

NUTRITION-SENSITIVE AGRICULTURE

PARTICIPANT MANUAL

FOR AGRICULTURE DEVELOPMENT AGENTS (DAs)

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Empowering New Generations to Improve Nutrition
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Acronyms

| | |
|--------|--|
| AEWs | Agriculture extension workers |
| DAs | Development agents |
| ENGINE | Empowering New Generations to Improve Nutrition & Economic Opportunities |
| FTCs | Farmer training centers |
| HH | Households |
| IQ | Intelligence quotient |
| MFIs | Microfinance Institutions |
| OFSP | Orange-fleshed sweet potato |

Introduction

About this training manual

Agriculture is the major source of food, employment and income upon which the majority of mankind relies to provide for and support their livelihood. Lower income families, in particular, are involved directly or indirectly in agricultural activities and derive multiple benefits arising from its multifunctional nature.

Since the purpose of economic growth and agricultural development is to improve living conditions, developments in agriculture must provide sustainable benefits for society as a whole and especially to those communities which depend on the land for their survival and tend to be resource poor, marginalized, food insecure and malnourished. Consequently, focus needs to be given to not only increasing the production and access to foods but also its consumption, ensuring that the poor have access to adequate quantities of safe, good quality food for a nutritionally adequate diet.

Agriculture and nutrition are interrelated. Agricultural production is an important means for most people to get the food and essential nutrients they need. On the other hand, as agriculture is highly labor intensive, particularly in poor countries like Ethiopia, productive agriculture requires the labor of healthy, well-nourished people.

In order to impact on the nutritional outcomes, there is a need to focus on nutrition-sensitive agriculture. Nutrition-sensitive agriculture involves the design and adoption of cropping and farming systems (crops and animal) which can provide agricultural solutions to the prevailing nutritional problems.

Development agents (DAs) or agriculture extension workers (AEWs) are at the forefront to support farmers for improved agricultural production and better income. This nutrition-sensitive agriculture training aims at building the knowledge and skill of DAs in nutrition-sensitive agriculture so that they can promote agricultural and other related practices that maximize nutritional benefits.

Overall Training Purpose

At the end of this nutrition-sensitive agriculture training, AEWs/DAs will be able to:

- Understand the importance of nutrition in decreasing morbidity and mortality; improving productivity and educational performance and eventually the country's economy
- Explain the relationship between agriculture and nutrition
- Describe nutrition priority groups and the undernutrition cycle
- Explain the concept of dietary diversity and what it means in practice
- Conduct food demonstrations
- Explain how to keep food safe by practicing safe handling, preparation and storage techniques (from farm to fork.)
- Describe the type of interventions that promote nutrition-sensitive agriculture and how to integrate them into their daily activities
- Use the tools to counsel farmers on nutrition-sensitive agricultural interventions

Session 1: Why Nutrition Matters?

Introduction

Malnutrition is one of the main health problems facing many women and children in Ethiopia. The country is one of the 36 countries with the highest rates of undernutrition in the world. Food insecurity, both chronic and seasonal, is also a widespread problem, affecting about 45 percent of the total population. Each year about five million people, particularly from rural areas, are facing food shortages and 2.8 million people required food assistance in 2011. Malnutrition continues to be a major public health problem in Ethiopia which afflicts many people, primarily children, and consequently impedes the social and economic progress of the nation.

What is Malnutrition?

Malnutrition is a general term that includes many conditions, such as undernutrition, overnutrition and micronutrient deficiency diseases (like vitamin A deficiency, iron deficiency anemia, iodine deficiency disorders and scurvy).

Wasting, or thinness, is an indicator of acute (short-term) malnutrition. Wasting is usually the result of recent food insecurity, infection or acute illness such as diarrhea. Measurements of wasting or thinness are often used to assess the severity of an emergency situation, with severe wasting often being linked to the death of a child.

Stunting, or shortness, is an indicator of chronic (long-term) malnutrition. It's often associated with poor development during childhood and is one of the harmful effects of poverty. Stunting is commonly used as an indicator for development, as it is strongly associated with poverty.

Underweight is an indicator of both acute and chronic malnutrition. Underweight is a useful indicator when examining nutritional trends. It is the indicator used to monitor the Millennium Development Goal (MDG) of ending hunger, with a target of halving the prevalence of underweight children and adults by 2015.

The impact of malnutrition is multifaceted. It does not only affect the health of women and children. It also decreases individual productivity, educational performance and eventually creates poor economic status for individuals and societies.

This session tries to show the negative impact of malnutrition. Participants will also learn the relationship between agriculture and nutrition.

Learning objectives

1. To describe the impact of malnutrition on mortality and morbidity, productivity, economic development and education.
2. To explain the relationship between agriculture and nutrition.

1. Impact of malnutrition

Malnourished children have retarded mental and physical development and this affects their educational performance and critical thinking. Malnutrition also weakens the immunity system and causes a predisposition to various illnesses and even death, particularly among children. When malnourished individuals are sick, they can't perform their daily work and this decreases their productivity, which will eventually result in poor economy.

Fig. 1 below shows the impact of malnutrition. An explanation of each arrow is described in the table that follows the figure.

Fig. 1: Impact of Malnutrition

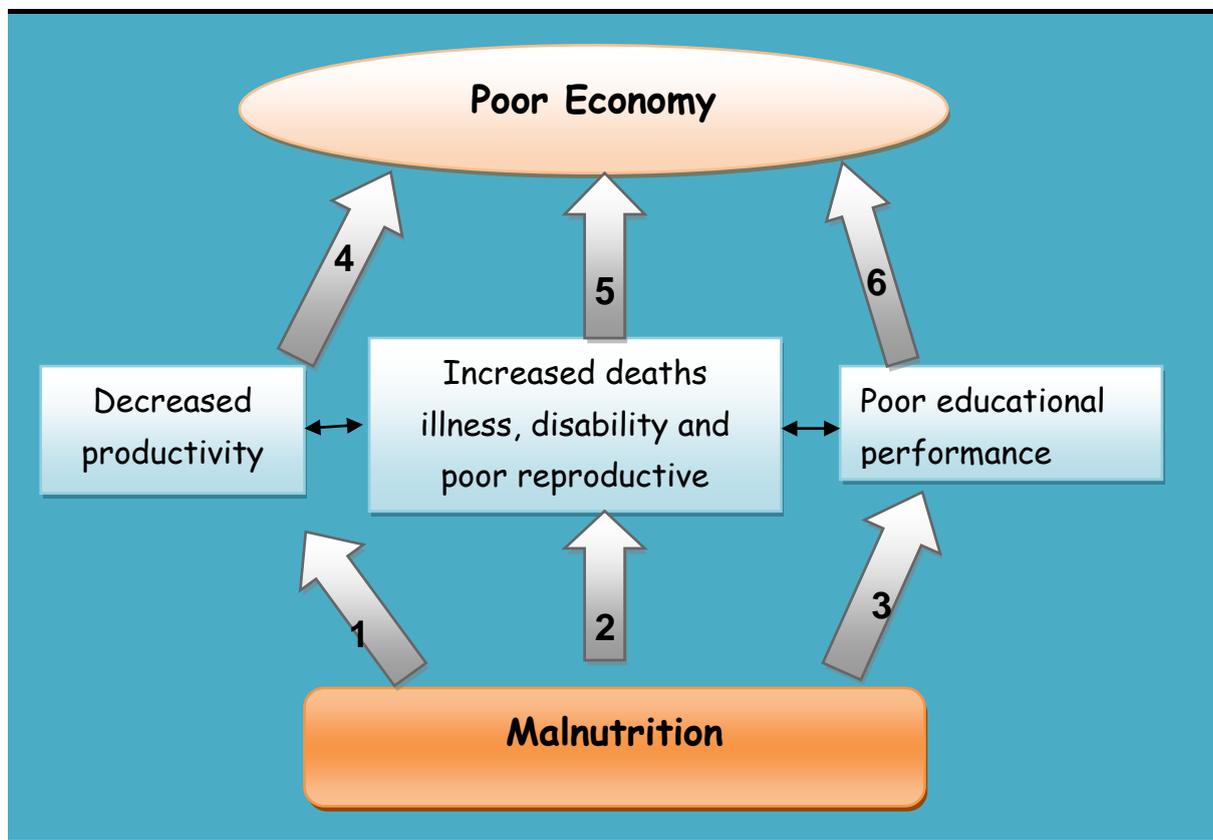


Table 1: Explanation of each arrow in Fig. 1

| Arrow-1: How malnutrition decreases productivity | Arrow-2: How malnutrition increases deaths and illness | Arrow-3: How malnutrition causes poor educational performance |
|--|---|--|
| <ul style="list-style-type: none"> - When malnourished individuals are sick, they can't perform their daily work (e.g., sick farmer) - Individuals with iron deficiency anemia (particularly women) become tired and can't perform their day-to-day activities - Shortage of iodine decreases IQ and causes a productivity loss - Stunting also causes less productivity | <ul style="list-style-type: none"> - Malnutrition weakens immunity and predisposes individuals to different infections - More than half of infant deaths are associated with malnutrition - Suboptimal breastfeeding is accountable for 24% of infant mortality and vitamin A deficiency for 17% of deaths - Marasmus and kwashiorkor and finally death are caused by severe malnutrition - Goiter due to iodine deficiency - Night blindness to complete blindness from vitamin A deficiency - Anemia from iron deficiency - Diseases from deficiency of vitamins (scurvy, pellagra, etc.) | <ul style="list-style-type: none"> - Iron deficiency anemia lowers IQ by 9 points, mild iodine deficiency by 10 points, severe stunting by 5-10 points, and low birth weight by 5 points - High absence and drop-out rates from school due to malnutrition associated illness |
| Arrow-4: How decreased productivity causes poor economy | Arrow-5: How increased deaths and illnesses cause poor economy | Arrow-6: How poor educational performance causes poor economy |
| <ul style="list-style-type: none"> - Less productive citizens will have lower income and this creates poorer society - Productivity loss due to iodine deficiency is estimated at 1,347 million birr each year and this has negative economic impact - Productivity loss due to stunting (low height for age) is estimated at 2,992 million birr per year and this has negative economic impact - Increased dependency due to less productive citizens causes poor economy | <ul style="list-style-type: none"> - High number of ill individuals will become less productive and have low income - Low number of productive citizens (due to high number of deaths) can't produce adequate income - High dependency due to low number of productive citizens (as a result of high deaths) | <ul style="list-style-type: none"> - Illiterate farmers will follow traditional agricultural practices and this will yield to poor agricultural productivity - Illiterate society will have poor access to modern health care and this will increase deaths and illness and finally create poor productivity and economy - Illiterate society will have less innovation and creativity and this will decrease productivity and cause poor economy - Illiterate mothers will follow poor feeding practices and this will eventually lead to increased deaths and illness and finally to decreased productivity and poor economy |

2. Relationship between agriculture and nutrition

Agriculture and nutrition are interrelated. For consumption of adequate and diversified foods, the process starts with agricultural inputs. Adequate and appropriate agricultural inputs are necessary to apply improved agricultural practices which increase agricultural productivity and ensure household food security. Increased production of foods, both in amount and quality, eventually improves nutritional status of households. On the other hand, improved nutrition practices and consumption of diversified foods is necessary to maintain healthy and productive citizens who can produce adequate amounts of nutritious foods. The figure below illustrates how nutrition and agriculture are interrelated. The explanation of each piece is described in the table that follows the figure.

Fig.1. One possible option that shows the relationship between agriculture and nutrition

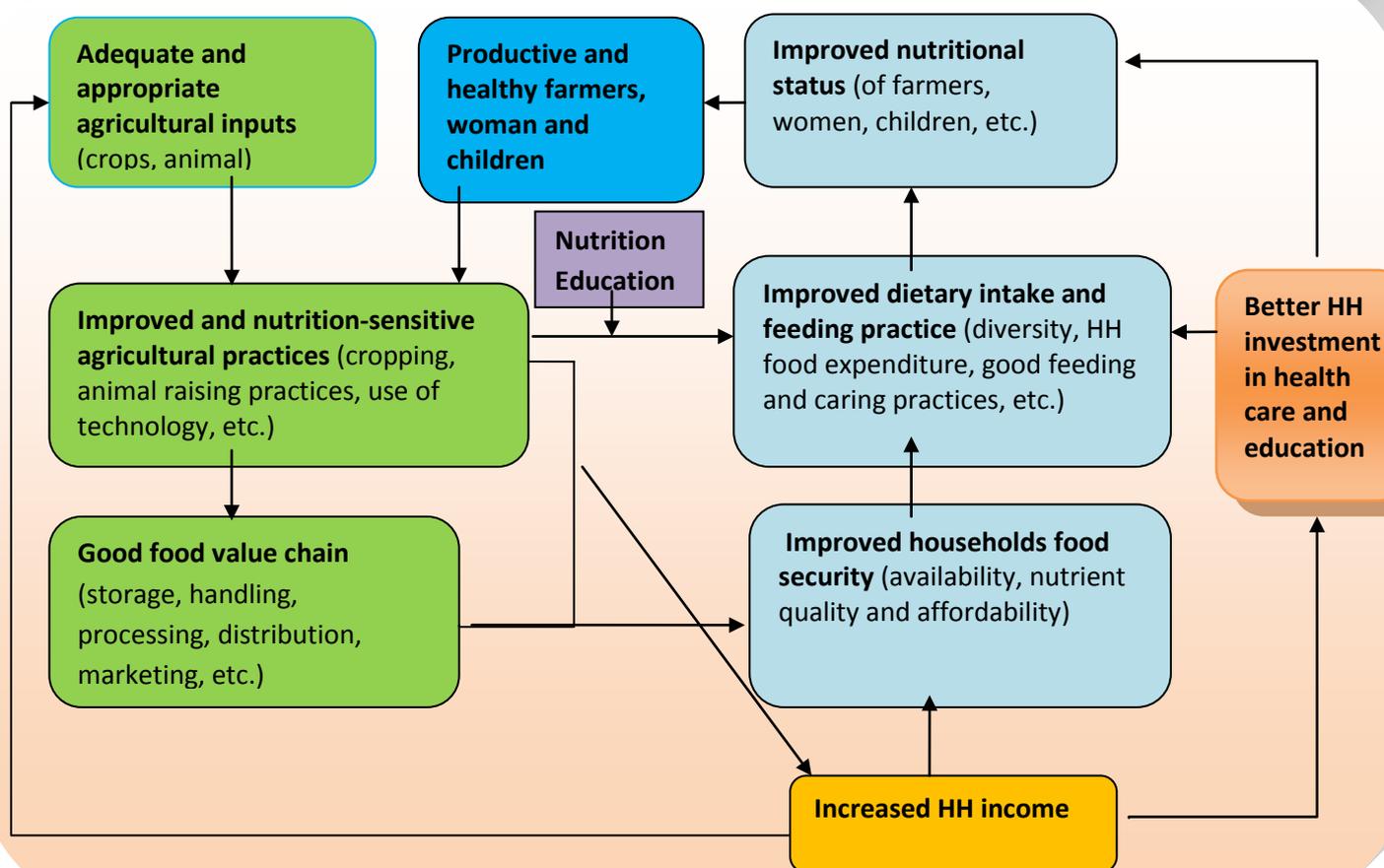


Table 2: Explanation of the ten pieces of the relationship between agriculture and nutrition

| | | |
|----|---|---|
| 1 | Adequate and appropriate agricultural inputs (crops, animal, fertilizer, etc...) | Producing adequate and diversified food starts with agricultural inputs. Agricultural inputs include crops, animals, fertilizer and other technology. |
| 2 | Improved nutrition sensitive agricultural practices (cropping, animal rearing practices, use of technology, etc...) | Having adequate and appropriate agricultural inputs improves agricultural practices. Cropping and farming systems that produce a variety of foods helps to improve the consumption of diversified foods at the HH level. |
| 3 | Good food value chain (storage, handling, processing, distribution, marketing, etc...) | Good agricultural practices result in better production, but only with improved harvesting, storage and proper marketing. Proper processing and storage is necessary to maintain the nutrient content of the food. The better the food value chain, the better the availability and quality of food. |
| 4 | Increased HH food security and income | Increased production and yield will increase HH income through selling surplus products which improves food consumption. |
| 5 | Better HH investments in health care and education | When households have better income, they have the capacity for investments in health care and education for their children and other family members. |
| 6 | Good access to food (availability, nutrient quality and affordability) | For consumption of adequate and diversified foods, there should be good access to food (both amount and quality). Better access is determined by good value chain practices. |
| 7 | Improved food consumption and caring and feeding practice (diversity, HH food expenditure, good feeding practices, etc.) | When households have good access to adequate and diversified foods, the consumption of such foods will be improved. Note that good agricultural practices that yield good production are also important for improved consumption. Increased investments in health care and education will also improve the feeding practices. |
| 8 | Improved nutritional status (of farmers, women, children, etc.) | Better consumption and feeding practices will result in improved nutritional status. The investment in health care and education will also contribute to improved nutritional status. |
| 9 | Productive and healthy farmers, women and children | The final outcome of improved nutritional status is productive and healthy farmers. This is an important input for establishing improved agricultural practices. |
| 10 | Nutrition Education | Good agricultural practices alone may not result in improved consumption and feeding practices. HHs should also have access to nutrition information. |

Session 2: Nutrition Priority Groups and Undernutrition Cycle

Introduction

This session focuses on population groups who need priority in terms of nutrition. Focus on these priority groups determines the health and future of a society and country at large. The session also describes the undernutrition cycle that demands intervention at each stage of the cycle.

Learning objectives

1. To identify the priority groups of population for nutrition and explain the importance of nutrition during the first 1,000 days (window of opportunity).
2. To describe the undernutrition cycle.

1. Nutrition Priority Groups

Today, undernutrition is still a leading cause of death of young children throughout the world. For infants and children under the age of 2, the consequences of undernutrition are severe, often **irreversible**, and reach far into the future.

During pregnancy, undernutrition can have a devastating impact on the healthy growth and development of a child. Babies who are malnourished in the womb have a higher risk of dying in infancy and are more likely to face lifelong cognitive and physical deficits and chronic health problems.

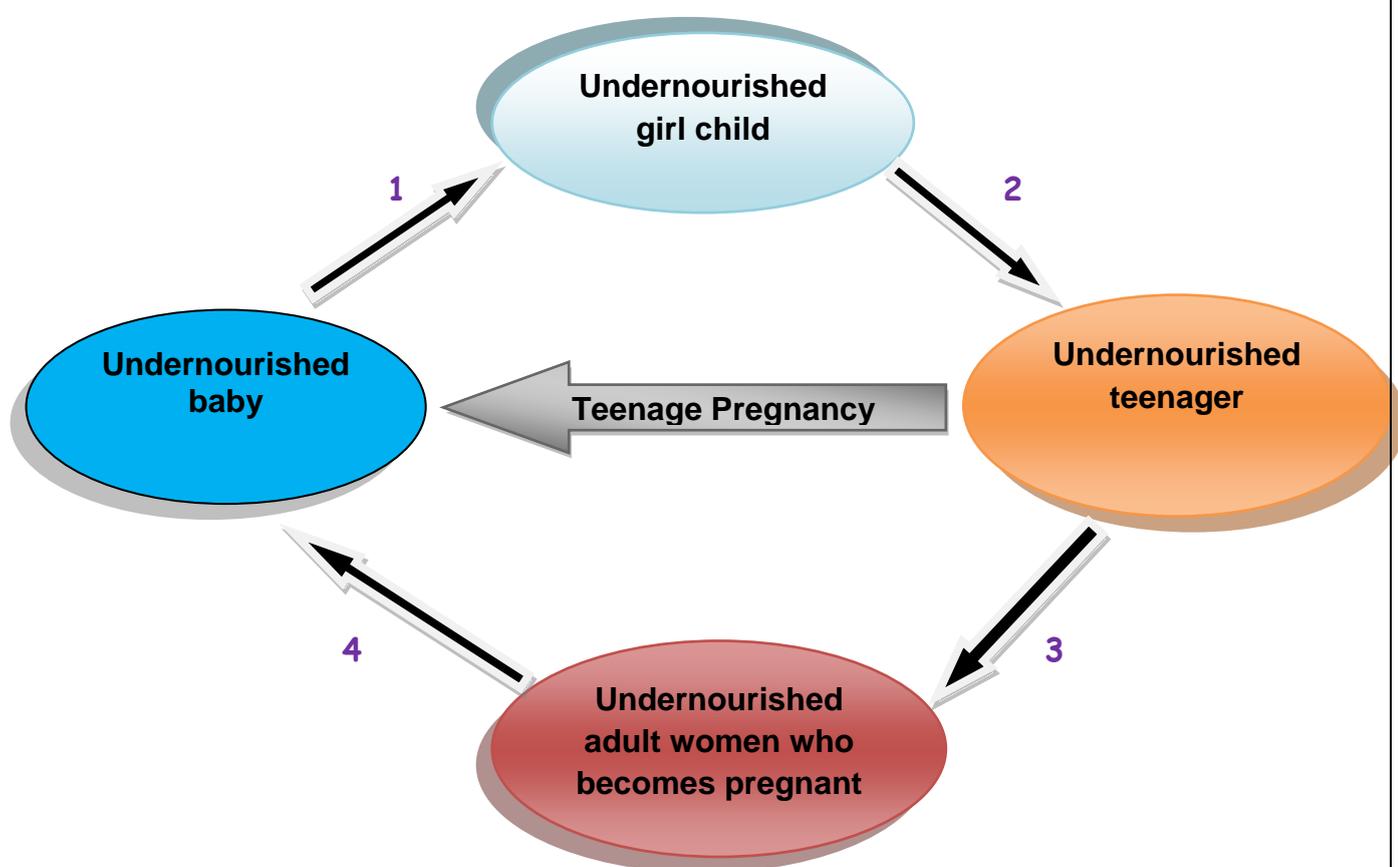
Therefore, pregnant and lactating (breastfeeding) women and children under the age of 2 years are the priority groups that need attention in nutrition. Pregnant women need one extra meal per day to feed themselves and the infant in the womb. Similarly, lactating women need two extra meals per day for their own body recovery, for adequate breast milk production and proper growth and development of their child.

The first 1,000 days is the period from pregnancy through 2 years of age. These 1,000 days offer a unique window of opportunity to shape healthier and more prosperous futures. Proper nutrition during this 1,000 day window can have a profound impact on a child's ability to grow, learn and rise out of poverty. It can also shape a society's long-term health, stability and prosperity.

2. The undernutrition cycle

The cycle of poor nutrition is perpetuated across generations. Young girls who grow poorly become stunted (low height for their age) women and are more likely to give birth to low birth weight infants. Those infant girls are likely to continue the cycle by being stunted in adulthood. Adolescent pregnancy heightens the risk of low birth weight and increases the difficulty of breaking the cycle. Good nutrition needs support during all of these stages—infancy, childhood, adolescence and adulthood—especially for girls and women. (See Figure 1 below)

Fig.1. The undernutrition cycle



Session 3: Gender and Nutrition

Introduction

Men and women have unique and significant roles to play in improving nutrition. Linkages between gender and nutrition are present in various areas and act through different pathways, thereby offering multiple opportunities for synergy. Nutrition may be an entry point for addressing more sensitive gender issues through nutrition education, school-based and agriculture extension, among others. Gender is important because initiatives to improve nutrition cannot achieve lasting success without taking into consideration the social, economic and biological differences between men and women and, in particular, the gender inequalities which stand in the way of good nutrition.

This session will provide the basics on the concepts of gender and sex, important concepts on gender, the importance of gender analysis and gender mainstreaming steps in nutrition and livelihood programs.

Learning objectives

1. To equip the participants with basic concepts and ideas on gender and sex.
2. To help participants understand the ideas on gender roles and division of labor and how they relate to maternal and child nutrition.
3. To help participants understand the concept of gender analysis and how it can be applied to understand the gender dynamics and relations in the community.
4. To help participants understand the concept of gender mainstreaming and ways of incorporating gender issues in nutrition interventions.

The Gender Game

Identify whether the statements below 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.
9. In one study of 224 cultures, there were five cultures in which men do all of the cooking and thirty six cultures in which women do all of the house building.
10. According to UN statistics, women do 67 percent of the world's work yet their earnings amount to only 10 percent of the world's income.

Sex and Gender concepts

Sex

- ✓ Sex refers to biological attributes that identify a person as a male or female.
- ✓ These attributes are generally permanent, universal and cannot be changed over time.
- ✓ The socially constituted relations between men and women did not stem from the biological differences between them, rather it originates from gender.

Gender

- ✓ Gender refers to the socially constructed roles and responsibilities assigned to men and women in a given culture or location.
- ✓ These roles are learned, they vary between cultures and they change over time.
- ✓ Historically, attention to gender relations has been driven by the need to address women's needs and circumstances since women typically tend to be more disadvantaged than men.
- ✓ In most instances, gender is equated with women. However, paying attention to gender does not mean focusing on women as beneficiaries, but focusing on gender analysis and incorporating the needs of girls, boys, men and women at all levels of interventions.
- ✓ Gender is learned through a process of socialization and through the culture of the particular society. The agencies of gender socialization are; the home, school, media and workplace. Children learn their gender from birth. Even before they are born, baby clothes are chosen by gender-based colors: blue for boys and pink for girls.

Gender Equality

Gender equality does not mean that there should be an equal number of boys and girls or women and men in all activities. Gender equality means that women, men, boys and girls have equal opportunities, resources, rights and access to goods and services. Gender equality also means equal opportunities and equal responsibilities in sharing workloads and energy expended within individual capability in caring for families and communities. (UNFPA, 2008)

Promoting gender equality in nutrition programs requires taking into consideration the social, economic and biological differences between men and women and addressing the inequalities which are barriers to good nutrition.

Gender Relations

Usually, the relations between women and men are based on unequal power. Women's and men's gender are not only different, they are often unequal in power, weight and value. The relations between men and women, boys and girls vary in different cultures. Some are more empowering than others. Some provide women and girls equal opportunities with men and boys to education, health services and gainful employment. These relations determine women's and men's access to 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 Sensitive

Gender sensitivity is being aware of the differences between women's and men's needs, roles, responsibilities and constraints and seeking out opportunities and mechanisms to include and actively involve women as well as men in all activities. It requires redressing the existing gender inequalities by addressing gender norms, roles and access to resources as necessary to reach the project goal.

Gender Roles and division of labor in the household

Gender roles are the roles both women and men are expected to fulfill in the society as defined by the virtue of being female or male. Men and women get messages about their role and division of labor 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 neighbors/relatives, community groups, etc. which boosts their social capital (FEMNET, 2006).

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.

These facts show that women are overburdened with triple roles and the probability that they face time-related constraints in providing adequate care for the children and seeking health care.

Gender Analysis and its importance in project designing and implementation

Gender analysis is a systematic effort to identify and understand the roles, needs, opportunities and life circumstances of men and women in a changing socio-economic context.

- It examines the differences in women's and men's lives, including those which lead to social and economic inequity for women, and applies this understanding to policy development and service delivery.
- It is concerned with the underlying causes of these inequities.
- It aims to achieve positive change for women. (FAO, 1997)

A gender analysis creates a “gender looking glass” through which we examine our community to promote gender equality through:

- Gender differences in the division of labor and access to and control over resources;
- Practical need and strategic interests of men and women;
- Power differentials and dynamics between men and women;
- Social, economic and political constraints and opportunities facing women and women;
- Assessing institutional capacities to promote gender inequality.

There are different frameworks of gender analysis. These include:

1. The Harvard Gender Analysis Framework
2. Moser’s Framework
3. Gender Analysis Matrix

Each of these frameworks has their unique features and relevance to specific contexts.

The Harvard framework is one of the widely used gender analysis framework for collecting and analysing data’s on gender relations. This framework has four interrelated components:

Gender analysis of projects

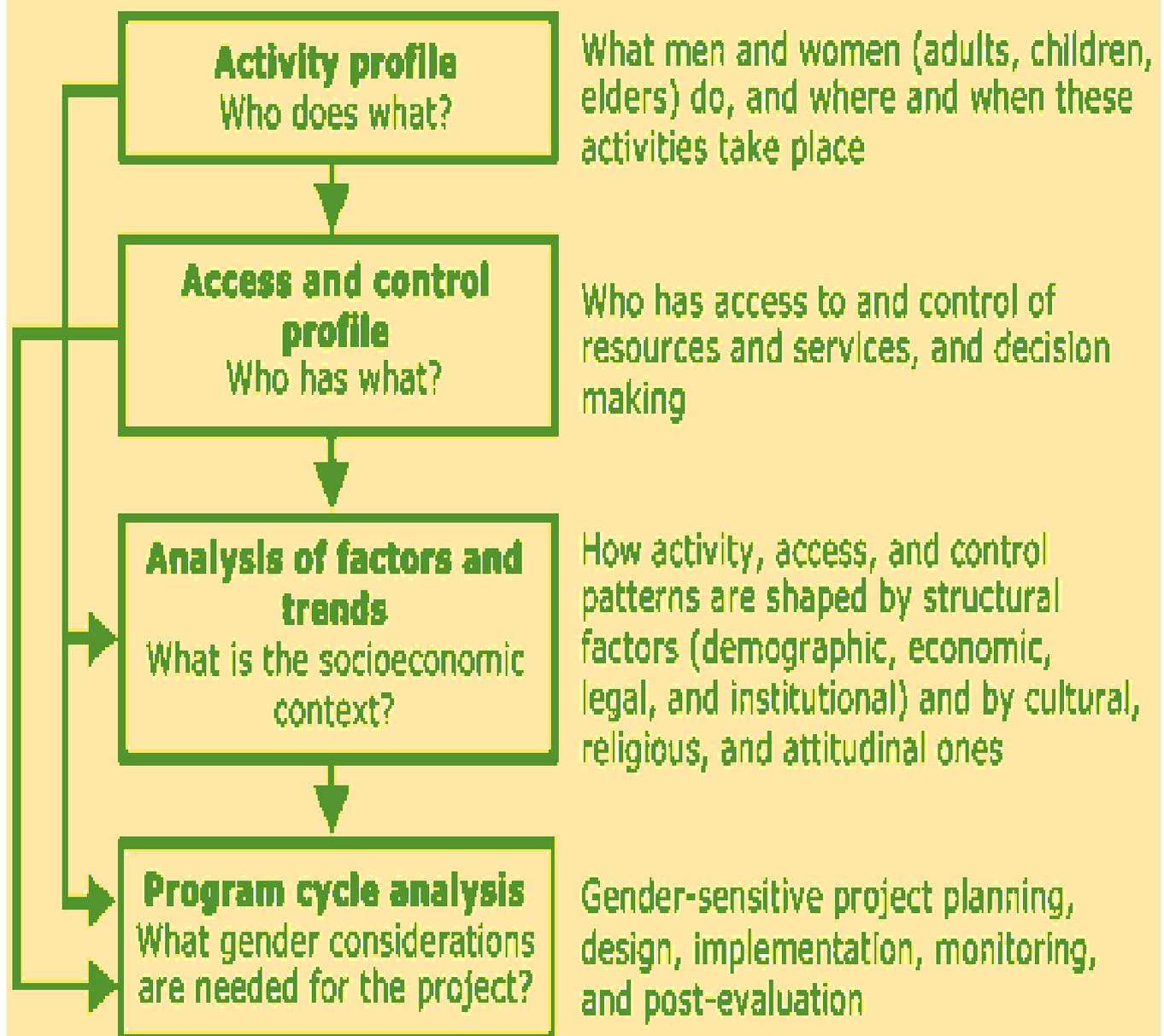


Table 1: Activity Profile

| | Women | Men | Boys | Girls |
|--|--------------|------------|-------------|--------------|
| Productive work | | | | |
| <ol style="list-style-type: none"> 1. Agriculture work (plowing fields, hoeing, harvesting, transporting, etc.) 2. Livestock production (herding, forage preparation, feeding/watering cattle, health care, cleaning their pens, etc.) 3. Other activities (daily work, regular paid work, income generating activities, etc.) | | | | |
| Reproductive work (activities carried out to maintain the family/household) | | | | |
| <ol style="list-style-type: none"> 1. Fetching water 2. Fetching fuel wood, preparing cow dung for fuel 3. Food preparation (processing, pounding, grinding, cooking, growing vegetables, serving, etc.) 4. Child care (feeding, bathing, health care, schooling, socialization, etc.) 5. Cleaning and repair (HH cleaning, washing clothes, compound cleaning, etc.) 6. Health care (caring for the sick, etc.) | | | | |
| Community management activities | | | | |
| <ol style="list-style-type: none"> 1. Celebrations and ceremonies 2. Community meetings 3. Collective agricultural activities 4. Project activities | | | | |

Access to and control over resources and benefits

One of the manifestations of power imbalances between men and women in any society relates to the disparity in access to and control over resources. This has implications on women's decision making power/ability both within the household as well as in community structures outside of the household.

Access to resources means having the opportunity to use resources without having the authority to decide on the output and the exploitation methods.

Control over resources or benefits means having full rights to use and authority to decide what the outputs should be and how they should be used.

Gender Mainstreaming in nutrition and livelihood programs

What is gender mainstreaming?

Gender mainstreaming is “a process of assessing the implications for men and women, of any planned activities including legislation, policies and programs, in all areas as well as all levels” (UN, 1997). It involves deliberate actions to ensure that the experiences, expectations, needs and concerns of men and women are integrated in decision making, planning, programming and budgeting, monitoring and evaluation of policies and programs.

Men, women boys and girls have distinct roles in agriculture and livelihood production, income generation or household activities. They also face specific constraints. Understanding and taking into account these different roles helps to ensure that projects do not reinforce or exacerbate gender inequality or power imbalances. If constraints are not identified, strategies cannot be developed to overcome them.

Key gender issues in livelihood

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

Women typically have limited access to markets or control over income from selling crops, despite the fact that increases in women's income are associated with improvements in child nutrition. 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. 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 gardening.
- Acknowledge and promote the role of men in improving nutrition for their families. Engage men as partners, as care givers and as agents of positive change.
- Use Farmer training centers 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.

Session 4: The Basics of Food Handling, Storage and Preparation

Introduction

While safe food preparation and storage prevents adults and children from illness, pre- and post-harvest handling and storage reduces nutrient loss and improves nutrient quality of a product. In this session, participants will learn about safe food preparation, pre- and post-harvest handling and storage techniques.

Learning objectives

1. To explain how to keep food safe by practicing pre- and post-harvest handling, preparations and storage techniques (from farm to fork).
2. Describe the barriers and motivations to keeping food safe.

1. Safe food preparation and storage

Safe preparation and storage of food is essential to reduce the risk of contamination and illness. Evidences have shown that hand washing with soap alone can reduce the risk of diarrhea by up to 40 percent. When children start complementary food at 6 months, the risk of diarrhea, illness and even death may increase if the food is not prepared and stored safely.

The following are key behaviors that need to be remembered and promoted for safe food preparation and storage:

Safe food preparation and storage behaviors

- 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.

2. Pre- and post-harvest handling and storage techniques

1. Recommended pre- and post-harvest storage and handling practices

- Harvest at maturity
- Solar drying or shed drying

- Use of proper storage for vegetables such as ware and diffused light store for potato consumption and seed respectively
- 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
- 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
- Milk hygienic practice should start by cleaning the udder and teat 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

2. The typical **causes and sources of food safety problems** during production and post-harvest handling fall into the following three major categories:

2.1 Physical Hazards: Examples of physical hazards which may become imbedded in produce during production handling or storage are:

- Seeds of weeds and soil from threshing ground
- Damage and bruising during harvesting particularly for bulb, root crops and fruits
- Contamination with animal manures while threshing
- Wood splinters

2.2 Chemical Hazards: Examples of chemical hazards which may contaminate produce during production handling or storage are:

- Pesticides, fungicides, herbicides, fungicide, rodenticides and factory wastes

2.3 Human Pathogens: There are four main types of human pathogens associated with fresh produce:

- Soil associated pathogenic bacteria (*Clostridium botulinum*, *Listeria monocytogenes*)
- Feces associated pathogenic bacteria (*Salmonella spp.*, *Shigella spp.*, *E.coli* O157:H7 and others)
- Pathogenic parasites (*Cryptosporidium*, *Cyclospora*)
- Pathogenic viruses (Hepatitis, Enterovirus).

3. **Food Safety on the Farm:** - Practices related to these four simple principles can reduce the risk that produce may become contaminated on the farm.

3.1 Clean soil

- Avoid the improper use of manure.
- Compost manure completely to kill pathogens, and incorporate it into soil at least two weeks prior to planting.
- Keep domestic and wild animals out of fields to reduce the risk of fecal contamination.
- Advise use of improved latrines instead of open defecations.
- Prevent run-off or drift from animal operations from entering produce fields.
- Do not harvest produces within 120 days of a manure application.
- Avoid consuming or selling crops recently sprayed with pesticides and animals fed with hormones.

3.2 Clean water

- Test surface water that is used for irrigation for fecal pathogens on a regular basis, especially if water passes close to a sewage treatment or livestock shelter.
- Keep livestock away from the active recharge area for well-water that will be used for irrigation.
- Keep chemicals away from the active recharge area for well-water that will be used for irrigation.
- Filter or use settling ponds to improve water quality.
- Where feasible, use drip irrigation to reduce crop wetting and minimize risk.
- Use potable water for making up chemical pest management sprays.

3.3 Clean surfaces

- Tools and field containers must be kept clean. Wash and sanitize these items before each use.

Session 5: Dietary Diversity- What it Means and Why it is Important?

Introduction

This session teaches about dietary diversity. Most people, particularly the poor, consume only one or two types of staple foods. Since the different food groups provide different benefits, consumption of diversified foods is important for the health of adults and proper growth and development of children. In this session, participants will get acquainted with food groups, the meaning and importance of dietary diversity and how to get a diversified diet.

Learning objectives

1. To list the six main food groups.
2. To explain that eating a variety of foods means variety across the food groups.
3. To know why eating a variety of foods is important.

1. The six food groups

Although most foods are mixtures of nutrients, many of them contain a lot of one nutrient and less of the other nutrients. Foods are often grouped according to the nutrient that they contain in abundance. According to the major nutrients they contain, food groups are divided in to **six groups**:

Staples

Foods in this include cereal grains such as sorghum, millet, maize, barley, oats, wheat, teff, rice, and starchy roots (cassava, sweet potato, false banana and potato). They are good sources of energy.



Legumes and Nuts

This group includes ground nuts, soya beans, beans, peas, chick peas, broad beans, kidney beans, lentils. They provide mainly protein and are important for growth, repair and body building.



Animal Foods

All of the foods in this group are of animal origin such as meat, poultry, eggs, milk products and fish. They provide protein, fats, vitamins and minerals. They help the child to grow, have strong bones and be healthy.



Vegetables

Include green leaf and yellow vegetables such as cabbage, kale, spinach, cauliflower, lettuce, carrot, celery, cucumber, eggplant, green pepper, broccoli, pumpkin, onion, tomato and others such as mushroom. They provide mostly vitamins, minerals and water. Vegetables also contain fiber that is necessary for proper digestion.



Fruits

They include citrus fruits (oranges, lemons and mandarins), bananas, apple, avocado, cherry, grapes, pineapple, papaya, mango, peach, guava, watermelon, sweet melon and many others. Fruits provide mostly carbohydrates, vitamins and water. They help to protect from illness.



Fats

This group includes oil seeds (soybean, sesame, linseed, and groundnut), avocado, cooking oil, milk and milk products such as butter, margarine, yoghurt, meat, fish and poultry. They mainly provide fat (additional energy).



2. Dietary Diversity

Dietary diversity is defined as the number of individual food items or food groups consumed over a given period of time (Ruel, 2003). It can be measured at the household or individual level with the use of a questionnaire. Most often it is measured by counting the number of food groups rather than food items consumed. At the household level, dietary diversity is usually considered as a measure of access to food, (e.g., of households' capacity to access costly food groups), while at individual level it reflects dietary quality, mainly micronutrient adequacy of the diet. The reference period can vary, but is most often the previous day or week (FAO, 2011; WFP, 2009).

It is recommended that an individual consume at least 4 food groups in each meal. Examples of diversified meals are described below:

In most parts of Ethiopia, fruits, vegetables and animal foods are not commonly consumed for different reasons. As these food groups are important sources of protein, vitamins and minerals, it is advisable that they are consumed as much as possible. Children, particularly under 2 years, should have priority in the absence of adequate access to such food groups.

How to get a diversified diet

All six food groups are important and should be eaten in combination in order for them to complement each other in increasing dietary intake and utilization of various nutrients by the body.

One should eat a variety of foods at every meal for a diversified diet. For example:

| Staples | + | Legumes & nuts | + | Vegetables | + | Animal foods | + | Fats | + | Fruits |
|--|---|---|---|--|---|--|---|---|---|--|
| Injera, genfo, kita, or kolo from: Millet Sorghum Maize Teff Barley Wheat Oats Cassava False banana | | Lentils Peas Ground beans Chick peas Beans Broad Beans* | | Kale* Spinach Cabbage* Lettuce Mushroom Pumpkin* + Eggplant Broccoli Irish Potato* Orange fleshed Sweet Potato* Carrot* Swiss chard* | | Egg Fish Meat (beef, lamb, poultry) Milk and dairy products | | Sesame seeds Linseeds Cooking oil Butter Sunflower seeds + Pumpkin seeds | | Mango* Banana Papaya* Guava Apple* Pineapple + Grapes Orange Lemon Avocado* |

Prepare your food from at least four food groups every day to become and stay healthy

* - Crops Recommended under ENGINE Support

Session 6: Conducting Cooking Demonstrations

Introduction

This session provides a brief guide on how to conduct cooking demonstration. Cooking demonstrations are practical sessions where community members, particularly mothers, learn how to prepare a diversified diet. Focus needs to be given for preparation of food for children 6-24 months. Mothers with children 6-24 months should learn how to prepare and feed porridge for their children. Cooking demonstrations are also important to teach community members how to prepare family foods.

Learning objectives

1. To gain skill in conducting a cooking demonstration to make food for children.
2. To gain skill in conduction a cooking demonstration for nutritious family foods.

1. Conducting cooking demonstrations

When cooking demonstrations are planned, the following issues need to be considered:

- Conduct the demonstration in a place where groups of people can gather (e.g., farmers training center, school).
- To encourage community members for this practice, mothers should be advised to bring one of the recipes (a mother may bring only one recipe and then all food items could be collected to make it a full recipe before the demonstration).
- Encourage participants of the cooking demonstration to ask questions during the practice.
- When the food is cooked, encourage participants to taste the food and consume all the food. This is particularly important during cooking demonstration for a young child so that mothers can learn how to feed a diversified food and a food appropriate for the age of the child.
- At the end of the practice, hold a discussion with the following questions:
 - Can you prepare this kind of food at home?
 - What are the difficulties/barriers?
 - Can you tell me the importance of consuming this kind of food for children and adults?
 - Do you have any other questions to ask?)

Recipes

During the cooking demonstration, recipes can be changed based on local staple foods. Sample recipes for a young child and family are below.

Sample Recipes (this sample can be changed depending on the staple food in the area)

For a young child:

✚ Teff/sorghum/maize/wheat/barley porridge enriched with pea flour, kale, tomato and butter/oil

Ingredients:

Staple: Teff/maize/sorghum

Meat or fish, egg, milk or beans or “mitin”

Vegetables: Kale, tomato

Fat: Butter/oil, water, iodized salt

Method:

1. Wash hands and use clean surface, utensils and plates.
2. Wash, chop and boil the kale and tomato.
3. Mix sorghum/maize/teff flour with pea flour.
4. Boil water and then add the flour into the water.
5. Add butter/oil, kale and tomato, and stir while cooking.

For a family food:

✚ Injera with shiro, onion, tomato and kale

Ingredients:

Staple: Teff/injera, potato, cassava, sweet potato

Meat or fish or beans- roasted pea flour, lentils

Vegetables: Tomato, onion

Fat: Butter/oil; water, iodized salt

Method:

1. Wash hands and use clean surface, utensils and plates.
2. Chop and fry onion with oil or butter.
3. Clean and chop the tomato, add oil and iodized salt and lemon.
4. Add pea flour (shiro) and stir while cooking.
5. When shiro is properly cooked prepare it for eating with injera

Session 7: Agriculture and Marketing for Improved Nutrition

Introduction

It is natural to assume that economic growth has a positive impact on people's nutritional status through increased income and food expenditures, but the limited evidence available shows that, in a number of developing countries, economic growth has failed to result in better nutrition. In this section, the focus is to encourage farmers to use the income generated from agriculture production to buy nutritious foods for the target groups, i.e., women of childbearing age and children under the age of 2.

Learning objectives

1. To enable participants to understand the key nutrition-sensitive agriculture interventions at the smallholders level.
2. To illustrate the importance of translating income into nutrition.
3. To bring about the introduction and promotion of nutritious crops through extension services.

Objective 1: To enable participants to understand the key nutrition-sensitive agriculture interventions at the smallholders' level

Since the purpose of economic growth and agricultural development is to improve living conditions, developments in agriculture must provide sustainable benefits for society as a whole and especially to those communities which depend on the land for their survival and are resource poor. Consequently, focus needs to be given to not only increasing the production and access to foods, but also its consumption, ensuring that the poor have access to adequate quantities of safe, good quality food for a nutritionally adequate diet.

Growing diverse food crops based on the agro-ecology of the area

- ✓ Cereal (staples) – on the farm plot
- ✓ Legumes – on the farm plot and intercropping with staples, crop rotation which also improves soil fertility
- ✓ Vegetables and fruits – in the backyard
 - Green leafy vegetables such as kale, Swiss chard, head cabbage, etc.
 - Root crops such as carrot, Irish potato, orange-fleshed sweet potato, etc.

- Fruits such as avocado, mango, apple, papaya, etc.
 - Use of irrigation during dry season
- ✓ Livestock rearing – such as dairy, small ruminants and poultry

Objective 2: To illustrate the importance of translating income into nutrition

Most agricultural interventions affect the household's nutritional status through support of production for household consumption and/or improving income generation. Increases in production and better storage improve food access. Higher profits from agricultural trade, better agriculture-based wage-earning opportunities, higher product prices and lower consumer prices all filter into the model through the income/food access element.

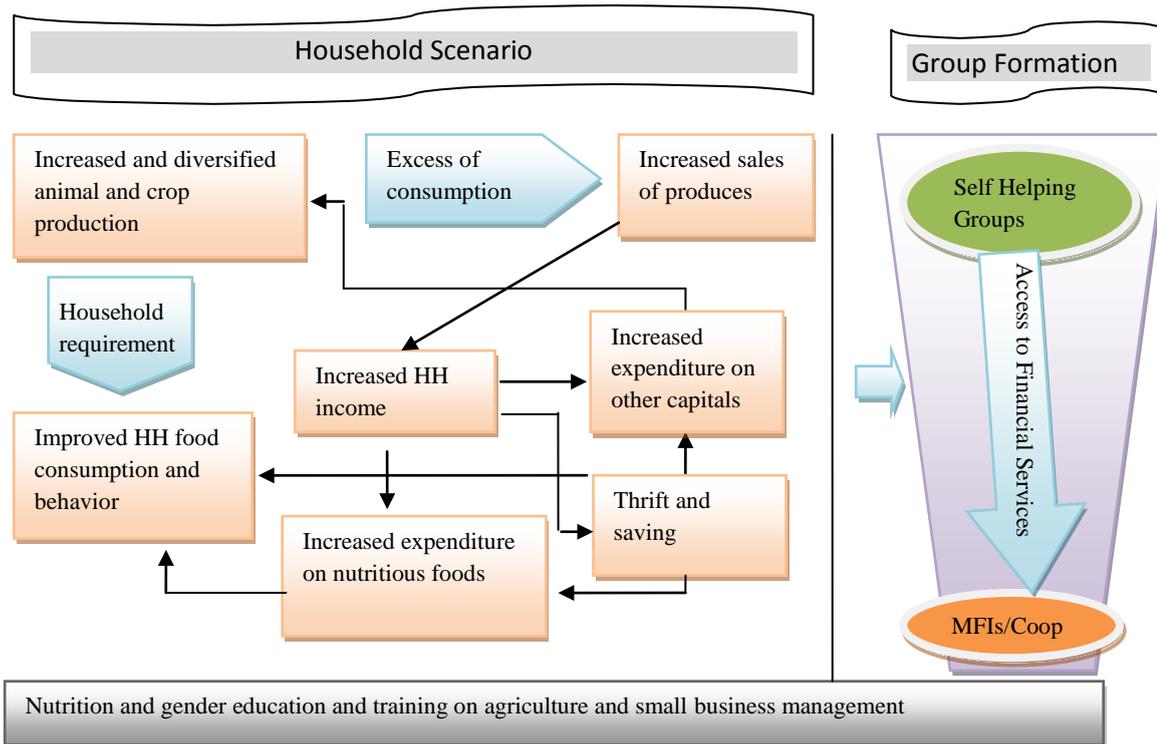
✚ Consumption and translating household income into nutrition

- ✓ Production of diversified farm products should be primarily for own consumption.
- ✓ Sale of surplus produce without compromising own consumption should be for the purchase of nutritious foods from the market (vegetable, fruits and animal source food that is not available at home and serve to children and mothers).
- ✓ Sales of surplus produce of vegetables and fruits should target local market before opting for other market channels.
- ✓ Certain amount of cash from the sale proceeds should be saved to sustain the intervention and for further asset building.
- ✓ Saving could be initiated at the household and within the group and consequently linked to financial service providers such as cooperatives or Microfinance Institutions (MFIs).
- ✓ It is possible to increase the likelihood of additional income in order to bring about positive nutrition effects through the following measures:
 - Increasing women's access to and control of income which will result in the increased likelihood of income translating to expenditures related to nutrition.
 - Building the capacity of farmers, especially women, on small business management. Receiving regular small amounts of income stream may be more beneficial than larger but less frequent payments.
 - Diversifying production systems and livelihoods including small-scale agro-processing and in-kind revolving funds or inventory credit.
 - Providing nutrition education to increase the likelihood of income gains being spent on nutritious food.
 - Targeting the poorest and most vulnerable households for income-generating opportunities.

Objective 3: To bring about the introduction and promotion of nutritious crops through extension services

Hypothetical framework of how production, income from sales of surplus produce and nutrition could be interrelated at household and group level.

Resource 1: Hypothetical model on how production, income and nutrition could be interrelated at household and group level



Resource 2: Agronomic and Nutritional Facts of OFSP

- An ideal crop in combating vitamin A deficiency and food insecurity in sub-Saharan Africa.
- The new OFSP varieties contain high levels of beta-carotene, a precursor to vitamin A
- A good source of energy, fibre and other essential vitamins such as vitamin C, iron, vitamin B6, riboflavin, thiamine, magnesium and niacin.
- Research has shown that regular intakes (125 grams per day or half cup) of OFSP varieties can provide the recommended daily amount of vitamin A for children under-5 years of age and pregnant or lactating women.
- OFSP makes an excellent food security crop and its production is less labor intensive.
- The crop is propagated by cutting the vines whereby one plant can yield around 25 cuttings.
- Most varieties of OFSP are drought resistant and therefore suited to low rainfall conditions.
- It can be produced year round, stored for considerable periods and can be used as a main ingredient in the production of a variety of secondary products such as breads, cakes, chips, drinks, starch, animal feed and flour.

- Preliminary studies conducted in East Africa showed that OFSP is well accepted by children and has been used to increase vitamin A status and reduce food insecurity in several food- based interventions.
- Promoting the consumption of OFSP is a proven intervention in combating malnutrition and food insecurity particularly in resource-poor settings.
- Increasing its consumption among women and children depends on a strategy that promotes OFSP production at the household level, adequate nutrition education and appropriate behaviour change communication.

Resource 3: Facts on poultry role in human nutrition and performance of improved chicken breed

- There is growing evidence to demonstrate the role of small-scale poultry in enhancing the food and nutrition security of the poorest households and in the promotion of gender equality.
- Poultry meat and eggs are widely available, relatively inexpensive and can be of central importance in helping to meet shortfalls in essential nutrients of impoverished people.
- The incidence of several common metabolic diseases associated with deficiencies of critical dietary minerals, vitamins and amino acids can be reduced by the contribution of poultry products rich in all essential nutrients except vitamin C.
- Providing small portions of eggs can have a highly beneficial effect on a child by reducing many of the signs associated with a dietary protein deficiency such as low growth, kwashiorkor and poor mental function.
- Chicken meat and eggs provide a readily available, high-quality source of proteins, vitamins and micronutrients. Eggs are an excellent source of iron, zinc and vitamin A, all of which are essential to health, growth and well-being. Chickens and eggs contribute to a nutritious, balanced diet, which is especially important for children, nursing mothers and people who are ill.
- Folic acid in poultry meat and eggs is especially important during pregnancy.
- The egg production potential of local chicken is 30-60 eggs/year/hen with an average of 38 gm egg weight under village management conditions, while exotic breeds produce around 250 eggs/year/hen with around 60 gm egg weight.
- Improved chicken has no broodiness.
- Hens start laying eggs at the age of 22-32 weeks, depending on the breed, their health and development. Often indigenous hens will start much later than imported (exotic) breeds.
- Hens around 40-50 weeks of age lay the most eggs, and then gradually their egg production decreases slowly. If a mature egg layer lays very few eggs, you should sell or eat it.
- Improved chicken growth rate is 50-55 gm/day, while local chicken growth rate is 5-10 gm/day.

Session 8: Conducting Group Nutrition Education

Introduction

This session discusses conducting group nutrition education. The nutrition education materials or counseling cards described under this session are supposed to be used by agriculture development agents to make their agricultural work nutrition sensitive.

Learning objectives

1. To become familiar with group nutrition education materials.
2. To be able to provide group nutrition education.

Counseling Cards

Counseling Cards

Counseling Card 1: Healthy Family Foods (ADD PICTURE)

1. Opening questions

- What is this family eating?
- How many different foods do you see? Do you think that they are eating well?
- Do you eat these foods?
- Do you grow any of these foods in your garden?

2. Why is it important to eat many different foods?

Different foods provide different nutrients that people need to be healthy:

- Children need a variety of foods to grow well and to develop properly.
- Adults need a variety of foods to have energy and be productive.
- Women who are pregnant or breastfeeding need different foods for the baby and themselves to be healthy and strong.

3. What can a family do to make sure that they have a healthy diet?

- Eat at least four different foods groups every day. Include vegetables or fruits in every meal.
- Spend some of the money from selling crops to buy foods that will add to the variety eaten by the family, including fruits, eggs, meat and poultry.
- Each day, eat at least one additional food that is different from your normal diet.

4. Discussion questions

- What are some challenges that you would face in trying to have a diversified food every day?
- What can you do to overcome these challenges?

Counseling Card 2: Food Safety (ADD PICTURE)

1. Opening questions

- What do you see in these pictures?
- Do you think that these people are doing healthy things? Why?

2. What might happen to a young child if the food was not washed or the mother did not wash her hands before feeding the child?

- The child might get sick with diarrhea.
- The child might not grow well.
- The child might have to go to the health center.
- The child might be crying and inactive.

3. What are things that your family can do to keep food safe for eating?

- Wash all utensils (pots, pans, knives) and all work surfaces for cooking—make sure all is clean.
- Clean hands with soap or ash and water.
- Keep flies and insects away from food.
- Cover or wrap leftover cooked food.
- Always reheat leftover food.
- Wash fresh foods (vegetables, fruits) in clean water.

4. Discussion questions

- What are some challenges that you would face in trying to keep food clean and safe to eat?
- What can you do to overcome these challenges?

Counseling Card 3: Growing diversified crops and, if not growing, purchase the necessary food by selling what you have (ADD PICTURE)

1. Opening questions

- What do you see in these pictures?
- Do you think that the food types you see are necessary? Why?

2. What might happen if the family or a child is not eating these foods?

- The child might get sick.
- The family might not get nutritious food.
- The child might become malnourished.

3. What are things that the family can do to improve the food intake?

- Give fruits and vegetables.
- Use backyard gardens
- Sell some of the products and buy others to diversify the food.

4. Discussion questions

- What are some challenges that you would face in this?
- What can you do to overcome these challenges?