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THE PERCEPTION OF DEFICIENCIES OF SMALLHOLDER COFFEE FARMERS A PANEL ANALYSIS OF A RURAL COMMUNITY IN EASTERN UGANDA

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Introduction

- About 42% of Uganda's Households (HH) are engaged in coffee production (Nucafe 2018)
- Smallholder coffee farmers often do not live under conditions that surpass subsistence level
- Successful solving of challenges leads to development in the individual and/or environment, whereas failing challenges impedes the solution of future challenges (Hendry and Kloep 2002)
 → research on the perception of deficiencies is required to develop approaches for successful solving of challenges.
 Due to the estimated decrease in climatic suitability for most of Ugandans Arabica coffee cultivation area, the debate of climate change might be considered as a potential high impact factor for more challenging situations (Damatta et al. 2012, Jassogne et al. 2012).



Table 2: Mean and standard deviation for the factors and single variables

Factor/Variable	Mean ± SE	Mean ± SE	Difference in	
	in 2018	in 2019	mean between	
			2018 to 2019*	
Factor I: Reliability	4.1152±0.692	3.0112±1.579	1.1040	
Factor 2:Water supply	3.0112±1.579	2.7736±1.325	0.2376	
Factor 3: Prerequisite	4.5117±0.453	4.2724±0.604	0.2393	
Factor 4: Infrastructure	4.3076±0.649	4.2756±0.707	0.0320	
Factor 5: Prices	4.4312±0.544	3.8837±0.763	0.5475	
Exploitive middleman	4.39±0.709	4.01±0.986	0.38	
Lack of insurance	3.67±1.277	3.72±1.391	-0.05	
Lack of health care	4.13±1.187	4.18±1.214	-0.05	

*Negative values show deterioration from 2018 to 2019 for the single factor or

- → More challenging conditions for coffee production the farmers are faced: higher occurrence of pests and diseases, higher uncertainties with regard to temperature and irrigation (UNDP 2012),
- → Reduction in coffee quantity and coffee quality (e.g. Jassogne et al. 2012, UNDP 2012, Läderach et al. 2012).
- → Lower income from coffee selling, what thereby would also have a long-term impact on the farmers' resources for the balance of wellbeing.
- The present study investigates the perception of deficiencies the farmers were faced in 2018 and 2019 and the changes with regard to the extent

Figure 2. One of the major deficiencies farmers percept are extreme weather conditions due to climate change. Next to drought, heavy rainfall destroy roads and make transportation harder or even impossible what causes a number of other challenges like longer storage required for perishable products or accessibility of health care centers.

Results

- Farmers have been asked about their perception of deficiencies. Therefore, they were asked to value 16 deficiencies on a scale from I (=constrains me not at all) to 5 (=constrains me very much).
- Results from the Principal Component Analysis (PCA) identified a 5-factors solution
- KMO: 0.667, explaining 57.807 % of total variance in 2018
- KMO: 0.695, explaining 58.982 % of total variance in 2019
- Grouped into two main topics (1) constitution for farm management activities and (2) general life quality.







Figure 5. Boxplot depicts means for each factor and subcounty for 2018 and 2019 Table 3: One-factor ANOVA for the influence of subcounty on the identified factors

	Source	Partial SS	df	MS	F	(P>F)
Factor 1 in 2018	Between groups	6.560	2	3.280	7.094	0.001
Reliability	Within groups	163.218	353	0.462		
	Total	169.778	355			
Factor 1 in 2019	Between groups	24.853	2	12.426	18.405	0
Reliability	Within groups	241.708	358	0.675		
	Total	266.561	360			
Factor 2 in 2018	Between groups	24.980	2	12.490	5.124	0.006
Water supply	Within groups	860.475	353	2.438		
	Total	885.455	355			
Factor 2 in 2019	Between groups	48.200	2	24.100	14.781	0
Water supply	Within groups	582.099	357	1.631		
	Total	630.299	359			
Factor 3 in 2018	Between groups	0.325	2	0.163	0.792	0.454
Prerequisite	Within groups	72.542	353	0.206		
	Total	72.868	355			
Factor 3 in 2019	Between groups	0.248	2	0.124	0.339	0.712
Prerequisite	Within groups	131.077	358	0.366		
	Total	131.326	360			
Factor 4 in 2018	Between groups	5.749	2	2.874	7.055	0.001
Infrastructure	Within groups	143.821	353	0.407		
	Total	149.570	355			
Factor 4 in 2019	Between groups	2.441	2	1.221	2.464	0.087
Infrastructure	Within groups	177.384	358	0.495		
	Total	179.825	360			
Factor 5 in 2018	Between groups	0.002	2	0.001	0.003	0.997
Prices	Within groups	105.062	353	0.298		
	Total	105.064	355			
Factor 5 in 2019	Between groups	4.615	2	2.308	4.030	0.019
Prices	Within groups	204.998	358	0.573		
	Total	209.614	360			

of deficits in order to provide ideas on the development of the living conditions of HHs engaged in coffee farming.

Material and Methods

- The study was conducted in the Mt. Elgon region, one of the three main Arabica coffee producing regions in Uganda (Knutsdatter Formo and Padegimas 2012).
- The survey rounds took place during September and November 2018 and 2019 in three subcounties of Elgon county (Fig. I, Tab. I):



Table 1: Number of HHs participating in the study in 2018 and 2019*						
SUBCOUNTY	2018	2019				
BULEGENI	156	133				
SIMU	90	79				
NAMISUNI	185	149				
ΤΟΤΔΙ	/ 131	361				

*In total, the starting sample of 431 HH in 2018 was reduced by 70 HH due to reasons of shifting to another region, the HH-head joined forces, was inprisoned or lost interest in the participation of the program.The majority of the 70 Fig. 3: Summarizing the components of the perception of deficiencies, the indicators investigated, and the results of the PCA

- Descriptive results indicate a higher constrain-level in 2018, compared to 2019.
- Only the perception of lack of insurance and of health care centre near by has deterioated comparing both years
- The highest improvement from 2018 to 2019 was recognized for the Factor I: Lack of reliability, information and input supply as shown in table 2.



- Many farmers mentioned improved source of information and provided water taps within the last 12 months, especially in Namisuni and Simu
 Regarding Factor 3, in 2018 most farmers complained about inappropriate machines and cheating of buyers and sellers, in 2019, nearly all HHs mentioned that the roads due to heavy rainfall are in very bad condition what results in further constrains.
- Further data analysis should focus more on impacts of climate change.

Acknowledgements

HH were not accessable due to heavy rainfalls and not passable roads.

Figure 1. Map of (b) South Uganda and (a) details of Bulambuli district with Bulambuli County (grey) and Elgon County (white) with the sub-counties Bulegeni (blue), Simu (cyan), and Namisuni (orange)

- Selection criterion: coffee cultivation
- Interviewed by local assistants, using the local language Lugisu



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Figure 3. Next to weather-related shocks, many HHs experienced individual shocks like food security at a risk, acute illness and the inability to raise school fees. Some farmers were able to cover those costs by loans from microfinancing groups or money borrowed from relatives.

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