



Land-use Alternatives and Livelihood Viability in Ecosystems at Risk of Emergent Animal Diseases

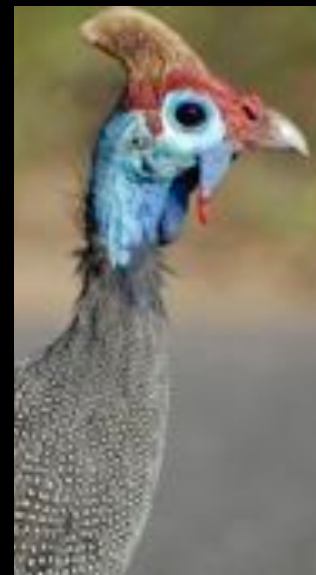
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University of Florida



Introduction: AHEAD GLTFCA Main Themes

Six main work themes / needs:

1. An overarching conceptual framework to facilitate integrated understanding through interdisciplinary approaches
2. Animal health and disease
3. Land use, ecosystem goods and services, and animal health
4. Human health and livelihoods, animal and ecosystem health
5. Policy support and capacity building at local, national and regional levels
6. Communications and outreach

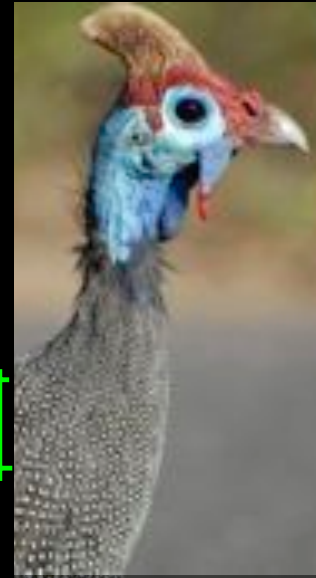




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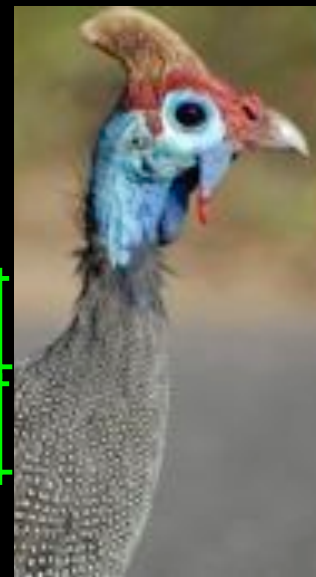
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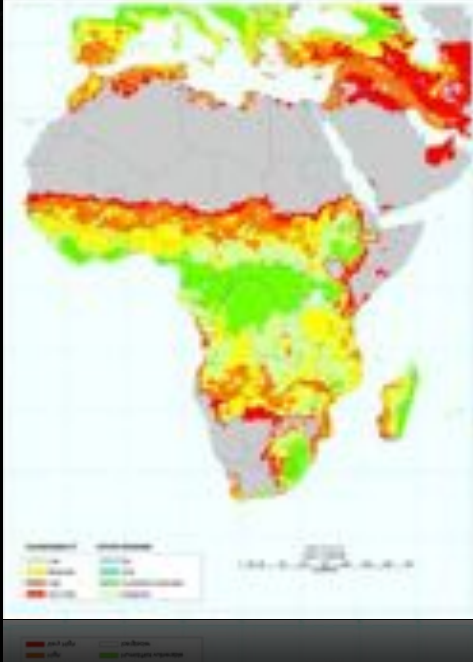
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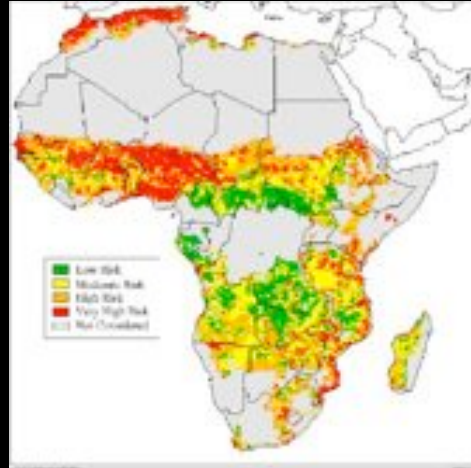


Introduction

Desertification Vulnerability

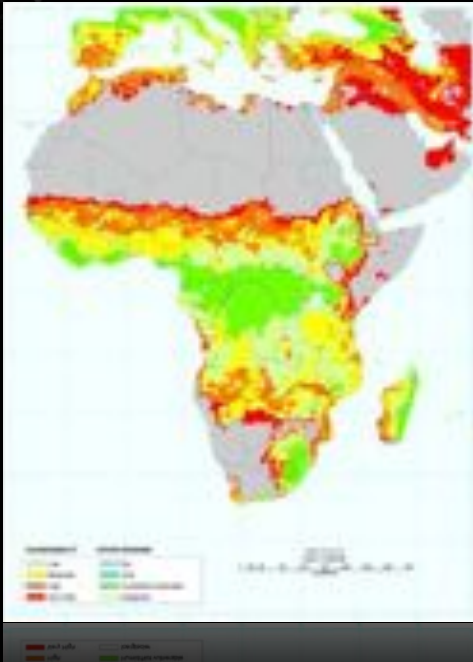


Risk of human-induced Desertification Vulnerability

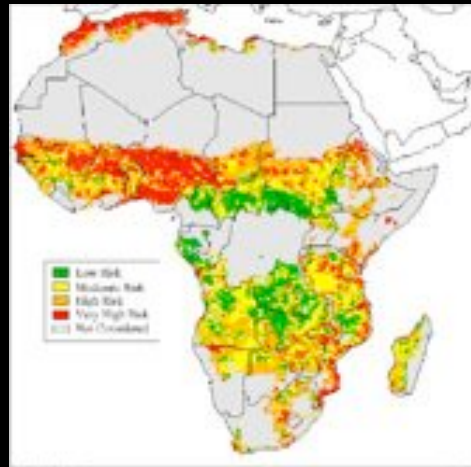


Introduction

Desertification Vulnerability



Risk of human-induced Desertification Vulnerability





Introduction



Introduction

■ Formal Land Use

- The purpose of this study is to
- Describe the current state of wildlife based land use on private land
- Determine financial and economic profitability game ranching
- Determine the impact of policy on wildlife utilization
- Determine the economic impacts of game ranching on local economy

■ Community Vulnerability

- To evaluate the vulnerability of livelihoods and land use systems to shock events
- To determine the influence between coping strategies, shocks and household characteristics.
- Evaluate the diverse household livelihood strategies in terms of relative contributions from local production sectors



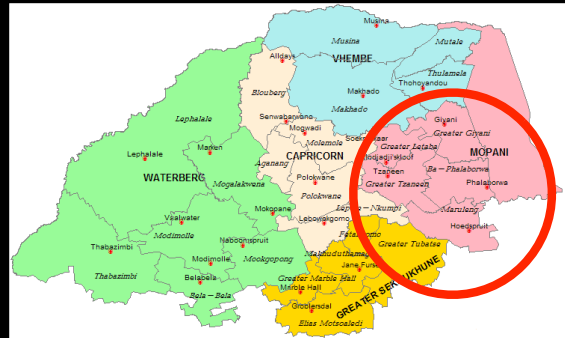
Introduction, Commercial Land-use

- Approximately 73% of the land in South Africa is privately held (Bond et al, 2004).
- 16.8% under private wildlife ranches Vs 6.1% under government protected areas (NAMC 2006).
- Sector is growing with conversion rate from livestock to wildlife of 2-2.5 % per year (ABSA 2005).
- The primary driver of this growth is the private game ranching sector.
- Approx 9000 + private wildlife ranches (ABSA 2005).



Methods, Commercial Land-use

- In depth interviews of ranch managers and key informants were conducted between June and August of 2009.
- The managers were asked about the farm history and activities, policy environment and financial records for the previous year
- District level ranching information from exemption permit records from Limpopo Department of Economic Development and Tourism.

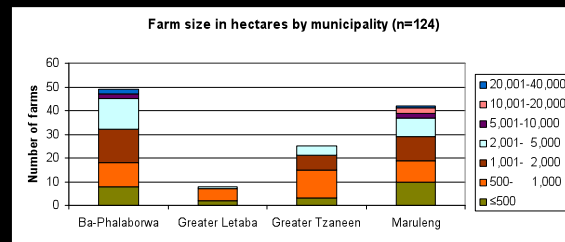
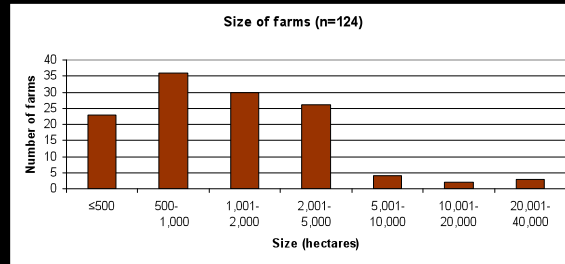


Type	Sample	Size
Private game ranch	10	1700 ha - 14500 ha
Conservancy	3	11500 ha - 60 000 ha



Mopani District

- The district has experienced a strong shift away from cattle production to wildlife in the last 20 years.
- 166 exempted (fenced) game ranches in the district.
- Exempted farms are approx 35% of district land area.
- Diversity in size, across municipalities:
 - Min =300ha Max= 38 000 ha



Farm Level

- District level belies farm level complexity
- High diversity within relatively small area
- Diversity in size, enterprise type, management, ownership.





Farm Incomes and Profitability

Farm	Primary Activity	Accommodation	Live animal Sales	Hunting	Other
A	Tourism (Top End)	94.5	0	0	5.5
B	Tourism (Mid level)	2.1	91.8	6.0	0.1
C	Tourism (Mid level)	78.7	2.4	15.8	3.0
D	Tourism (Mid level)	94.7	0	0	5.3
E	Breeding	0	100	0	0
F	Breeding	5.1	71.1	23.2	0.6
G	Mixed	0	14.3	2.0	83.7
H	Leisure	0	100	0	0

- Farmers rely on a mix of activities to meet objectives
- Variety gives ranch flexibility to maintain profitability



Farm Incomes and Profitability

Farm	Primary Activity	Gross Income rand per hectare	Gross Margin rand per hectare
A	Tourism (Top End)	8,706	8,282
B	Tourism (Mid level)	4,936	2,886
C	Tourism (Mid level)	2,231	856
D	Tourism (Mid level)	105	4
E	Breeding	1,643	1,434
F	Breeding	1,099	768
G	Mixed	2,906	1,947
H	Leisure (conservancy)	150	90
	Cattle*		717

*Limpopo department of Agriculture enterprise budget 2007

- Returns vary for a variety of reasons:
 - Tourism type (high end, mid level, self catering) , number of beds,
 - Level of development (number of years operational, experience with breeding, transition form one enterprise to another)
- Gross Income comparable to in KZN by Porter et al (2003) and Eastern Cape Langholtz and Kerley (2005)
- Returns to wildlife based farms exceed those from cattle



Employment

		Labour			Labour per hectare
		Skilled	Unskilled	Total	
Farms					
A	Tourism (top end)	32	162	194	0.037
F	Tourism (mid level)	4	80	84	0.049
B	Tourism (mid level)	2	17	19	0.009
C	Tourism (mid level)	1	5	6	0.003
D	Tourism (mid level)	3	6	9	0.003
E	Breeding	1	16	17	0.006
G	Breeding	1	9	10	0.003
Average		48.4			0.016
H	Mixed (cattle & breeding)	3	72	75	0.005
Conservancy					
A		1	9	10	0.000
B		12	27	39	0.001
C		4	80	84	0.007
Average		44.3			0.003

- Variation by enterprise type
 - High labor for ecotourism
 - Lower labor use for hunting and breeding
- Wage bill 280 000-14.5 mill Rand or
 - 87 -2800 ZAR/ha
 - Average of wage bill of 672 ZAR/ha



Operation Costs

Farm	Primary Activity	Employees	Animal care	Administration	Fuel & Transport	Safari costs	Maintenance	Utilities
A	Tourism (Top End)	77.3	0	7.7	1.7	3.3	6.7	3.2
B	Tourism (Mid level)	20.5	51.3	3.5	10.8	0.8	7.0	6.0
C	Tourism (Mid level)	42.7	4.9	24.1	5.6	9.8	11.0	1.8
D	Tourism (Mid level)	63.3	0.2	11.6	0.2	0	13.2	11.5
E	Breeding	51.2	12.7	0.5	8.6	0	23.6	3.2
F	Breeding	18.2	47.0	9.5	9.8	1.0	11.5	3.1
G	Mixed	19.3	58.8	0.9	13.7	0	6.8	0.6
H	Conservancy	17.9	40.1	1.5	19.4	0	18.3	2.9

- Operating costs:
 - Range from 407 rand/ha to 3608 rand/ha
 - Average 1376 rand/ha



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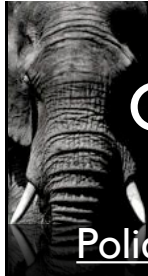
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Veterinary regulations

“ it’s not so much the regulations as the permits and the hassles surrounding them”

- Farmers aware of disease threat and need to comply with vet restrictions.
- Farm activities are affected by slow processing of permits required for wildlife related activities e.g. Translocation, and animal sales.
- Slow processing are partly due to the lack of manpower at local service centers.
- Vet regulations also affect choice of wildlife enterprise.



Conclusions

Policy Environment

- “Legislation doesn’t fit with new way of thinking in game ranching industry. We have already lost a lot of opportunities”
- Farmers believe there are too many regulations for the game sector.
- Regulations impact negatively on business limiting ability to benefit from lucrative game meat, skin and hide markets.
- Farm activities are affected by slow processing of permits required for wildlife related activities e.g. Translocation, and animal sales
- Slow processing are partly due to the lack of manpower at local service centers.
- Value of wildlife is not recognized
 - Ranchers did not receive assistance or compensation for drought losses
 - Ranchers do not receive compensation for value of game in land restitution processes.
 - Ranchers perceive that government acts in a regulatory rather than facilitation role for the sector



Poverty & Vulnerability

- Poverty: (Then) Understandings centered on the understandings of material deprivations and level of access to education and health.
- Poverty: (Now) The realization that the causes of poverty are multi-dimensional – and involve political and social as well as economic processes (World Bank, 2001)
- Must adopt a broader agenda





Background: Theoretical Framework

- Vulnerability: the existence and the extent of a threat of poverty and destitution
- Ex-ante and ex-post strategies to cope with the consequences of risk impact long-term consumption / income (Aldman et al., 2003; Dercon, 2004, 2005 Mordoch, 1990)
- While strategies are often successful in smoothing consumption, short-term fluctuations in welfare outcomes exist where risks are uninsured.
 - Long-term consumption
 - Capital formation
 - Reduced income gains, household choice to limit exposure to risk come at the cost of significantly lower incomes (Dercon, 2002; Dercon, 1996)
- Exposure to uninsured risk may cause households to alter production decisions to mitigate risk at a cost of future income



Research Design

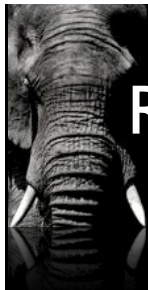
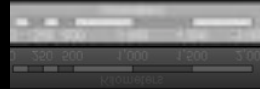
- 402 household interviews were conducted from late May to late August in the the Mutale and Makoko communities after pretesting the survey instrument in March
- Household were selected randomly and if a household refused or absent after 3 attempts, a replacement household was selected randomly (only 7 refused)
- Interview questions modules:
 - Socio-demographic
 - Extensive income / consumption index
 - Shock event and coping mechanisms
 - GPS of households, borehole used, and village infrastructure.





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 - Sample drawn from village household roster
 - Checked with village key informants for accuracy
 - Randomly selected







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Methods



- Three econometric methods exist for quantifying vulnerability:
 - Vulnerability as expected poverty

$$V_{ht} = \Pr(C_{h,t+1} = c(X_h, \beta_{t+1}, \alpha_h, e_{h,t+1}) \leq z | X_h, \beta_t, \alpha_h, e_{ht})$$
 (Chaudhuri et al., 2002)
 - Vulnerability as expected low utility

$$V_h = [U_h(Z_{CE}) - U_h(EC_h)] + [U_h(EC_h) - EU_h(C_h)]$$
 (Ligon & Shechter, 2003)
 - Vulnerability as uninsured exposurer to risk

$$\Delta \ln c_{htv} = \lambda S(i)_{tv} + b S(i)_{htv} + d D_v + d X + \Delta \varepsilon_{htv}$$
 (Skoufias & Quisumbing, 2002)



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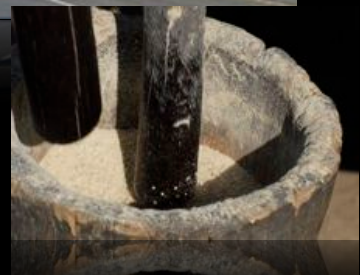
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Methods

- Advantages:

- Produces a “headline vulnerability figure
- Identifies households who are “at risk”, but not poor
- Can be estimated with a single cross-section

- Disadvantage

- If estimated using cross-section, one must make the assumption that cross-sectional variability captures temporal variability
- But, single round cross-sections can still be used if they are supplemented with other data sources (Hoddinott and Quisumbing, 2003)

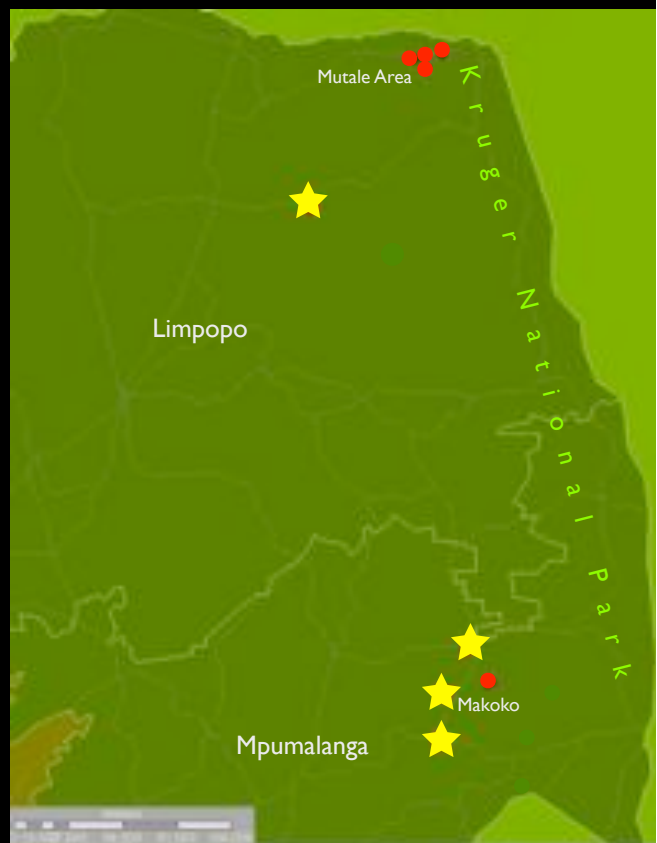


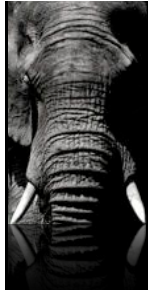


Results

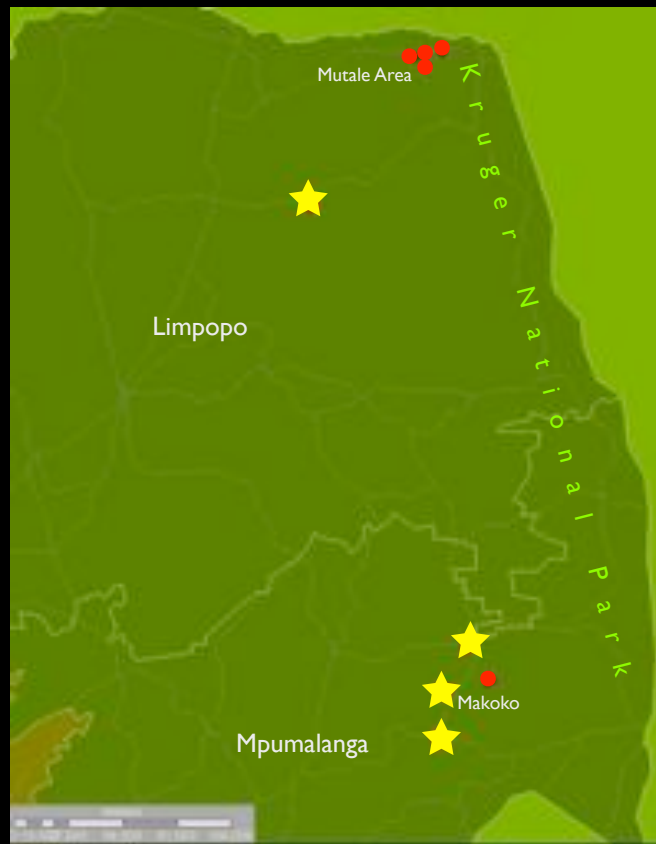


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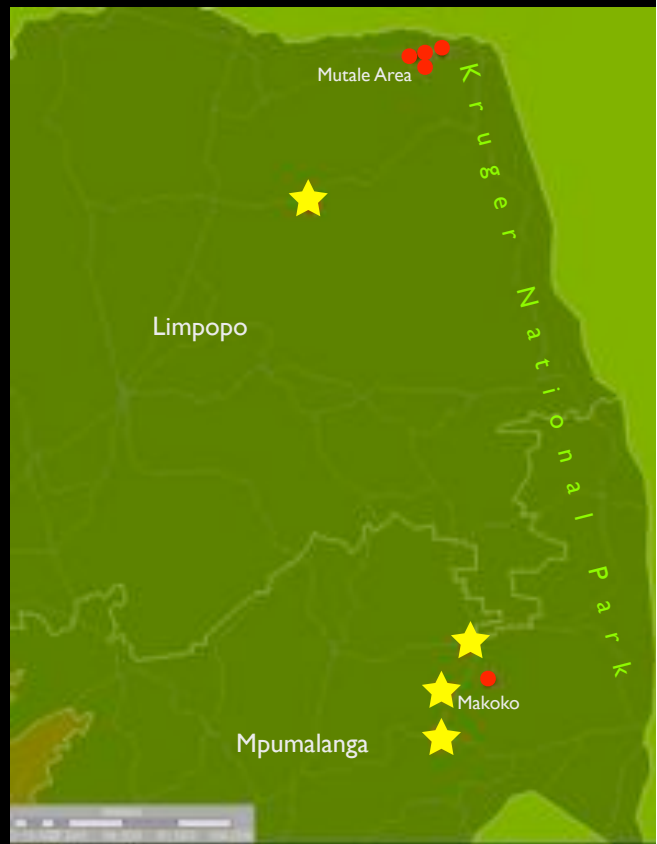


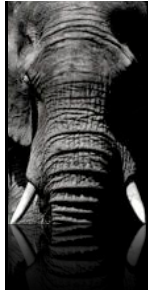
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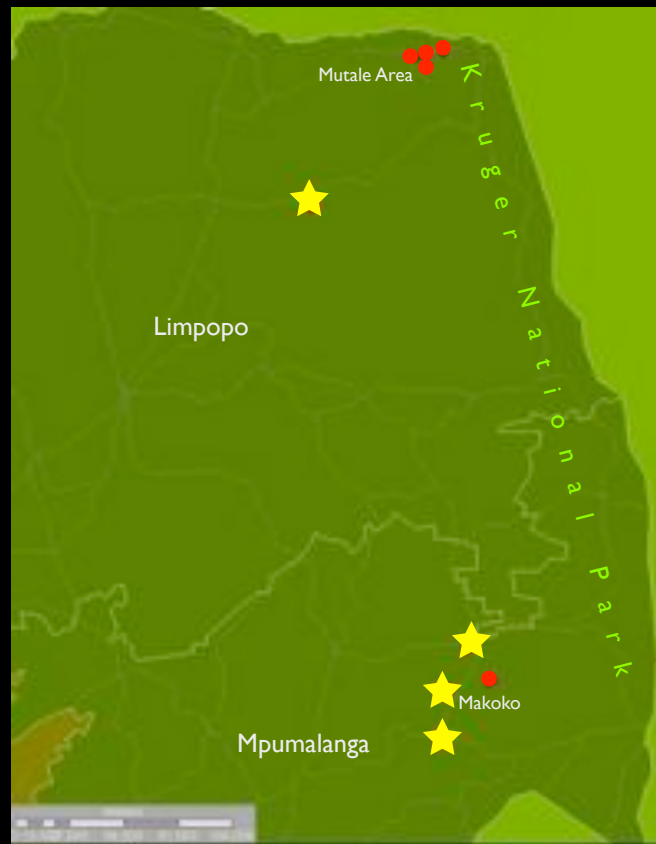
Crops	Household Participation (%)	
	Mutale	Makoko
Maize	47.0	69.8
Groundnuts	41.4	12.0
Watermelon	46.1	1.2
Beans	44.0	1.2
“Spinach”	14.7	14.5
Sorghum	22.8	0.6
Sweet Potatoes	0.0	15.7
Cassava	5.3	12.7
Pumpkins	1.2	3.0
Thatch	28.0	22.9
Wood	97.4	65.0
Reeds	0.4	6.0





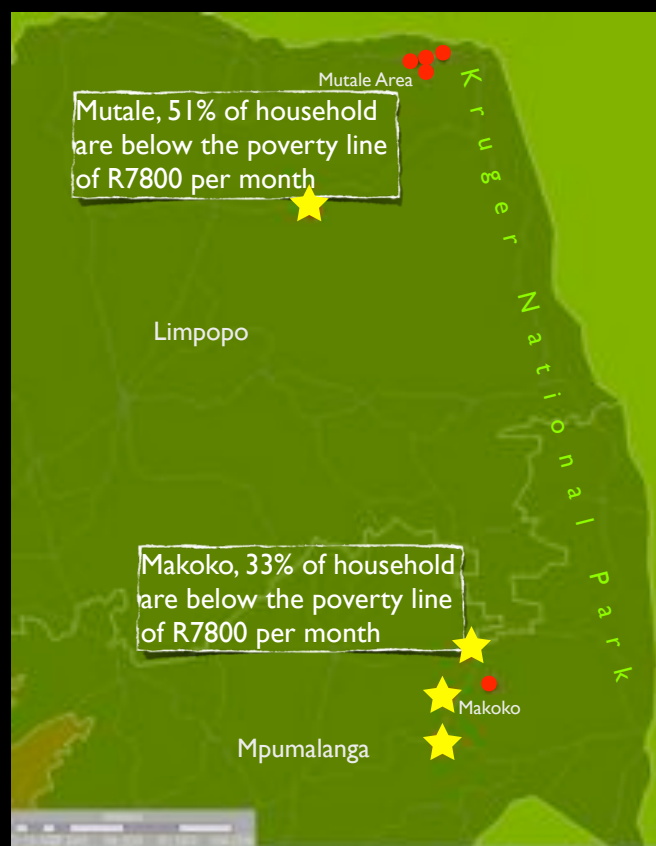
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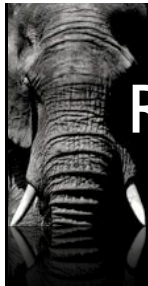
Activity	Household Participation (%)	
	Mutale	Makoko
Wage Work	43.4	44.6
Piece Work	37.1	17.5
Animal Sales	28.4	6.6
N.R. Sales	13.3	9.0
Trad. Beer	7.3	1.2
Other Res. Proc.	0.0	5.4
Remittances	8.6	9.6
Government Grants	79.7	86.7



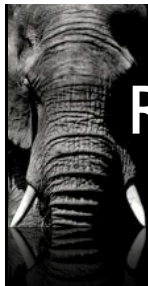
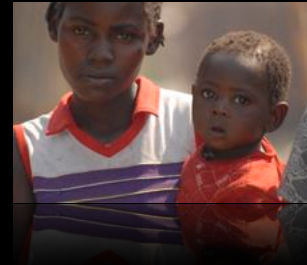
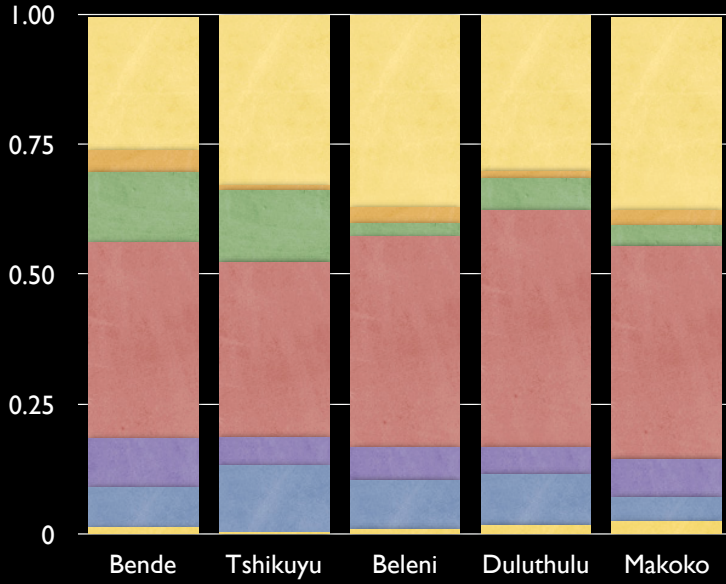
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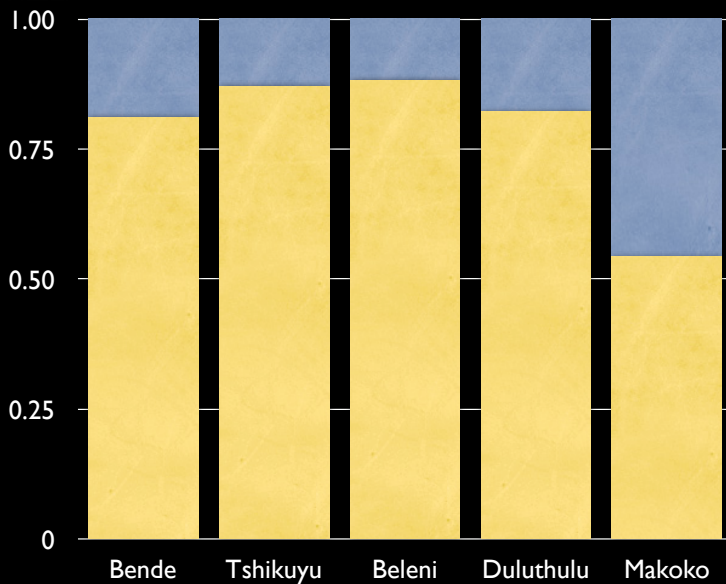




Results



Results



Mean Value of Livestock Assets

Mutale Area - R21,514
 Makoko - R8,398



Results

Vulnerability



Variables	Mean Vulnerability
HH under poverty line	0.41
HH above poverty line	0.12
Female Headed HH	0.25
Male Headed HH	0.23
Less then three head of Cattle	0.27
More then 3 head of Cattle	0.13
Receive Grants	0.27
No Grants	0.13



Results

Coping Mechanisms

Risk Coping Mechanism (Binary Dependent Variable)				
	Reduced Consumption	Sale of Assets	Change in Work Habits	Help from Gov't / NGOs
Drought	+	***	**	+
Timing of Rain		-	-	-
Loss of Livestock, Disease	*-	-	+	-
Loss of Livestock, Predation	*-	+	+	**+
Inflation	***+	-	***+	-
Death of male hh head	+	+	-	-



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Questions??
?

What does
chicken taste
like??

Do I taste
good???

Questions
???

???