Wildlife PES Schemes and Pastoral Livelihoods in Arid & Semi-Arid Lands (ASALs) in Kenya

Philip Osano¹,², Jan de Leeuw², Mohammed Said²

¹Department of Geography, McGill University, Montreal, Canada
²International Livestock Research Institute, Nairobi, Kenya
Presentation Outline

1. Kenyan ASALS: Environmental Goods & Services
2. Issues and Challenges
3. Community Conservancies & Wildlife PES Schemes
4. Ecological Outcomes
5. Livelihood and Poverty Impacts
6. Lessons Learnt and Future Directions
1. Kenyan ASALs: Environmental Goods & Services
1. Kenyan ASALs: Environmental Goods & Services

High spatial and temporal variability in precipitation and temperature fluctuations

Ref: Sombroek et al., 1982
Livestock, Wildlife and Tourism

—Extensive livestock production through pastoralism
—70% of national livestock population
—Supply of protein and food security

—90% of wildlife and 88% of protected area in ASAL
—Majority of wildlife (large mammals) live permanently or seasonally outside protected areas

—Wildlife and pastoral landscape backbone of biodiversity conservation and tourism industry

2. Issues and Challenges in ASALs
2. Issues and Challenges in ASALs

Land privatisation & fragmentation

- Maasai speaking people arrived in Athi Kaputiei with their livestock (1600)
- Arrival of White Settlers (1895)
- In 1811, the northern reserve was closed to Maasai and a single extended southern reserve was created from south Kenya to northern Tanzania. The Maasai lost about 80% of their best land to white farmers (1911)
- Creation of Parks and Maasai cut from dry season range (1940s)
- Land adjudication Act (1968)
  Establishment of group ranches and the first group was the Athi-Kaputiei
- Establishment of Export Processing Zone (19xx)
- Ngong forest gazetted due to deforestation (1985)
- Subdivision of group ranches began with Athi-Kapiti (1986)
- Land lease programme initiated by local community and FoNAPP not to fence the land (2002)
- Increase in land sales, expansion of rural and urban development (2005)

Policy change in property rights has led to rapid shift from large land parcels under communal tenure to small individuated land parcels under private tenure.

Ref: Norton-Griffith, 1996; Galaty, 1994; Reid et al., 2004; 2008
2. Issues and Challenges in ASALs

Changes in human population, livestock, wildlife and cultivation in ASALs

- Decline in wildlife numbers and increase livestock, human population, off-take and cultivated areas in ASALs
- Overall, majority of wildlife found in private PAs; the only land category exhibiting positive trends in wildlife populations

Ref: Norton-Griffith & Said, 2010; Western et al., 2009
Agriculture expansion in ASALs (1981-2000)

- Crop cultivation in ASALs increased by 34% in 1981-2000 period
- In 2000, ~11% of ASAL was under agriculture
- Increased intensification of livestock production in ASALs

Source & Ref: ILRI & Ref: Osano et al., 2010
High poverty levels among pastoral communities also around wildlife parks and reserves.

Diversification of income sources and payment for wildlife conservation could reduce poverty levels?

Ref: ILRI; Okwi et al., 2007; Homewood et al., 2009; Little et al., 2008
3. Community Conservancies & Wildlife
PES Schemes in ASALs
3. Community Conservancies & Wildlife

PES Schemes in ASALs

Evolution of Community Conservancies

<table>
<thead>
<tr>
<th>Land Tenure</th>
<th>Funding Source</th>
<th>Conservancies &amp; PES Schemes</th>
<th>2000</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communal Tenure (Group Ranches and Trust Land)</td>
<td>Market</td>
<td></td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Public</td>
<td></td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>Private Tenure</td>
<td>Market</td>
<td></td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Public</td>
<td></td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>7</td>
<td>36</td>
</tr>
</tbody>
</table>

Conservancies Established

<table>
<thead>
<tr>
<th>Conservancies Established</th>
<th>No data</th>
<th>2000s</th>
<th>1990s</th>
</tr>
</thead>
<tbody>
<tr>
<td>I (humid)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II (sub-humid)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III (semi-humid)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV (semi-humid to semi-arid)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V (semi-arid)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VI (arid)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VII (very arid)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: ILRI (International Livestock Research Institute)
PES Case 1: Wildlife Lease Program

Secure the wildlife dispersal area and migratory corridor for Nairobi National Park by paying pastoralists US$10/ha/yr

Conditionalities in WLP

- No selling of land enrolled in PES scheme
- No-sub dividing land in lease
- No fencing of land in lease
- Landowners to refrain from and report poaching
- Protect natural vegetation
Enrolment & Payments in the WLP

Trend in enrollment in Wildlife Lease Scheme (2000-2010)

No. of enrolled households

Amount paid (US$, 000's)

Total PES payments to WLP Households (in 2005'$)

Ref: Osano et al., (forthcoming)
PES Case 2: Olare Orok Conservancy (OOC)

Pastoral land owners paid between US$ 30-40/ha/yr to consolidate and lease individual land parcels to private investors for high end wildlife tourism and conservation in the dispersal area of Maasai Mara National Reserve.

Conditionalities in OOC:

- Exclusion of settlements in the conservancy
- Restriction on cattle grazing except in drought periods (controlled)
- Restrictions on land sales
Replication of OOC PES Model (2006)

Conservancy & Area (Ha)
1. Olare Orok (9,720)
2. Olkinyei (4,856)
Replication of OOC PES Model (2006-2012)

- Total area under conservancy quickly expanded

Conservancy & Area (Ha)
1. Olare Orok (9,720)
2. Olkinyei (4,856)
3. Motorogi (5,466)
4. Mara North (30,955)
5. Naboisho (20,946)
6. Enoonkishu (6,566)
7. Lemek (6,860)
8. Ol-Chorro (6,879)
### Comparison between PES Case 1 & 2

<table>
<thead>
<tr>
<th></th>
<th>Case 1: Wildlife Lease Program</th>
<th>Case 2: Olare Orok Conservancy (OOC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year started/period</td>
<td>2000 (12 years)</td>
<td>2006 (5 years)</td>
</tr>
<tr>
<td>Land Tenure</td>
<td>Private, individuated</td>
<td>Private, individuated</td>
</tr>
<tr>
<td>Area of land</td>
<td>16,700ha (2010)</td>
<td>10,000ha</td>
</tr>
<tr>
<td>Funding source</td>
<td>Public funding (Government and World Bank/GEF)</td>
<td>Market funding (Private tourism enterprises and investors)</td>
</tr>
<tr>
<td>Contract arrangement (period)</td>
<td>Individual contract (1 year)</td>
<td>Group contract (5 &amp; 10 years)</td>
</tr>
<tr>
<td>Governance</td>
<td>Intermediary: NGO (The Wildlife Foundation)</td>
<td>Intermediary: Private company (Ol Purkel Ltd)</td>
</tr>
</tbody>
</table>
4. Ecological Outcomes of Wildlife PES Schemes
PES & wildlife dispersal/migration corridor in ASALs in Southern Kenya

Source: DRSRS (Department of Resource Surveys & Remote Sensing) et al. (in prep)
Distribution of selected species in Athi Kaputiei Plains

Legend
- Zebras Observed
- Tsnas
- Major Rivers
- Fences
- Nairobi National Park

4. Ecological Outcomes of Wildlife PES

Schemes
4. Ecological Outcomes of Wildlife PES Schemes

PES & wildlife dispersal/migration corridor in Athi Kaputie Plains

Ref: Osano et al., forthcoming
4. Ecological Outcomes of Wildlife PES Schemes

Impact on fencing and blockade of wildlife & livestock mobility in Athi Kaputie Plains

Ref: Osano et al., forthcoming
Potential Leakages and Knock-off effects on Park and Communal Lands

Ref: Ogutu et al., 2011
5. Pastoral Livelihood and Poverty Impacts

—PES income represents an invaluable source of income diversification in periods of severe drought e.g. 2008-2009

—PES can provide a ‘safety net’ for pastoral households in dealing with environmental shocks

Ref: Osano, 2011; Zwaagstra et al., 2011
## Determinants of Participation and Poverty in the WLP PES Scheme

| Explanatory Variable                  | Co-efficient | z-value | P>|IzI | Pseudo R² | N |
|---------------------------------------|--------------|---------|------|----------|----|
| Size of Farm (ha)                     | 0.005        | 2.51    | 0.012| 0.172    | 158|
| Wildlife predation                    | 0.864        | 2.05    | 0.041| 0.172    | 158|
| Adult labour                          | 0.163        | 2.04    | 0.042| 0.172    | 158|
| NDVI_lag3 (2004-2009)                 | -9.769       | -2.33   | 0.020| 0.172    | 158|
| Composite Asset Index (CAI)           | 0.622        | 1.82    | 0.069| 0.172    | 158|
| Constant                              | -0.747       |         |      | 0.172    | 158|

---

Richer households with greater asset endowments, including larger farms, and occupying areas with higher grazing potential are the most likely to participate in the WLP.

Ref: Osano et al., forthcoming
## Per capita poverty impact of PES in OOC

<table>
<thead>
<tr>
<th>N</th>
<th>Mean income (US$/person/day)</th>
<th>CV</th>
<th>% Contribution to household income</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Agriculture</td>
</tr>
<tr>
<td>Mara Group Ranches (1998-2004)</td>
<td>210</td>
<td>0.84</td>
<td>116</td>
</tr>
<tr>
<td>OOC – PES 2009</td>
<td>58</td>
<td>1.51</td>
<td>157</td>
</tr>
<tr>
<td>OOC + PES 2009</td>
<td>73</td>
<td>2.45</td>
<td>93</td>
</tr>
</tbody>
</table>

**Individuals**: Higher income for those benefitting from PES in Olare Orok Conservancy (OOC)

**Households**: Significant (40%) household income derived from PES payments in 2009

**Equity income** among households increased because families received more or less same area of land

Ref: Osano et al., (in prep.)
6. Lessons Learnt and Future Directions
Lesson 1: Land tenure system can be a constraint or enabling factor in PES

—Privatisation of pastoral lands in ASALs led to expansion of landuses that are incompatible with pastoralism (extensive livestock production) and wildlife conservation; cropping, fencing etc;

—Privatisation of pastoral lands in ASALs provided individual landowners security of tenure hitherto not guaranteed in communal land tenure system, and enabled landowners to capture benefits of PES payments at the household level

—Self organised private PES schemes tapping into market funding are more common under private, individuated land tenure regimes while public funded PES schemes tapping into government and NGOs funding are more common under public and communal (private) land tenure regimes
Lesson 2: PES involves synergies and trade-offs among pastoralism, income and wildlife conservation

—Higher payments to pastoral landowners are necessary for PES with conditionalities that do not support pastoral livelihoods (e.g. US$ 43/ha/year in OOC for restriction to settlements and livestock grazing) compared to PES conditionalities that support traditional pastoral livelihoods (e.g. US$ 10/ha/year in the WLP)

—PES is a critical source of income diversification for pastoral households, during periods of shock such as drought when PES income can buffer households from fluctuating livestock income

—Wildlife PES schemes tapping into funds from the tourist sector may promote the conservation of only species of tourist value such as charismatic carnivores overlooking knock-off effect on the larger ecosystem such as displacement of grazing pressure
Lesson 3: Pay attention to poverty and equity implications

— Land based PES schemes among pastoral households exclude the landless poor and women from direct benefits.

— High inequality exists in terms of cash income, livestock assets, land holdings and other assets among potential environmental service providers, which is likely to favor non-poor households in terms of PES participation.

— Over 40 community based conservancies in Kenya (1 million ha); Payments from $1 to $40/ha – sufficient to impact poverty levels.

— Review of different sources of income shows that in both OOC and WLP PES Schemes, PES payments is the most equitable of all the income sources irrespective of existing inequalities in land ownership (high inequality for WLP and low inequality for OOC).
Lesson 4: Plan for “Climate-smart” PES

—Evidence shows that drought effects and grassland vegetation conditions is a significant determinant of participation of pastoral households in wildlife PES schemes.

—In the short-term, variability in climate will impact conservancies and PES schemes differently.

Precipitation change (1970-2025)

Temperature change (1970-2025)

Source: modified from FEWSNET 2010
Lesson 5: Multiple policy goals (Kenya Vision 2030)

**Vision for 2030**
A nation living in a clean, secure and sustainable environment

<table>
<thead>
<tr>
<th>Strategic thrusts</th>
<th>Conservation</th>
<th>Pollution and waste management</th>
<th>ASAL and high-risk disaster zones</th>
<th>Environmental planning and governance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promote and safeguard the state of environment for economic growth</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Goals for 2012</th>
<th>Overall</th>
<th>Specific</th>
<th>Specific</th>
<th>Specific</th>
<th>Specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase forest cover from less than 3% to more than 4%</td>
<td>Establish fully functional solid waste management systems in 5 municipalities and in the special economic zones (SEZs)</td>
<td>Achieve significant reduction in losses arising from floods and droughts</td>
<td>Ensure that all environmental regulations and standards are enforced</td>
<td>Attract 5 CDM projects per year</td>
<td></td>
</tr>
<tr>
<td>Ensure that all wildlife ecosystems are fully protected</td>
<td>Sustain enforcement of new regulations on plastic bags</td>
<td>National trends and impacts assessment determined</td>
<td>Implement 5 adaptation projects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorporate natural resource in national accounts</td>
<td>Develop and enforcement of pollution and waste management and hazardous waste regulations;</td>
<td>Shift from disaster response to disaster risk reduction;</td>
<td>Upgrade capacity for enhanced geo-information coverage and application;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identify 2 new natural resources</td>
<td>Design and application of economic incentive/disincentives;</td>
<td>Bridge the gap between science of climate change and policymaking;</td>
<td>Harmonize environmental related laws;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase extraction of marine resources</td>
<td>Public private partnership for municipal waste;</td>
<td>Aggressively promote adaptation activities to climate change</td>
<td>Strengthen institutional capacities;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rehabilitation of degraded forest areas and promotion of farm forestry;</td>
<td>Reduce importation of oil with high Sulphur content</td>
<td>Use of incentives for environmental compliance;</td>
<td>Strengthen negotiation skills on MEAs and enhance coordination of their implementation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>User compensation for environmental services; Promote biotechnology;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secure wildlife corridors and migratory routes;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve security of boundaries of protected areas;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensity exploration of new minerals;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase extraction of marine resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Cross cutting issues**
- Education for sustainable development

5. Lessons Learnt and Future Directions
Lesson 5: Multiple policy goals and strategies

1. National ASAL Vision and Strategy
2. National Climate Change Response Strategy
3. Sectoral Strategies (Tourism, Wildlife, Livestock, Land etc)
References

FEWSNET (2010). *La Nina and Food Security in East Africa*. Washington, D.C.: FEWSNET (Famine Early Warning System in East Africa) and USAID.


Acknowledgements

FUNDING SUPPORT
1. International Livestock Research Institute (ILRI) (www.ilri.org)
2. McGill University
   - Department of Geography (www.geog.mcgill.ca)
   - McGill Institute for International Development Studies (IIDS)
3. Center for International Governance Innovation/Africa Initiative Project, Canada (http://www.africaportal.org/exchange)
4. International Development Research Center (IDRC), Canada (www.idrc.ca)
5. Africa Technology Policy Studies Network (ATPS) (www.atpsnet.org)
6. Embassy of the Federal Republic of Germany, Nairobi
7. Association for the Strengthening of Agricultural Research in Eastern and Central Africa (ASARECA grant PAAP/09/02) (http://www.asareca.org/)

DATA
International Livestock Research Institute (ILRI)
The Wildlife Foundation (TWF);
Olare Orok Conservancy (OOC)
Local communities and respondents in Maasai Mara and Kitengela who participated our survey