



Costs, benefits and equity in biodiversity conservation

CARE Poverty and Environment Network Study
Supported by CARE Uganda

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Summary

How can a knowledge of economic costs, benefits and equity help target conservation interventions with communities?

- Key issues – equity and
- General economic relationships between people and PA
- Results – selected findings
- Conclusions and recommendations related to ICDP, CC and PES approaches

Protected Area Threats

Two key factors may be seen as the major threats to protected areas worldwide (Barbier & Burgess, 2002):

1. Conversion of PA into agricultural and grazing land, due to population expansion and extensive pastoral systems
2. Over harvesting (mining of the resource) for fuel wood, timber, NTFP and charcoal due to high dependence by predominantly rural populations to maintain their livelihoods.

Conservation threats vs. human needs

Conservation threats

- Habitat loss
- Hunting
- Harvesting

Human needs

- Income
- Consumption
- Livelihoods security
- Good health

Challenge:

Maintaining balance between social and economic needs with environmental integrity

Threats or opportunities?



Framework for analysis

- Direct and indirect use values
- Financial and Economic values

Financial values – prices of goods and services as they accrue to a private individual

or

Economic values – value of goods and services to nation as a whole adjusted to account for social and environmental concerns (social and financial values combined)

Components of Total Economic Value

Direct economic costs and benefits:	Indirect economic costs and benefits:
<p>Timber-Fuel wood, Construction, Charcoal</p> <p>Non Timber- Honey, wild food, medicinal plants, bushmeat</p> <p>Recreational use- Tourism</p> <p>Grazing</p> <p>Cultivation</p> <p>Management costs</p> <p>Damage costs (crop raiding)</p> <p>Risk management</p>	<p>Soil - fertility and erosion control</p> <p>Water - conservation and regulation</p> <p>Carbon sequestration</p>

Why equity?

Convention of Biological Diversity

Target (2.1)

- *Establish by 2008 mechanisms for the equitable sharing of both costs and benefits arising from the establishment and management of protected areas."*

Conservation should do no harm to local communities!

Assess the economic and socio-cultural costs, benefits and impacts arising from the establishment and maintenance of protected areas,

Emphasis on:

- Indigenous people
- Local communities

Mitigate negative impacts and where possible compensate costs and share benefits

What do we mean by equity?

Economic: distribution of benefits between groups or level in the economy

Social: Sense of fairness by stakeholders about the share of costs and benefits from PA

Sampling

- Sites – governance type
- LC 1 Adjacent to the PA
- 30 Households in each LC1
- Sampled proportionately according to wealth/well being groups
- 630 households in total



Communities were often very remote!

Methods

Rapid Social Impact Assessment:

- Scoring and ranking of key costs and benefits
- Overall impact of PA on household and attitude to PA

Financial:

- Household income studies
- Proportion of HH income from PA products

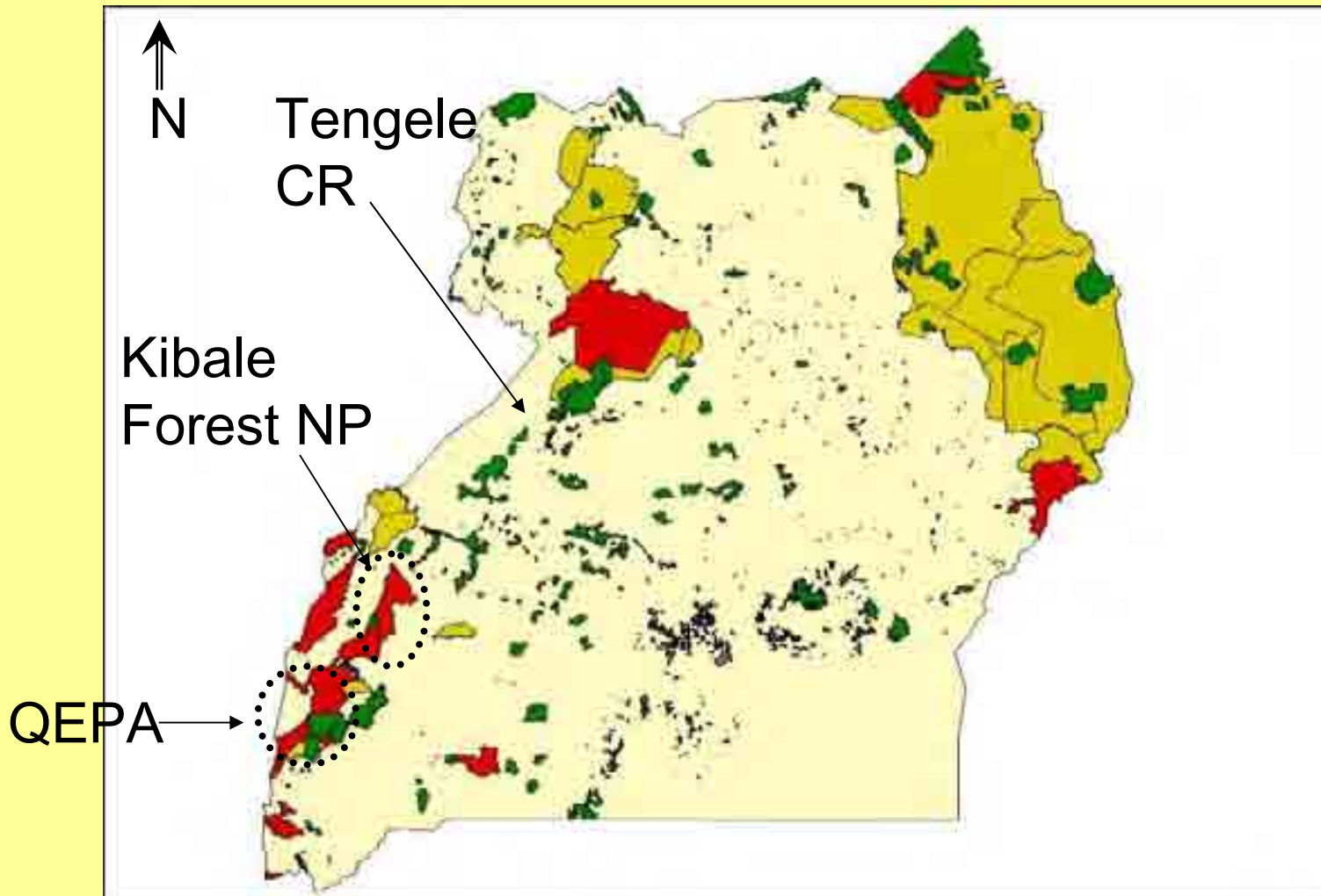
Economic:

- Contingent valuation (willingness to accept compensation for loss of access)
- Total direct benefits

Study Sites Uganda

Protected Area	Bio Type	Governance Type	No of Households in survey
Queen Elizabeth National Park	Savannah Woodland & Grassland	Strict National Park (no community co-management)	330 (in 11 communities)
Bwindi Impenetrable Forest National Park	Afromontane Forest	National Park with some community co-management	240 (in 8 communities)
Tengele Community Forest Reserve (Masindi District)	Tropical (Closed Forest	High Canopy) Forest on private (community) land, community owned and managed	60 (in 2 communities)
Total HH			630

Study Sites Uganda



Key Protected Areas in
Uganda

Local level – RSIA

QEPA –Costs and Benefits

Rank	IMPACT -Benefits	Total responses	% n benefit
1	Impact on local rainfall	228	69.30
2	Impact on your access to firewood	101	30.70
3	Impact on your access to NTFP	77	23.40
4	Effect on your knowledge and skills	74	22.49
5	Effect on security	43	13.07
6	Impact on your access to timber	28	8.51

Rank	IMPACT - Costs	Total responses	% n cost
1	Effect on your agricultural productivity	288	87.54
2	Impact on out migration	225	68.40
3	Effect on the time you have available for agriculture	157	47.72
4	Impact on your access to firewood	148	44.99
5	Access to farm land	113	34.35
6	Impact on your access to NTFP	107	32.52

Local level – RSIA

Bwindi –Costs and Benefits

Rank	IMPACT -Benefits	Total responses	% n benefit
1	EFFECT ON RAINFALL	217	91.56
2	EFFECT ON LEVEL OF SUPPORT FROM NGO	115	48.52
3	EFFECT ON HEALTH SERVICES	102	43.04

Rank	Issue	Total responses	% n costs
1	EFEFCT ON AG. PRODUCTIVITY	171	72.15
2	ACCESS TO NTFP	136	57.38
3	ACCESS TO FIREWOOD	134	56.54
4	EFFECT OMN TIME FOR AGRICULTURE	131	55.27
5	CAUSED ANY OUT MIGRATION	104	43.88
6	ACCESS TO TIMBER	103	43.46
7	EFFECT ON SCHOOL ATTENDANCE OF CHILDREN	64	27.00

Local level – RSIA

Tengele –Costs and Benefits

Rank	Benefits	% of respondents n=60
1	EFFECT ON RAINFALL	83.33
2	ACCESS TO FIREWOOD	65.83
3	ACCESS TO NTFP	65.83
4	EFFECT ON YOUR KNOWLEDGE AND SKILLS	40.83
5	ACCESS TO TIMBER	28.33
6	EFFECT ON LEVEL OF SUPPORT FROM NGO	25.17

Rank	Key Costs	% of respondents n=60
1	EFFECT ON AGRICULTURAL PRODUCTIVITY	81.7
2	EFFECT ON TIME FOR AGRICULTURE	58.3
3	ACCESS TO FARM LAND	23.3
4	EFFECT ON SCHOOL ATTENDANCE OF CHILDREN	15.8
5	CAUSED ANY OUT MIGRATION	15.0

RSIA – PA impact on livelihood

Site	Score of impact (% of respondents by site)						
	-3	-2	-1	0	1	2	3
QEPA	26.83	9.76	7.01	48.17	0.91	3.96	3.35
Bwindi	42.31	12.82	3.42	0.00	4.70	19.23	17.52
Tengele	0.00	5.00	0.00	0.00	10.00	33.33	51.67

- QEPA – wealthiest felt most negatively impacted
- Bwindi – clear trend poorer groups felt most negatively impacted
- Tengele – the wealthiest groups felt most positively impacted

What do PA contribute to household income?

	n	Mean total HH income (\$)	Mean adjusted HH income (\$)	Mean total HH PA income (\$)	Mean adjusted HH PA income (\$)	Mean % of total HH income from PA (\$)
QEPA	319	1,393.05	303.12	303.12	36.24	8
Bwindi	232	681.37	182.12	0.05	0.01	0.00
Tengele	60	894	242	44	16	6.78

- Up to 8% of HH income from PA
- Low values for Bwindi! High level of enforcement?
- Either people reluctant to reveal info or they really are not getting much access
- Looked at communities with access and without access and results were similar

What is the difference in HH PA income between income/wealth groups?

		Mean Proportion of Total HH Income from PA (%)			
		N	QEPA	Bwindi	Tengele
LOWEST 25 %	Very Poor	80	15	0	13.24
LOWER MIDDLE 25%	Poor	80	7	0	4.00
UPPER MIDDLE 25%	Average	80	4	0	8.39
HIGHEST 25%	Wealthy	79	7	0	6.62
ALL		319	8	0	6.78

- PA income was proportionately more important for the lowest income/poorest households (bottom 25%) than in higher income households.

What is the difference in HH PA income between income/wealth groups?

		Mean Adjusted PA Income (\$)			
		N	QEPA	Bwindi	Tengele
LOWEST 25 %	Very Poor	80	1.77	0	3
LOWER MIDDLE 25%	Poor	80	2.34	0	2
UPPER MIDDLE 25%	Average	80	3.00	0	8
HIGHEST 25%	Wealthy	79	26.40	0	51
ALL		319	8.32	0	16

- On average in absolute terms higher income households appropriate more income from the PA than lower income/poorer households

Total direct benefits

- Mean value over all sites was \$350 per annum WTA compensation (S.D.320)
- Compare to financial estimate of \$22

WHY?

- Difference between economic and financial measures.
- A measure of the social value plus financial expressed in a money term

Difference between HH financial value and their WTA value:

- Total household income (-), low dependence/other alternatives
- Agricultural land (-), low dependence/other alternatives
- Household occupants (+), poorer and more dependant
- Community management (+), value the security of access arrangements, high dependency

How is PA income distributed between income groups?

Quartile	Wealth group	Cumulative share of total income available (%)		
		QEPA	Bwindi	Tengele
LOWEST 25 %	Very Poor	5.32	3	4.6
LOWER MIDDLE 25%	Poor	7.05	8	3.74
UPPER MIDDLE 25%	Average	9.05	9	12.3
HIGHEST 25%	Wealthy	78.57	72	71.36

- Overall despite the wealthiest households being the lowest proportion of the communities they capture most of the available income from the PA
- Community participation in management has only a small marginal impact on elite capture

National and Global Economic Benefits

		QEPA	Bwindi	Tengele
NATIONAL	Watershed	6,538,000	1,149,933	1,069
	Soil Conservation	6,410,000	4,378,886	18,694
	Biodiversity value	693,243	356,793	13,111
	Tourism revenue	728,661	2,400,955	
	Tourism revenue multiplier	1,500,369	4,681,863	
	Tourism tax multiplier	488,818	720,287	
Total		16,359,091	13,688,716	32,874
GLOBAL	Carbon	1,894,717	2,941,527	3,219
	Biodiversity option	298,453	3210	110
	International tourism (cor	1,095,965	4,570,000	
Total		3,289,135	7,514,737	3,329
Per Ha	National	79	414	450
Per Ha	Global	16	138	46

Distribution of benefits

		Relative distribution of gross benefits		
		Local	National	Global
Strict national park	QEPA	24%	57%	19%
National park with community management	Bwindi	15%	45%	40%
Community conserved area	Tengele	83%	9%	8%

Summary

Local Level

- Households near PA use them for a substantial proportion of their income
- PA goods are important for both subsistence as well as for cash income needs
- Wealthier households gain more in absolute terms than poorer households (locally inequitable)
- Despite financial and economic evidence, community based initiatives empower people (believe the deal is fairer)
- Compensation for local communities – PA can not always afford to do this. If global community wishes to continue to benefit can they afford to pay?

Summary

National & Global Level

- PA contribute more to the national and global economy than is often appreciated
- Public goods as the values contribute generally to poverty reduction and economic growth
- Community approaches management appears to shift the balance of benefits to the local level
- Complex issues of local to global externalities benefits at one level are costs at another

ICD and CC vs PES

- ICD – rural development/income generating activities assuming some indirect link to conservation objectives.
- CC – activities having some direct impact on PA management contributing to local livelihoods also social infrastructure paid for through conservation money
- PES – direct payments (incentives) to PA adjacent households to engage in socially desirable activities

ICD & CC limitations

- ICD – twin goals conservation and community/household welfare
- Assumption- improving human welfare also leads to improved local management of resources including PA (not proven)
- Complex and costly institutional and organisational framework to succeed
- Conservation through distraction (Conrad & Ferraro 2001)
- Social infrastructure projects do not put money in the household purse limited impact on behaviour change

PES a superior alternative?

PES more economically efficient in theory!

Potentially less institutionally heavy than ICDP

Direct compensation of household opportunity cost most likely to change behaviour toward the PA

Improved cash flows

Allows own decision over best courses of action/investment in livelihood options

Manage expectations – no false promises, just a defined payment at a given time

Sources of international finance – Carbon finance, international biodiversity funds

PES challenges

- What level of payment (economic or financial)?
 - How much to which households?
 - Defining community/individual property rights over public lands
 - Payments made to individuals with a defined property right over a given resource
 - Monitoring biodiversity status (targets) may be more costly than currently appreciated
 - Subsistence farmers can't eat or burn money; substitutability of money for availability of forest products foregone
- i.e. investment in woodlots may not be constrained by availability of money but land which may be locally scarce

Conclusions

Implications for PA management

ICDP & CC

- Increasing household income will not necessarily lead to decreased use of the PA resources (*ceteris paribus*)
- Reducing use to a sustainable level may increase rural poverty as it implies significant losses to household income.
- Access to PA benefits by poorest groups may suffer with increasing community involvement in management
- Still need adequate protection and enforcement activities to combat illegal uses of PA
- Need more effective targeting of the different risk groups (poor need to be targeted in different ways from wealthy)

Conclusions

Implications for PA management

PES

- Different income groups have different social values towards PA variable payments to reflect relative importance?
- Monitoring conservation targets may be more expensive and challenging than first perceived?
- A participatory monitoring essential in proving level of inclusion necessary. Capacity problems
- Payments need to change constantly to reflect changing economic conditions I.e. inflation and performance of alternative resource values I.e. price/availability of fuel wood

Conclusions

Implications for PA management

Need a mix of local level approaches:

- Social infrastructure visible contribution of PA to local communities – building good will in communities
- Direct ICD & CC interventions to resolve resource scarcity issues
- Direct payments to give incentives to change behaviour

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