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1. Introduction

- High rates of poverty, food insecurity and malnutrition [1,2,3]
- Staple-based diets with lack of micronutrients [1, 3]
- Wild fruits as supplementing food [4,5] and income source [6]
- Free access, great content of vitamins and minerals [5]
- Insufficient understanding of collection reasons and effect on food security [7]

Research Questions:

- 1) What are the determinants of wild fruit collection?
- 2) What impact do wild fruits have on food security?

2. Data



- Data provided by FoSeZa (Food Security in Rural Zambia) project
- Socio-economic census: 215 households from Mantapala region
- Year: 2018
- Wild fruit context: cultivation and analysis of nutritional value to improve food and nutrition security

3. Methodology

Food Security Indicators

- Food Consumption Score (FCS): prevalence of consumption of different food groups [8]
- Reduced Coping Strategy Index (rCSI): households' coping behaviour during food shortages [9]

Econometric Models

1) Multiple Linear Regression Model

$$\ln(Y_i) = \beta_0 + \beta_1 X_i + \beta_2 D_i + \varepsilon$$

- Y_i Collected quantity (kg) of wild fruits (*Uapaca kirkiana* / *Anisophyllea boehmii*)
- X_i Vector of household characteristics
- D_i Dummies of wild fruit characteristics

2) Ordered Logit Model

$$\Pr(Y_i = j) = F(a_j - X_i \beta_1 + Q_i \beta_2) - F(a_{j-1} - X_i \beta_1 + Q_i \beta_2)$$

- j Categories of food security (FCS / rCSI)
- a_j Cut-offs of categories
- X_i Vector of household characteristics
- Q_i Collected quantity of wild fruits (all species)

4. Results

Descriptive Results

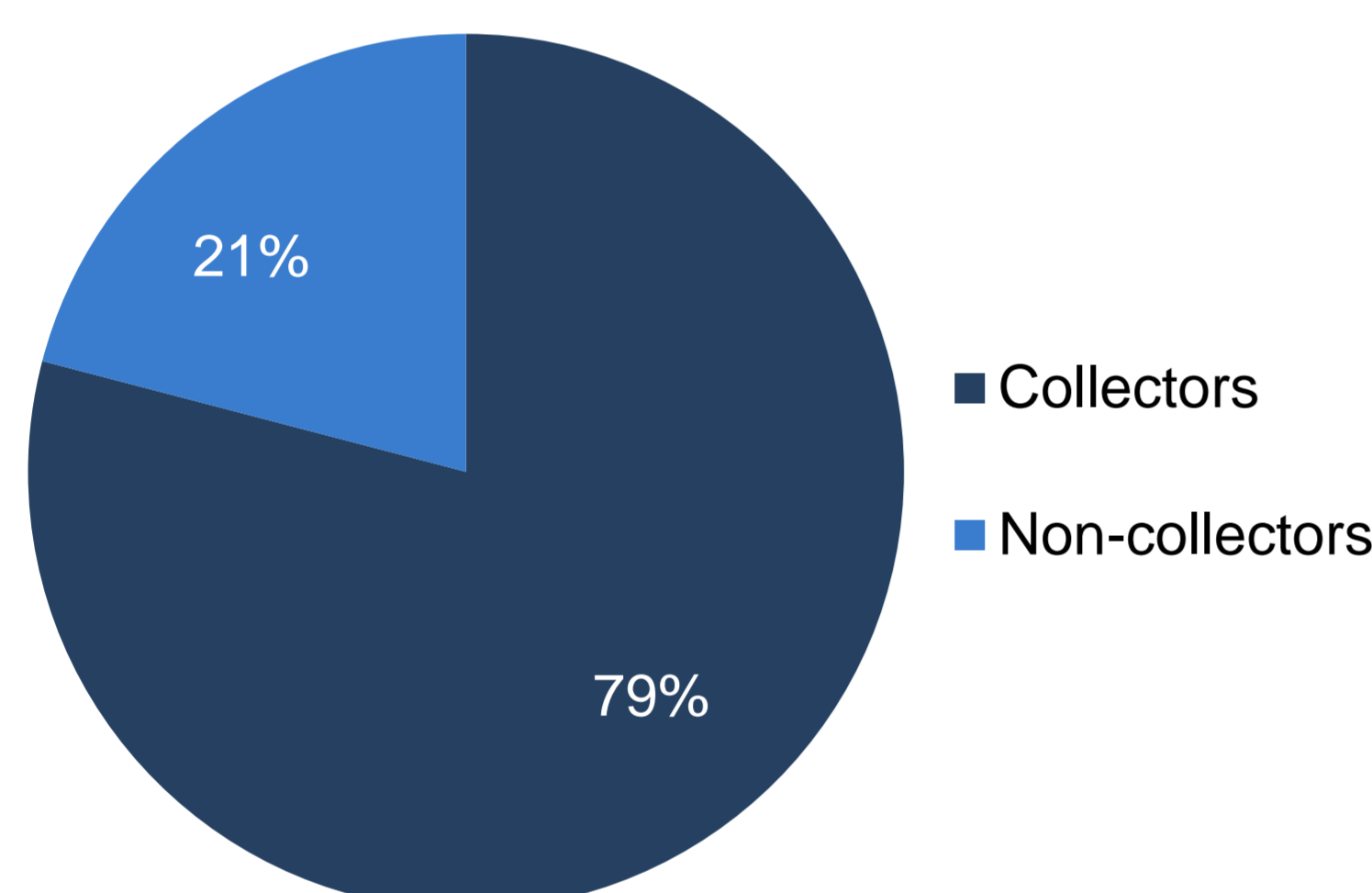


Figure 1: Percentage share of households collecting wild fruits.

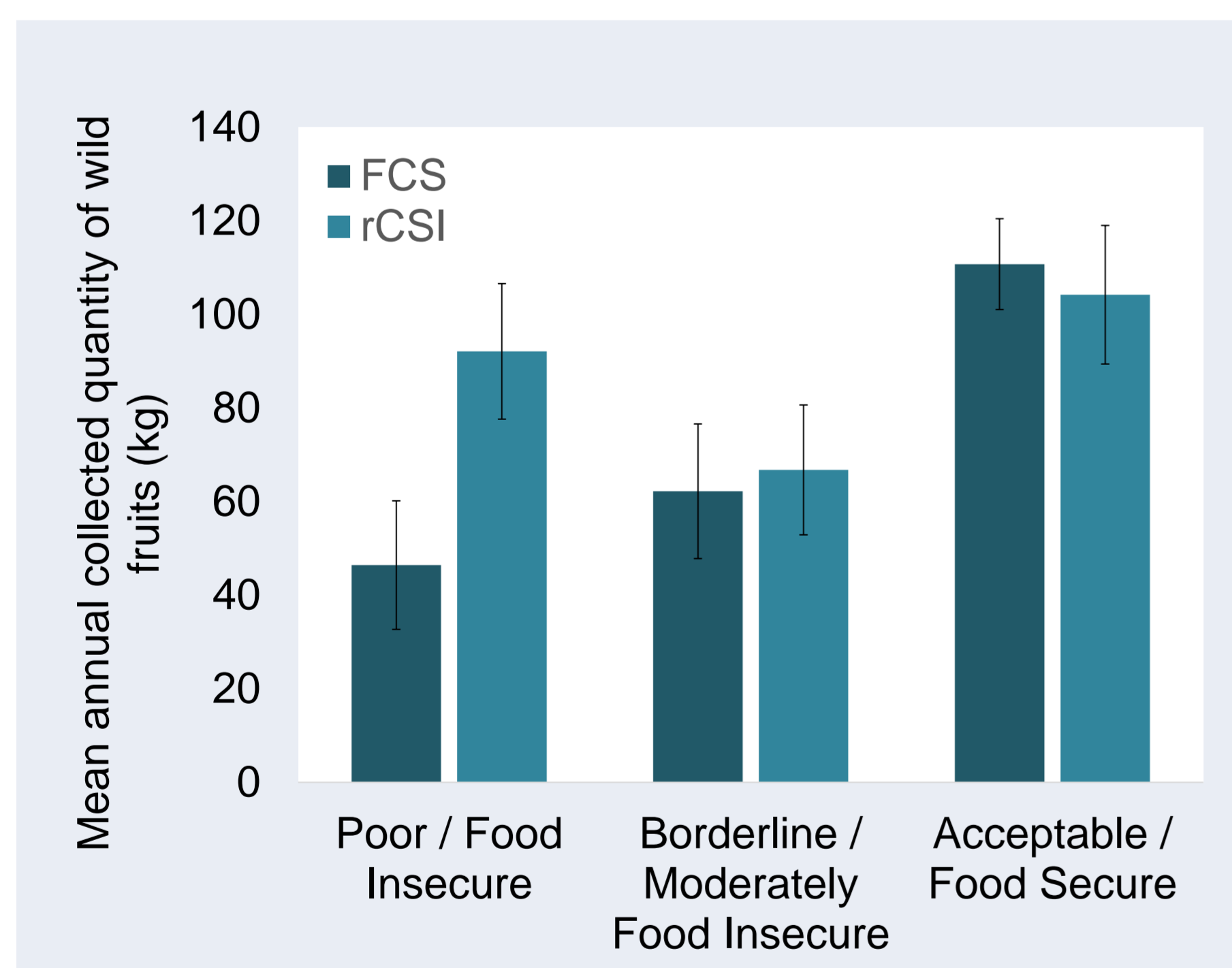


Figure 2: Mean annual quantity (kg) of wild fruits collected per household in dependency of food security categories (n=213).

Regression Results

1) Determinants of wild fruit collection

Table 1: Regression results: Determinants of collected quantity (kg) of most preferred fruit species.

Regressors	<i>U. kirkiana</i>	<i>A. boehmii</i>
Household Size	0.162*** (0.0574)	0.133** (0.0587)
Area Size	0.0273** (0.0120)	-0.00630 (0.0179)
Distance Dummy ¹⁾	-0.404 (0.256)	-0.869*** (0.303)
Availability Dummy ²⁾	-0.548** (0.275)	-0.295 (0.223)
Constant	2.685*** (0.868)	1.892* (1.106)
Observations	129	95
R-squared	0.230	0.229

Note: Robust standard errors in parentheses. Only significant results reported.

¹⁾ Dummy takes value 1 if household walks less than 2 km as furthest distance, 0 if households walks more than 2 km.

²⁾ Dummy takes value 1 if household considers availability of fruit species as important, 0 if not important.
*** p<0.01, ** p<0.05, * p<0.1.

2) Impact of wild fruits on food security

Table 2: Regression results: Impact of collected quantity of wild fruits (kg) on FCS

Regressors	Coefficients	Marginal effects		
		Acceptable	Borderline	Poor
Quantity of wild fruits (kg) ¹⁾	-0.00304* (0.00156)	0.000708** (0.000359)	-0.000311* (0.000170)	-0.000396** (0.000200)
Observations	213	213	213	213

Note: Robust standard errors in parentheses. Other regressors not shown.

¹⁾ Includes quantity collected of all wild fruit species.

*** p<0.01, ** p<0.05, * p<0.1.

Table 3: Regression results: Impact of collected quantity of wild fruits (kg) on rCSI

Regressors	Coefficients	Marginal effects		
		Food Secure	Moderately Food Insecure	Severely Food Insecure
Quantity of wild fruits (kg) ¹⁾	0.00115 (0.00116)	-0.000225 (0.000226)	-5.38e-05 (6.04e-05)	0.000279 (0.000282)
Observations	213	213	213	213

Note: Robust standard errors in parentheses. Other regressors not shown.

¹⁾ Includes quantity collected of all wild fruit species.

*** p<0.01, ** p<0.05, * p<0.1.

5. Conclusion

- 1) Household size highly determines collected quantity of both species, whereas effect of area size, distance to collect fruits and assessment of their availability depends on species
- 2) Higher quantities of wild fruits collected increases probability of being food secure based on FCS but has no significant effect on food security with respect to rCSI

Policy Recommendations

- Further research on wild fruits and impact on food security
- Education programmes to raise awareness
- Analysis of nutritional value
- Promotion of cultivating, processing and trading
- Sustainable land use and forest management
- Marketing and advertisement

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