Practice Guide

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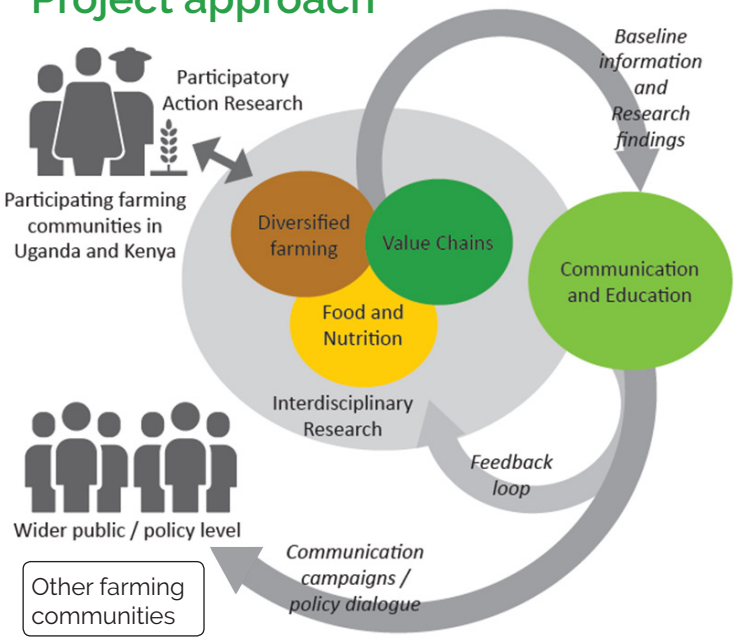
Education and Training for Sustainable Agriculture and Nutrition in East Africa

The EaTSANE project

The EaTSANE project was an international research project on diversified agriculture, nutrition, and value chains running from 2018 until 2022. The project was interdisciplinary, including agricultural, social, nutrition science as well as economics, and was implemented by the University of Hohenheim and the Justus-Liebig University Giessen, both in Germany, as well as the KIT Royal Tropical Institute in the Netherlands, Makerere University in Uganda and Egerton University in Kenya. The main objectives were to develop more sustainable farming practices, improve diets of households and establish value chains for nutrition-sensitive crops in the project areas Teso South Sub-County, Kenya and Kapchorwa District, Uganda.

The EaTSANE Project encompassed four areas of activities. Three science-based work packages focused on the interlinked topics diversified farming, value chains and food and nutrition and were based on a participatory action research approach involving farming communities in the project areas. The fourth work package on communication and education translated insights and findings of the research activities into practical information and training materials that were shared to a wider public and discussed on a policy level.

Project approach



As part of the work in communication and training, we developed a set of Practice Notes to share our research findings and resulting practical implications with decision-makers and implementers of agriculture and nutrition programs, e.g. extension officers, teachers, hospitals or public media. This practical guide provides an overview of the overall outcomes and practical implication of the project. A list of all practice notes can be found on the last page.

Research activities

The EaTSANE project team carried out a set of action research activities together with farming communities, students from secondary schools, and value chain stakeholders. These activities contributed to the three main objectives of the project:

1. **Identifying and promoting improved farming practices for healthier soils and production of diverse, nutritious crops:**
   - Novel mixed cropping systems, such as the Three Food Strata System and Three Sisters System, were developed and tested by farming communities in jointly managed field trials.
   - Vertical garden systems for expanding the farming area for vegetable production were established and tested in collaboration with students in secondary schools.
2. **Improving local nutrition-sensitive value chains:**
   - Local nutrition-sensitive value chains were assessed together with farmers and other value chain actors, with a specific focus on post-harvest losses.
   - Chain-wide problems were identified and prioritised, and a number of local solutions were tested, adapted and promoted through multi-stakeholder value chain platforms.
3. **Enhancing consumers food culture, resulting in healthier diets and more equitable distribution of food in households:**
   - Trials of Improved Practices (TIPs), focus group discussions, and individual counselling were carried out to assess current feeding and food preparation practices and their impact on nutritional status.
   - Findings from these activities were used to identify options for behaviour change and culturally acceptable communication strategies.

Findings and practical implications

Researchers in the EaTSANE project studied multiple aspects of the food system, including production, marketing and consumption of nutrient-dense crops such as pumpkin, amaranth, legumes and green-leafy vegetables. Special emphasis was placed on the interlinkages between farming, value chains and nutrition, and how these aspects relate to gender issues and the role of the youth. The findings showed that a higher diversification in food systems could lead to an enhanced availability and access and improved quality and utilisation of healthy and nutritious food. To experiment with and scale these practices, the project applied a set of intervention strategies that could guide also other research and development initiatives with similar objectives.

Availability and Access

Field trials demonstrated that **plant performance staple crops (e.g. maize, cassava, sweet potato) can be improved through intercropping** in a more diverse production system.

Access to green leafy vegetables can be increased through the establishment of **vertical gardens.** We identified two types of garden systems that are suitable for the indicated project areas and can be constructed using locally available materials.

Preservation techniques make fruits and vegetables also available during the lean season. We developed recommendations for **preserving vegetables and fruits by solar drying and storing of the dried foods in an airtight containers.** These recommendations proved to be useful and feasible for the participants of our trials.

To increase the current low diversity of children s diet, we identified cultivation of fruit trees as a suitable measure to increase availability of and access to fruits. Therefore, we recommend promoting **the cultivation of local fruit tree varieties** through tree nurseries.

Quality and Utilisation

Through **diversification of agricultural systems**, pest and weed infestations were generally reduced, while the occurrence of macro-fauna in soil was increased. **A higher soil fertility resulted in a higher yield and total nutrient content** (e.g. more thiamine and -carotene in cowpea leaves).

Preventing post-harvest losses improves the nutritional quality of legumes and vegetables. We identified **different hotspots of post-harvest loss** for black nightshade and bush beans, particularly during post-harvest handling and food preparation. Weather and market forecasting, improved storage (e.g. heavy moulded plastic containers, and ZeroFlyBags) and collection centers might reduce post-harvest losses.

Consumer awareness about improved food preparation methods can improve the nutritional quality of beans. **The beans should be soaked before cooking rather than adding soda ash** to them. This leads to a shorter cooking time as well as a higher vitamin content.

Intervention Strategies

Gender inclusive approach: For improving nutrition and agriculture outcomes, both men and women should be included in trainings and workshops. This requires (i) addressing social norms (ii) identifying alternative motivators for participation, and (iii) creating a non-judgemental environment to discuss experiences and attitudes.

Value chain platforms: To increase availability and quality of nutrient-dense vegetables, value chain platforms have proven an effective tool to facilitate cooperation between value chain actors. Inclusive participation of a mix of farmers, engagement in early stages, creating trust amongst participants are crucial in this process.

Cooperation with schools: Cooperation with farmer clubs in secondary schools was a valuable platform for testing prototypes of vertical gardens. The students were keen on experimenting with new technologies and willing to share their insights widely, also beyond the schools.

Support farmer innovation: Inspired by joint research activities and trainings, farmers in the EaTSANE project developed their own innovations in nutrition, value chains and agriculture. An analysis of the innovation system in the project areas helped identify entry points for decision makers and advisors to provide better innovation support services.

Practice Notes

Building on the findings and insights from action research with farmers, we developed seven practice notes that describe practical implications and provide hands-on instructions on how to apply the promoted technologies for more sustainable agriculture and nutrition:

1. Vertical Gardens
2. Three Food Strata System
3. The Three Sister System
4. Preparing vegetables and legumes without soda ash
5. Conserving and preparing of sun-dried vegetables
6. Post-harvest losses in the value chains for cowpea leaves and African nightshade
7. Women's participation in marketing of bush beans

Further Reading and Training Material

All Practice Notes, project publications, the Happy Family board game, and other products that resulted from the EaTSANE project are available on the EaTSANE website: www.eatsane.info.

Main contact persons in the EaTSANE project

Prof. Georg Cadish (project coordinator), University of Hohenheim, Germany: georg.cadisch@uni-hohenheim.de

Prof. Johnny Mugisha, Makerere University, Uganda: jomugisha@caes.mak.ac.ug

Dr. Lydiah, Waswa, Egerton University, Kenya: marutilydiah@gmail.com

Dr. Irmgard Jordan, Alliance Bioversity International & CIAT: i.jordan@cgiar.org

Gracia Glas de Temel, Justus Liebig University Giessen: maria.g.glas@zeu.uni-giessen.de

Dr. Verena Bitzer, KIT Royal Tropical Institute, The Netherlands: V.Bitzer@kit.nl