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## Participatory environmental valuation of forest resources in the Aberdares, Kenya

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### • 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. But protection has been an inequitable and ineffective means of forest conservation. It has prohibited 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 valuation techniques

Forest resources form an important part of domestic subsistence and local livelihoods in the area around the Aberdares. We needed valuation techniques that would allow people to define forest values within the context of their own

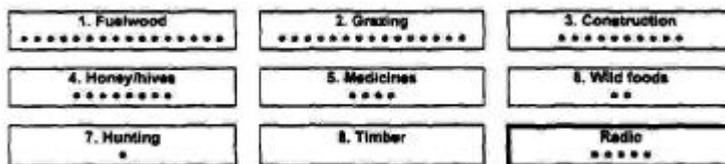
perceptions, needs and priorities rather than according to our categories.

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

We use these pictures to value forest use. Cash measures have little relevance in a subsistence economy such as the Aberdares. We had 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 varies between different communities, and includes a radio, a bicycle and a milk cow in villages around the Aberdares (see Box 1). Wherever possible we try to use a single indicator within the same community for consistency and to allow comparison.

**BOX 1  
FOREST VALUES FOR MAMA NJOROGE, A CASE STUDY**

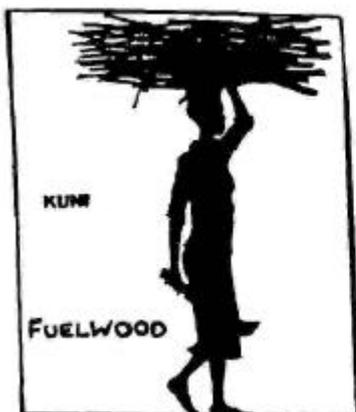
Mama Njoroge chose a radio as the numeraire for valuation. Although she does not own one herself, she often listen her neighbour's radio while she is working on her farm, and is aware of how much it costs to buy. This is how she valued forest resources:



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* (garden). Like most households in the area Mama Njoroge relies on the forest for a range of subsistence items because they are unavailable elsewhere. She collects fuelwood every day with a group of women from the village. Although she does not hold a licence she knows that the Forest Guards will not arrest her if she pays a small bribe (e.g. maize flour). While she is gathering fuelwood, she may also gather herbs or plants which she uses in her role as midwife. She values these medicines but thinks they are not as important as forest products, such as fuelwood, that 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. They are highly valued because livestock are an important part of household security and wealth. Mama Njoroge's grandson takes her cattle into the forest everyday and cuts grass for zero-grazing. He stays at some distance from the herd because he is afraid of being caught and beaten by the Forest Guards. While he is in the forest, he sets traps for antelopes and hunts birds with his catapult. He roasts the meat and shares it with the other boys who herd nearby. Like the wild fruits and vegetables that the children gather, these foods are never brought back to the homestead. They are not considered 'proper foods' because they are not central to the family's diet. They are not valued highly by Mama Njoroge.

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. Construction materials are highly valued because they are difficult to get elsewhere and shelter is critical. Mama Njoroge's son owns 16 beehives in the forest. He works in Nairobi and hires them to a relative, who pays for their use with a proportion of the honey harvest. Mama Njoroge uses the honey for brewing *uki*, a traditional beer, with which she pays her neighbour to plough her farm each season.



**Figure 1. Examples of pictures used to value forest use in the Aberdare**

First we perform a scoring exercise using the picture cards. 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. 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 translated into an annual forest use value (see Box 2).

### • **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 asking direct questions about actual, surrogate or hypothetical market behaviour. In the Aberdares, the market model would be misleading. The forest-adjacent area contains a subsistence economy where cash prices have little relevance as a frame of reference or indicator of value. There are also 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'. Thus, it is more useful to base valuation on locally meaningful categories than on an inappropriate and externally-imposed model.

#### **Using pictures as a tool**

The use of pictures helps overcome people's reluctance to respond to direct questions about sensitive topics and stimulates open discussion about forest use. We found 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 broader livelihood strategies and is influenced by wider needs and priorities.

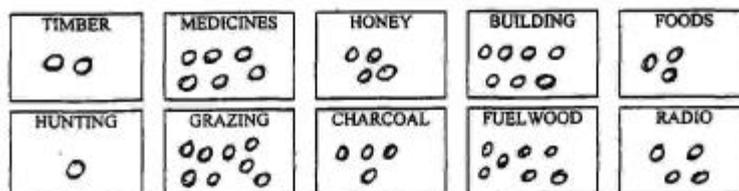
### **Translating local values into the language of decision-makers**

Decision-makers operate within the context of a cash economy and subsistence forest use is compared with other market activities. This exercise demonstrates how it is possible to link local categories of value and find a common 'currency' which can bridge the gaps between commercial and subsistence activities. 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 local communities at every stage of the conservation process, and real rights to forest access, use and management.

BOX 2

STEPS IN VALUING FOREST USE FOR ABERDARES HOUSEHOLDS

i. Scoring forest uses by allocating counters.



ii. 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	0.5 X 10 000 = 5000
Medicines	6	6/4 = 1.5	1.5 X 10 000 = 15 000
Honey	4	4/4 = 1	1 X 10 000 = 10 000
Building materials	7	7/4 = 1.75	1.75 X 10 000 = 17 500
Wild foods	3	3/4 = 0.75	0.75 X 10 000 = 7500
Hunting	1	1/4 = 0.25	0.25 X 10 000 = 2500
Grazing	8	8/4 = 2	2 X 10 000 = 20 000
Charcoal	4	4/4 = 1	1 X 10 000 = 10 000
Fuelwood	7	7/4 = 1.75	1.75 X 10 000 = 17 500
Radio	4	-	10 000

iii. Dividing lifetime values to give annual values, using the formula:

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

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

Forest Product	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
<b>Total</b>	<b>105 000</b>	<b>18 408</b>

## • 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. Forest use has been compared to other land-use and investment options which are perceived to be more profitable and 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. This value is in addition to the less tangible ecological benefits provided by forests;
- Quantifying forest values highlights the heavy costs forest protection has incurred on local communities by removing legal access to vital sources of subsistence. It also 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. This is reflected in a range of customary management systems designed to conserve highly valued forest resources. These mechanisms provide valuable building blocks for participatory forest conservation.

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### NOTES

The methods developed in these notes have been refined and applied to other forests and situations in Kenya as part of a two year study funded by ESCOR. Copies of the summary

report Valuing Domestic Forest use: Communities and Conservation in Kenya are available from Natural Resources Adviser, BDDEA, Box 30465, Nairobi, Kenya.