

THE ECONOMICS OF PROTECTED AREAS IN UGANDA: COST AND BENEFITS OF MANAGING BWINDI IMPENETRABLE FOREST NATIONAL PARK

Presented

By

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and partners*

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Goal

To provide an overview of the costs and benefits associated with Bwindi Impenetrable Forest National Park as a PA

Major objectives

1. To value the direct and indirect benefits of Bwindi Impenetrable National Park to society.
2. To value management and opportunity costs of Bwindi Impenetrable National Park.
3. To quantify the Total Economic value (TEV) of BINP
4. Enhance awareness on economic values of the protected areas among the various stakeholders

Justification

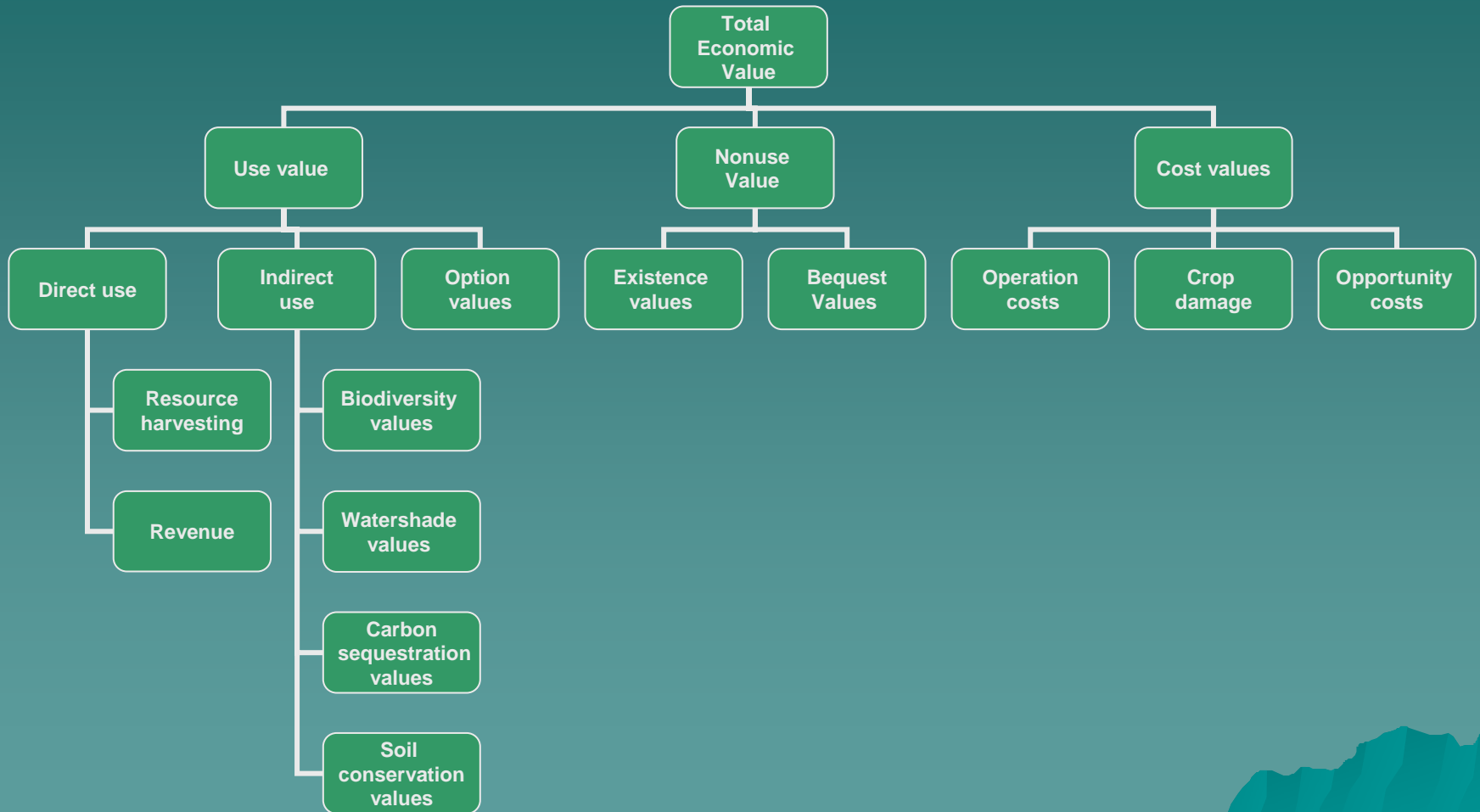
- ◆ Demands on **land use** have resulted in major **challenges** related to the need for the protected area to **pay for its way and benefit** a broader community



PA values that arise from conservation have to come out clearly to **'favorably compete'** with other alternative land uses

Components of TEV

(Pearce and Turner, 1990)



Methods –Direct use values Revenue

- ◆ Revenue statistics were obtained and statistics compiled from the accounts sections of the park and UWA HQs
- ◆ The potential revenue of BINP through tourism was obtained by the contingent valuation methods (CVM) as applied by HM Treasury (1984), in Kula (1984) and Pearce and Turner, (1990) through a questionnaire.

Methods –Direct Use values NTP

- ◆ **non-timber products** of BINP i.e. firewood, poles and herbal medicine : Strategic meetings, direct observation and measurements, in kgs (Peters et al. 1989) while medicinal herbs were measured through handfuls on harvests (Aylward 1993)

40 households from each selected six parishes (<2km 'near' and >2 km'far') from that park boundary for a period of 12 months

Harvested resource values per household were calculated.

Methods- Indirect Use Values (IUV)

- ◆ **Biodiversity and existence values** : Contingent valuation involving Willingness to Pay (WTP) Pearce and Turner, (1990) and UNEP (1995)
- ◆ **Soil Conservation and watershed values**: A combination of methods: market prices, circumstantial evidence and substitution methods in 40 households (Pearce (1990)).
40 households from each selected six parishes (<2km 'near' and >2km 'far') from that park boundary
- ◆ **Carbon sequestration** : market prices methods and Published related methods on protocarbon credits (Pearce (1990))

Methods-Costs

- ◆ **Management/operation costs** : statistics compiled from the accounts sections of the park and UWA headquarters
- ◆ **Crop damage costs** : productivity value loss estimates : through Direct observations and surveillance , measurements of crop and areas planted and damaged Using market prices
- ◆ **Opportunity cost- foregone agricultural opportunities.** (food and revenue from sales) –
75% of BINP is suitable for agriculture (Tukahirwa and Pomeroy, 1993);
Estimated the expected mean standard production -two seasons of Kisoro–Kabale highlands agro-ecological system main food/cash crops sorghum, beans, irish and sweet potatoes according to Agriculture and livestock census, 1993 and Market News Service (MNS) Jan. 2006

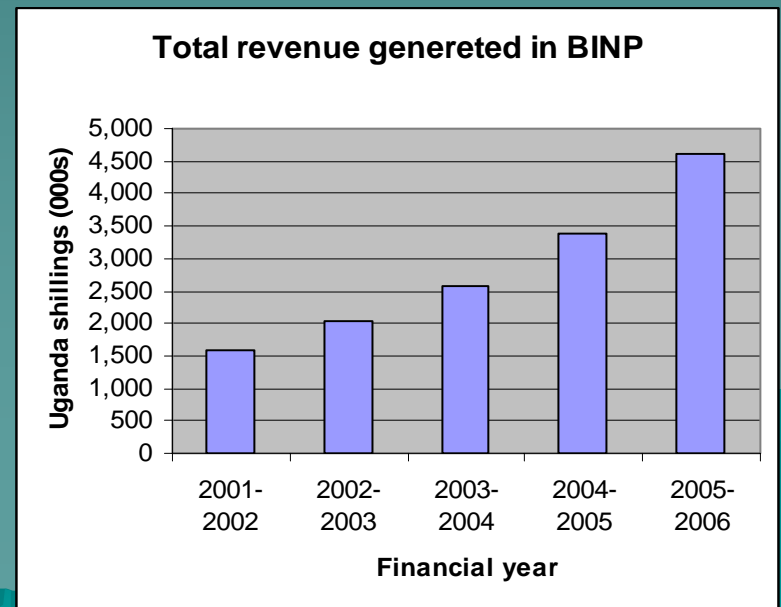
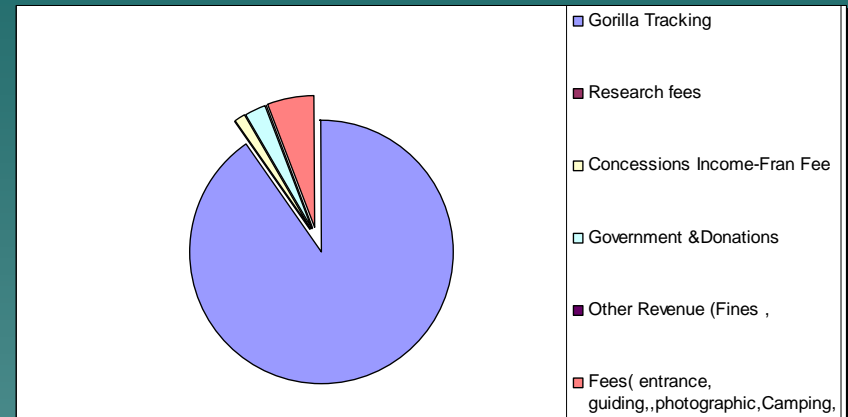
Study sites



4 0 4 8 Kilometers

Results -Direct use values – revenue

- ◆ five years revenue was steadily increasing
- ◆ highest 2005-2006 4.5 billion Uganda shillings
- ◆ major revenue significantly based on the mountain gorilla (*Gorilla gorilla berengei*)



Potential revenue- consumer surplus

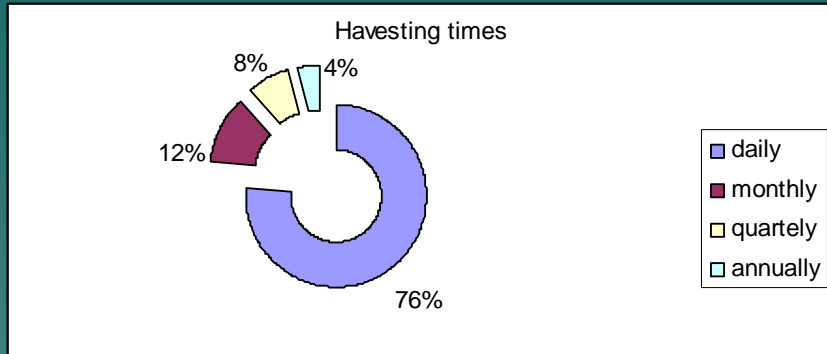
- ◆ The analysis of results showed that 70 % of tourists would be willing to pay for an increased rate of the gorilla permit -10% increase from the \$360.
- ◆ The WTP of 10 % was a potential income that accrued to tourists from their gorilla-viewing experience, over-and-above expenditure –on the permit
- ◆ This consumer surplus - significant but commonly overlooked in planning –for max returns

Regional Comparative issues- Potential revenue

(Source: modified from Hatfield, R. and Malleret-King, 2005)

	Virunga/ Volcanoes 2003	BINP	Proposed
Size of the PA	434Km ²	330 Km ²	
Total number of groups	32	27	
Gorillas population	380	320	
Average group size (standard deviation)	11.4 (11.2)	11.3 (5.7)	
No of habituated groups	16	4	8
No of un-habituated groups	16	23	19
% of habituated groups	50%	15%	30
Tourist per day	8	6	10
Permit fee (\$)	375	365	400

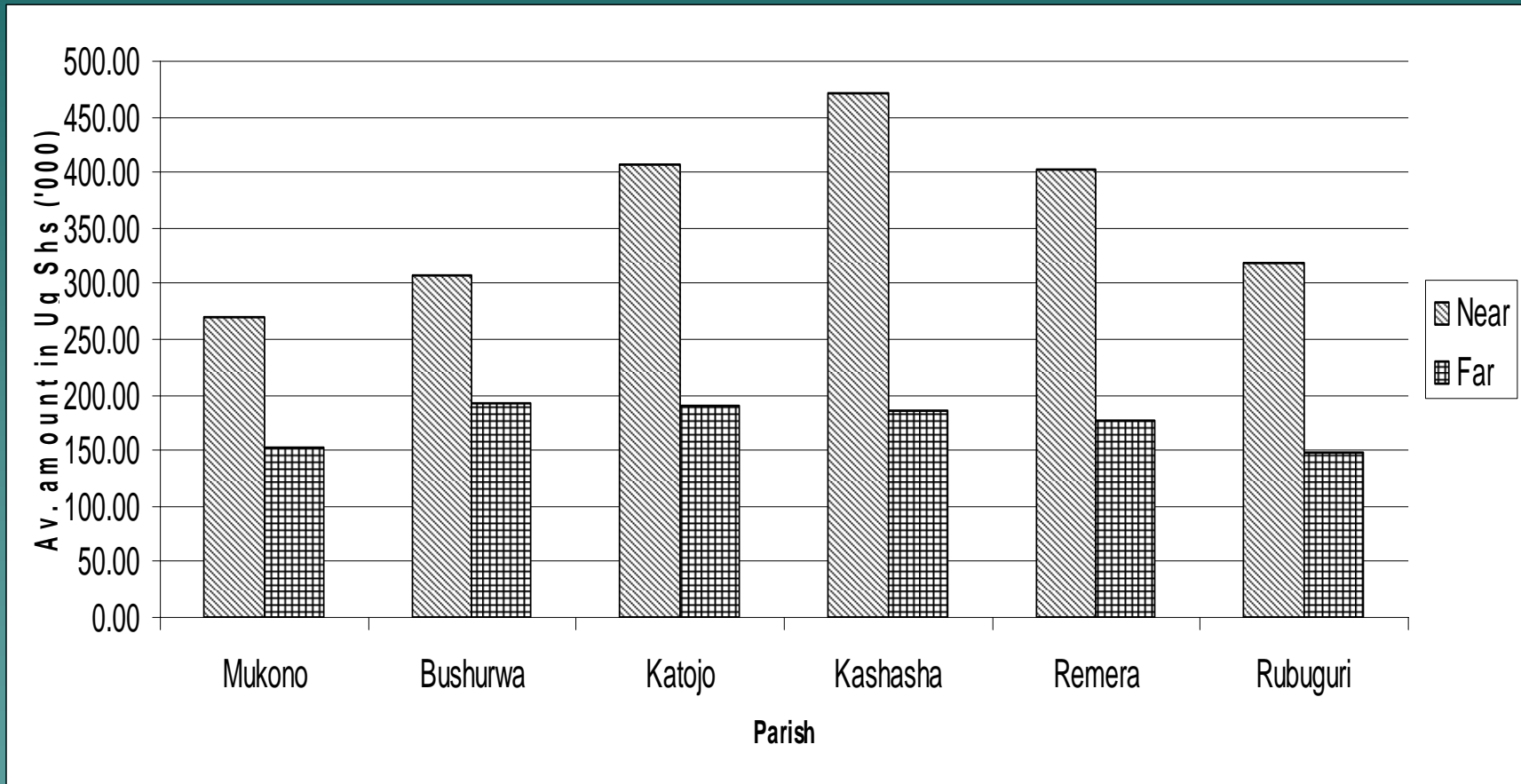
Direct Use values NTPs



Average Resource value per house hold per year (Firewood, poles, medicinal herbs) was derived

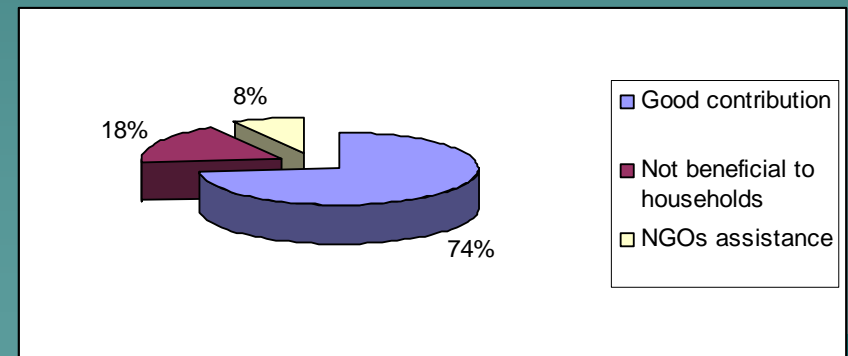


Fire wood collection distance from the park boundary (<2km 'near') and >2 km 'far' households



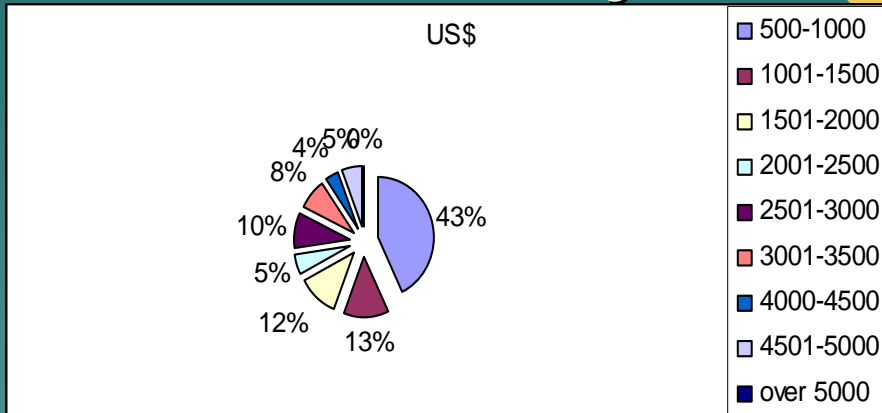
Revenue sharing

- ◆ 2000 and 2006
fUganda Shillings
193,955,700/= or US
\$ 107,753 in the three
districts
- ◆ In 2006, a Community
Levy on Gorilla tracking
permits of US \$ 4 was
introduced to add value
on MBICT).
- ◆ Revenue sharing not
directly benefiting
Households



Indirect use values

◆ WTP for Biodiversity

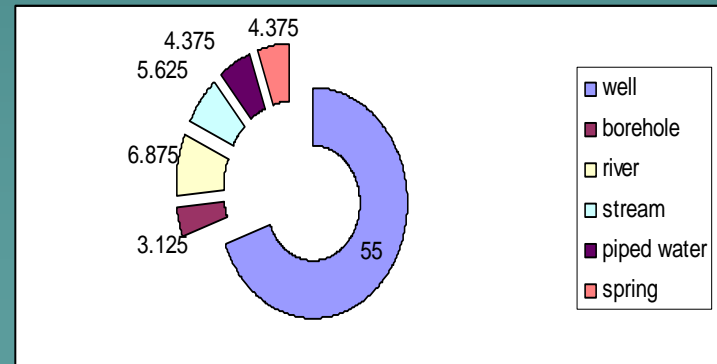


- ◆ 70% respondents (375) were WTP annual contribution of \$500 per US \$ 2,250,000 or US \$ 70.3 ha¹ annum¹



◆ Watershed values

An average value of \$ 0.3 hh¹ day¹,
 US \$ 80 ha¹ yr¹



Carbon sequestration

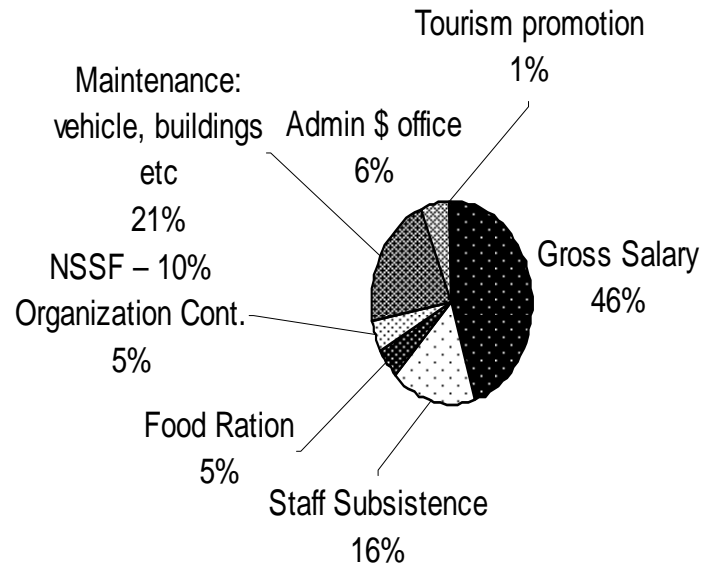
FACE, 2006 price range US\$1.80 to US\$25.50 per tone CO₂

- ◆ 32100 ha of closed forest of BINP an estimate of. of may have the opportunity to sell 6,741.000 tC equivalently in protocarbon credits valued at \$13,482,000
- ◆ Related projects: ECOTRUST-Uganda with a tree planting programme in Bushenyi District; UWA – FACE Foundation for re-forestation in Mt. Elgon and Kibale Forest, IUCN with tree planting around Mt.Elgon; Busoga Forest Company LTD doing re-forestation, Bukalega Forest reserve; Rift valley Tourism Promotion Ltd in Masindi reforestation and Chimpanzee conservation and Liberty Trust Mityana on fruit trees promotion.

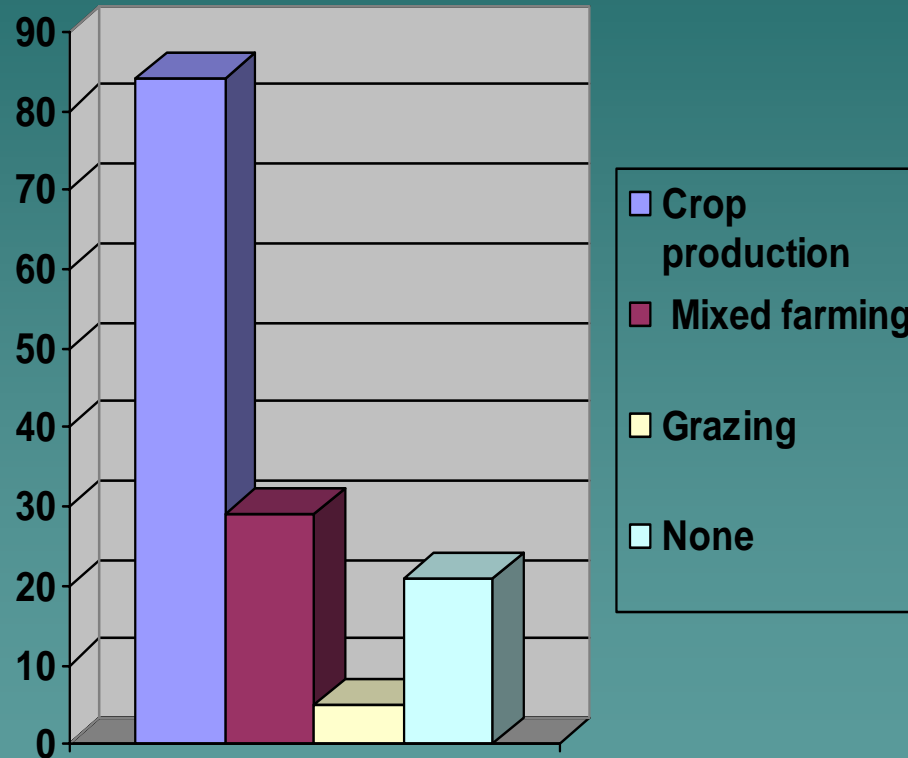
Soil conservation

- ◆ The estimated cost for farmers to replace the forest functions ie construction of barriers such stone walls , mulching and fertilizers
- ◆ 30,000 or US \$ 17 were used average value of per household per year
- ◆ The total annual value of the soil conservation derived Uganda shillings 768,600,000 or US \$ 427,000

Operation costs



>79% HH wish to utilize the PA!



Estimates of Total Economic Values

Values calculated	Valuation technique(s)	Annual value (US \$)
Direct use –tourism revenue	Review Revenue statistics and reports reveal	465,000
Potential Revenue 10% consumer surplus	CVM to estimate Willingness to Pay (WTP) and Literature review	46,500
Direct use – NTFPs	Market prices to estimate cash flow from extraction and CVM to estimate willingness to accept compensation for resources got from the forest. files ,Focused group discussions	5,070,000
Revenue sharing	Review Revenue statistics and reports	17,958
Indirect use – Biodiversity Values	CVM to estimate Willingness to Pay (WTP) and Literature review	2,250,000
Indirect use Watershed values	Circumstantial evidence, substitution cost and market prices methods and a Literature review	2,565,000
Carbon sequestration	Literature review	13,482,000
Soil conservation values	Circumstantial evidence, substitution cost and market prices methods and Literature review	427,000
Existence values	CVM to estimate Willingness to Pay (WTP) and Literature review	2,250,000
Costs of managing BINP	Review Revenue statistics and reports	315,000
Opportunity costs	Circumstantial evidence, substitution cost and market prices methods and Literature review	117,544
Crop damage costs	Direct observations, measurements	881,740

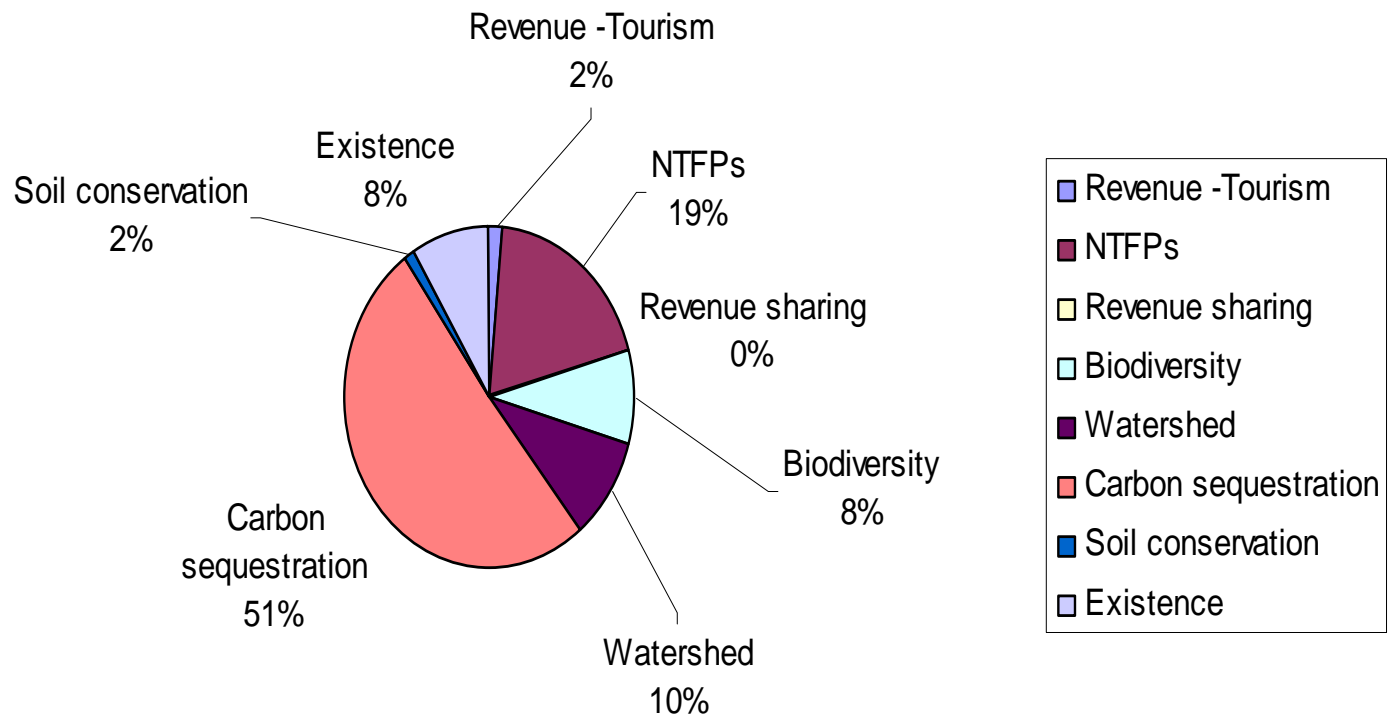
Total Economic Value (TEV) of BINP

- ◆ Pearce and Turner, 1990, described and derived TEV as a sum of all benefits less the sum of all costs.

$$TEV = GB_{DU/M} + GB_{DU/MN} + GB_{IU} + GB_{NU} - C_M - C_{LO}$$

- ◆ Where TEV = The Total Economic Benefit or Net benefit to society of maintaining BINP
- ◆ $GB_{DU/M}$ = Gross Benefits derived from Direct uses –marketed products (Tourism)
- ◆ $GB_{DU/MN}$ = Gross Benefits derived from Direct uses of non-Marketed products (NTFPs, and revenue sharing)
- ◆ GB_{IU} = Gross Benefits derived from Indirect Uses Biodiversity, Watershed, carbon sequestration, soil conservation
- ◆ GB_{NU} = Gross Benefits from Non-Use -existing/option values.
- ◆ C_M = Costs of Management operations
- ◆ C_{LO} = Opportunity Costs and crop damage
- ◆ The average annual TEV of BINP = US \$ 25,259,174

% of benefits from BINP



Conclusion

- ◆ BINP generates significant benefits over-and-above the costs borne. US \$ 25,259,174
- ◆ Most benefits are not localised and are mostly felt by the international communities and the local communities largely bear the burden of the costs and little direct benefits.

Recommendations

1. Integrate Protected area values in the designing and implementation of the economic recovery programmes such as Poverty Eradication Action Plan (PEAP) and Plan for Modernization of Agriculture (PAM)
2. PAs be guided by business plans
3. Review the policies (revenue sharing and collaborative management)and laws to strengthen local institutions e.g LC, CPI, LCSC (MBIFCT), HUGO, for collaborative management determining what is fair as far as benefit and costs sharing is concerned


Recommendations continued

4. Increase revenue to capturing a greater part of the revealed potential revenue from mountain gorilla tourism
 - ◆ increasing number of tourists per gorilla group from 6 to 10
 - ◆ habituate more gorilla groups
 - ◆ increase the gorilla fee foreign visitor as revealed by the Consumer surplus
 - ◆ Target well wishers that are willing to contribute to conservation e.g. conservation societies adoption programmers, selling deeds to donors or sponsors e.g. naming gorilla after a sponsor

5. Need to review the present multiple use Memorandum of understanding to cater for new changes and demands

6. Synergies be created with policies to oblige the international community to contribute towards

Recommendations continued

7. Consider conservation indemnity or insurance scheme that would cover uncertainties that may affect the management and revenue generation
 8. More research on the economics of BINP and other protected areas is needed for deepening our understanding of the economic aspects of conservation and development
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Thank you

