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Cultural and Gender Differences in Assessing Upgrading Strategies (UPS) for Enhancing Food Security in Tanzania

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Introduction

Developing best suitable strategies to upgrade food security in rural poor areas needs the active involvement of expertise from all fields of the food value chain. Factors such as cultural background and gender may influence their assessment on potential and feasibility for the implementation of such strategies.

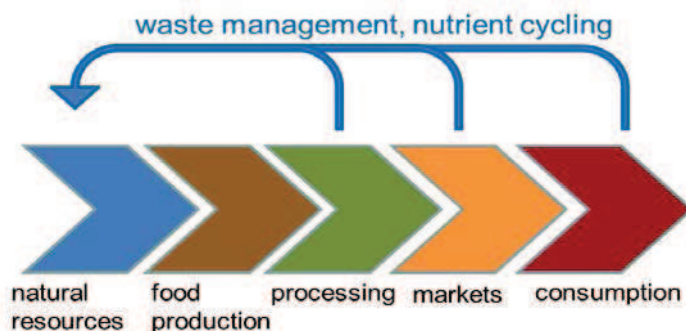


Fig.1: The Food Value Chain consisting of six components

The aim of this study is to assess 42 upgrading strategies (UPS), proposed by researchers, along all components of smallholder food value chain (FVC) in order to gain evidence on their potential and feasibility for enhancing food security. Two regions were focussed on: semi-arid Dodoma and sub-humid Morogoro. The FVC consists of five main components: Natural Resources,

Food Production, Food Processing, Markets, Consumption, and an additional cross-cutting one: Waste Management/Recycling (Fig.1), but it is perceived as an interconnected complete chain (Gomez et al. 2011). The focus was on the relevant local food value chains related to agricultural production, such as of Maize, Millet, Sesame and Sunflower and on the improvement of local livelihoods. The assessment results of the UPS are analysed in regards of cultural background and gender of the respondents. This study is embedded in a trans-disciplinary research project called Trans-SEC: Innovating Strategies to safeguard Food Security using Technology and Knowledge Transfer: A people-centred Approach (Graef et al. 2014).

Material and Methods

A questionnaire was developed and distributed to 90 scientists throughout the Trans-SEC consortium. Scientists were asked to assess 42 predefined UPS (Table 1) regarding their potential and feasibility for upgrading in order to enhance food security at the case study sites. 32 of the

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scientists responded and 29 of the datasets were valid for evaluation. 20 male and 9 female scientists participated, 18 of them were Tanzanian and 11 were German. The FVC components were also assessed by the experts regarding their overall importance and feasibility for upgrading local livelihoods.

The dataset was descriptively analysed using SPSS deriving frequency tables and cross-tabulations to find correlations between variables (DeVaus, 1996). We checked for differences between the scientists' assessments considering their cultural background (Tanzanian and German) and gender.

Natural Resources	Food Production	Food Processing	Markets	Consumption	Waste Management/Recycling
Rainwater harvesting	Mineral fertilizer input	Preservation techniques	Savings- and Credit Cooperatives (SACCOs)	Diet diversification	Crop residues as mulch
Conservation agriculture	Manure input	Oil extraction processes	Warehouse receipt systems	Nutrition awareness training	Animal feed from crop residues
Agroforestry	Intercropping	Fortification of staple foods	Guarantee systems	New food habits	Food waste and animal faeces for biogas
Ridges for erosion control	Cover crops	Food storage devices	Vertical coordination in trading systems	School feeding	Food waste and animal faeces for production of compost
Ridges as water catchments	Improved animal feed		Horizontal coordination in trading systems		Food waste and animal faeces for heating
Nutrient input from waste	Improved crop varieties		Outgrower schemes (contract farming)		Waste water irrigation
Biochar utilization for soil improvement	New crop varieties		Communication techniques		
Drip irrigation	New crop types		Rural energy		
	Pest and disease control				
	New livestock breeds				
	New livestock management				

Table 1: Upgrading strategies along the food value chain components

Results and Discussion

Differences in assessing UPS are found both between Tanzanian and German scientists and female and male scientists. The differences occur both in the assessments of UPS between the two regions and within a region. However they are not statistically significant, possibly due to the low number of respondents.

Some examples of assessed UPS with highest upgrading potential are presented in Table 2. *Rainwater harvesting* in Dodoma and *food storage devices* in Morogoro are assessed by both nationalities to have a very high potential for improving food security. Other UPS such as *improved crop varieties*, *Savings- and Credit Cooperatives (SACCOs)* and *nutrition awareness training* are assessed to have a very high upgrading potential for both regions by most of the Tanzanian scientists. The German scientists prefer *communication techniques* and *diet diversification* for both regions. Some UPS are assessed only by scientists from one nationality to have a high potential. For instance *manure input* in Dodoma, which is assessed as having a very high potential by 100% of German scientists, but only by 57% of Tanzanian experts. The UPS assessments of the FVC component *recycling* vary largely between nationalities.

Upgrading Strategies with highest potential for implementation								
Dodoma				Morogoro				
	Tanzanian	%	German	%	Tanzanian	%	German	%
Natural Resources	Rain Water Harvesting	94	Rain Water Harvesting	83	Agroforestry	62	Ridges for Erosion Control	75
Food Production	Improved Crop Varieties	77	Manure Input	100	Improved Crop Varieties	82	Intercropping	50
Food Processing	Oil extraction processes	71	Preservation Techniques	57	Food Storage Devices	67	Food Storage Devices	63
Markets	SACCO's	81	Communication Techniques	60	SACCO's	86	Communication Techniques	67
Consumption	Nutrition Awareness Training	58	Diet Diversification	63	Nutrition Awareness Training	55	Diet Diversification	56
Recycling	Food Waste for biogas	58	Waste Water Irrigation	80	Crop Residues as Mulch	55	Crop residues as mulch and animal feed, waste water irrigation	29

Table 2: Examples for different assessments by Tanzanian and German scientists showing similar ratings for both regions by scientists with the same nationality (grey) and similar ratings of UPS for one region by scientists of different nationalities (blue).

When focusing on the FVC components' potential and feasibility for upgrading local livelihoods, they are assessed differently between Tanzanian and German scientists. Tanzanian experts consider *natural resources* for Dodoma and *food production* for Morogoro most important, whereas German scientists see a higher importance for *food production* in Dodoma and *natural resources* as well as *food processing* (both favoured by 38%) in Morogoro. Tanzanian scientists assume the *food production* UPS most feasible to implement at both case study sites. German scientists regard UPS for *natural resource management* as well as *food production* most feasible for Dodoma, and UPS for *natural resource management* to be most feasible for upgrading smallholder livelihoods in Morogoro.

We also found gender differences in the assessments, however they were not statistically significant. Figure 2 displays the main differences between assessments of UPS between male and female. Some UPS are favoured by female scientists for one region, for example *conservation agriculture* for Dodoma, while more male scientists are in favour of the same UPS for Morogoro region. The UPS *crop residues as mulch* is considered to have very high upgrading potential in Dodoma region by 67% of the female compared to 40% of the male scientists. For Morogoro region only male experts (62%) consider this UPS as having a high upgrading potential. None of the female scientists found *crop residues as mulch* to have a high potential here. *Food storage devices* (Dodoma) and *rainwater harvesting* (Morogoro) are examples for UPS assessed equally by male and female scientists for one region. Largest differences between male and female scientists for UPS assessments are found among *food production*, *markets*, *consumption* and *waste management*.

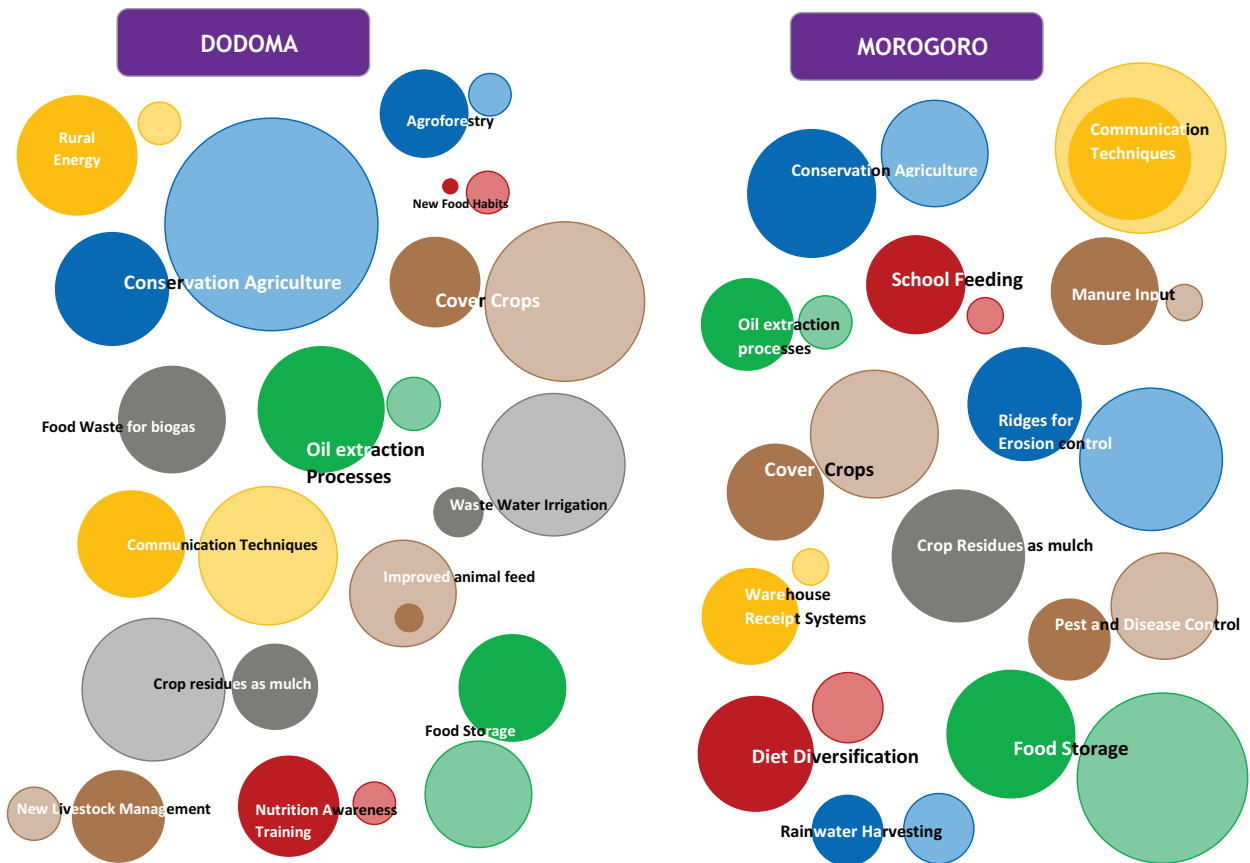


Fig.2: Differences between assessments of UPS with high potential by male (dark colours) and female (light colours) scientists.

Conclusions and Outlook

We searched for differences between the Tanzanian and German scientists' assessments of the importance of food value chain components and potentials of 42 UPS for enhancing food security in Dodoma and Morogoro region of Tanzania. We find assessment differences for UPS with site specific requirements, such as UPS for *natural resource management*, *food production*, *food processing* or *recycling*. Reasons may be the different professional backgrounds and perceptions of scientists, and also their field experience at the case study sites.

Male and female scientists differ in assessments of the UPS. The main differences are linked to site specific UPS requirements. Also, there is some evidence that more technical UPS, for example *oil extraction processes* are preferred by male scientists.

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