

Valuation of Local Forest Conservation Costs and Benefits

The case of Tharaka, Kenya

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Forest policy formation and implementation in East Africa, and particularly Kenya, takes little account of local forest conservation values—either costs or benefits. Yet local communities in particular incur considerable forest conservation opportunity costs in the form of foregone alternative land use benefits and reduction of on-farm productivity due to crop and livestock raids by forest-dwelling wildlife. At the same time, forests do however yield considerable economic benefits, although these values are hardly reflected within national statistics that attempt to gauge the value of forest resources. Underestimation of the forest sector's contribution to both national and local level economies has, unfortunately, become the norm.

Research conducted in Tharaka, Kenya, reveals that forest resources play an important livelihood role at the local level. They are a major source of household subsistence needs, as well as being a crucial source of cash income during lean seasons. The large majority of the population who live beside gazetted forests depend on them for the provision of fuelwood, traditional medicines, foods, poles and other construction materials. They also derive utility from the forests due to its existence as well as its cultural values. It is estimated that a hectare of these dryland forests yields goods and services worth US\$21 per annum to surrounding households. This is of very significant economic value, particularly for communities such as those who live in Tharaka, where per capita cash income has been calculated to be worth less than US\$ 80 per year.

One of the problems with conventional economic analysis is that little attention has been paid to non-wood tree products—traditionally, the value of forests has been seen only in terms of timber products. The need to reform traditional economic accounting systems has become urgent, so as to incorporate the total economic value of forests into development statistics and into conventional indicators of economic growth, income and profits. Among other things, such forest resource accounting systems should be able to indicate

Map of Tharaka in Kenya



accurately the value of the stock of forest resources, of forest resource flows, and their linkage with other sectors of the economy.

Based on the case study of Tharaka, this paper will explore the role of forest resources in dryland rural livelihoods and explain the types of methods that can be used to assess the monetary value of these benefits. In turn, the way in which such information about forest values can be used to strengthen attempts at on-the-ground forest conservation will also be described.

Tharaka lies within Kenya's arid and semi-arid lands, where rural livelihoods are extremely vulnerable. Agro-climatic conditions are uncertain, infrastructure and other services are undeveloped, and sources of both income and subsistence are limited. In absolute terms, the majority of the population can be classified as living well below Kenya's national poverty line. Lack of capacity to improve their productive base is a major challenge for most households.

It is against this background that trees and forests make a major—although largely informal—contribution to people's livelihoods in Tharaka. Most forest products are sourced from the two main gazetted forests in the locality—Ntugi and Kijege, which together cover just over 4,500 ha of land. Forest-based cash income, although important, is currently obtained from a very narrow band of tree products, mainly charcoal and polewood. Markets for other forest products, although potentially lucrative, are as yet poorly developed. Almost all households, however, obtain a wide range of household subsistence items, from many tree species. These basic needs (which, in times of emergency often cannot be found anywhere else) include the use of forest products for domestic energy, fodder, pasture, medicines, ropes, building materials, foods and other utility items.

A major challenge is how to assess the value of this forest use, and thereby to demonstrate its importance to statisticians, development planners and economic analysts. Economic valuation techniques are poorly adapted to

situations where forest utilisation has no clear price, and have thus tended to ignore such informal markets and subsistence-level use. Yet to ignore these values would be, in the case of Tharaka, to omit consideration of one of the most important sources of local livelihoods. It is clear that new methods of economic valuation must be found to cope with such non-marketed forest benefits.

Three approaches are conventionally used to assess the value of forest use. The first, Contingent Valuation Methods, ask people their willingness to pay for forest resources (or willingness to accept compensation for their loss). Valuation can also be carried out by relying on observed markets—how much people actually buy and sell forest products for. A third method uses surrogate prices as a proxy for the value of forest use, looking at the expenditures people make on alternatives to forest products where they are not available, or at costs incurred in collecting and using forest products.

In Tharaka these methods were modified and combined, so as to capture the diversity of forest uses and the unique nature of local socio-economic conditions. Certain products could be valued using market prices—for example wild meat, fuelwood, honey, fruits and agricultural produce are all sold in Tharaka, and have a clear price. In many cases it was also possible to look at the costs incurred to households in harvesting and processing products (for example labour costs) and to use this as an indicator of forest value, or to look at the contribution of forest resources to some other, marketed, output (for example the role of forest fodder and pasture in livestock production).

For some products however—such as medicines, certain utility items, and many of the ecological services and cultural values associated with forests—no market price, or market substitute exists. Here, a modified form of the Contingent Valuation Approach was used. It was clear that in a largely subsistence-based economy such as Tharaka, asking people directly the amount of money they would be willing to pay for forest resources made little sense. It also ran the risk of prejudicing people's responses, as they might suppose that there was a real danger that they would actually be asked to pay to use forest resources in the future. Thus an indirect method of questioning, and a non-cash valuation

numeraire, was used. This had to be a locally relevant wealth-item which respondents were conversant with as an indicator of value, and yet also had a market price by which it could be expressed in cash terms. In Tharaka, the numeraire that was selected by participants was a heifer, which carries both economic and social attributes.



Three basic steps in valuation were used. First, respondents were asked to distribute counters to indicate the relative importance of a range of forest goods and services and the numeraire (the heifer). Then the forest goods and services were converted into “heifer equivalents”. Finally, these could be converted into cash values according to the value of

the numeraire, the heifer and discounted to annual values.

These valuation exercises revealed information both about the benefits and the costs of forests within local livelihoods. On the positive side, it was clear that communities derive a wide range of benefits from forest goods and services—to a value of almost US\$ 175,000 a year. They also, however, incur costs from the attacks that forest-dwelling wild animals make on farms, through destroying crops. These costs total almost US\$ 30,000 a year.

What does such information about local forest values tell us in a place like Tharaka, and how does it provide insights for forest conservation? One of the most important results is that it underlines just how important a role forests play in rural livelihoods, and expresses this importance in a form that can easily be understood by planners and decision-makers—cash sums. It also highlights the fact that the value of forests extends far beyond direct, timber, uses. Especially, forest products are economically important in Tharaka because they provide many essential goods that are unavailable (or unaffordable) for much of the population—especially as a source of fallback during lean times or drought. Yet, given the rising competition over forestland for agriculture, such information also indicates the urgent need to increase the cash value of forests so that they can compete on monetary terms with crops (and thereby safeguard their essential emergency, ecological and cultural values). There is considerable need, and potential, to add local value to forest resources through improving harvesting, processing and marketing strategies.


The Tharaka case study also raises the question of why such values

invariably are omitted from “official” forest sector statistics and economic indicators. One solution to this classic under-valuation of forest resources is to attempt to start to reform national accounts statistics and to include such forgotten livelihood values. It also demonstrates the need to focus development attention on forest resources, through implementing activities to add local value to them, to stimulate investment, and to provide appropriate local economic incentives for forest conservation. Unless such reforms take place, there is a real and increasing danger that such local-level forest values will be lost – not just from official development and economic estimates, but from the livelihoods of the rural populations who depend upon them so heavily for their continued survival.

Kijenge and Ntugi Forest – Economic Values

Forest value	Net annual value (US\$/year)
Subsistence products	117,000
Cash income	41,400
Ecological services	7,100
Cultural and existence values	7,800
Loss in farm output	(-28,100)
TOTAL	145,200

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