

Sustainable Undernutrition Reduction in Ethiopia (SURE) Programme

Training manual for Health and Agriculture Development Armies



Federal Democratic Republic of Ethiopia
Ministry of Health & Ministry of Agriculture

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About this manual

This training manual is designed for health and agriculture extension workers to train health and agriculture development armies as part of the Sustainable Undernutrition Reduction in Ethiopia (SURE) programme. It provides HDAs and ADAs the **knowledge** they need to improve infant and young child feeding and dietary diversity through the discussions they facilitate with their 1-5 and 1-30 community networks.

The course will run over 2 days, in which the HEWs and AEWs need to cover all 5 chapters. Please note the recommended time given to complete each course is just a guide. However, you must complete the entire course within the 2 days.

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Chapter 1: Undernutrition and its consequences

1.1 What is nutrition?

Exercise: Discuss what is nutrition?

- What is nutrition? What are nutrient requirements?
- Do all people have the same nutrient requirements?
- What factors affect nutrient needs?

Nutrition is the intake of food and the interplay of biological, social and economic processes that influence the growth, function and repair of the body.

Nutrients are components in foods that an organism uses to survive and grow. There are two types of nutrients: Macronutrients and micronutrients. Macronutrients provide the bulk energy an organism's metabolic system needs to function, while micronutrients provide the necessary cofactors for metabolism to be carried out. Both types of **nutrients** can be acquired from diet. Macronutrients include carbohydrates, proteins, fats and water whereas micronutrients include vitamins and minerals.

1.2 Macronutrients

1.2.1 Carbohydrates

Carbohydrates provide the body with energy to keep alive, build and repair tissues, stay warm, and move and work. Carbohydrates are the most abundant and economic source of food energy in the human diet.

What major food sources of **carbohydrates** does the Ethiopian diet include?



Figure: Sources of carbohydrates

1.2.2 Proteins

Proteins provide the body with essential amino acids that have a range of functions: growth and development, repair or replacement of tissues, production of metabolic and digestive enzymes, and production of some hormones.

What major food sources of **proteins** does the Ethiopian diet include?



Figure: Sources of proteins

1.2.3 Fats

Fats provide the body with essential fatty acids necessary to build cell membranes and to make hormones. They also help the body to absorb and transport some of the essential vitamins. Fats also provide the body with a concentrated source of energy. Fats are necessary for growth, reproduction, skin integrity, to maintain cells and to use body fat for energy.

What major food sources of **fats** does the Ethiopian diet include?



Figure: Sources of fats

1.2.4 Water

Water is essential for life and it is very important to get the right amount of fluid to be healthy. Adequate fresh water is required by the body on a daily basis.

1.3 Micronutrients

1.3.1 Vitamins

Vitamins are a group of organic compounds that play important functions in body but cannot be made by the body. Some vitamins can be stored in the body so need to be eaten often but not every day (fat soluble vitamins A, D, E and K), while others cannot be stored and should be eaten daily (water soluble B vitamins, vitamin C).

Vitamins play different roles in helping the body in important ways. Some examples include building protein and cells, protecting cells from damage building bones, protecting vision, metabolising macronutrients, and helping to heal wounds. Without essential vitamins, there are multiple nutritional diseases that can result.

1.3.2 Minerals

Minerals are a solid, inorganic group of compounds that are like essential building blocks of different types of cells. Essential minerals include iron, zinc, calcium, and iodine among others. For example, **iron** is part of red blood cells, which transport oxygen through the body. **Zinc** has many critical functions in the body, including the make-up of cells and body systems including immune function.

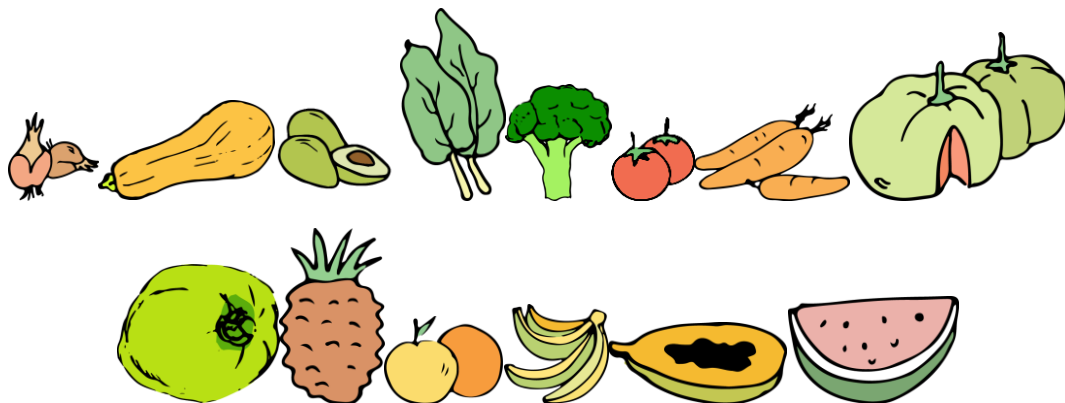


Figure: Sources of minerals

Nutrient requirements refer to the different nutrients required by the body for energy, growth and repair, and protection from disease. They differ according to age, gender, physical activity, height, weight, and health status of the individual.

Each food has different quantities of different nutrients, which sometimes interact with each other in the body.

Remember!

Different foods provide different quantities and qualities of nutrients that are essential for function and health. It is necessary for all people to eat a wide variety of foods. No single food or food group can provide all of the nutrients needed for the body to function well. Breastmilk is the only exception as it is a complete food for under-six old children.

Nutritional status of an individual person therefore results from nutrient intake, nutrient requirements, and the body's ability to digest, use and absorb the nutrients that are ingested.

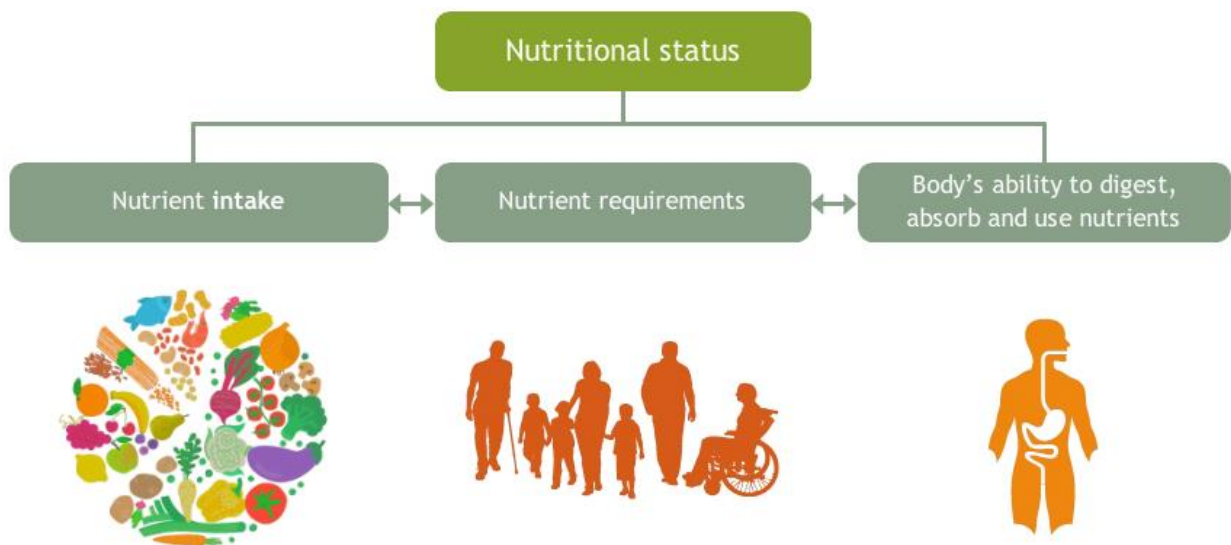


Figure: Determinants of nutritional status

Source: FAO 2015

1.4 Malnutrition

All of the children pictured below are the same age. Which of them suffer from malnutrition?

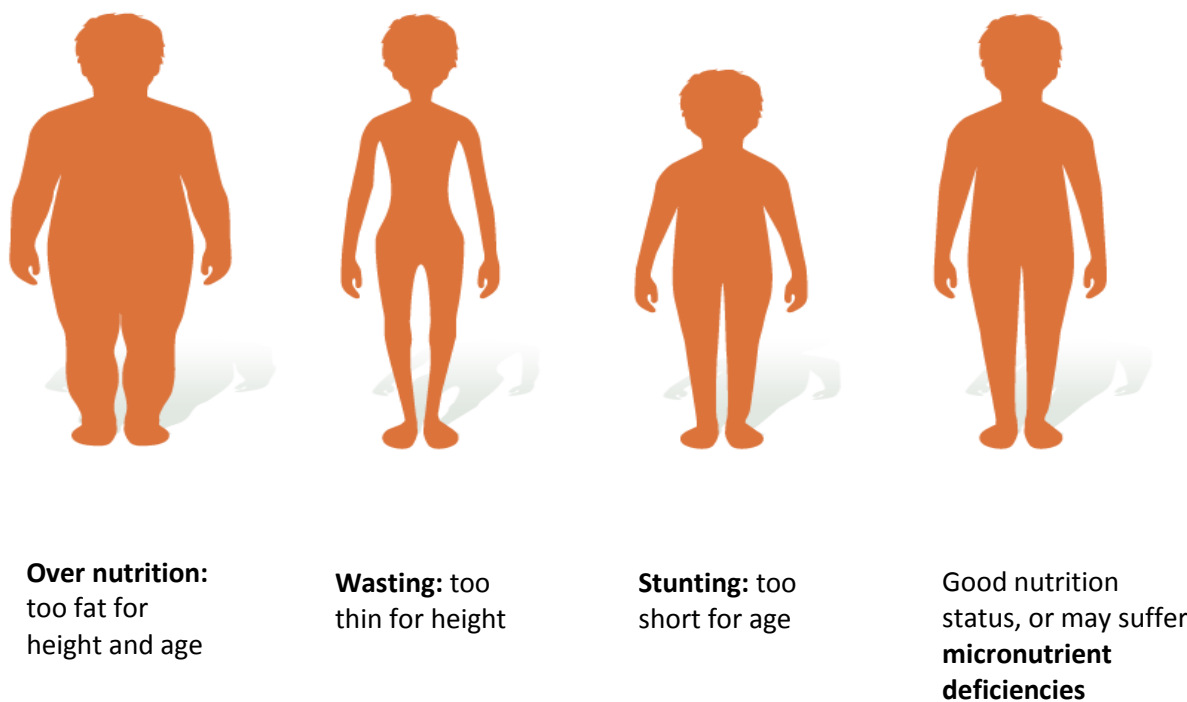


Figure. Types of malnutrition

Source: FAO 2015

1.4.1 Types of malnutrition

Malnutrition is a term that includes over nutrition and undernutrition.

Over nutrition results from too much nutrient intake relative to nutrient requirements based on age, gender, physical activity, height, weight, and health status of the individual. In Ethiopia, this is still rare, but it is becoming more common in populations with increased exposure to energy-dense foods who often live in urban areas. Effects of over nutrition include increased lifetime risk of chronic diseases, including diabetes, cardiovascular disease, obesity and cancer.

Undernutrition is, in general terms, an outcome of insufficient quantity and quality of food and frequent episodes of infectious disease.

Undernutrition describes a range of conditions including being underweight, being short, being thin and being deficient in vitamins and minerals. A child is defined as undernourished if they are very thin or much shorter than the average for their age. The most commonly used indicators of undernutrition are:

- **Wasting:** normally the result of **acute or short-term insufficient food intake** often combined with frequent illness. Results in a child who is dangerously thin (i.e. they have a very low weight for their height).
- **Stunting:** normally an indicator of **chronic or long-term insufficient energy or micronutrient intake** although it has many non-nutritional causes such as helminth infestation and frequent or chronic infection. Results in a child who is very short (i.e. they have a very short height for their age).
- **Underweight:** an indicator assessing adequacy of weight-for-age. The causes of which can be short-term or long-term and are difficult to define.
- **Deficiencies in vitamins and minerals** as a result of a poor quality diet. Micronutrient deficiencies can also result from frequent illness which may increase requirement, utilisation or loss of nutrients.

What are the effects of undernutrition?

Short-term

- Both wasting and stunting significantly increase the risk of mortality in children
- Undernutrition increases the susceptibility to, and severity of, infections in childhood

Long-term

- Functional losses in mental development, ability to learn in childhood, and work productivity in adulthood
- Low birthweight infants remain short into adulthood
- Low birthweight infants are also at increased risk of chronic diseases such as diabetes and cardiovascular disease
- Stunted children are at increased risk of becoming shorter adults; for women, being stunted increases the chances of having a low birthweight baby
- Stunted children also perform less well at school and have lower incomes in adulthood

1.4.2 Consequences of micronutrient deficiency

Vitamin A deficiency

Vitamin A deficiency in children results in severe visual impairment and blindness. Vitamin A deficiency also increases the vulnerability of children to severe illness and death, from common childhood infections as diarrhoeal disease, measles and respiratory infections.



Source: Courtesy of Google Images

Anaemia

Anaemia has multiple causes, one of which is *iron deficiency*. Anaemia has the following consequences:

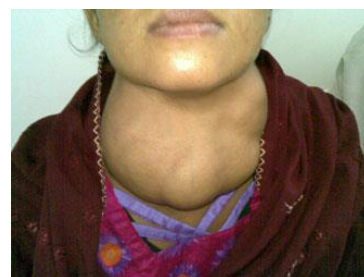
- Tiredness, lethargy, apathy
- Reduced endurance and work capacity resulting from impaired energetic efficiency and lower voluntary activity levels
- Poorer cognitive development in children
- Low birth weight and other poor pregnancy outcomes
- Poor resistance to infections

Zinc deficiency

Zinc deficiency is associated with poor growth, loss of appetite and an impaired immune system. Zinc deficiency increases the risk of morbidity and of infant death from diarrhoea, pneumonia and malaria.

Iodine

A consequence of iodine deficiency is goitre, or swelling of the thyroid gland. Iodine deficiency during the critical window of brain development (foetal life and early infancy) causes mental retardation and cretinism and is the commonest cause of preventable brain damage in children. Iodine deficiency contributes to poor school performance and impaired work capacity



Source: Courtesy of Wikimedia Commons

1.4.3 Causes of undernutrition

Undernutrition is caused by many different factors that often interact with one another. The diagram on this page is based on the UNICEF conceptual framework for undernutrition, developed in the 1990s. This important framework provides a clear depiction of the various factors associated with undernutrition and the distinct levels at which these factors act.

In the framework, the causes of undernutrition are divided into three levels: immediate, underlying and basic.

- **Immediate causes (individual level):** Inadequate food intake and disease are immediate causes of undernutrition. These operate at the individual level.
- **Underlying causes (household and community level):** Household food security, social care for mothers and children, and the health environment and access to health services are underlying causes that contribute to undernutrition.
- **Basic causes (sub-national, national and international level):** Political, cultural, financial and environmental factors also contribute to undernutrition at the basic level.

How nutrition and disease interact?

There is an important interaction between the two immediate causes of undernutrition.

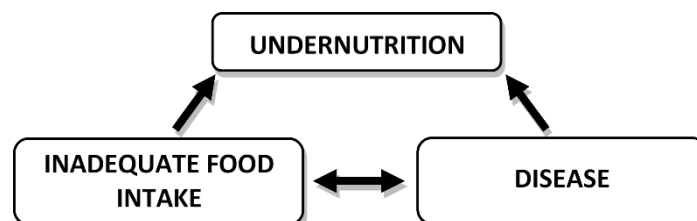


Figure: interaction between disease and nutrition

Nutrition and disease interact in the following ways:

Infectious diseases can cause loss of appetite, loss of nutrients from the body, poor absorption of nutrients consumed, and changes in metabolism.

Inadequate food intake can cause weight loss and micronutrient deficiencies, lowering the body's immunity and increasing susceptibility to infectious disease.

A child who suffers multiple episodes of infectious disease is more likely to have poor nutritional status, and a child with poor nutritional status is more susceptible to infectious diseases of longer duration, severity and incidence – a negative cycle that results in a less healthy child who is experiencing poorer growth and development.

Exercise: Stunting case study

Genet is a mother who was born and raised in a rural farming community in Ethiopia. She is very short. As a child, she was sometimes hungry during the lean season and often had diarrhoea. She was stunted as a child and remains stunted as an adult. Six months ago, Genet gave birth to a baby boy, Awoke, who was also small and had a low birthweight. Genet does not eat much meat or other source of iron and often feels tired. She does not always have the time or energy to cook thick porridge for Awoke. Genet's family grows their own food and they live in a village far from access roads and markets. There is no school in the village. Most families do not have improved latrines and defecate in the open.

The health extension worker recently came to the village and weighed Awoke at growth monitoring and promotion. Awoke is underweight and at risk of stunting. The health extension worker warns Genet that if Awoke does not grow taller, he is less likely to succeed in school or to earn as much money as an adult.

Brainstorm:

What are Awoke's risk factors for stunting? Why is Awoke more at risk of being

1.4.4 Multisectoral nature of undernutrition

As illustrated in the causes of undernutrition conceptual framework, there are many different factors that contribute to undernutrition. Ensuring good nutrition requires the contributions of many different sectors. The range of sectors that need to become involved in efforts to reduce undernutrition are identified in the figure below.

1.4.5 Undernutrition in Ethiopia

Undernutrition is a major public health problem in Ethiopia. About five million people experience food shortages each year, and approximately 2.9 million people were expected

to receive food assistance in 2015. The nutritional status of a population is indicated by the number of children under 5 who suffer from undernutrition.

In Ethiopia:

- 8.7% of all children under 5 years are wasted
- 40.4% of all children under 5 are stunted
- 25.2% of all children under 5 are underweight

Wasting

As of the most recent Demographic and Health survey in 2014, the national prevalence of wasting in Ethiopia is 8.7%, which is poor by World Health Organisation (WHO) standards.

What is the significance of wasting?

Prevalence of wasting in a population can change quickly during shocks that result in food shortages. High or increasing prevalence of wasting in children may indicate an emergency. Severely wasted children are starving and at high risk of death due to infectious diseases. They are also at higher risk of becoming stunted.

Stunting

Ethiopia has shown very good progress in reducing stunting, with a 27% decrease in prevalence among children under five since 1992. As of the most recent Demographic and Health survey in 2014, the national prevalence of stunting in Ethiopia is 40.4%. By WHO standards, stunting remains a public health problem of very high significance.

What is the significance of stunting?

Stunting is an indicator that reflects persistent poverty. Stunting results when children miss out on critical nutrients during critical development periods, either in the womb or as young children. It also results from poor health care access, infectious disease, poor sanitation and hygiene, low maternal education and inadequate child care over time. Stunted children have poorer mental development, lower achievements in school and are less economically productive as adults.

Stunting remains one of the most important social and public health problems in Ethiopia. In 2013, UNICEF's cost of hunger in Ethiopia report showed that:

- The annual costs associated with child undernutrition are estimated at Ethiopian birr (ETB) 55.5 billion, which is equivalent to **16.5% of GDP**.

- 67% of the adult population in Ethiopia suffered from stunting as children.
- 28% of all **child mortality** in Ethiopia is associated with undernutrition.
- 16% of all repetitions in primary school are associated with stunting
- Stunted children achieve **1.1 years less in school education**.
- 44% of the health costs associated with undernutrition occur before the child turns 1 year-old.
- Child mortality associated with undernutrition has **reduced Ethiopia's workforce** by 8%
- Eliminating stunting in Ethiopia is a necessary step for its growth and transformation.

The National Nutrition Programme

These sectors are included in the Ethiopian **National Nutrition Programme (NNP)**. The NNP is a national multi-sectoral programme that sets out Strategic Objectives to improve nutrition and Results to be achieved by the sectors above, each of which has an important role to play to address the determinants of undernutrition.

Strategic Objectives:

1. Improve the nutritional status of women (15–49 years) and adolescents (10–19 years)
2. Improve the nutritional status of infants, young children and children under 5 years
3. Improve nutrition service delivery for communicable and lifestyle related/non communicable diseases affecting all age groups
4. Strengthen implementation of nutrition sensitive interventions in various sectors
5. Improve multi-sectoral coordination and capacity to ensure implementation of the NNP

As per Strategic Objective 5, the NNP provides for multi-sectoral coordination and linkages for nutrition. The purpose is to enhance the nutritional impact of programmatic activity in these sectors. To ensure viable linkages and harmonization among relevant sectors, the Federal Ministry of Health is mandated to house and manage the organizational and management structure of the NNP. The National Nutrition Coordination Body and the National Nutrition Technical Committee were established in 2008 and 2009, respectively, to ensure effective coordination and linkages in nutrition. This revised NNP outlines human resource capacity-building activities, with emphasis on all relevant sectors. These adjustments will ensure that implementation of the NNP is harmonised across all sectors and at different levels, particularly at regional, woreda and community levels.

Institutional arrangements for multisectoral nutrition coordination and linkages

The National Nutrition Coordination Body remains the main mechanism for leadership, policy decisions and coordination of the NNP. Similar multi-sectoral nutrition coordination framework and programme implementation arrangements are provided for at regional,

woreda and kebele levels. The terms of reference, membership, frequency of meetings and the roles and responsibilities of NNP implementing sectors have been detailed in the Guideline for Multi-sectoral Nutrition Coordination.

Exercise: NNP case study

Discuss in groups of two

You and your partner will each be given a card printed with a different sector which participates in the NNP. Explain to your partner how the sector can contribute to reducing undernutrition in Ethiopia. Your partner will then do the same for his/her sector. Listen to your partner's ideas and help him or her to explore. (3 minutes for discussion)

Then explain your ideas to the larger group.

Chapter 2: Diet diversity

2.1 What is dietary diversity and why is important?

Dietary diversity is a measure of the number of individual foods or food groups consumed in a given time period. It can reflect household access to a variety of foods and can also act as a proxy for an individual's consumption of adequate nutrients.

Low dietary diversity is a particular problem in Ethiopia where the diet is frequently based on starchy staples e.g. teff and wheat. The diet is often lacking in animal-source foods, (meat, fish, eggs and dairy). Many contain only small quantities of fresh fruit and vegetables.

While staples are important sources of energy in the diet, many of the important vitamins and minerals essential for a healthy diet are found in greatest abundance in animal-source foods, fruits and vegetables, and legumes. In addition, certain staple foods, such as wheat, maize and millet, can contain high levels of anti-nutrients e.g. phytates, which reduce the absorption of available micronutrients in the food source.

Micronutrient deficiencies are particularly common among low-income rural households, where monotonous diets high in starchy staples and low in micronutrients are the norm, and where adequate amounts of micronutrient-rich foods, such as meat, dairy products, legumes, vegetables and fruit, are frequently unavailable or inaccessible. **Dietary diversification** – the consumption of a wide variety of foods across nutritionally distinct food groups – is a commonly food-based approach used to enhance nutrient intakes.

2.2 What are food groups?

No one single food or food group contains all of the nutrients that the human body requires for optimal function and good health. The human body requires nutrients that come from a variety of foods. To achieve good dietary diversity, it is important to regularly eat a variety of foods and to consume foods from all food groups.

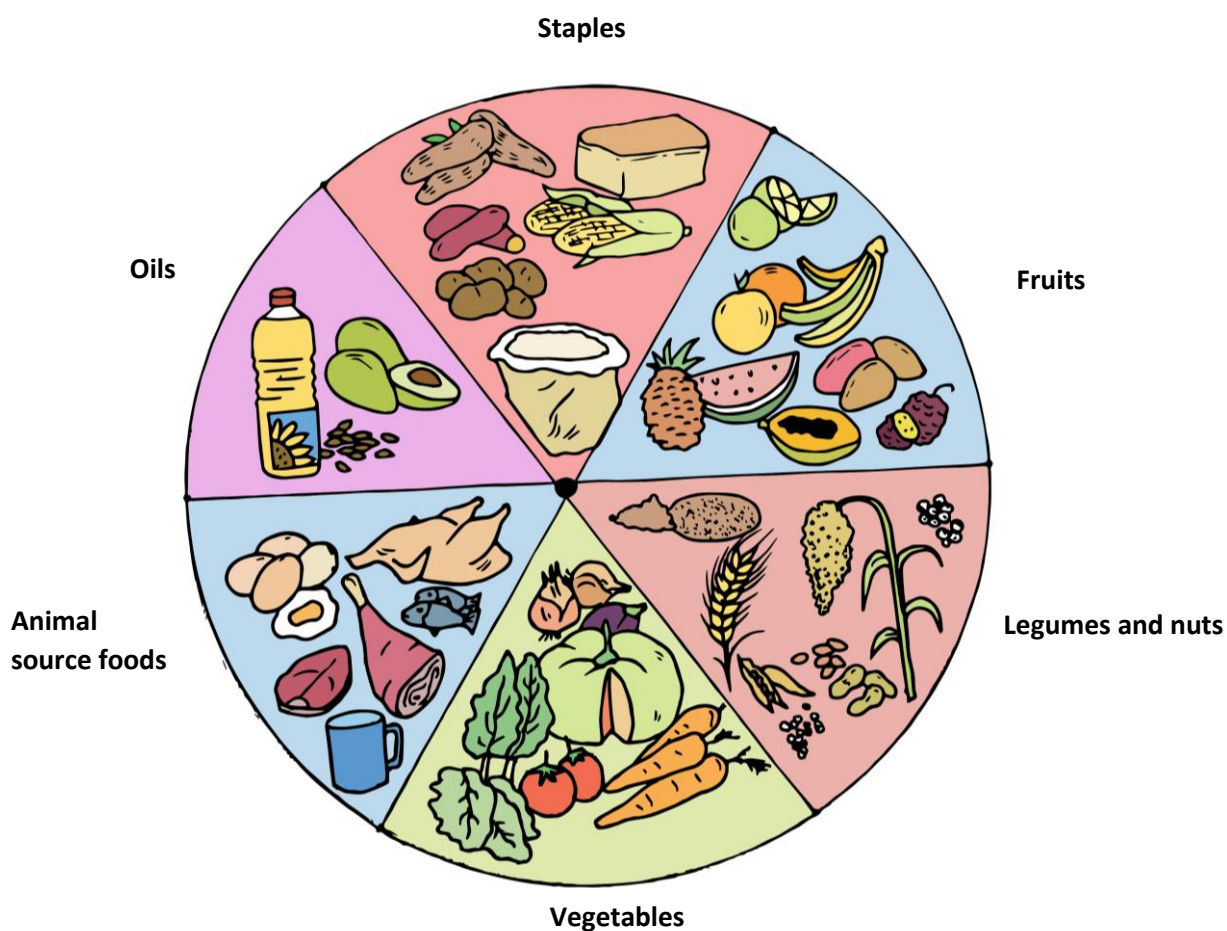


Figure: The six food groups

2.2.1 Staples

Foods in this group comprise the largest part of the diet. Cereal grains such as teff, sorghum, millet, maize, barley, oats, wheat, teff, rice and starchy roots (cassava, potato, sweet potato) are included. Staples are a good source of **energy**.

2.2.2 Legumes and Nuts

This group includes ground nuts, beans, chick peas, and lentils. This food groups is a good source of **protein** in addition to energy.

2.2.3 Animal-Source Foods

Foods from animals including meats, eggs, dairy and fish are good sources of **protein, fats,** and **essential micronutrients** (vitamins and minerals). These nutrients are especially critical for child growth and development in the first two years of life.

2.2.4 Vegetables

Foods in this group include green leaf and yellow vegetables including kale, spinach, celery, cucumber, peppers, broccoli, carrots, cauliflower, pumpkin, onion, tomatoes and others. Vegetables provide **essential micronutrients** (vitamins and minerals). They also provide fibre to aid digestion.

2.2.5 Fruits

Foods in this group include bananas, oranges, lemons, papaya, avocado, peach, guava, watermelon, sweet melon and many others. They mainly provide energy and **essential micronutrients** (vitamins and minerals).













































2.2.6 Fats

Fats include cooking oils, oil seeds, avocado, and oil seeds. Some foods such as animal-source products (meat, milk, and dairy products like butter and yoghurt) also provide **fat**.

2.3 How to get a diversified diet

One should eat a variety of foods at every meal for a diversified diet i.e. at least four or more groups as indicated in the table below.

Table: Ways on how to consume diversified meal

 <h1 style="text-align: center;">Eat Diversely!</h1> <div style="text-align: right; font-size: small;"> SURE programme Ministry of Health & Ministry of Agriculture </div>					
For good health eat at least 4 different food groups at every meal!					
STAPLES	LEGUMES/NUTS	VEGETABLES	ANIMAL FOODS	FATS	FRUITS
Millet 	Lentils 	Kale 	Egg 	Cooking oil 	Mango 
Sorghum 	Peas 	Broccoli 	Fish 	Butter 	Papaya 
Maize 	Broad beans 	Carrot 	Beef 	Sesame Seeds 	Avocado 
Teff 	Chick peas 	Orange sweet potato 	Lamb 	Linseed 	Banana 
Barley 	Beans 	Pumpkin 	Poultry 	Sunflower seeds 	Grapes 
Wheat 	Ground nut 	Cabbage 	Milk 	Pumpkin seeds 	Pineapple 
Oats 		Squash 	Yoghurt 	Avocado 	Guava 
		Tomatoes 			Orange 

Exercise: Mixed meal game

The facilitator will first draw a plate on a flipchart and ask the Participants to name foods that make up a usual meal.

1. Participants must estimate (and draw) the proportions of the plate that are taken up by each food group.
2. The facilitator breaks Participants into small groups of 3.
3. Refer Participants to the **Seasonal Food Calendar** on the next page to understand which foods belong in which food groups.
4. In small groups, Participants draw another plate on their flipchart and divide it up into portions by food groups (staples 50%; fats 10%; animal source food/legumes 10%; vegetables and fruits 30%).
5. Accordingly, suggest new foods to replace the usual meal foods (write on the plate).
6. Post your new plate on the wall.
 - How are these meals improved?
 - Which is the most nutritious?

- Which is the most appealing?
- Which is the most affordable and realistic?

Seasonal food calendar:

The seasonal calendar shown in the table below helps individual households to plan ahead on how to diversify their meal depending on the availability of various food groups in different seasons.

Table: Ethiopia Seasonal Food Calendar






























Plant



Harvest




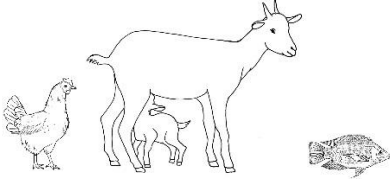
Eat

Food Group	Type	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Staples	Teff 												
	Barley 												
	Millet 												
	Sorghum 												
	Maize 												
	Wheat 												
Legumes/nuts	Lentils 												
	Beans 												
	Ground nuts 												
	Chick peas 												
Vegetables	Kale / swiss chard 												
	Pumpkin 												
	Orange sweet potato 												
	Carrot 												
	Broccoli 												
	Squash 												
Animal foods	Egg 												
	Milk 												
	Meat 												
	Fish 												
Fruits	Banana 												
	Mango 												
	Orange 												
	Papaya 												
	Guava 												
Oils	Cooking oil 												
	Avocado 												

2.4 Dietary diversity in Ethiopia

Ethiopia has very low levels of dietary diversity. The following graph shows the proportion of children 12-23 months with diets containing meat, fish, poultry or eggs, by country.

There are 6 ways by which agriculture can help increase the quantity and quality of diverse foods available for consumption?

<p>1. Community or home vegetable and fruit gardens</p> <p>Support for household level production of micronutrient-rich foods (legumes, green leafy vegetables, fruits). Encourage the household to reserve some of these foods for consumption by children and pregnant/lactating mothers.</p> 	<p>2. Production of fish, poultry, and small animals</p> <p>Animal foods have high levels of essential micronutrients such as vitamin A, iron and zinc. These foods are expensive to buy but may be available for household level consumption if raised by households.</p> 
<p>3. For larger farms - commercial vegetable and fruit production</p> <p>To provide nutritious foods at reasonable prices through effective and competitive markets, which lower consumer prices without reducing producer prices.</p>	<p>4. Improve storage and food preservation facilities</p> <p>This reduces loss of nutrients over time due to exposure to the environment. At household level, better cooking methods and improved storage will also preserve the nutrients in foods.</p>
<p>5. Improve micronutrient levels in soils and plants, which will improve the composition of plant foods and enhance yields</p> <p>Correct soil quality and pH and increase soil mineral content depleted by erosion and poor soil conservation. Improve agricultural practices, seed quality, and plant breeding.</p>	<p>6. Agriculture extension workers support increased consumption of nutrient-rich foods.</p> <p>This will both increase dietary diversity and generate more demand in the market for nutritious foods, improving opportunities to generate income through production of nutritious foods, and lowering market prices over time.</p>

Exercise: Livelihoods

1 HDA and 1 ADA (15 minutes)

1. Facilitator asks participants to list the different livelihood zones of their district.
2. Facilitator should assign 1 livelihood to each pair.
3. In pairs of HDA/ADA, discuss factors that contribute to lack of dietary diversity specific to the assigned livelihood
4. Participants list ways that agricultural practices in your livelihood zone have contributed to good nutrition (e.g. contribution to diets and income)
5. Participants list ways that agricultural practices in your livelihood zone may have contributed to undernutrition (e.g. lack of hygiene, women's workload)

Facilitator asks each pair to present their ideas to the group.

Chapter 3: Infant and young child feeding (IYCF) practices

The first two years of a child's life are particularly important, as optimal nutrition during this period lowers morbidity and mortality, reduces the risk of chronic disease, and fosters good child development. Infants and children under two require a diet that is sufficiently dense in energy and nutrients to maintain the process of rapid growth during this stage of life.

3.1 Infant and Young Child Feeding recommendations

Infant and young child feeding (IYCF) is a key area to improve child survival and promote healthy growth and development. The World Health Organization recommends the following IYCF practices:

- Early initiation of breastfeeding within 1 hour of birth;
- Exclusive breastfeeding for the first 6 months of life; and
- The introduction of nutritionally-adequate and safe complementary (solid) foods at 6 months together with continued breastfeeding up to 2 years of age or beyond.

Breastfeeding

Exclusive breastfeeding for 6 months has many benefits for the infant and mother. Breast milk has protective factors to support and stimulate the infant's immune system. Early initiation of breastfeeding, within one hour of birth, protects the newborn from acquiring infections and reduces newborn mortality. The risk of mortality due to diarrhoea and other infections can increase in infants who are either partially breastfed or not breastfed at all.

Breast milk is also an important source of energy and nutrients in children aged 6 to 23 months. It can provide half or more of a child's energy needs between the ages of 6 and 12 months, and one third of energy needs between 12 and 24 months. Breast milk is also a critical source of energy and nutrients during illness, and reduces mortality among children who are malnourished.

Complementary feeding

At 6 months of age, an infant's need for energy and nutrients starts to exceed what is provided by breast milk, and complementary foods are necessary to meet those needs. An infant of this age is also developed enough to eat complementary foods.

If complementary foods are not introduced around the age of 6 months, or if they are given inappropriately, an infant's growth may falter.

WHO and UNICEF recommended the following guiding principles to ensure appropriate complementary feeding practices:

- continue frequent, on-demand breastfeeding until 2 years of age or beyond;
- practice responsive feeding (e.g. feed infants directly and assist older children. Feed slowly and patiently, encourage them to eat but do not force them, talk to the child and maintain eye contact);
- practice good hygiene and proper food handling;
- start at 6 months with small amounts of food and increase gradually as the child gets older;
- gradually increase food consistency and variety;
- increase the number of times that the child is fed: 2-3 meals per day for infants 6-8 months of age and 3-4 meals per day for infants 9-23 months of age, with 1-2 additional snacks as required;
- use fortified complementary foods or vitamin-mineral supplements as needed; and
- increase fluid intake during illness, including more breastfeeding, soft and favourite foods.

3.2 Infant and Young Child Feeding practices in Ethiopia

According to the 2011 Ethiopian Demographic and Health survey report, in Ethiopia

- 52% of mothers initiated early breastfeeding (within 1 hour of birth)
- 52% of children under 6 months were exclusively breastfed
- 96% of children had continued breastfeeding at 1 year; and 82% at 2 years
- 49% of children 6-8 months had timely introduction of complementary foods
- Only 5% of children 6-23 months had minimum dietary diversity (at least **4 food groups** fed per day)
- Only 4% of children 6-23 months had the minimum acceptable diet (number of meals per day based on age and breastfeeding status plus at least **4 food groups** fed per day)

Findings from formative research in Ethiopia identified common IYCF practices, which are summarized in the table below:

Table: Summary of common problems in IYCF practices in Ethiopia

Child age	Recommended Practice	Common Problems
0-5 months	Exclusive breastfeeding; on-demand and frequently, day and night.	<ul style="list-style-type: none"> • Delayed initiation of breastfeeding • Giving pre-lacteal feeds in place of colostrum • Feeding water, milk, or other liquids, usually by bottle • Premature introduction of complementary foods because the mother feels her milk is not enough to nourish the baby
6 up to 9 months	Continued breastfeeding on demand. Gradual introduction of soft, nutritious complementary foods.	<ul style="list-style-type: none"> • Delay in introducing complementary foods at 6 months • Dilute or watery foods with low nutrient density • Insufficient dietary diversity, especially of animal source foods
9 up to 12 months	Continued breastfeeding. Increasing variety of foods, including mashed family foods, fruits and vegetables.	<ul style="list-style-type: none"> • Low frequency of feeding • Low nutrient density: starchy or dilute foods continued • Lack of variety of foods • Fear of children choking or being unable to digest meat or thick foods
12 to 24 months	Family meals, plus snacks or special foods between meals. Continued breastfeeding.	<ul style="list-style-type: none"> • Inadequate amounts consumed per meal (small servings, lack of supervision, lack of appetite) • Lack of variety of foods • Low frequency of feeding
7 to 24 months	Careful monitoring of child's intake; encouragement and assistance with feeding to ensure adequate intake.]	<ul style="list-style-type: none"> • Child's refusal or lack of interest in eating • Lack of persistence or coaxing of a child with poor appetite • Quantity consumed is unknown; child is not given own serving of food
Sick child	Continue or increase frequency of breastfeeding. Continue feeding regular foods or switch to soft foods. Provide special foods or more food for several days once child feels better.	<ul style="list-style-type: none"> • Breastfeeding and feeding dramatically reduced or stopped, due to belief that food will worsen illness • Period of convalescence not recognized

3.3 Age-appropriate IYCF messages

Source: All Illustrations below are produced by the Alive & Thrive project (2015) managed by FHI 360 and reprinted with permission.

1.3.1 From birth to 5 months

Message 1: Start breastfeeding within one hour of birth.



- Early skin to skin contact between mother and baby helps to start breastfeeding and comforts the baby.

Message 2: Feed your baby colostrum (yellow milk).

- Ensures that the baby receives the colostrum, or “first milk”.
- Colostrum contains growth factors, which help the infant’s body to mature and function well.
- Colostrum helps regulate the baby’s developing immune system.
- Colostrum is rich in essential nutrients.
- Colostrum comes in small volumes, just right for the new baby.

Message 3: Ensure good positioning and attachment

- This helps the baby to suckle well and production/supply of breastmilk

How to ensure good positioning

- The baby’s body should be straight, not bent or twisted, but with the head slightly back
- The baby’s body should be facing the breast not held flat to mother’s chest or abdomen, and he or she should be able to look up into mother’s face
- The baby should be close to mother
- Mother should support the baby’s whole body, not just the neck and shoulders, with her hand and forearm

How to ensure good attachment

- Baby's mouth is wide open
- More of the mother's darker skin (areola) can be seen above the baby's mouth than below
- Baby's lower lip is turned outwards and chin is touching mother's breast



Message 4: Don't give your baby any other liquids, not even water.



- A newborn baby's stomach is the size of two chick peas. If you give any other liquids, the baby will not be able to drink the colostrum.
- Breastmilk is a complete food for an infant from birth until six months. It contains all the essential nutrients necessary, including water.

- Giving any other liquids, including water, increases the chances of a baby getting diarrhoea or other infectious diseases.
- Babies exclusively breastfed for the first six months have six times greater chance of survival than babies given other liquids or formulas.

Message 5: Empty one breast of milk before switching to the other.

- The milk at the end of the feed from a single breast has higher fat content than the milk at the beginning of the feed. This will promote growth and will help the baby to feel full.



Message 6: Breastfeed whenever the child would like to, day or night, at least 10 times a day.

- Mothers should respond to the baby's needs and desire to breast feed anytime during the day or night
- Mothers should feed babies on demand, with love, patience and affection



1.3.2 From 6 months to 11 months

Message 1: Start feeding your child complementary food when he or she is six months.



- At six months, a child needs more energy and nutrients than what breastmilk alone can provide.
- Mothers and fathers should not wait until the infant is older than six months to begin feeding complementary foods.
- Timely introduction of complementary foods is essential to the good health and development of the child.

- A good complementary food for infants is soft porridge. Feed the child one small coffee cup of porridge two times per day (for children 6-8 months), or three times per day (for children 9-11 months), in addition to breastmilk.
- Porridge can be made from various cereals and pulses. When preparing, mix 3 handfuls of cereal and 1 handful of pulses to increase the nutritious content.
- Thicker porridge has denser nutrient content. As the child grows older, pay attention to their capacity to swallow and accordingly thicken the porridge. Eventually it should be thick enough to feed with your thumb.
- Because thin gruel will not satisfy your child's hunger, it may lead to improper growth and undernourishment.

Message 2: Fathers, support your wife by providing eggs, milk, vegetables, or fruits for your baby's food.



- Fathers have a special role to play in the family by ensuring the health and good nutrition of their babies.
- Fathers may consider a variety of ways to acquire special foods, including investing in household livestock or small crops for the child to consume, or selling products to get income to buy these foods.
- Fathers may also support mothers by ensuring their access to household funds to buy such foods for the baby.

Message 3: Add a variety of foods to your child's porridge to ensure it is nutritious.

- Adding in dried meat, eggs, milk, oil, vegetables, and fruit is useful for your child's growth and strength.
- If possible, use milk instead of water to prepare the porridge. (You may also give the child cow's milk to drink, but this should not replace the child's complementary food.)
- Mash the food types that you will add to fortify the porridge so that your child can easily swallow the food.
- It is very beneficial to your child's health to eat animal products (meat, liver, fish, and eggs).
- Ripe and yellow-coloured fruits (mango, papaya) and vegetables (carrots) are good sources of Vitamin A.
- Dark green vegetables (collard greens/kale) and pulses are sources of nutrients such as iron.
- Add oil or butter to the complementary food that is prepared.
- Use iodised salt while preparing the porridge.



Message 4: Wash your hands with soap and water before preparing food and feeding the baby.

- To prevent diarrhoea and other diseases, never prepare food or feed your baby without washing your hands with soap and water.
- The child's food should be prepared in a clean environment.
- Touching food with unclean hands may cause food to spoil.
- Dishes used to eat food all have to be clean.
- Feed your child using cups. It is easy to keep cups clean.
- Do not use bottles because they are difficult to clean and may cause diarrhoea.

- It is necessary to store infants' food in a clean place to prevent diarrhoea and the spread of contagious diseases.



Message 5: Between meals and breastfeeding, also give the child one or two snacks such as pieces of fruit, soft cooked vegetables, or fried bread.



- Breast milk is an important source of food and can provide about half of the energy requirements of a child between 6 and 11 months of age.
- Because infants' stomachs are small, they cannot eat much at one sitting. Therefore, it is necessary to feed them small servings frequently.
- Give mashed soft fruits or mashed cooked vegetables, for example: half of a mango, a small avocado, or a small sweet potato. Other snacks might include fresh bread, fried potatoes, etc.
- Give these small pieces of food at least once or twice a day as a snack.

Message 6: Continue breastfeeding your child.



- Breastfeed whenever the child would like, day or night, at least 8 times a day.
- Breast milk is an important source of food and can provide about half of the energy requirements of a child between 6 and 11 months of age.

Message 7: Warm the child under the sun for 20 – 30 minutes per day so that he can grow properly.

— Sunbathing allows your child to get Vitamin D, which is good for their health, bone growth, and strength.

How much a 6 to 8 month old infant eats every day?

- Two small coffee cups of cooked, soft porridge. Feed the child one small coffee cup of porridge at each sitting.
- One small coffee cup of milk, either added to the porridge or given separately.
- For snacks, give two to three spoonfuls of mashed fruits or mashed cooked vegetables.
- Continue breastfeeding on demand.

How much a 9 to 12 month old infant eats every day?

- Three small coffee cups of cooked, soft porridge. Feed the child one small coffee cup of porridge at each sitting.
- One small coffee cup of milk, either added to the porridge or given separately.
- For snacks, give mashed soft fruits or mashed cooked vegetables, for example: half of a mango, a small avocado, or a small sweet potato.
- Continued breastfeeding on demand.

1.3.3 From 12 to 23 months

Message 1: Infants from the age of 12 to 23 months may eat from the same food that the family eats 3 to 4 times a day and should be given one or two snacks.



- The child 12-23 months old may begin eating from the family's food.
- Food given to the child should include various types including milk, eggs, meat, vegetables and fruits.
- Feed the child one coffee cup of food (porridge or family food) 3 to 4 times per day, in addition to breastmilk.

- An infant 12-23 months can safely chew cooked meat that is cut into small pieces. Meat is an important source of nutrients for developing children.
- Because infants' stomachs are small, they cannot eat a lot at one sitting. Therefore, frequent small feedings are necessary.
- You can give snacks multiple times. This can be small pieces of ripe papaya, mango, avocado, bananas and other fruits and vegetables, fresh bread, fried potatoes, sweet potatoes, pita, etc.
- It is necessary to store the prepared foods carefully to prevent diarrhoea and other contagious illnesses.
- Don't forget to wash your hands with soap before preparing food and feeding your child to prevent diarrhoea and other contagious illnesses.

Message 2: As your infant grows older, increasing the infant's food portions and varieties of food will help provide the nutrition your child needs.

- Alternate the type of food and its preparation every day.
- It is necessary to encourage your child to eat more as your child grows older.

Message 3: Feed your child with love, patience and happiness so that your child finishes their meal and can grow properly.



- Because new foods will be unfamiliar, feed the infant patiently, soothingly, and with playfulness.
- Let the infant have his or her own plate so that the amount they have consumed is known.
- Forcing the child to eat will cause the child to hate food. Persistently encourage your child to finish his or her food but be gentle and loving.

How much a 12 to 23 month old infant eats every day?

- Four small coffee cups of porridge and family's food. Feed the child one small coffee cup of food at each sitting.
- Two small coffee cup of milk, either added to the food or given separately.
- For snacks, give mashed soft fruits or mashed cooked vegetables, for example: half of a mango, a small avocado, or a small sweet potato.
- Continued breastfeeding on demand.

- Because infants cannot eat and finish meals on their own, you will need to keep feeding the infant until the meal is finished.

1.3.4 Sick child

Families and children in difficult circumstances require special attention and practical support. Wherever possible, mothers and babies should remain together and get the support they need to exercise the most appropriate feeding option available. Breastfeeding remains the preferred mode of infant feeding in almost all difficult situations including for low-birth-weight or premature infants; HIV-infected mothers; adolescent mothers; infants and young children who are malnourished; and families suffering the consequences of complex emergencies. Complementary feeding should also begin at six months and continue until 24 months in such circumstances.

Message 1: During an illness, feed your child breast milk and complementary food frequently to recovery.



- The need for liquids and food substantially increases during an illness.
- As there is a loss of appetite during an illness, take the time to feed your child small amounts of food frequently and with patience.
- If your child has a favourite food, encourage your child to eat it. Continue giving your child breast milk and complementary food during the illness so that the child does not grow weak or lose weight.

Message 2: As soon as your child begins to recuperate from the illness, feed your child an additional meal for two weeks, in addition to what your child used to eat previously.

- It is necessary to give plenty of breast milk and complementary food to infants who are just recovering from an illness so that their strength and normal weight gain returns.
- Feed your child one extra meal for two weeks after the illness.
- If the child's appetite remains low due to the illness, it is necessary to provide extra attention and encouragement to eat complementary food.

Message 3: Before preparing food and feeding your child, it is necessary to wash your hands with soap. This will

prevent diarrhoea and other transmittable diseases.

- Touching food with unclean hands may cause food to spoil.
- Dishes used to eat food all have to be clean.
- Feed your child using cups. Do not use bottles because of the risk that it may cause diarrhoea.
- It is necessary to store infants' food in a clean place to prevent diarrhoea and the spread of contagious diseases.



Message 4: Make sure your child takes Vitamin A when he or she is six months old.

- Because your child needs to take Vitamin A every six months (or twice a year) starting from six months until the age of five, go to a health facility or consult your health extension worker.
- Vitamin A is good for your child's eyesight and immunity.

Message 5: Use iodized salt when preparing food for the family, as it will improve your family's health.

- When using iodised salt, salt your food after the food is already cooked, as iodine depletes if cooked for a long time.
- Use a container with a lid to store iodized salt, as this prevents the depletion of the iodine over time.
- Pregnant mothers especially should use iodized salt so that the newly born child is healthy.

Chapter 4: Agriculture for nutrition

Smallholder farms are responsible for about 90 percent of the food produced in Ethiopia. Yet, these households are often in a permanent state of **food and nutrition insecurity**, suffering from poor quality diets and undernutrition. Smallholders provide food for themselves and also for their communities and a growing urban population.

The role of nutrition-sensitive agriculture is to reduce poverty and undernutrition among smallholder farmers in their roles as both producers and consumers and help them to optimize their contribution to agricultural production and to food systems as a whole.

Agriculture is of fundamental importance to human nutrition, both as a determinant of food consumption, and through its role in livelihoods (income generation). In Ethiopia, agriculture is a primary livelihood for many households. Agriculture also plays a fundamental role in food systems and influences the varieties and prices of foods that are widely available and accessible to a given population. The agriculture sector therefore provides an essential entry point to improve nutrition.

4.1 Food and nutrition security

Agriculture has a key role to play in **food and nutrition security**.

Food security is when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (World Food Summit, 1996)

Nutrition security is when all people, at all times, consume food of sufficient quantity and quality in terms of variety, diversity, nutrient content and safety to meet their dietary needs and food preferences for an active and healthy life, coupled with a sanitary environment, adequate health and care (State of Food Security, 2013 FAO)

The figure below shows how food security and nutrition security are inter-related. Nutrition security includes food security plus adequate hygiene, health and care environments.

4.2 Links between agriculture and health

Agriculture and food systems are linked to food security, nutrition and health. While they can support health through the provision of food and nutrition and by generating income that can be spent on food and health care, they can also be harmful to health. Negative

health impacts may arise through the contamination of food and water, or may be related to specific practices such as crop cultivation and animal rearing.

Bi-directional links between agriculture and health

- Poor health in farmers can lead to reduced productivity, a decline in household income and food insecurity.
- Poor health in agricultural producers also reduces their ability to learn about and try new farming practices. Healthier producers are more productive and able to drive the development of agricultural systems.
- Poor production may lead to poor harvest and then to food insecurity. Food insecurity leads to poor food availability and access. This condition leads to undernutrition and poor health.
- Undernutrition, overnutrition and poor health affect the demand for food (quantity, quality and diversity), the prices populations are willing to pay for food and consequently the market price of food.
- Foodborne illnesses can reduce the demand for agricultural outputs which may then have consequences for agricultural producers.
- The main effect at the household level is the shock due to cost of illness necessitated by out of pocket expenses for transport, clinic visits, treatment, alternative medicines etc.
- The main effect at the sectoral level is consumers changing purchasing behaviour in response to disease scares.

4.3 Food and nutrition security in Ethiopia

There is low food security in Ethiopia.

- Low dietary diversity is reported in 30% of households (consuming 3 or fewer food groups per week)
- 40% of households are food energy deficient (less than 2,550 kcal per adult per day consumed)
- 50% of households sourced a very high portion (>75%) of their total calories from starchy staples, i.e. consume a highly unvaried diet

In addition to the above information on food security, the following statistics are relevant to nutrition security in Ethiopia:

- 46% of households do not have access to an improved source of drinking water
- Only 8% of households have access to improved sanitation

- Advice or treatment from a health care facility was sought for 32% of children with diarrhoea

Exercise: Role of agriculture in nutrition

- How can agricultural practices improve water access?
- How can agricultural practices improve access to adequate diverse foods?
- What are the ways by which the agriculture sector can contribute to sanitation, the health environment or access to health services (aspects of nutrition security)?

4.4 Agricultural practices in Ethiopia

Studies have identified common problems associated with poor agricultural practices in Ethiopia and these are summarized in the table below:

Table: Common problems associated to poor agriculture practices in Ethiopia

	Recommended practices	Common Problems in Ethiopia
Land management	Good soil quality management including crop rotation, intercropping, agroforestry, and conservation farming.	<ul style="list-style-type: none"> • Soil degradation • Pests and diseases in the soil • Resource utilisation (nutrients, soil) not optimised due to monocropping • Soil erosion due to improper tillage and drainage practices
Water management	Good water quality management including control of livestock, use of improved latrines, appropriate irrigation methods and harvesting of water during rainy season.	<ul style="list-style-type: none"> • Lack of water harvesting during rainy season • Lack of soil-appropriate irrigation methods • Water contaminated due to animal or human defecation • Lack of water harvesting during rainy season • Lack of soil-appropriate irrigation methods • Water contaminated due to animal or human defecation
Selection and diversity of crops	Crops selected to optimise food security, commercial potential, yield or diversity of consumption.	<ul style="list-style-type: none"> • Lack of variety of crops • Lack of use of improved varieties of seeds • Lack of multi-year plants or trees
Livestock	Animal source foods are produced for consumption, with improved or higher yield varieties reared and appropriate animal husbandry practices.	<ul style="list-style-type: none"> • Manure burned as a fuel in the home rather than used to fertilise soil • Livestock/poultry are not confined and kept away from the house or water sources • Animal source products are sold and not kept for family or child consumption • Animal feed may not be of sufficient quality or quantity, and livestock are not robust and healthy
Income from agriculture	Women's participation in agriculture increases income, and incomes are used for nutritious foods or health care.	<ul style="list-style-type: none"> • Women's participation in income-generating activities is limited • Women have limited access to household resources • Income not reserved for family health or nutrition uses

4.5 Nutrition sensitive agriculture messages

4.5.1 Selection and diversity of crops

Crop selection must be done with consideration of multiple factors, including: suitability for the agro-climate and soil, availability of water, level of risk, and required investment. Diversity of crops should also be considered.

Message 1: Provide nutritious foods for your family with poultry, small livestock, vegetable gardening

- Maximise your family's access to animal source foods, vegetables and fruits by producing them for consumption at your own farm.
- These foods can be expensive to buy, therefore own production may be an appropriate solution.

Message 2: Plant different crops to be harvested at different times of year

- It is important that the family and young children eat multiple food groups throughout the year.
- Consider planning crops that will increase availability of diverse foods over all seasons and months.

Message 3: Grow plants that live for more than one year, which is useful for food security.



- Some trees and shrubs can live for many years and produce foods.
- Trees/bushes can also improve soil management through agroforestry.

Message 4: Grow a variety of cereals whenever possible. Intercrop with legumes

- Grow more than one cereal for diversity and improved land management.
- Intercrops different cereals with legumes or vegetables for soil quality and variety.

Message 5: Grow diverse foods such as vegetables and fruits to eat and to sell



- In appropriate agro-climates, where commercial production is feasible, consider growing such crops to be sold on the commercial market.
- Grow some vegetables and fruits for household consumption.

Message 6: Attend a farmer demonstration centre or talk to your agriculture extension agent for help with crop selection.

- Your agriculture extension agent will help to consider your farm's specific circumstances including soil quality, access to water, and current crops.
- Consider growing crops from multiple different food groups.

Message 7: Use improved seed varieties.

- Improved seed varieties may have better survival properties, or may produce higher yields.
- If a farmer does not have the necessary improved seed varieties or inputs, encourage him or her to discuss options with the local farmer's cooperative group, the agriculture extension worker, or kebele officials.

Message 8: Consider producing and eating nutritious foods in your area that are available but not commonly consumed, such as wild fruits.

- This will help to provide increased access to diverse foods.
- This will maximise access to various food groups all year round.

4.5.2 Land Management

Sustainable agricultural practices are linked with nutrition. The quality of the soil is important to nourish healthy plants and make them more nutritious for consumption. Quality soils also promote higher agricultural yields; it also results in food that is of higher nutrient-content and therefore is more nutritious for human consumption.

Message 1: Rotate crops among different fields



- Crop rotation, or planting different crops on the same field in successive years, helps to control pests and diseases in the soil
- Nutrient depletion is reduced, as different crops use nutrients in different quantities
- Crops belonging to different families should be rotated each 2-3 years

Message 2: Practice intercropping (rows of legumes and/or vegetables with main staples)



- Intercropping maximises the use of land, nutrients, water and sunshine available, by planting crops of different heights/root depths together
- Intercropping reduces erosion.
- Use of intercropping also increases crop diversity, which is good for soil quality.

Message 3: Practice agroforestry (planting trees or shrubs to reduce erosion) in or around planting fields



- Trees and shrubs have deep roots that help to keep the soil firm and reduce erosion.
- It is useful to plant such trees in or around the crop fields to keep soil in place.

Message 4: Practice conservation farming and minimum tillage methods to reduce soil erosion, such as terracing

- Talk to your agriculture extension worker about appropriate conservation farming methods to reduce erosion.
- Some techniques include terracing and minimum tillage methods.

Message 5: Use drainage methods to prevent excessive soil water logging or run off

- Water logging of the soil increases run off and erosion of the topsoil. Building good drainage around the farm is very important to preserve soil.

Message 6: Plough manure from livestock back into the soil to fertilise it

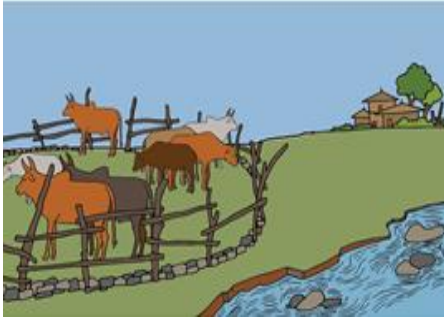


- Manure is a natural fertiliser which replaces essential nutrients back into the soil, providing for higher crop yields and more nutritious crops.
- Avoid the improper use of manure.
- Compost manure completely to kill pathogens, and incorporate it into soil at least two weeks prior to planting.
- Do not harvest produces within 120 days of a manure application.

4.5.3 Water Management

Good water management practices are essential both for agricultural productivity, and for the good health and hygiene of the family.

Message 1: Keep animals away from water sources



- This will prevent animal faeces from running off fields and contaminating water sources, causing diarrhoea and other diseases.
- Infants and young children need clean water to reduce infection and ensure good growth and development.
- The family's health care expenses will be reduced with fewer illnesses.

Message 2: Use improved latrines, do not practice open defecation



- Use of improved latrines prevents human faeces from running off from fields and contaminating water sources.
- Good sanitation will reduce diarrhoea in infants and young children. This will help to improve their growth and development.
- The family's health care expenses will be reduced with fewer illnesses

Message 3: Filter or use settling ponds to improve water quality.

- Safe water sources are necessary for good nutrition and health.
- Water quality can be improved by using filters or settling ponds, in addition to ensuring good sanitation and hygienic practices around the farm.

Message 4: Harvest water during the rainy season

- Reliance on rain fed agriculture alone reduces the variety and yield of crops.
- Safe methods to harvest water during the rainy season should be employed to increase water availability throughout the year.

4.5.4 Livestock

Livestock make an important contribution to agriculture and to the nutrition of the family.

Message 1: Raise poultry, goats or sheep, or larger animals, or aquaculture, especially high yielding or improved varieties



- Poultry, livestock or aquaculture can make a very important contribution to the diet of your family and community
- Use high yielding or improved varieties to increase the productivity of animal source foods

Message 2: Use confined/caged poultry production systems

- Use of cages protects chickens and prevents them from getting into the house and causing illness
- Your local AEW will be able to advise you on caged poultry systems, including:



- Eggs and chickens contribute to a nutritious, balanced diet, which is especially important for children, nursing mothers and people who are ill
- Provide simple houses or shelters and perches inside houses to protect chickens and give a shelter for laying eggs
- Give unlimited access to clean water
- Nutritious feeding is important to increase productivity
- Control the birds' health daily and vaccinate
- Isolate a bird when it becomes ill, call the veterinary assistant or kill the bird

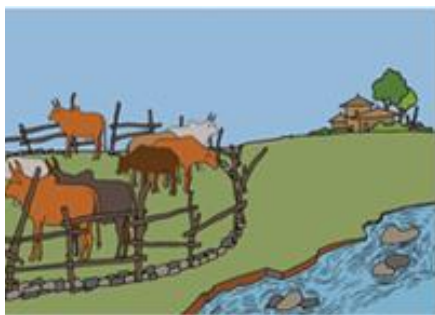
Message 3: Attend livestock demonstrations to learn how to care for livestock and keep them healthy

Your local AEW will be able to advise you on care of livestock, including:

- Feed only clean, fresh and dry fodder that does not have mould.

- Provide a diverse diet of feeds such as grasses and legumes, tree leaves and fresh kitchen remains.
- Always have fresh water for livestock to drink at any time.
- Clean the feeding trough and water bucket every day.
- Feed confined livestock at least 3 times/day and at the same time every day.
- Vaccinate livestock and deworm before and after rains
- Wash animals with salt water, spent oil or repellent herbs to prevent external parasites

Message 4: Keep livestock out of the house to avoid infectious disease



- Livestock faeces cause infectious diseases
- Infants and young children who are sleeping or crawling around on the house floor are especially at risk of infection due to contact with livestock faeces
- Ensure that children sleep on a raised platform and not on the floor

Message 5: Keep eggs and milk for consumption

- There are highly nutritious foods that make a very important contribution to the diet
- Animal source food hygiene and safety starts with what the animals eat since what goes into an animal is what comes out as a food



- Clean the udder and teats before milking
- Keep milk and milk products in a clean and easy to clean container (if possible aluminium can)
- As a “rule of thumb” eat animal source food fresh and cooked

4.5.5 Income from Agriculture

Agricultural productivity can have a positive impact on nutrition by providing money to diversify the family’s diet and to ensure health care treatment when children or family members are ill.

Message 1: Fathers and mothers, allocate some money to buy nutritious foods at the market



- Use some of your money to buy nutritious foods for your family
- Focus on buying foods from food groups that are missing from your family's diet

Message 2: Fathers and mothers, save money to use for nutrition or for your child's treatment when sick



- Save income for medical treatments
- Save money to buy nutritious foods to eat throughout the year

Message 3: Mothers, participate in agriculture or livestock to generate income for the family



- Mothers may earn money and food by keeping a vegetable garden, poultry, small livestock, or other livelihoods activities
- Fathers should help mothers in the household to increase mothers' time and support the total amount of income generated by the family

Message 4: Fathers, empower mothers to budget money for the health and nutrition of the family



- Mothers often prioritise the safety and well-being of children
- Mothers are more likely to spend household resources to ensure the good health and nutrition of the children and family
- Fathers should recognise the special role of mothers and include them in decision-making about how to spend household income
- Fathers should give mothers money to save and spend as needed

4.5.6 Shared role of fathers and mothers on their family nutrition

Message 1: Fathers, help your wife with household tasks so she can ensure your child's good diet



- The role of a father is to provide good nutrition and access to health care to his family. Earning money is one way to do this, and supporting and helping his wife is another way.
- Feeding a child well usually takes a lot of the mother's time (breastfeeding, cooking, washing, feeding). It is important that the father help with other tasks to ensure the good diet of his child.

Message 2: Fathers and mothers, play with your child to promote healthy growth of mind and body



- Good early childhood development is linked with improved growth, and can be supported by playing with the child to stimulate the mind and develop the body
- In addition to nutrition, children need love and affection to help them grow well.

Message 3: Fathers and mothers, work together with respect and partnership to help your children grow well



- A husband and wife are a team. Only together can they ensure that their children grow up healthy and develop to their full potential
- Good nutrition takes time and effort. Mothers and fathers must work together and support one another to ensure diverse foods and good child feeding practices
- Fathers and mothers can show respect, affection and partnership to each other to support a productive environment for their children to feel secure and grow well.

4.5.7 Food handling, processing and storage

The nutritional content of food is affected by food handling, processing and storage.

Message 1: Use safe food preparation and storage behaviours

- Wash your hands with soap and water before preparing foods and feeding.
- Wash your hands and your baby's hands with soap before and after eating.
- Wash your hands with soap and water after using the toilet and/or washing the baby's bottom.
- Use clean hands, clean utensils and clean cups.
- Store food in a covered container and clean place.
- Cook small amounts of food to avoid long periods of storage for more than a day.
- Re-heat before eating.

Message 2: Use good pre- and post-harvest storage and handling practices

- Harvest at maturity
- Solar drying or shed drying

Message 3: Use proper storage for vegetables and diffused light storage for seeds and potatoes

- Cool, well-ventilated storage facility protected against insects and rodents

- Inspect produce
- Clean and maintain the storage structure
- Remove trash and weeds
- Rat guards
- Cement floors preferred
- Disinfect used sacks
- Wooden pallets

Chapter 5: Gender

5.1 Gender and Sex

What do we mean by **gender** and how does it differ from **sex**?

Sex refers to the biological attributes of men and women; these attributes are universal and cannot be changed.

Gender refers to social, behavioural and culturally specific characteristics defining the behaviour of women and men, boys and girls, and the relationship between them. Gender roles, status and relations vary according to place (countries, regions, and villages), groups (class, ethnic, religious, caste), generations and stages of the lifecycle of individuals. Gender is, thus, not about women but about the relationship between men and women.

Exercise: The Gender Game

Ask participants if these statements refer to gender or sex?

1. Women give birth to babies, men don't.
2. Girls should be gentle; boys should be tough.
3. Women or girls are the primary caregivers for those sick with AIDS-related illnesses in more than two-thirds of households worldwide.
4. Women can breastfeed babies, men can bottle feed babies.
5. Women in many countries are more likely to experience sexual and domestic violence than men.
6. Men are paid more than women for the same work (in many countries).
7. Men's voices break at puberty, women's do not.
8. Women have long hair and men have short hair.

Source: USAID and Save the Children 2012

Gender equality: When women and men enjoy equal rights, opportunities and entitlements in civil and political life

Gender equality does not mean that there should be an equal number of women and men in all activities. It means that both women, men, girls and boys enjoy equal opportunities, resources, rights and access to goods and services. It also means equal responsibilities in sharing workloads and energy expended in caring for families and communities.

Promoting gender equality in the nutrition programme requires taking into account the social, economic and biological differences between men and women and addressing barriers to improved nutrition.

Gender relations: The ways in which a society defines rights, responsibilities and the identities of men and women in relation to one another

Women's and men's gender are not only different, they are often unequal in power, weight and value. These relations determine women's and men's access and control over material resources and benefits. Since these relations are socially constructed, they can be changed. Ensuring that women have the same access to productive resources as men and improving the gender inequalities can significantly improve nutrition and well-being for the entire household.

Gender mainstreaming: An approach for achieving gender equality involving ensuring that gender perspectives and gender equality are central to policy development, research, advocacy, dialogue, legislation, resource allocation, and planning, implementation and monitoring of programmes and projects.

Exercise: Discuss typical household duties

Ask participants to list typical household duties that take place on a regular basis. To assist, ask them to think about what needs to be done in a household and on the farm from the first activities of the day until the last thing before going to sleep. List and number all of the activities on a flip chart. The list of activities should include:

- Cooking, house cleaning, washing clothes, collecting water, collecting fuel
- Upkeep and maintenance, including repairing household items or farm equipment
- Farming, trading, food shopping
- Looking after animals, child care

2. Ask the participants to identify which of the listed activities are usually done by women or men, or equally by both?

3. Tally the number of activities that women, men and both sexes normally do and ask the participants to discuss what they think about the division of labour. For example, you can raise the following question:

- Do men help take care of young children when the mother is around, or only when she is away?
4. Ask the participants about what they learned from this exercise and what they can do to promote an equitable distribution of labour in household work and to increase the participation of men in feeding and caring for their children.
 5. Summarize the discussion by presenting points from **Gender and social norms** listed in the manual

Source: USAID and Save the Children 2012

5.2 Gender and social norms

Gender roles are the roles both women and men are expected to fulfill in society as defined by the virtue of being female or male. Men and women get messages about their role and division of labour from family, schools, media and society at large. Gender roles show society's rule for how men and women are supposed to behave. These rules are sometimes called gender norms. They dictate what is "normal" for men and women to think, feel and act.

Many of these differences are created by society and are not part of our nature or biological make-up, and many of these expectations help us enjoy our identities as either men or women. However, some of these expectations limit us from using our full potential as human beings.

For example: If and how a father is involved in child feeding and care is not linked to biological characteristics, but depends more on how women and men are raised as to whether they believe that men can also take care of children.

Both men and women play multiple roles in society. These roles can be broadly categorized into:

1. Productive role: Tasks which contribute to the economic welfare of the household through production of goods. Women's role as producers is usually undermined and undervalued.
2. Reproductive role: Activities performed for reproduction and caring for the household, water and fuel/wood collection, child care, health care, washing, cleaning, etc.

3. Community management or socio-cultural activities: Activities primarily carried out by men and women to ensure the co-existence of themselves as well as their family in their social environment. Examples of such activities include idir, mutual help among neighbours/relatives, community groups, etc. which boosts their social capital.

Men usually focus on productive roles and play their multiple roles sequentially. Women, in contrast to men, must play their roles simultaneously and balance their time between all of them. Some women may be overburdened with triple roles and the probability that they face time-related constraints in providing adequate care for the children and seeking health care.

Source: Reprinted with permission from USAID and Save the Children 2012.

5.3 Why does gender matter?

There is a direct link between good children's nutrition and women's generation of household income or access to household income. Research shows that improving women's access to agriculture or livelihoods inputs and services has the potential to reduce undernutrition in children.

One reason is that money controlled by women is more likely to be spent on nutrition and health care for the children and the family than if the same money is controlled by men. In many societies, women's access to productive assets such as land, formal credit, capital, inputs and extension services is constrained even though women produce most of the subsistence crops, manage household seed stocks and contribute to the maintenance of plant biodiversity.

Men have an equally important role to play in ensuring the good nutrition of their family. Fathers have an essential role to play to support the family to acquire nutritious foods, to support wives to generate additional income to spend on nutrition or health care, and to help with child care practices to ensure that women have enough time and physical rest (especially if they are pregnant or lactating).

Below are the key issues being considered in agriculture and nutrition:

1. Equal access to land and other resources such as credit and other support services
2. Gender differences in roles and activities
3. Gender and agriculture extension services
4. Women's empowerment and equal access to decision making

5.4 Women's ability to manage child care

Care for mothers and children is a significant underlying determinant of child nutrition. A major component of care is infant and young child feeding practices (IYCF), including breastfeeding, complementary feeding and the many factors that influence these practices.

The division of labour, or the work, roles and responsibilities allocated to men and women in agriculture, is directly tied to social and cultural patterns which determine the tasks that women and men generally perform. In addition to their roles in agricultural production and income generation, women in developing countries often undertake most of the work related to child care, food preparation, health service uptake and other household responsibilities such as collecting fuel and water. Women may therefore face multiple trade-offs in the allocation of their time that directly impinge on their own and their children's health and nutritional status.

5.5 Agricultural labour and women's own nutritional status

Agricultural activities tend to make up a major share of rural women's energy expenditure, often at high levels of effort and in addition to normal domestic duties. This level of effort may fluctuate during different seasons, particularly among rural women employed in agriculture. This may have a direct effect of maternal nutrition status, and therefore also on a the child nutrition.

Efforts to boost agricultural productivity must therefore also consider the impacts on time use and physical demands – especially of female agricultural workers. Therefore, it is important that women have access to infrastructure and technology, where available, to lessen these burdens.

Several guidance notes and policy recommendations stress the importance of avoiding harm. For example, by avoiding giving an increased agricultural workload to women as this could harm both their own nutritional status and their children's, if time spent caring for children was reduced. Including men and boys could be helpful to avoid harm so that they are able to understand and support women in projects targeting women.

5.6 Strengthening women's access to, and control of resources

5.6.1 Land, Soil, and Water

- Improve women's access to inputs and technologies that improve soil fertility
- Design water supplies explicitly for mixed domestic and productive uses
- Consult communities to define local water rights

5.6.2 New varieties and technologies

- Take into account both women's and men's preferences when developing and introducing new varieties
- Disseminate high-value crops to women that do not require large initial investments or asset ownership
- Assess how the introduction of new technologies targeted to women will affect gender norms
- Find ways to protect women's gains from new technologies
- Recognise that women of different ages and status may have different agricultural roles that can influence the adoption process

5.6.3 Labour

- Introduce labour-saving technologies that reduce women's time and energy burdens

5.6.4 Markets

- Invest in market-oriented interventions that facilitate women's market access while addressing gender norms

5.6.5 Credit and financial services

- Encourage women to enter high-value or high-return sectors for higher returns to credit
- Use group liability as a collateral substitute, with the option of graduation to individual liability
- Target credit, or design loan packages, based on women's different needs throughout their life cycle
- Protect women's rights to their own savings and financial assets

5.6.6 Social Capital

- Secure women's participation by emphasising benefits that matter to women

- Promote institutional mechanisms that foster women’s active participation in groups

Exercise: Discuss assets and benefits

- 1 Ask participants to list typical household assets and resources that are being used for household consumption. List and number all of the assets and benefits on a flip chart. The list of household assets and benefits may include:
 - Land, cows, poultry, sheep, goats, etc.
- 2 Ask the participants to identify if the listed assets/benefits are usually accessed or controlled by women or men, or equally by both?
- 3 Tally the number of assets/benefits that women, men and both sexes normally access and control.
- 4 Ask the participants to discuss what they think about the division of labour. For example, you can raise the following questions:
 - Do you think women and men have equal access to the assets and benefits in the household?
 - Do you think that women and men have equal decision making power and control over the household assets and benefits listed or do you think there is a difference in the patterns of ownership and decision making?
 - Do you think the differential access and control of assets and benefits by women and men affects the nutrition of the household?
 - What can be done to improve women’s access, control and decision making power over household assets and benefits?
- 5 Summarize the discussions by presenting key points from **Integrating gender into agriculture and nutrition**

Source: USAID and Save the Children 2012

5.7 Integrating gender into agriculture and nutrition

The following are some tips in identifying ways to integrate gender concerns in agriculture and nutrition interventions:

- Understand the roles of men and women, boys and girls in the household reproductive and productive systems (division of labor, workload and time allocation, resource control, etc.) and anticipate how the project might affect them.

- Involve and empower both men and women equally in addressing nutrition problems in the community. Focusing on women only as victims, may instigate negative outcomes, such as inciting jealousy among men; turning away men from nutrition issues and actions resulting in the stigmatization of nutrition activities as “women’s business.”
- Acknowledge and enhance the key roles of women in the production, storage and preparation of food by providing training and nutrition education to empower their ability to offer healthy diets for their families through homestead gardens or animal husbandry.
- Acknowledge and promote the role of men in improving nutrition for their families. Engage men as partners, as caregivers and as agents of positive change.
- Use farmer training centres to practically demonstrate gender and nutrition-sensitive interventions as complementary to other health-based nutrition interventions.
- Consult and include men and women in community meetings, demonstrations at field level and monitoring & evaluation of nutrition interventions.
- Educate men and women on good fatherhood and motherhood practices, breastfeeding, complementary feeding and other nutrition matters.
- Incorporate gender awareness as part of the community awareness sessions and campaigns on health and nutrition matters.
- Conduct routine assessment and client exit interviews at facilities to assess the friendliness of services to mothers and children.

Source: Reprinted with permission from UNICEF Ethiopia 2014.

References

- 1 Alive & Thrive and FHI 360. Infant and Young Child Feeding in Ethiopia Job Aids. 2015.
- 2 Black RE, Allen LH, Bhutta ZA, Caulfield LE, de Onis M, Ezzati M, Mathers C, Rivera J, et al. Maternal and child undernutrition: global and regional exposures and health consequences. *The Lancet*. 2008 Jan 19;371(9608):243-60.
- 3 Central Statistical Agency of Ethiopia. Demographic and Health Survey. 2011
- 4 LSHTM, Agriculture, Nutrition and Health. Online module. 2014
<https://ble.lshtm.ac.uk/course/view.php?id=1700>
- 5 FAO. Nutrition, Food security and Livelihoods: Basic Concepts. Short course. 2015
www.fao.org/elearning/#/elc/en/course/NFSLBC
- 6 USAID. Nutrition Education Training for Agriculture Extension Workers. Infant and Young Child Nutrition Project, 2011. <http://iycn.wpengine.netdna-cdn.com/files/IYCN-Nutrition-Training-for-Ag-Extension-Officers.pdf>
- 7 USAID and Save the Children. Nutrition-Sensitive Agriculture Trainer Manual for Agriculture Development Agents. Addis Ababa, 2012.
- 8 UNICEF Ethiopia. Integrating Agriculture and Community-based Nutrition to Improve Nutrition. A training manual for Agriculture Development Agents and Health Extension Workers. Addis Ababa, 2014.
- 9 UNICEF. Facilitator Guide: The Community Infant and Young Child Feeding Package. 2013.
- 10 UNICEF. The Cost of Hunger in Ethiopia Report. Addis Ababa, 2013.
- 11 UNICEF, World Bank and WHO. Joint Malnutrition dataset (as of October 2015).
<http://data.unicef.org/nutrition/malnutrition.html#sthash.ddGbnWSv.dpuf>
- 12 WHO. Physical status: the use and interpretation of anthropometry. Report of a WHO Expert Committee. Technical Report Series No. 854. Geneva, World Health Organization, 1995. http://whqlibdoc.who.int/trs/WHO_TRS_854.pdf
- 13 WHO and UNICEF. Global Strategy for Infant and Young Child Feeding. 2003