

Determinants of the risk perception of farmer-herder conflicts: Evidence from rural Nigeria

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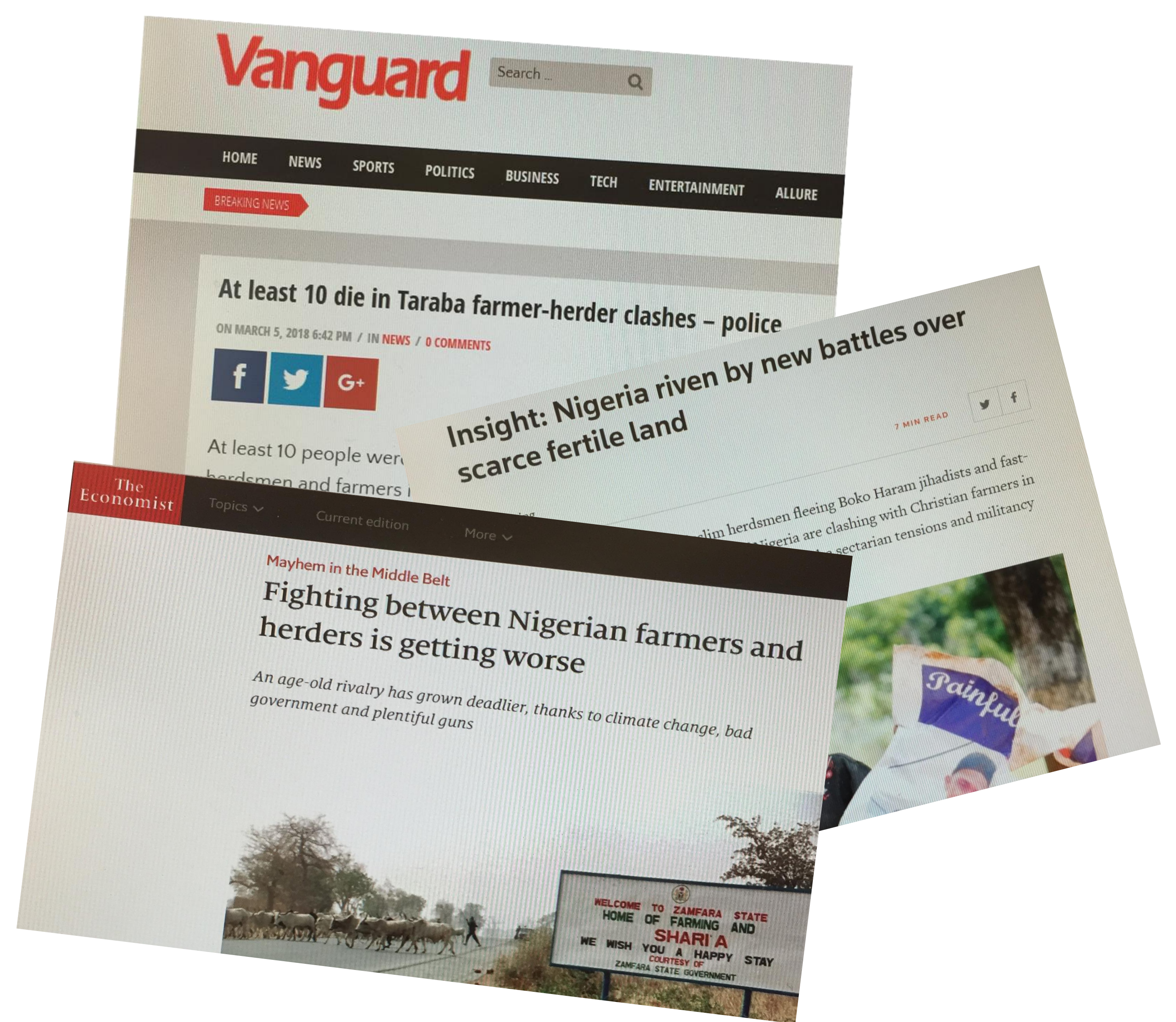
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Background and Motivation

- Climate change and population increase
- Competition over scarce resources
- Farmer-herdsmen conflict
- Risk perception

Research
objective

- ❖ To determine the factors influencing rural households' risk perception of FH conflict



Conceptual framework

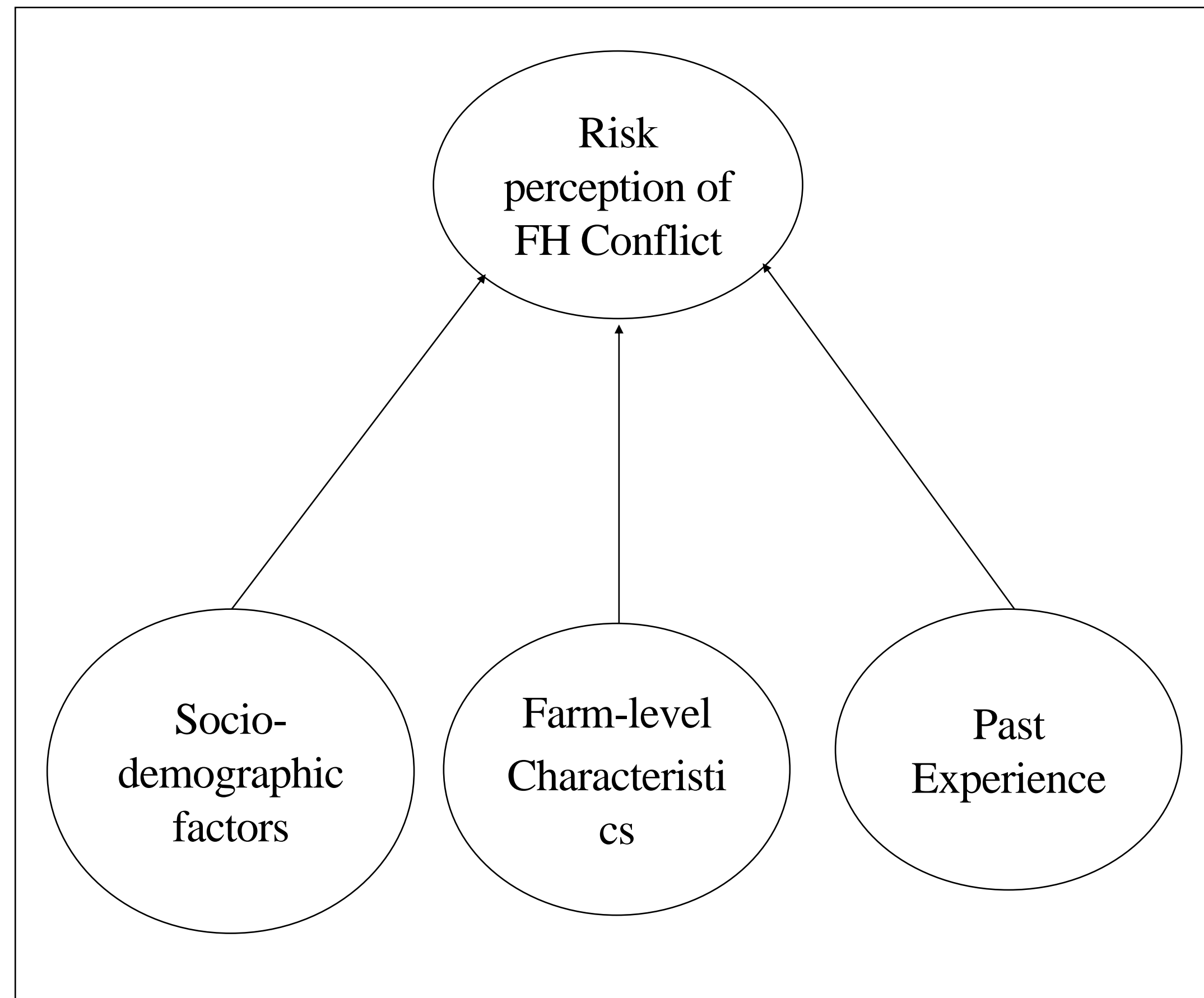
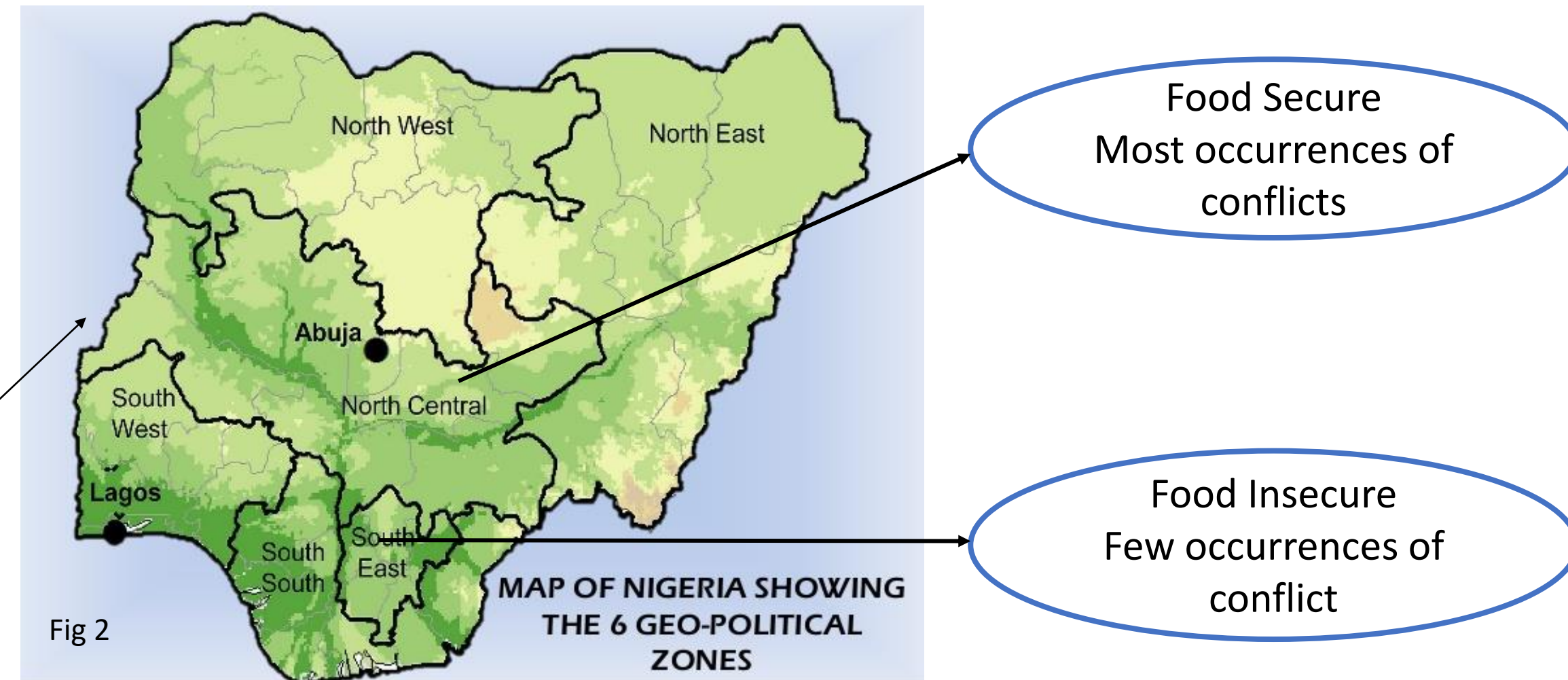


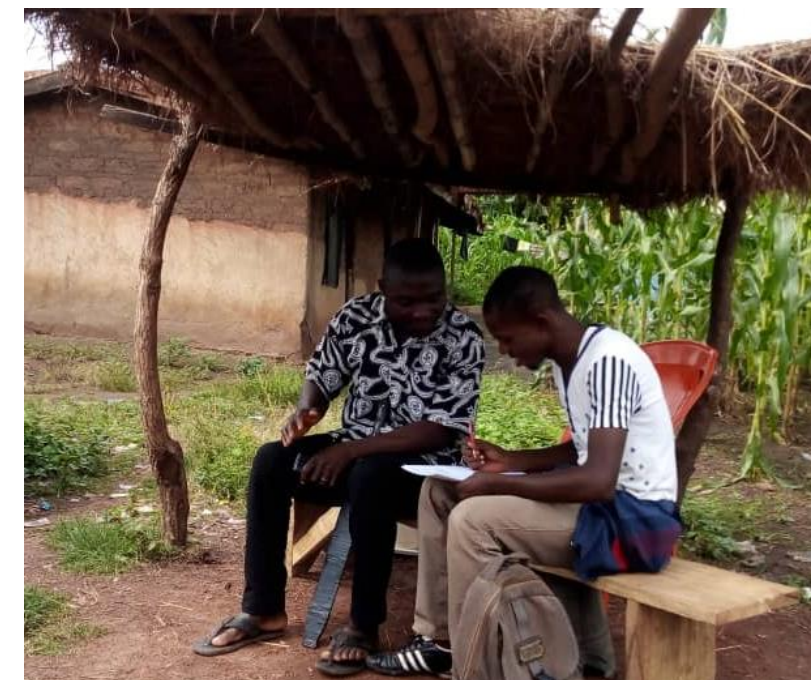
Figure 1. Conceptual framework of Risk perception of FH conflict

Study Area and Data



- Multi-stage sampling technique

- Zone; State; Local Government Area (LGA); Towns; Villages; Households



Methods

Empirical model

$$RPI_i = \sigma + \beta X_i + \mu_i$$

where

- RPI_i is the risk of farmer-herder conflict.
- σ is the intercept
- X_i is a vector of household, farm-level characteristics
- β is a vector of coefficients.
- μ_i is the error term.

Key explanatory variables include :

- Household head characteristics - age, gender , education, marital status, farming experience
- Household characteristics – household size, dependency ratio, languages spoken, income, religion, distance to city, distance to nearest neighbour, migrate, location
- Farm-level characteristics - farm size, crop and livestock diversity, formal land title,
- Past experience – Farmer-herder conflict exposure, number of FH conflicts.

Methods

Constructing the farmer-herder conflict risk perception indices

❖ Factor analysis

❖ Nine-item construct

$\alpha=0.85$

❖ Sub-indices:

❖ Risk perception of farmer-herder conflict relating to food production and supply

$\alpha=0.84$

❖ Risk perception of farmer-herder conflict relating to physical insecurity and wellbeing.

$\alpha=0.48$

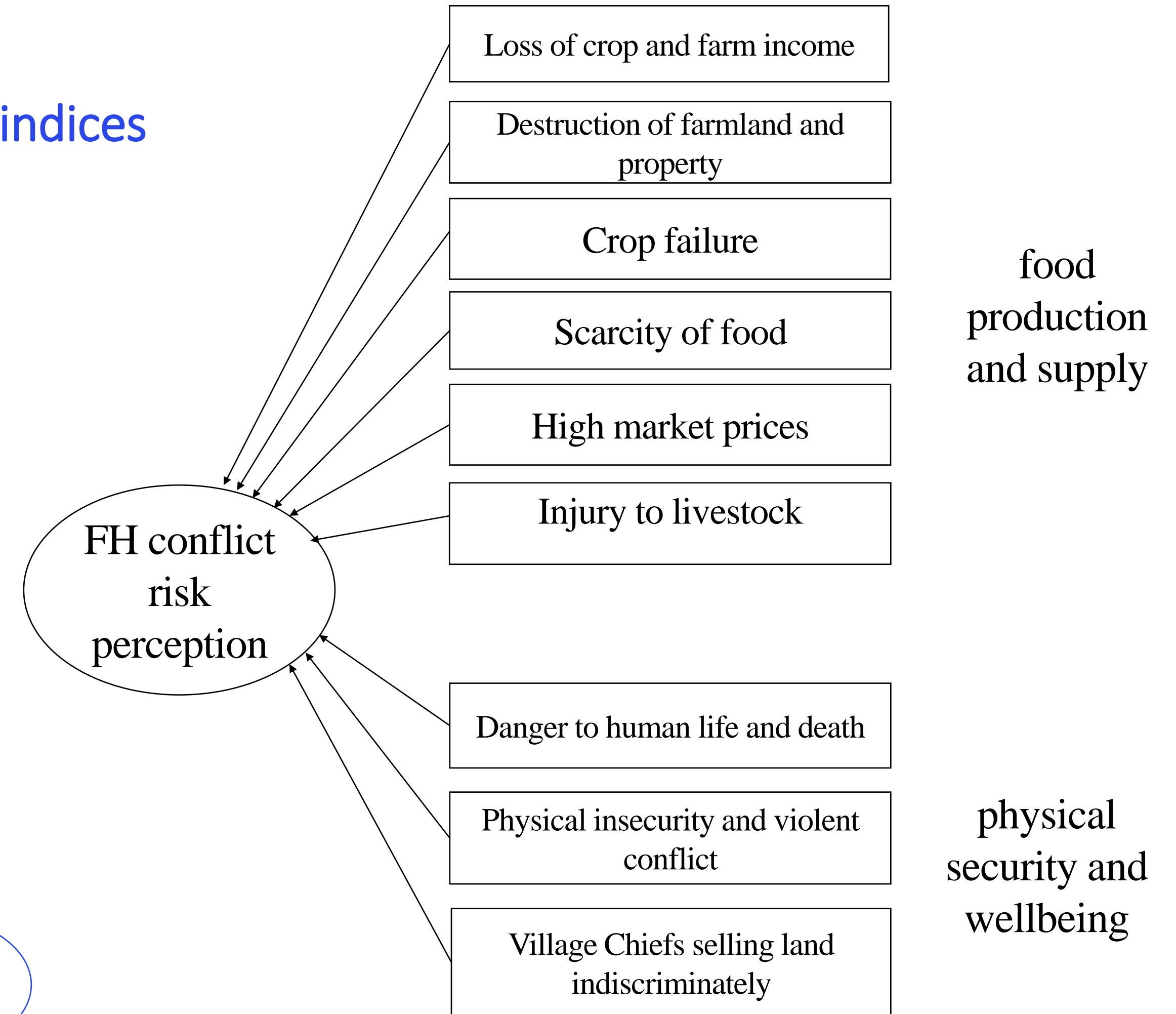


Figure 2. Construction of the FH conflict risk perception index and sub-indices

Table 1. Definition and summary statistics of independent variables

Variable	Variable description	Mean (SD)
Risk perception of FH conflict	Household risk perception of FH conflict	-0.001 (0.671)
Age	Age of household head (years)	49.43 (14.46)
Gender	1 if household head is female, 0 otherwise	0.24 (0.43)
Education	Education of household head (years)	8.64 (5.18)
Religion	1 if Christian, 0 otherwise	0.94 (0.23)
Marital status	1 if household head is married, 0 otherwise	0.86 (0.35)
Dependency ratio	Number of household members below 18 years and above 60 years	0.40 (0.23)
Household size	No of household members	9.44 (6.82)
Language	The number of languages spoken in the household	2.20 (0.78)
Household income	Total household income (NZ\$10,000)	30.69 (20.40)
Farming experience	Household head's years of farming	26.83 (15.25)
Farm size	Total area of cultivated farmland (acres)	3.86 (3.85)
Crop diversification	Number of crops cultivated by household	7.52 (3.15)
Livestock diversification	Types of livestock reared by household	1 (1.04)
Distance to city	Distance from household to closest city (km)	15.41 (9.72)
Distance to closest neighbour	Distance to closest neighbour (km)	0.32 (0.43)
Migrate	1 if household migrated to the community, 0 otherwise	0.12 (0.33)
Formal land title	1 if household has title deed to largest farmland, 0 otherwise	0.14
FH conflict exposure	1 if household is in a community that has experience FH conflict in the last five years, 0 otherwise	7.52
Number of FH conflicts	Number of FH conflicts in the community in 2018 (0-28)	3.95 (6.20)
Location	1 if household is located in the Northcentral zone, 0 otherwise	0.50



Table 2. Mean differences in key variables by gender of household head

Variable	Male	Female	Mean difference
Risk perception of FH conflict	0.11 (0.03)	-0.35 (0.08)	0.46***
Age	49.28 (0.84)	49.89 (1.43)	-0.60
Education	9.22 (0.28)	6.80 (0.59)	2.42***
Religion	0.94 (0.01)	0.96 (0.02)	-0.02
Marital status	0.95 (0.01)	0.55 (0.05)	0.41***
Dependency ratio	0.40 (0.01)	0.41 (0.03)	-0.01
Household size	10.28 (0.42)	6.84 (0.39)	3.44***
Language	2.37 (0.04)	1.67 (0.06)	0.70***
Household income	33.49 (1.16)	21.92 (1.89)	11.56***
Farming experience	27.30 (0.89)	25.34 (1.45)	1.97
Farm size	3.53 (0.21)	4.92 (0.43)	-1.39***
Crop diversification	7.74 (0.17)	6.80 (0.34)	0.94***
Livestock diversification	1.06 (0.06)	0.80 (0.08)	0.26***
Distance to city	14.09 (0.52)	19.57 (1.05)	-5.48***
Distance to closest neighbour	0.30 (0.02)	0.37 (0.05)	-0.07
Migrate	0.12 (0.02)	0.12 (0.03)	1.27
Formal land title	0.17 (0.02)	0.05 (0.02)	0.12***
FH conflict exposure	0.71 (0.03)	0.78 (0.04)	-0.07*
Number of FH conflicts	4.75 (0.39)	1.43 (0.20)	3.31***
Location	0.65 (0.03)	0.03 (0.02)	0.62***

Note:
*, **, *** represent
significance at 10%,
5%, and 1% levels,
respectively; SE in
parenthesis



Results

Table 3. Estimation results for models of FH conflict risk perception with and without an interaction between FH conflict and gender

Variables	Model 1	Model 2	Model 3
Age	-0.005* (0.003)	-0.005* (0.003)	-0.006* (0.003)
Gender	-0.101 (0.097)	-0.101 (0.098)	-0.179 (0.116)
Education	0.006 (0.007)	0.006 (0.007)	0.005 (0.007)
Religion	0.009 (0.110)	0.009 (0.110)	0.025 (0.112)
Marital status	0.104 (0.119)	0.105 (0.119)	0.112 (0.120)
Dependency ratio	0.177 (0.151)	0.176 (0.151)	0.197 (0.151)
Household size	-0.004 (0.004)	-0.004 (0.004)	-0.004 (0.004)
Language	0.087** (0.042)	0.089** (0.043)	0.089** (0.043)
Household income	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
Farming experience	0.009*** (0.003)	0.009*** (0.003)	0.009*** (0.003)
Farm size	-0.017** (0.007)	-0.017** (0.007)	-0.016*** (0.007)
Crop diversification	0.034*** (0.010)	0.034*** (0.010)	0.032*** (0.010)
Livestock diversification	0.065** (0.025)	0.066** (0.025)	0.067** (0.026)
Distance to city	0.001 (0.003)	0.001 (0.003)	0.001 (0.003)
Distance to closest neighbour	0.313*** (0.062)	0.312*** (0.062)	0.321*** (0.063)
Migrate	-0.260*** (0.098)	-0.261*** (0.098)	-0.256*** (0.098)
Formal land title	-0.420*** (0.083)	-0.421*** (0.084)	-0.414*** (0.084)
FH conflict exposure	0.384*** (0.080)	0.392*** (0.093)	0.374*** (0.092)
Number of FH conflicts		-0.001 (0.004)	-0.002 (0.005)
FH conflict and gender interaction			0.056* (0.033) ★
Location	0.438*** (0.071)	0.442*** (0.075)	0.445*** (0.075)
Constant	-1.115*** (0.274)	-1.117*** (0.274)	-1.133*** (0.275)
R-squared	0.428	0.428	0.434

Note:
*, **, *** represent
significance at 10%,
5%, and 1% levels,
respectively; SE in
parenthesis



Table 4. Estimation results for models of FH conflict risk perception relating to food production and physical insecurity and wellbeing

Variables	Model A	Model B	Model C
Age	-0.005* (0.003)	-0.007* (0.003) ★	-0.003 (0.003)
Gender	-0.101 (0.097)	-0.107 (0.113)	-0.093 (0.116)
Education	0.006 (0.007)	0.002 (0.008)	0.016** (0.008) ★
Religion	0.009 (0.110)	0.007 (0.129)	0.048 (0.114)
Marital status	0.104 (0.119)	0.138 (0.133)	-0.013 (0.139)
Dependency ratio	0.177 (0.151)	0.236 (0.157)	0.055 (0.175)
Household size	-0.004 (0.004)	-0.001 (0.005)	-0.011** (0.005) ★
Language	0.087** (0.042)	0.099** (0.051) ★	0.063 (0.046)
Household income	0.000 (0.001)	-0.002 (0.002)	0.004** (0.002) ★
Farming experience	0.009*** (0.003)	0.009*** (0.003)	0.010*** (0.003)
Farm size	-0.017** (0.007)	-0.014 (0.008)	-0.025** (0.011)
Crop diversification	0.034*** (0.010)	0.037*** (0.012)	0.028** (0.012)
Livestock diversification	0.065** (0.025)	0.047 (0.030)	0.104*** (0.028) ★
Distance to city	0.001 (0.003)	-0.002 (0.004)	0.008** (0.003) ★
Distance to closest neighbour	0.313*** (0.062)	0.355*** (0.071)	0.232*** (0.077)
Migrate	-0.260*** (0.098)	-0.309*** (0.112) ★	-0.153 (0.126)
Formal land title	-0.420*** (0.083)	-0.472*** (0.101)	-0.317*** (0.082)
FH conflict exposure	0.384*** (0.080)	0.524*** (0.090) ★	0.090 (0.090)
Location	0.438*** (0.071)	0.396*** (0.083)	0.539*** (0.094)
Constant	-1.115*** (0.274)	-1.110*** (0.318)	-1.151*** (0.309)
R-squared	0.428	0.397	0.340

Note:

*, **, *** represent significance at 10%, 5%, and 1% levels, respectively; SE in parenthesis

Conclusion

- ❑ Age of household head, farm size, and possession of a formal title to farmland had a negative significant effect on FH conflict risk perception,
- ❑ Language diversity, farming experience, number of crops household cultivates, types of livestock reared, distance between household and nearest neighbour, and exposure to FH conflict and being located in the northcentral zone had a positive significant influence on FH conflict risk perception.
- ❑ Education and household income and size, farm size, and distance from household to the city are more important predictors of FH conflict risk perception concerning physical insecurity and wellbeing,
- ❑ Age, language diversity, and FH conflict exposure are more important predictors of FH conflict risk perception concerning food production and supply.

Policy implications

- ❑ Findings have implications for governmental and non-governmental agents willing to influence the risk behaviour of rural households to FH conflicts by means of targeted interventions
- ❑ Findings recommend the enactment of initiatives that facilitate procurement of formal titles to land resources as well as encourage gradual shift to more sustainable herding systems.
- ❑ Strategies that improve farmers' capacity to cope with FH conflict risks should be facilitated.



Additional Suggestions and Comments?

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