormones and chemicals, are all hazardous to health. Added to this is the physical, mental and psychological stress faced by people in the modern world. In the last century, many problems were due to poverty or the lack of food whereas today many problems are due to over eating and improper eating. Wrong choices of food taken at the wrong time and life style with no exercise are the problems of the modern world. Health problems due to dieting and over exercise to keep the body slim are also a growing concern even when there is sufficient food to eat. In addition, there are health hazards due to environmental issues.
6.8 Summary

In this unit, you have learnt how modern agriculture practices and industrial growth have affected peoples’ health and the environment. We have also looked at the relationship between food, health and the environment, seen that we should eat the right food, at the right time and in the right quantity in order to promote and maintain his health and well-being. Next, we have explored the concepts of food security and food safety, and seen that food security is only assured when there is food safety. Lastly, we have discussed about the issue of changing food culture and its negative impact on health.

As a CDW, you have an important role to play in creating community awareness through health education on nutrition and eco-friendly agricultural practices. Educate parents so that they can be good role models to their children. Partner with teachers and community workers so that they can help you to bring about change in the community. In the next unit, you will learn about environmental hygiene and sanitation.

6.9 Model Answers to Activities

Activity: 6.1

1. Organic agriculture/farming is an agricultural production system that sustains the health of the soil, ecosystems and people. It relies on ecological processes, biodiversity and methods adapted to local conditions, rather than the use of inputs like fertilizers and pesticides with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved. Organic farming thus combines eco-friendly conservation with development; it promotes sustainable development.

2. Chemical based agricultural practices have led to environmental damage.

3. 1) Organic farming
   2) Crop diversification
   3) biological control of pest and weeds
   4) Watershed management

Activity: 6.2

1. The chemical components of food which perform the functions of food are called nutrients

2. The lack, excess, or imbalance of nutrients in the diet may result in malnutrition
3. A state of inadequate supply or availability of essential nutrients to the body is nutritional deficiency
4. The result of excessive intake of nutrients which disturb normal body functions is termed as over nutrition
5. Nutrients required in smaller quantities are called micronutrients

**Activity: 6.3**

Fill in the blanks.

1. The diet that contains carbohydrates, fats, proteins, vitamins and water in adequate quantity and quality is known as Balanced diet
2. RDA means Recommended Daily Allowances
3. ICMR means Indian Council for Medical Research
4. IFOAM means International Federation of Organic Agricultural Movements

**Activity: 6.4**

I. Match the following.

1. Cereals - Energy yields
2. Pulses - Body building
3. Protective foods - Vegetable and fruits
4. Fruits - Vitamin C
5. Oil and fats - Calories

II. Fill in the Blanks

1. WHO means World Health Organisation
2. Through health education & value education we can encourage a healthy population.

**6.10 Unit-end Questions**

1. Write down two lists of activities seen in your locality that, you think, can:
   a. Contribute to the basic requirements of environmental health
   b. Can damage the environmental health

2. Write down any incident you have heard of or seen in your locality/state related to human or environmental health hazard due to the following:
   a. Agricultural production
   b. Industry
   c. Consumption of unhygienic food
You are welcome to Unit 7 on environmental health and sanitation. In the last unit you learned about eco-friendly agricultural practices and healthy food. The term ‘environment’ broadly refers to people’s surroundings and the circumstances relating to it. In the last unit, we saw that environmental factors influence the health of people while human activities affect the quality of the environment. We also noted that many of the human activities can pollute the environment and cause health hazards to people. You might require 16 hours to study this unit.

We shall start by considering different environmental risks and health hazards. Next we will look at two major health risk factors resulting from human activities; i.e., waste and unsafe waste. In addition, we shall discuss the relationship between water, health and sanitation and how water supply and sanitation can be improved to promote health and sustainable development. Lastly, we shall look at what we can do to protect the quality of our environment and to prevent diseases.
7.2 Learning Objectives

On completion of this unit, you will be able to:

- Describe environmental risks and health hazards in your community
- Identify different types of waste generated in the community and the health impacts of poor waste disposal
- Describe the two types of waste and the different methods of waste disposal
- Explain the importance of water quality on health and water conservation

7.3 Environmental Risks and Health Hazards

In the previous units, we explained how the quality of the environment is affected by human activities and how the environment affects human health. We hope that you also remember the meaning of environmental health. It addresses all the physical, chemical and biological factors external to an individual, and all the related factors affecting their health and behaviour. It includes the assessment and control of those environmental factors that can potentially affect one’s health. The target of environmental health is disease prevention and creation of health-supportive environments. Therefore, any external factor that negatively affects your health can be considered as an “environmental health hazard”. Common environmental health hazards include indoor and outdoor air pollution, and contaminated food and water. Less commonly discussed environmental health hazards include lack of sidewalks, crime, insufficient physical activity, poor nutrition, social isolation, noise, stress and the lack of aesthetically pleasing living environments.

Figure 7.2: A good practice for keeping you healthy.
Many substances exist in our environment, both indoor and outdoor, that affect our overall health. There are varying degrees of risk associated with certain substances found in the air we breathe, the water we drink and the food we eat. Some of these substances pose serious health risks as they may cause illness and diseases. As you learned earlier, children, the elderly and people with heart or lung diseases tend to be more vulnerable to certain environmental risks.

Environmental health risks at home, such as indoor pollution are today recognized as sources of illness, particularly in vulnerable populations, such as pregnant women, children, the elderly, and those living with a chronic medical condition or disability. The common agents that are responsible for polluting indoor residential air have been found to include lead, carbon monoxide, radon, pesticides, etc. Governmental agencies are taking steps to maintain the quality of outdoor air while the responsibility for maintaining the quality of indoor air in your home rests on you and your family members.

Household activities, such as smoking, frequent use of air fresheners, cleaning products and pesticides can affect air pollution levels in residential air. Laboratory studies show that long-term exposure to such chemicals and pesticides can cause health problems, such as birth defects, nerve damage, cancer and other effects that might occur over a long period of exposure. However, these effects depend on the toxicity and the extent of consumption of these chemicals and pesticides. Some pesticides also pose unique health risks to children.

Outdoor pollution was covered in the previous unit. Let us look at a list of common environmental health risk factors to give you an idea.

### 7.3.1 Common environmental health risk factors

The common environmental health risk factors include the following biological, chemical and radiological hazards:

- Pesticides
- Lead
- Mercury
- Arsenic
- Allergens
- Carbon monoxide
- Solvents
- Automobile exhaust
- Sun exposure
- Passive smoking
• Drinking water contaminants
• Indoor and outdoor air pollutants
• Pollutions at occupational site
• Radioactive elements
• Nuclear weapons and wars

Some of the diseases and health problems seen in adults and children because of these environmental exposures include:

• Asthma and/or respiratory disorders
• Childhood cancer
• Cardiovascular problems
• Congenital anomalies (birth defects)
• Developmental disorders
• Gastrointestinal disorders
• Liver disorders
• Mental retardation
• Neurological disorders
• Skin disorders
• Metabolic disorders
• Learning disabilities in children
• Malfunctioning of various organs and physiological systems
• Psychosocial problems
• Mental health problems

Potential symptoms may include, but are certainly not limited to:

• Anaemia
• Weakness
• Shortness of breath
• Weight loss
• Behavioural changes
• Diarrhoea

Fortunately, there are things you can do to limit your exposure to common environmental hazards and protect your health, as well as that of the community. We shall discuss these measures in the following sections. Before we move on, complete the activity below.

**Activity 7.1**

List any five environmental problems in your locality that were caused by human activities.

1
7.3.2 Strategies for reducing common environmental risk factors

There are a number of steps that we can take to reduce our exposure to common environmental risks. These are:

- Reducing outdoor air pollution
- Avoiding contaminated drinking water
- Controlling the use of pesticides
- Avoiding tobacco smoke
- Controlling lead poisoning
- Proper disposal of waste

Let us consider each strategy in turn.

Reducing Outdoor Air Pollution

Air pollutants consist of different gases, droplets and particles that reduce the quality of the air. Automobiles, as well as industries and constructions, contribute to air pollution. Ground-level ozone and smog are major sources of air pollution in most cities. Also many natural calamities like floods, tsunamis, fires, hurricanes, cyclones, high temperatures, drought, man-made crises like accidents, explosion, bomb blasts and wars can also pollute the environment.

What you can do:

- Educate people to test pollution control or quality index of their automobiles regularly. Many countries have provisions to check air pollution levels or the “air quality index”. This index rates air quality conditions as good, moderate, unhealthy, very unhealthy or hazardous. This information is provided in newspapers, television and radio weather reports by the authorities. If your area does not
have such a system, you can motivate the authorities to take necessary steps to initiate one. This will be useful for people who live near factories or places where air pollution is high.

- Stay indoors as much as you can when pollution levels are high. If you must go outside, limit outside activities to the early morning hours or wait until after sunset.
- Do not exercise or exert yourself outdoors when the air quality reports indicate unhealthy conditions or when there is too much smoke or fumes. If you cannot avoid going outside, use protection to cover your face.
- Take extra care if you or a family member has a chronic heart or lung problem. Talk with your doctor about other steps you can take.
- With the help of governmental and other agencies, you can enforce proper pollution control measures in small and large scale industries.

Avoiding contaminated drinking water

In the last unit, we discussed the effects of water pollution and its impact on health. Can you remember how we defined water pollution? We said that water pollution is any alteration in the physical, chemical and biological properties of water as well as concentration of any foreign substance. About 75% of water pollution is caused by the poor disposal of sewage, domestic and municipal wastes in rivers, canals and lakes. By human waste, we mean human excreta, soap, detergents, metals, glass, kitchen wastes, organic substances, etc. Other substances that can pollute water include agricultural discharges, fertilizers, toxic material, industrial waste, oils, contaminated soil and radioactive materials.
What you can do:

- Do not dispose toxic materials in the toilet or sink as it may contaminate water bodies through sewage lines.
- Do not throw litter or garbage and other waste into streams, lakes, rivers or seas.
- Try to promote the use of natural fertilizers and pesticides as far as possible. This will help in reducing the pollutants that get into water systems through rain water runoff.
- Do not use coloured bathing soaps. They are known to contribute more to water pollution.

Controlling the use of pesticides

Many households use some kind of pesticide such as insecticide or garden weed killer. It has also been found that most of the agricultural products available today have pesticides sprayed on to them to prevent pest attacks or to improve their shelf life. Pesticides can be dangerous if they are not used properly or stored safely. Pesticide residues may also be found in food.

What you can do:

- Wash and scrub all fresh fruits and vegetables thoroughly under running water.
- Peel fruits and vegetables when possible to reduce pesticide residue as well as dirt and bacteria. Discard outer leaves of leafy vegetables. Trim fat from meat and skin from poultry and fish because some pesticide residues collect in fat.
- Eat a variety of foods and consider buying organically grown foods whenever possible.
- If you must use pesticides in your home garden, always read the label first and follow all of the directions and precautions. Use only the amount indicated and for the purpose listed.
- Protect your skin, eyes and lungs while using pesticides. Always change your clothes and wash your hands right after use.
- When using a pesticide, move children, their toys and pets away from the area until it has dried or for the time the label indicates.
- Always store pesticides in the original container in a safe place and out of reach of children and pets.

Avoiding tobacco smoke

Environmental tobacco smoke is the mixture of smoke that comes from the burning end of a cigarette, pipe or cigar, and the smoke exhaled by the smoker. It is commonly termed passive smoking. There are several
respiratory health risks associated with environmental tobacco smoke. Infants and young children, invalids, the elderly, pregnant women and other vulnerable groups are especially at high risk.

What you can do:

- Minimize or eliminate smoking in your home. Consider asking guests who smoke to do so outdoors.
- If smoking indoors cannot be avoided, increase the ventilation in the area by opening the windows or using exhaust fans.
- Do not smoke if children are present, particularly infants.

Controlling lead poisoning

Lead-based paints or lead water pipes are present in many old homes. Lead poisoning is a serious health risk to children and adults. Children can get lead poisoning from putting their hands in their mouths after touching toys with lead dust on them. Research evidence has acknowledged that children are more vulnerable to the harmful effects of lead because their nervous systems, including the brain, are still developing. Children, especially those aged six and below, tend to absorb greater amounts of lead than adults when exposed to the same amount of lead. Further complicating the issue is the behaviour of young children, including increased hand to mouth activity, a tendency to crawl and play in spaces that could be contaminated with lead, and a lack of awareness of safe and sanitary habits. The damage from lead poisoning lasts a lifetime. The Environmental Protection Agency (EPA) and the Centres for Disease Control (CDC) have established guidelines for childhood lead testing and both strongly urge that children under the age of six be tested for the presence of lead once a year.

What you can do:

- Have your children tested for the presence of lead. In certain countries, this test is free at local health clinics although it might not be available everywhere. If such problems exist in your area, you can approach the local bodies or governments to take the necessary steps.
- Find out if your home has lead pipes and have them tested. Use an expert if you need to repair or remove lead painted surfaces. They use special methods to permanently eliminate lead hazards. Dry scraping or sanding surfaces with lead paint can be a serious source of lead exposure to children.
- Keep children away from peeling paint and wash their hands frequently, especially before they eat.
- Wet mop floors and wipe furniture and other dusty surfaces.
- Learn more about lead and how it affects health and well-being.
Paints and other materials with minimum permissible amounts of lead are now available in the market. Promote the use of such materials only.

Proper waste disposal

This is another growing issue of the modern world. This is considered in detail in the next section. Before we move on to the next section, complete the activity below.

Activity 7.2

I. Fill in the blanks

1. Water pollution is caused by ______________________________________

2. Passive smoking is ______________________________________________

3. EPA means ___________________________________________________

II. Match the following

| 1. Automobiles | − | Garden weed killer |
| 2. Water pollution | − | Nicotine |
| 3. Cigarette Smoke | − | Contaminated Water |
| 4. Lead | − | Lead pipes |
| 5. Pesticides | − | Air quality index |

Compare your answers with those provided at the end of this unit.

7.4 Waste and Health Hazards

Waste and waste disposal is a global problem of the modern world. Waste production and unscientific disposal are some of the human activities that adversely affect the quality of our environment. Waste is any material, substance or produce that one no longer wants. In other words, waste is anything discarded by an individual, household or organization. This includes domestic, municipal, industrial, commercial, agricultural and clinical waste (hospital and other medical wastes). Waste is also produced in gaseous, liquid or solid form, any of which may or may not be hazardous. As a result, waste is a complex mixture of different substances, some of which are directly hazardous to health. Waste is classified either according to the source: domestic, commercial; or by its state: solid or liquid. It
is also classified according to the type of control needed to deal with it: controlled, difficult, hazardous, etc.

Figure 7.4: Bad practice of waste dumping.

7.4.1 Common health hazards related to waste disposal

With the increase in the global population and the rising demand for food and other essentials, there has been a rise in the amount of waste being generated and disposed daily by each household. This waste is ultimately thrown into municipal waste collection centres from where it is collected and thrown in landfills and dumps by municipalities or corporations.

Waste that is not properly managed, especially excreta and other liquid and solid waste from households and the community, poses a serious health hazard and can lead to the spread of infectious diseases. Unattended waste in public places attracts insect and rodents that in turn spread diseases. Normally, it is the wet (organic) waste that decomposes and releases a bad odour. This leads to unhygienic conditions and thereby to a rise in health problems. Plastic waste is another cause of ill health.

Research has shown that toxic waste not only causes cancer but also other diseases of the central nervous system, liver, kidneys, heart, lungs, skin, reproduction, etc. For example, research has associated waste dumping sites with reproductive health problems, such as low birth weight (less than 2.5 kg), foetal and infant mortality, spontaneous abortions and the occurrence of birth defects. Other health problems reported include respiratory disorders; irritation of the skin, nose and eyes; gastrointestinal problems; fatigue; headaches; psychological problems; and allergies. A relationship has also been noted between the distance from these sites and high mortality or high incidence of some cancers, for example, laryngeal and lung cancers, childhood cancers and leukaemia. Further,
a number of occupational hazards have been reported, for example, skin and blood infections resulting from direct contact with waste, and from infected wounds. Eye and respiratory infections also result from exposure to infected dust, especially during waste dumping operations. Different diseases also result from the bites of animals feeding on the waste and intestinal infections that are transmitted by flies feeding on the waste.

The groups at risk because of the unscientific disposal of solid waste include children; waste workers and workers in areas producing toxic and infectious material. Other high-risk groups include populations living close to a waste dump and those whose water supply has become contaminated either due to waste dumping or leakage from landfill sites.

Note It

Waste is classified based on its source, its type or state and the type of control needed to manage it.

You now know the health hazards of poor waste disposal. Next let us look at the different types of waste and their effects on health.

7.4.2 Types of waste and their effect on health

As we have seen in the previous section, waste treatment and disposal sites can also create health hazards for the neighbourhood. Improperly operated incineration plants cause air pollution and improperly managed and designed landfills attract all types of insects and rodents that spread diseases. Ideally, these sites should be located at a safe distance from all human settlements. Landfill sites should be well lined and walled to ensure that there is no leakage into the nearby ground water sources. Let us look at the effects of each type of waste on our health.

- **Organic domestic waste**: this poses a serious threat to health since it ferments and creates conditions that are favourable for the survival and growth of disease-causing germs. Direct handling of solid waste can result in various types of infectious and chronic diseases. Waste workers and rag pickers are the most vulnerable to health problems related to organic domestic waste.

- **Exposure to hazardous waste**: this adversely affects the health of all community members. In fact, direct exposure to chemicals waste can lead to diseases. The release of chemical waste into the environment generally leads to chemical poisoning.

- **Industrial and Agricultural Waste**: poor disposal of industrial hazardous waste along with municipal waste can expose people to chemical and radioactive hazards. Poisoning and chemical burns
resulting from contact with small amounts of hazardous chemical waste mixed with general waste have also been reported. Other common incidents include burns and other injuries caused by occupational accidents at waste disposal sites or from methane gas explosion at landfill sites.

- **Medical waste:** the waste generated from hospitals, health care centres, medical laboratories and research centres is a serious health hazard. It includes discarded syringes, needles, bandages, swabs, plasters and other types of infectious waste.

- **Plastic:** this has become an unavoidable material today but the threats they pose to human health and the environment is enormous. The unhygienic use and disposal of plastics and its effects on human health has become a matter of great concern throughout the world.

Coloured plastics are harmful as their pigment contains heavy metals that are highly toxic. Also, plastic bags used for packing pesticides and other poisons are recycled without proper cleaning. Thin coloured plastic bags are usually recycled from such materials whereas fresh and new carry bags are generally white. Some of the harmful metals found in plastics are copper, lead, chromium, cobalt, selenium and cadmium. Exposure to the fumes from burning plastic causes serious damage to health. Disposal of plastic materials in the open causes severe damage to soil fertility and throwing it in gutters or rivers can cause blockages and contamination of water if they end up in the gutters. Animals or birds that swallow plastic die as it cannot be digested by their systems. The solution lies in recycling, banning their use or encouraging the use of approved plastics. As a CDW, you should create awareness among the public about the dangers and the proper use and disposal of plastic. In most industrialized countries, coloured plastics have been banned.

- **Recycling:** this also carries health risks if proper precautions are not taken. Workers who scavenge in waste dumps for items that can be recycled, may sustain injuries and come into direct contact with these infectious items.

**Note It**

Poor waste disposal and handling are dangerous to both our health and the environment. Hence careful control and management is essential.

We hope you now understand the health hazards of poor waste disposal and you are able to sensitize members of your community on these issues. In the next section, we shall look at how to manage waste.
7.5 Waste Management

Management and control of millions of tons of waste produced every day, without harming the environment or the health of the people, is of grave concern today. Waste management or treatment of waste is defined as any method, technique or process that is designed to change the physical, chemical or biological characteristics or composition of waste. Waste can be classified into two main categories: biodegradable waste and non-biodegradable waste. Let us look at these two in further detail.

7.5.1 Biodegradable and non-biodegradable waste

Waste management usually depends upon the types of control activities necessary to deal with its disposal. Some are easy to manage, while others are difficult and still others are hazardous to human health and the environment. So the waste management methods to be used are determined by the type of waste involved. Waste is mainly classified as biodegradable and non-biodegradable

Biodegradable Waste

Biodegradable waste material is generally of organic origin and is able to decompose naturally into simpler forms of matter. Biodegradable waste includes food scraps, garden waste, or waste materials or products made of plant or animal-derived substances. It also includes artificial/man-made waste materials that are similar enough to organic matter. Biodegradable waste can be found in municipal solid waste (sometimes called biodegradable municipal waste, or BMW) as green waste, food waste, paper waste and biodegradable plastics. Other biodegradable wastes include human excreta, manure, sewage, slaughterhouse waste, etc. (CSL London Olympics Waste Review. cslondon.org cited in Wikipedia).

The process of decomposition is essential for new growth and development of living organisms. It is the process that nature uses to recycle the finite matter of the living world. When organic matter breaks down, it gives back energy and materials that can be used by nature to generate more energy and organic materials. This is the process by which our planet is able to sustain life. Biodegradable waste materials thus are decomposed naturally and does not harm the earth.

Non-biodegradable Waste

Non-biodegradable waste material is inorganic or man-made matter that does not decompose or breakdown into simpler forms of matter. It either takes a very long time to decompose or never gets decomposed. It includes substances like metal cans, bottles, toxic chemicals, plastic products, metal
scraps, glass, etc. which are difficult to decompose. This means that they will remain as pollutants in the environment for a very long time.

### 7.5.2 Waste disposal methods

**Where does our waste go?**

Have you ever thought about what happens to the waste we throw away or how it is eventually disposed off? Our waste can end up in a number of places, such as, recycle centres, sanitary sewers or septic tanks, as compost or as litter, in landfills, or incineration centres. If these methods are not properly managed, they can pollute both our natural environment and towns and cities. In order to reduce the negative environmental impact of our waste, we need to consider where and how we dispose of it.

There are six main methods of waste management. These are:

1. Composting
2. Sewage treatment
3. Incineration
4. Landfills
5. Recycling
6. Reuse

Let us consider each method in further detail.

**1. Composting**

Composting is a biological process of degradation of biodegradable organic matter. The biodegradable waste is decomposed by micro-organisms. Such waste is dumped into pits made specifically for this and is covered with soil. Micro-organisms convert them into manure.

**Pipe composting:** This is a method of composting whereby a PVC or concrete pipe of the desired size is fitted with a lid and fixed on the ground. Waste is deposited daily for decomposition. After a few days, the decomposed material is removed and can be used as a good bio-fertilizer. This is useful for flats or buildings where there is limited ground space. (see Figure 7.5).

![Pipe composting](image)
Vermi compost:

Vermi compost is another method that uses the same principle. Here, simple earth worms are used to decompose the biodegradable waste into manure. This method is a suitable method for household waste disposal where more space is available. (See Figure 7.6).

![Vermi composting.](image)

Figure 7.6: Vermi composting.

Biogas plants:

This is used for decomposing biodegradable waste and producing manure and biogas, which can be used for cooking and electricity. This is advisable in bigger homes with a court yard, small hotels, offices, etc.

2. Sewage Treatment

Sewage treatment is the process of removing physical, chemical and biological contaminants from waste water and household sewage by physical, chemical and biological processes, and converting it into an environmentally safe fluid waste stream (effluent) and solid waste (sludge). The effluent is discharged into rivers or sea and the sludge is re-used as farm fertilizer.

3. Incineration

Incineration is a process of combustion designed to recover energy and reduce the volume of waste going for disposal. In certain areas where no space is available to construct a landfill, waste is burned using incineration by industrial boilers, furnaces or other facilities. Incineration reduces the volume of waste by 90%. Health problems are seen in local residents and workers in the neighbourhood. Incomplete incineration can at times produce carbon monoxide and/or other harmful substances.

4. Landfills

Landfills are areas where waste is deposited with modern sites consisting of pre-constructed cells or areas lined with an impermeable layer (man-
made or natural) and with controls to minimize emissions. A great deal of our household and commercial waste end up in landfill sites which are large areas filled with all kinds of rubbish. If not carefully done this can have severe health effects as it can pollute the nearby water sources or attract rodents and other living things. The foul smell canals pollute the surrounding air which can trigger protest. The Vilappilsala issue in Kerala is an example where this method of waste disposal has started polluting the water, soil and air of the locality. The foul smell and emerging health issues have prompted the people to protest. This shows that we must dispose off our rubbish thoughtfully. The recyclable or biodegradable materials when not disposed off properly end up in landfills or are incinerated. These too contribute to the mass of non-biodegradable and polluting waste as they cannot be reusable.

5. Recycling

There are two types of recycling. The first is primary or closed-loop recycling, where used materials such as glass, paper, metals and plastics are collected and recycled to create new products of the same type. For instance, newspapers into newspapers, aluminium soft drink cans into aluminium soft drink cans, etc. This method can reduce the use of virgin materials for manufacturing a product by 20-90%. The other type of recycling is secondary or open-loop recycling and reduces the use of virgin materials by 25%. In this system, the waste material is converted into different products, for example, polypropylene ice cream containers or straws are re-manufactured as clothes pegs or rubbish bins. Recycling often uses less energy than waste disposal. It conserves resources as well as prevents waste from ending up in landfills or incinerators. Recycling also produces pollution, but the emissions are generally lower than those from virgin sources in manufacturing.

6. Re-use

Products can be designed to be used a number of times before becoming useless. For example, food and drink containers can be designed in such a way that they can be reused several times. The advantage of re-use is that energy and raw materials can be saved. This reduces the waste disposal and is cost effective. If proper communication is maintained between producers and consumers, new market opportunities can be made available for re-use of materials.

Figure 7.7: Waste management methods.
Now let us see how we can modify our waste disposal techniques to improve our life and the health of our planet.

**How can we improve our methods of waste disposal?**

In order to ensure that biodegradable waste is disposed off correctly, we need to support composting through our local councils or within our own homes and communities:

- Create your own compost bin, one that suits your space, needs and lifestyle. We can all compost our kitchen and garden scraps, and even newspaper and paper products in this way. You can go for pipe composting or vermin compost, which is not very expensive and is easy to operate.
- Avoid throwing away any materials that can be re-used or recycled. Find out where recycling facilities may be located.
- Reduce consumption of non-biodegradable products by limiting your dependency on plastics, including disposable goods, shopping bags, and packaging and wrapping items.
- Purchase goods made from recyclable materials and always reduce, reuse and recycle.
- Avoid non-biodegradable ingredients and materials as much as possible. You can reduce the amount of toxic waste piling up around you.

It is time for you to complete another activity to remind yourself what you have just covered.

**Activity 7.3**

Note down any two methods of waste management which you think are suitable for domestic purposes.

1. 

2.
7.6 Water, Health and Sanitation

The quality and safety of water and its role in maintaining health are crucial environmental health issues of the modern world. Access to safe water is a problem in many nations. It is the duty of every individual to keep the water safe and to conserve it for the future.

7.6.1 Water quality and health risks

Both the quality and quantity of water is of serious concern. You know that adequate water supply is essential not just for drinking and bathing, but for provisions of sanitation, irrigation, industry, generation of electricity and for fishing.

Access to safe water is a problem faced by many. Do you know that according to the United Nations, one-third of the world’s population lives in countries with moderate to high water stress. An area is said to be under water stress when annual water supplies provide below 1700m$^3$ of water to meet the needs of each person. Water scarcity occurs when the annual water supplies drop below 1000m$^3$ per person. A lot of water is drawn from rivers, lakes, wells and ground water, and its supply is no longer adequate to satisfy all human needs or the requirements of the ecosystem. This results in increased competition between consumers. It is predicted that if urgent steps are not taken to conserve water and to limit the use or waste of water, countries will start fighting each other for water in the near future.

As we all know, water pollution also poses certain health risks due to water pollution are also a serious problem that the world faces. Faecal contamination of water is the world’s leading environmental health problem. Over three million deaths a year occur because of diarrhoea. This could be avoided through adequate water supplies, sanitation and domestic hygiene.

![Safe drinking water](image_url)
**What you can do to ensure water quality?**

The best way to ensure the safety of your drinking water is to take the following steps:

- Filter the water and then boil it for 10-15 minutes.
- Disinfect the water with chlorine/bleaching powder. Dissolve one teaspoon full of bleaching powder in a glass of water and then use three teaspoons full of this solution to purify a bucket (15-20 litres) of water. Chlorine tablets are also available.
- Water purifiers can also be used to kill the germs using ultra violet rays.
- Clear your pipes before drinking. Anytime the water from a water tap has not been used for six hours or longer, run the water until it becomes as cold as it can get (this may take up to two minutes). This will flush out water that has been sitting in your home’s pipes and picking up lead.
- Only use water from the cold-water tap for drinking and cooking. Hot water from your pipes is likely to contain higher levels of lead. It is better to boil and cool tap water before drinking or cooking. If your water is from a well or other private water supply, have it tested annually.
- Test the water regularly for quality and contaminants. Encourage people to test their water at testing laboratories or arrange a day in the locality where all the local residents can test the water they use for drinking and other domestic purposes.
- Always keep the sources of water away from latrines/toilets/bathrooms.
- Only use galvanized iron pipes for pumps or tube wells.
- Try to initiate enforcing of standard setting for the quality of the water supply and treatment by governmental agencies.

### 7.6.2 Water conservation – needs and methods

You are already aware that many people throughout the world are not getting enough water to drink, cook or even to clean themselves or their surroundings. Many die every year due to lack of access to clean water and the situation is only going to get worse. With climatic changes and global warming, water scarcity is increasing. If the rate of use of ground water through tube wells or other sources and the rate of replenishment through rain water are equal, then the ground water level remains constant at a certain depth. But when more water is taken than the rain water going into
the soil, problems arise and drought occurs. Then the need for conservation of water starts. Previous units have highlighted the importance of harvesting rain water for sustainable development. We will now look into other methods of conservation.

1. Build dams and reservoirs to hold back and store rain water for use during dry periods.
2. Build tanks and ponds to retain water for later use.
3. Protect ponds and other water sources from pollution and conserve them for future use.
4. Promote reforestation of hill slopes and catchment areas to hold back rain water and prevent its loss in floods or rainy seasons.
5. Prevent soil extraction to protect rivers.
6. Encourage water shed agricultural practices to prevent water loss and to minimize wastage.
7. Recycle used water.
8. Encourage open spaces or grass lands so that rain water can be absorbed into the ground.
9. Protect forests and hills to hold back rain and to prevent droughts.
10. Try to convene mass awareness programmes for judicious use of water.

**Activity 7.4**

I. Fill in the blanks

1. With ___________ and ____________, water scarcity is increasing
2. The other sources of water besides rain water _________________________
3. Conservation of water can be done by building _____________________ and _____________________
4. Promote _____________________ to hold back rain water
5. _____________________ the used water

II. How can waste end up

1.
2.
3.
III. Write down any four health hazards from waste.

1. 

2. 

3. 

4. 

IV. Match the following

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Composting</td>
<td>Suitable for cooking gas and electricity</td>
</tr>
<tr>
<td>2. Biogas plant</td>
<td>Waste deposited in designated area</td>
</tr>
<tr>
<td>3. Incineration</td>
<td>Degradation of organic matter</td>
</tr>
<tr>
<td>4. Landfills</td>
<td>Convert waste water to safe water</td>
</tr>
<tr>
<td>5. Sewage treatment</td>
<td>Burning method</td>
</tr>
</tbody>
</table>

Compare your answers with those provided at the end of this unit.

7.7 Protection of Environmental Quality and Prevention of Health Risks

You have come across the different methods or ways through which community health can be achieved through protecting environmental quality and controlling health risk factors. In addition to these scientific approaches, there are certain steps which a CDW can initiate to retain environment quality for the future.
Community education and outreach is another major step that can be taken to reduce the health risks and environmental hazards by:

- Raising awareness about environmental conditions that may harm people, particularly growing children and other vulnerable groups.
- Providing guidance on preventing or reducing harmful environmental exposure in everyday situations.
- Providing practical advice on helping children and others to cope and recover during and after floods, wildfires, chemical spills and other crises.
- Involve school children, parents and teachers in these efforts through school cleanliness campaigns.
- Publish articles, leaflets or case studies on environmental health issues to impart environmental health literacy.
- Provide training of health workers, teachers, community workers, social workers or other grass roots level workers who have direct and frequent contact with community.
- Provide quick access to testing laboratories, referral services and medical facilities in case of emergencies.

These can be achieved successfully through community participation and also through the help of local governments, local organisations and the NGOs, and with the help of those experts in the field, school teachers or community leaders.

That topic on conservation brings us to the end of this unit. Let us now review what you have learned.

7.8 Summary

In this unit, you have learnt about the relationship between health and environmental quality, the major pollutants that destroy the quality of the environment and the several health risks and hazards associated with poor environmental quality. We have also considered the issue of waste control and management techniques. This information will help you motivate the community to minimise their waste and create awareness on how they can dispose waste without harming human and environmental health. Lastly, we discussed the issues concerned with safe water and water scarcity. We hope you will now be able to encourage people in your community to conserve water for sustainable development. In the next unit, you will learn about pollution and its impact on health.
7.9 Model Answers to Activities

Activity 7.1
I. List any five environmental problems in your locality that were caused by human activities.

1. Smoking
2. Smoke from factories/vehicles
3. Waste disposal
4. E-waste or construction of flats
5. Deforestation

Activity 7.2
I. Fill in the blanks

1. Water pollution is caused by **disposal of waste to river, lakes and oceans**
2. Passive smoking is the polluted air inhaled from a cigarette smoker when he uses it
3. EPA means **Environmental Protection Agency**

II. Match the following

1. Automobiles - Air quality index
2. Water pollution - Contaminated Water
3. Cigarette Smoke - Nicotine
4. Lead - Lead pipes
5. Pesticides - Garden weed killer

Activity 7.3
I. Note down any two methods of waste management, which you think is suitable for domestic purposes.

1. Making a compost pit – manure can be used for kitchen garden
2. Make a bio-gas plant – put all the waste to produce the bio gas, which can be used for cooking and electricity

Activity 7.4
I. Fill in the blanks

1. With **climate changes** and **global warming**, water scarcity is increasing
2. The other sources of water besides rain water **ground water**
3. Conservation of water can be done by building **dams** and **reservoirs**
4. Promote **reforestation** to hold back rain water
5. **Recycle** the used water
II. How can waste end up
1. Recycle centres
2. Septic tanks
3. As compost
4. Land up
5. Landfills
6. Incineration centres

III. Write down any four health hazards from waste.
1. Cancer
2. Infectious disease
3. Mortality
4. Psychological problem

IV. Match the following
1. Composting - Degradation of organic matter
2. Biogas plant - Suitable for cooking gas and electricity
3. Incineration - Burning method
4. Landfills - Waste deposited in designated area
5. Sewage treatment - Convert waste water to safe water

7.10 Unit-end Questions

1. Go through the different factors which affect environmental health. List any three that are hazardous to human health and that are found in your locality.
2. Make a list of sources of air, water and soil pollution in your locality.
3. Analyse the merits and demerits of the waste disposal system being adopted in your locality and try to list any three steps that can be initiated by a CDW at the community level to improve it.
Unit 8: Survey of Pollution-based Health Issues of the Locality

8.1 Introduction
Welcome to the last unit in our module on community health and hygiene. In the previous units, we highlighted the important link between environment and health. This explains the importance of the environment in community health. You are now aware that there are many environmental health hazards which affect our health. With this knowledge, you should be able to identify the local environmental issues which affect the health of your community. Only then, can you identify the solutions to these problems and improve the health status of your community. This unit enables you to look closely into the community and exposes you to various tools and techniques you can use to conduct studies in the community.

In this Unit, we shall start by discussing how to use a health walk and checklist to identify pollution-based issues in your community. Next we shall discuss how to conduct a communicable disease survey in your community. In addition, we shall consider the steps to follow when evaluating a waste management system. Lastly, we shall discuss how to assess the quality of water in your locality. You might require 14 hours to study this unit.

8.2 Learning Objectives
After completing this unit, you should be able to:

- Use a checklist and health walk to identify pollution-based health problems in your community
- Conduct a survey of communicable diseases in your community
• Utilise the interview technique to gather information on waste management from members of your community

• Apply the PRA method to assess the quality and availability of water in your community

• Plan awareness programmes to educate members of your community on various health issues

8.3 Studying the Pollution-based Health Issues of the Community

As a CDW, you should be able to identify the local health issues in your community, including the different types of pollutants and their effects. Your prolonged exposure to the community and the relationships you have cultivated will make this process easier. To conduct a study of pollution-based health issues in your community, you need to select the area that you will use for the study. Once you have selected the area, you should then take a health walk.

**What is a Health Walk?**

When you take a walk through an area in the morning, to observe the activities and environment is named as a health walk. A health walk is best done in the morning because there are not many activities going on. As you walk, you should observe the surroundings and the different morning activities taking place in each area. Note down the activities and facilities, such as the toilets or evidence of open air defecation, bathing of children near a dirty water source, or contamination of well water. This method of gathering information is known as the Observation method. A common village scene is depicted in Figure 8.1.

During your health walk, you may locate children with health problems like worm infestation, diarrhoea, coughs, skin lesions, etc. This walk will help you to also engage in casual conversations with the local people in order to get more information. This is known as direct and indirect observation. It will give you an idea of the common diseases prevalent in the area. Observation and conversation with people will strengthen your ideas and will give you a true picture of the situation. Based on this, make a list of the common health problems of the locality and the environmental problems you have noticed.
You can also observe and identify the types of pollution present. You can make a list as shown in Table 8.1 for each area or locality. You can use this list as a reference material for the existing health problems there.

Table 8.1: Diseases, causative factors and remedies.

<table>
<thead>
<tr>
<th>Name of disease</th>
<th>Causative factor</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diarrhoea</td>
<td>Open air defecation and unprotected water</td>
<td>Clean surroundings, sanitary latrines</td>
</tr>
<tr>
<td>Hookworm infestation</td>
<td>Walking without chappals</td>
<td>Use of chappals</td>
</tr>
<tr>
<td>Jaundice</td>
<td>Polluted water</td>
<td>Use of safe water</td>
</tr>
</tbody>
</table>

A lot more can be added to this list depending on what one observes during the walk.

The next step would be to collect some information on the common health problems due to pollution and the types of pollutants causing the problem. For this, you should use a checklist to collect the information you need.

**What is a checklist?**

A checklist is a list of the things you want to do. It is a research instrument that is easy to administer. The researcher prepares a list of indicators or the things they want to look for. They mark with a tick if the indicator is present and a cross if it is absent. Once all the items in the checklist have been filled, the researcher adds the scores and determines the results.
You can use this kind of tools to collect information regarding pollution-related health problems and the types of pollution in your area of study. Let us see how you should go about it.

**Steps in Collecting Information from the Community**

- Refer to your study material and make a list of the common pollutants and associated diseases. For example, air pollution is a type of pollution and it is associated with respiratory problems such as asthma and anaemia. Water pollution is another type of pollution and is associated with diseases, such as cholera and diarrhoea. Please refer to the sample checklist given in Table 8.1 and make your own based on your knowledge from the study materials and your own observation.
- Select any one area of your locality for your study.
- Arrange a meeting with the residents (one member from each household) with the help of local leaders. You can restrict the number but a minimum of 30 is necessary.
- Explain your reason for arranging the meeting to the gathering.
- Then ask each member whether there has been any prolonged/chronic illness or disease in their family for the last six months. If they do not remember, you can prompt them by reading from your list. Next, you can ask them to give you the reasons they think are responsible for the incidence of these diseases, e.g., a factory in the premises or a dump site nearby. This will give you an idea of the morbidity status of the place.
- You should then try to identify the reasons. From your list of pollutants and diseases, you can make your own unbiased interpretations after listening to their cases.
- Next you should identify the form of pollution. You can even make a visit to the area and check it out for yourself.
- Make a brief report of your findings. It should include the major health issues of the locality, their reasons, and your suggestions and solutions on what can be done to overcome them.

**How do you collect information using the checklist you prepared?**

In this instance, you already have a checklist containing information about the health problems, their reasons, list of pollutants causing them and the forms of pollution. This makes your study and suggestions easy and less time consuming.

Look at Figure 8.2 which gives you an example of a checklist.
You can use this example to make your own checklist, after referring to your study material for guidance.

Present the list to an audience made up of representatives from the community. Ask each of them to put a tick against the appropriate answer to your question. For example, if you ask about the health problems seen in your locality, they should tick the diseases that apply from the list.

Alternatively, you can read out the list and request them to put a tick against the items that apply on the answer sheet given to them. If they have anything more to add which is not on the list, they can make a note of it.

Another alternative would be to give them an answer sheet with numbers given to each item in the list. You can then read out the list and ask them to mark a tick against the number corresponding to each item.

If the group contains illiterate people, you can keep the list ready with you, approach each person individually, seek their opinion and make a tick mark on the list yourself.

To gather information on the causes of pollution, you can write them down after listening to their explanations.

Alternatively, you can also read out the reasons from your list and ask them to mark.

Once you have gathered all the information, add up the tick marks to determine the common health issues in the locality and their causes.

After that, you can make your own unbiased interpretations.

You can even visit the place for observation.

Based on the above, write a brief report of the major health issues of the locality, the reasons you have found and your suggestions to overcome them.
When you collect the information from each individual, ask them to write their name, address, panchayath and ward number, contact number, age, education, gender, religion, community, monthly income of the family and the total number of members in the family. This comprises the basic information that you should get from every individual whenever you do a field study. You should tailor the information you collect based on the need of your study. For example, if your study is on agriculture, you can include questions about the land they own or the animals they keep. Now that you have gone through the steps used in preparing a checklist, give it a try. Go ahead with your study on the health problems in your locality and prepare your report based on the study.

**Activity 8.1**

I. How can you prepare a checklist? Describe the main points below. You may need 10 minutes to complete this activity.

Compare your answer with that provided at the end of this unit.

We hope you are now able to develop a checklist and use it to conduct a study in your locality. Next, let us discuss how to conduct a survey of communicable diseases in your locality.

### 8.4 Survey of Communicable Diseases in the Community

In the previous units, we discussed the importance of hygiene and sanitation in keeping away health problems. It is important for you to identify the common health problems in your community and their causes. There are various tools that you can use to collect information in your locality. In this section, we shall look at the survey method of collecting information and how to prepare a questionnaire.
What is a survey?

A survey is a method of collecting information from many people. This can be done through face-to-face interviews, using a schedule to collect the information. Alternatively, it can be done with the use of a questionnaire covering all the information you need for the purpose in hand. In either method, you can provide a number of choices for the respondent to choose from, or you can make them write their own answers briefly within the space given. The questionnaire can either be mailed to them or given directly to them. In cases where the respondent is illiterate, you need to read out the questions and mark the answers for them. When designing a questionnaire or schedule, you should collect the address and family details of each respondent. Let us now look at the steps you should follow to design and administer a questionnaire.

1. Start by writing the title of the questionnaire. For example, ‘A Questionnaire to collect the information on communicable diseases in Kerala.........’

2. Include the following basic information.
   - Name:
   - Address:
   - Ward:
   - Panchayath:
   - Contact number:
   - Age:
   - Sex: Male/Female  Religion ________Community ________
   - Education:
   - Monthly income:
   - No. of members in the family____ Adults ______ children ____
     Male _____ Female____
   - Incidence of diseases to children or adults during the last year
   - Whether diseases like cancer, HIV etc.? If so details.
   - What is the medical aid they receive at instances of illness?
     From where they are getting it?

3. Write the instructions for the respondents: e.g.

   Example of instructions for the respondents:
   Read the questions and give your answers. Do not discuss your answers with others. Insert a “Tick” (✓) mark if the answer is
true. Answer each question. Please do not omit any question. There are no right or wrong answers. Give only one answer to each question. The aim of this questionnaire is to collect information about the locality in which you live. You should only mark the middle column if you are not sure.

(This helps to give directions to the respondents. Explain to them clearly before they start answering the questions). Figure 8.3 shows a sample questionnaire.

4. Start by making a list of the common diseases or infections seen in your locality regularly and recently, such as Dengue fever, Chikungunya and Diarrhoea. You can collect this information directly from the people and from secondary sources of information like hospitals, health clinics and public health centres.

5. Make a list of contagious diseases seen in your locality for the last one year and try to identify their causes.

Use this information to frame the questions for your questionnaire.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Statement of facts</th>
<th>Yes</th>
<th>Not sure</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cholera is a common communicable disease seen in my locality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Diarrhoea is a water borne disease</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Many children here die every year due to diarrhoea</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>The dirty water in the locality helps mosquitoes multiply</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 8.3: Sample questionnaire.

6. Do not include so many questions. Just a maximum of 20–30 questions will do. The total score gives you a picture of the situation. The questionnaire sample in Figure 8.3 is a closed questionnaire, in which the answers are given. You can use an open-ended questionnaire where space is provided next to each question for the respondents to write their own answer. Alternatively, you can provide multiple choice questions with 2 or 3 answers for them to choose from.
For example:

<table>
<thead>
<tr>
<th>Diarrhoea in this locality is caused by? Tick the correct answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dirty water all around the place</td>
</tr>
<tr>
<td>2. Waste dumped everywhere</td>
</tr>
<tr>
<td>3. Open latrines near water sources</td>
</tr>
<tr>
<td>4. All of the above three</td>
</tr>
</tbody>
</table>

Once you have designed the questionnaire, the next step is to use it to collect information. The following steps will guide you on how to use the questionnaire to collect information on communicable diseases from your locality.

7. You can collect the information by approaching each person directly or by asking them to gather at a place. You can get one or two assistants and train them to help you. When collecting data about diseases in the family, it is better to get the details from the female members of the families.

8. In India, it is easier to arrange such gatherings at Anganwadis with the help of local Anganwadi workers who keep close contact with the families.

9. You can distribute the questionnaires with the help of Anganwadi teachers and collect the answers from each member of the group. Read out the questions to them and ask them to mark or write the answers. If they are illiterate, you can note down their answers after asking them.

10. Later, consolidate the answers and crosscheck with the secondary data that you collected from other sources. You will get a true picture of the diseases, their prevalence and the most affected group.

11. Based on this information, you can make a report of the common communicable diseases in the locality.

Here, you have used the survey method to collect information from a group using a questionnaire tool. Before we end this section, please complete the activity below.

Figure 8.4: Distributing questionnaire for collecting information from the public.
Activity 8.2

1. Illustrate a comparison between the checklist and the survey method.

<table>
<thead>
<tr>
<th>Survey</th>
<th>Checklist</th>
</tr>
</thead>
</table>

Compare your answers with those provided at the end of this unit.

We hope you are now able to use the questionnaire tool to conduct a survey of health issues in your community. In the next section, you will learn how to evaluate the waste management system in your locality.

8.5 Evaluation of Waste Management System of the Locality

In Unit 7, you learned about waste management and the health hazards caused by poor waste disposal. With this information, you should be able to evaluate the waste management system in your locality. Let us look at the steps you should follow.

1. Use the information you gathered from your health walk to choose the area for your study on waste management.

2. Start by making a list of the various waste management techniques being used in the area, like burning, composting and recycling.
You can collect this through house visits and can seek the help of residents’ associations. Identify an area where waste management is a problem. A popular waste management system is depicted in Figure 8.3.

![Biogas plant.](image)

**Figure 8.5: Biogas plant.**

3. With the help of a social worker, select 30 houses in the locality at random. Interview them using the interview schedule, already prepared by you. The schedule should have the questions you would like to ask them. For example, you can ask the respondents the following questions:

- What types of waste are found in your home? (kitchen waste, animal waste, waste from plants and trees, stagnant water etc.)
- Do you separate it as biodegradable and non biodegradable wastes before they are disposed off?
- How do you dispose off the waste? (Throwing out to open spaces, burying, burning, composting, recycling, etc.)
- What are the problems that you face to discard or dispose the waste?
- What are the health problems local people face due to improper waste management?
- Do the people in the locality face any problems due to improper waste control measures in the locality?
- What are the problems?

These questions apply to household or domestic waste but you can gather this information from other places, such as offices, hospitals and schools. You can even add the following questions in the interview schedule:

- What type of waste has accumulated in the neighbourhood?
- Who is responsible for dumping this waste?
4. Make your own observations and note them down immediately before you forget. After collecting the data through house visits, you can analyse and rate the information as Excellent/Good/Average/Not good/Bad. Make a short report of your interpretations with suggestions for improvement. You can also approach leaders in the panchayat/municipality/corporation authorities for assistance with destroying or managing the waste.

The method you used for this study is known as the Interview technique and the tool used is an interview schedule.

You now know how to use the interview technique to conduct a study on waste management. Next, let us look at how to conduct a study using the participatory rural appraisal technique.

**8.6 Study on the Availability and Quality of Water in the Locality**

You are now well informed about water, its importance, and the need to protect and conserve it. Let us assume that you want to study the availability and quality of water in your locality. You can collect this information with the participation of members of the community. The technique selected for this purpose is known as Participatory Rural Appraisal (PRA technique). Let us look at how to carry out a study using the PRA technique.

1. Prepare a rating scale with all the statements that you need to collect the required information about water quality of the locality.

2. Arrange a gathering of the farmers of the locality. They are the ones who use water for household purposes and for cultivation.

3. Draw a map of the locality on the ground with a stick or a chalk. You can ask them to mark the boundaries. They may even help you draw the map.

4. Then ask them about the different sources of water like wells, tube wells, ponds, canals, rivers, etc. and mark them on the map.

5. Next, ask them about the quantity and quality of water available from each source. Ask them for what purpose the water is being used (drinking, cooking, washing, watering, bathing, animal rearing). Ask them whether it is a source for common use and how many households use it. If it is only for a single family, find out how much water they use and how much water is wasted. Remember to note down all the important information you get from this discussion.

6. Now read out the questions in your rating scale and allow them to rate.
What is a rating scale?

It is a tool used in research to evaluate or judge a particular concept like quality of a thing, ability of something, etc. This involves qualitative description of certain characteristics of a thing, trait or situation. The individual is given choices to select the most appropriate answer. See Table 8.2 for a sample rating scale.

Table 8.2. Sample rating scale.

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Statement/question</th>
<th>Excellent</th>
<th>Very good</th>
<th>Good</th>
<th>Not good</th>
<th>Bad</th>
<th>Very bad</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Drinking water found in the community is</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To design a rating scale for this study, get the information directly from the community who use this water for various purposes. You can prepare all the statements to rate water as shown in Table 8.2.

Once you have collected the necessary information, you should then:

- Consolidate the information you have collected in the rating scale.
- Arrange for a discussion on water, importance of sanitation, safety and conservation. You can get an expert’s help for this.
- After the discussion, ask the group for their opinions and suggestions regarding the future activities that can be done to improve the situation.
- Use all the information you have gathered from the group along with the map they have prepared to locate the water sources and to prepare a report.

You now know how to use a rating scale to collect information from the community.

You now also know how to collect information using the PRA technique. The PRA is a good method as it involves the participation of community members to locate the important areas in the locality. During a PRA, you are also able to probe for more information during the discussions.
Before you continue, complete the following activity.

**Activity 8.3**

1. What is a rating scale? Write a short note.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Right</th>
<th>Not sure</th>
<th>Wrong</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dengue fever is caused by mosquitoes</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Compare your answers with those provided at the end of this unit.

In the next section, we shall discuss how you can create awareness on the prevention and control of health issues and risks.

**8.7 Creating Community Awareness on Control and Prevention of Local Health Issues**

Once you have gathered information from the various studies, it is very important to create awareness among community members on how to prevent and control the health problems you have identified. To help you assess their knowledge on health issues, you can develop a schedule containing statements that tests their understanding of various health issues. Use the knowledge you have already gathered in these units to prepare the statements. The following figure shows you a sample schedule.

![Sample knowledge assessment schedule](image-url)

*Figure 8.4: Sample knowledge assessment schedule.*
As you can see from the sample in Figure 8.4, you should write the statements in the first column. For example, dengue fever caused by mosquitoes.

The next three columns provide choices for the participants to indicate their understanding of the statement by marking whether it is Right, Not sure or Wrong.

You can collect this information from three or four areas with 10 people from each area. The respondents can be housewives, school children, family head or anyone in a family. After going through their answers, you will be able to assess their knowledge level. This will give you the baseline information you need to prepare your awareness campaign and any other future interventions.

In this unit, you have come across different techniques and research tools. Do not forget to collect personal details of each respondent, i.e., their name, age, etc. You can include this at the beginning of every tool that you use. An example for this is given under section 8.4 where you learned how to design a questionnaire. Practice makes perfect! So the more you use the various methods to conduct field studies in your community, the better you become. Remember, to choose small groups of about 30 respondents from one area or 10 each from three locations.

To develop an effective programme, you need to ensure that all the people involved are aware of the problems you are trying to solve. Awareness programmes are very effective. You may conduct awareness programmes on the causes and prevention of various diseases. To conduct this type of awareness programmes, you should proceed as follows:

- Empower the leaders to find solutions to their problem with the local administrations department. You can motivate them and help them in doing this.
- Contact the nearby hospitals or health institutions to provide you with information about the common diseases in the locality and to involve them in giving talks.
- Note down the suggestions of the participants in awareness sessions and consolidate their views. These views give you an idea of their needs and the type of service activities you can plan for the area. The service activities will depend on the need but may include the following:
  1. Immunisation camps
  2. Cancer detection camps
  3. Environmental protection classes
You should involve experts, such as doctors from different hospitals, social workers, agricultural extension workers or environmental health experts to participate in sessions during your awareness programmes. They can help clarify issues and provide up-to-date information to community members. The use of focus group discussions is another useful technique of collecting information about a community’s health problems.

The information you collect using different methods and tools can be useful in your welfare activities or will come in handy as your reference material in your community work. It can also form a foundation for your future intervention programmes in the locality. You should keep a copy of all the reports you have prepared for your future references.

Congratulations! You have now come to the end of this unit. We hope you are now able to design and conduct a study to find out the needs of your community members. Let us now review what you have covered.

**8.8 Summary**

In this unit, we have equipped you with the various tools and techniques that you need to collect information on the health problems of your community. We started by discussing how to use a health walk and checklist to identify health issues in your community. We then discussed how to conduct a survey of communicable diseases in your locality using the survey method. We looked at how to design a questionnaire recommended that you should administer it with the help of the local Anganwadi workers who keep close contact with the families. Next, we discussed how to collect information on waste management practices in your community using the interview techniques. We saw that you should work with a social worker to help you identify the homes in each area. We also discussed how to assess the availability and quality of water using rating scale and the PRA technique. Lastly, we looked at what you need to do when planning a community awareness session and the kind of experts you can invite to provide specialised information. All these techniques help you gather the information you need so that you can plan future interventions to protect the health of the local people and improve and conserve their environment. Good Luck! You can now go ahead confidently to help the community as a CDW.
You have also come to the end of this module. We wish you luck as you work with the community to improve their health and hygiene.

8.9 Model Answers to Activities

Activity 8.1
I. How can you prepare a checklist? Describe the main points below.

1. Prepare a list including all the required information.
2. Give the list to the audience and ask them put tick mark against the appropriate answer or you can read out the list and they can put a tick mark.
3. Fill the reason after listening to their explanations.
4. Add up the tick marks.
5. Make interpretations and prepare a brief report of the issues of the locality and suggest solutions to the problem.

Activity 8.2
I. Illustrate a comparison between checklist and survey method.

<table>
<thead>
<tr>
<th>Survey</th>
<th>Checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Method of collecting information from a wider population or a mass of people</td>
<td>● Method of collecting information from a group of people</td>
</tr>
<tr>
<td>● Face to face talk using a schedule/questionnaire to collect information</td>
<td>● A list of indicators or components are made by the researcher and tick or cross marks are made against the right or wrong answers in order to collect information</td>
</tr>
<tr>
<td>● It is very vast and could gather more information easily</td>
<td>● It is not vast as a survey. The method is very easy for the people to give the information</td>
</tr>
</tbody>
</table>

Activity 8.3
I. What is a rating scale? Write a short note.

It is a tool used in research to evaluate or judge the quality of a thing/ability of something. It includes the qualitative description of certain characteristics of a thing or a situation. The individual is given choices to select the most appropriate answer and the answer can be related easily.

8.10 Unit-end Questions

1. What basic information should you include in the tools used for research?
2. Prepare a checklist, an interview schedule and a rating scale for a topic on personal hygiene.
Additional Readings

12. Wikipedia, the free Encyclopaedia
13.(Adapted from Health hygiene tips – hand washing. www.domestos.co.uk)

Glossary

**Adulterated food:** Food that is generally impure, unsafe or injurious to health due to the addition of substances.

**Balanced diet:** A balanced diet is one which all the necessary nutrients,
namely: carbohydrates, proteins, fats, vitamins, and minerals, required by the body in the correct proportion.

**Biodiversity:** The diversity of plant and animal life in a particular environment.

**Checklist:** A commonly used research instrument, where the researcher prepares a lists of indicators in one column and ticks against them.

**Contaminants:** Biological, chemical, physical or radioactive substances that can adversely affect living things.

**Eco-friendly:** Literally means Earth-friendly. It refers to any product or service that is not harmful to the environment.

**Interview schedule:** Another tool used for research study. A set of questions are framed and asked by the researcher to the respondents.

**Incineration:** It is the process of burning a material so that only ashes remain. Waste is generally destroyed in a furnace by controlled burning at a high temperature.

**Microorganisms:** Living organisms such as bacteria, fungi, and viruses which are too small to be seen with the naked eye but can be seen under a microscope.

**Questionnaire:** A set of questions on a particular topic under study, framed as a research tool, to gather some information from the respondents.

**Rating Scale:** A tool used in research to evaluate or judge a particular concept like quality of a thing, ability of something, etc.

**Sewerage:** Refers to the infrastructure that conducts sewage.

**Sustainable development:** It is the development that focuses on the present generation’s responsibility to meet their present needs while preserving the environment.

**Questions for Reflection**

1. Think about your locality. That is the local area in which you live or work.

   a. What are the different forms of environmental pollution that you can identify there? List them out.

   b. How many are due to human activities and how many are due to other environmental forces? Make a list based on the priority of control measures needed.

   c. How many of these you think can be reduced or controlled by your efforts or through community efforts and which are they? Make a note of it.
d. Make notes of the potential areas that need help in maintaining community and environmental health in your locality.

e. Prioritise the activities requiring individual and community awareness programmes in your locality.

2. After going through the different units in the module, can you now identify the major health problems faced by your community?

3. You are asked to take an awareness class for adolescent school students on the topic “Avoid wrong food and Eat right food at the right time to keep you healthy”. Prepare the notes for your class.

4. What can you do as a community worker to promote good health through proper hygiene, sanitation and healthy food?

5. List the different research methods that you have come across. Which method would you adopt to study environmental hygiene in your local bus stand? Just think, plan and note down.
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