How Much are Uganda's Forests Worth?

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The Albertine Rift – Africa's Western Rift





Land of people and exceptional biodiversity







- Highest vertebrate species richness in Africa
- Highest numbers of endemic and threatened vertebrates
- High Human population density in the Albertine Rift
 - ◆ 200-600/km²
- People are very poor and livelihoods are insecure
- Conservation challenge to conserve biodiversity and alleviate poverty



WCS Activities in the Albertine Rift



- Site Based Conservation Greater Virunga Landscape
 - Transboundary collaboration
 - Landscape species –lions, elephants, golden cats
 - Business planning/sustainable financing
- Research
 - Biodiversity Surveys
 - Endemic/threatened species monitoring
 - Socioeconomic studies
 - Corridors
 - Baselines for monitoring

Capacity Building

 National Monitoring and Research Plans for Uganda, Rwanda and Tanzania



WCS Activities in the Albertine Rift - 2



Policy

- Value of Protected Areas
- ICD Project effectiveness
- Landscape planning in northern Uganda

New Model Development

 Testing a market-based approach to community conservation

Ex Situ Collaboration

Uganda Wildlife Education Centre



Forest Valuation



- Protected areas seen by government as potentially free land for private investors
- Pressures to de-gazette the less valuable areas – particularly in Uganda
- National accounts only value the mainstream trade from forests
- Budget planning processes do not value hidden benefits to the local and national economy



Why consider the broader values?



- Need to better link conservation to poverty alleviation
- Show importance of forests to economic growth and development
- Demonstrate that forests are important in the livelihoods of many rural people
- To develop a more sustainable and integrated approach to forest management
- To influence policy and budgetary processes



Environmental Economics

Direct economic benefits:	Indirect economic benefits:
Eg.	Eg.
Timber	Soil protection
Non timber forest products	Water conservation
Recreational use	Carbon sequestration
Grazing	Cultural values
Crops/swidden cultivation	Option and existence values

Total Economic Value = Direct + Indirect values



Forest Valuation in the Ugandan Context



- Poverty Reduction Strategy Process
- Poverty Eradication Action Plan
 - Focused on poverty alleviation
 - Drives international donor support
 - Forestry/environment left out of early PEAP but included in a recent revision



Previous Forest Valuations

Uganda has some good studies on the economics of forests:

- Peter Howard (1995)The Economics of Protected Areas in Uganda; Costs Benefits and Policy Issues
- Falkenberg and Sepp (1999) "Economic Evaluation of the Forest Sector in Uganda"
- Emerton & Muramira 1999, "Uganda Biodiversity: An economic assessment
- Yaron et al (2003) "The role of the environment in increasing growth and reducing poverty in Uganda"

These were an important start



Limits of Previous Forest Valuations



However:

- Mainly macro in their scope
- Did not collect wealth disaggregated data on the economics of forest livelihoods.
- Supported the need to collect such data



Study Sites





Methods: 1. Household Survey





Use of Forest Products

- Timber, fuelwood, charcoal
- building poles, bean stakes, lianas,rattan, medicinal plants, bushmeat
- Division of households into wealth categories
- Contribution to Annual Income
- Qualify role of forests in livelihoods security and lessening vulnerability.
- 696 households, 48 villages



Method: 2. Evaluation of Secondary Data

A significant body of national data are available on which to base estimates of ecosystem and other services

Source	Data Type
Uganda Bureau of Statistics	Demographic
Forestry Department	Biomass Department Timber revenues by district Timber marketing and management data Forest Tourism revenues
Uganda Wildlife Authority/Uganda Tourism Department	Tourism Revenues in National Parks and other areas
Ministry of Agriculture	Land use data
Ministry of Finance	Economic indicators for key natural resources, and Trade Figures
Makerere University, Faculty of Agriculture	Selected farm management data



Livelihoods - Income

Forest (n)	Mean total Income	Mean income from	Mean % income
	US\$ p.a.	the forest US\$ p.a.	from the forest
Budongo (154)	784.25	65.93	8.4
Bugoma (175)	1,090.78	177.81	16.3
Kasagala (151)	952.6	101.40	10.6
Rwenzori (159)	1,113.68	403.95	35.6
All Forests (639)	994.72	188.72	19.0



•Rwenzori higher total value of income and consumption as well as income from forest and proportion of income from forest



Home consumption vs sale

Forest (n)	Mean value of goods sold US\$ p.a.	Mean value goods consumed US\$ p.a.	Mean income from the forest US\$ p.a.	Value of goods consumed as % of mean forest income
Budongo (154)	21.74	44.19	65.93	67.0
Bugoma (175)	31.63	146.18	177.81	82.2
Kasagala (151)	45.71	55.69	101.40	54.9
Rwenzori (159)	85.19	318.76	403.95	78.9
All forests (639)	46.06	142.66	188.72	75.6



•Forest goods in all forests tended to be consumed in the home

•Lower in Kasagala – because of the charcoal industry



Livelihoods- forest income type

Forest	Observations (n)	Annual NTFP Income Value US\$ p.a.	Annual Woody FP income US\$ p.a.*	Woody FP value as a % of mean forest income
Budongo	180	30.75	27	46.75
Bugoma	179	65.12	109.45	62.70
Kasagala	176	26.21	61.45	70.10
Rwenzori	161	287.97	168.35	36.89
All forests	696	97.94	89.61	47.78

Woody FP = sawn wood, fuel wood and charcoal



 Rwenzori significantly greater proportion of income from Non-Timber Forest Products (NTFPs)

•Budongo lower timber income than might be expected, - enforcement, pitsawyers not from local community?



Breakdown of NTFPs

Forest	Non Wood Products ^a % of total value	Wood Products ^b % of total value	Bushmeat Total ^c % of total value	Large Wild Animals ^d % of total value	Small Wild Animals ^e % of total value
Budongo	12.07	69.81	18.12	8.81	9.30
Bugoma	33.19	60.28	6.53	0.98	5.55
Kasagala	10.75	82.08	7.17	1.46	5.71
Rwenzori	11.97	29.96	58.07	39.97	19.10



^aNTFP not including wild animals, and birds
^bTimber, firewood, charcoal etc
^cWild mammals and birds
^dElephant, buffalo and larger antelopes
^eDuiker and smaller mammals such as rats, bush pigs



Livelihoods – Wealth and forest use



- In Budongo, Kasagala and Rwenzori there was no significant difference found between wealth groups in absolute forest income
- In percentage terms the poorest households derived significantly more income from forests than the wealthier categories.
- This is a strong indicator of the economic reliance that poor people have on forests.



Household size and distance from forest

- Positive correlation between household size and forest use
- Positive correlation between household size and wealth
- Negative correlation between distance from forest and forest income







Seasonality

- Positive correlation between the months when the forest was used most with:
 - -Months in which food must be bought -Months when cash needed most
- Corresponds to the dry season months and 'Hungry Gap'
- Clearly shows the role forests play in reducing vulnerability from seasonal shocks



Livelihoods- Value per Ha to households

Forest	A Area of forest (Ha) ^a	B Total No [⊳] households	C Mean household income from forests US\$ p.a.	D Total local livelihoods value US\$ p.a. (B*C)	E Livelihood value per Ha of forest US\$ p.a. (D/A)
Budongo	79,300	12,078	65.93	796,302.54	10.05
^c Bugoma	128,804	12,213	177.81	2,171,593.53	16.86
Kasagala	10,105	2,792	101.40	283,108.80	28.02
Rwenzori	97,380	32,468	403.95	13,115,448.60	134.68

aNational Biomass Study 2003

^bUBOS, Census 1992

°The area of riverine and gallery forest south of Bugoma forest reserve, not the forest reserve itself.



•Rwenzori highest value to local households

•BUT Current use values are probably unsustainable



Livelihoods National Values – Forest Type

Forest Type	A Livelihood value per Ha US\$	B Total Ha of forest type in Uganda	C Total livelihood value of forest type US\$ p.a. (A*B)	D NTFP value US\$ p.a.	E Timber products value US\$ p.a.
Protected THF	10.05	427,210	4,272,100	2,524,811	1,747,289
Private THF Forest	16.86	350,130	5,903,192	2,266,826	3,636,366
Savannah Woodland /Bushland	28.02	1,372,78	38,463,278	15,154,532	23,308,746
Afromontane	134.68	264,200	35,582,456	20,744,572	14,837,884
	Grand Total	2,414,248	84,221,026	44,216,039	40,004,987



•Highest per ha values for wood-based products ('Timber') from Savannah Woodland – charcoal

•Highest per ha values for NTFPs in Afromontane forest – home consumption



Other Direct values



Tourism - \$1.4 million
 Timber revenues - \$8.5 million
 Forage values - \$20 million





Ecosystem Values

Water

59.3% of all respondents obtained water from local forests

Value of domestic water from forests is about \$35.8 million/year

Soil Fertility

Replacement cost of \$58.3 million/year using mineral fertiliser to replace nutrients lost

Carbon

Carbon sequestration was valued at \$33.1 million/year

Biodiversity

Valued at \$3.4 million/year



Informal sector	111.8 million (33%)
Non-market	130.6 million (37%)
Total	349.5 million

Timber only accounts for 7% of Forest values

Only 10% of TEV accrues to Global Community (carbon and biodiversity)

90% of TEV contributes directly to the Ugandan Economy



National Context – GDP



•Estimate from this study currently at 5.2% of GDP (2002 figure)

•But an increase in real terms in the estimated value of forests

•\$275.5 million in 1998 to \$350 million in 2003

•\$75 million increase is primarily due to better data on people's use of the forest



Policy Recommendations Local



- Current forest use is unsustainable
- Making rural households wealthier will not reduce the exploitation of forest resources
- In the short term there is every indication that forest exploitation will increase
- Need to integrate local people in forest management as resources are too few to police



Policy Recommendations National



- Public goods need to be funded from Treasury
- Need to develop a sector investment plan to integrate the needs of the forestry sub-sector into the GOU budgetary process
- Coordinate forest management and rural development to reduce impacts of any move to sustainability



Policy Recommendations International



- Need for International Financing for global benefits:
- GEF and World Bank Bio Carbon Fund
- In addition finances from carbon offset schemes and debt for nature swaps should also be investigated
- Promote the fact that funding forest conservation also contributes to poverty alleviation



Poverty Alleviation and conservation



- Results show forests are important for:
- Increased incomes for poor
- Maintaining quality of life
- Reducing seasonal stress and vulnerability
- Important to local and macro economic development



Linking forest valuation to business planning



- It is clear that forests in Uganda have value
- How do we get people who can afford it to realise the value and contribute to the conservation of the resource?
- Business planning is a tool that has the potential to do this.

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FOREST RESOURCES MANAGEMENT AND CONSERVATION PROGRAMME