



# Scale-N: Hidden hunger and sustainable food security in East Africa

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strategies for food security in developing countries focused exclusively on the amount of food available. The aim was to increase the calories on the plates of poor and hungry people. In that context, food quality and diversity were often neglected and have, for years, been given only little consideration in research and development projects. That focus has shifted recently, as “Hidden Hunger” moves into the centre of attention. The Federal Ministry of Agriculture and Food takes this development into account in its research budget. Especially, since malnutrition during the first 1,000 days after conception significantly influences the physical and cognitive development potential. Accordingly, inadequate diets can pose a lasting threat to the healthy development of humans.

**With the project “Scaling-Up Nutrition: Implementing potentials of nutrition-sensitive and diversified agriculture to increase food security”, the Federal Ministry of Food and Agriculture (BMEL) funds research on innovative applications of nutrition-sensitive and diversified agriculture. The long-term goal is to ensure food security in Africa.**

Malnutrition is still among the biggest challenges of the 21st century, especially for the rural population in developing countries. Although the absolute figure of people suffering from hunger

had been decreasing for years, it rose again, to a little over 800 million in 2016, corresponding to about eleven percent of the world’s population. For decades, research and development policies and

## Urgent need for action in Tanzania

In Tanzania, malnutrition is still widespread, especially among children and among women of child-bearing age. Consequently, approx. 35 percent of Tanzanian children under the age of five show signs of stunting (*UNICEF Tanzania 2016*). This condition is often accompanied by limited mental development. The causes lie mainly in a unbalanced and nutrient-poor diet, which leads to a lack of essential micronutrients and partly also protein. The specific causes of low nutritional diversity are manifold and, depending on personal and regional living conditions, include:

- decreasing amounts of rural farmland due to high population growth (Tanzania’s population has quadrupled since the 1960ies (*World Bank 2012*)),
- inefficient production systems,
- a lack of markets,
- losses during preparation and storage (up to 50 %) (*Abbas et al. 2014*),

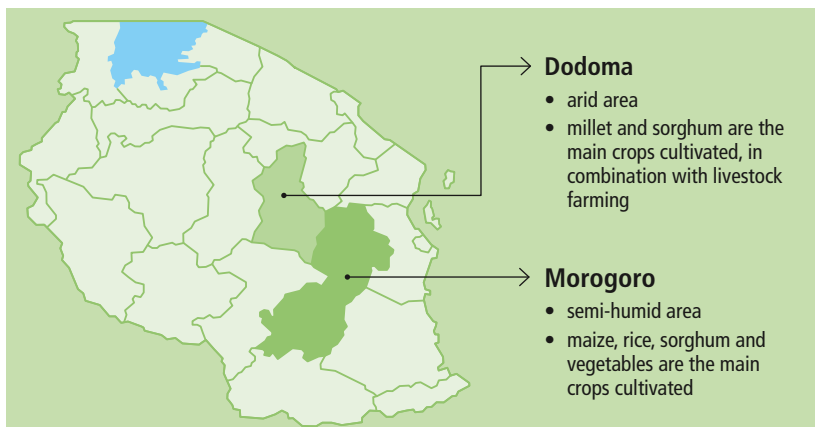


Figure 1: Dodoma and Morogoro regions in Tanzania

- insufficient knowledge about food and nutrition.

Also, gender-specific aspects play an important role: Women are primarily responsible for the provision of food for the family, while decisions on the use of the land and how money is spent are the privileges of men.

## The Scale-N project

In view of the array of causes which may lead to malnutrition, uniform recommendations for action can hardly be made. Instead, solutions must be geared to individual situations. Hence, the Federal Ministry of Food and Agriculture (BMEL) funds the Scale-N research project which is jointly carried out by the Leibniz Centre for Agricultural Landscape Research (ZALF), Hohenheim University and Sokoine University of Agriculture (SUA) in Morogoro/Tanzania. The project follows a participatory research approach.

Scale-N conducts research in four different villages in Tanzania. The resulting strategies for action shall be implemented at national and, where applicable, at supra-national level. The villages are located in the regions of Morogoro and Dodoma and vary strongly in terms of climate and culture (Fig. 1).

The project applies a broad spectrum of various participatory research activities and strategies to first assess and evaluate the status of malnutrition in detail as well as to develop and implement strategies for overcoming it in cooperation with the local population.

In a first step, information on people's nutritional statuses in the study regions was gathered by means of questionnaires and blood tests. In addition, existing local value chains were identified and classified according to whether or not they provide nutritious plant-based foods. In order to close the gaps in the provision of nutrients, villagers tested various new cultivation methods for vegetables. Foremost, cultural acceptance is crucial for the success of the project. Once the most promising strategies and methods were selected, the nutrition-sensitive innovations were implemented in the villages. For example, kitchen and bag gardens were created (Fig. 2) where, ideally, green leafy vegetables grow water-efficiently on small patches of land close to people's homes; also, user-friendly nutrition training for mothers, nurses, teachers and village elders were developed and provided.

In addition to the scientific work, the results of the project are to be prepared in such a way that they help political decision-makers to scale up successful measures so that more families in Tanzania and (East) Africa will eat more diverse and healthier.

## Practical examples

### Kitchen gardens

Kitchen gardens refer to a small area of land to be cultivated close to the household. The size of the available land, the soil conditions and available water resources determine how kitchen gardens are designed and which vegetables can be grown: in Dodoma, a rather dry region, planting in bags is appropriate given that water, which during the dry season even has to be paid for, is used much more efficiently; in Morogoro, it is raining a lot, such gardens may be created in small fields. Mixed forms are also possible (Fig. 3). The kitchen garden as a land use system close to the home offers families an excellent and cost-effective opportunity to grow nutritious leafy vegetables for individual consumption, all year round. Kitchen gardens offer a variety of advantages, such as

- generally higher food security,
- production of nutritious foods,

- a very low requirement of resources (e.g. water, growing area and financial investment),
- year-round cultivation, especially advantageous during the dry season,
- sale of possible excess production at local markets generate additional family income.

When planning and implementing kitchen gardens, Scale-N explicitly applies a participatory approach: Advice, support and implementation of measures only takes place after all options have been considered in cooperation with the villagers. In practice, this often results in a long and sometimes (very) complicated negotiation process between village elders, women involved and various interest groups within the village.

However, it promotes ownership of the achieved results and the success of the project in the long term. Depending on available financial and natural resources, villagers developed together with the Scale-N project staff the suitable design for their kitchen gardens.

### Fact sheet

**Scale-N:** ScalingUp Nutrition: Implementing potentials of nutrition-sensitive and diversified agriculture to increase food security

**Funding agency:** Federal Ministry of Food and Agriculture (BMEL); project executing agency: Federal Office for Agriculture and Food (BLE)

**Project budget:** 1.38 million euros over three years

**Team:** About 20 employees, including five PhD students

**Goal:** Food security for the rural population in Tanzania by developing diversified and sustainable agriculture

**Intermediate results:** The nutritional status of the local population was assessed and evaluated, strategies towards the alleviation of malnutrition were discussed and implemented. It is particularly noteworthy that dietary habits do not necessarily improve in rural Africa given higher incomes, but that people eat more sugar and fat, similar to a tendency we are familiar with in industrialised countries.



Figure 2: Bag garden in Dodoma



Figure 3: Kitchen garden in Morogoro



Figure 4: Workshop on planting green leafy vegetables in bag gardens



Figure 5: Education and training on nutrition in Tanzania: Wash hands properly before preparing food.



Figure 6: Pupils prepare and set up a school garden.

To create a ground-level kitchen garden, the area is first dug out, then filled with a layer of gravel and dry grass to keep the soil cool and to minimise humidity loss. In a second step, the space created is demarcated, using stones, and is then planted with nutrient-rich green leafy vegetables (Fig. 4). First, seedlings are grown in nursery beds, as a particular precaution measure to avoid, for example, excessive drying out. Free-range chickens also diminish the number of young vegetable plants.

Parallel to the main purpose of creating kitchen gardens, Scale-N staff organises additional workshops on subjects such as resource-efficient production, minimisation of crop loss and nutrient-sensitive preparation and storage. Participants also learn about the nutrient content of various vegetables and about the purposes they serve in the human body (Fig. 4).

In addition, such workshops offer platforms for the exchange of experiences. They provide villagers, project staff, stakeholders and scientists the opportunity to discuss strategies for optimisation and to evaluate the advantages and disadvantages of certain cultivation and preparation methods.

### Education on food and nutrition

In addition to the production of nutrient-rich leafy vegetables, nutritional knowledge plays a central role in combating malnutrition. In Africa, women play the key role when it comes to providing food for the household members. In training courses on food and nutrition and in workshops on food preparation at household level they acquire additional knowledge on food ingredients and on the least invasive methods to prepare and preserve food (Fig. 5). In cooperation with SUA scientists, the villagers learn about plant-based food that is particularly rich in nutrients (e.g. in provitamin A or iron), about which dietary aspects to observe during pregnancy and breast feeding in particular, and about what kind of food and diets is most suitable for toddlers and children. In addition, the trainings include aspects of hygiene, pointing out, among other things, the

importance of hand-washing or of boiling water before use. A complementary element is the specific training of female nutrition trainers at village level in order to maintain the knowledge generated in the local communities and to explicitly promote women. Even though this aspect is particularly challenging in Africa's often rather patriarchal societies, it is indispensable, since women typically take care of the provision of families with food.

### School Gardens

Introducing school gardens is another nutrition-sensitive innovation. Establishing school gardens with the pupils (Fig. 6, 7), and taking care of them together (watering, weeding, etc.) as well as teaching nutritional knowledge at school are suitable ways to sensitise pupils about agricultural production and healthy and sustainable nutrition. Also, school gardens aim at producing nutritious leafy vegetables which support adequate child development. Pupils prepare and consume the vegetables directly on site. Since the parents also learn about the children's specific needs in the frame of the nutrition trainings, this approach offers the opportunity to improve the nutritional knowledge of the whole family through various channels. The participatory approach of the project contributes to the sustainable management of kitchen and school gardens as well as to anchoring nutritional knowledge in families and among multipliers such as nurses or teachers in the participating villages.

### Conclusion

Thanks to the involvement of the Tanzanian Ministry of Agriculture, Food Security and Cooperatives and the Food and Agriculture Organization of the United Nations (FAO), project results will be made available directly to political decision-makers at national and international level, whether during personal conversations, through project reports, special conferences, exhibitions, workshops, publications and flyers describing the various strategies and measures and their potential. Thus, thanks to BMEL funding, Scale-N can contribute to a sustainable im-

**Interview with Nyamizi Bundala, PhD student at Sokoine University of Agriculture in Morogoro/Tanzania on the topic of "Agricultural Production and Food Consumption: Drivers and Constraints for the Consumption of Diversified Diets in Rural Farming Households of Tanzania". The questions were asked by Harry Hoffmann.**



Nyamizi Bundala

**What is your professional background?**

I am a nutrition expert for the Tanzanian health authorities and have worked with the population at the local level for nine years. I also taught at Sokoine University of Agriculture in Morogoro. Morogoro is located about three hours west of Dar es Salaam where I offered courses on nutrition for Bachelor students.

**What inspires you about your dissertation topic? Why do you think it will change anything?**

I became interested in my topic during my Master's degree already. Later, I was truly enthusiastic about participating in a pilot study on the "Education for Effective Nutrition Measures", organised by the FAO. In its course, it became clear to me that correct communication is absolutely essential in nutritional education if one wants to bring about positive changes in behaviour. These could then actually help reduce malnutrition and undernutrition in my country. Finally, a nice incident served as additional proof for the success of my work: One participant of our training named her newborn daughter after me – according to her mother's wishes she should also become a nutritionist.

**How will you apply your knowledge and experience once you have completed your PhD?**

My PhD dissertation on nutrition education, which I am currently writing within the ScaleN project, allows me to exploit my potential as a scientist and teacher at SUA, but also to pass on and disseminate the knowledge I have gained about my diverse work in the villages. I will also be able to identify gaps and shortcomings, particularly in nutrition education, nutritional attitudes and eating habits, so that I can work towards effectively changing eating habits in rural Tanzania to support the people there.

# INTERVIEW



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Figure 7: Pupils plant a tree.

provement of the nutritional status of rural communities in Tanzania. ■

## Literature

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**FOR THE TEAM OF AUTHORS**

Dr. Constance Rybak is a nutritional scientist. She obtained her doctoral degree from the ETH Zurich. She has been working at the Leibniz Centre for Agricultural Landscape Research (ZALF) since 2012 and coordinates food security projects in Tanzania.

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