Nutrition-Sensitive Climate-Smart Agriculture (NSCSA)

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At the end of this module you will...

• ... understand Food and Nutrition Security (FNS) and its complexity and be able to correctly use the main terms and concepts

• ... better understand the linkages between climate change and food and nutrition security (FNS)

• ... be able to define what you can do to make climate-smart agriculture interventions more nutrition-sensitive
Outline

• Food and Nutrition Security: What is it all about?
• The Food and Nutrition Security Situation in Mauritius
• Climate Change and Nutrition – what are the linkages?
• Nutrition-sensitive agriculture: Why and how?
• Examples of nutrition-sensitive approaches in agriculture
Food and Nutrition Security: What is it all about?
**Food and Nutrition Security** exists when:

- **all people at all times** have
- physical, social and economic **access to food**, 
- which is safe and **consumed** in sufficient quantity and quality to meet their dietary needs and food preferences, 
- and is supported by an environment of adequate sanitation, **health services and care**, 
- allowing for a healthy and active life.

Source: CFS 2012, giz
Hunger (undernourishment):
A subjective sensation of an individual after a certain period without nourishment (is often used as a synonym for lack of food, chronic calorie deficiency)

Malnutrition with the following manifestations:

- **Undernutrition**
  - result of insufficient intake of nutritional energy and/or nutrients; also caused by inadequate health and hygienic conditions

- **Overweight & obesity**
  - result of an excess intake of nutritional energy over a longer period of time.

- **Micronutrient deficiencies, hidden hunger**
  - result of an inadequate supply of vitamins and/or minerals

Source: giz
Malnutrition – comes in many forms

- **Overweight or obese** (evidence of overnutrition)
- **Normal** Normal weight or height
- **Stunted** Short for age (chronic malnutrition)
- **Wasted** Low weight for age (acute malnutrition)

Source: giz
All three problems occur, in some instances, in the same countries, societies and families.

Individuals may suffer from underweight or overweight and micronutrient deficiencies at the same time.

- **Undernutrition and micronutrient deficiencies** still major challenges worldwide.
- **Overweight and obesity** are increasing rapidly, causing nutrition-related chronic diseases (non-communicable diseases).
- **NCDs** responsible for over 75% of deaths globally.

Source: giz
Global State of Malnutrition – Who is affected?

- **Child Stunting**: Low height for age. 159 million children worldwide.
- **Child Wasting**: Low weight for height. 50 million children worldwide.
- **Child Overweight**: High weight for height. 41 million children worldwide.
- **Adult Overweight & Obesity**: BMI ≥ 25. 2 billion adults worldwide.

**Micronutrient Deficiency**
Iron, folic acid, vitamin A, zinc, iodine below healthy thresholds | Affecting 2 billion people.

**Noncommunicable Diseases**
Diabetes, heart disease, and cancers
1 in 12 people worldwide has diabetes.

THINK YOU KNOW WHAT MALNUTRITION IS? THINK AGAIN. #NUTRITIONREPORT

Source: giz
Africa is ranked as having amongst the highest rates in the world and SSA carries a high burden of under-nutrition with 33% of childhood deaths linked to under-nutrition.

17 countries on the continent have stunting rates above 40 percent, and 36 countries have rates above 30 percent.
### Malnutrition in Mauritius (May 2018)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mauritius (%)</th>
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<tbody>
<tr>
<td>Wasting (Children 0-59 months)</td>
<td>18.3</td>
</tr>
<tr>
<td>Overweight (Children 6-59 months)</td>
<td>8.8</td>
</tr>
<tr>
<td>Stunting (Children 6-59 months)</td>
<td>27.3</td>
</tr>
<tr>
<td>Underweight (Children 6-59 months)</td>
<td>21.1</td>
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<tr>
<td>Undernourished population (FAO estimates 2014-2016)</td>
<td>5.2</td>
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<tr>
<td>Severe food insecurity (FAO estimates 2014 - 2016)</td>
<td>4.98</td>
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<tr>
<td>Overweight and obese population (2014)</td>
<td>18</td>
</tr>
<tr>
<td>Vitamin A deficiency (Children 6-59 months)</td>
<td>29</td>
</tr>
<tr>
<td>Anaemia among women (2016)</td>
<td>25.1</td>
</tr>
</tbody>
</table>

Nutrition-Related Myths and Practices

- Food quality is synonymous with food quantity
- Micronutrient supplements are for people with a medical condition
- Being over weight or fat is sign of wealth or good living
- There are “special foods” for men and not for women and children
- Stunting is hereditary and has nothing to do with nutrition
The Cost of Malnutrition

- Malnutrition and diet are the biggest risk factors for the global burden of disease, responsible for over 70% of mortalities.
- Losses of 11 percent of gross domestic product (GDP) every year in Africa and Asia.
- Preventing malnutrition delivers $16 in returns on investment for every $1 spent.
- Countries have agreed on targets for nutrition, but still a long way in reaching the targets.
- While policies may be in place, countries do not always know how to design and implement effective interventions.

Global Nutrition Report 2017
Investment in first 1,000 days of life from a woman’s pregnancy to her child’s second birthday

Consequences of malnutrition during this period are to a large extent irreversible

Improving nutrition during this critical window has potential to save lives, help children develop fully and thrive, deliver greater economic prosperity

Source: giz
Causal model of malnutrition (UNICEF)

**UNDERLYING CAUSES**
Household level, nutrition sensitive

- **INADEQUATE FOOD INTAKE USE**
  - Access to and control of human, natural and economic resources; institutional structures and governance; sector policies (gender, agriculture, health); human rights violation, consequences of climate change, or fragility and armed conflicts

- **DISEASES (INFECTIONS) UTILISATION**
  - Access to and control of human, natural and economic resources; institutional structures and governance; sector policies (gender, agriculture, health); human rights violation, consequences of climate change, or fragility and armed conflicts

**IMMEDIATE CAUSES**
Individual level, nutrition specific

- **INSUFFICIENT HOUSEHOLD FOOD SECURITY AVAILABILITY**
  - e.g. production, trade
  - **ACCESS TO FOOD**
    - e.g. income, infrastructure

- **INSUFFICIENT HEALTH SERVICES, INADEQUATE HYGIENE ENVIRONMENT**

- **INCORRECT INADEQUATE CARING PRACTICES**
  - e.g. breastfeeding

- **EDUCATION**

Source: adapted from UNICEF (1991), giz
Nutrition is central to achievement of SDGs

At least 12 of the 17 SDGs contain indicators that are highly relevant for nutrition

Improved nutrition has a positive impact on health, education, employment, female empowerment, and poverty and reduction of inequality

Conversely, poverty and inequality, water, sanitation and hygiene, education, food systems, climate change, social protection, and agriculture affect nutrition outcomes

Important to incorporate nutrition targets into development and social sectors, where many governments spend more than 30 percent of their budgets

Delivering nutrition requires a multi-sectoral approach
Global and Regional Nutrition Goals

• SDG 2:
  • End hunger
  • Achieve food security and improved nutrition
  • Promote sustainable agriculture

• African Union Vision 2063:
  • Healthy and well-nourished citizens

• Malabo Declaration 2025 targets:
  • End hunger by 2025
  • Reduce stunting to 10%
  • Underweight reduced to 5%
Nutrition-Specific vs Nutrition-Sensitive Interventions

• Address immediate causes of malnutrition
  • **Examples:**
  • Support for exclusive breastfeeding up to 6 months of age
  • Continued breastfeeding, together with appropriate and nutritious food, up to 2 years of age
  • Fortification of foods
  • Micronutrient supplementation
  • Treatment of severe malnutrition

• Address underlying causes of malnutrition
  • **Examples:**
  • Agriculture: Making nutritious and safe food more accessible to everyone, and supporting small farms as a source of income for women and families
  • Clean Water and Sanitation: Improving access to reduce infection and disease
  • Education and Employment: Making sure children have the energy that they need to learn and earn sufficient income as adults
  • Healthcare: Improving access to services to ensure that women and children stay healthy
  • Support for Resilience: Establishing a stronger, healthier population and sustained prosperity to better endure emergencies and conflicts
  • Women’s Empowerment: At the core of all efforts, women are empowered to be leaders in Nutrition-Sensitive Approaches.
Addressing Malnutrition Requires a Multi-sectoral Approach

Food Systems Approach to Nutrition

- Food systems include all processes and infrastructure involved in feeding a population: growing, harvesting, processing, packaging, transporting, marketing, consumption, and disposal of food and food-related items.
- Food systems need to be nutrition-sensitive to address the underlying causes of malnutrition.
- Agriculture is but one component of the food system which helps to deliver healthy diets.
Brainstorming: Healthy Diet

• Task:
✓ What constitutes a healthy diet?

(5 min)
Healthy Diet Examples

Put the rainbow on your plate!

Source: giz

Source: www.fao.org/nutrition/education/food-dietary-guidelines
A healthy diet helps protect against malnutrition in all its forms, as well as non-communicable diseases (NCDs), including diabetes, heart disease, stroke and cancer.

Healthy and sustainable diets have low environmental impacts contribute to food and nutrition security and to healthy life for present and future generations.

Source: giz
More than 100 countries worldwide have developed food-based dietary guidelines, adapted to their nutrition situation, food availability, culinary cultures and eating habits.


Source: giz
The Link Between Agriculture and Nutrition
• Agriculture is fundamental to food production

• Link to nutrition through food use via food availability and access is apparent ...

... but availability and access do not always lead to good nutrition

• Agriculture also has impacts on health-related outcomes.

Source: giz
Agriculture and Nutrition Disconnect

• There is a disconnect between agriculture and nutrition
• What can agriculture projects do to deliver positive nutrition outcomes?
• Traditionally, agricultural development tended focused on productivity, production and incomes rather than nutrition.
• Agriculture, including CSA, must transform to become nutrition-sensitive in order to deliver on healthy diets and SDGs.
... an approach that

• addresses potential disconnect between agriculture and nutrition

• seeks to ensure the production of a variety of affordable, nutritious, culturally appropriate and safe foods

• In adequate quantity and quality

• To meet the dietary requirements of populations

• In a sustainable manner.

Source: giz
Pathways from Agriculture to Nutrition

Source: giz

source: FAO (2016) adapted from Herforth and Ballard (2016)
Can be anywhere along the agricultural value chain, depending on the design and objectives of project.
Where are Opportunities for Nutrition-Sensitive Interventions (NSIs)?
What is the Link Between Climate Change and Nutrition?
Effect of Climate Change on Food and Nutrition Security

- e.g. decrease in income
- Loss of assets following shocks
- Increase in food prizes
- Infrastructure damaged

- e.g. more health stresses as food- and water- born diseases (e.g. diarrhoeal disease), aflatoxin contamination
- Spread of diseases in new regions (Malaria, Sleeping Sickness)
- Shortage and quality of fresh and drinking water
- Higher workload for women

- e.g. reduced agricultural productivity, biodiversity
- Land degradation and desertification, rise sea level
- Shift range of plant and livestock diseases
- Changes in food quality (nutritional value)

- e.g. loss of harvest and livelihoods through increasing extreme weather events
- Degradation of land and water resources
- Scarcity of water and land resources
- Increasing conflict potential

Source: giz
The Need for Nutrition-sensitive Climate-smart Agriculture

CC will have negative effects on global food supply

- Global agricultural production could fall by 2% per decade through 2050
- Global food demand will be increasing by 14% each decade because of population growth, urbanization, and increased incomes.
- Sub-Saharan Africa and South Asia are the two regions of the world facing the highest burden of malnutrition today and will prospectively face the most serious impacts of climate change.

Source: Global Panel on Agriculture and Food Systems for Nutrition (2015)
The Need for Nutrition-sensitive Climate-smart Agriculture

CC may also negatively affect the diversity and nutritional value of foods

- Nutrient-rich foods are particularly susceptible to climate change impacts (drought, spread of pests and diseases, temperature fluctuations).
- Higher levels of CO2 in the atmosphere may reduce the nutrient content and/or quality of various staple crops, e.g. zinc, iron and protein content in wheat, rice, field peas and soybeans.
- Feedback loop between food choices and climate change adaptation – e.g. animal source foods (meat, fish, poultry, milk, and eggs) have large carbon food print but provide essential nutrients (e.g. iron, zinc, vitamin A, riboflavin, and vitamins B-6 and B-12).

Source: Global Panel on Agriculture and Food Systems for Nutrition (2015)
Nutrition-Sensitive Climate Smart Agriculture (NSCSA)

- Need to integrate nutrition into CSA
- Integrate the traditional objectives of agricultural development (production, productivity, food security and income) with nutrition
- Can do this at various points along the agriculture value chain
How can agricultural extension services contribute to nutrition-sensitive climate-smart agriculture?
The most basic requirement for nutrition-sensitive programming is to avoid possible negative impacts on nutrition.

### Intended Pathway

1. **Improving agricultural productivity (maize)**
2. **Better availability of maize at the household level and local markets**
3. **Food security**

### Unintended Pathway

1. **Increase in women's load (overload)**
2. **Reduction of dietary diversity**
3. **Micronutrient deficiencies**
4. **Malnutrition of children**
5. **Reduced care capacity for children**

Source: giz
Food Safety is Important

- Aflatoxin is considered to be one of the main causes of stunting during the first 1,000 days
- Physical + cognitive impairments
- Intake of aflatoxin by pregnant women leads to lower birth weight in newborns

e.g. Aflatoxins: natural, highly toxic byproducts of molds that affect mainly staple foods and others (maize, rice, peanuts etc.)

No decontamination of contaminated food with aflatoxin possible!

Source: giz
Good Hygiene is Key…

Routes of fecal disease transmission and protective barriers for babies!

Sanitation

Clean water supply

Hygiene

Protective Play Space

Feces

Fluids

Fingers

Flies

Fields/floors

Laundry Water

Geophagia, dirty hands

Nappy Handling

Source: giz

Ngure et al, 2013
Entry points for nutrition-sensitive Agriculture

Focus on nutrition-dense foods incl. (Bio) fortified food

Labour saving technologies

Diversified production; improved income used to buy nutritious food

Nutrition-sensitive agricultural policies

Political and economic conditions, governance
Sectoral policies (agriculture, health, gender)
Social protection
Peace and security

Education on Nutrition (e.g. Farmer Business Schools)

Health services / WASH
Environment, hygiene, drinking water

Improved income invested in Health and Hygiene

Safe agricultural practices

FOOD and NUTRITION SECURITY
adequate nutritional status

Food safety: e.g. storage and transportation

FOOD CONSUMPTION
Food USE

FOOD AVAILABILITY
e.g. production, trade
ACCESS TO FOOD
e.g. income, infrastructure

CARING CAPACITY
e.g. breastfeeding, workload of women

EDUCATION

Source: giz

Source: adapted from UNICEF (1991)
FANRPAN has developed frameworks that may be used to do the following:

1. Assess project/program suitability for integrating nutrition-sensitive interventions-identify entry points
2. Select and design nutrition-sensitive interventions.  
   http://www.atonuframeworks.fanrpan.org/
3. Impact evaluation of nutrition-sensitive interventions
   • Available to provide technical assistance to existing and pipeline projects that would like to deliver positive nutrition outcomes
Implementation of NSIs and Evaluation of their Impact

• Partnerships for delivery of NSIs
• Capacity development of local development practitioners (public, NGO, and private extension agents)
• Delivery approaches: group sessions, demonstrations, individual household visits, community theatre
• Monitoring of implementation and assessment of impact of NSIs: process monitoring and impact evaluation
Well-nourished rural smallholder farm families

Policy makers and investors incorporate nutrition in the design of agricultural and climate change policies and programmes

Agricultural experts working with nutrition and health experts to deliver positive nutrition outcomes

Validated evidence of nutrition-sensitive climate smart agricultural interventions

Ag-Nutrition community of practice equipped to design nutrition-sensitive climate smart agriculture projects

What Will Success Look Like?
Summary of What to Keep in Mind for NSCSA

• First of all: Do no harm! Remember: Higher productivity does not always lead to better nutrition. Nutrition-security goes beyond food security.

• Include hygiene, health and care especially for children and pregnant and lactating women.

• Young children are the most vulnerable – their nutritional status depends mainly on whether they receive adequate care (including breastfeeding) → Be aware of gender dimensions!

• Availability of and access to diverse foods is basis for a diverse diet. Diversified production (e.g. incl. home gardens) is one key element, but be aware that this is not automatic. Focus on nutrient-dense foods.

• Food safety is key - consider in food production, storage and processing.

Source: giz
We Need a RAINBOW Revolution
Examples of Nutrition-sensitive Agriculture Approaches
Promoting the African rice value chain (CARI)

Nigeria, Ghana, Burkina Faso, Tanzania

Objective: Double the income of 125,000 rice farmers from US$2 to US$4 per person per day through integration into sustainable business models.

Context
• Strongly growing demand for rice, 40% to 60% covered by imports so far
• Low productivity of rice production schemes
• Nutrient poor nutrition of rice farmers

Approaches/instruments
• Improving the supply and marketing channels for rice; Improving access to financing
• Nutrition Education (Modul at FBS)
• Training on improved farming practices and supporting diversification of cultivation (mainly vegetables)
• Measures to increase income for women in rice processing activities

Results
• > 122,000 farmers have been integrated into sustainable business models
• Up to 60% yield increase achieved

Intended Impact (Analysis as of June 2018)
• Improved diversity of diets at household level (HDDS)
• Improved nutritional knowledge

Source: giz
Global project Food and nutrition security, enhanced resilience

Nutrition-sensitive agriculture in Ethiopia

Knowledge on nutrition and hygiene

Pregnant and breastfeeding mothers receive training on hygiene, breastfeeding practices and the preparation of healthy and balanced food.

In addition to the cultivation of diverse foodstuffs, farmers receive trainings in small animal husbandry, storage and processing of healthy foodstuffs.

Nutrition-sensitive agriculture

Intersectoral coordination

Source: giz
Realigning Agriculture to Improve Nutrition (RAIN)

Challenges
- 45% under the age of five suffering from chronic undernutrition, manifesting as stunted growth
- Lack of dietary diversity
- Poor nutritional status of pregnant and breastfeeding women

Approaches/instruments:
- Improve home gardens & small livestock rearing
- Diversifying food: crops with high nutritional value (e.g. biofortified pulses)
- Training on agriculture and nutrition
- Processing and storage of foodstuffs
- Multisectoral coordination structures (District Nutrition Coordinating Committee – DNCC)

Results:
- Significant production increase of diverse and micronutrient rich foodstuffs
- Improved dietary diversity (IDDS) in children and mothers
- Better participation of women in decision-making processes (e.g. crop production, use of money)
- District coordination structures adopted in 14 other districts (SUN fund, FMCDP)

Source: giz
Community-based multisectoral training approach
[Laos, Cambodia, Myanmar, Sri Lanka, India, Sierra Leone]

Objective: Improving the nutritional situation through behavioural change, empowerment and improved coordination between agriculture, natural resource management, WASH, income generation and food education

Focus:
- Regions with ethnic minorities, low literacy, agro-ecological zones with significant distribution of wild fruits

Approaches/instruments
- Training concept includes participative "action learning" such as theatre, role-plays, cooking classes and recipe development.

Results:
- Increasing the diversity of nutrient-rich foods produced
- more food diversity in the consumption pattern of vulnerable groups ↑ IDDS
- Increase in exclusively breastfed children
- Improved care practices → Cooking practices, hygiene practices
- Decrease of diseases transmitted by drinking water
- More active participation of women in decision-making processes at household and village level
- Greater resilience

Source: giz
# ATONU Project - Chickens and cereal value chains

<table>
<thead>
<tr>
<th>Pathway</th>
<th>Nutrition-Sensitive Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production for household consumption</td>
<td>Introduction of improved and adapted chicken genotypes (ACGG)</td>
</tr>
<tr>
<td></td>
<td>Social Behaviour Change Communication (SBCC) on nutrition education and hygiene to increase consumption of eggs and chicken meat</td>
</tr>
<tr>
<td></td>
<td>Promotion of home gardens for improved dietary diversity</td>
</tr>
<tr>
<td>Income-oriented production for purchase of food</td>
<td>Increased expenditure on nutritious food from household incomes from sale of eggs and chicken</td>
</tr>
<tr>
<td>Women empowerment</td>
<td>Changes in women’s time use and status (decision-making) within the household</td>
</tr>
</tbody>
</table>
• Promote women empowerment and increased decision-making at household level, especially targeting men inclusion

• Influence expenditure of household income on nutritious food

• Partner with relevant stakeholders (e.g. health workers and extension) to provide nutrition and WASH knowledge and skills (demonstrations)

• Promote increased shelf life and reduce post-harvest losses of seasonally abundant foods.

• Promote production and consumption of small livestock (birds, rabbits, ducks, guinea fowl, snailery, catfish etc), tropical fruits (mangoes, oranges, pawpaw, banana etc) and vegetables (spinach, bitter leaves, scent leaves)
References and further readings

- BMZ (2013): Promoting sustainable agriculture
- GIZ (2016): Sample results models and indicators for rural development and agriculture projects
- WorldBank (2013): Improving nutrition through multi-sectoral approaches
- FAO (2017): Nutrition-sensitive agriculture and food systems in practice
- IFPRI (2017): Discussion Paper: Nutrition-Sensitive Agriculture – What Have We Learned and Where Do We Go from Here?
- Herforth and Harris (2014): Understanding and Applying Primary Pathways and Principles
- FAO e-learning course Improving Nutrition through Agriculture and Food Systems
- GloPan (2016): Food systems and diets: Facing the challenges of the 21st century
- HLPE (2017): Nutrition and food systems
- FAO (2016): Compendium of indicators for nutrition-sensitive agriculture
Thank you