The wellbeing of smallholder coffee farmers in Mt. Elgon region
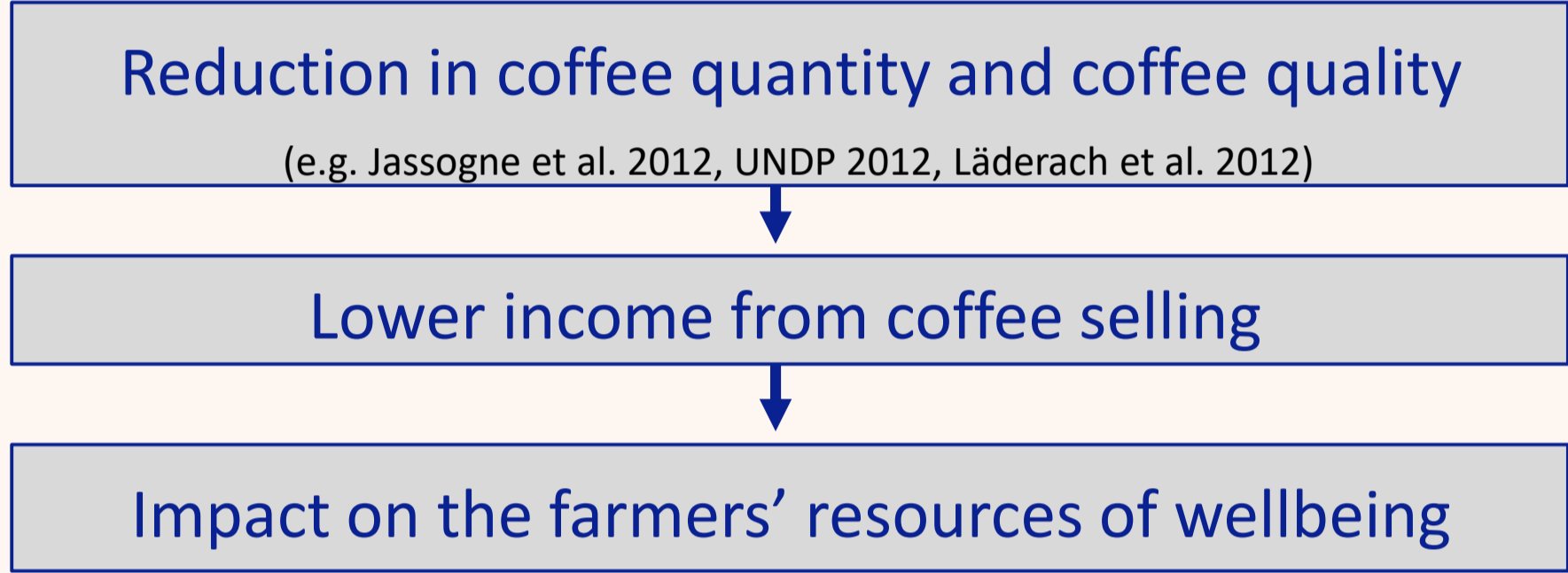
A quantitative analysis of a rural community in Eastern Uganda

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Wellbeing is "the balance point between an individual's resource pool and the challenges faced" in terms of physical, social and psychological sub-components (Dodge et al. 2012)

$$CI \text{ of } wellbeing = (W_{Trust} * \mathbf{Trust}) + (W_{Security} * \mathbf{Security}) + (W_{Housing} * \mathbf{Housing}) + (W_{Landholding} * \mathbf{Landholding})$$

The z − standardized scores used for the PCA were regressed for each factor.

$$\text{Weight of the factor } (Wq) = \frac{\text{Variance explained by the factor}}{\text{Total variance of the four factors}}$$

Introduction

- 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 wellbeing is not only required to measure development it is also the prerequisite for development

- In Uganda, about 1.3 million households (HH) are engaged in coffee production (UBOS 2010)
- Smallholder coffee farmers often do not live under conditions that surpass subsistence level
- Estimated decrease in climatic suitability for most of Ugandans Arabica coffee cultivation area (Damatta et al. 2012, Jassogne et al. 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

↓

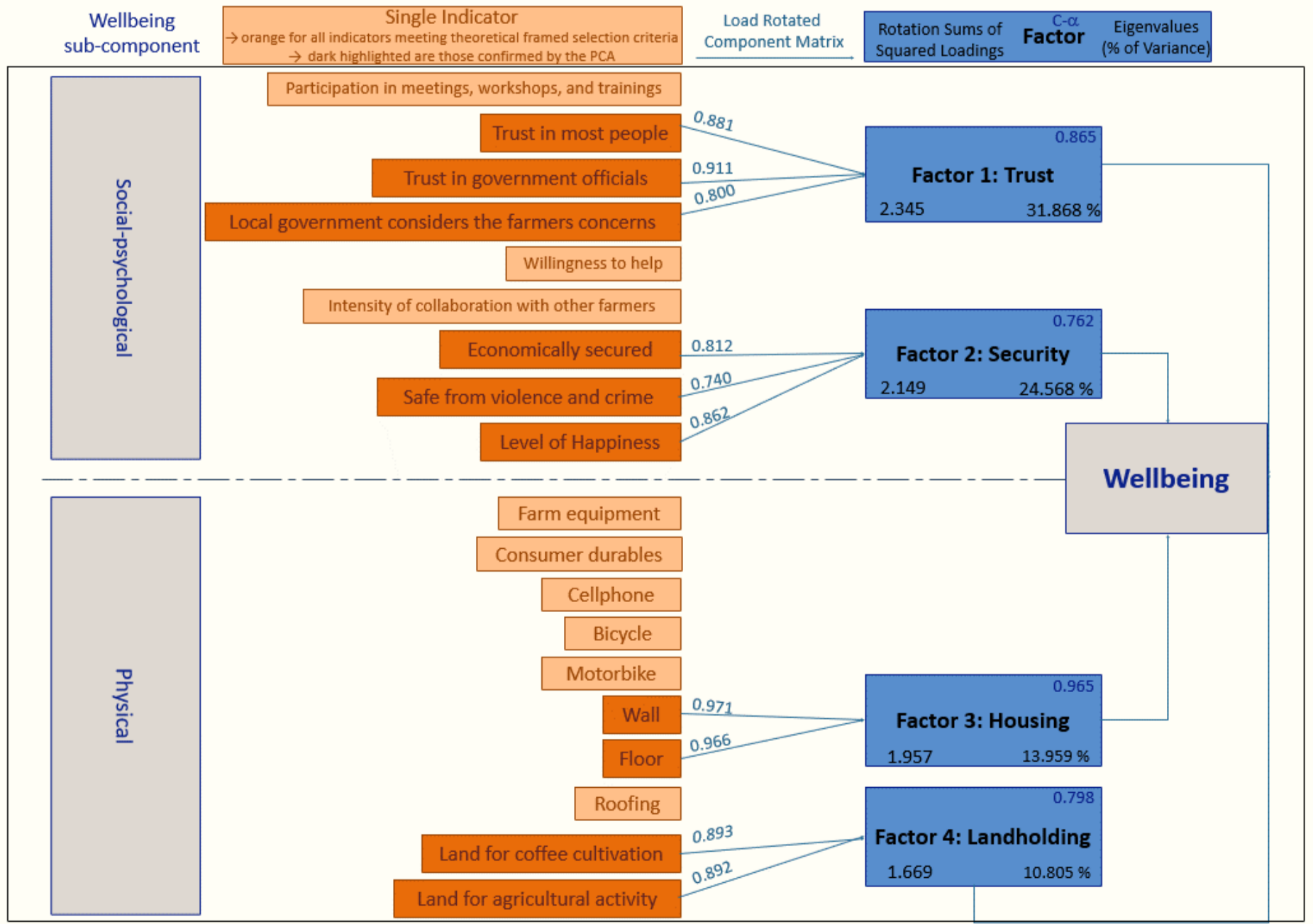Impact on the farmers' resources of wellbeing

The present study investigates the composition of wellbeing in order to provide ideas on the development of the living conditions of HHs engaged in coffee farming

Survey and data

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)

- 431 interviews in the Mt. Elgon region
  - → One of the three main Arabica coffee producing regions in Uganda (Knutsdatter Formo and Padegimas 2012).
- Surveys were administered in Elgon county (Bulambuli district) where 60.5 % of its HH were engaged in coffee growing (NPHC 2014).
- Within Elgon county, HH in three sub-counties Bulegeni (156 HH), Simu (90 HH), and Namisuni (185 HH) were randomly chosen (Fig.1)
  - → Selection criterion: coffee cultivation
- Interviews were conducted by local assistants

Construction of the Composite indicator

- A composite indicator (CI) for wellbeing is built based on
  - → Material wealth **(physical)**
  - → Social and psychological satisfaction **(social-psychological)**
- After theoretical framed indicator selection, a Principal Components Analysis (PCA) was performed (Fig.2)
  - → A four factors solution can explain 81.20% of the total variance (KMO = 0.681, Bartlett's Test Sig. =0.000)

Extraction Method: Principal Component Analysis., Rotation Method: Varimax with Kaiser Normalization
Rotation converged in 5 iterations, ** highly significant P=0.01
Figure 2: Summarizing of wellbeing sub-components, investigated single indicators, and the results from the Principal Components Analysis (PCA)

Results

- A slight deviation of the socio-demographic parameters between average HH and sample (Table 1) could be explained by
- → High fertility rates (5.4 children per women in 2016) in Uganda (SUPRE 2018)
- → Cash crop production like coffee cultivation is usually male-dominated (e.g. Doss 2002)

Table 1: Sample characteristics

Quantitative data set		Bulegeni	Simu	Namisuni	Total	Research area
Number of HHs		n= 156	n= 90	n= 185	n=431	21,244 [1]
Gender of HH head	Male	94.2%	95.6%	93.5%	94.2%	81.4% [1]
	Female	5.8%	4.4%	6.5%	5.8%	18.6% [1]
Age of HH head	<18	0.0%	0.0%	0.0%	0.0%	1.0% [1]
	18-30	7.1%	11.1%	16.1%	11.7%	25.9% [1]
	31-59	60.3%	62.2%	65.0%	62.7%	53.9% [1]
	>60	32.7%	26.7%	18.9%	25.6%	19.2% [1]
Highest level of education for head of HH	Illiterate	3.9%	4.4%	2.2%	3.3%	9.3% [2]
	Primary school	45.8%	41.1%	59.7%	50.7%	58.7% [2, 3]
	High school	44.4%	47.8%	34.3%	40.8%	27.8% [2, 4]
	College	3.9%	3.3%	2.8%	3.3%	8.2% [2, 5]
	University	2.0%	3.3 %	1.1%	1.9%	
People per HH	MD/SD	6.31/2.338	6.41/2.238	5.21/2.170	5.86/2.312	4.638/0.135 [2]
Coffee production is the main source of income		83.2%	93.3%	88.6%	87.7%	83.0% major economic activity is crop farming [2]

[1]Data for Elgon County from NPHC 2014
[2]Data for Elgon Region from UNHS 2016/17
[3]Sum from category: some primary and completed primary for the whole HH
[4]Sum from category some secondary and completed secondary for the whole HH
[5]Post-secondary and above for the whole HH

Impacts of the single factors on wellbeing differ (Fig.3).

- The results of the one-factor ANOVA show a significant influence of sub-county on *Housing* (P=0.004**) and on *Landholding* (P=0.000***)
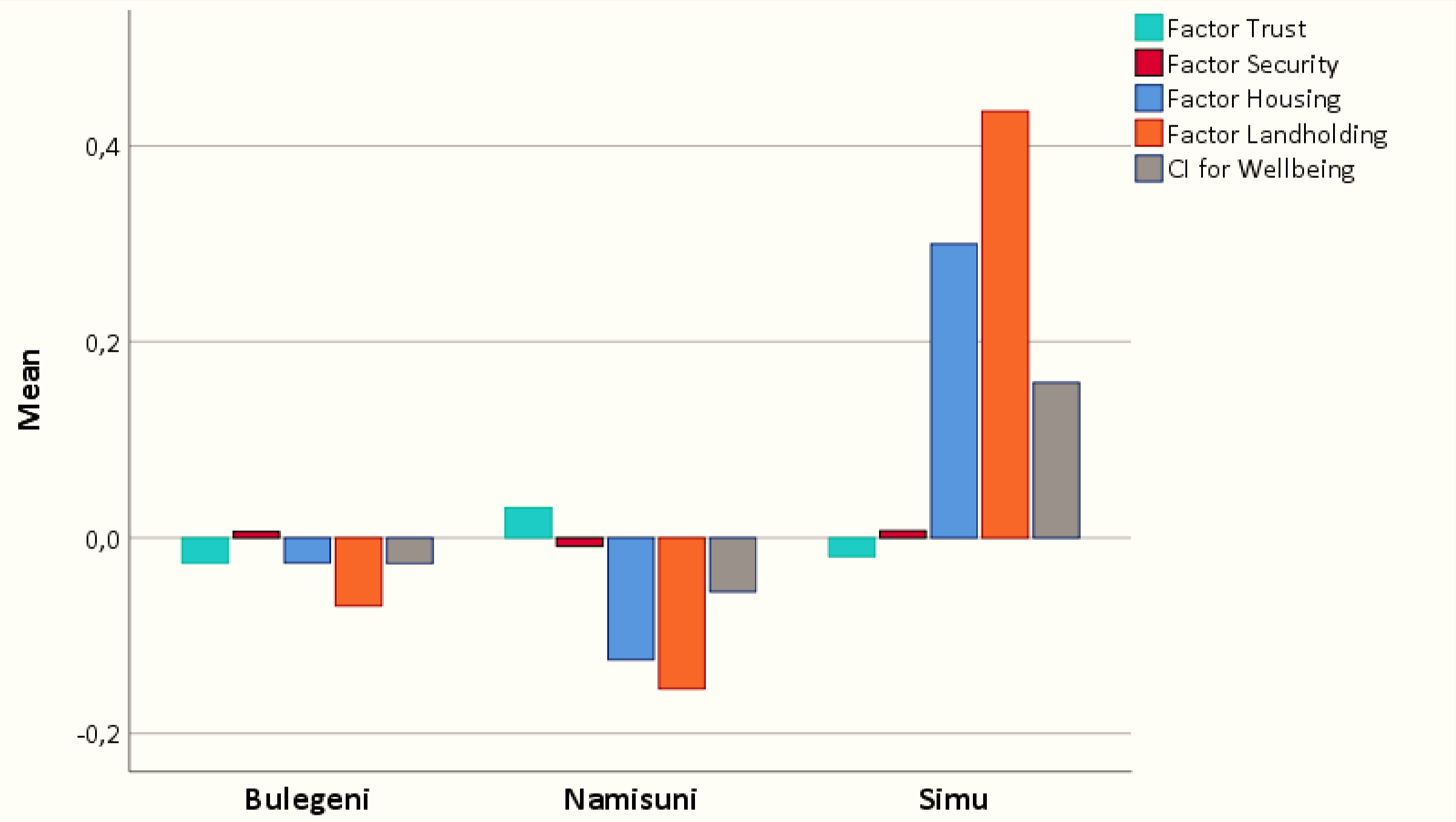- The influence of sub-county on *Trust* (P=0.858) and *Security* (P=0.988) is not significant

Figure 3: Means for all factors and the CI of wellbeing for the single sub-counties

The wellbeing index shows a mean of 0.000 for the total group, despite having different means of wellbeing in various sub-counties (Table 2)

Table 2: Descriptive statistics for the CI of wellbeing and sub-county

Sub-county	Mean	SD	Median	Minimum	Maximum	Range
Bulegeni	-0.026	0.446	-0.028	-0.885	1.856	2.742
Simu	0.158	0.661	0.131	-0.912	2.266	3.178
Namisuni	-0.055	0.445	0.093	-1.088	1.150	2.238
Total	0.000	0.504	0.068	-1.088	2.266	3.355

One of the interviewed coffee farmers (left) and other HH members in Bulegeni (I. Bartl)

- Across all sub-counties 52.45% of the HHs belong to the group with mid, about 44% show a low, and only about 4 % indicate a high wellbeing level
- From the illustrations of wellbeing levels (Fig. 3) an influence of sub-county on wellbeing can be assumed
- Results of the one-factor ANOVA (P=0.003**) indicate that the sub-county influences the wellbeing
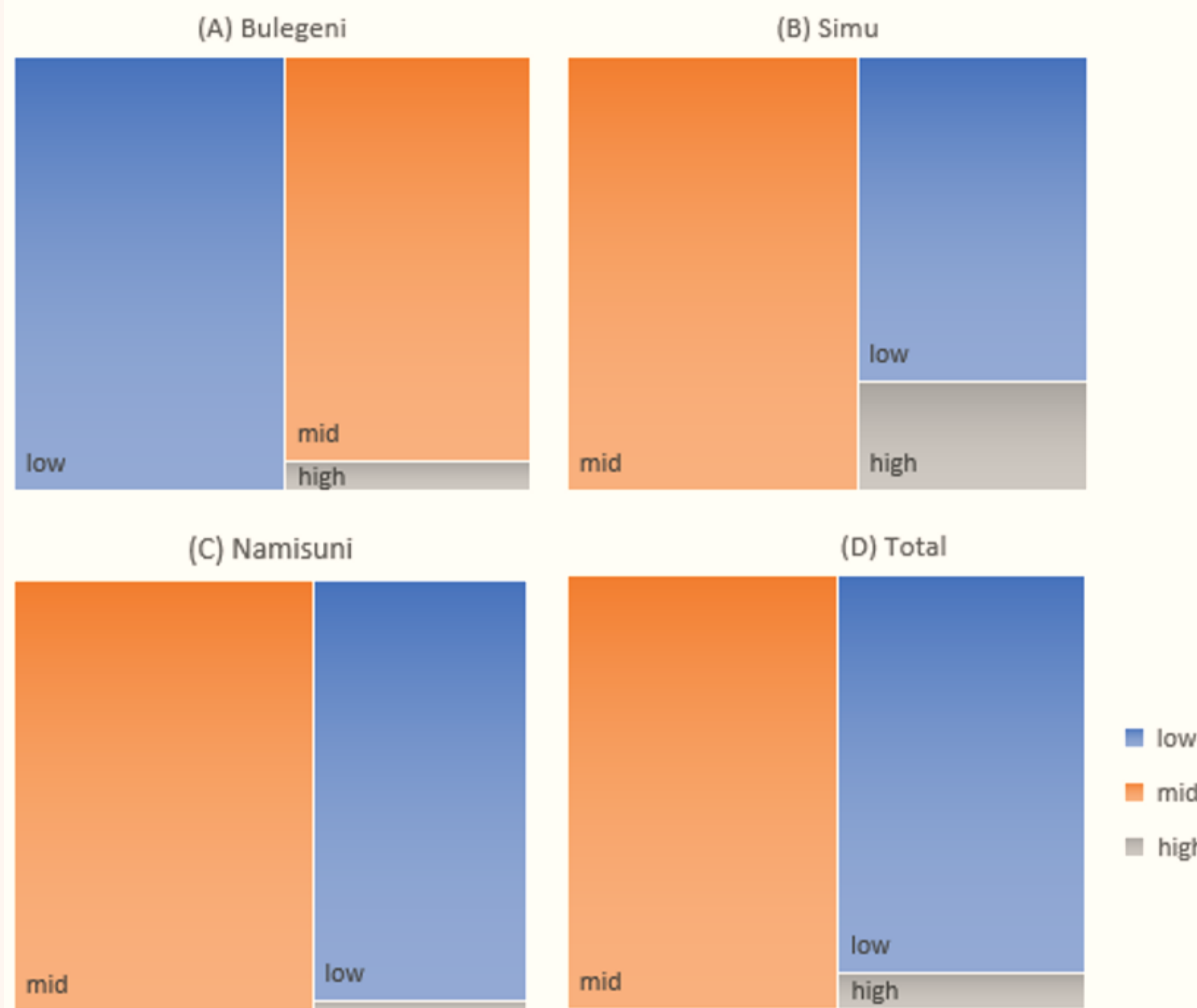

Figure 3. Hierarchical tree-structured maps depicting the proportions of the different wellbeing levels of low CI < 0, mid CI 0-1, and high CI >1 wellbeing level in (A) Bulegeni, (B) Simu, (C) Namisuni, and (D) across all sub-county

Discussion

- A composite indicator can prevent low answering quality due to
  - → different understanding of wellbeing and
  - → lower social desirability
- **Different emphasis on wellbeing within sub-counties**
- **Different emphasis on wellbeing between sub-counties**
  - → Findings of the NPHC (2014) also indicate different situations of living for different sub-counties
- **The influence of the sub-county on wellbeing can be mainly explained by significant differences found for *Housing* and *Landholding***

Further research should investigate

- If geographical location matters for wellbeing
- → A possible explanation for the higher emphasis on welfare in Simu could be inter alia the presence of the Sissyi waterfalls, which provide more constant water
- If there are other reasons that could explain the differences in physical wellbeing in different sub-counties
- Reasons explaining the higher Trust levels and the lower Security perception in Namisuni, compared to the other sub-counties
- The relationship between the perceptions of deficiencies and wellbeing
- On how the farmers cope with external forces with regard to climate change

Conclusions

- Results indicate that **development activities can focus on improving *Housing* quality and *Landholding*,** especially in Namisuni and Bulegeni
- Based on the here presented wellbeing levels, one could create development programs that help in terms of strengthening the individually required resource level or in terms of reducing the level of challenges (Dodge et al. 2012)
- Results could be used to investigate the success of development approaches in the Mount Elgon area

References:
DaMatta F.M., Cavatte P.C. and Martins S.C.V. (2012). Coffee physiology: Growth. yield and quality.
Dodge, R., Daly, A., Huyton, J., & Sanders, L. (2012). The challenge of defining wellbeing.
Doss, C. R. (2002). Men's crops? Women's crops? The gender patterns of cropping in Ghana. World Development
Hendry, L. B., & Kloep, M. (2002). Lifespan development: Resources, challenges and risks. London: Thomson Learning.
Jassogne L., Läderach P. and van Asten P. (2012). The impact of climate change on coffee in Uganda.
Läderach P., Ovalle O., Lau C., Haggar J., Eitzinger A., Baca M., Benedikter A. and Zelaya C. (2012). Climate Change at mesoamerican origins.

National Population and Housing Census (NPHC) 2014. Area Specific Profiles. Bulambuli district. April 2017State of Uganda Population Report (SUPRE) (2018). Good Governance; A prerequisite to harness the demographic dividend for sustainable development.
Uganda Bureau of Statistics (UBOS) (2010). Uganda census of agriculture 2008/2009
Uganda National Household Survey (UNHS) 2016/17. Report. www.ubos.ug