





# THE NATIONAL PROGRAM ON CLIMATE CHANGE AND HUMAN HEALTH (NPCCHH)

Training Manual  
for  
Community Level Training  
on  
Air Pollution and its Impact on Women's Health



**National Programme  
on Climate Change  
and Human Health**

National Centre for Disease Control (NCDC),  
Directorate General of Health Services (DGHS)

MINISTRY OF HEALTH AND FAMILY WELFARE  
GOVERNMENT OF INDIA

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# About the Manual



## Purpose of this document

An enlightened community is one that is willing to change and to take action when required. This Training Manual is designed to inform and increase the knowledge of health workers, and community members regarding the sources of air pollution in the community, in the environment, and at home. Women living in rural communities in India are the target audience. Building the capacity of trainers or facilitators to engage community members to take action will start by empowering women and their households with knowledge about ways to decrease the sources of air pollution around them. Alternative strategies, combined with effective and simple measures for reducing the use of biomass fuel and exposure to smoke and other forms of pollution are discussed in the manual.

Providing timely information on air pollution sources that is relevant to women living in rural areas is necessary for behavior change to happen. This IEC manual should:

1. Enable the State Health Authorities (SHAs) and other stakeholders to understand the importance of Information, Education and Communication (IEC) in promoting health behaviors.
2. Serve as a guide for the trainers/or discussion leaders to share information regarding the dangers of air pollution to health, specifically to women's health.
3. Assist as a tool to ensure the consistent delivery of relevant health information during various IEC activities with women as the key targets for intervention



## Role of Information, Education and Communication (IEC) activities

- ❖ To drive higher level of awareness about the problem of air pollution in rural areas.
- ❖ To disseminate relevant information to drive changes in attitude and behavior
- ❖ To create user-friendly and stand-alone materials for target audiences that highlight useful knowledge and grass-roots solutions to improve their everyday lives

## Guidelines on conducting the sessions

### 1. Place and medium of communication

The discussion on the effects of air pollution on rural women's health can be conducted in community meeting spaces such as the anganwadi centre or a community hall. Other possible settings for the discussion are:

- » Village/panchayat meetings
- » Meetings of Self-Help Groups (SHG)
- » Village Health Sanitation and Nutrition Days
- » Health mela, health camps, etc.
- » LPG Panchayat meetings

It should be noted that each discussion group should not consist of more than 20 people. It will be quite difficult for a facilitator to lead a meaningful discussion with a bigger group. The meeting space should be prepared ahead of time and it should be ensured that participants have ample space to spread out. The space should be well-lit and ventilated.

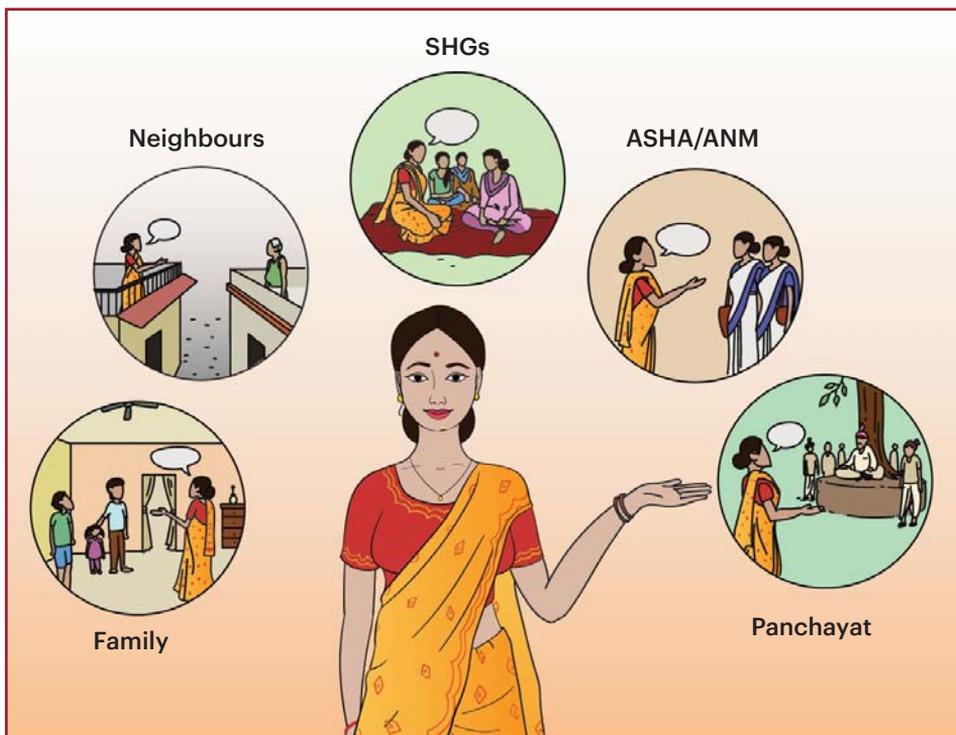
### 2. Time commitment of participants

The discussion can be done within an hour. It can be discussed in shorter durations, by concentrating on each concept at a time.



The flipchart (accompanying the manual) can be used by medical or non-health professionals. It is best to arrange a meeting beforehand and invite both men and women of varying ages, for a group discussion in a common area. Women of all ages should be invited, especially those with young children or adolescent children. Men should be welcome to participate in these meetings; their views and opinions on clean household energy and control of air pollution sources are very important.

3. During the discussion, the facilitator should be respectful and be responsive to the thoughts and opinions of the participants. The proper way to approach any behavior change communication is to acknowledge different points of view and work towards a common understanding. The facilitator should not be biased regarding religion, caste, social class or age. Every participant at a meeting should be treated with courtesy.



## The manual covers the following topic:

1. Sources of air pollution inside and outside the home
2. Burning of biomass fuels and how it pollutes the air
3. Long term health effects of polluted air
4. Reducing personal exposure and preventing pollution at its source

### Notes for the Facilitator

1. The facilitator must ensure that everyone in the group has a chance to speak freely and to participate.
2. He/she should acknowledge the responses of the group and encourage participation by those who just listen quietly. It would be best to get everyone to talk and contribute their opinion and experience. Most importantly, the participants should feel comfortable about asking questions and clarifying doubts they may have.
3. The facilitator must speak loudly and clearly. If there is any disagreement, he/she should resolve it calmly and positively, and also make the point that everyone has the right to his/her opinion.

## Sensitivity and tactfulness during discussions

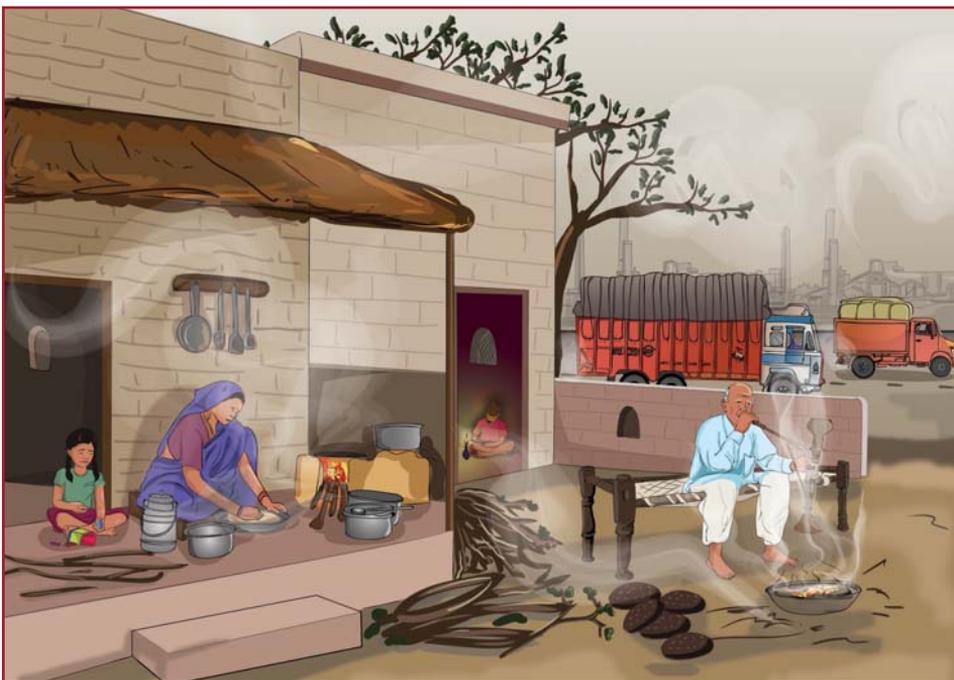
The structure of the discussion should be flexible, with the facilitator engaging all members of the group and asking them about their experience and knowledge regarding air pollution and specifically biomass fuels. These pictures relate to everyday life of women living in rural areas; however, some women may have different experiences altogether. It is important for the Facilitator to encourage questions and to



be sensitive about the practices regarding biomass fuel use, as well as the burning of incense or waste matter. The lack of access to clean energy is an important issue and challenge that many rural communities face. For many families, some practices such as burning incense or chilies have been customary for generations, and are closely connected to spiritual, religious or traditional beliefs that may be difficult to change immediately. Sometimes people do not change their beliefs, practices and attitudes at all.

## General instructions for using the flipchart

This Facilitator's guide contains information on sources of air pollution in the community, and especially inside the home, and step-by-step instructions on how to use the flipchart. Each flipchart page has pictures relating to a particular topic and theme connected to air pollution. Before starting the discussion, the Facilitator must ask the participants to describe the pictures that they see on the flipchart. The page with visual images or pictures is to be shown to the women participants while the Facilitator speaks and



guides the discussion. The description and discussion guide on the opposite or next page should be read by the Facilitator. These pages also contain some “Notes to the Facilitator” which include question prompts to encourage participants to speak freely and to raise questions regarding the pictures shown. The instructions and key concepts are included in this discussion guide..

## **Learning objectives of the air pollution manual**

- ❖ To raise awareness of the participants (women, men, children) about the importance of clean surroundings, especially clean air
- ❖ To increase their understanding of the connection between smoky cooking fuels and health
- ❖ To increase the understanding that inhaling smoke has long term effects on health, and can lead to serious diseases over time
- ❖ To increase awareness of how biomass fuels affect children even more than adults
- ❖ To increase awareness about ways to avoid exposure to smoke and other sorts of polluted air



# Overview



Knowledge is power! Read the following pages to increase your knowledge and understanding of air pollution, its sources, its effects on human health, and strategies for reducing personal exposure.

## What is air quality?

Air quality indicates the condition of the air surrounding us. It tells us how clean the air we breathe is.

If there is more than a certain percentage of harmful particles in the air, air quality is said to be bad. These particles, which may be made up of dust or some form of chemicals, are so small that they cannot be seen by the naked eye. If there are very few harmful particles, we can say that the air quality is good. Air quality helps us decide whether the air is healthy or not.

## What are the sources of air pollution?

At times natural events such as volcanic eruptions, dust storms, and forest fires produce smoke and pollute the air. Nowadays, it is smoke or gas from diesel trucks, buses, cars, bikes and tractors that usually affect us. They make us cough and sneeze, and can also make our eyes water. In extreme cases they can make it difficult to breathe. Factories, small or large, and chimneys, also produce smoke. Something important to understand is that air inside our homes may also become polluted, if someone smokes bidis or cigarettes, or uses mosquito coils. You can also see that kerosene lamps give off black smoke. When farmers burn straw in the fields, that also makes the air smoky.



## What is Ambient Air Pollution?

Ambient means something that surrounds us. Fumes from the industrial, power and transportation sectors and the unprecedented growth of cities in India have contributed to increasing ambient air pollution. The manufacturing process in factories creates a lot of waste and smoke. The amount of gas/chemicals factories and power plants can release into the air is regulated by the Central and State Pollution Control Boards. In many cities, there are a lot of cars, buses, and trucks, which also release pollutants in the air. People are exposed to these pollutants, which are known as “particulate matter”, which can be dust, chemicals or gases such as Sulphur dioxide, nitrogen dioxide, carbon monoxide or ozone (but the particles are so small we cannot see them). The levels of these pollutants are monitored by the Government through the National Air Quality Monitoring Programme (NAMP). The amount or levels of these pollutants in the air are reported and monitored by the government because of their negative effect on our health.

## Sources of outdoor air pollution

- ❖ Construction materials
- ❖ Vehicular emissions
- ❖ Tobacco smoke



- ❖ Power plant emissions
- ❖ Agricultural practices like straw burning
- ❖ Trash burning
- ❖ Fuel used in factories or diesel generators

## What is particulate matter?

Particulate matter can be made up of smoke, liquid droplets, soot, dirt and dust. These may be easy for us to see because these are black or dark, or made of smoke. But PM<sub>2.5</sub> is so small you cannot see it in the air. You will hear and read a lot about particulate matter, especially PM<sub>2.5</sub>, in the news and from scientists, doctors, and nurses. Particulate matter and aerosols are usually solid air pollutants. These particles are very small in diameter and the names PM<sub>2.5</sub>  $\mu\text{g}/\text{m}^3$  (microgram per cubic meter) and PM<sub>10</sub> come from the diameter of these particles which are 2.5 micrometers and 10 micrometers respectively. Due to their small diameter, they do not get filtered through our nose hairs and can enter the lungs.

## What is household air pollution?

When air inside the home or inside buildings becomes dirty or contaminated we describe it as household or domestic air pollution. The most common cause is the incomplete burning of biomass fuels used for cooking and heating (cow dung, wood, charcoal, rice husk) and for lighting stoves (kerosene). Domestic pollution can also be the result of tobacco smoke and the burning of substances to keep away insects like mosquitos, especially in poorly ventilated rooms.

## Indoor air pollution sources

- ❖ Suspended particulate matter (PM)
- ❖ Smoke from tobacco use and biomass cooking fuel
- ❖ Particles suspended in the air as a result of incomplete combustion of cooking fuel



## What are biomass fuels?

Biomass fuels are of organic origin, meaning that they are made from matter that was live at some time. There are 280 crores (2.8 billion) families around the world who use solid fuels or biomass fuels such as cow dung, wood, and charcoal for cooking their food, lighting and heating their homes. In 2011, it was reported in the census of India that 78 crores of Indians used biomass fuels. As people stay inside their homes much of the time, most of the population (especially women and children) are exposed to this source of pollution.

Currently the government is working to supply all homes with LPG cylinders, solar power and electricity..

## How do people get exposed to air pollution?

As you have seen, people are exposed to pollution during both indoor and outdoor activities. However, our exposure to air pollutants varies depending on where we are standing or sitting (PLACE), the time we spend in a place (DURATION and FREQUENCY), and the activities that produced the pollution (TYPE and TOXICITY). We measure the cleanliness of the air in our communities through pollution monitors.

**Personal exposure happens when we breathe in the pollutants. This the most important concept or idea that helps us begin to think about what can be done to protect our health. We must identify the sources of pollutants and avoid personal exposure. We can also work with our family members, neighbors and the gram panchayat to reduce pollution in our communities.**

Personal exposure to pollution sources: In this picture, the people who live near the road are exposed to different types of pollution. The diesel trucks and the factories produce smoke and exhaust gas. The smoke from the hookah, the kerosene lamp and smoke from the chulha are also producing lots of smoke. The family members are exposed to pollution both from outside and inside sources.



## The use of Personal Protective Equipment (PPE) against pollution

We can reduce personal exposure in various ways. The workers inside the factories need to wear masks, eyeglasses, or gloves so they will not get hurt while working. These objects together make up what is called “personal protective equipment” or PPE. Inside the home, we do not generally use masks or PPE, but we can reduce exposure to smoke by opening windows and doors to let air inside the house, or using a wet cloth during dusting. We can mop the floor twice a day if possible. So one can see that some changes in our practices and behavior may be required. We will talk about these changes in the next few pages.

**Note to the Facilitator:** Please remind the participants about personal hygiene (handwashing) and the recommendation about wearing masks or cloth to cover their noses, eyes and faces, as much as possible. Nowadays, everyone is encouraged to wear masks especially when outside the home or in work places, or when travelling, so that we don't get sick from infectious diseases such as COVID-19, and also to avoid breathing in smoke, gas and exhaust from trucks, cars, factories or shops.

*Covering our noses and mouths with a cloth or a mask helps to protect us from getting sick from infectious diseases like COVID-19, tuberculosis, influenza, cough and cold. Someone who is sick can spread the virus whenever they cough, sneeze, or when they talk and laugh.*

***The mask protects you, and also others, from getting sick!***

## Health effects of air pollution

### Children and air pollution: How are children affected?

Children are especially sensitive to the effects of smoke or pollution. Their bodies are still in the process of growing and maturing. Their bodies are smaller in size and they stay close to the ground or floor during play.



Children's bodies are different from adults! They breathe faster and through their mouths.

This list shows how fast children breathe compared to adults:

<b>Children breathe faster than adults</b>	
Adults	12–20 breaths a minute
Newborn (0–12 months)	30–60 breaths a minute
Infant (6–12 months)	24–30 breaths a minute
Child (1–5 years old)	12–20 breaths a minute
Child (6–12 years old)	20–30 breaths a minute
Child (12 years and above)	12–20 breaths per minute

- ❖ Air is a basic need of life. We cannot survive more than a few minutes without breathing. Breathing in polluted air (smoke/gases) affects the functioning of the lungs over time. .
- ❖ very high pollution level makes breathing difficult even for healthy lungs and can cause coughing, wheezing, irritation, and dangerous stress on the whole body system..



## Behavior of children

- ❖ Children spend much time outside the house
- ❖ Children spend time near their mothers who are cooking
- ❖ Children live closer to the ground which may be dusty or dirty
- ❖ Children also breathe through their mouths which cannot filter small particles or dust
- ❖ Children may not understand when they feel dizzy, or have difficulty breathing

## What is the respiratory system?

The respiratory system is a system of organs that helps in taking air into, and exhaling it from, the body. It includes the airways, the lungs, blood vessels and muscles. The respiratory system delivers oxygen (from the air) to different parts of our body, and removes carbon dioxide when exhaling. We breathe through the airways (nose, mouth, throat, and the air passages called bronchi and bronchioles) which connect to the lungs. The small hairs and moisture in the airways trap dust particles. This process can sometimes cause irritation and coughing or sneezing. The air then passes through the air passages and to the lungs.

## Does air pollution make a person sick?

Scientists and doctors have reported that people who get sick with pneumonia, stroke, heart disease, and chronic obstructive pulmonary disease (COPD), and lung cancer have also been exposed to high levels of air pollution. There is an association between these illnesses and pollution, but there are also other reasons why people get them, such as tobacco smoking, malnutrition or eating unwholesome food. Most importantly, regular personal exposure to air pollution makes the body weaker and more likely to get sick.





## Does air pollution affect pregnant women?

Personal exposure of pregnant women to air pollution is especially important to understand. Scientists and doctors have reported that some pregnant women who are consistently exposed to air pollution give birth early or give birth to smaller babies. We must remember that there are many other reasons why babies are born small or early, including malnutrition (not getting enough healthy food, nutrients and vitamins), high blood pressure of the mother, etc. It is recommended by doctors and scientists that pregnant women and small children should stay away from sources of air pollution such as smoke and gases.

**Pregnant mothers and children are especially vulnerable and must be protected from poor quality air**

## What is the life-course approach or concept?

We are taught by our elders, teachers, doctors and nurses that eating wholesome food is important because it keeps us healthy and strong as we age. Pregnant women need to eat nutritious food, take adequate rest, and keep a positive attitude to stay strong and healthy and to protect their



unborn children. Newborns drink breastmilk because it gives them all the proper nutrients and makes their immune system strong and their bodies and minds healthier as they grow up. The health benefits of drinking breastmilk last a lifetime! Similarly, scientists and doctors advise pregnant women to avoid pollution because it continues to affect children after birth. This is described as the long-term effects on health or the 'life-course' concept.

1. Pollution affects an individual in various ways during each stage of life – from the time one is in the womb (called the 'intra-uterine' period) to old age. This is called the life-course approach.
2. The effects of pollution vary according to the stage of exposure.
3. Infants whose mothers were exposed to pollution during pregnancy may be born small/underweight or pre-term. However, there may also be other significant reasons for this outcome, such as lack of adequate nutrition, unhygienic environment, or other health problems during pregnancy.
4. Children may be susceptible to poor lung growth or to developing respiratory illnesses later in life.
5. Pollution also affects the developing brain of children making it harder for them to concentrate and develop to their full potential.
6. Children and women are very vulnerable to poor air quality and so are the sick and elderly.

**Note for the Facilitator:** Other examples that can be used to explain long-term effects is education. Children go to school to learn how to read, write, and count. The things they learn in school will be useful throughout their entire lives. If a children misses their classes, or cannot go to school, it becomes harder to teach them the basic concepts as they get older.



During the meeting, the Facilitator must be sensitive when discussing how air pollution can affect our health. Pregnant women may become afraid and excessively worried about their unborn child if they use biomass for cooking. It is more important to understand, and explain, that many actions can be taken to avoid personal exposure and so to increase the chances of a trouble-free pregnancy and having a healthy newborn.

**The participants should not feel they are responsible for causing any sickness in the family.**

### LET US REVIEW!

**Air pollution** is caused when harmful gases, dust, smokes, odours or any toxic substance that adversely affect the environment and health are introduced into the air.

**Indoor air pollution or household air pollution** is the contamination of indoor air due to the use of biomass fuels for cooking and heating (cow dung, wood, charcoal, rice husk), for lighting (kerosene) or due to second hand tobacco smoke, mosquito coils, etc.

**Outdoor or ambient air pollution** is the contamination of the air outside by exhaust or smoke produced by diesel trucks, cars, factories, power plants and shops. The smoke from households can also contribute to outdoor air pollution.

**The possibility of reducing personal exposure to pollution** is the most important concept that we need to communicate to the women and their families. It is also possible for families in the community to reduce pollution at its source.



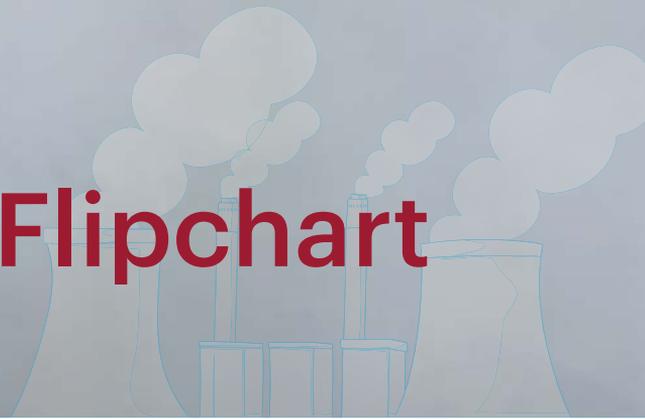
**Disease** is an abnormal condition affecting the body. It is the term we use when someone feels pain, discomfort, lack of interest or lack of physical energy for everyday activities. It may become the reason for a person's death.

**The 'life-course' concept or approach means air pollution** affects us in various ways during each stage of life – from the time one is in the womb (the intra-uterine period) to old age.

**Pregnant mothers and children are most vulnerable** and must be protected from poor air both indoors and outdoors to prevent long-term health effects.



# Guide for Flipchart Contents



The following section introduces the Facilitator to the flipchart, its content and use. The whole document should be reviewed before any meetings are started.

## Introduction

### English

Good morning/afternoon! My name is \_\_\_\_\_, and I am (an Anganwadi worker/ASHA/a Social Worker). Today we will talk about the importance of clean air for our health and the some problems connected to it. We have gathered here to share our experiences and also to think about different solutions that may be possible right now. I hope that you will continue to think about what you hear and learn from today's discussion with other women and your own family members in the days to come.

We are going to different communities in the country to talk with women and men about things that they can do to make sure their families and communities remain healthy. It is also important to think about keeping our environment clean. A clean environment (village) means a healthy community.

We will talk about the types of things inside the home that make our air dirty. Have you heard about air pollution?

Note to the Facilitator: Observe and take note of the answers that the women give to your question. Remember the words and terms that the participants use. Take note if they do not have any answers, to gauge the level of understanding or awareness based on this initial question.

Alright, thanks for your comments and thank you for coming to this meeting.

Let's start!



# A healthy and good life

## What is a healthy life?

A healthy person is mentally and physically fit and has strong relationships with people in his/her family and community.

A person requires safe and clean drinking water, clean air, nutritious food, healthy lifestyle, physical activity, and healthy living conditions including sanitation and a clean home environment.

Every citizen of India has the right to access healthcare services, education, and government services and benefits.

## Clean air is good for our health

- ❖ Emphasize local understanding of good health among women and children, etc. Ask participants about their knowledge of how to keep their kids healthy
- ❖ *Prompts: Good appetite, effortless breathing, continuous growth, playing actively, no fever/coughs/cold*



**Discussion point:**

**What things contribute to a healthy life?**

Start the discussion with the following questions:

- ❖ Can you tell me what a healthy person is? What are the things we need to make us healthy?
- ❖ What about disease and sickness? Can you tell me what types of health problems you see in the community?
- ❖ Can you tell me 5 things that you do every day to keep yourselves healthy?

## **Women and children are breathing in smoke**

**Discussion point:**

**What happens when you are around smoke**

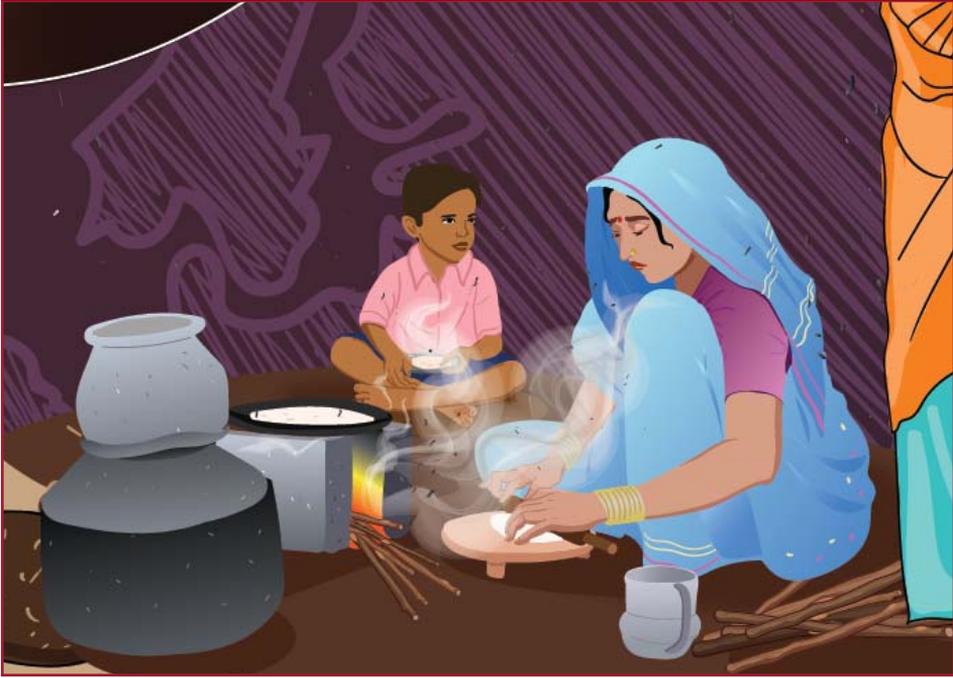
- ❖ *Guide the discussion and ask further questions about the times when they are near sources of smoke*
- ❖ *Prompts: Cooking, burning garbage, burning wood or straw, smoke from factories, construction sites, diesel trucks, cars, power plants or factories, straw burning*

**Discussion point:**

**What happens when they breathe through the smoke?**

- ❖ List 3–5 things that they experience when there is too much smoke inside or outside their homes
  1. Let's talk about smoke. Have you heard the term air pollution? Has somebody mentioned it to you? Or maybe you have heard it on the radio, TV or from your children? How about in newspapers?





2. Did you know that there are two types of air pollution? Indoor and outdoor!
3. Did you know that there are many sources of pollution around us? ?

**Note to the Facilitator:** The use of biomass fuels is very common in various rural communities. Often, people do not use their LPG cylinder or electricity for cooking (for various reasons). Using biomass has been a practice for centuries and for most people it is the only affordable fuel. The discussion should not make them feel that they are deliberately making a bad choice or causing illness in their families. Let the participants understand that there are ways they can control the pollution and reduce their exposure.

Before proceeding, the Facilitator should remind the participants that they have discussed the following



- ❖ Know the major air pollutants
- ❖ Understand that many human actions cause air pollution
- ❖ Local sources of air pollution

Check whether the women can identify man-made and natural sources of air pollution. Ask them to identify which of these sources are the result of human action?

- ❖ Burning of fossil fuel (Answer: Human action)
- ❖ Tobacco smoke (Answer: Human action)
- ❖ Pesticide spraying (Answer: Human action)
- ❖ Dust from Thar desert (Answer: Ecological/Natural event)
- ❖ Ash from volcanic eruptions (Answer: Ecological/Natural event)
- ❖ Straw burning (Answer: Human action)

Start the discussion about biomass fuels.

## What are biomass fuels?

**Discussion point:**  
**What are biomass fuels?**

- ❖ Allow the participants to identify the types of biomass fuels used by their family
- ❖ Prompts: Cow dung, wood or straw, kerosene, incense, mosquito coils, charcoal



**Discussion point:**

How long have they used these fuels? Have there been any changes in their cooking/heating/lighting practices?

Let the participants talk about any significant changes in their use of biomass or any other energy source. Most households may use more than one, and this is called fuel stacking. Participants may offer insights on how participants choose to use one fuel over another

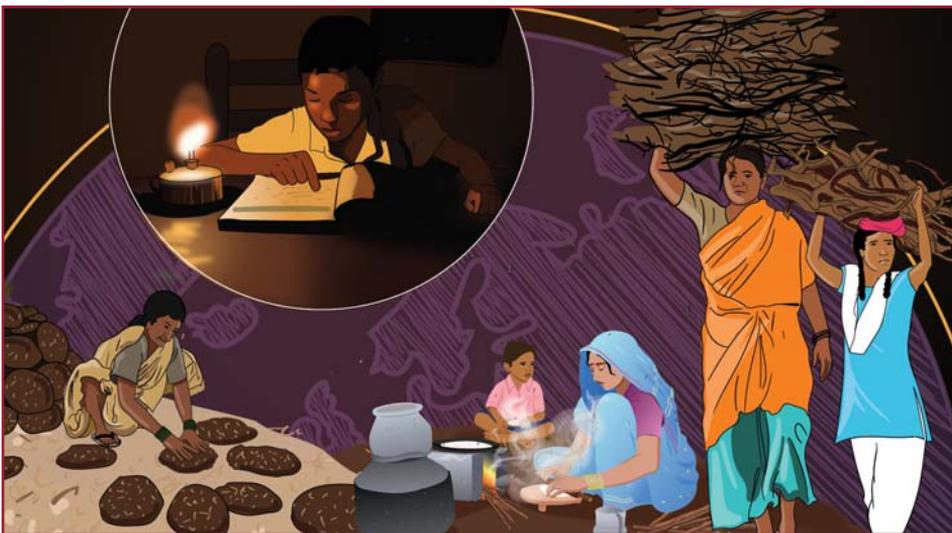
Probe about the “hidden costs” of collecting biomass fuels. Ask the women the number of hours required to gather fuel for daily use. Are the children also helping in collecting wood, etc.?

## What are biomass fuels? (Continuation)

**Discussion point:**

Information about biomass fuels and why it's important for the health of women and children

- ❖ 3 billion people (300 crores) or close to half of the world's population use wood, kerosene, coal, straw, and cow dung for energy. These are called biomass fuels.



- ❖ These biomass fuels are used for cooking, lighting, and heating
- ❖ Women and children spend many hours collecting biomass fuel for household use
- ❖ Women and girls are the main users (in the sense that they do the cooking and other tasks that involve fuel use) and procurers of household energy/fuel. So they are also the ones who get sick because of these fuels.

**Discussion point:**

Ask the participants if they have any questions or additions.

## STOP

If there are no more questions or additional points, start the activity on particle size

### Required Training Material

#### Activity: Gaseous pollutants

#### Materials:

- ❖ spray bottle filled with water, with an adjustable nozzle
- ❖ can of deodorant spray

Spray each bottle and ask the participants to observe the sprayed water and the deodorant.

Press the deodorant spray for a long time (strong smell should permeate/spread throughout the room – this can be used to explain the high level or concentration of air pollutants in a room).

Ask the participants what the difference between spraying water and the deodorant spray is.

Do they notice the effect on their eyes, nose and mouth?



## Discuss:

- ❖ We cannot see these particles because they are gaseous and are very small. Sometimes the gas has no smell. As these particles are very small, they go inside our bodies through our noses and settle inside the lungs. Our lungs cannot clean these small particles.
- ❖ The smell inside a closed room may be stronger and may last longer. When the room is closed, the smell of the deodorant spray is more concentrated. The trees and plants near our home give us oxygen to breathe. When a person inhales, the oxygen goes through to the lungs and is carried by the blood to the rest of the body
- ❖ Wood, dung or straw and other biomass fuels do not get completely burnt in the chulha. The burning that does happen releases particles and gases, including carbon monoxide, nitrogen oxides, black carbon, benzene, formaldehyde. These gases are extremely bad for health and affect our lungs and other organs. Biomass fuels can also make a room very smoky.

## Smoky cooking fuels cause pollution

### Discussion point:

Why are we easily affected by smoke? Why are children easily affected by smoke and pollution?

### Relevant points:

Children and women who are regularly exposed to smoke experience more coughing and get more colds.

Because children's lungs are not fully developed, it becomes hard for them to breathe if the air is dirty. Repeated exposure can ultimately lead to damage to their lungs due to persistent coughs and colds, which can develop into serious problems when they grow older. Air is a basic need of



life and we cannot survive more than a few minutes without it. Breathing in polluted air (smoke/gases) affects the functioning of lungs over time. Very thick smoke (high levels of air pollution) makes breathing difficult even for healthy lungs and can cause coughing, wheezing, irritation, and make the body weak

## Particular issues related to children

- ❖ Children spend time near their mothers in the kitchen
- ❖ Children breathe through their mouths which cannot filter small particles or dust.
- ❖ Children may not understand when they feel dizzy, or have difficulty breathing

### Discussion point:

Ask the participants if they have experienced the following health problems

- ❖ Irritation of the mucous membranes (eyes, nose, throat)
- ❖ Cough, wheeze, chest tightness, increased incidence of acute respiratory illness (colds, pneumonia)
- ❖ Tracheobronchitis: emphasize the symptoms of coughing, phlegm formation, fever
- ❖ Asthma or difficulty in breathing

## Other activities that may worsen air quality inside the home

### Discussion point:

Ask the participants about other sources of air pollution in their community



Ask the women if they have heard or read anything about the harmful effects of air pollution. Do they see it in the newspapers, radio, village meetings, etc.? Do they agree or disagree with what scientists and doctors are saying about air pollution?

Do they know that there are sources of air pollution inside the home? These are daily activities that may make it harder for family members to breathe properly.

- ❖ Someone who smokes tobacco inside or near the house
- ❖ Burning incense or burning cow dung to control mosquitoes
- ❖ Burning of rice straw/tree branches/vegetation can create a lot of smoke which can enter the house
- ❖ Pesticides used in the nearby farms can be carried in the wind and enter the house
- ❖ If the house is near the road, exhaust from cars, and trucks can enter the house
- ❖ Apart from the smoke we see, there are also other particles or gases that are produced when we burn biomass fuels. The following gases cannot be seen by the eye and also have no smell:
  - » Carbon Monoxide
  - » Nitrogen dioxide
  - » Sulfur dioxide
  - » Particulate matter

## **Lasting health effects of pollution**

- ❖ Exposure to pollution continues to affect us in various ways as time passes
- ❖ A young person who often has a cough or breathing problems can develop more serious lung problems as he/she grows older





- ❖ Pollution affects the developing brain of children, making it harder for them to concentrate while studying in school
- ❖ The effects of smoke on our eyes and lungs are not temporary. Women are the ones who cook in the home and many are exposed to smoke throughout their lives. Many women have suffered serious eye problems due to exposure to smoke.

#### Discussion point:

This concept is called the life-course approach; we think about how the state of our health and personal exposure to pollution today affects our lives as we age.

As you know, various practices, customs, events, and activities result in good or bad effects on our lives and health. We are taught by our elders, teachers, doctors and nurses that eating wholesome food is important because it keeps us healthy and strong. Pregnant women are advised to eat nutritious food, take adequate rest, and keep a positive attitude to stay strong and healthy and to keep their unborn children safe and healthy also. Newborns are given breastmilk because it provides them all the proper nutrients, strengthens their immunity, and makes their bodies and minds healthier as they grow



**older. On the other hand, scientists and doctors advise pregnant women to avoid pollution because it also affects both them and their newborns as they grow. The reason is that pollution leads to serious and long-term effects on health. This understanding has led to what is called the 'life-course' concept.**

1. Pollution affects us in various ways during each stage of life – from the time one is in the womb (called the intra-uterine period) to old age. This is called the life-course approach.
2. The effects vary at each stage of exposure to pollution.
3. Infants whose mothers were exposed to pollution during pregnancy can be born small/underweight or pre-term.
4. Children can experience more respiratory infections and poor lung development in later life.
5. Pollution also affects the developing brain of children, making it harder for them to concentrate and develop to their full potential.
6. Children and women are very vulnerable to poor air quality and so are the sick and elderly.

## **STOP**

### **If there are no more questions or additional points for discussion, start the activity on long-term pollution exposure**

- ❖ Ask a woman her age
- ❖ Ask what kind of stove she uses; ask how many years she has been cooking or using the chulha
- ❖ How many times does she cook in a day? Multiply that figure by the days in a month and then by the number of months in a year.
- ❖ Multiply the total number of times in a year she has cooked times the length of time she has cooked.



### Discussion points:

The participants should understand that the effects or symptoms of exposure to air pollution are not temporary, but are cumulative. Not only do people get sicker, their life expectancy also declines as a result of their exposure to pollution.

## Certain groups are more vulnerable to the harmful effects of air pollution

- ❖ Many people around the world die of illnesses related to the lungs such as pneumonia and chronic obstructive pulmonary disease (COPD)
- ❖ People who are exposed to pollution are more likely to develop, and die of, heart problems such as stroke or heart attack
- ❖ People exposed to smoke are more likely to develop cancer
- ❖ People who use tobacco are more likely to get sick if exposed to smoke in the environment
- ❖ Asthma or tuberculosis patients, or people who have problems breathing, will get sicker if exposed to smoke

## Scientists and doctors have found that:

- ❖ Children, especially infants will have difficulty breathing when smoke is present in the environment
- ❖ Children have more colds and cough throughout the year in case of repeated exposure to smoke or other air pollution
- ❖ Too much smoke may also hurt their eyes and cause headaches
- ❖ Children may get burned when playing near the chulha
- ❖ Children who cannot breathe properly or have asthma have more problems when exposed to smoke



## Pregnant women and their unborn child are affected by air pollution

- ❖ Pregnant women can also get sick and can become tired more easily if they breathe in too much smoke
- ❖ Pregnant women exposed to smoke are more likely to give birth earlier than expected and have smaller/underweight babies
- ❖ Infants who are born early often need special care, grow slowly or may be shorter compared to other children
- ❖ Children who are short or sickly, may experience more health problems as they grow older

### Discussion point:

Emphasize that the exposure of the child starts early, even while in the womb

**This is in continuation of the discussion on the life-course approach.**

## Women and children are more exposed to smoke and the effects may be lifelong

- ❖ Children are exposed to smoke when they are with their mothers or sisters in the kitchen or in the home
- ❖ Girls spend more time in the kitchen and inhale more smoke, so they develop more respiratory infections than boys
- ❖ Children cannot study properly when their eyes are affected by the smoke from kerosene lamps
- ❖ Normal growth may be affected in children who have breathing problems. Getting sick frequently can also cause stunting (lower height than other children their age)..

## STOP

**If there are no more questions or additional discussion points, start the activity on ventilation**



# Required Training Material

## Activity on ventilation

### Materials

- ❖ Incense, Matches, 1 Box with no holes, 1 Box with holes (simulating windows)

### Objectives

To demonstrate the importance of ventilation in the home when biomass fuels are used for cooking (reinforcement of need for windows, or chimneys near the stove)

### Steps

- ❖ Facilitator will light incense and wait for it to generate smoke
- ❖ The incense while burning will be put on a dish on the floor. One of the boxes will be put on top of the incense (covering the incense). The boxes represents a kitchen (with windows and without windows)
- ❖ The participants will observe the smoke and how long the incense burns.
- ❖ If the box has no holes, the smoke will just stay inside. In case of the other box which has holes, the smoke will be released through the holes. The participants will be able to see how the smoke goes out of the box





**Discussion point:**

Emphasize the importance of ventilation when cooking with biomass fuels. The children should not be present inside the home/kitchen if there is no ventilation in place

**Activity:**

Discuss how improved stoves with chimneys are better than the old type of chulha that uses biomass fuel

**What can I do to protect myself and my family?**

- ❖ When cooking, keep the door or a window open, to make sure the smoke can go outside the kitchen/house
- ❖ A chulha with a chimney can take smoke outside the house directly





- ❖ Your children should not sit with you in the kitchen while you are cooking, let them stay in another place, away from the smoke
- ❖ Position the chulha near a window or the door. If possible, put the chulha in an outdoor area
- ❖ Use clean fuels such as LPG, biogas or solar cooker. Ask the LPG Panchayat about information on getting an LPG cylinder and stove

## **Eat vegetables and fruits to keep healthy**

- ❖ One of the best ways to make our families healthy is to ensure that they eat vegetables and fruits
- ❖ The vitamins and minerals in these foods allow us to fight diseases
- ❖ Eating proper meals with our family gives us energy and strength





## What can I do to save fuel and time while cooking?

### Discussion points:

These are some suggestions that can be given to participants. The less time they spend near the smoke, the better it is for their health

- ❖ Use round bottom pots on chulhas
- ❖ The pots should be 1-2 times bigger than the mouth of the chulha
- ❖ Clean the bottom of the pot so it gets hot faster
- ❖ Soak chana, rajma beans overnight and they will cook faster
- ❖ Soak rice before cooking
- ❖ Cover the pots to keep the heat inside
- ❖ Cut the wood in small pieces so it burns faster and completely
- ❖ Add dung on the wood or sticks. Once the dung is dry, these sticks will burn better and produce less smoke



## What can I use for lighting and heating?

- ❖ It is far easier to keep yourself warm, than to keep your whole house warm
- ❖ Wear a cap and shawl at all times. You lose more body heat and feel cold when your head and neck are uncovered. Wear socks if possible
- ❖ The government has many programs that can help your family and neighbors
- ❖ Solar energy can be used to heat water and also provide electricity at night

## Government programmes available

- ❖ What government programmes provide clean household energy?

**Note to the Facilitator:** Here is some relevant information on government programmes for availing of clean household energy

- ❖ **Solar Lantern Programme** – from the Ministry of New and Renewable Energy, Government of India. This programme is implemented by the state nodal agencies/Departments (SNAs) and the Akshaya Urja shops.
- ❖ Solar rooftop installation, solar cookers and solar water heaters (Jawaharhalal Nehru National Solar Mission)
- ❖ **Improved cookstoves/Unnat Chulha Abhiyan** is a programme of the Ministry of New and Renewable Energy, Government of India. The programme develops and distributes better biomass cookstoves that do not create or emit smoke. This programme targets households in rural areas that use biomass for cooking, anganwadi centres, and small businesses or restaurants. There is financial support for those who are interested in buying improved cookstove models. There is also financial support for the masons who are interested in construction of earthen chulhas.



- ❖ **National Biogas and Manure Management Programme** or Shakthi - Surabhi - Biogas plant for households
- ❖ **Pradhan Mantri Ujjawala Yojana (PMUY)** provides women from BPL households access to a clean cooking fuel – LPG, for better health and less drudgery.

**Discussion points:**

Emphasize the availability of clean energy such as solar, biogas, LPG, etc. depending on what is accessible in the community

## CALL TO ACTION:

### How to reduce exposure and contribution to air pollution

Read and discuss the various strategies listed in the flip-chart in this section with the participants to conclude the session.



# Checklist For Household Visits



## AIM

To aid ASHAs/ANMs in creating awareness about air pollution during home visits

## Objective:

Home visits are an opportunity for you to educate and equip community members with knowledge and tools to minimize the health effects of air pollution. This checklist provides a list of questions and actions to assist you in discussing this topic with pregnant women or those with small children. This provides important guidance about measures for identification and mitigation of sources of domestic air pollution, which may be found in and around the household. The checklist is divided into two parts:

- ❖ The first section focuses on identifying sources of domestic air pollution in different areas of the household.
- ❖ The second section focuses on common habits and behaviors which can be changed to secure the household from severe health consequences.

The contents of this checklist can serve as an extension to your usual home visit agenda and health messaging about diet, vaccinations etc.



## Methodology

**ANM & ASHAs:** Through this checklist you can provide information about preventive measures regarding air pollution, address myths and misconceptions, disseminate messages for household awareness through inter-personal communication, report and share feedback about any observations to district authorities, promote personal safety and precautions through the use of IEC materials, encourage the use of local medical services for any health issues etc.

**TARGET GROUP:** Pregnant women or mothers of infants or toddlers (5 years and below) at household level

## Checklist for households

HOUSEHOLD AREAS			
S. NO.	Indoor household spaces	Questions	Precautions
1.	Kitchen	<ul style="list-style-type: none"> <li>❖ Who does the cooking?</li> <li>❖ Who is present in the kitchen/home while the cooking is going on?</li> <li>❖ What cooking method is used?</li> <li>❖ Which cooking fuel is utilized?</li> <li>❖ Is there a separate cooking space at home?</li> </ul>	<ul style="list-style-type: none"> <li>❖ Biomass (wood, cow dung etc.) burning for cooking is harmful for health of those involved in cooking and also for those who breathe in the fumes</li> <li>❖ Remember to open a window while cooking to ensure good ventilation</li> <li>❖ Switch to clean cooking fuels to reduce pollution and for good health</li> </ul>



2.	Washroom/ Toilet	What substances are used for cleaning?	<ul style="list-style-type: none"> <li>❖ Reduce use of cleaners, air fresheners, sprays as they can be harmful especially to people with pre-existing breathing and health conditions etc.</li> <li>❖ Do not burn any residue or waste which can worsen air quality and also affect breathing in children.</li> </ul>
3.	Construction Materials	Has asbestos been used in the construction of the house?	<ul style="list-style-type: none"> <li>❖ Exposure to asbestos can occur through indoor air in households containing friable (crumbly) asbestos materials</li> <li>❖ All types of asbestos cause lung cancer, mesothelioma, cancer of the larynx and ovaries, and asbestosis (fibrosis of the lungs).</li> <li>❖ If the house is old: check for old paint chips on the floor or by the windows. The paint may contain heavy metal lead (Pb). Children must not be allowed to eat these paint chips, because they are very harmful.</li> </ul>



4.	Pests/Mites/ Pets/Animals	<ul style="list-style-type: none"> <li>❖ Has any pest control treatment taken place at home?</li> <li>❖ Are there any pets at home</li> </ul>	<ul style="list-style-type: none"> <li>❖ Make sure that no family member, and especially a child or anyone with a respiratory illness, is present indoors during pest control treatment.</li> <li>❖ Dogs/cats/pets may carry mites and can aggravate breathing problems or cause complications for people with existing respiratory illnesses.</li> </ul>
5.	Ventilation		Ensure windows and doors are open when cooking or when using mosquito coils, kerosene lamps, etc.

### HABITS AND BEHAVIOURS

6.	Smoking Indoors/in proximity of homes	<ul style="list-style-type: none"> <li>❖ Are there any smokers at home?</li> <li>❖ Are any members exposed to passive smoking?</li> </ul>	<ul style="list-style-type: none"> <li>❖ Smoking has serious ill-effects on health. Along with poor air quality, it can affect the health of not only the smoker but also passive smokers (anyone who is nearby). This is called secondhand smoking. Pregnant women and children are especially susceptible to harmful effects of cigarette/bidi smoke)</li> </ul>
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			<ul style="list-style-type: none"> <li>❖ Discourage visitors/ family members from smoking tobacco/ hookah</li> <li>❖ Prevent smoking at home/avoid second hand smoke</li> </ul>
7.	Heating or lighting	<ul style="list-style-type: none"> <li>❖ Is wood burnt for creating a warmer environment or for heating purposes?</li> <li>❖ Who usually manages the heating process at home?</li> </ul>	<ul style="list-style-type: none"> <li>❖ Gases released from wood stoves and heaters can irritate eyes, nose, throat and may also cause shortness of breath.</li> <li>❖ Use new devices for heating that do not use materials such as firewood etc.</li> <li>❖ Avoid directly inhaling fumes or blowing into the fire through metal tubes to start the fire, as the gases released can cause respiratory illness in the long run</li> <li>❖ If no other heating alternative is available, make sure that the person who handles the fire does not have any pre-existing medical conditions. Also, in case wood burning takes place indoors: make sure there is proper ventilation and precaution is taken to avoid anything/anyone from catching fire</li> </ul>



			<ul style="list-style-type: none"> <li>❖ Always extinguish fires before going to bed for the night</li> </ul>
8.	Cleaning	<ul style="list-style-type: none"> <li>❖ What materials are being used for cleaning?</li> <li>❖ What are the timings for cleaning?</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use a damp cloth for cleaning surfaces</li> <li>❖ Restrict sweeping which can lead to suspension of dust particles in the air; change the timings to the afternoon rather than early morning or late evening</li> <li>❖ Do not use sprays/chemicals etc.</li> <li>❖ Remember to be careful when cleaning around people with asthma or any lung related ailment or / breathing problems</li> </ul>
9.	Agricultural Activity	<ul style="list-style-type: none"> <li>❖ How is waste dealt with?</li> <li>❖ Are pesticides/ insecticides used, how are they stored?</li> </ul>	<ul style="list-style-type: none"> <li>❖ Try to use alternatives for burning agricultural waste or stubble as this worsens air quality</li> <li>❖ Follow precautions and wear necessary protective equipment to reduce threat of illness from exposure to pesticides</li> <li>❖ Do not store insecticides/pesticides inside the home (as they contain harmful chemicals).</li> </ul>



			<ul style="list-style-type: none"><li>❖ Remember to change clothes at home after using such substances in the field</li><li>❖ Immediately wash your hands, face, feet and any parts exposed during spraying, or handling of chemicals. Take a bath and leave your clothes outside to be washed separately.</li><li>❖ Stop spraying or touching chemicals if you feel dizzy, have numbness in the arms and legs, have problems breathing, or start vomiting. Go to the nearest doctor. These symptoms could be a sign of chemical poisoning.</li></ul>
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10.	Health Seeking	<ul style="list-style-type: none"> <li>❖ Is anyone or has anyone shown symptoms such as breathing problems and nasal congestion/ runny nose, nausea, dizziness, eye irritation, headache, burning or stinging eyes, etc.?</li> <li>❖ Does anyone have severe difficulty breathing or feel a tightness in their chest, along with a fever that has lasted for several days?</li> </ul>	<ul style="list-style-type: none"> <li>❖ Seek medical help if anyone shows symptoms of fever, cough, or difficulty in breathing, etc.</li> <li>❖ wear a mask to protect yourself and others.</li> <li>❖ Wash your hands with soap and water when taking care of someone who is ill.</li> <li>❖ Do not let children or family members near a sick family member.</li> <li>❖ Contact the nearest health facility or get in touch with us (ASHA or ANM)</li> <li>❖ Do not self-medicate or delay in case of prolonged illness</li> <li>❖ Remember to keep the mobile numbers or contact information of ASHA, ANM or the nearest health centre</li> </ul>
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# References

- ❖ International Federation for Women in Agriculture (IFWA) and International Institute of Rural Reconstruction (IIRR), *Environmentally Sound Technologies for Women in Agriculture*, 1996.
- ❖ NITI Aayog, Breathe India: An Action Plan for Combating Air Pollution [Year of publication?]
- ❖ World Health Organization (WHO), *Burning Opportunity: Clean Household Energy for Health, Sustainable Development, and Wellbeing of Women and Children*, 2016.





**This Training Manual for Community Level Training on Air Pollution and its effects on Women's Health will help to develop Trainers at various levels in the States/UTs under NPCCHH to enable them in reaching an increased awareness level on the sources of air pollution to women, women's health impacts due to air pollution and better adaptation ways to protect and prevent their health effects due to air pollution in the States/UTs in the country.**