Achieving Biodiversity Conservation through Food Security and Rural Livelihoods in Zambia: The COMACO Model

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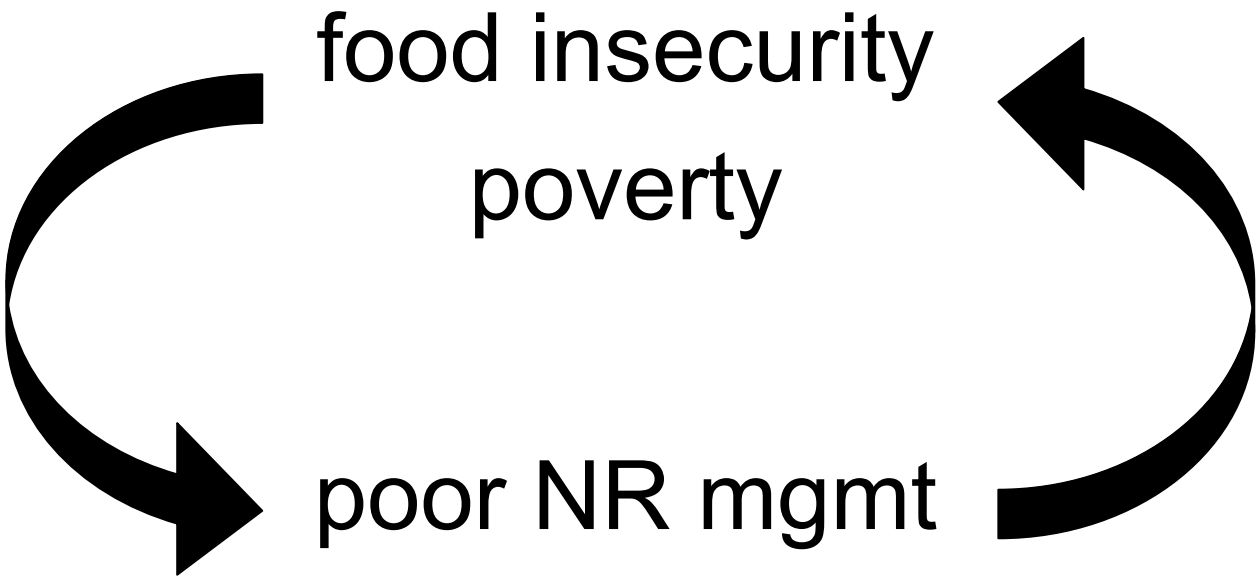
Problems Affecting Conservation Are the Same Problems Affecting Rural Development



History of conservation strategies

- “fences and fines” approach
  - Disregard for historical land use patterns of people and animals
  - Failure to recognize need for sharing of resources
  - Over-reliance on law enforcement
  - Conservation viewed as working *against* the interest of local stakeholders
- community-based natural resource mgmt
  - False economic assumptions (expanding human needs cannot be met by NR & eco-tourism)
  - External “co-opting” by foreign concessions

Zambia
Malawi
Mozambique
Zimbabwe
Botswana

COMACO

Community Markets for Conservation

The COMACO Pilot Project

- site selection: Luangwa Valley, Zambia
- vital for wildlife-based tourism
- 20-60% of households are food insecure
- effect of cotton and tobacco
  - deforestation, pesticides, poverty cycle, HIV, gender inequality
- 42% of food insecure families poach (annual loss of 3000-4000 animals in GMA in Valley alone)

DUNAVANT
ZAMBIA
DUNAVANT
ZAMBIA

The COMACO Pilot Project

- Develop a market-driven, community-owned approach to improve biodiversity by improving food security and rural livelihoods. Market incentives make the adoption of sustainable agricultural and NRM practices economically and socially preferred, and are explicitly linked to conservation practices.

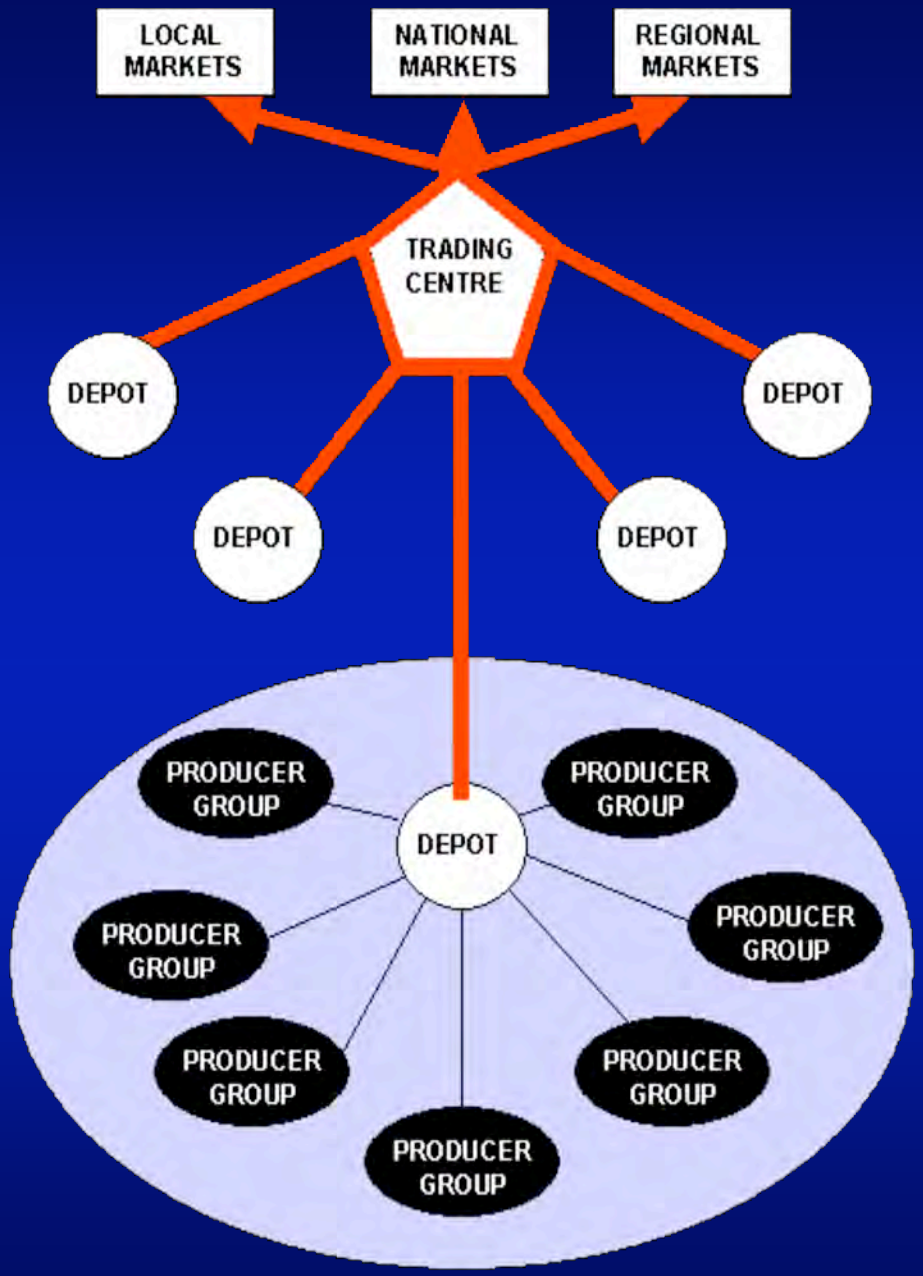
- run for 4 years
- now covers 25,000 km^2
- 30,000 families participate

How COMACO differs from other CB conservation plans

- primary target: improve food security and rural livelihoods
- participatory: community-owned, led, and staffed
- economic development based on sound economic principles (reducing transportation costs, improving market access, value-added products), NOT eco-tourism (which is being developed as a downstream “side-effect”)
- strives to be socially, environmentally, and economically sustainable

Implementation

- Choose first participants (food insecurity, likelihood to poach)
- Supplemental maize exchanged for guns/snares and successful training in conservation farming techniques
  - “pothole” farming, retention of crop residues (no burning), composting, crop rotation, agroforestry
- Families get to pick crops they wish to grow (critical because of soil, climate, culture and gender differences--HIV/AIDS 16.5%, many households with single, female parent)


LOCAL MARKETS
NATIONAL MARKETS
REGIONAL MARKETS
TRADING CENTRE
DEPOT
DEPOT
DEPOT
DEPOT
DEPOT
PRODUCER GROUP
PRODUCER GROUP
PRODUCER GROUP
PRODUCER GROUP
PRODUCER GROUP
PRODUCER GROUP
PRODUCER GROUP

Benefits of the System

- Produce bulked/transactions carried out locally
  - Improves price per unit (collective bargaining)
  - Decreases male time away, HIV exposure
  - Increases financial equity as money returns home
- Decreased transportation costs, increased time to work
- Access to wider markets, value-added products and economy of scale results in higher returns
- Community-ownership & community planning

CONSERVATION FARMER WILDLIFE PRODUCER TRADING CENTRE
Conserving natural resources for our future
CAM 7776
ZA
AAZ 4076

06 23 2005

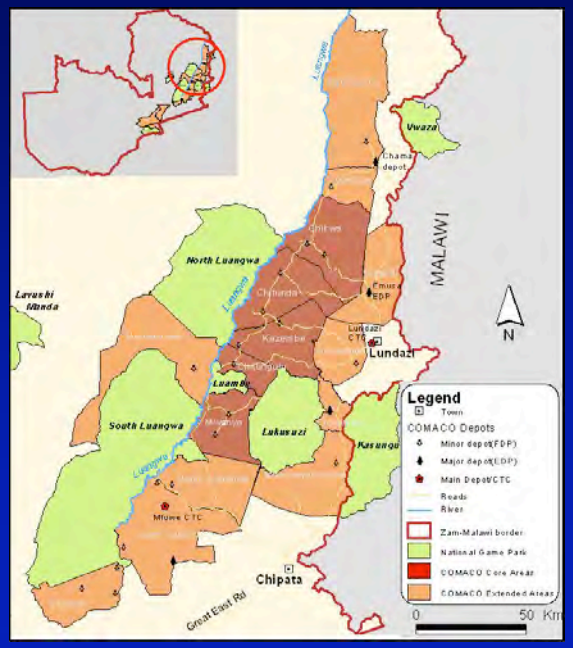
Chama Rice
It's Wild!
THIS PRODUCT SUPPORTS WILDLIFE CONSERVATION AND RURAL LIVELIHOODS IN ZAMBIA

06 23 2005

Luangwa Valley HONEY
It's Wild!
Luangwa Valley PEANUT BUTTER
06 23 2005

Preliminary Data

- 79% of participating households continued compliance after maize supplementation ended
- Decrease in food insecurity to 20-40% by 2004
- Prices up: 100% for rice, 67% for honey, 25% for groundnuts, 80% for chickens


Uwaza
Chama depot
MALAWI
North Luangwa
Lavushi Manda
Chinsali
Emusa EDP
Lundazi CTC
Lundazi
Kazembe
Luambe
South Luangwa
Lukwazi
Kasungu
Mfuwe CTC
Chipata
Great East Rd
N
Legend
Town
COMACO Depots
Minor depot(FDP)
Major depot(EDP)
Main Depot/CTC
Roads
River
Zam-Malawi border
National Game Park
COMACO Core Areas
COMACO Extended Areas
0
50 Km

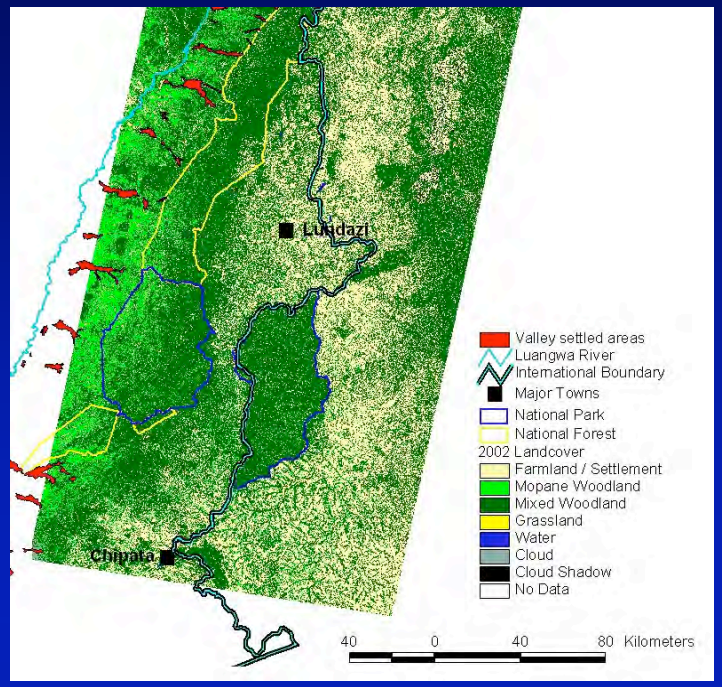
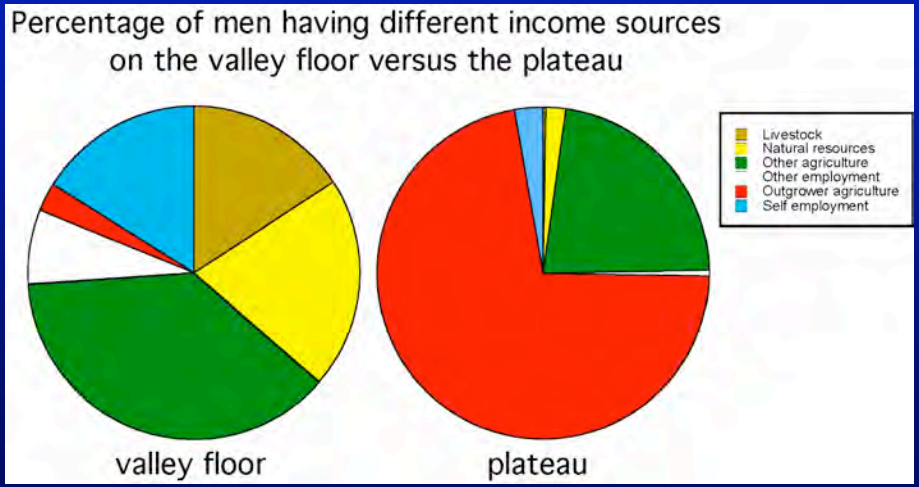

Lundazi
Chipata
Valley settled areas
Luangwa River
International Boundary
Major Towns
National Park
National Forest
2002 Landcover
Farmland / Settlement
Mopane Woodland
Mixed Woodland
Grassland
Water
Cloud
Cloud Shadow
No Data
40
0
40
80 Kilometers

Figure 3.


Percentage of men having different income sources
on the valley floor versus the plateau
Livestock
Natural resources
Other agriculture
Other employment
Outgrower agriculture
Self employment
valley floor
plateau

Hypothesis

A market-driven, community-based model designed to improve food security and rural livelihoods will lead to sustainable watershed and biodiversity conservation on a regional scale, when based upon environmentally and economically sound practices.

Testing and Optimizing the Model

How do you test a holistic, landscape-scale model?

Can break each component down into specific research questions (and risk losing the forest for the trees), or…

Devise specific experimental questions within each discipline that could disprove the workings of the model as a whole.

Points that Could Disprove the Model

- might not be economically self-sustaining
- efforts might not sustainably improve biodiversity conservation
- might not be exportable
- might not be a causal relationship between actions undertaken and trends observed
- improved profitability might be “too successful” (farmers might abandon SA&NRM practices to scale up individual production)

Specific Aims

1. To determine the extent to which the COMACO model can be economically self-sustaining and the effectiveness of the different COMACO model components.

Research

<u>Business economics</u>:

Business plans for each CTC

Market analysis for new value-added soybean products

Branding under the “It’s Wild!” name

Training in presentations, contracts

<u>Macro-scale natural resource economics</u>:

Valuation of hunting vs non-consumptive eco-tourism

“Equation” of cost of biodiversity conservation

Specific Aims

2. To identify and integrate new technologies into the COMACO model to improve its profitability, food security, and rural incomes.

Research

Soil & crop sciences:

Conservation farming techniques: key aspects? Maximum yields?

Tailor for different soils/climates?

Agroforestry

Food sciences:

Training programs in food sciences: hygiene and safety

Integration of new technologies: “soy cow” and extruders (new products/markets)

Research

<u>Veterinary medicine</u>:

Poultry husbandry, medicine

Train veterinary para-professionals

Web-based, “virtual” diagnostics (surveillance)

Economics of veterinary and husbandry interventions

Specific Aims

3. To determine the extent to which the COMACO model provides self-sustaining social institutions and meaningful roles for COMACO participants.

Research

<u>Sociology</u>:

Comparisons (before/after; within/without)

Economic gender equity?

Effect on HIV transmission?

Effect of conservation farming on public health?

Specific Aims

4. To determine the extent to which the COMACO model improves biodiversity and watershed conservation.

Research

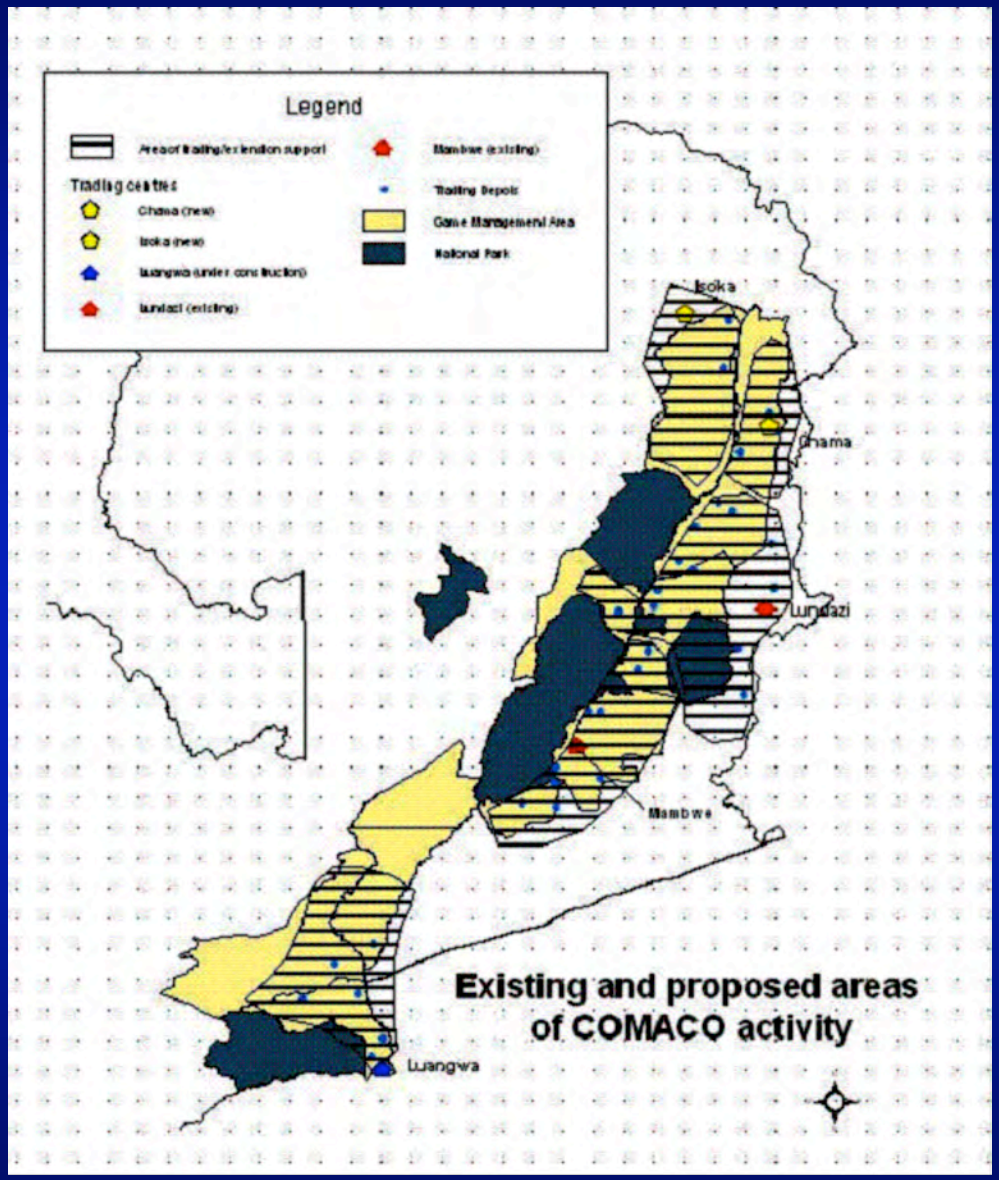
<u>Biodiversity conservation</u>:

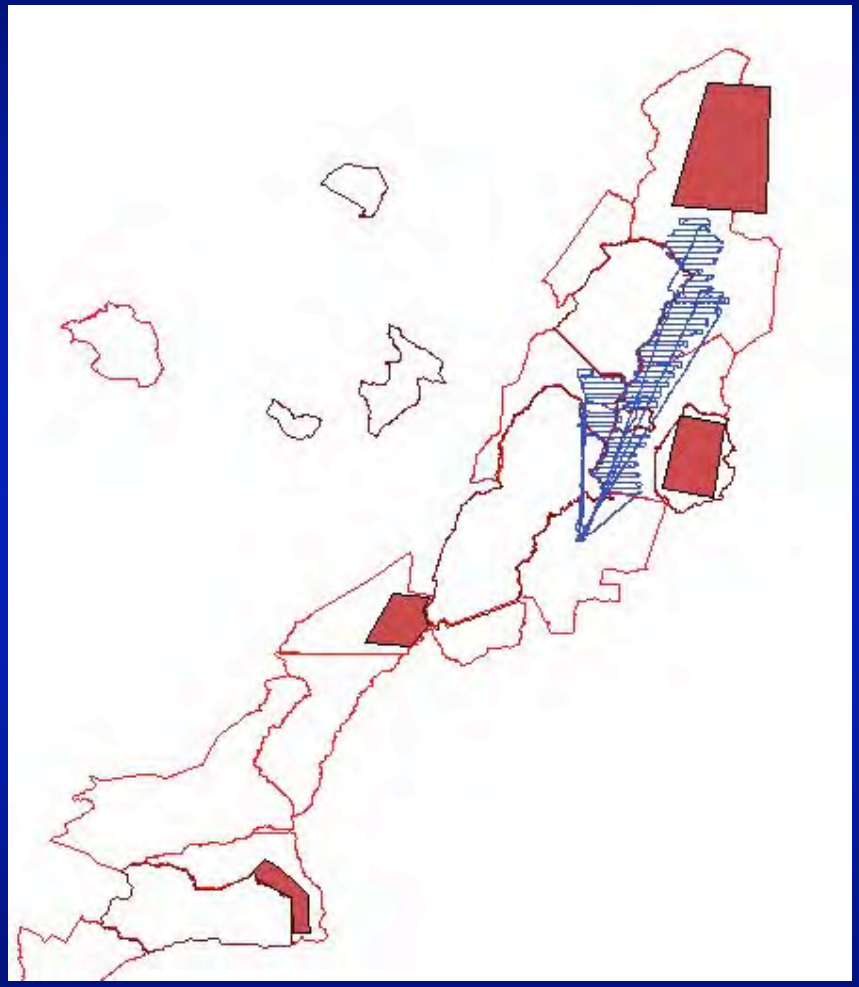
Confirm adoption of conservation practices (snare counts, safari complaints of poaching)

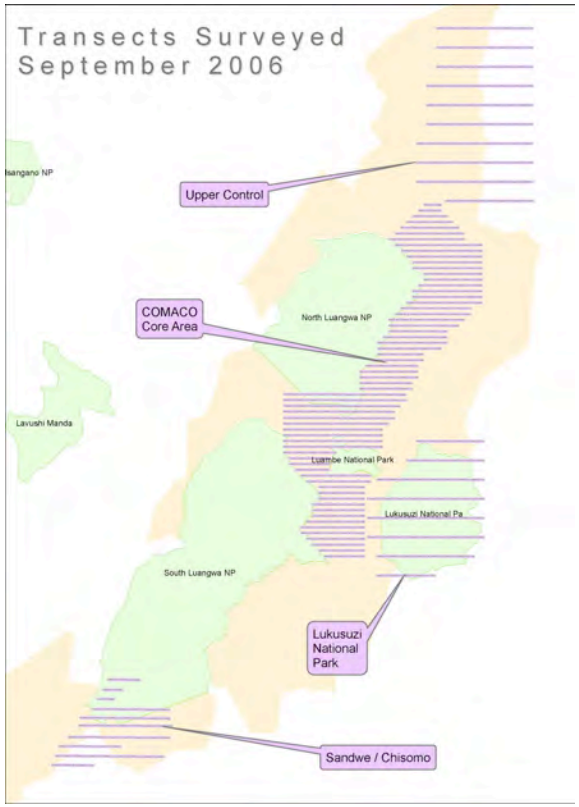
Proxy data for wildlife populations (hunting effort, % success)

Wildlife censuses (multi-species; aerial and ground)

Handling of crop predation: social and economic aspects of adoption of solar electric fencing


Legend
Trading centres
Chama (new)
Isoka (new)
Luangwa (under construction)
Lundazi (existing)
Mambwe (existing)
Trading Depots
Game Management Area
National Park
Isoka
Chama
Lundazi
Mambwe
Luangwa
Existing and proposed areas
of COMACO activity





Area	COMACO Core	Upper control	Lukusuzi NP	Chisomo GMA
Area sampled (km2)	5329	5303	3758	250
Species				
Buffalo	156	0	0	0
Wildebeest	167	0	0	0
Waterbuck	75	0	0	0
Zebra	116	13	15	0
Elephant	207	24	0	32
Eland	7	0	0	0
Hartebeest	40	0	2	0
Roan	14	3	11	0
Kudu	13	1	1	0
Puku	224	0	0	0

	1999			2002			2006				
Area	**Obs**	**Total**	**Se**	**Obs**	**Total**	**Se**	**Obs**	**Total**	**Se**	**02**	**99**
Chikwa	14	**80**	35	24	**137**	51	53	**520**	167	**2.19**	**2.58**
Chifunda	3	**12**	7	11	**55**	20	14	**137**	83	0.96	1.50
Chanjuzi	3	**17**	14	1	**6**	5	28	**303**	70	**4.26**	**4.04**
Munyamadzi	45	**222**	103	17	**127**	53	42	**412**	189	1.45	0.88
Mwanya	43	**222**	80	0	**0**	0	13	**127**	72	1.77	-0.88

Table 12: Data combined for the poaching-susceptible species, excepting wildebeest. Comparisons between 1999 and 2006, and 2002 and 2006 are shown, with significant values shaded ($p<0.05$, ~25 df)

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Robert Delve

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COMACO

WILDLIFE CONSERVATION SOCIETY

SANREM CRSP

1872 VirginiaTech Invent the Future

UNITED STATES AGENCY INTERNATIONAL DEVELOPMENT USAID

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