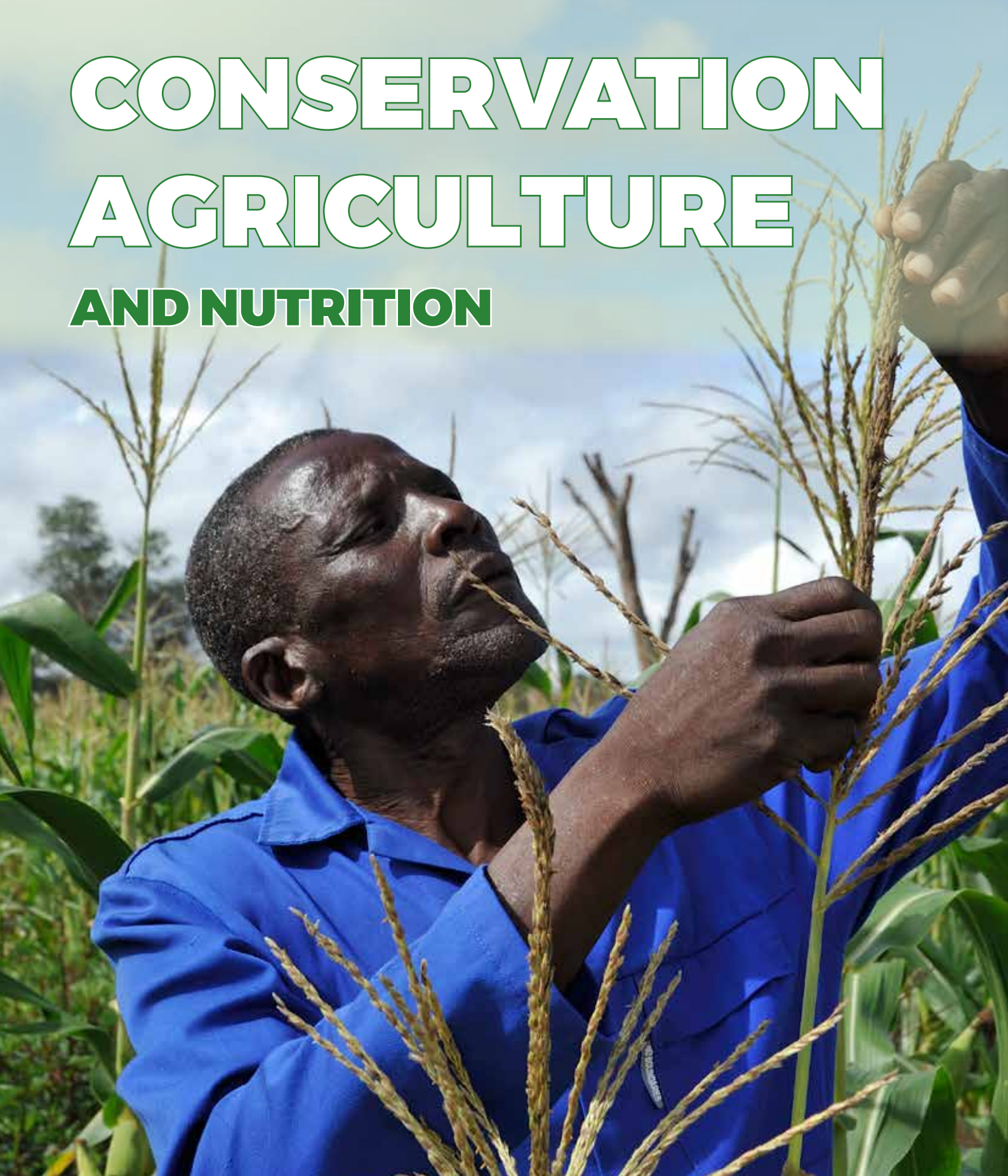


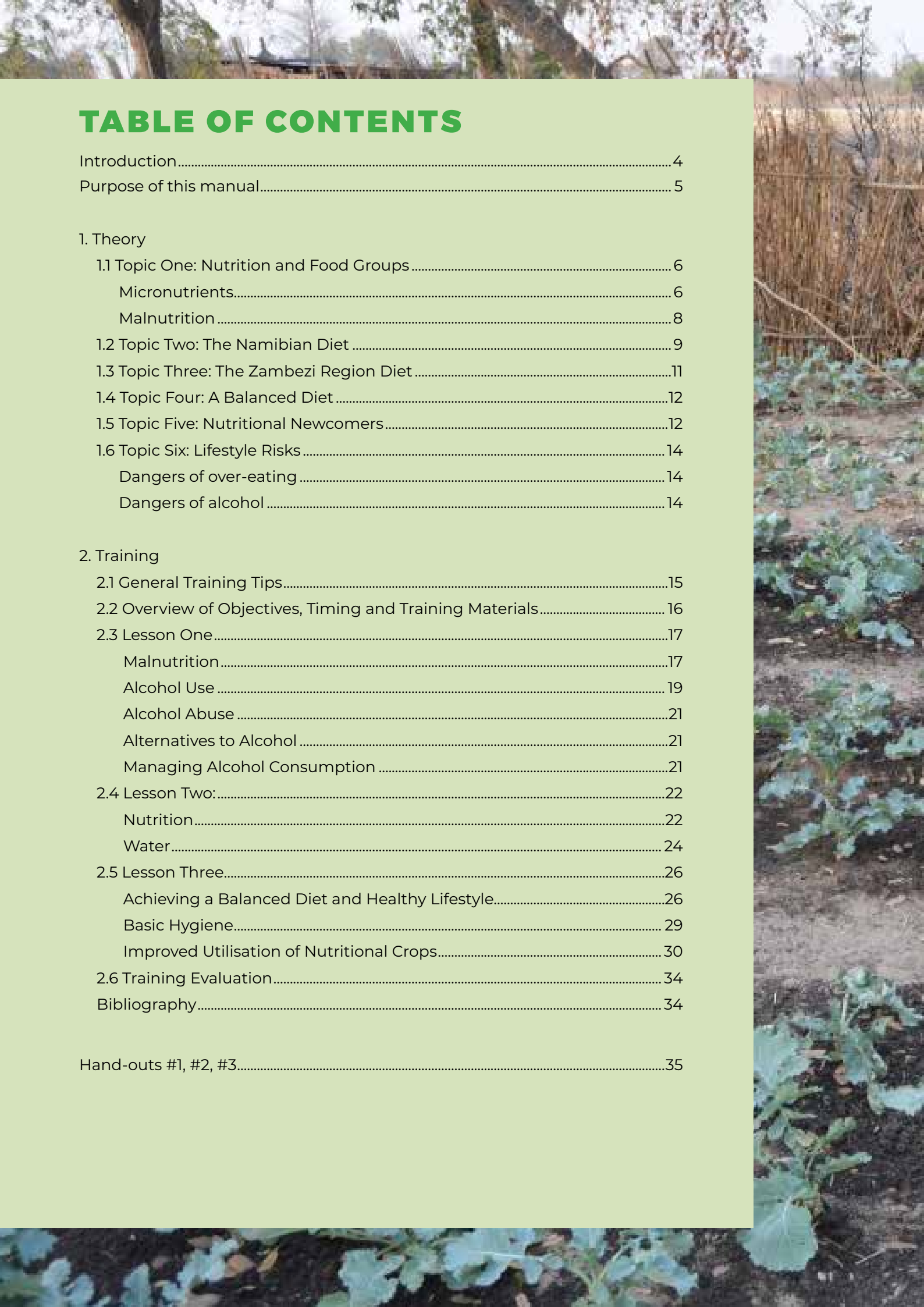
CONSERVATION AGRICULTURE AND NUTRITION



Facilitator Manual

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ACRONYMS

CA	Conservation Agriculture
CBNRM	Community-based Natural Resource Management
IRDNC	Integrated Rural Development and Nature Conservation
NNF	Namibia Nature Foundation
SCP	Sustainable Communities Partnership
WHO	World Health Organization
WWF	World Wildlife Fund

ACKNOWLEDGEMENTS

This manual was produced for the Sustainable Communities Partnership, funded by the Morby Family Charitable Foundation through WWF in Namibia. The materials used to develop this training manual have been built on years of experience and work under the Namibian CBNRM Programme, and have now been updated to bring in new topics and understanding and knowledge gained from pilot activities supported by the Foundation. Acknowledgement is thus given to the individual and collective experiences of all NACSO members and partners who made the production of this manual possible. The Namibia Nature Foundation supported the development and piloting of these materials.

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March 2019

Photos:

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Based on:

- Module 5 – SCP CA Manual (NNF 2016)

Introduction

Background

Although Namibia is classified as an upper-middle income country, food security remains a constant concern: “42.3 per cent of the population is undernourished, wasting in children under five years is 7.1 per cent, stunting in children under five years is 23.1 per cent.” (*The Namibian newspaper, 2017*)

The Zambezi Region is one of the regions that is most affected by malnutrition. The dietary diversity is very low, which is caused by the marked absence of fruit consumption; very low consumption of pulses; and the relatively modest consumption of vegetables. Ultimately, it is these insufficient dietary requirements that point to why vitamin A deficiencies are very high in the region. At the same time, the quantities of food consumed seem to be more limited than they should be for an area that has a sub-humid climate. Bukania et al. note: “Nutrition-sensitive agriculture that focuses on increasing locally-sourced diversity is more likely to achieve impact [on reducing stunting] in conjunction with population-wide nutrition education, directed especially to caregivers, that emphasises the need for diversified diets.”

The limiting factors for food consumption in the Zambezi Region include the following:

- **Food Availability**

The most immediate example of food availability is the produce grown by farmers, which is, in turn, determined by climate, access to agricultural inputs and/or financial resources. Availability also refers to food provided by food relief/assistance agencies (these agencies are more likely to distribute maize meal); wild food which can be found naturally in the local area; and finally, all food which is sold in a particular market location (some food will be more commonly found here than others).

- **Food Access**

However, as the food in stores needs to be purchased, the purchasing power of a family determines which food an individual can access. Eggs might be commonly available at the market, but without the necessary financial resources to purchase them, eggs become ‘inaccessible’. Important factors that affect access to food are household financial resources, food prices, the capacity to cover transport costs to the market, and non-economic socio-political factors such as gender inequality or religious dietary constraints.

- **Food Utilisation**

It is possible that a certain type of food is both available and accessible, but it is either not utilised at all or utilised incorrectly. Lack of knowledge about a specific food, associated with conservative eating habits, can preclude the utilisation thereof. More commonly, foods are improperly utilised, in ways that minimise their potential nutritional impact on the consumer; this can also include inappropriate preparation or storage of the food.

If food is grown locally, availability and utilisation thereof are important factors for ensuring food security.

- **Limited Rainfall**

Given the limited rainfall in Namibia, fruits and vegetables can be harder to grow, resulting in reduced availability.

Conservation Agriculture is understood as a set of principles, which also includes the diversification of crops. Many farmers’ diets are mostly comprised of what they produce in their fields and are primarily based on grains and meat, with very little fruits, seeds, pulses and vegetables. The diversification of crops may follow a number of objectives (e.g. increasing drought

resilience), but against this background of nutritional deficiencies in the region, the objective considered here is to strategically improve the nutrition of the local community.

Purpose of this manual

This manual aims to equip local communities with the knowledge and skills that enable them to understand nutrition and the various food groups that exist. Farmer instructors using this manual should be able to advise local communities on how to best diversify their diets and improve their lifestyles as part of the wider field of Conservation Agriculture.

This manual is designed for Conservation Agriculture local level facilitators (i.e. farmer instructors) or other trainers for nutrition.

The manual consists of two sections:

1. Theory
2. Training

The Theory section focuses on six topics:

- 1.1 Nutrition and Food Groups
- 1.2 The Namibian Diet
- 1.3 The Zambezi Region Diet
- 1.4 A Balanced Diet
- 1.5 Nutritional Newcomers
- 1.6 Lifestyle Risks

1. Theory

1.1 TOPIC ONE NUTRITION AND FOOD GROUPS

NUTRITION

Nutrition refers to the intake of food, which is considered in relation to the body's dietary needs. Good nutrition is an adequate, well-balanced diet, and combined with regular physical activity, it is the cornerstone of good health. Poor nutrition can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development, and reduced productivity.

FOOD GROUPS

A balanced diet consists of different types of food (food groups) which provide the adequate amounts of nutrients required for good health.

There are five food groups into which all food can be divided. These food groups make up a balanced diet, and they play an important role in providing essential nutrients and energy that support normal growth and good health.

The five food groups are as follows:

- **Carbohydrates**
This group includes starchy foods such as pasta, rice, oats, potatoes and cereals. These foods provide fuel for energy.
- **Protein**
This group includes meat, fish and eggs, as well as vegetable protein such as beans and peas. These foods provide protein and iron, as well as certain other minerals and vitamins.
- **Milk and dairy products**
This group includes milk, yoghurt and cheese. These foods provide calcium and protein.
- **Fruit and vegetables**
This group includes fresh, frozen, tinned, dried, and juiced fruits and vegetables. These foods contain fibre, which keeps the digestive system healthy.
- **Fats and sugars**
This group includes butter, margarine, cooking oils, chocolate, sugary soft drinks, sweets, jams, cakes, etc. These foods provide a lot of energy, but not many nutrients.

A balanced diet should include food from all of these five food groups.

Figure 1 illustrates the essential requirements that constitute a balanced diet.

Micronutrients

Micronutrients are one of the major groups of nutrients that your body needs. They include vitamins and minerals. All of the five food groups contain micronutrients, but in different content levels; therefore, it is best to eat a variety of foods to obtain enough vitamins and minerals for your body.

Kid's Healthy Eating Plate



Figure 1: Essential requirements for a balanced diet

(Source: <https://www.hsph.harvard.edu/nutritionsource/kids-healthy-eating-plate>)

A micronutrient is a “chemical element or substance required in trace amounts for the normal growth and development of living organisms, which include vitamins, minerals, elements and amino acids.” Important micronutrients are vitamin A, iron and iodine. Deficiencies of these important micronutrients can lead to malnutrition and illness.

Vitamins allow your body to grow and develop. They also play important roles in bodily functions such as metabolism, immunity and digestion.

The following list illustrates several essential vitamins, including their functions and the foods in which they are found:

- **VITAMIN A**

Functions: Vitamin A helps cell reproduction. It also stimulates immunity and is needed for the formation of some hormones. Vitamin A helps vision and promotes bone growth and tooth development. It helps to maintain healthy skin, hair and mucous membranes.

Foods: guava, mango, papaya, passion fruit (granadilla), tomato, watermelon, butternut squash, carrot, peas, pumpkin, spinach, sweet potato, egg, cow milk, goat milk.

- **VITAMIN B**

Functions: Vitamin B plays many important roles in the body. It helps with the production of energy and body growth. It strengthens the immune system and assists metabolism.

Foods: avocado, watermelon, orange, mango, pomegranate, squash, corn, potato, millet, oats, peanuts, brown rice, beef, fish, cow milk (sour milk), chicken, banana, passion fruit (granadilla), amaranth leaves, beans, pumpkin, sweet potato, wheat, oats, beef, egg, fish, lamb, pork.

- **VITAMIN C**

Functions: Vitamin C is one of the most important of all the vitamins. It plays a significant role as an antioxidant, thereby protecting body tissue from the damage of oxidation. Antioxidants protect your cells against the effects of free radicals, which are potentially damaging by-products of the body's metabolism.

Foods: grapefruit, orange, papaya, passion fruit (granadilla), butternut squash, green pepper, kale, spinach, goat milk, soy beans.

- **VITAMIN D**

Functions: Vitamin D is known as the 'sunshine vitamin' because it is manufactured by the body after being exposed to sunshine. Ten to fifteen minutes in the sun, three times a week, is enough for the body to produce its requirement of vitamin D. Vitamin D is vital to the human body because it promotes the absorption of calcium and magnesium, which are essential for the normal development of healthy teeth and bones.

Foods: mushrooms, beef, cheese, egg, fish, yogurt, pork, beef, turkey.

- **VITAMIN E**

Functions: Like vitamin C, vitamin E plays a significant role as an antioxidant, thereby protecting body tissue from the damage of oxidation. It is important for the formation of red blood cells and assists with the absorption of vitamin K.

Foods: avocado, mango, mulberries, nectarine, papaya, peach, pomegranate, squash, potato, pumpkin, Swiss chard, sunflower seeds, egg, fish.

- **VITAMIN K**

Functions: Vitamin K is fat soluble and plays a critical role in blood clotting. It regulates blood calcium levels and activates at least three proteins involved in bone health.

Foods: avocado, mango, tomato, cabbage, carrot, cauliflower, celery, cucumber, kale, leek, okra, peas, spinach, winter squash, Swiss chard, cashew nuts, beef, egg, lamb, duck.

Malnutrition

Malnutrition is a condition that results from eating too little of the right kinds of food (insufficient nutrition), or too much of the wrong kinds of food.

Malnutrition caused by under-nutrition can lead to stunting and wasting. Over-nutrition or over-consumption leads to excessive weight gain or obesity.

Stunting, or low height for age, is caused by long-term insufficient nutrient intake and frequent infections. Stunting generally occurs before the age of two, and the effects are largely irreversible. These include delayed motor development, impaired cognitive function and poor school performance.

Wasting, or low weight for height, is a strong predictor of mortality among children under the age of five. It is usually the result of acute significant food shortage and/or disease.

1.2 TOPIC TWO THE NAMIBIAN DIET

Namibia's ecology is predisposed to livestock production: Only 8.6% of the land in Namibia receives enough rainfall to practice rain-fed agriculture, while 91.3% is adapted to cattle and small stock ranching (Mendelson, 2006). Even in areas where crops are grown, livestock production is considerable. It is thus unsurprising to find that like many other arid-land nations, Namibians are a meat-eating nation.

In Namibia, the Zambezi Region receives the most rainfall, with an annual precipitation ranging from 550 mm to 650 mm. Maize cultivation, which has a minimum requirement of 500 mm of rain, only makes sense in the Zambezi Region; however, in years with lower rainfall, maize is the first crop to suffer. Despite the modest adaptability of maize in much of Namibia, maize is the principle staple, and the per capita consumption of maize is around 44 kg per year, while millet is about 29 kg per year (Shifiona, 2016). This means that Namibia has to import maize rather than depending on millet, which is more adapted agro-ecologically. This dietary preference for a cereal that is less adapted to the local climate can, in effect, reduce Namibians' access to these very same cereals. Furthermore, given the limited rainfalls in Namibia, fruits and vegetables can be harder to grow, which also reduces their availability.

A quantified overview of the Namibian diet is presented below to provide a rough idea of the local diet.

Table 1: Food groups and Namibian status of consumption

Food Groups	Recommended Levels	Namibian Levels	Status
Vegetables	400 g/day	40 g/day	Deficit
Pulses		20 g/day	Deficit
Fruits	300 g/day	30-74 g/day	Deficit
Meat	15 g/day	50-60 g/day	Excess
Whole grains	125 g/day	50-199 g/day	Equal

A CLOSER LOOK AT THESE FOOD GROUPS IN THE NAMIBIAN DIET

Fruits and Vegetables

In Namibia, 87.0% of men and 88.3% of women have a low consumption of fruits and vegetables (less than 400 grams a day). Fruit and vegetable consumption in Namibia together total only about 155 g/day.

Vegetable consumption in Namibia is very low, at only 40.6 g/person/day, which is approximately only 10% of the WHO (World Health Organization) recommended daily vegetable consumption levels.

Fruit consumption in Namibia is around 50 g/person/day, which means Namibia is consuming under a quarter of the recommended 300 grams of fruit a day.

Pulses

Consumption of pulses in Namibia is 20 g/person/day (Micha et al.).

With only 19,000 metric tons of pulses produced in Namibia, the availability of pulses seems to be a limiting factor.

Meat

Namibians consume 50-60 g/person/day of meat. This is above the world average of 41.8 g/day and well over the minimal 100 g/person/week (Micha et al.).

Whole grains

Namibia has the second highest level of consumption of whole grains with 50-199 g/person/day, while the recommended consumption is 125 g/day (Micha et al.).

The Namibian diet is based on grains and meat. It is very low in fruits, vegetables, seeds and pulses.

The Namibian population does not meet the minimum levels of dietary consumption.

A lack of micronutrients leads to malnourished children.

Results from the 2006/7 Namibia Demographic and Health Survey demonstrate that a drop in poverty levels is correlated with a drop in the consumption of micronutrient rich foods by infants. The intake of iron rich foods was only 40% amongst the poorest of the poor in Namibia. This demonstrates the importance of targeting poorer rural populations for micronutrient promotion.

1.3 TOPIC THREE THE ZAMBEZI REGION DIET

Cereals are the most commonly consumed food group in the Zambezi Region. Cereals lack diversity in terms of nutrient and mineral content. This food group alone, or together with limited quantities of other food groups, does not provide enough of the required nutrients to maintain a healthy body. A lack of these required nutrients may lead to deficiency-related health complications.

The following micronutrient deficiencies and their related health complications are evident amongst people living in the Zambezi Region (this also applies to the Namibian population in general):

- **Iron deficiency:** is the major cause of anaemia, tiredness, shortness of breath, weakness, brittle nails and poor appetite.
- **Vitamin A deficiency:** leads to visual impairment and blindness.

The following foods can reduce the risk of vitamin A and iron deficiencies:

- **Iron foods:** meat, beans, dark leafy greens and dried fruit. (Foods which contain vitamin C help with the absorption of iron. These foods include citrus, tomato, greens and peppers.)
- **Vitamin A foods:** sweet potato leaves, Moringa leaves, mango, papaya, leafy greens, egg, milk and liver.

A CLOSER LOOK AT IRON DEFICIENCY

In the Zambezi Region, 33% of girls and 43.9% of boys in primary schools in the Eastern Caprivi region were found to be anaemic (NAFIN, 2010). The Namibia Association for Improved Nutrition's (NAFIN) more recent National Nutrition Profile states that 57% of children in the Zambezi Region (6-59 months of age) have anaemia – a considerably higher percentage than the 47% recorded at the national level (WHO, 2015). Given the importance of iron for cognitive development, these figures for iron deficiency amongst children in the Zambezi Region are very high. This is a cause for concern.

The National Nutrition Profile found that the anaemia levels of adult women in the Zambezi Region match up to national levels: 26% in pregnant women and 20% in non-pregnant women, while levels of iron supplementation are slightly lower than national levels at 36%.

A CLOSER LOOK AT VITAMIN A DEFICIENCY

Vitamin A deficiency levels nation-wide are high, and they seem to be rising dramatically. And while it is less clear what the status of vitamin A deficiency is in the Zambezi Region, it would make sense that like iron, it is higher than the national average. Although iron deficiency is high in the Zambezi Region (particularly amongst children), it is still lower than African averages.

Even though the Ministry of Health and Social Services (MoHSS) is fairly proactive in providing both iron and vitamin A supplements to the most vulnerable, a more sustainable solution can be promoted by improving the production and the consumption of foods rich in iron and vitamin A.

The Namibian University of Science and Technology's (NUST) Baseline Study notes that only 9.6% of surveyed farmers in the Zambezi Region produce enough food to last them a whole year, and a staggering 50.4 % did not produce enough to last even one month after harvest. This perhaps explains why 59% of the Zambezi Region's population receives the bulk of their cereals from Food Assistance – the highest percentage in the country (Directorate of Disaster Risk Management (DDRM) /

World Food Program (WFP), 2016).

There is a need to focus on producing foods rich in nutrients, as well as increasing the amount of food, through the improved production technologies promoted by Conservation Agriculture. This will in all probability benefit the nutritional status of households in the Zambezi Region.

1.4 TOPIC FOUR A BALANCED DIET

The Zambezi Region receives the most rainfall in Namibia. Maize is the staple food in this region, and it is supplemented with meat, fish, and a few seasonal fruits and vegetables. This diet can be improved and diversified by means of CA techniques or keeping a small backyard garden. These gardens can supply households with fresh vegetables, and excess produce from these gardens can be sold at local markets to supplement household income.

1.5 TOPIC FIVE NUTRITIONAL NEWCOMERS

The dietary deficiencies in the Zambezi Region were addressed and considerations were made regarding the most feasible produce to effectively address these needs in the larger context of CA. As a result, a few fruits and vegetables that are or can be locally produced were identified.

The fruits and vegetables that are or can be locally produced in the Zambezi Region include the following:

★ FRUIT RICH IN VITAMIN A

PAPAYA

The papaya fruit is rich in vitamin A. The papaya plant has adapted to the Zambezi climate. It produces fruit in a relatively short period after planting. If they receive periodic watering, they can also produce fruit throughout the year. Many families have at least one papaya plant in their courtyard, which provides approximately one fruit a month. Planting more papaya plants in old kraal fields near the household, or in the household compound, should be encouraged. This way, families can have access to produce from five or six papaya plants, rather than just one. Papaya plants are easily grown from seed and do not require project-driven nurseries.

★ VEGETABLES RICH IN VITAMIN A

SWEET POTATO

Sweet potato is rich in vitamin A. It is cultivated locally, though not in great quantities. The advantages of sweet potatoes are that they can stay in the ground for long periods of time, and their leaves can be eaten as a vegetable.

★ DARK GREEN LEAFY VEGETABLES RICH IN IRON AND VITAMIN A

MORINGA OLIFERA

Although *Moringa olifera* is not indigenous to Namibia, it has adapted well to the Zambezi climate. Moringa leaves are high in iron and vitamin A. As it is with all beneficial exotic plants, it takes time for their valuable uses to become widely known and appreciated. Despite this, Moringa is not uncommon in the region and is cultivated by many for medicinal purposes. Moringa grows very quickly and is very easy to cultivate, either from cuttings or by direct seeding. Given that

Moringa is easily cultivated, has adapted to the climate and makes a decent agro-forestry species, it would make sense to encourage families to grow more Moringa in their fields or household gardens.

However, given the fact that most farmers in the region are not in the habit of eating Moringa leaves, increased planting of Moringa will need to be accompanied by training on how to prepare the leaves as a 'relish' that matches local taste. As the Moringa tree is already known in the region, promoting the use of its leaves should not be too challenging a task, but it will require working with knowledgeable nutritional experts regarding the culinary preparation of Moringa to assist the promotion of its use.

★ **DARK GREEN LEAFY VEGETABLES RICH IN IRON**

RAPE

Rape is a fairly common green vegetable, which is also cultivated in the Zambezi Region. Rape contains no vitamin A, but a portion of rape does supply 12% of a person's daily iron requirement (three times the amount of iron available in Moringa). However, unlike Moringa which has the potential for year-round production, rape is a horticultural product.

★ **LEGUMES RICH IN IRON**

COWPEAS

Cowpeas are rich in protein and iron. Even though intercropped legume production is an integral element of Conservation Agriculture practice, the consumption of beans and cowpeas is fairly limited in the region.

In order to focus on the most efficient solution to address these nutritional deficiencies, a ranking of the various products based on nutritional impact, duration of production, the capacity to leverage ongoing activities and cost was conducted (with scores of 1-3).

Table 2: Ranking of the four products based on nutritional impact, duration of production, capacity to leverage ongoing activity and cost

Factors	Papaya & Mango	Cowpea	Moringa	Sweet Potato	Rape
Absence of representative food group in diet (potential to increase dietary diversity scores)	3	3	1	3	1
Capacity to address local nutrient deficiencies	3	2	3	3	2
Continual production	3	1	3	2	2
Integration with CA activities	3	3	3	2	2
Locally known	3	3	2	2	3
Time / expense to promote*	2	3	2	2	2

* (Note: A higher score means less time and expense is invested in the activity.)



A balanced diet does not automatically lead to a healthy lifestyle. There are certain lifestyle habits that endanger health, and these need to be taken into consideration and dealt with.

Dangers of over-eating

Over-eating refers to the act of consuming too much food in relation to the energy that an individual requires. This excess energy is stored by the body and it can lead to several health problems.

These health problems include the following:

- **Weight gain**
- **Disease**
- **Other physical problems** (e.g. high cholesterol, high blood pressure, sluggishness and fatigue, uncomfortable digestive problems, bone and joint pain)
- **Mental health problems** (e.g. decreased self-esteem, anxiety, sexual and intimacy difficulties, an unnatural preoccupation with food)

Dangers of alcohol

The consumption of alcohol can lead to various short-term and long-term health and behavioural complications, depending on how much is consumed and the physical condition of the individual. Alcohol is especially dangerous for the growth and development of children, whether consumed directly or indirectly through the mother during pregnancy.

2. Training

2.1 GENERAL TRAINING TIPS

Preparation:

- Prepare in advance to ensure that all necessary materials (e.g. the Flipchart Sheets you would like to prepare before the workshop; enough copies of Hand-outs #1-3) and visual aids are available.
- Wherever possible, use visual aids to enhance your training.
- This manual provides an outline of how training should proceed. Not all of the technical details are included here; therefore, you need to add the necessary technical details as you prepare for the workshop.
- Be aware of local customs – remember to open and close the training day with a prayer and to give due recognition to any traditional leaders present.
- Provide translation services where necessary.
- Print out pictures (from the Theory and Training section) for visualisation.

General training and presentation guidelines:

- Keep an eye on the time to avoid wasting the participants' time – but also keep in mind the time needed for translation, and, if necessary, be prepared to slow down to ensure understanding.
- Maintain good eye contact with the participants.
- Speak clearly.
- Keep your training language simple and appropriate to your audience.
- Provide clear instructions for activities and check to see if your instructions are understood.
- Where appropriate, summarise.

Visual presentation:

- Write clearly and boldly when using flipchart paper.
- Keep your visual aids visible. Avoid standing in the way of your visual aids and blocking the participants' view.

Involving the participants:

- Encourage questions and participation.
- Ask questions to get participants thinking about the topic and key issues.
- Keep the group focused on the task, but take breaks if participants are tired and begin to lose concentration. Pay attention to participants' body language for any signs of fatigue.
- Be patient and courteous with all participants.
- Acknowledge all comments and feedback from participants.



Training Icon Key for the Facilitator



This icon indicates directives for you, as well as the directives you need to give the participants regarding activities they are expected to undertake.

(The directives are all in italics.)



This icon, which is situated in a text box, indicates the Flipchart Sheets which contain the training information that you need to display/compile and convey to the participants.

(NOTE: These Flipchart Sheets can be prepared before the workshop or compiled during the workshop, as is best suited.)

2.2 OVERVIEW OF OBJECTIVES, TIMING AND TRAINING MATERIALS

WHO WILL USE THIS MANUAL TO DELIVER THE TRAINING?

Health consultants and/or farmer instructors.

WHO IS THE TRAINING INTENDED FOR?

Any rural community.

DURATION

The duration of time needed to deliver the training is 4½ hours.

OBJECTIVES

Participants will gain an understanding and knowledge of the following:

- The different types of malnutrition
- The signs of under-nutrition
- The three most common deficiencies in sub-Saharan Africa
- The harmful effects of alcohol and alternative activities to drinking and strategies to control use
- The five major food groups and examples of each
- Appropriate portion sizes on a plate
- The benefits of drinking water
- How to achieve a healthy lifestyle
- How to prepare Moringa and sweet potato leaves in a way that matches local tastes and retains the most nutrient content

MATERIALS REQUIRED FOR THE WORKSHOP

- A flipchart stand; at least one roll of flipchart paper; different coloured marker pens
- Prepared Flipchart Sheets (as required)
- Paper and pens for the participants
- Paper plates (as required)
- Ingredients and cooking utensils for the cooking demonstration
- Enough copies of Hand-outs # 1-3

TRAINING CONTENT

LESSON ONE	Malnutrition Alcohol Use and Abuse Alternatives to Alcohol and Managing Alcohol Consumption	1½ hours
LESSON TWO	Nutrition and Water	1½ hours
LESSON THREE	Achieving a Balanced Diet and Healthy Lifestyle Basic Hygiene Improved Utilisation of Nutritional Crops	1 ½ hours
Training Evaluation	Assessment of participants' understanding	

2.3 LESSON ONE

MALNUTRITION

ALCOHOL USE AND ABUSE

ALTERNATIVES TO ALCOHOL AND MANAGING ALCOHOL CONSUMPTION



OBJECTIVES

- Participants will gain an understanding of the different types of malnutrition.
- Participants will be able to discuss the signs of under-nutrition.
- Participants will be able to identify the three most common deficiencies in sub-Saharan Africa.
- Participants will gain an understanding of the harmful effects of alcohol, and will explore alternative activities to drinking and strategies to manage alcohol use.

Malnutrition

Malnutrition is a condition that results from eating too little of the right kinds of food (insufficient nutrition), or too much of the wrong kinds of food.

Malnutrition caused by under-nutrition can lead to stunting and wasting. Over-nutrition or over-consumption leads to overweightness or obesity.

Stunting, or low height for age, is caused by long-term insufficient nutrient intake and frequent infections. Stunting generally occurs before the age of two, and the effects are largely irreversible. These include delayed motor development, impaired cognitive function and poor school performance.

Wasting, or low weight for height, is a strong predictor of mortality among children under the age of five. It is usually the result of acute significant food shortage and/or disease.



WHAT ARE THE SIGNS OF UNDER-NUTRITION?



- ❖ Ask the participants to brainstorm the signs of under-nutrition that they have seen.
- ❖ Record the participants' responses on the flipchart.

(Add any of the under-nutrition signs from the list below that have not been mentioned by the participants.)

The signs of under-nutrition include the following:

- Weight loss
- Loss of fat and muscle mass
- Hollow cheeks and sunken eyes
- A swollen stomach
- Dry hair and skin
- Delayed wound healing
- Fatigue
- Difficulty concentrating
- Irritability
- Depression and anxiety



THE MAIN DEFICIENCIES IN SUB-SAHARAN AFRICA



- ❖ Discuss the following main deficiencies in Sub-Saharan Africa with the participants.
- ❖ Either display the prepared Flipchart Sheet or write the main deficiencies in Sub-Saharan Africa on the flipchart during the discussion.

Flipchart Sheet 1



The main deficiencies in Sub-Saharan Africa include the following:

Vitamin A

- Visual impairment and blindness
- Significantly increased risk of illness from lowered immune system (especially in early childhood, e.g. diarrhoea and measles)

Iron

- Major cause of anaemia
 - Without iron, the body cannot produce enough haemoglobin to carry oxygen in the blood cells
 - ↳ Tiredness, shortness of breath, weak and brittle nails, poor appetite
- Associated with poorer cognitive function in children
- Reduced work performance and productivity as adults
- Low birth weight of foetuses with anaemic mothers
- Risk of premature birth

Protein

- Can lead to stunting
- Loss of muscle mass
- Risk of bone fractures
- Hair/skin/nail problems
- Fatty liver
- Greater appetite
- Lower immune system function



OVER-NUTRITION

Over-nutrition refers to the act of consuming too much food in relation to the energy that an individual requires. This excess energy is stored by the body and it can lead to several health problems.



- ❖ Ask the participants to brainstorm the health problems associated with over-nutrition.
- ❖ Record the participants' responses on the flipchart.

(Add any of the associated health problems from the list below that have not been mentioned by the participants.)

Health problems associated with over-nutrition include the following:

- **Weight gain:** if regular exercise is not practised to burn off excess calories; weight gain can also lead to obesity.
- **Disease:** increased risk of heart disease, type II diabetes, certain types of cancer, and gallbladder disease.
- **Other physical problems:** high cholesterol, high blood pressure (which can increase the risk of a stroke), sluggishness and fatigue, uncomfortable digestive problems (bloating and gas build up), and bone and joint pain.
- **Mental health problems:** decreased self-esteem, anxiety, sexual and intimacy difficulties, and an unnatural preoccupation with food.



IMPORTANT INFORMATION TO REMEMBER ABOUT MALNUTRITION



❖ *Discuss the following important points regarding malnutrition with the participants.*

- Malnourishment can reduce the immune system's ability to fight infection, illness, and disease (which is why it is also important to always practice basic hygiene).
- Malnourishment can stunt physical growth (bones and organs).
- Malnourishment can reduce intellectual growth (this feeds into the cycle of poverty).
- The important time frame for feeding children the nutrients they need to develop properly is between 0-5 years of age.
- Breast feeding should be exclusive for the first 6 months, and then given in combination with food for up to 2 years.
- Individuals living with HIV already have a weak immune system, therefore the intake of enough immune-boosting nutrients to maximise their immunity is very important.

Alcohol Use

The consumption of alcohol can lead to various short-term and long-term health and behavioural complications.



SHORT-TERM EFFECTS OF ALCOHOL



- ❖ *Ask the participants to brainstorm the short-term effects of alcohol (e.g. what have they seen in their community?).*
- ❖ *Record the participants' responses on the flipchart.*

(Add any of the short-term effects of alcohol from the list below that have not been mentioned by the participants.)

Depending on how much is consumed and the physical condition of the individual, alcohol can cause the following short-term complications:

- Slurred speech
- Drowsiness
- Vomiting
- Diarrhoea and upset stomach
- Dehydration
- Headaches
- Breathing difficulties
- Distorted vision and hearing
- Impaired judgment
- Decreased perception and coordination
- Unconsciousness
- Anaemia (loss of red blood cells)
- Coma
- Memory lapses (the drinker cannot remember events that occurred while under the influence)

LONG-TERM EFFECTS OF ALCOHOL



- ❖ Ask the participants to brainstorm the long-term effects of alcohol (e.g. what have they seen in their community?).
- ❖ Record the participants' responses on the flipchart.

(Add any of the long-term effects of alcohol from the list below that have not been mentioned by the participants.)

Continued alcohol use in large amounts, as well as binge drinking, is associated with the following health complications:

- Unintentional injuries (car accidents, falls, burns, drowning)
- Intentional injuries (firearm injuries, sexual assault, domestic violence)
- Increased on-the-job injuries and loss of productivity
- Increased family problems and broken relationships
- Alcohol poisoning
- High blood pressure, stroke, and other heart-related diseases
- Liver disease
- Nerve damage
- Sexual problems
- Permanent damage to the brain
- Vitamin B1 deficiency (which can lead to a disorder characterized by amnesia, apathy and disorientation)
- Ulcers
- Gastritis (inflammation of the stomach walls)
- Malnutrition
- Cancer of the mouth and throat

EFFECTS OF ALCOHOL ON CHILDREN



- ❖ Discuss the following effects of alcohol on children.

The effects of alcohol on children include the following:

- Heavy alcohol use can lead to the inadequate intake of protein, calories and micronutrients.
- Drinking alcohol during pregnancy exposes the baby to the danger of Foetal Alcohol Spectrum Disorder (FASD). FASD is the leading cause of developmental disabilities in children. (Taking drugs during pregnancy or while breastfeeding could also harm the baby.)
- Alcohol can pass from the mother's blood into her baby's blood. It can damage and affect the growth of the baby's cells. The cells most prone to damage are the brain and spinal cord cells.
- Heavy alcohol use during pregnancy can lead to a miscarriage, stillbirth, or premature birth.

The visual and behavioural effects of alcohol on children include the following:

- Distinctive facial features (i.e. a small head, flat face, narrow eye openings – which become more obvious at 2-3 years of age)
- Growth problems (children who were exposed to alcohol before birth may be smaller than other children of the same age)
- Birth defects
- Learning and behavioural problems
- Difficulty bonding or feeding as a new-born

Alcohol Abuse



❖ Discuss the following factors concerning alcohol abuse.

BINGE DRINKING

Binge drinking is a pattern of drinking that brings the Blood Alcohol Content (BAC) level over 0.08 g/dl. This typically occurs after 4 drinks for women and 5 drinks for men in about 2 hours.

- 1 Drink = 1 serving size of the following:
 - 350ml of beer [3-5% alcohol]
 - 250ml tombo (local beer) or sweet wine [6-9% alcohol]
 - 150ml wine [10-15% alcohol]
 - 90ml liquors (sweet drinks such as Kaluha, Amaretto, Amarula, brandy, schnapps, etc.) [20-25% alcohol]
 - 45ml hard alcohol (whisky, gin, vodka, rum, etc.) [37-45% alcohol]
- Alcohol consumption should be done in moderation.

HEAVY ALCOHOL USE

Heavy alcohol use constitutes binge drinking on 5 or more days within a month.

Alternatives to Alcohol Managing Alcohol Consumption



- ❖ Ask the participants to offer other entertaining activities that they could do instead of consuming alcohol.
- ❖ Record their suggestions on the flipchart.



- ❖ Ask the participants to suggest ways to manage/limit alcohol consumption.
- ❖ Record their suggestions on the flipchart.

(Add any of the activities from the lists below that have not been mentioned by the participants.)

The following activities can be alternatives to using alcohol:

- Exercising: walking, sports activities, dancing
- Playing cards and/or board games
- Arts and crafts (weaving, sewing, building, etc.)
- Spending time with family
- Reading

The following activities can assist in managing alcohol consumption:

- Consume alcohol in moderation
- Create a support system (a friend who can help you to monitor your alcohol use)
- Drinking more water
- Eating snacks in between drinks
- Saying 'No': Do not be afraid to say 'no' to peer-pressure!

2.4 LESSON TWO

NUTRITION AND WATER



OBJECTIVES

- Participants will be able to identify the five major food groups and provide examples of each.
- Participants will be able to demonstrate appropriate portion sizes on a plate.
- Participants will understand the benefits of drinking water.

Nutrition



THE FIVE MAIN FOOD GROUPS FOR A BALANCED DIET



❖ Ask the participants to volunteer what they believe to be the five major food groups.

❖ Record the correct responses (according to the list below) on the flipchart.



❖ Ask the participants to provide food examples for each category, and to explain each food group's role in the body.

❖ Add the correct responses (according to the list below) to the flipchart.

The five main food groups for a balanced diet include the following:

- **Carbohydrates:** This group includes starchy foods such as maize porridge (mielie pap), pasta, rice, oats, potatoes and cereals.
→ *These foods provide fuel for energy.*
- **Protein:** This group includes meat, fish and eggs, as well as vegetable protein such as beans, peas, and nuts.
→ *These foods provide protein and iron, as well as certain other minerals and vitamins.*
- **Milk and dairy products:** This group includes milk, yoghurt and cheese.
→ *These foods provide calcium and protein.*
- **Fruit and vegetables:** This group includes fresh, frozen, tinned, dried, and juiced fruits and vegetables.
→ *These foods contain fibre, which keeps the digestive system healthy.*
- **Fats and sugars:** This group includes butter, margarine, cooking oils, chocolate, sugary soft drinks, sweets, jams, cakes, etc.
→ *These foods provide a lot of energy, but not many nutrients.*



APPROPRIATE PROPORTIONS

What kinds of food and how much do you put on your plate?



❖ Set up two clean sheets of flipchart paper. Ask for two volunteers.

❖ Ask the volunteers to draw a giant plate on their sheet of flipchart paper, and to then draw the type of foods they normally put on their dinner plate, as well as the portion sizes of each food type.



❖ Ask the other participants to critique the plates of food, explaining what they think is missing and which portions they think are too small or too large.

❖ Then, draw the plate (Figure 2) below on the flipchart, and discuss the points regarding the importance of portion sizes.



As an additional activity and resource, you can supply all the participants with paper plates and ask them to draw the correct portion sizes on their own plates (according to Figure 2), which they can take home for future reference.

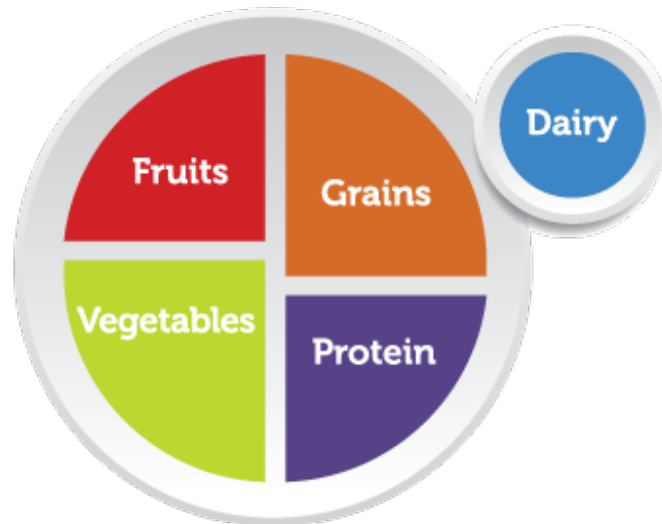


Figure 2: Correct portion sizes of food types on a plate



THE IMPORTANCE OF PORTION SIZES

Carbohydrates

These foods are your body's main source of energy. They are used to support biological processes such as respiration and digestion, and they are also used to support your daily activities and exercise.

- ➔ **Excess carbohydrates can be stored for a day or two, in case there is an energy shortage; but after that, your liver processes the extra carbohydrates into fat for long-term storage. Therefore, it is important that you do not overload your plate with carbohydrates that you will not burn off through exercise!**

Proteins

Proteins exist in many different forms and have many different functions, for example:

- Enzymes – these are the proteins which make everything happen
- Haemoglobin – the protein which, with iron, carries oxygen around your body
- Myoglobin and elastin – these are the two main proteins in muscle fibres
- Bones – bones are mainly proteins with calcium, magnesium and phosphate
- Hormones – these send chemical messages between nerve cells, and regulate metabolism
- Antibodies – these circulate in your blood to protect you against viruses
- Keratin – this forms your hair and nails
- Proteins form part of your DNA

- ➔ **Excess intake of protein is usually stored as fat, and a high intake of certain proteins can cause heart disease and digestive complications. Therefore, it is important that you only eat about a quarter plateful of protein!**

Fruits and Vegetables

These foods contain essential vitamins and minerals which are necessary for all your bodily functions and growth.

- ➔ **Low intake of these foods could result in nutrient deficiencies (which lead to other developmental problems), digestive complications, risk of disease, and weight gain.**

Water



QUESTION: Why is it important to drink water?

- More than half of the human body is made up of water.
- Without water, there would be no life.
- Water plays a very important role in a balanced diet.
- The minimum requirement of water per day is 2 litres (more if you are sick or exercising a lot).



HEALTH BENEFITS ASSOCIATED WITH DRINKING WATER DURING MEALS

Some of you may have heard that drinking water while eating can cause health problems. In fact, the opposite is true.



- ❖ *Explain the following health benefits associated with drinking water during meals to the participants.*
- ❖ *Either display the prepared Flipchart Sheet or write the health benefits associated with drinking water during meals on the flipchart during your explanation.*

Flipchart Sheet 2



The health benefits associated with drinking water during meals include the following:

- Helps to prevent over-eating
 - Helps to move food through your digestive tract smoothly; therefore, your water intake could prevent bloating and constipation
 - Helps to break down food so that your body can absorb nutrients
 - Softens stools, which helps to prevent constipation
-
- **But, be aware** that people who suffer from gastro-oesophageal reflux should not drink water or any other liquid while eating, because the fluid builds pressure in the stomach.



QUESTION: What are the benefits of drinking water?



- ❖ Ask the participants to brainstorm the benefits of drinking water.
- ❖ Record their suggestions on the flipchart.

(Add any of the reasons from the list below that have not been mentioned by the participants.)

Ten reasons why you should drink lots of water are as follows:

- Aids digestion
- Prevents dehydration
- Suppresses appetite and increases metabolism
- Flushes out toxins
- Reduces fatigue
- Improves your mood and the ability to think (dehydration leads to reduced brain function)
- Promotes healthy skin
- Reduces bad breath (flushes bacteria and food build-up)
- Regulates body temperature (through sweating)
- It keeps you alive! (A person can only survive 3-7 days without water)

2.5 LESSON THREE

ACHIEVING A BALANCED DIET AND HEALTHY LIFESTYLE

BASIC HYGIENE

IMPROVED UTILISATION OF NUTRITIONAL CROPS



OBJECTIVES

- Participants will gain knowledge on how to achieve a balanced diet and a healthy lifestyle, and how to practice basic hygiene.
- Participants will learn how to utilise and prepare Moringa and sweet potato leaves in a way that matches local tastes and retains the most nutrient content.

Achieving a Balanced Diet and Healthy Lifestyle



❖ *Either display the already prepared Flipchart Sheet or write the following suggestions on the flipchart of how the participants can strive to achieve and maintain a balanced diet and healthy lifestyle.*

Flipchart Sheet 3



Suggestions on how to achieve a balanced diet and lifestyle include the following:

- Mix proteins and/or vitamins into maize porridge (*mielie pap*)
- Add variety to your diet (Eat the rainbow! Rainbow foods are all the red, orange, yellow, green, blue/purple, and white foods that are healthy.)
- Grow Moringa and fruit trees
- Keep a backyard garden
- Support locally grown foods (local produce)
- Eat healthy snacks throughout the day
- Keep chickens for egg-laying (Keep them in a coop for safety; the coop must have enough space, water, and sheltered areas from the rain and sun.)
- Keep a cow for milk
- Grow and eat greens (Greens that grow well in the Zambezi Region are wild spinach, sweet potato leaves, pumpkin leaves, bean leaves, rape, Swiss chard.)
- Drink at least two litres of water a day (carry a water bottle wherever you go)
- Exercise regularly and practice basic hygiene



❖ Briefly discuss the rainbow coloured foods and their benefits with the participants (Figures 3 and 4).

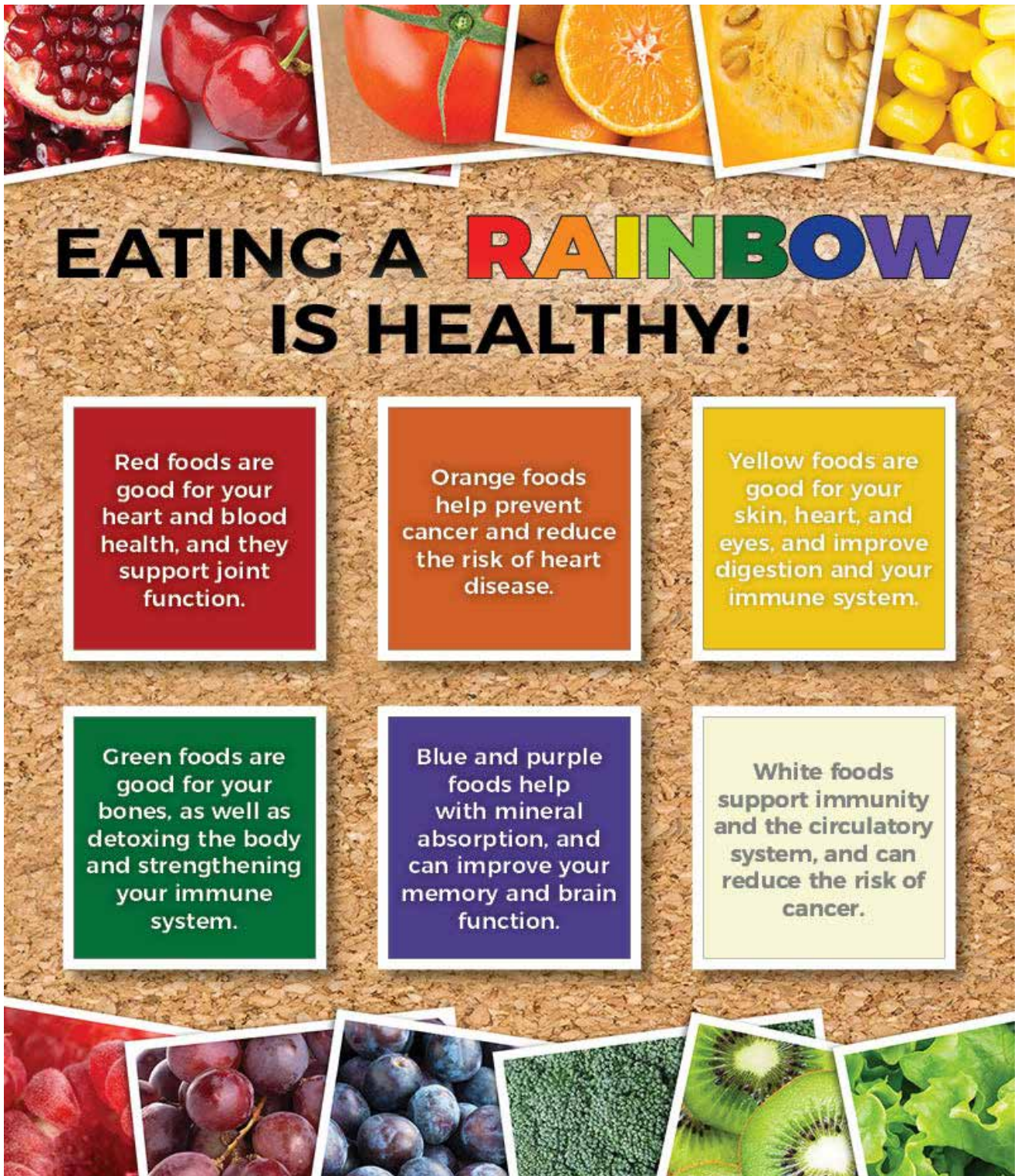


Figure 3: The rainbow-coloured foods that keep you healthy
(Source: <https://49140351515532791808-0db34d0ff83b1259c67fb64906a8985a.ssl.cf2.rackcdn.com/eat-a-rainbow-nutrition-activity-2.jpg>)



Figure 4: Examples of different rainbow foods and their benefits
 (Source: <https://i.pinimg.com/originals/23/44/ef/2344efc98dafcb5d4d17512e17def878.jpg>)

Basic Hygiene

Hygiene refers to conditions and practices that help to maintain good health and prevent the spread of diseases. This includes maintaining personal cleanliness as well as keeping your home environment clean.



- ❖ Ask a volunteer to demonstrate how to properly wash hands. (If the technique demonstrated needs improvement, advise on how.)
- ❖ Then, review the following points about hygiene with the participants, and write them on the flipchart as you discuss each point.

Maintain good health by adhering to the following basic hygiene practices:

- Bathe regularly with soap (your body is constantly shedding skin and it needs to be washed away; wash your hair only once a week).
- Trim your nails.
- Brush and floss your teeth twice a day (the bacteria that build up and cause gum disease can go straight to your heart, causing very serious valve problems. Unhealthy gums also cause your teeth to loosen, which makes it difficult to chew properly).
- Wash your hands with soap and water for at least 15 seconds before preparing or eating food, after going to the bathroom, after coughing or sneezing, and after handling garbage.
- Cover your mouth with your elbow when coughing or sneezing.



Figure 5: Basic personal hygiene practices
(Source: <https://www.pinterest.com/pin/394839092317997390/>)

Improved Utilisation of Nutritional Crops

HEALTH BENEFITS OF MORINGA LEAVES



❖ Either display the prepared Flipchart Sheet or write the health benefits of Moringa leaves on the flipchart and discuss them with the participants.

Flipchart Sheet 4



HEALTH BENEFITS OF MORINGA LEAVES

The health benefits of Moringa leaves include the following:

- Contain a lot of vitamin A, C & E, calcium, potassium and protein
- Contain antioxidants that fight molecules which cause inflammation, stress and cell damage
- Help to reduce the symptoms of diabetes by lowering glucose levels
- Improve brain function
- Protect the liver and cardio-vascular system
- Contain antibacterial and antifungal properties to fight infections
- Enhance the healing of wounds
- Lower cholesterol

HEALTH BENEFITS OF SWEET POTATO LEAVES



❖ Either display the already prepared Flipchart Sheet or write the health benefits of sweet potato leaves on the flipchart and discuss them with the participants.

Flipchart Sheet 5



HEALTH BENEFITS OF SWEET POTATO LEAVES

Sweet potatoes, also known as yams, are tuberous plants. These sweet-flavoured potatoes are highly nutritious and easily digested.

The health benefits of sweet potato leaves include the following:

- | | |
|--|--|
| <ul style="list-style-type: none">• High in fibre, vitamin C, potassium, vitamin B3, B5 & B6, manganese, magnesium, copper and proteins• High in vitamin K, which helps to de-calcifying the hard and harmful plaque deposits in the arteries (a major cause of heart attacks), and helps to reduce inflammation of the cells lining the blood vessels along your veins and arteries.• Support the digestive system• Contain anti-diabetic compounds that lower blood glucose content | <ul style="list-style-type: none">• Boost the immune system (antibacterial properties)• Support eyesight• Fuel the brain• Help to ease stress and anxiety• Boost fertility• Contain antioxidants and anti-mutagenic compounds or substances that reduce the rate of mutation of cancer cells• Contain anti-inflammatory properties |
|--|--|

HOW TO RETAIN NUTRIENT CONTENT WHEN COOKING VEGETABLES



❖ Provide the participants with Hand-out #1 (How to retain nutrient content when cooking vegetables), and discuss.

HOW TO

HOW TO RETAIN NUTRIENT CONTENT WHEN COOKING VEGETABLES

The best ways to retain nutrient content when cooking vegetables include the following:

1. Limit the amount of cooking water

- When you cook vegetables in water, they lose nutrients.
- To retain these vitamins, cook vegetables in as little water as possible for a minimal amount of time (unless you plan to use the water as a soup).

2. Use a small amount of fat

- Many nutrients, like beta carotene, vitamin D, and vitamin K are fat soluble, so they can only pass from your intestine into your blood stream with some fat to carry them across.
- Use a small amount of fat when preparing your vegetables.

3. Add citrus

- Vegetables like spinach, broccoli, and kale contain lots of iron, but the iron is in a form that is difficult for our bodies to use, so most of it passes through undigested. Vitamin C reacts with iron chemically, changing it into a form that is more easily absorbed by our bodies.
- Citrus fruits (oranges, lemons, grapefruit, naartjie) provide abundant vitamin C. Tomatoes also provide vitamin C, but less than citrus fruits.
- Add squeezed orange or lemon juice to your vegetables, or fresh tomatoes.

4. Keep the peel (skin) on

- Many important nutrients are found in or just under the vegetable peel.
- Whenever possible, leave the peel on when cooking vegetables.

5. Try not to cut vegetables before cooking

- Cutting a vegetable breaks its cell walls, allowing nutrients to escape into any water on contact.
- By not cutting the vegetables before cooking, the nutrients stay safely tucked inside their cell walls and are not leached into the water.
- Before cooking the whole vegetables, always wash them first.

6. If you cut the vegetables, cook them soon after

- Nutrients can be destroyed when exposed to light and air.
- Once you have cut the vegetables, cook and eat them as soon as possible afterwards.

7. Cut vegetables into larger, uniform (same-sized) pieces

- First, by cutting your vegetables into larger pieces rather than small pieces means that fewer cell walls are broken and fewer nutrients are lost to heat, light, or the cooking water.
- Second, by making sure that your larger cut vegetable pieces are all more or less the same size ensures that everything is cooked at the same time. This eliminates the problem of the smaller pieces being overcooked with a loss of nutrients.

8. Do not overcook vegetables

- The longer vegetables are cooked, the more nutrients they will lose.
- Remove vegetables from the heat before they become too soft and lose too much colour.



- ❖ Demonstrate and discuss the process of preparing and cooking Moringa and sweet potato leaves.
- ❖ Provide the participants with Hand-out #2 (Moringa and sweet potato leaf recipes) for the participants to look at while you are preparing the dishes.
- ❖ Once the dishes are complete, invite the participants to taste the results and conduct a feedback discussion.

RECIPE

MORINGA LEAF RECIPE

INGREDIENTS

- Moringa leaves
- Chopped tomatoes
- Chopped onion
- Cooking oil
- Salt and other spices for flavouring



PREPARATION

- Begin by separating the Moringa leaves from the stem (it is preferable to use the newer leaves).
- Thoroughly wash the leaves in water, and then drain the excess water.
- In a pot or pan over the fire, heat a few tablespoons of cooking oil, add the chopped onion, and stir occasionally for a few minutes.
- When the onions have become transparent, add the Moringa leaves.
- If necessary, add a small amount of oil.
- Let the Moringa leaves cook for about 5 minutes, and stir occasionally.
- Then add the chopped tomatoes, salt, and other spices.
- Stir occasionally.
- The Moringa leaves will be ready when they are soft but still have their bright green colour (about 5 more minutes).



Figure 6: A local woman demonstrates how to clean Moringa leaves



Figure 7: A Peace Corps volunteer demonstrates how to cook Moringa leaves to a community in the Zambezi Region

RECIPE

SWEET POTATO LEAF RECIPE

INGREDIENTS

Sweet potato leaves

Chopped tomatoes

Chopped onion

Cooking oil

Salt and other spices for flavouring



PREPARATION

- Begin by separating the sweet potato leaves from the stems (it is preferable to use the newer leaves).
- Thoroughly wash the leaves in water, and then drain the excess water.
- Thinly slice the leaves and set aside.
- In a pot or pan over the fire, heat a few tablespoons of cooking oil, add the chopped onion, and stir occasionally for a few minutes.
- When the onions have become transparent, add the sweet potato leaves and stir occasionally.
- If necessary, add a small amount of oil.
- Let the sweet potato leaves cook for about 5 minutes.
- Then add the chopped tomatoes, salt, and other spices.
- Stir occasionally.
- The sweet potato leaves will be ready when they are soft but still have their green colour (about 5 more minutes).

2.6 TRAINING EVALUATION



To evaluate the effectiveness of the training provided, ask the following questions and discuss their answers:

- What did you like most about this training workshop?
- ,What aspects of the training could be improved?



To further evaluate the effectiveness of the training provided, supply the participants with the Evaluation Form (Hand-out #3) for them to complete.

BIBLIOGRAPHY

Directorate of Disaster Risk Management (DDRM). (2016) *Namibia Food & Nutrition Security Monitoring. Bulletin No: 5;* March 2016. WFP.

http://documents.wfp.org/stellent/groups/public/documents/ena/wfp284547.pdf?_ga=1.178059436.869999729.1479535860

Krieger, Ellie. "The Right Way to Cook Vegetables." *Fine Cooking*, pp. 36–37. <https://www.finecooking.com/article/the-right-way-to-cook-vegetables>

Mendelsohn, J. (2006). *Farming Systems in Namibia*.

MoringaNews (2010) *Growing and Processing Moringa Leaves*. http://miracletrees.org/moringa-doc/moringa_book_growing_and_processing_moringa_leaves.pdf

Namibia Association for Improved Nutrition (2010). *Malnutrition in Namibia. The Time to Act is Now!*. https://www.unicef.org/namibia/na.Malnutrition_final.pdf

Namibia Association for Improved Nutrition (2016). *National Profile. Nutrition in Namibia*.

Namibia Association for Improved Nutrition (2016). *Zambezi Regional Profile. Nutrition in Namibia*.

Shifiona, T.K., Wang, D. and Hu, Z. (2016) *Analysis of Namibian Main Grain Crops Annual Production, Consumption and Trade—Maize and Pearl Millet*. *Journal of Agricultural Science*; Vol. 8, No. 3; 2016

WHO (2015). *The global prevalence of anaemia in 2011*. World Health Organization.

WHO (2009). *Global prevalence of vitamin A deficiency in populations at risk 1995–2005 WHO Global Database on Vitamin A Deficiency*. World Health Organization.


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TO

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RECIPE

MORINGA LEAF RECIPE

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Chopped tomatoes
Chopped onion
Cooking oil
Salt and other spices for flavouring



PREPARATION

- Begin by separating the Moringa leaves from the stem (it is preferable to use the newer leaves).
- Thoroughly wash the leaves in water, and then drain the excess water.
- In a pot or pan over the fire, heat a few tablespoons of cooking oil, add the chopped onion, and stir occasionally for a few minutes.
- When the onions have become transparent, add the Moringa leaves.
- If necessary, add a small amount of oil.
- Let the Moringa leaves cook for about 5 minutes, and stir occasionally.
- Then add the chopped tomatoes, salt, and other spices.
- Stir occasionally.
- The Moringa leaves will be ready when they are soft but still have their bright green colour (about 5 more minutes).

RECIPE

SWEET POTATO LEAF RECIPE

INGREDIENTS

Sweet potato leaves
Chopped tomatoes
Chopped onion
Cooking oil
Salt and other spices for flavouring



PREPARATION

- Begin by separating the sweet potato leaves from the stems (it is preferable to use the newer leaves).
- Thoroughly wash the leaves in water, and then drain the excess water.
- Thinly slice the leaves and set aside.
- In a pot or pan over the fire, heat a few tablespoons of cooking oil, add the chopped onion, and stir occasionally for a few minutes.
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- Then add the chopped tomatoes, salt, and other spices.
- Stir occasionally.
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Conservation Agriculture and Nutrition

EVALUATION FORM

Venue: _____ Date: _____

Facilitator/s: _____

Evaluation		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	The facilitator was knowledgeable about the workshop content.					
2.	The workshop content was well presented by the facilitator.					
3.	The workshop content was relevant.					
4.	The workshop content was easy to understand.					
5.	I gained new information.					
6.	I learnt new skills.					
7.	The allocated time for the workshop was sufficient.					
8.	The workshop met my expectations.					
9.	Workshop logistics:					
a)	Notice for the workshop was given on time.					
b)	The venue was appropriate.					
c)	Transport was well organised.					
d)	Meals and accommodation were satisfactory.					

ADDITIONAL QUESTIONS

1. Which aspect (or aspects) of the workshop did you find the most valuable, and why?

2. Do you have any other comments/suggestions that could help with improving future workshops?

3. Do you need any follow-up training, or training in other areas? If so, please list them.

