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**Participatory Environmental  
Valuation: Subsistence Forest Use  
Around the Aberdares, Kenya**

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# Participatory Environmental Valuation: Subsistence Forest Use Around the Aberdares, Kenya<sup>1</sup>

## Introduction

Most of the closed canopy indigenous forests in Kenya are gazetted as Forest Reserves and managed by the government Forest Department under a system of strict protection. Protection has been an inequitable and ineffective means of forest conservation. It has severely restricted nearby populations' access to vital forest resources and generated little local support. Forest planners and managers have bypassed local communities and their constraints and priorities in the conservation process.

The Forest Department are attempting to move away from 'traditional' protection measures - preventing human access by policing and legal bans - to a system which recognises the dependencies and needs of local communities and integrates them into forest conservation. Little is known about how and why people use forests in Kenya. We describe an attempt to gauge the value of subsistence forest use in the Aberdares Forest. This formed part of a wider community consultation exercise to plan for future forest conservation.

## Developing participatory environmental valuation techniques

Forest resources form an important part of domestic subsistence and local livelihoods in the area around the Aberdares. We needed valuation techniques which would allow people to define forest values within the context of their own perceptions, needs and priorities rather than according to our categories.

Most forest uses are illegal. People are reluctant to speak openly about their forest activities because they fear arrest. Some forest activities also have ritual or cultural significance, and knowledge is considered the preserve of specialist groups. Whereas households are reticent in the face of direct questioning, drawing and manipulating pictures of different forest activities (collecting fuelwood and building materials, gathering medicines and wild foods, grazing livestock, making hives and so on) is a good means of stimulating discussion (see Figure 1).

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<sup>1</sup> Published as 'Participatory environmental valuation: subsistence forest use around the Aberdares, Kenya', *Participatory Learning and Action Notes* 26: 6-10, 1996, International Institute for Environment and Development, London

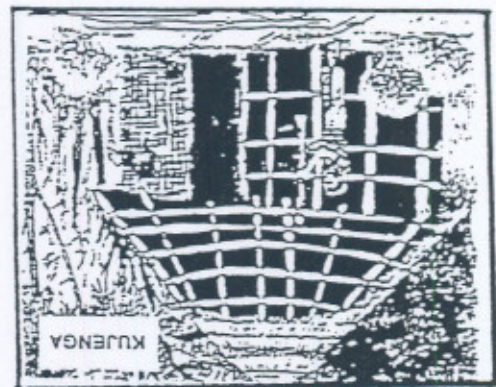
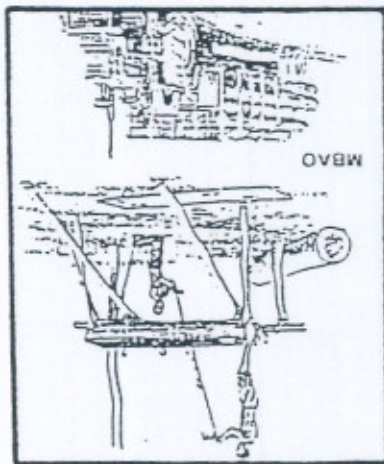
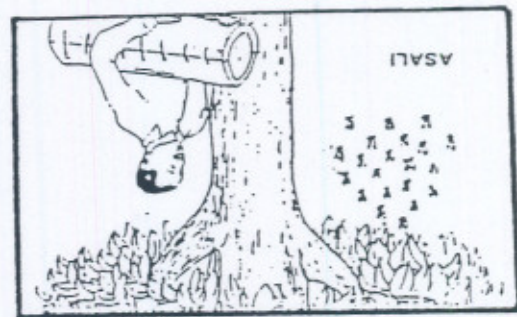
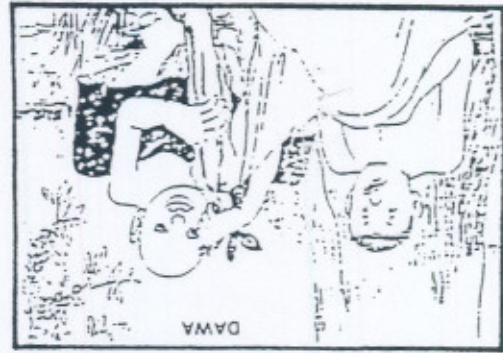
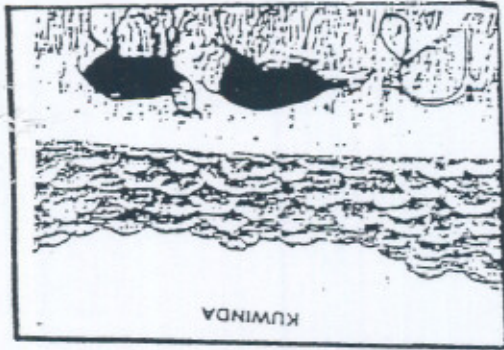


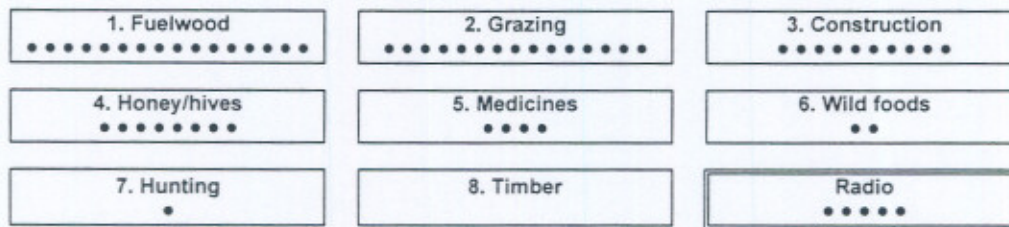
Figure 1. Pictures used to value forest use in the Aberdares

We use these pictures to value forest use. Cash measures have little relevance in a subsistence economy such as the Aberdares. It is necessary to find a numeraire for valuation which forms part of the local socio-economy, has wide significance as an item of value, and can be translated into a monetary amount, the 'currency of decision-makers'. We asked people what they thought was the best measure of value in their community. This varied between different communities, and included a radio, a bicycle and a milk cow in villages around the Aberdares. Wherever possible we try to use a single indicator within the same community for the sake of consistency and comparability.

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**Box 1: Forest values for Mama Njoroge**

Mama Njoroge chose a radio as the numeraire for valuation. Although she does not own one herself, she often listens to her neighbour's radio while she is working on her farm, and is aware of how much it costs to buy. This is how she valued forest resources:



Forest use is worth nearly KSh 9 000 a year to Mama Njoroge, over half as much as the annual net value of food production on her *shamba*. Like most households in the area Mama Njoroge relies on the forest for range of subsistence items because they are unavailable to her elsewhere. She enters the forest to collect fuelwood every day with a group of other women from the village. Although she does not hold a license she knows that the Forest Guards will not arrest her if she pays them a small bribe in the form of maize flour. This is the most important forest activity because it helps to feed the family. While she is gathering fuelwood Mama Njoroge also gathers any herbs or plants she comes across which might be useful in her role as a midwife. She values these medicines, but thinks they are not as important as forest products which directly sustain the household.

Because her farm is small and most local land is under cultivation, there is no space for pasture. Glades in the forest provide the only local source of grazing and are highly valued because livestock form such an important part of household security and wealth. Mama Njoroge's youngest grandson takes her cattle into the forest every day and at the same time cuts grass for zero-grazing. He stays at some distance from the grazing herd because he is afraid of being caught and beaten by Forest Guards. While he is in the forest he sets traps for antelopes and hunts birds with his catapult. He roasts the meat on the spot and shares it with the other small boys who are herding nearby. Like the wild fruits and vegetables the children gather while they are in the forest, the meat is never brought back to the homestead. Because they are not 'proper foods' and are not central to the family's diet, Mama Njoroge does not value bushmeat or wild foods very highly.

Mama Njoroge lives in a mud and thatch house. The poles and roof come from the forest because there are no trees on farm and she cannot afford to buy timber frames from Nyeri Town, 25 km away. They are highly valued because construction materials are difficult to get elsewhere and shelter is so critical. Mama Njoroge's son owns 16 beehives in the forest. As he works in Nairobi he has hired them to a relative, who pays for their use with a proportion of the honey harvest. Although they yield very little, they have importance to Mama Njoroge because she uses the honey for brewing *uki*, a traditional beer, with which she pays her neighbour to plough her farm each season.

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First we perform a ranking exercise using the picture cards drawn earlier. People order these cards in terms of their perceived importance to the household. This leads to further discussion about how and why different forest activities are carried out, and why they are important. To evaluate the worth of forest use we use a technique based on a local game and on traditional voting procedures. Counters such as seeds or stones are distributed between the different pictures of forest products and an additional card depicting the chosen wealth item, according to their importance and perceived value. Using the number of counters allocated to each card, forest products are translated into 'wealth item equivalents' and ultimately into cash amounts which can be discounted to give an annual forest use value (see Figure 2).

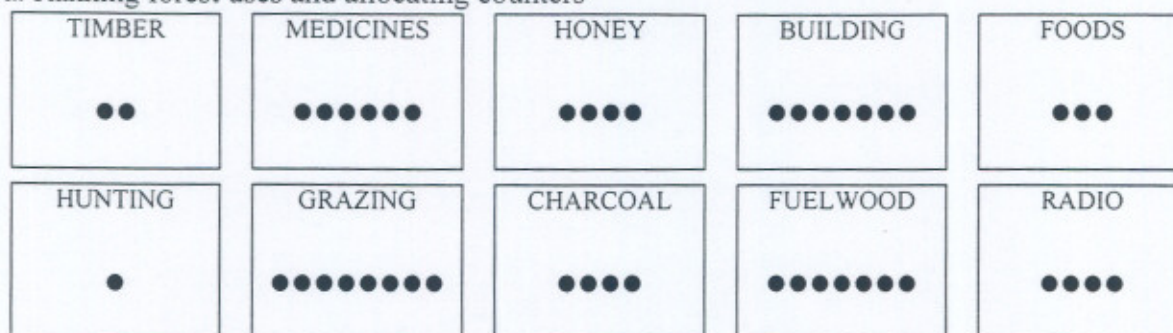
## **Conclusions**

Valuing subsistence forest use around the Aberdares has provided useful information for conservation planning. Most importantly, it demonstrates the significance of forest use in local livelihoods and household subsistence, especially for resource-poor households who have few alternatives.

- Conserving the Aberdares Forest has been difficult to justify in economic terms compared to land-use and investment options which are perceived to be more profitable and to give wider and more immediate benefits to society. The high value of local forest use, and its central role in livelihoods, provides an important justification for maintaining the area under forest cover, in addition to its less tangible ecological benefits;
- Quantifying forest values highlights the heavy costs forest protection has incurred on local communities by cutting off legal access to vital sources of subsistence. Likewise, it demonstrates the benefits of a conservation system based on sustainable forest use according to local needs and priorities rather than on protection and exclusion;
- The high value of forest resources for local populations is linked to local forestry knowledge and practices and is reflected in a range of customary management systems designed to conserve highly valued forest resources. These mechanisms provide valuable building blocks for collaborative forest conservation.

Figure 2: Steps in valuing forest use for Aberdares household

a. Ranking forest uses and allocating counters



b. Translating forest products into 'wealth item equivalents' and overall values

Picture card	Points allocated	Points in radio equivalents	Overall value (KSh)
Timber	2	2/4 = 0.5	0.5X10 000 = 5000
Medicines	6	6/4 = 1.5	1.5X10 000 = 15000
Honey	4	4/4 = 1	1X10 000 = 10000
Building materials	7	7/4 = 1.75	1.75X10 000 = 17500
Wild foods	3	3/4 = 0.75	0.75X10 000 = 7500
Hunting	1	2/4 = 0.25	0.25X10 000 = 2500
Grazing	8	8/4 = 2	2X10 000 = 20000
Charcoal	4	24/4 = 1	1X10 000 = 10000
Fuelwood	7	7/4 = 1.75	1.75X10 000 = 17500
RADIO	4	-	10 000

c. Discounting overall values to give annual values, using the formula

$$\frac{1}{T} \sum_{t=1}^{t=T} \frac{V}{1+r^{(T-t)}}$$

where T is the total lifetime of the wealth item (10 years), V the value of the forest activity, r the discount rate (10%) and t the year

	Overall value (KSh)	Average annual value (KSh)
Timber	5 000	877
Medicines	15 000	2 630
Honey	10 000	1 753
Building materials	17 500	3 068
Wild foods	7 500	1 315
Hunting	2 500	438
Grazing	20 000	3 506
Charcoal	10 000	1 753
Fuelwood	17 500	3 068
TOTAL	105 000	18 408

## Lessons learned

We learned a number of lessons from the Aberdares experience concerning valuation, participatory techniques and forest planning:

- *Using a market paradigm to value forest use.* Most environmental valuation techniques rely on observing, or asking direct questions about, actual, surrogate or hypothetical market behaviour. The market model is inappropriate and often misleading in the case of the Aberdares. Much of the forest-adjacent area is a subsistence economy and cash prices have little relevance as a frame of reference or indicator of value. There are no market substitutes for many forest products because of their unique characteristics or because alternatives are unavailable. Social and economic categories are not universal and do not necessarily correspond to our idea of 'markets'. It is more useful to base valuation on locally meaningful categories than on an inappropriate and externally-imposed model.
- *Using pictures as a tool.* Using pictures overcomes people's reluctance to respond to direct questions about sensitive topics, and stimulates open discussion about forest use. We found out that picture categories are not universal. When we drew pictures of forest resources they were often misinterpreted or given additional meanings we had not intended. When people drew their own pictures they had less ambiguity and incorporated other information about forest use.
- *The broader context.* Values are meaningless unless they are related to people's broader environment. Forest use forms part of wider livelihoods and is influenced by wider needs and priorities.
- *Translating local values into the language of decision-makers.* Decision-makers operate within the context of a cash economy, and subsistence forest use is compared with other market activities. The Aberdares exercise demonstrates how it is possible to link these contexts to local categories of value and find a common 'currency' which can bridge these gaps. However it also raises a number of questions about the reasons for valuation. By quantifying subsistence activities, were we decontextualising local perceptions for the sake of easy, top-down planning? Participatory forest management in the Aberdares involves much more than just representing the value of domestic forest use. It will require dialogue with forest-adjacent communities at every stage of the conservation process, and negotiating real rights to local forest access, use and management.

## APPLIED CONSERVATION ECONOMICS DISCUSSION PAPERS

The African Wildlife Foundation is an international non-governmental organisation working for conservation and development in Africa who, as part of its Conservation and Commerce programme, is active in the field of conservation economics.

This discussion paper has been produced as part of AWF's Conservation and Commerce Programme. Its aim is to present preliminary findings and on-going work from AWF's conservation economic activities. We welcome any comments and feedback.

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