Introduction to a Special Issue: Regional Food and Nutritional Security in Tanzania – Methods, Tools and Applications

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Received: 23 October 2017 / Accepted: 5 November 2017 / Published online: 27 December 2017
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Trans-SEC: Regional Food and Nutritional Security in Tanzania: Methods, Tools and Applications for participative Action Research. Part 1.

This special issue is composed of 13 papers and represents Part 1 of the papers from the Trans-Sec project. Further papers will be published in the April 2018 issue of Food Security. We focus on the tools, methods and applications that we have developed to achieve multiple objectives. The thematically-clustered group of papers focus on (I) frame conditions and cross-cutting research issues, (II) tools and surveys, which support decisions or the assessment of impacts or (III) participative approaches for implementation of agricultural interventions (UPS) involving their stakeholders.

I. Frame conditions

- **Urban-rural linkages** are evident in food security and must be well defined in order to respond appropriately. In this regard, Wenban-Smith et al. (2016) discuss the challenge of rapid urbanisation and seek to

identify its implications for food security in Tanzania to 2030, the Sustainable Development Goals horizon. Given the fact that rural regions interplay with urban regions, a holistic consideration of both areas is needed to define food security issues.

- **Stunting** interplays with food insecurity as a major driver, whereas levels of micro-deficiencies is the key problem for human development. This complex issue, also known as “hidden hunger”, is investigated by Hadijah A. Mbwana et al. They identify the factors influencing stunting among children in rural Tanzania from an agro-climatic zone perspective.
- **Energy** is closely linked to food security, since labour is a limiting factor when firewood collection for cooking is a daily and time-consuming chore for small-scale farmers. A system change through innovation can often be achieved only by lowering daily working hours, especially for women. Harry Hoffmann et al. (to be published in Part 2) show that the availability and access to energy is strongly linked to food security owing to the need for cooking to render the food fit for consumption.
- **Gender** is a horizontal research issue, which overarches socio-economic research. Non-existence of gender-balances is often key to failure of implementation of agricultural innovations. Hence, T.S. Mnimbo et al. discuss the influence of gender on roles, choices of crop types and value chain upgrading strategies in semi-arid and sub-humid Tanzania. This involved investigating the gender influence on preferred food and cash crops, as well as upgrading strategies in sub-humid Kilosa and semi-arid Chamwino Districts.
- **Management systems** are hardly analysed in international food security research, but widely known in a business context. The question is, how can the quality of research consortia be increased and thus the

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promised results obtained? Therefore, for the first time, Katharina Löhr et al. discuss the integration of conflict management programs as a tool within such research projects by establishing frame characteristics and activities that define the food security research environment.

II. Tools, surveys and strategies

- **Quantitative household surveys** as information bases help to formulate key strategies, which are major conditions for success. Hence, Kathleen Brüssow et al. focus on the implications of climate-smart strategy adoption by farm households for food security. The objectives of this paper were to identify adaptation strategies in response to climate change and the determinants for their adoption, and to explore the impact of these strategies on food security. The adequateness and most likely impact provides the basis for further dissemination of successful upgrading strategies.
- The same information provided the basis for the analysis of food value chains. Luitfred Kissoly et al. used this key methodological approach to analyse the integration of smallholders in agricultural value chain activities and food security, using primary household data from Kilosa and Chamwino districts.
- Again, using the same household survey as an information base, Lutengano Mwinuka et al. focused on simulating the willingness of farmers to adopt fertilizer micro-dosing and rainwater harvesting technologies in semi-arid and sub-humid farming systems.
- **Impact assessment tools** are key elements for the identification of the effects of agricultural interventions. But decision support is often needed to structure decision processes and generate a consistent information base. Therefore, Frieder Graef et al. conducted expert-based ex-ante assessments of potential social, ecological, and economic impacts of upgrading strategies for improving food security in rural Tanzania using the ScalA-FS approach. The article reports the application of the ScalA-FS tool including the assessment of the potential impacts of the upgrading strategies on social, economic and environmental assessment criteria.
- **Crop modelling** is an important method to assess potentials, risks and bottlenecks, which is also often used in yield gap analyses. Feasibility testing for adequateness, depending on site-conditions, is key for implementation of agricultural innovations. Hence, Marcos A. Lana et al. (to be published in Part 2) answer the question as to whether dry soil planting,

a strategy used by farmers to cope with low rainfall conditions, is appropriate for maize cultivation in semi-arid Tanzania.

III. Participation and implementation

- **Participatory soil mapping** combined with gamma ray spectrometry-assisted transect mapping was employed by Nadja Reinhardt and Ludger Hermann to update soil data bases. This method enables local farmers to receive better information from advice services, such as extensionists.
- **Participatory impact assessment** involves stakeholders in order to assess food security options. A key advantage is that assessments by stakeholders are imparted in a structured and transparent way. In this regard Jana Schindler et al. developed community-based food security criteria in four selected study villages, using a procedure based on the so-called Framework for Participatory Impact Assessment (FoPIA).
- **Participatory problem analysis** ideally gives a detailed overview on social relations within farm systems. Knowing key problems at grass roots-level facilitates adoption of agricultural innovations. Pamela Ngwenya et al. (to be published in Part 2) conducted a participatory problem analysis of crop activities with attention to gender and wealth in order to develop researchers' understanding of farmers' crop production systems and the local context. This participatory problem analysis revealed the critical difficulties of low-income households, which suffer from poor inter-connectedness.
- **Participatory implementation analyses** may suggest activities that foster community empowerment, social network development and help to close implementation gaps in food insecurity and health in the communities. Against this background, Michelle Bonatti et al. (to be published in Part 2) investigated the opportunities and constraints of implementing a policy of kitchen gardens as a practice for smallholder farmers in two contrasting climate regions, semi-arid Dodoma and sub-humid Morogoro.
- **Participatory, qualitative and quantitative methods** are often analysed in parallel without integration. Integration is advantageous for looking at trade-offs in comparative analyses. Hence, Hannes J. König et al. combined participatory, qualitative and quantitative methods for impact assessment of food value chains, integrating natural resources, food production, processing, marketing, and consumption.

Acknowledgements This special issue is a product of the Trans-SEC project (www.trans-sec.org). The German Federal Ministry of Education and Research (BMBF) funded the Trans-SEC project, with co-finance from the German Federal Ministry for Economic Cooperation and Development (BMZ). The views expressed in this paper are those of the authors and may not under any circumstances be regarded as stating an official position of the BMBF and BMZ and all other involved institutions including the European Commission.

We would like to thank you very much Heike Schobert (ZALF), who coordinated the entire special issue over a time of 1.5 years. Heike Schobert was very patient and followed-up all processes in a wonderful way. Also the following researchers may be acknowledged for having provided valuable comments to previous versions of the papers included in this special issue: Maria Espinosa Goded, Pedro Andres Garzon Delvaux, Silvia Saravia Matus, Tim Hycenth Ndah, Aymeric Ricome, Liesbeth Colen, Sabine Liebenehm, Alabel Bayrou, Joseph Hella,

Bettina Rudloff, Jana Schindler, Lin Zhen, Ana Paula Turetta, Ann Waters-Bayer, Ndambi Asaah, Johannes Schuler, Stefan Sieber, Krista Isaacs, Anna Segerstedt, Michael Büntrup, Henry Mahoo, Felix Wendenburg, Sergio Gomez y Paloma, Khamaldin Mutabazi, Severin Polreich, Joyce Kinabo, Til Feike, Leonardo Monteiro, Raoul Hermann, Nadine Andrieu, Alebel Bayru, Marcos Lana, Jens Rommel, Sreejith Arvindakshan and Bola Awotide.

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