Training Manual for Community Based Service Providers on Integrated WASH, Agriculture and Nutrition

PARTICIPANT'S HANDOUT

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KIWASH | USAID Kenya Integrated Water, Sanitation and Hygiene Project

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List of Acronyms

ACF	Action Against Hunger
AEWs	Agriculture Extension Workers
ANC	Antenatal Care
AVCD	Accelerated Value Chain Development
CBCC	Centre for Behaviour Change and Communication
CHEWs	Community Health Extension Workers
CHVs	Community Health Volunteers
CLTS	Community Led Total Sanitation
DHIS	District Health Information System
DTCs	Drought Tolerant Crops
EE	Environmental Enteropathy
ENA	Essential Nutrition Actions
GAP	Good Agricultural Practices
KAP	Knowledge, Attitude and Practices
KIWASH	Kenya Integrated Water, Sanitation and Hygiene
MOH	Ministry of Health
MCH	Mother and Chile Health
MTM	Mother to Mother
MUS	Multiple Use Water Services
NE	Nutrition Education
OD	Open Defecation
ORT	Oral Rehydration Therapy
SBCC	Social Behaviour Change and Communication
SODIS	Solar Water Disinfection
SWOT	Strengths Weaknesses Opportunities and Threats
TOR	Terms of Reference
TOT	Training of Trainers
UNICEF	United Nations International Children's Emergency Fund
USAID	United States Agency for International Development
WAOs	Ward Agricultural Officers
WASH	Water Sanitation and Hygiene
WHO	World Health Organization
WRA	Women of Reproductive Age

Acknowledgments

About KIWASH

The Kenya Integrated Water, Sanitation, and Hygiene (KIWASH) project is a five-year (October 2015–September 2020) investment by USAID and the American people to improve access to drinking water, sanitation, hygiene and nutrition services for one million Kenyan citizens in nine counties. To achieve this, KIWASH works collaboratively with local government agencies, dozens of private sector companies and hundreds of communities. KIWASH activities are implemented in nine counties in two principal focus areas: Busia, Nyamira, Migori, Siaya, Kisumu, and Kakamega counties in the Lake Victoria Focus Area, and Kitui, Makueni, and Nairobi counties in the Tana/Athi Focus Area.

Manual Development

This ***Participant's Handout: Training Manual for Community Based Service Providers on Integrated Wash, Agriculture and Nutrition***was developed by the KIWASH Team in collaboration with county and national government stakeholders from ministries of water, health and agriculture. The stakeholders were involved in drafting and reviewing the manual through three workshops held in Nairobi and Kisumu in the months of September and October, 2018. A list of all contributors has been included in the manual's annexes.

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Module 1: Introduction to WASH, Agriculture and Nutrition

Handout 1.1: WASH Definitions

- W.A.S.H. stands for Water, Sanitation and Hygiene
- WASH mainly refers to activities aimed at improving access to and use of safe drinking water, sanitation as well as promoting good hygiene practices. Further description of WASH activities and terminologies are indicated below:
  - **Water quantity:** Provision of facilities and services that increase the amount of water available for drinking, cooking and maintaining good hygiene practices within households, health care facilities or schools, and reduce the time and effort required to collect the water
  - **Water quality:** Improvement and protection of the chemical, and physical quality of drinking water through water treatment and safe storage or by improving existing water sources to protect them from outside contamination. Improved water sources include piped water on-site, public taps or standpipes, boreholes, protected dug wells, protected springs and rainwater
  - **Sanitation:** Provision and use of facilities and services that safely dispose of human waste (thereby preventing contamination of the environment. Improved sanitation facilities are those that hygienically separate human excreta from human contact and include: flush or pour-flush toilets to piped sewer systems, septic tanks or pits, ventilated improved pit latrines, pit latrines with slab, and composting toilets
  - **Hygiene:** Conditions and practices that help to maintain health and prevent spread of diseases such as proper handwashing practices and proper food handling and storage.

SOURCE: WHO, UNICEF, USAID. IMPROVING NUTRITION OUTCOMES WITH BETTER SANITATION AND HYGIENE, 2015

Handout 1.2: Nutrition Definitions

- Food is anything edible that provides the body with nutrients.
- Nutrients are chemical substances in food that are released during digestion and provide energy to maintain, repair or build body tissues. Nutrients include macronutrients and micronutrients.
  - Macronutrients include carbohydrates, protein and fat (needed in large amounts).
  - Micronutrients include vitamins and minerals (needed only in small amounts).

- Nutrition is the process of consuming food and drink and the chemical and physical processes that break down the food and release nutrients needed for growth, reproduction, immunity, breathing, work and health.

- Nutrition security is the ongoing access to the basic components of good nutrition, that is, a diversified diet, safe environment, clean water and adequate health care for all people, and the knowledge needed to care for and ensure a healthy life for all household members.
- Food security exists when all people, at all times, have both physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. A household is food secure when all its members have food, the ability to obtain food throughout the year while ensuring proper use to meet their nutritional needs.

- Malnutrition occurs when food intake does not match the body's needs. A malnourished person can either have under-nutrition or over-nutrition.
  - Under-nutrition is the result of not consuming enough nutrients for healthy growth and development. Undernutrition includes being underweight for one's age, dangerously thin for one's height (wasted), too short for one's age (stunted), and deficient in vitamins and minerals (micronutrient deficient).
  - Over-nutrition is the result of consuming more nutrients than the body needs for healthy growth and development. It results in one either being overweight or obese. WHO defines overweight and obesity as abnormal or excessive fat accumulation that presents which increases the risk of chronic diseases such as high blood pressure, diabetes, stroke and heart diseases.

Handout 1.3: Causes of Malnutrition among Children (0-2 years) in our Community

A. Immediate causes

Inadequate food intake

i. _____

ii. _____

Diseases

i. _____

ii. _____

iii. _____

B. Underlying causes

Inadequate access to food

i. _____

ii. _____

iii. _____

Inadequate care for children and women

i. _____

ii. _____

iii. _____

Insufficient health services and unhealthy environment

i. _____

ii. _____

iii. _____

C. Basic Causes

i. Economic: _____

ii. Nutrition knowledge: _____

iii. Education levels: _____

iv. Land availability: _____

v. Food production: _____

Handout 1.3: Consequences of Malnutrition

1. **Increased risk of disease:** There is a vicious cycle of malnutrition and disease. This is because when one is malnourished, their immunity against infections is reduced and they can easily get sick. Similarly, when one is sick, he/she is likely to have reduced appetite, poor absorption of nutrients in the body or increased use of nutrients for healing that may not be replaced as fast.

2. **Intergenerational cycle of malnutrition:** The cycle of malnutrition may continue from one generation to the next generation. Young girls who are stunted (too short for their age) are likely to become stunted women and are more likely to give birth to low birth weight babies. The babies who are girls are then likely to continue the cycle of being stunted in adulthood. Adolescent pregnancy increases the risk of low birth weight and make it difficult to break the cycle of malnutrition.

3. **Stunting reduces mental capacity:** Children who become stunted before birth or during the first two years of their lives may perform poorly in school because their brains have not developed properly. They are also at risk of easily getting sick and are likely to grow up to become less productive as adults and earn lower income.

4. **Stunting and delayed maturation significantly increase risk of complications during pregnancy:** When women are short (height), this is often associated with small pelvises, and this is an important risk factor for obstructed labour. The risk rises sharply when the height is below 1.45 m.

5. **Stunting in early childhood increases risk of obesity and chronic diseases later in life:** Obesity and stunting often co-exist. Evidence shows there is increased chronic disease risk (hypertension, diabetes, etc.) among people having been exposed to malnutrition in early life.

6. **Malnutrition reduces work capacity:** Undernutrition (particularly stunting) might limit work capacity and endurance of affected individuals.

7. **Obesity increases the chances of getting non-communicable diseases** such as diabetes, cardiovascular diseases and hypertension. These diseases greatly affect one's quality of life and they may lead to either disabilities or premature death.

Handout 1.4 a: Food Groups and Locally Available Foods

No.	Food Group	Locally available foods
1	Cereals, tubers, roots	Cereals: Maize, rice, sorghum, millet, wheat, oats and pearl millet
		Roots and tubers: Irish potato, sweet potato, cassava, yams, arrowroot and green banana
2	Beans, pulses	Bambara nuts (njugu mawe/ bande), beans, peas, cow peas, pigeon peas (mbaazi), soya beans, dolicos beans (njahi), green grams, lentils
3	Nuts, seeds	Pumpkin, amaranth, sunflower, sesame (simsim), groundnuts, macadamia, cashew nuts
4	Dairy/milk products	Milk from goats, camels, cows and sheep, fermented milk (mursik, amarurano,) yoghurt, cheese and other products
5	Eggs	Chicken, quail, and goose eggs
6	Meat, fish, poultry, insects, organ meats	Goat meat, pork, beef, mutton, rabbit, donkey, chicken, guinea fowl, turkey, geese, ducks, quail, wild birds, doves, edible insects, organ meats -liver, kidney, heart, tilapia, omena, nile perch and cat fish
7	Orange/yellow fruits and vegetables	Carrots, pumpkin and butternut; orange fleshed sweet potato, red sweet bell pepper
8	Dark green vegetables	Spinach, kales (sukuma wiki), cow peas leaves (kunde), bean leaves, black African nightshade (managu), amaranthus (Terere), stinging nettle (thabai/oilo), sweet potato leaves (matembele), non- poisonous cassava leaves (kisamvu), spider weed (saget/dek/ akeyo/sagaa), pumpkin leaves (Susa), arrow root leaves (matekyo
9	Other vegetables	Green pepper, onions, cauliflower, cabbages, cucumbers, eggplant, courgettes, French beans, okra, leeks, broccoli, celery
10	Other fruits	Guava, avocado, pineapples, green plums, green grapes, apples, gooseberries (nathi), oranges*, lemons, limes, tamarind, loquats, zambarao (jamna), ripe bananas, custard apples, peaches, thorn melon, melons, pomegranates (kungu manga), wild fruit

Handout 1.4b: Nutrients and their Functions In the Body

Nutrient	Why we need it	Rich food sources
Proteins	Help to build body tissues, fluids and the immune system	Beans and pulses, milk and milk products, meat and meat products
Carbohydrates (starches and sugars)	Provide energy for the body to function, move and keep warm.	Cereals, tubers and roots
Fats	Provide concentrated sources of energy and substances needed for health and growth. They also help with the absorption of some vitamins such as Vitamin A.	
Vitamin A	Helps prevent infection and keeps the immune system working properly. Also keeps skin, eyes and lungs healthy. Helps with night time vision.	Orange and yellow fruits and vegetables; dark green leafy vegetables
B-group vitamins	Help the body use other nutrients and the nervous system.	Beans and pulses; meat and meat products; whole cereals
Folate	Needed to make blood and helps with normal development of the foetus	Meat and meat products, dark green leafy vegetables
Vitamin C	Helps absorption of iron, destroys some harmful substances in the body and helps wound healing	Calciferous vegetables – cabbage, cauliflower, broccoli; Citrus fruits– oranges, lemon, pumpkin, lime
Iron	Needed to make blood and helps brain function	Meat and meat products, dark green leafy vegetables
Iodine	Essential normal growth, for brain and nervous system development	Iodized salt
Zinc	Needed for growth, development, reproduction and the functioning of the immune system	Nuts and seeds
Fibre	Helps the digestive process and keeps the gut healthy. It absorbs harmful chemicals, slows digestion and improves the absorption of nutrients from food.	Whole cereals, tubers and roots; fruits and vegetables

Handout 1.5: Nutrient Needs for Children and Women of Reproductive Age

For children under 5 years

- Infants from birth to 6 months require breastmilk only. This is sufficient to meet all the nutrients that the baby needs in the correct quantities
- After 6 months, breastmilk alone is not enough to meet the child's nutrient needs. Other foods must be introduced in the right quantities, while still breastfeeding on demand
- Children aged above 6 months to 5 years have additional nutrient requirements (energy, protein and micronutrients). This is to support their maximum growth (height and weight) and to prevent infections

For pregnant women

- Pregnancy increases a woman's nutritional requirements and micronutrient needs
- Extra energy is needed for the growth of the foetus, placenta, and associated maternal tissues
- Extra micronutrients – iron and folic acid – are needed to ensure the body has enough iron stores to prevent anaemia, low birth weight and birth deformities
- The average woman should gain about 10 kilograms during pregnancy (individual energy requirements may be different depending on the woman's pre-pregnancy height and weight and activity level). Many women do not even gain half of this recommended amount because of poor diets and heavy workloads
- Women who enter pregnancy when already underweight need more calories to achieve adequate weight gain
- Pregnant women need an extra meal each day in addition to their regular 3 meals and 2 snacks to support her nutrition and that of the foetus

For breastfeeding mothers

- Breastfeeding increases women's nutritional requirements and micronutrient needs
- Breastfeeding mothers have higher nutrient needs than pregnant women
- A woman who has eaten well during pregnancy will have adequate fat reserves to help meet the additional needs required during breastfeeding period
- Mothers should eat an adequate diet (especially protein, calcium, and vitamins) for successful breastfeeding without depleting their own nutrient stores
- Breastfeeding mothers should eat 2 extra meals each day in addition to their regular meals and 2 snacks to support her nutrition and to meet the breastfeeding needs

Handout 1.6: Small Scale Agriculture

DEFINITION OF SMALL SCALE AGRICULTURE

Small-scale agriculture is the production of crops and livestock on a small-piece of land within a community, school or near a homestead.

- **Livestock farming** includes big and small livestock – e.g. cattle, goats, sheep, rabbits, poultry, pigs, etc.
    - Also includes aqua culture which is the breeding, rearing and harvesting of various types of fish.
- **Crop farming** includes a variety of crops e.g. vegetables, fruits, maize, legumes, etc. Examples of nutrient dense vegetables that can be grown include: black night shade, amaranthus, cow peas, spinach, carrots, pumpkins, orange fleshed sweet potato, spider plant, kales, okra, tomatoes and crotolaria.

ROLE OF SMALL SCALE AGRICULTURE

- Contributes to household income
- Enhances nutrition at the household level
- Is sustainable agriculture that creates opportunities for agri-business and for promoting local foods
- Promotes diet diversity, that is, households obtain nutrients from both animal and plant products
- Continuous availability of nutritious foods all year round for the family
- Provides an opportunity for establishing plant nurseries and trying out new farming technologies
- Contributes to food safety as the household can control the use of safe technologies in food production, harvesting and processing

FORMS OF SMALL-SCALE AGRICULTURE

- **Home garden:** This is an area around the family home with an integrated system, which comprises of kitchen garden, mixed garden, fishpond, storage facilities, animal house, etc. It produces a variety of foods and agricultural products, such as vegetables, fruits, medicinal plants, poultry, livestock and fish, for both home consumption and/or for income
- **Kitchen garden:** This is any convenient size of a plot near a homestead where a variety of crops grown are mostly used for household consumption. Surplus produce from the garden may sometimes be used to generate income

Handout 1.7: Types of Crops and Livestock Enterprises

a) Crops	
Food Group	**Possible Crops**
Grains, roots and tubers, and plantains	**Cereals:** Maize **Roots and tubers:** Irish potato, white sweet potato, cassava, yams, arrowroot, green banana
Pulses (beans, peas and lentils)	**Legumes and pulses:** chick peas, cow peas, green beans, kidney beans, rosecoco, lentils, black-eyed peas, black beans, butter beans
Dark green leafy vegetables	**Dark green leafy:** Spinach, kales (sukuma wiki), cow peas leaves (kunde), bean leaves, black African nightshade (managu), amaranthus (Terere), stinging nettle (thabai/oilo), sweet potato leaves (matembele), non-poisonous cassava leaves (kisamvu), spider weed saget/dek/ akeyo/sagaa), pumpkin leaves (Susa), arrow root leaves (matekyo)
Other vitamin A-rich fruits and vegetables	**Vitamin A rich vegetables:** Carrots, pumpkin and butternut; orange- fleshed sweet potato, red sweet pepper Vitamin A rich fruits: Ripe mango and papaya, passion fruit
Other vegetables	**Other vegetables:** Green pepper, onions (red and spring varieties), cabbages, eggplant, courgettes, French beans, celery and tomatoes
Other fruits	**Other fruits:** avocado, plums, oranges, lemon, ripe bananas, wild fruits
Herbs and Spices	Mint, Oregano, Rosemary, Basil, Celery, Coriander, sage, chilli peppers
Medicinal Plants	Stinging nettle, Aloe Vera, Moringa
b) Livestock enterprises	
Poultry	Poultry include local chicken and exotic (layers and broilers), ducks, geese, turkeys and quails
Rabbits	Rabbit products are mainly meat; a rabbit weighing 2 kilograms (kg) produces about 1.2 kg meat. Other products include skin, manure and urine
Goats	Meat and dairy goats
Fish farming	Common species of fish, found in Kenya include tilapia, nile perch (mbuta), cat fish, omena, among others

Module 2: Linking WASH to Agriculture and Nutrition

Handout 2.1: Key WASH Pathways to Undernutrition

1. REPEATED BOUTS OF DIARRHOEA

There is a vicious cycle between diarrhea and undernutrition – a child with diarrhea eats less and are less able to absorb the nutrients from their food. A malnourished child has weaker immunity and is more likely to get diarrhea when they are exposed to faecal matter from their environment.

2. INTESTINAL WORM INFECTION

Poor sanitation directly causes soil-transmitted helminthic infections, that is, roundworm, whipworm and hookworm. One can get infected when they ingest the worms through contaminated water or food, or by direct contact with the skin when walking barefoot on contaminated soil. These helminthic infections may affect one's nutrition through poor nutrient absorption, loss of appetite or increased blood loss. Hookworm infections a major cause of anaemia in pregnant women and children while severe whipworm and roundworm can affect child's growth.

3. ENVIRONMENT ENTEROPATHY

Environmental enteropathy (EE) is a 'chronic infection of the small intestine caused by prolonged and persistent exposure to faecal pathogens either by ingesting faecal matter or living in poor WASH conditions'. This condition leads to poor nutrient absorption and reduces immunity to fight infections. EE can occur in children who do not have diarrhea.

Handout 2.2: Essential WASH Actions to improve Nutrition Outcomes

CATEGORY	ESSENTIAL WASH ACTION
WATER SUPPLY AND WATER QUANTITY	- Build rainwater catchment tanks, storage tanks and install piped water system – where water is scarce or difficult to get to - Practice multiple use water services (MUS) approach to maximize on the available limited water to meet domestic and agricultural household needs
WATER QUALITY	- Protect water sources (piped water on-site, public standpipes, boreholes, protected dug wells, protected springs and rainwater) - Strengthen water safety planning and maintenance - Treat water for drinking - Safely collect and transport water to point of use - Drink safe water - Safely store water - Safely handle water
SANITATION	- Safely dispose and treat human faeces – use of a sanitation facility by all - Safe disposal of child faeces o Use of diaper/nappies and safe disposal of faecal matter into toilets and safe washing of nappies o Use containers that help to collect faeces into latrines for safe disposal o Make latrines 'child friendly' - Proper construction, placement and hygienic use of latrines o Make structural improvements to latrines to make it easy to use for people with physical disabilities or difficulties
ENVIRONMENTAL HYGIENE	- Keep animals away from food preparation and child feeding areas, child play areas and water sources - Clear the compound of any animal or child faeces, everyday - Control disease vectors such as flies, mosquitoes, cockroaches and rats by covering food, improving drainage and safely disposing of garbage into a protected pit - Clean key surfaces, such as latrines, toilet basins and kitchen floors with soap and water (and bleach if available)
HYGIENE PROMOTION	- Correct handwashing with soap at critical times o Before preparing food or cooking o Before eating or feeding a child (including breastfeeding) o After changing diapers or cleaning a child's bottom o After visiting a latrine (or defecating) - Safe food hygiene o Keep a clean environment for handling food (including handwashing, cleaning cooking surfaces and utensils, protecting food preparation areas from insects, pests and other animals) o Use safe water for cooking or cleaning raw food/utensils - Construct and use tippy taps for handwashing

Handout 2.4: Good WASH Practices to Improve Small-Scale Agriculture

Good Agricultural Practice	Description and Benefit
Proper mapping of the garden	Sketch a map of the entire garden. Determine the garden size and shape by taking into consideration key factors such as; level ground, away from main traffic routes, near water site, purpose of the garden, gardening technology to be adopted, the family's nutrition needs and land available

Planning for garden improvements (site, water supply and soil improvement)	• Site Improvement: Decide what to keep; remove rocks/roots/bushes; kill perennial grasses and weeds; level the ground; establish fences/hedges/walls; dig drainage ditches; provide secure garden shed
	• Water supply and irrigation system: Improve and secure water supply (e.g. harvest water from roof tops or use 'grey water' from washing dishes and establish watering or irrigation system
	  o Adopt a multiple-use water services (MUS) approach: MUS is an approach that optimizes water availability and quality at the community level so that it can be used to meet domestic, agricultural and household water needs in a sustainable manner. MUS is best used where water availability is limited or where only one water source is available to meet community needs
	• Soil Improvement: Do a soil analysis; us the appropriate type and quantity of fertilizer; dig over the soil, but avoid over tillage; use composted manure to kill harmful pathogens. Materials used for production of compost manure include; chicken faeces, young weeds, leaves, grass cuttings, wood ash, egg boxes, fruits and vegetable scraps, tea bags, old flowers and animal bedding. Fish and meat bones, newspapers, cooked food and dog faeces should be avoided
	  o Treated human excreta as with animal manure, contains all the relevant nutrients, organic matter and water needed for plant growth, and can serve as an important source for enriching soil and higher yields

Selection of basic farm equipment that are appropriate to soil type and moisture content	• Determine the basic equipment that is needed to establish the garden. You can either borrow some tools while some can be home-made. • Learn to use equipment in compliance with safety regulations and observe established safety standards for operation of equipment for crop and fodder production
Proper planning and laying out of the garden	• The main elements of the garden are beds, paths, nurseries, compost heaps and garden shed. The recommended garden beds should be permanent raised beds. • Other considerations include: spacing plants adequately for ease of cultivation, consistent watering, staggering the cropping to ensure at least 10 days apart of the same crop (for continuous supply of produce), inter- planting as much as possible, to maximize on the use of space and ensure that the crops support or complement each other, rotating the crops often and practice contour planting where there is a slope.

Handout 2.4: Good WASH Practices to Improve Small-Scale Agriculture

Identification of crops or livestock based on nutritional and income needs of the family	• Find out the nutritional value of local foods and choosing foods to grow or livestock that gives nutrient-dense products • Seed selection: Choose annual and perennial crops that meet family and market needs and that are suitable to the site and their role within crop rotation for the management of soil fertility, pests and diseases. • Integrate livestock into crop rotations to utilize nutrient cycling provided by grazing or housed livestock to benefit the fertility of the entire farm • Seed sowing: large seeds, e.g. beans and pumpkins are planted directly into the garden, but small seed such as lettuce, celery, tomato, coriander should be transplanted to the garden bed
Tending to plants (watering, mulching and weed control)	• Watering of crops should be carefully done, ideally close to the ground to avoid over splashing and compacting the soil when water hits the ground with force, while keeping the bed moist. Use a watering can or punch holes in a plastic bottle to provide a fine spray. o Run-off water and waste-water (grey water) can be used in watering kitchen gardens. • Weed control should be ensured to rid the garden of weeds that compete with the crops for light and nutrients. Care should be taken not to damage the roots of the crop during weeding. Weeding can also be done by use of chemicals. Seek advice before purchasing the chemicals. Some crop varieties require digging around the stems to provide partial support to the plants and allow root and tuber development. Weeding is usually done before fertilizer application.
Proper and safe use of pesticides[1], herbicides and fungicides	• Pesticide application should be controlled throughout every phase from land preparation to post harvest handling. • Prevent water contamination: Pesticide users should map the location of water sources to avoid contamination. Establish vegetation and other barriers to help limit contact between chemicals and water sources. All farm and pesticide equipment should be washed regularly to prevent contamination of farm produce • Ensure that irrigation runoff is not used for drinking water: Irrigation water can be contaminated with pathogens from farm animals and toxins from pesticides. This water should not be in contact with household drinking water. • Safe handling of pesticides: Pesticide handlers must be properly trained by the appropriate authorities and they must wear the protective gear.

1 **Pesticides** are chemical substances used for the control of insects or other organisms that are harmful to crops or livestock. **Herbicides** are chemical substances that are toxic to plants and are used to destroy unwanted weeds. **Fungicides** are specific types of pesticides that control fungal disease by specifically inhibiting or killing the fungus.

Handout 2.4: Good WASH Practices to Improve Small-Scale Agriculture

	• Pesticide transportation and storage: Pesticides should not be transported or stored with food, animal feed, seeds, fertilizers, packaging material, water or other material which they could contaminate • Disposal of pesticides: Pesticide containers should not be dumped near water sources. Empty pesticide containers should not be accessible to children or animals.
Use of appropriate gardening technologies that are simple and affordable	• Examples of appropriate technologies in: o **Pest and disease management** e.g. sprinkling ash over sucking insects, such as aphids; grow plants that have a strong smell such as lantana and lemon grass near food crops to repel insects o **Watering of crops:** should be done close to the ground to avoid over splashing and to keep bed moist/wet. Use drip irrigation or a watering can or punch holes in a plastic bottle to provide a fine spray o Harvesting – careful handling of produce during harvest enhances shelf life and utilization. Use clean hands and tools while harvesting. o **Post-harvest Management:** Crops not for immediate consumption or sale should be stored appropriately. Fresh vegetables are perishable and need to be cooled as quickly as possible after harvest. Fresh roots and tubers should be washed immediately to remove soil after harvest and air dried in shade for 1-2 days to partially heal wounds prior to packaging and storage. They can also be peeled and sun-dried for longer preservation. o **Storage and preservation:** Proper storage of food is critical in helping to increase shelf life of produce. It also maintains the nutritive value, e.g. keep fresh vegetables in cool conditions. o **Use of appropriate kitchen gardening technologies:** improved conventional kitchen garden, multi-storey gardens, moist beds (sunken or raised), staircase garden, small scale drip irrigation and Zai pits.
Practice group farming for optimal socio-economic benefits	Advantages of group farming • Information spreads more quickly among group members • Members get more economic benefits • Different skills of farmers are better utilized among members • Work is made lighter and is completed faster • A group has more bargaining power with input suppliers, banks and other credit suppliers, and with buyers of their products • Members can get the services of village and county level organizations • It is easier and more cost effective to organize trainings and monitoring/follow-up visits with groups • Gained skills and experience is better preserved in group settings • Groups can take responsibility over certain extension activities e.g. establishing demonstration plots

Handout 2.4: Good WASH Practices to Improve Small-Scale Agriculture

Use of appropriate gardening technologies that are simple and affordable	• Examples of appropriate technologies in: o **Pest and disease management** e.g. sprinkling ash over sucking insects, such as aphids; grow plants that have a strong smell such as lantana and lemon grass near food crops to repel insects o **Watering of crops:** should be done close to the ground to avoid over splashing and to keep bed moist/wet. Use drip irrigation or a watering can or punch holes in a plastic bottle to provide a fine spray o Harvesting – careful handling of produce during harvest enhances shelf life and utilization. Use clean hands and tools while harvesting. o **Post-harvest Management:** Crops not for immediate consumption or sale should be stored appropriately. Fresh vegetables are perishable and need to be cooled as quickly as possible after harvest. Fresh roots and tubers should be washed immediately to remove soil after harvest and air dried in shade for 1-2 days to partially heal wounds prior to packaging and storage. They can also be peeled and sun-dried for longer preservation. o **Storage and preservation:** Proper storage of food is critical in helping to increase shelf life of produce. It also maintains the nutritive value, e.g. keep fresh vegetables in cool conditions. o **Use of appropriate kitchen gardening technologies:** improved conventional kitchen garden, multi-storey gardens, moist beds (sunken or raised), staircase garden, small scale drip irrigation and Zai pits.
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12 Edict is legislation that was enacted under the military regime

Module 3: Essential WASH Actions

Handout 3.1: Summary of WASH Challenges in the Country

Sanitation Challenges	Hygiene Challenges	Possible Solutions
• Open defecation (OD) is common in slum areas within urban settings owing to: poor security especially at night forcing people to opt to practice OD; cost related to use of latrines which is a constraint owing to poverty • OD is still practiced in many rural communities. The reasons for this are multiple to include, but not limited to: low prioritization of use of sanitation facilities, insufficient knowledge on benefits of sanitation, and perceived high cost of construction of sanitation facilities • Poor disposal of child faeces • Use of shared latrines which may be in poor conditions – both structurally and hygienically • Some shared latrines, particularly in slum areas drain into open drains, with no sewer system. Faeces subsequently leak into rivers and other water sources • In some areas, there are challenges of high water table and weak soil structure (rocky, sandy or clay) which heighten the risk of latrines collapsing • Low knowledge on use of available resources to construct appropriate latrines • Limited land space resulting in high number of people using shared latrines and also risk of contamination of water sources that are near the latrines	• Low use of tippy taps within homesteads and institutions such as schools • Inaccessibility to clean water making it difficult to promote hygienic practices • Low availability of soap or knowledge on use of traditional alternative cleansing agents • Low access to sufficient quantities of water • Low practice of water treatment • Sub-optimal hygiene practices, especially hand washing during critical times • Limited land space resulting in congestion of facilities within homes. There is subsequently limited space for clothesline, sufficient kitchen storage, child play areas and sleeping areas. There is also no clear demarcation of livestock sleeping areas. This increases risk of children being exposed to contaminants while playing within the homestead.	• Ensure shared sanitation facilities have a bathroom and toilet. They should also have either a bio-digester or connection to a proper sewer system • Sensitize communities on use of tippy taps • Sensitization on placement of the soap to minimize wastage and theft. • Use of old pieces of soap to make liquid soap. • Use of water treatment chemicals at household level. • Artisans training on appropriate latrine options e.g. SAFI toilet for areas with weak soil • Promote integrated Community Led Total Sanitation (CLTS), Social Behaviour Change and Communication (SBCC) and sanitation marketing • Sensitize communities on the benefits of handwashing • Establish Oral Rehydration Therapy (ORT) corners in health facilities • Engage CHVs and CHEWs to provide regular sanitation and hygiene sensitization talks to communities • Intensify CLTS interventions through CHVs • Encourage every household to have a sanitation facility • Train school children on WASH and engage them as influencers of their families • Need to use appropriate technology in constructing sanitation facilities that do not flood or collapse • Training of communities on construction of low cost and safe sanitation facilities • Sensitize communities on enhancing household and environmental hygiene within homesteads • Sensitizing communities on demarcating areas within the homestead for livestock, child play areas and cooking areas.

Handout 3.2 a: Correct Handwashing Steps

Correct Handwashing Steps

1. Wet hands with water
2. Apply soap to cover all surfaces of the hands
3. Rub hands palm to palm
4. Rub each palm over the back of the other hand
5. Rub palm to palm with fingers interfaced
6. Rub backs of fingers to opposing palms with fingers interlocked
7. Rub each thumb clasped in opposing palm
8. Clasp fingers and circular rub opposing palm
9. Rub each wrist with opposite hand
10. Rinse hands with clean running water and air dry

Important Information on Handwashing

- It is not necessary to use pure or treated water to wash hands. It is however key to use running water to rinse hands
- Use soap in any form – liquid, bar, antiseptic. (Bar soap must be allowed to drain between uses. Also, use soap racks to place the used soap)
- Use friction while washing
- Remove dirt from under fingernails
- 10-15 seconds is the standard acceptable length of time for handwashing
- Use clean towels for drying, or allow for air-drying

SOURCE: MOH, KENYA. MODULE 7: WATER, SANITATION AND HYGIENE

FIGURE 1: CORRECT HANDWASHING STEPS

Handout 3.2 b: Critical times of Handwashing

Critical Times of Handwashing

BEFORE	AFTER
1. Before feeding a child (including breastfeeding)	4. After changing diapers/napkins/ cleaning children's bottoms/handling children's faeces
2. Before eating	5. After visiting the latrine
3. Before preparing food or cooking	

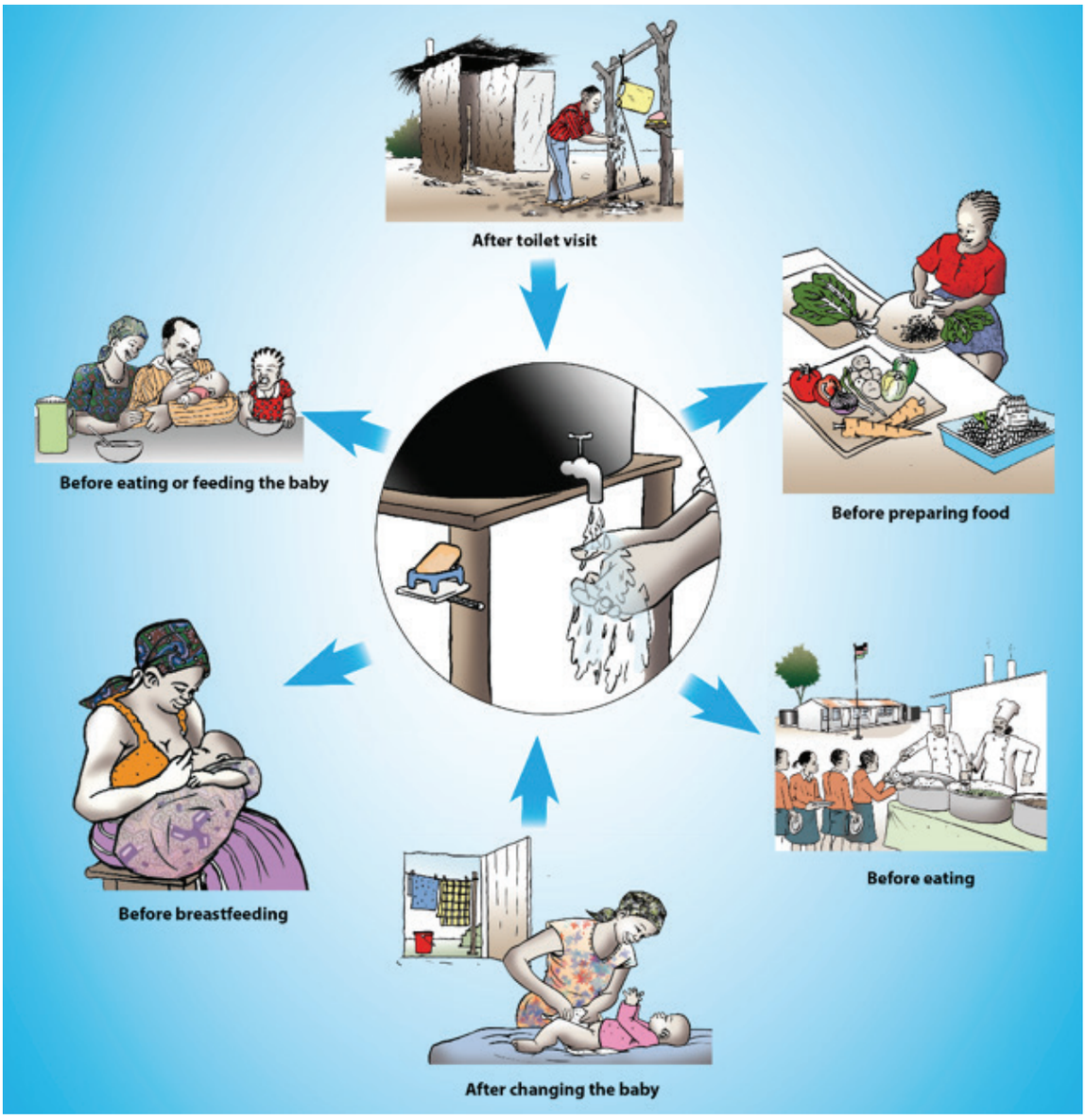


FIGURE 2: CRITICAL TIMES OF HANDWASHING

Handout 3.2 c: How to construct a tippy tap with soap holder

Materials

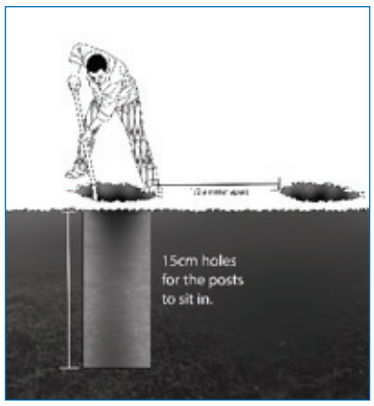
- 3-4 sticks
- Wire/string
- 3-5 litre jerrycan
- Panga for digging holes
- Soap dish

Steps for building a tippy tap

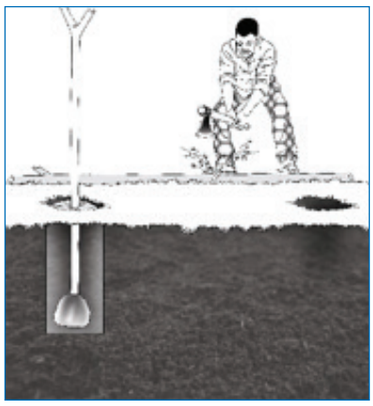
- Start out by digging 15 centimeter holes for the posts to sit in. Space them about half a metre apart from one another.
- Cut the wood to the post's desired length, wrap the bottom parts with the plastic bags (this prevents the wood from rotting) and then put them in the ground. Fortify the stability of the posts by filling in the remaining empty space in the holes with the mixture of rocks and dirt.
- Next, unscrew the lid of the jerrycan and poke a hole at the top. The hole should be large enough for the string to pass through. Tie one end of the string to the wire. Thread the string through the hole so that the wire sits snugly in the underside of the lid.
- Slide one of the slender pieces of wood through the handle of the jerrycan. Make sure it can rock back and forth in the middle of the beam. If the stick is too big, whittle it down. Nail one side of the beam into the top.
- Extend the string to the ground and tie a piece of wood to the end of it. The tippy-tap can then be tipped using your foot on the piece of wood like a foot pedal.

SOURCE: MOH, KENYA. MODULE 7:WATER, SANITATION AND HYGIENE

Step 1



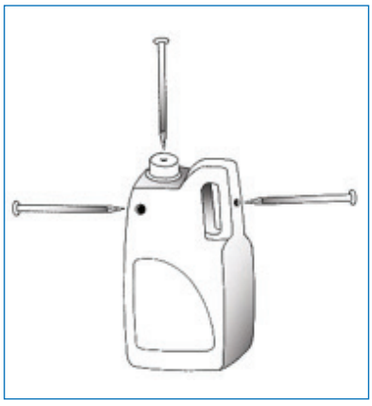
Step 2



Step 3

Step 4

Step 5



Step 6

Step 7

Step 8

FIGURE 3: HOW TO CONSTRUCT A TIPPY TAP

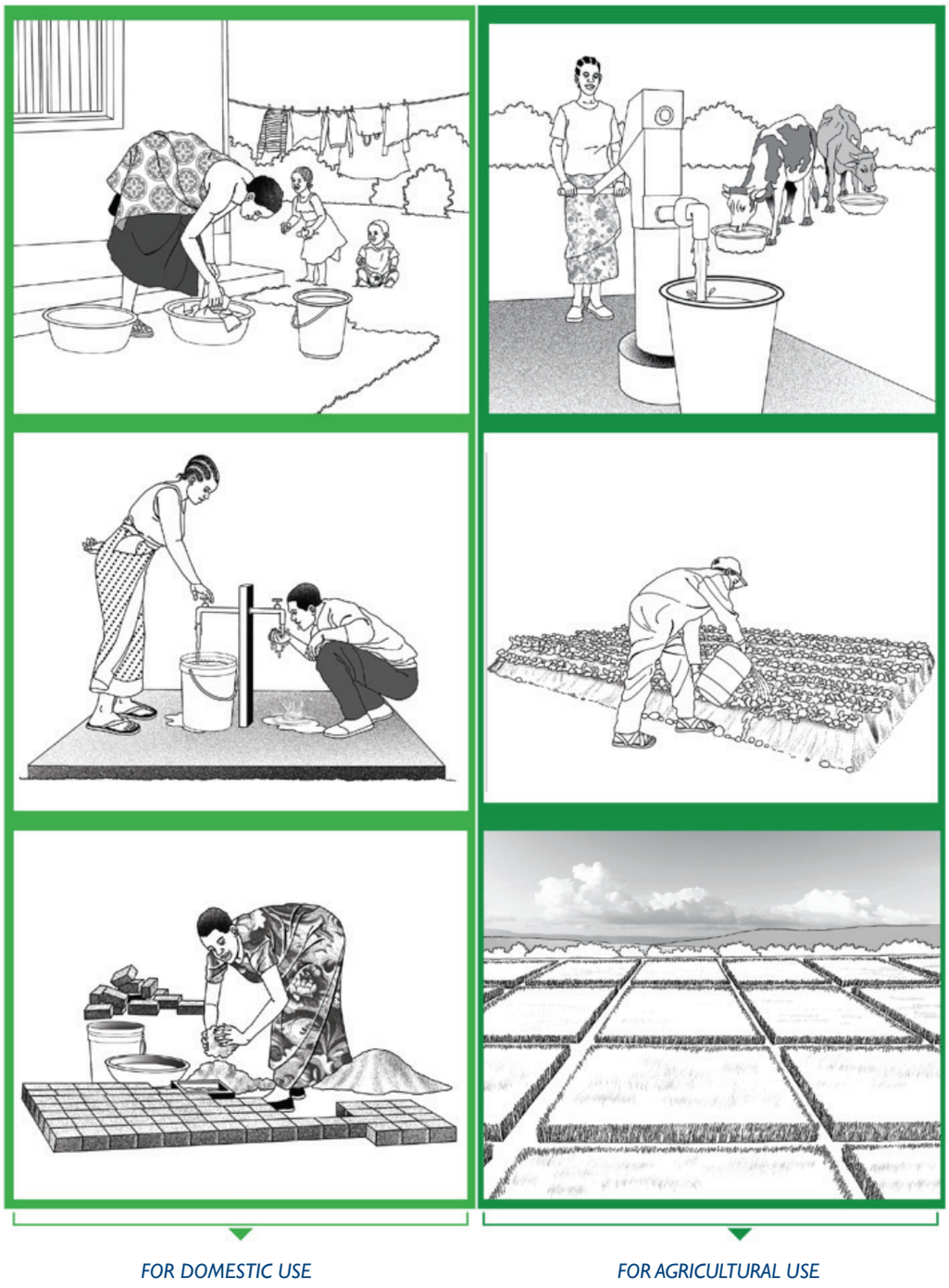


FIGURE 4: MULTIPLE USE WATER SERVICES (MUS)

Handout 3.2 d: Safe Collection, Handling and Storage of Drinking Water

Resource Notes

Safe Collection of Water

- Collect water from protected sources, e.g., protected springs and water pans, boreholes, piped water, etc.
- Collect and transport water with a clean container that has a lid, e.g. a jerrycan

Safe Handling of Water

- Treat water before drinking with an appropriate method, e.g., boiling, water guard, etc.
- Do not treat more water than you need for short-term use, for example, for drinking and preparing food, approximately 5 litres for each person is sufficient for each day.
- Pour water out of the container without touching the mouth of the container. You can do this by either:
    - Pouring water from jerrycan or clay pot directly to clean cup or jug
    - Using a clean long-handled dipper or ladle for drawing water out of the container. Do not let the dipper touch anything else, or it will contaminate the clean water when it is used again. Hang the ladle on the wall or place on top of water container
- Tie cup with a string to container or put on the reed hanging in the house
- Teach children to use the cup/ladle system when they need to drink water
- Keep drinking cups clean

Safe Storage of Water

- Use narrow necked containers or pots for storing drinking water
- Store water in covered jug or 5 litre jerrycan for children to use
- Keep water containers always covered
- Use jerrycan with tap or improvise by purchasing a tap and fit it on it
- Keep water container away from animals
- Store container off the floor, ideally waist high for easy serving and to prevent contact with children and animals
- Empty and clean the container with hot water every 2 or 3 weeks
- Never store water in containers that have been used for pesticides or other chemicals

FIGURE 5: SAFE COLLECTION, HANDLING AND STORAGE OF WATER

Handout 3.2 e: Water Treatment Methods

FIGURE 6: WATER TREATMENT THROUGH FILTRATION

Types of Water Treatment Methods

Boiling
Chlorination using water guard or chlorine tablets
Filtration
Solar water disinfection (SODIS)

STEPS IN WATER TREATMENT USING WATER GUARD

STEP 1
- Fill a clean 20 litre container (jerrycan) with water filtered through a clean cloth

STEP 2
- Pour one cupful of Water Guard liquid into the 20 litres of water
- For clear water, use 1 capful of Water Guard. For visibly dirty/cloudy water, use 2 capfuls

STEP 3
- Close the container (jerrycan) and shake thoroughly to ensure the Water Guard is well mixed with the water

STEP 4
- Let the container stand for 30 minutes before drinking the water. This allows the Water Guard to destroy any contaminants in the water

STEP 5
- Store the tightly closed container in a cool place, away from sunlight

STEPS IN WATER TREATMENT USING SODIS

STEP 1
- Wash a plastic bottle with soap before use. The bottle must be clean, transparent, colourless, 2 litres in volume or smaller, and have all plastic or paper labels removed
- It is recommended that PET plastic bottles are used instead of PVC-type plastic bottles. PET bottles, unlike PVC bottles, burn easily (with a sweet smell)
- PVC bottles should not be used for SODIS
- Glass bottles can also be used for SODIS, as long as they have a reusable lid.

STEP 2	• Fill the bottle with water. Unclean water is put into the bottle. It is important that the water should not be very turbid
STEP 3	• Expose bottle to the sun. The bottle is exposed to direct sunlight for one full day, for at least 6 hours • It is recommended that this step is done during sunny days • When this step is done during cloudy days that are not that sunny, the exposure to sunlight should be done for two full days instead of one day • SODIS should not be done during (continuous) rainy seasons
STEP 4	• Store the treated water in the same bottles until it is consumed to avoid re-contamination

FIGURE 7: WATER TREATMENT THROUGH BOILING

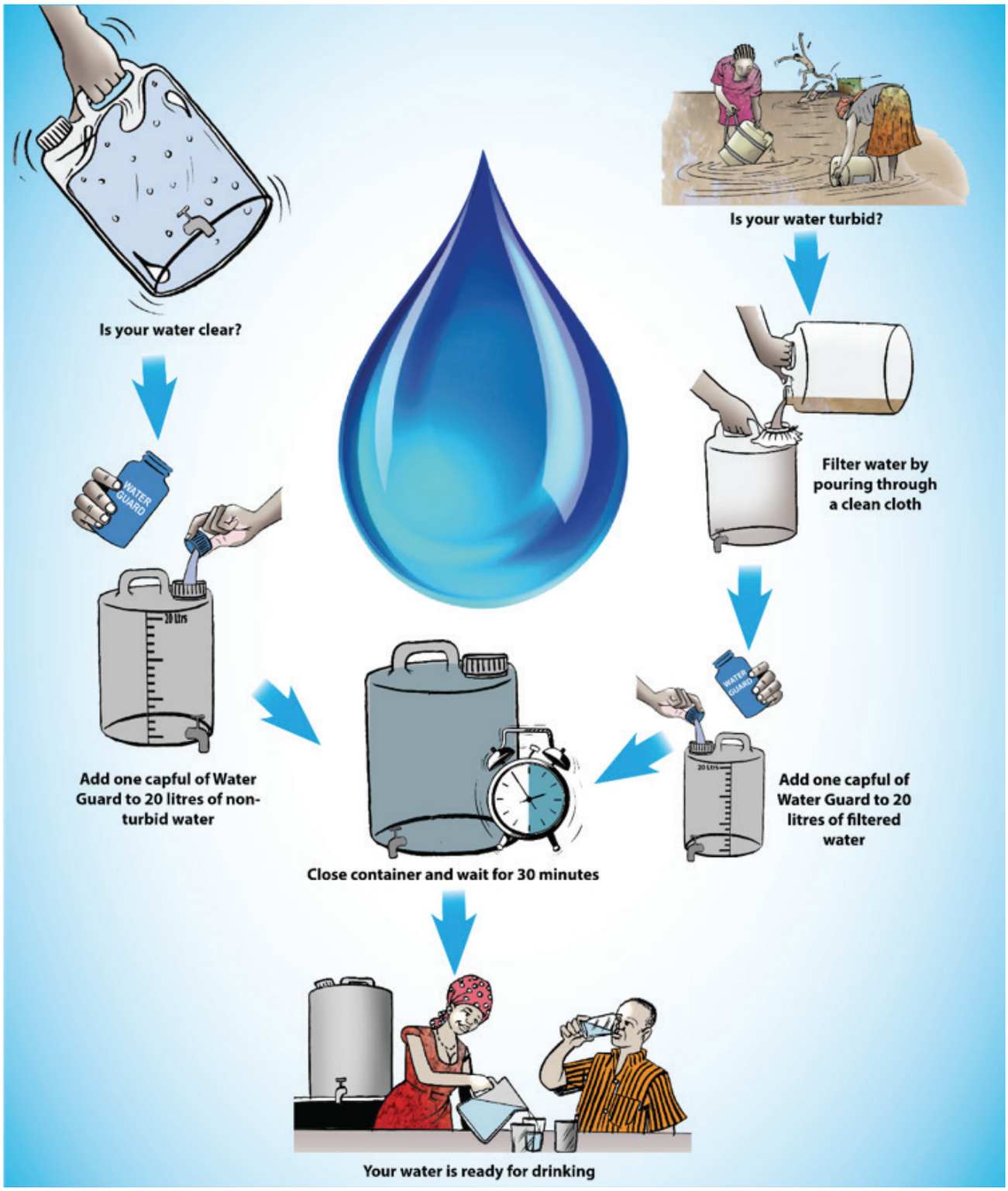


FIGURE 8: WATER TREATMENT USING WATER GUARD

FIGURE 9: WATER TREATMENT USING SOLAR DISINFECTION METHOD (SODIS)

Handout 3.2 f: Food Hygiene during Preparation, Consumption and Storage

Personal hygiene tips

Good personal hygiene is essential to prevent food-borne diseases. Therefore, the following habits must be practiced.

- Ensure handwashing is done with correct technique
- Observe the 5 critical times for handwashing
- Keep hair covered and never comb it where food is being prepared or eaten
- Wear clean clothing or use clean apron while preparing/cooking food
- Do not touch nose & mouth with hands or lick your fingers when handling food
- Do not cough, sneeze or spit near food or dishes.
- If possible, do not cook if suffering from a communicable disease
- Use clean cloth/towel to wipe hands while in kitchen
- Taste food with clean spoon and do not re-insert it into the cooking pot
- Keep clean and short fingernails

Food preparation hygiene tips

Food hygiene

- Food can cause sickness if contaminated. Therefore;
    - Ensure food is obtained from a clean and reliable source
    - Food must be washed thoroughly in clean water before cooking
    - Wash vegetables and fruits before eating them
    - Store, prepare and cook food in clean surroundings
    - Cook foods when fresh and at high temperatures to kill germs
    - Cover food to protect from flies, mice, and other vectors
    - Use serving spoon where appropriate to serve the food
    - Leftover foods must be thoroughly reheated before use
    - Cooked foods should not be stored for long as it can cause food poisoning

Handout 3.2 g: Sanitation Ladder

SANITATION LADDER

What is a Sanitation Ladder?

This is an assessment tool that helps individuals and households to identify their current practices regarding faeces disposal. The ladder indicates the most dangerous (step 1) to the safest options (step 8) of disposing human faeces. The sanitation ladder helps people to identify options for improving sanitation in their community through a gradual process.

How it can be used: The tool can be used by community health workers to help them assess current faeces disposal practices at household level, and to subsequently support these families to make small incremental steps up the ladder.

THE STEPS ON THE SANITATION LADDER

STEP 1	Defecation in the open. This includes children defecating in the compound
STEP 2	A selected and particular place in the open for defecation
STEP 3	Cat's method, where one defecates in a small hole and covers it with soil
STEP 4	A traditional pit latrine (without slab)
STEP 5	An improved pit latrine (with slab)
STEP 6	An improved pit latrine with ventilation
STEP 7	Flush toilet with on-site disposal
STEP 8	Flush toilet with sewage and waste water treatment

FIGURE 10: UNIMPROVED AND IMPROVED PIT LATRINE

Handout 3.2 h: Resource Notes on Safe Disposal of Human Waste

- Safe disposal of faeces aims to keep the environment free from uncontrolled and scattered human faeces
- Faeces in the public and domestic environment are the primary source of diarrhoeal diseases.
- ALL **faeces contaminate** and spread diseases, whether they are from adults, babies, young children or animals
- **Safe disposal of faeces** is the best way to prevent diarrhoeal infections.
- The ideal way to dispose of human faeces (both adults and children) is in an improved sanitation facility
- **An improved sanitation facility:** is one that hygienically separates human excreta from human contact. Improved sanitation facilities include: flush or pour-flush to piped sewer system, septic tank or pit latrine, ventilated improved pit latrine, pit latrine with slab and composting toilet
- **Unimproved sanitation facility:** A sanitation facility is considered unimproved when shared with other households, or open to public use. It includes: flush or pour-flush to elsewhere, pit latrine without slab or open pit, bucket, hanging toilet or hanging latrine and no facilities or bush or field (open defecation)
- Animal and human faeces that are in and around the house or near a water source should be picked up with a shovel or hoe, but not by hand. The faeces should then be thrown into a latrine or buried (like the way cats bury their faeces)
- **Preventing faecal exposure among young children:**
    - Human and animal feet carry faeces from the open to the domestic environment where babies and children are. These children frequently crawl on contaminated soil and surfaces and may be continually exposed to faeces of chicken, young goats and other small livestock in the compound. This contamination is a health risk to these children, especially during the critical window of a child's growth and development.
    - It is critical to ensure a safe child play environment that prevents fecal-oral transmission. This can be done by safely disposing of all animal and human faeces; washing hands at all critical times for all, including children and ensuring hygienic play areas that are free of faeces.

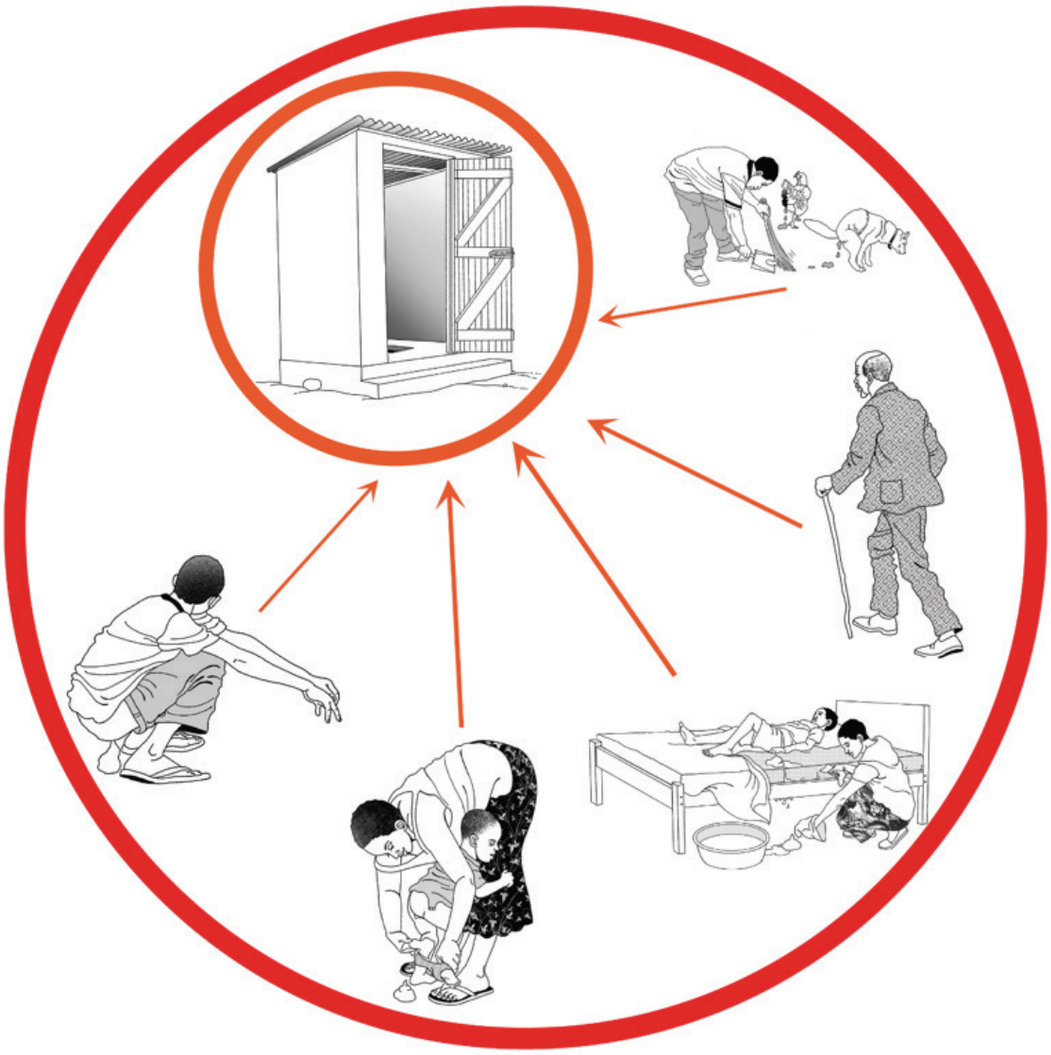


FIGURE 11: SAFE DISPOSAL OF HUMAN FAECES

Handout 3.2 i: Proper construction and location of improved latrines

How to construct a pit latrine with slab

1	Identify the best location of the pit latrine. The pit should be dug at least 10 metres away from the kitchen or homestead; 30 metres away from water sources; and in the back of the house
2	Clear the site of any bushes
3	Measure the site where the structure will be constructed
4	Dig pit: The size of the pit should be 0.6 metres (m) wide, 0.9 m long and 5 m deep
5	Create a lining with stone or bricks: Build 10 to 20 centimetres (cm) of mud above the ground
6	Put wooden logs at the top of the pit and make sure the logs extend 50 cm beyond the edge of the pit
7	Cover the logs with mud leaving a squat hole of about 12.5 and 25 cm
8	Construct a superstructure and a roof with locally made materials and plaster the walls with mud or cow dung
9	Make a latrine cover: Cut a piece of timber of 17 cm wide and 30 cm long and its centre, fix a stick of about 50 cm long with a nail to make a squat hole cover
10	Construct a tippy tap with soap holder next to the pit latrine

FIGURE 12: HOW TO CONSTRUCT AN IMPROVED PIT LATRINE WITH A SLAB

Module 4: Essential Nutrition Actions

Handout 4.1: Essential Nutrition Actions for Key Population Groups

Handout 4.1 a: Essential Nutrition Actions for Infants (0-6 Months)

ENA	Description	Benefit
Early Initiation of breastfeeding	Place babies in skin-to-skin contact (Kangaroo mother care*) with their mothers immediately following birth for at least an hour. ***Kangaroo mother care: position the naked baby on the mother's naked chest. Put the legs in a frog position and secure the baby in a cloth.***	• Helps baby to stay warm, breathe well, establish a strong bond between mother and child and helps to start breastfeeding as soon as possible • Breastfeeding immediately after delivery: helps the baby to develop the suckling reflexes, helps to increase milk production and provides baby with the first milk (colostrum) which is rich in nutrients that fight off infections.
Exclusive breastfeeding	During the first 6 months of life, the baby should be given ONLY breastmilk.	• Breastmilk is the perfect food as it: has all the nutrients the baby needs for the first 6 months of life, it has enough water to satisfy the thirst of the baby, it has substances that protect the baby from common infections and it is clean, safe, easy to digest and readily available

FIGURE 13: EXCLUSIVE BREASTFEEDING FOR INFANTS 0-6 MONTHS

Handout 4.1: Essential Nutrition Actions for Key Population Groups

Handout 4.1 b: Essential Nutrition Actions for Young Children (7-23 Months)

ENA	Description	Benefit
Continued breastfeeding	• After 6 months, breastmilk is not enough. Young children should start other foods in addition to breastmilk at 6 complete months. • Breastfeeding should continue frequently, on demand until when a child is 2 years or beyond.	• Breastmilk provides half of the nutritional requirement up to 12 months, a quarter up to 18 months and a third of the requirements up to 2 years. • Breast milk is a key source of energy and essential fatty acids and provides good amounts of certain micronutrients.

Complementary feeding	• After 6 completed months, breastmilk is not enough. Young children should start other foods in addition to breastmilk **Guiding principles of complementary feeding** • Practise food safety and hygiene for preparing safe and healthy complementary foods and while feeding children. • Gradually increase food consistency, quantity and variety as the child grows older. • To achieve food variety and the minimum food diversity for a child, the child should be fed foods from at least 4 food groups each day. • To achieve increased quantity or amount of food as child grows, meals should be provided four to five times per day, with additional nutritious snacks offered one or two times per day.	• Food safety and hygiene helps to prevent child infections such as diarrhoea. • Eating 4 out of the 7 food groups for children ensures that they get all the nutrients they need to grow and develop optimally.
Vitamin A supplementation for children under 5 years of age	• In settings where vitamin A deficiency is a public health problem, vitamin A supplementation is recommended in infants and children 6–59 months of age as a public health intervention to reduce child morbidity and mortality. • Vitamin A supplementation should be provided to infants and young children beginning at 6 months and every 6 months until 5 years. • The recommended dose is 1 tablet of 100,000 International Units (IUs) every 6 months for those aged 6-11 months; and 1 tablet of 200,000 IUs for those aged above 12-59 months	• Vitamin A supplementation is important for the reduction of common child illnesses and in preventing child deaths.

Handout 4.1: Essential Nutrition Actions for Key Population Groups

Handout 4.1 b: Essential Nutrition Actions for Young Children (7-23 Months)

ENA	Description	Benefit
Zinc supplementation and ORS for diarrhoea management	• A 10-day dose of zinc supplements used together with low concentration oral rehydration salts (ORS) to treat diarrhoea in children. • Zinc supplementation dosage: 10 milligrams per day for infants younger than 6 months for 10 days; and 20 milligrams per day for children older than 6 months for 10 days.	• Use of zinc supplements and ORS has been found to reduce the duration and severity of diarrhoeal episodes and the likelihood of subsequent infections for two to three months • Zinc for the treatment of diarrhoea significantly reduces deaths related to diarrhoea

FIGURE 14: 7 FOOD GROUPS FOR CHILDREN UNDER 2 YEARS

Handout 4.1: Essential Nutrition Actions for Key Population Groups

Handout 4.1 c: Essential Nutrition Actions for women of reproductive ages (15-49 years)

ENA	Description	Benefit
Adopt appropriate nutrition practices for all women	• Ensure adequate food intake – 3 main meals and 2 snacks daily • Increase food intake of underweight women to protect their health and establish reserves for pregnancy and breastfeeding • Diversify diet by eating foods from at least five food groups every day • Reduce nutrient depletion by reducing workload • Consume adequate micronutrients through available food, supplements and fortified foods • Control iodine deficiency through taking small amounts of iodized salt • Space births 3 years apart or longer	• Ensures optimal nutrition for women for their own health and well-being and more importantly to ensure the health and well-being of future children and generations (to break the cycle of malnutrition)

FIGURE 15: WHEEL OF TEN FOOD GROUPS FOR WOMEN OF REPRODUCTIVE AGES

FIGURE 16: NUTRITION FOR PREGNANT WOMEN

Handout 4.1d: Essential Nutrition Actions for Pregnant Women

ENA	Description	Benefit
Daily supplementation with iron and folic acid for women during pregnancy	• Pregnant women should take one iron and folic acid supplement (IFAS) every day from the time they conceive until they deliver the baby (that is, throughout pregnancy period) • IFAS should be taken together with food to avoid getting side effects such as nausea and vomiting • The pregnant woman should also eat foods rich in iron including: animal source foods (meat,milk, eggs), green leafy vegetables, legumes (beans, peas, green grams)	• This reduces the risk of low birth weight, maternal anaemia and iron deficiency

Handout 4.1d: Essential Nutrition Actions for Pregnant Women

ENA	Description	Benefit
Consume iodized salt	• Optimal iodine nutrition can be achieved through intake of iodized salt. This should however be taken in small amounts to avoid increasing risk of diseases such as high blood pressure	• Iodine is very important in the brain development of the foetus and young child
Eat a variety of foods – foods from at least 5/10 food groups	• Pregnant women should eat foods from at least five food groups out of 10 • Pregnant women should eat sufficient amounts of food. This will be achieved by eating one extra meal in addition to the regular 3 main meals and 2 snacks. • She should be encouraged to rest and reduce heavy work to conserve her energy • She should control parasitic infections by maintaining hygiene and taking deworming tablets in the third trimester of her pregnancy	• Eating a varied diet provides all the needed nutrients to support fetal growth, nutrition of mother and future breastfeeding needs • Deworming tablets help to treat parasitic worms and to prevent anaemia during pregnancy
Early and Frequent ante-natal clinic attendance	• The pregnant woman should see a skilled health worker as soon as she is pregnant within the first 3 months • She is also encouraged to attend at least 4 ANC visits during her entire pregnancy	• Antenatal care is critical to ensure the health of the mother and the foetus through regular check ups
Prevent and treat malaria	• In malaria endemic areas, the pregnant woman should receive, during her ANC visits, anti-malarial tablets and sleep under Insecticide Treated Nets (ITNs). These should be taken from the second trimester of her pregnancy.	

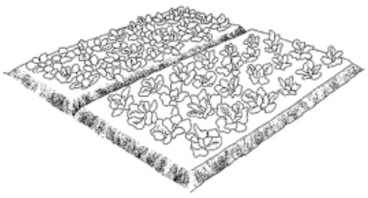
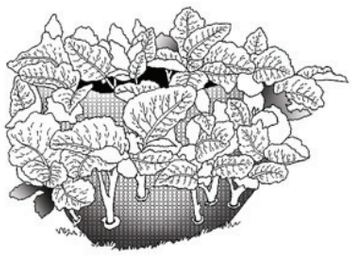
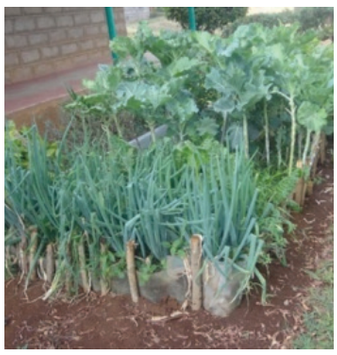
FIGURE 17: NUTRITION FOR BREASTFEEDING MOTHERS

Handout 4.1e: Essential Nutrition Actions for Breastfeeding Mothers

ENA	Description	Benefit
Eat a variety of foods – foods from at least 5/10 food groups	• Breastfeeding mothers should eat foods from at least five food groups out of 10 (*refer to figure 2 above: wheel of ten food groups*) • Breastfeeding mothers should eat sufficient amounts of food. This will be achieved by eating an extra 2 meals in addition to the regular 3 main meals and 2 snacks. • She should be encouraged to reduce heavy work and engage in light physical activities to stay healthy.	• Eating a varied diet provides all the needed nutrients to support the mother's nutrition and health status and that of the breastfeeding infant

Module 5: Kitchen Gardening Technologies

Handout 5.1: Kitchen Gardening Technologies

	Technology
	**Improved Ordinary Kitchen Garden** • **Description:** This is a small-scale form of vegetable growing, usually located within the household compound or back yard. The plot may be divided into rows with an assortment of crops grown in different rows. Suitability: Popular in rural areas where land is not as limiting and where water is more readily available. • **Crops:** A variety of vegetables, for example, leafy onions, kales, spinach, a majority of African green leafy vegetables, carrots, tomatoes, root crops (arrow roots and sweet potatoes), among others.
	**Multi-Storey Garden** • **Description:** In this technology, crops are grown on a sack or polythene tube which has been filled with fertile soil. The crops are grown on the sides (perforated) and on the top surface. • **Suitability:** Ideal where space is highly limited or dry, non-fertile areas where soils are not suitable for conventional gardening, areas with water scarcity. • **Materials:** Empty cereal bag/polythene tube, 1 empty oil can or '6'' PVC pipe with holes, 2 buckets small stones, 6 buckets of soil, 6 buckets of manure, seeds, adequate water and basic gardening tools. • **Crops:** A variety of vegetables e.g. leafy onions, kales, spinach and a majority of the African green leafy vegetables.
	**Raised Moist Bed Garden** • **Description:** Raised-bed gardening is a form of gardening in which the soil is formed in three-to-four-foot-wide (1.0-1.2 m) beds, which can be of any length or shape and involves having the soil in a plastic lining enclosed by a frame generally made of wood, rock or concrete blocks. The use of plastic lining prevents water loss through seepage and protects the soil and roots in the bed from coming into contact with local contaminated soil. • **Suitability:** Ideal in urban areas where open grounds are limited, water scarce areas or areas with contaminated soil • **Crops:** A variety of vegetables e.g. leafy onions, kales, spinach, majority of the African green leafy vegetables, root crops (arrow roots, carrots, garlic, beets).

Handout 5.1: Kitchen Gardening Technologies

Sunken Moist Bed Garden

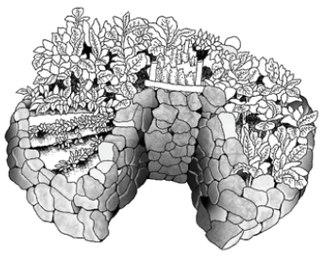
- **Description**: A sunken moist bed differs from the raised bed in that the plastic lining is placed in a ground which has already been sunk to a depth of 1 foot, which is then filled with fertile soil
- **Suitability:** Ideal in water scarce areas or areas with contaminated soil
- **Crops:** A variety of vegetables, e.g. leafy onions, kales, spinach, majority of African green leafy vegetables, root crops (arrow roots, carrots, garlic, beets)

Container Garden

- **Description:** In this technology, crops are grown in plastic containers which have been filled with fertile soil. Periodic water application is necessary to ensure optimum soil moisture
- **Suitability:** Very popular in areas with limited space, e.g. urban areas and water scarce areas
- **Materials:** Ordinary plastic containers (cooking oil, paint or 20-litre plastic bottles)
- **Crops:** A variety of vegetables, e.g. leafy onions, kales, spinach, majority of the African green leafy vegetables

Hanging Container Garden

- **Description:** This is an innovation on the container garden technology. The containers are in a hanging position instead of being placed on the ground or floor surface
- The additional materials needed are nails, metallic wires or plastic strings and metal or wooden support posts.



Key-Hole Garden

- **Description:** A key-hole garden is a 2 meter-wide circular raised garden with a key-hole-shaped indentation on one side. The indentation allows gardeners to add uncooked vegetable scraps, grey water and manure into a composting basket that sits in the centre of the bed. In this way, composting materials can be added to the basket throughout the growing season to provide nutrients for the plants. The upper layer of soil is hilled up against the centre of basket so that the soil slopes gently down from the centre to the sides. Most keyhole gardens rise about one meter above the ground and have walls made of stone. The stone wall not only gives the garden its form, but helps trap moisture within the bed
- **Crops:** A variety of vegetables, e.g. leafy onions, kales, spinach, majority of the African green leafy vegetables and root crops (arrow roots, carrots, garlic, beets)

Handout 5.1: Kitchen Gardening Technologies

Staircase Garden

- **Description:** This is a technology whereby the crops are grown in a soil media contained in a raised platform either assuming a flat table or a staircase pattern
- **Suitability:** Suitable in areas with limited space, contaminated water or water scarce or rocky areas
- **Materials:** Timber, nails, well textured soil, manure, water and seeds/seedlings
- **Crops:** A variety of vegetables, e.g. leafy onions, kales, spinach and a majority of the African green leafy vegetables

Tyre Garden

- This is an innovative technology whereby crops are grown in old vehicle tyres which have been filled with a fertile soil media
- **Suitability:** Popular in slum areas where land is highly limited as well as in dry areas with high water scarcity
- **Materials:** Used vehicle tyres, well textured soil, manure, water, seeds/seedlings and basic gardening tools
- **Crops:** A variety of vegetables, e.g. leafy onions, kales, spinach and a majority of African green leafy vegetables

Small-Scale Drip Irrigation

- **Description:** Drip irrigation is a low-cost and water-saving technique. At its core, it is a network of perforated tubes linked to a water source. The water flows through the tubes and trickles out of the perforations onto the soil. The crop is planted at the perforation. Many versions of the drip irrigation tubes installed on small farms are gravity-driven, with the water stored in a tank raised above the farm so that the water can flow through the tubes below
- **Materials:** Drip lines, tank, pipes, water, fertile soil, water
- **Suitability:** It is highly suitable in water scarce areas (arid and semi-arid areas)
- **Crops:** A variety of vegetables, e.g. leafy onions, carrots, tomatoes, kales, spinach and a majority of the African green leafy vegetables. Also herbs such as rosemary, etc.

Module 6: Small Doable Action Planning

Handout 6.1: Action Plan to Support Integrated WASH, Agriculture and Nutrition Programs

Problem Area (in: WASH, agriculture and nutrition)	Proposed Small Doable Action	Time Frame for Actions	Indicators	Responsible person

Module 7: Monitoring and Reporting

Handout 7.1: Key Community-Level WASH, Agriculture and Nutrition Indicators

Level of Indicator	Indicator	Data Collection Tool	Reporting Tool
WASH			
Outcome/ Impact	• Proportion of population with access to safe water	• Household register • Community service delivery log book – MoH 513	CHEW summary form MOH 515
	• Proportion of households with latrines or Population using improved sanitation facilities	• Environmental health diary books • Community Log MoH 513	CHEW summary MoH 515
	• Proportion of households using treated water	• Community service delivery log book – MoH 513	
Output	• Proportion of households with hand washing facilities (tippy tap, leaky tine or wash hand basin)	• Community service delivery log book – MoH 513	CHEW summary MoH 515
	• Number of children with diarrhea treated with Zinc and ORS	• Community service delivery log book – MoH 513	CHEW summary MoH 515
	• Proportion of households with refuse disposal facilities	• Community service delivery log book – MoH 513	CHEW summary MoH 515
Process	• Proportion of households not using toilets	• Community health workers service log book – MoH 513	MoH 515
Nutrition			
Outcome/ Impact	• Percentage of children under five years of age who are underweight	• Mother and Child Booklet – MoH 216	
	• Percentage of children less than five (< 5) years who are stunted	• Mother and Child Health (MCH) Booklet– MoH 216	
	• Number of mothers with newborns reporting counselled on exclusive breastfeeding	• Community service delivery log book • Household register	CHEW Summary MoH 515
Output	• Proportion of children age 12-59 months de-wormed	• Community health workers service log book – MoH 513	CHEWs summary MoH 515

Handout 7.1: Key Community-Level WASH, Agriculture and Nutrition Indicators

Level of Indicator	Indicator	Data Collection Tool	Reporting Tool
Process	• Proportion of households reached for health promotion • Proportion of children 6-23 months receiving 3 or more food groups three time a day	• Community health workers service log book – MoH 513 • Community health workers service log book – MoH 513	CHEWs summary MoH 515 CHEWs summary MoH 515
Agriculture			
Outcome /Impact	• Number of farmers using improved agricultural technologies and practices • Proportion of production of major cereals and pulses • Proportion of adopters of efficient and effective water use practices		
Output	• Proportion of farmers reached with extension information • Number of farmers accessing agricultural inputs • Number of farmers supported with new farming technologies (green houses, drip kits, fish ponds and water harvesting facilities) • Proportion of small holder farmers using fertilizers • Number of post-harvest technologies promoted and adopted		

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