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112



Many decisions taken during the process of planning conservation interventions in tropical forests are influenced by scientists and politicians. Although local people may be strongly affected by these decisions, there are problems related to external professionals' understanding of how such decisions

might affect the livelihoods of local residents. And despite the worldwide move towards more 'participatory' methods, there are still problems in finding ways to consult local people to find out which areas they themselves would like to conserve.

Local values: A challenge for research

Decision making for conservation has its own particular set of challenges. Different interest groups use different concepts to guide them, and these in turn are associated with different sets of values. The idea of biodiversity is now considered by many scientists to be the most important factor influencing conservation initiatives. However, it is a concept invented by scientists, and we cannot expect local people to share it. Therefore, one of the most urgent challenges faced by social research in conservation is to understand how the values local people associate with the forest relate to the scientific idea of biodiversity. Perhaps it is even more urgent to explore ways of conducting such research. Mountains are particularly valuable for this type of investigation, as they have a

range of distinctive habitats based on different kinds of vegetation and different degrees of human influence.

Developing socioeconomic and ecological indices

A project funded by the Environmental Research Programme of the UK Department for International Development (R7112) and managed by the University of Wales, Bangor, includes as one of its objectives 'improved evaluation of biodiversity by stakeholders in complex mountain environments through the use of socioeconomic and ecological indices of biodiversity value.' We are testing new ways to do this on Mount Cameroon in West-Central Africa, in association with the Mount Cameroon Project (MCP), a multilateral biodiversity conservation project working to implement participatory strategies that support sustainable use and conservation of forest resources. We worked with two villages in the project area (one low on the mountain, one high) and a range of different people MCP had already identified as having an important interest in, and influence on, resource use. They included hunters, forest-herb collectors, women farmers, and officials. Altogether we interviewed about 25 people in each community.

Our work was in two stages. The first activity aimed to gather information about values as we walked through the forest (Figure 1). We asked the villagers to classify the forest habitats according to their own knowledge and then to plan a walk to visit each kind of habitat. During this walk, we asked them about the plants and animals they knew in each habitat, which were important to them, and any other features of each habitat they liked or disliked. As a second stage, villagers discussed the values associated with habitats

FIGURE 1 Recording a Bakingili woman's perception of biodiversity in the forest. (Photo by Anna Lawrence)



they identified in photographs. The use of photographs enabled us to ask about certain local habitats that were poorly represented during the forest walk and to explore more abstract values such as beauty. We anticipated that the forest walk would reveal values related mostly to uses, while discussing photographs with interviewees would draw out less tangible values and provide complementary results.

The importance of the forest's 'existence value'

Our initial results are very interesting and some were quite unexpected. First, both the forest walk and the use of photographs revealed a wide range of intangible values. Most work with local people has been based on the assumption that their values are almost entirely related to uses of the forest, so it was exciting to find that people were again and again telling us about the beauty of a place, the quality of 'peace and quiet' found there, spiritual values shown by their attachment to a place through its affinity with ancestors or its role in traditional ceremonies, or simply what economists would call 'existence value,' that is, the value of habitats and species being there 'because that is what God intended' (Figure 2).

Intangible values are closely linked to habitat types. The forest (lowland and montane) generated the widest range and greatest frequency of intangible values, while high-altitude grassland was closely associated with beauty and tourism. Forest fallow and forest also elicited responses connected with option values; in other words, villagers were seeing the land, rather than the actual species there, in terms of future potential use. Negative intangibles were mostly related to the presence of pests or diseases and the quality of the terrain or vegetation type.

The high use value of variety

As expected, many of the values listed were use values, but the analysis of these was in itself interesting. It suggested that a local concept of diversity per se is related to usefulness of a habitat. To our surprise, a majority of participants explicitly appreciated diversity of species and of habitats because it provided them with all the things they needed for their existence.



FIGURE 2 The aesthetic value of Mount Cameroon forests ranks high in villagers' perceptions of their environment. (Photo by Bianca Ambrose-Oji)

Also, the more products found in one place (e.g., herbs, wild fruit, bushmeat, medicines) the better because this allows people to carry out many activities in the same place at the same time. This appreciation of variety means that habitats further from the village have some positive values (because the distance from people is related to numbers of both plant and animal species, enhancing the diversity of resources available to them) and negative values (because those habitats are harder to reach).

The work also showed that local people have a detailed understanding of ecological processes associated with particular habitats, and of the role of mountain forests in regulating climate and water availability.

Using the photos, we were able to explore which habitats people preferred. Their reasons for habitat preference were broadly similar across interest groups, with primary importance being placed on habitats (domestic and wild) that provided food crops and other important products related to livelihood. However, most people perceived that man's activity led to decreased diversity. They usually ranked habitats closest to the farm as more important but those further from the farm as having greater biodiversity. But when we compare these opinions with the number of plants and animals they actually mentioned during the forest walk, there are some interesting contrasts. In general, each respondent mentioned more species on farmland and in fallow (Figure 3) but showed a greater tendency to mention the

FIGURE 3 Average number of species mentioned by each respondent in different habitats of Bakingili.

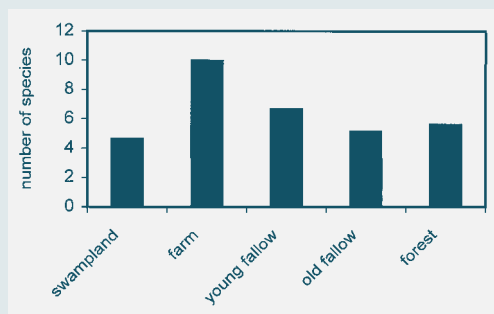


FIGURE 4 Total number of species mentioned in different habitats by people in Bakingili.

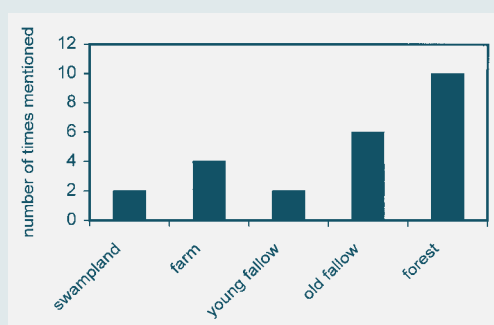


FIGURE 5 Total number of times people in Bakingili mentioned diversity as a value in different habitats.

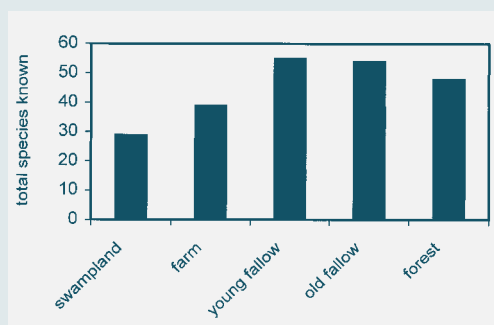


FIGURE 6 Exchange of perceptions between local stakeholders and scientists regarding evaluation of biodiversity in mountain forests is vital. (Photo by Anna Lawrence)



value of diversity in old fallow and (particularly) forest (Figure 4). Furthermore, when we add up the total number of plants and animals mentioned in each habitat (i.e., discounting duplications between respondents), we find that, overall, more are known in forest fallow than on farmland or in forests (Figure 5).

These results suggest some fundamental differences between the appreciation of diversity and the knowledge of useful species by forest users (Figure 6). We will be carrying out further research and analysis. But the work so far shows that it is worth going beyond assumptions that local values associated with biodiversity are based on simple counts of useful species or on monetary values based on the income or subsistence value of species known to be useful. Our ultimate aim is to develop a set of research techniques or 'tools' that could provide locally derived indices or 'maps' of biodiversity value to stand alongside those produced by ecologists and conservation managers. If we can find ways to communicate local perceptions of biodiversity and combine resource users' evaluations with scientific evaluations, we hope that local communities will have a stronger voice in the negotiation of natural resource management plans and conservation interventions. This should also provide scientists, managers, and the communities themselves with a clear understanding of decision making procedures.

Some views expressed by the villagers in Bakingili

Utilitarian appreciation of biodiversity	Intangible values linked directly to diversity
<p>During a group discussion with hunters from Bakingili (a village at the base of the mountain), it emerged that two types of diversity, that is, diversity across habitats as well as diversity within habitats, were appreciated, particularly for utilitarian values. One of the older hunters said,</p> <p style="padding-left: 40px;">The more things there are in one place, the better, because we can get more done there—God has given us everything so if we start cutting things down God is lacking.</p> <p>And another man added,</p> <p style="padding-left: 40px;">It's better to have lots of habitats because as you wander around you find more things.</p>	<p>Surprisingly, participants often talked about the beauty and wonder of particular habitats and sections of the landscape we passed through during the forest walk. These seemed to divide into two kinds: those related to general preferences and those more closely associated with religious or spiritual values. For example, in one particularly dramatic part of the forest looking over a ravine, a young man exclaimed,</p> <p style="padding-left: 40px;">I like to see this place; it shows the wonder of what is our mountain, and you can see the beauty of the forest in front of you; you can see all the kinds of trees into the distance.</p>
Intangible values of peace and quiet	Historical/cultural value linked directly to habitat/diversity
<p>In both Bakingili and Ekona Lelu (a high altitude village in the montane forest zone), men and women mentioned their appreciation of the peace and quiet they could find in forest fallow and the forest further away from the village. One middle-aged man in particular explained:</p> <p style="padding-left: 40px;">I often come here just to sit and rest; it is good to get away from the noise, the arguments and disturbances of the village. In this kind of place, it is possible for me to think about my problems and to make my plans.</p>	<p>When we visited patches of a more swampy habitat called locally 'tondo bush' or 'elephant bush,' most respondents attached firm cultural values to the habitat. The following comment of one young woman was typical:</p> <p style="padding-left: 40px;">Before, before, in those days, elephants would dance here. They made this place, and it is important for that. You only get these kinds of things [plants] where elephants have been; we like to see them. I have not been here before, but I know these kinds of places are in our forest, and it is important to me that they are around with all the other kinds of places I visit and know about.</p>

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Rita Lysinge

Rita Lysinge is an anthropology graduate of the University of Buea, Cameroon, and during the period of this research work was undertaking a training program supported by the Mallison Trust administered through the University of Wales, Bangor, and MCP Cameroon.

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Charles Tako currently holds a position as West Coast Area Manager with the Mount Cameroon Project, Limbe, Cameroon. He is a graduate of the University of Wales, Bangor, and holds an MSc from the University of Aberdeen. He is responsible for action research on participatory methodologies for biodiversity conservation and use as well as for field-level negotiation and implementation of forest management planning.

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