



*The material that follows has been provided by [Overseas Development Institute](#)*

---

## **PARTICIPATORY BIODIVERSITY CONSERVATION - RETHINKING THE STRATEGY IN THE LOW TOURIST POTENTIAL AREAS OF TROPICAL AFRICA**

**David Brown**

*Converting international interest in biodiversity conservation into a positive development strategy represents a major challenge for governments and the donor community. While defensive strategies in line with the 'fines and fences' approach are now widely rejected, attempts to provide positive incentives through alternative income generating strategies have not proven very effective. The way forward is increasingly seen to lie in the consolidation of existing livelihoods through the integration of biological and socio-economic information supported by efforts to increase local management capacity.*

### **Policy conclusions**

- Participatory conservation projects are particularly problematic in low population density areas where there is no evident crisis in the local economy. Income substitution strategies have a poor record in such situations, and should be treated with scepticism. Livelihood enhancement strategies are likely to be more promising, though they are not without their own difficulties.
- Intervention approaches differ radically according to the potential of sites for tourist development. Low tourist potential areas require fundamentally different strategies from high tourist potential areas.
- In West and West-Central Africa, there is a need for greater realism as to the potential for tourist development to support protected area management costs. Countries with poor tourist infrastructure and/or high political instability are unlikely to be able to generate sufficient revenues from tourism to justify the costs of protected area maintenance, let alone to develop national infrastructure to a point where tourism has the potential to support the national economy.
- Funders need to exercise caution in the selection of conservation sites. Particular care is needed over the rehabilitation of dormant protected area schemes. If national governments have lacked the ability or will to implement existing legislation, a key question is whether externally-supported and relatively short lived development assistance projects will be any better

placed.

## **From biodiversity preservation to the conservation of resource biodiversity**

While the concept of biodiversity relates to the whole variety of life on earth (for a review of the debate, see Blench, No. 32 in this series), the primary concern of development assistance agencies is with the sustainable management of biodiversity in support of human needs. The term 'resource biodiversity' emphasises this more limited perspective, and focuses upon the livelihood values which biodiversity may represent.

Converting the interest in biodiversity into an active conservation strategy poses a number of difficulties. This is most conspicuously the case where the international desire to preserve threatened biodiversity appears to conflict with local livelihoods systems that rely on converting natural habitats, generally to agriculture. In such a situation, it is all too easy for outsiders to see these local systems as a part of the problem not the solution, and to underestimate their positive attributes. The potential conflict between donors and recipients is heightened by the fact that the highest levels of both biodiversity and natural habitat conversion tend to occur in the same environments, in the humid tropics (Blaikie and Jeanrenaud, 1996). In the worst case scenario, this has led to the conservation movement taking on something of the character of a *mission civilisatrice*, whose main effect has been to stigmatize the land management practices of the low-consumption peasant farmers of the South, in the interests of a world order whose most obvious beneficiaries are the high-consuming middle classes of the North. Even where development agencies have sought to respect the primacy of local human needs, it has often proven difficult to design interventions which build effectively on this principle. The tension between conservation as preservation of the existing biological capital and conservation as sustainable exploitation remains largely unresolved in the practice of development.

## **Exclusionist strategies of the 1980s and the choice of conservation sites**

Many of the conservation projects which are now undergoing critical review began in the mid-1980s. Their design tended to reflect the early domination of the movement by natural scientists with narrow and 'defensive' preservationist aims. The centre-piece was likely to be the creation or revitalisation of a national park or other protected area (PA) chosen for both its high biodiversity and low level of human settlement. Even despite its low population density, the proposed exclusion zone was in all probability already subject to a variety of forms of local land use, but this difficulty was often glossed over, and viewed as requiring merely that the relevant legislation be implemented. Where the area in question was already gazetted but not yet actively managed, then an alliance could often be found between the conservation agency and the host government to the effect that the citizenry must be prevailed upon to respect the national legislation. If this required that the presumptive national park be cleared of its 'settler' or 'squatter' populations, then there was no alternative but to swallow the pill. One problem with this strategy was that there was no guarantee that the original demarcation of the protected area had ever been regarded as legitimate by

the local populations. To the extent that they had acquiesced to it at all, this was more likely to have reflected their tolerance of a non-functioning (even if potentially threatening) institution, than active approval of the principle of exclusion. An external agency entering this arena was thus prone to find itself uncomfortably caught between the interests of the local populations and the potentially coercive policies of the state, the latter given renewed vigour by its new-found source of donor funds. The traditional ownership claims were often of surprising emotional power, and many donors have discovered the high costs of underestimating their long-term strength.

### **Acknowledging the livelihoods dimension**

Social concerns tended to be brought to bear on this generation of projects at a relatively late stage, under pressure from funding authorities. Although the importance of local needs in relation to protected areas had long been recognised (for example, the principle was acknowledged in both the World National Parks Conference at Bali in 1982, and the MAB/UNESCO Biosphere Reserves Action Plan adopted at Minsk in 1984 [Oldfield, 1988]), the most crucial influence was the Earth Summit at Rio in 1992. More strongly than any of its predecessors, this asserted that there could be no conservation without development, and that sustainability implied sustainable livelihoods.

Biodiversity projects now became difficult to fund on purely conservationist lines, and social concerns became *de rigueur* in all aid-funded biodiversity interventions. The likely scenario was for a social component to be introduced into the second phase of project funding in the form of buffer zone development, grafted onto the original and still largely unmodified, core protected area scheme. Starting from a situation in which the human dimensions of conservation were hardly recognised at all, expectations were suddenly raised to unrealistic levels, and the social development component was now expected to compensate for all the former failings — to legitimise the restriction of access to the reserved area, relieve pressure on its biodiversity, offer pathways to sustainable community development, even, where necessary, to entice the troublesome populace into resettlement.

### **Ways to link conservation with development**

Linking conservation to participatory development has imposed radical demands on the conservation movement, and has required the development of new design and management skills. Following Moorehead and Diakite (1991), we can identify a number of ways in which this linkage can be made; these are considered in turn below:

- a. alternative resources can be identified and developed to replace existing livelihood strategies;
- b. compensation can be provided for the extra costs incurred by conservation activities;
- c. benefits can be derived from conservation as a motor for development.

The third of these options may take a number of forms, of which two are of particular interest:

- i. conservation can bring in tourist revenues;

- ii. existing management strategies can be developed, in ways compatible with the conservation of valued resources—either through improved industrial practice or local livelihoods enhancement.

Paradoxically, it is the first—seemingly the most intellectually demanding—of these strategies which initially provided the preferred model for ‘conservation with development’ in many forest areas.

## Alternative income-generating strategies

The earliest attempts to introduce a participatory dimension to conservation management typically involved strategy (a)—the promotion of alternative income generating activities (IGAs) which would divert local populations away from their (ostensibly) harmful traditional practices towards new forms of employment, often in the buffer zones around protected area sites. Though presented as a way to engage the interest and participation of the local population, the outcome has more often been either total non-engagement or active hostility (see Box 1).

## Compensation schemes

Offering compensatory payments for traditional uses foregone (strategy [b]) may provide a valid alternative in certain circumstances, though there is need for realism as to the extent of the international funding available to fully cover the additional costs.

It needs to be remembered that very significant and sustained income streams may be

## Box 1. Alternative income-generating schemes and their limitations

There are a number of difficulties with IGAs which make them doubtful prospects for conservation projects in low-population density areas, particularly those with a ‘participatory’ ethos:

1. The approach tends to rely on a misreading of low population density dynamics. Where the existing economy is stable and livelihoods secure, this often indicates what is, from a farmer perspective, a high level of efficiency in resource use (particularly in terms of returns to labour); in such circumstances it is most unlikely that external consultants will have the imagination to design livelihoods systems which represent a superior set of factor combinations.
2. The attempt to identify alternative means of income generation has often relied on errors of perception, in which the project seeks to parallel the stigmatized activity rather than replace the income stream. Thus, domestication of game animals (such as, in the West African context, the grass-cutter, *Thryonomys spp.*, or Blue Duiker, *Cephalophus monticola*) has tended to be proposed as an alternative to game hunting, because of its resemblance to the activity to be foregone. In reality, however, local interest in hunting usually lies in the high returns which it offers to labour, rather than its lifestyle attributes or aesthetic appeal. Keeping nervous undomesticated species in captive conditions does not often commend itself as a rational use of scarce labour time, particularly in areas where the same species are thriving untended in the surrounding bush.
3. Because of their identity as ‘alternatives’ and their location outside of the PA, IGAs lack any direct association with the goal of conservation. Even where they prove successful, there is no guarantee that the population will accept them as alternative rather than additional sources of income, still less that they will contribute to the conservation of the valued resource.
4. While donors are now learning to avoid the more doubtful ventures, excessive faith still tends to be put in a small number of improved technologies, such as apiculture and intensive poultry breeding, often without any real appreciation of likely market demand.
5. IGA promotion tends to be linked to environmental education work founded on the doubtful assumption that local populations lack awareness of desirable alternatives and thus need to be educated; in practice, non-adoption of the IGAs is more likely to result from a lack of means, markets or perceived benefits than any lack of ‘consciousness’.
6. Though intended to enhance the participation of the local population, the approach is often fundamentally anti-participatory in its conception, in that it is founded on

under threat, relating to a variety of livelihood interests. Some of these interests concern fall-back strategies which are only invoked in bad years and in situations of particular stress. Governments and their partners have a tendency to undervalue or discount these safety nets, because of their unpredictability, failing to recognize the crucial role which they may play in guaranteeing livelihoods in the longer term. Compensation schemes are thus doubly problematic in that they need to take into account both the recurrent costs of PA management and long-term support to local communities. The situation in many countries is not encouraging even as regards the securing of the PA, and the prospects for adequate funding of both in-situ conservation of biodiversity and compensation to local communities must often be considered as remote. Many PAs are significantly underfunded, and very large investments would be needed to bring them up to basic standards of management, even before any consideration is given to compensating for livelihoods foregone.

There are 746 protected areas in Africa, covering 1.54 million km<sup>2</sup>, 5.2 per cent of the total land area (WRI, 1998). Table 1 compares the sums spent on PA maintenance in some industrialised and African countries. It is apparent that, even from the perspective of maintenance costs the difference between present levels of spending and likely target levels is immense, and probably unbridgeable for countries with little tourist potential. This is despite the fact that the percentages of national budget spent on PA management may be comparable to those of the industrialised countries.

**Table 1. PA Maintenance costs**

	% national budget spend on PAs	US\$ per km <sup>2</sup>
Germany	0.01	1,154
UK	0.06	3,516
USA	0.16	1,998
Kenya	0.77	524
Tanzania	0.22	27
Zimbabwe	0.27	132
Cameroon	0.02	20
Democratic Congo	0.05	12

*Source:* Africa Resources Turst, Fact sheet No. 6 (1997)

The Congo Basin sub-region has 200,000 km<sup>2</sup> of protected areas out of a total land area of 4 million km<sup>2</sup> (WRI, 1998). Were the Democratic Republic of Congo to spend the same proportion of its budget on protected area management as, say, Kenya, this would represent a total expenditure of US\$52 million per year, 0.9% of GNP. Were it to spend the same amounts as the USA, then the relevant totals would be US\$198

million per year, 3.6 per cent of GNP. Actual expenditure is claimed to be of the order of US\$1 million (0.017% of GNP).

Figures on staffing levels reinforce the overall picture of a major mismatch between resources and needs. In Congo-Brazzaville, for example, each park guard is responsible for over 300 km<sup>2</sup> of territory. IUCN considers 10 km<sup>2</sup> to be the most that one guard can patrol (Sayer *et al*, 1992: 129).

In reality, most of the Central African PAs currently exist in name only, and with negligible exceptions, their resident populations receive little benefit from their existence. Such expenditures as are claimed to occur go almost exclusively on staff costs and do nothing to compensate local users for the (often very high) values of the resource flows foregone. Many of these PAs are in countries with chronic problems of social instability and national security—not the sorts of places in which the donor community is likely to have the confidence to invest significant long-term funds. And even in those few instances where funds are available, important questions need to be asked about their management. Holding funds off-shore is likely to be the safest long-term solution, though this raises issues of national sovereignty, and it leaves open the mechanisms by which compensation is expected to reach the intended local-level beneficiaries.

## Conservation tourism

Tourism development (strategy c-i) is attractive as a conservation strategy because of the high revenues which it can generate from the non-consumptive use of natural resources. One promise that has been widely made to local populations (though rarely, one suspects, delivered) is for the redistribution of the anticipated tourist revenues linked to the conservation scheme. Tourism and allied activities (sport hunting, for example) may well represent optimal forms of land use in some localities, though on the African Continent most of these areas are already well-known, and confined to fairly restricted parts of the east and south. With growth in the specialist tourist market, other areas in West and Central Africa may be able to experience some increase in tourist revenues, though the potential of these is arguably low, (see Box 2). Even in the core areas, the extent of benefits received by local populations (as opposed to urban-base commercial interests) is often very limited.

The statistics for wildlife viewing are not encouraging. The major tourist destinations in West Africa are countries such as Senegal and Côte d'Ivoire, which receive volumes of the order of 300,000 and 200,000 tourists respectively per year. Surprisingly few of these tourists visit the national

## Box 2. Wildlife tourism in West and West-Central Africa

In most parts of West and West-Central Africa, tourism suffers from a number of limitations of a fairly intractable kind:

1. Tourist infrastructure is likely to be slight, and necessary investment costs beyond the means of the respective governments; the field project is a poor instrument for addressing such overwhelming infrastructural constraints.
2. The western public who fill the tourist markets have become conditioned by the mass media to expect to see game in quantity, such as is easily achieved in the East and Southern African game parks. Elsewhere, game is more thinly spread, and low tourist volumes mean that such game as does exist is less conditioned to the human presence. *Tourisme de vision* is not likely, therefore, to be a major revenue earner, and the tourist market is restricted primarily to those searching for something out of the ordinary. By definition, this is not a mass market.
3. Given the low and uneven levels of international demand, air and local travel and hotel costs are likely to be exorbitant, and to far exceed the comparable charges in countries with well-established tourist markets and good international communications; many of the West and West-Central African parks are in remote locations, creating problems of access.
4. Governments are likely to be preoccupied with much more basic questions—their own survival under conditions of adjustment, problems of law and order and security, provision of basic public services—which render any significant national investment in tourism out of the question.
5. There are also ethical questions involved in providing the high levels of facilities (hotels and infrastructure, constant hot and cold water and electricity supply, etc.) which tourists now demand, in societies where local populations are starved of even the most basic services.
6. Even where they are positively disposed in principle, many governments are prevented by structural adjustment conditionalities from taking on the numbers of personnel which are required to staff and police tourist facilities, and few private companies are in a position to make the up-front investments needed to prime the market. There is thus likely to be a vicious circle in which poor facilities and low occupancy rates act in a mutually reinforcing way.
7. Given the contested nature of many of the existing



parks; Niokolo-Koba and Djoudj in Senegal, for example, receive on average only about 3,000 and 1,500 visitors per year, while the Parc de la Marahoué in Côte d'Ivoire receives only about 600. The majority of visitors in each case are resident expatriates, not external tourists (Sournia, 1997). While there are exceptions—the Rwandan Parks generated up to US \$10 million per year in the 1980s and were the third most important foreign exchange earner in the country before the emergency (thanks largely to a single economic asset, mountain gorillas)—the overall picture is modest, and as this latter example suggests, the prospect is often uncertain.

Thus, while one cannot entirely exclude tourism from the range of options open to governments wishing to promote conservation with development, its role can be easily overrated, and it is unlikely to provide the panacea for biodiversity conservation in many parts of Africa. Alternative strategies need to be identified.

### **The management of biodiversity with the assistance of local people**

None of the most widely favoured solutions to the problem of conservation with development—alternative income generation schemes, compensatory payments, and redistribution of tourist revenues—thus looks to be capable of providing the kinds of sustainable benefits which large scale biodiversity conservation in Africa is likely to require. If local populations are to be relied on to manage biodiversity in areas where the primary interest is in the off-take of the resource not its non-consumptive use, then the only other realistic alternative is for constructive engagement with the existing economy. Two alternative models (both variants of strategy [c-ii]) are of interest here:

#### **Sustainable timber extraction?**

Involving forest dependent communities in timber exploitation is an interesting avenue which is currently being explored in Cameroon, by projects such as the DFID-funded Community Forestry Development Project, the SNV project in Lomié and the French project *Forêts et Terroirs* (the former '*API-DIMAKO*'). It remains to be seen whether local communities prove able to compete with the commercial sector, and whether, if they do, their best interest lies in conserving the forest and regenerating the harvested species, or converting logged-over areas to agricultural use (cf Reid and Rice, 1997).

Outside of commercial timber production, there are likely to be rather few options in low population density high forest areas for participatory conservation. Given that there is little pressure for radical change in such environments, the most promising alternatives may lie in the attempt to enhance, rather than replace, existing livelihoods.

#### **An alternative perspective—local livelihood enhancement**

The enhanced livelihoods strategy is founded on the recognition that many of the management systems employed by local resource users depend upon the existence of forest cover and are in sympathy with the needs of sustainable forest management. Thus local populations are not seen as a threat to biodiversity but as its potential managers. A number of different types of products may be involved, for example:

- Naturally-occurring products which are either restricted to forest habitats or cannot usually be produced economically outside of them; this group includes many non-timber forest products (NTFPs—oil-producing nuts, wrapping leaves, rattans, medicinal plants, bark etc.) and game animals for the bushmeat trade;
- Domesticated plant species which thrive in, and mimic, forest environments; this group includes certain beverage crops and shade-loving species such as forest yams, corms and tubers.

Barriers to the effective management of such resources, under existing arrangements, tend to derive from two sources:

- i. the lack of management systems to regulate off-take (this may well have occurred through the loss of traditional management systems, under the influence of colonial and post-colonial legislation);
- ii. inadequacy of understanding of the biology of the species, and lack of knowledge as to the sustainable harvest level.

Projects may thus have useful roles to play in helping primary users to understand better the biology of the resource, and to institute and maintain management systems which allow sustainable levels of harvest.

A viable enhanced livelihoods strategy is likely to contain at least three major elements:

- increased knowledge of the biology of the resource, through the bringing together of local user-knowledge and ‘scientific’ understandings of its ecology;
- ability to master the wider institutional and legislative context in ways which enhance the commitment of the primary resource users to long-term conservation;
- good rapport with the resource users, and ability to work with them in a participatory fashion.

The Mount Cameroon Project based at Limbe, funded by DFID and the Government of Cameroon, has pioneered this approach (Box 3).

The enhanced livelihoods approach has the great advantage over the alternative income-generating approach of starting from the premise of user interest and seeking to build on locally-expressed values and livelihood systems. As such, it fits well with innovations in donor thinking such as DFID’s current focus on ‘sustainable rural livelihoods’, the central tenets of which likewise include a holistic orientation, building on people’s

### Box 3. Case study: Mount Cameroon Project

The Mount Cameroon Project (MCP) aims to maintain the exceptional biodiversity of the Mount Cameroon area, by developing the capacity to implement a participatory conservation strategy. The project grew out of the Limbe Botanical Gardens and Rainforest Conservation Project. The original MCP project design favoured the search for ‘delinked rural development initiatives’ (ie. alternative income-generating opportunities) to relieve pressure on the resources of the mountain. This approach was soon abandoned in favour of a strategy with the following components:

1. *Multiple partnerships*, involving close links between the MCP and the Government of Cameroon (GoC), civil society and the private sector (particularly the Cameroon Development Corporation, which has major plantations in the area, and the French company *Plantecam*, which processes the bark of the tree *Prunus [Pygeum] africana* for chemicals used in drugs against prostate cancer).

2. *Focus on institutional development*, by building the capacity of local communities and government departments, and by sensitising industry to the need for incorporating sound environmental principles into development activities.

3. *A livelihoods and ‘multi-use’ perspective focusing on high-impact solutions for key resources* and favouring the search for benefits directly linked to forest use, through the more efficient conversion of biological capital and improved trade and marketing patterns which bring increased ‘profits’ to direct users—and aiming to strengthen conservation best practices while so doing.

4. *Directed and integrated biodiversity and socio-economic information*, of immediate benefit to both primary resource users and project management.

Project activities are context-specific and address specific resource management requests, for example:

- improved harvesting of *Prunus africana* bark, through institutional support to a harvesters’ union, and help with monitoring the condition of the resource, and identifying the levels of sustainable harvest;
- support to the formation of hunters’ unions, aiming to both regulate local use and limit the activities of non-resident ‘Yaoundé hunters’; the project has also worked with a cooperative of women engaged in ‘pepe soup’ sales;
- work with communities in areas of commercial logging, to better understand the

strengths—rather than their ‘needs’—linking the micro to the macro with a strong policy and institutional analysis, and encouraging partnerships in development assistance strategies (see Carney, 1998). By increasing the level of local investment in the area to be conserved (rather than, as is the case with exclusion strategies, diminishing it), the approach also limits the external costs of conservation area management.

While inherently participatory in its orientation, it is not without certain difficulties; for example:

- i. There is no assured connection between the sustainable harvest of a particular forest product and the sustainable management of the forest as an ecosystem. Whether or not the conservation of a specific resource will lead to general habitat preservation is highly context-dependent, being linked both to endogenous factors (the characteristics of the resource, the heterogeneity and diversity of its habitat) and exogenous factors (the nature of the external threats to that habitat).
- ii. Capacity to implement the strategy is likely to be directly proportional to the resident population of resource users; where population densities are low, it may be difficult to police the resource through ‘participatory’ means.
- iii. Transferring authority to sedentary communities may marginalise other traditional and legitimate resource users, such as hunter-gatherers (Baka or Bakola pygmies in West-Central Africa, for example).
- iv. NTFPs are notoriously vulnerable to substitution by labour-saving innovations.
- v. The institutional context may not be easy for a development project to master; for example, national or transnational companies may actively oppose the empowerment of their local suppliers, and governments may likewise be unwilling to introduce the legislative changes needed to give local users full authority over the use of the resource, particularly where this will have wider tenurial implications, and shift power away from the state.
- vi. Pursuit of a livelihoods strategy demands an institutional structure that is flexible and responsive to local needs. This in turn requires staff who are willing to innovate and take risks. Bureaucratic structures tend to be risk-averse, and to reward conformity not innovation. Exceptional talents may therefore be required if the approach is to take root.

In many areas, the most effective management strategies are likely to involve the exclusion of non-traditional resource users, particularly those of external origin. The approach needs, therefore, both to seek for local legitimacy and to involve local government authorities, for externally-funded development projects often lack the political authority to pursue exclusion strategies unsupported. Whether local government authorities are in a position—or have the inclination—to restrict wider public access is another matter. Many developing country governments are reluctant to pursue policies which explicitly favour sectional interests, and the fact that user groups may well be defined in terms of ‘tribal’ identities is an additional disincentive.

The approach does not represent a final solution to the problem of participatory biodiversity conservation, but is merely the first step in the definition of a strategy which will require continuous support and responsive management. Nor does it

represent the sole means necessary for the in situ conservation of biodiversity. Guaranteeing existence and option values may well imply continued recourse to protected area reservation, and the onus of responsibility is on the international community, more than the direct resource users, to cover the costs involved. This underlines the fact that biodiversity conservation is a long-term project, which demands sustained commitments on the part of both governments and donors (Sayer, 1992).

### **Biodiversity conservation and the project approach**

Faced with growing international concern about the state of the global environment, governments and donors alike have come under immense pressure in recent years to act rapidly and decisively to save the most threatened ecosystems. One result of this has been to place excessive faith in the ability of the favoured tool of aid-funded rural transformation—the ‘project intervention’—to turn the tide of environmental decline. In the forest sector, one of the major lessons of recent project experience has been to keep ambitions modest. The field project is likely to be at its most effective when it involves long-term deployment of resources in support of (rather than in opposition to) local livelihoods and when it pays due attention to the wider institutional and legislative context in which forest dwellers are constrained to seek their livelihoods. ‘Silver bullet technologies’ which attempt, at a stroke, to replace livelihood systems which have evolved over centuries with miracle cures of external origin have proven of doubtful benefit to forest-dependent communities.

### **References**

African Welfare Trust (1997) *Fact sheet* Number 6.

Blaikie, P and Jeanrenaud, S (1996) ‘Biodiversity and human welfare’ UNRISD *Discussion Papers* No. 72, Geneva.

Carney, D (1998) ‘Implementing the Sustainable Rural Livelihoods Approach’, in *Sustainable Rural Livelihoods: What contributions can we make?* Papers presented at the 1998 DFID Natural Resource Advisers’ Conference, ed. D Carney, DFID/ODI.

Davies G, et al (1997) *Project Strategy Statement*, Mount Cameroon Project, Limbe, Cameroon.

Moorehead, R and Diakite, M (1991) *Mission Socio-Economique au Parc National de Zakouma*, CARE Tchad.

Oldfield, S (1988) *Buffer Zone Management in Tropical Moist Forests*, IUCN, Gland.

Reid, J and Rice, R (1997) ‘Assessing Natural Forest Management as a Tool for Tropical Forest Conservation’ *Ambio* Vol.26 No.6, Sept.

Sayer, J (1992) ‘Buffer Zones in Rainforests: Fact or Fantasy?’ *Parks* Vol.2 No.2, July.

Sayer, J, Harcourt, C, and Collins, M (1992) *The Conservation Atlas of Tropical Forests: Africa*, IUCN.

Sournia, G (1997) 'Tourism, Wildlife and National Parks in West and Central Africa', *Wildlife and Nature* Vol.13 No.2, April-June. FAO Rome.

World Resources Institute (1998) *World Resources: A Guide to the Global Environment 1998-9*, OUP.

---

**Related titles in the NRP series include:**

No. 7 *The erosion of crop genetic diversity: Challenges, strategies and uncertainties*  
Robert Tripp and Wieneke van der Heide

No. 13 *How does stronger protection of intellectual property rights affect seed supply? Early evidence of impact*  
Jeroen van Wijk

No. 23 *Neglected species, livelihoods and biodiversity in difficult areas: How should the public sector respond?*  
Roger Blench

No. 26 *Rethinking approaches to tree management by farmers*  
Michael Arnold and Peter Dewees

No. 29 *Shifting cultivators as agents of deforestation: Assessing the evidence*  
David Brown and Kathrin Schreckenberg

---

David Brown is a Research Fellow at ODI.  
Email: d.brown@odi.org.uk

---

ISSN: 1356-9228

© Copyright: Overseas Development Institute 1998

Natural Resource Perspectives present accessible information on important development issues. Readers are encouraged to quote from them for their own purposes or duplicate them for colleagues but, as copyright holder, ODI requests due acknowledgement. The Editor welcomes readers' comments on this series.

ISSN: 1356-9228  
© Copyright: Overseas  
Development Institute 1998

**Overseas Development  
Institute  
Portland House  
Stag Place  
London SW1E 5DP, UK**

**Telephone +44 (0)171 393  
1600**

Administrative Editor: Helen  
Suich  
Series Editor: John Farrington

**Fax +44 (0)171 393 1699**  
**Email: [nrp@odi.org.uk](mailto:nrp@odi.org.uk)**



Home Page

---