

## 1 Introduction

Seventeen years after Zimbabwe's independence in 1980, land and resource issues continue to dominate policy discussions (Moyo 1995). The expectations of an equitable land redistribution, raised during the liberation struggle for independence, have largely been unfulfilled. The slow progress that has been made in land redistribution has driven some landless and poor people to resort to 'squatting' as a means of gaining access to land for settlement and farming. Forest lands, as state lands, have been especially vulnerable to squatting and illegal resource use by neighbouring communities, resulting in conflicts with forest managers (Bradley and McNamara 1993).

The post-independence government has continued with the basic structure of property regimes that existed before independence (Bruce *et al.* 1993). Approximately 42 per cent of the country's land lies in private ownership by not more than 4,000 people. The remaining 58 per cent is held by the state: national parks, wildlife and forest lands and communal lands. Over 60 per cent of Zimbabwe's 11.5 million people live in the communal lands. There are three major categories of land tenure in Zimbabwe: state land, communal land and commercial land (Moyo 1995). The government has begun to address the land inequities of the colonial era by resettling some of the communal land residents on purchased commercial land. However, options for use of state land for resettlement have not been accorded the same level of importance as options for commercial land (Katerere *et al.* 1993; Matzke and Mazambani 1993). Consequently, state lands continue to be characterised by overlapping property relations in which a multiplicity of actors engage in struggles over property rights (Bruce *et al.* 1993). These overlaps manifest themselves through competing legal and utilization systems at national and local levels. This competition often places the same resource under different users with conflicting land use objectives. Unless action is taken to resolve such conflicts, unsustainable forest use practices may continue around and within state forests, leading to the destruction of the resource base.

The recognition of this potential scenario has led policy-makers to consider co-management options for some forest reserves in Zimbabwe. In recent

# Conflicts Around Forest Reserves in Zimbabwe

*What Prospects for  
Community  
Management?*

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IDS Bulletin Vol 28 No 4 1997

years, a more participatory approach to forest management has often been argued for (Bradley and McNamara 1993), with communities becoming the guardians and managers of resources. The widely trumpeted success story of joint management of wildlife around national parks in Zimbabwe (Murphree 1993) is seen as a potential model for resource sharing arrangements in state forest areas. Similarly, the experience of joint forest management in India is also seen as a good example to follow (Poffenburger and McGean 1996), although distinctions between the two settings make direct comparison difficult (Nhira and Matose 1996).

But such contemporary debates about community-based sustainable development must be put in context. Today's forest policies emerge from a long history. The following section traces forest policy development in Zimbabwe since the turn of the century, and explores the justifications used for different policies at different times.

## 2 Forest Policy and its Justifications

Over the last century state intervention in forest reservation and management has been justified in a number of ways, drawing on ideas about ecological dynamics, social issues and the economics of resource use. Shifts in scientific opinion about appropriate forest management techniques have interacted with changes in political control, the influence of different actors over policy decisions and the economics of forestry resources at national and international levels. A number of 'policy narratives' – or stories about what should be (cf. Roe 1991) – surrounding both ecological and economic issues can be identified which have informed policy decisions.

The decades following the turn of the century saw the first attempts by the state to control the exploitation of indigenous hardwood forests. These controls were heavily contested by powerful timber logging merchants. As a result, the first forests were reserved only in 1930, despite initial attempts having been made as early as 1909 (Matose and Clarke 1993). The resistance of timber loggers also delayed the setting up of the Forestry Commission (FC), as well as the introduction of forestry legislation, until 1948. During this period, forest policies and

activities were aimed at controlling timber merchants who were perceived to be threatening the indigenous hardwood resource base, and a preservationist stance to ecological management prevailed.

Between the 1950s and the 1960s, scientific, ecological management objectives were proclaimed. The management of timber extraction from forests on a sustained yield basis became more pronounced, while the soil and watershed conservation value of forests was increasingly recognised (Judge 1975). The major function of the forests, particularly in the west of the country, was seen as conserving watersheds for the major rivers that flow into Lake Kariba, from the mid-1950s the country's source of hydro-electric power. The justification was that the forests maintain vegetation cover which prevents siltation that might occur were the forests under small-scale peasant agriculture and communal tenure. To this day, this argument remains the major reason for not ceding forests to local communities, despite a range of evidence which disputes some of the hydrological benefits of watersheds in these environments (Pereira 1973; Hough 1986). In the 1990s, forestry policies have increasingly drawn upon global debates to legitimate maintaining forests under state control. For example, the FC has justified the reservation of forests for the purpose of conserving biological diversity, following the Rio Summit in 1992. Kalahari Sand forests of western Zimbabwe, it is argued, have traditionally been a habitat for a diversity of wildlife species and are a unique dry tropical forest type found in southern Africa.

The prime economic reason for reserving forests in the early 1900s was to regulate timber extraction by logging companies. The Kalahari Sands are home to three hardwood species – *Baikea plurijuga*, *Pterocarpus angolensis* and *Guibortia coloesperma* – which were logged for railway sleepers at the turn of the century, but are now used largely for furniture making. In the 1950s and 60s economic returns from forests were increased not only from timber revenue, but also through the hunting of wildlife. Tourism became a particularly important economic activity in the 1980s. Most forests are contiguous to national parks but have less visitors and thus attract more wildlife. These latter economic activities were enhanced further in the 1990s as government subsidies for forest management

have been declining under economic structural adjustment policies, and it became imperative for the FC as a parastatal to seek alternative ways of raising revenues. Its hunting and safari section has proved quite successful in this regard.

Diverse justifications, drawing on combinations of ecological and economic arguments, have therefore been used to sustain state control over forest reserves. These arguments have been used in various ways to control the activities of local populations. Up to the 1960s, forest inhabitants were largely left alone, as they provided a useful labour reserve for commercial forestry operations. However, in the 1960s, a multiple land-use policy was pronounced, which led to the development of a tenancy system for forest inhabitants. Levies were introduced whose aim was to contain populations of forest inhabitants. The tenancy system was enhanced in the 1970s with the development of an agricultural system for inhabitants. This policy aimed at developing the agricultural potential of forests, at the same time as restricting the growth of the populations of forest communities. However, the tenancy system was disrupted by the liberation war in the mid-1970s and the 'dissident' activities of the civil war of the early 1980s. State forestry presence only resumed after the merger agreement between the ZANU-PF and the opposition party, ZAPU, in 1987. During the FC's absence, the forests had been settled by many 'illegal' inhabitants which led, in the late 1980s, to the adoption of a policy of mass evictions of all forest settlers, including former tenants. Through this, the FC sought to reassert its exertion of control over forest dwellers by force.

For the period up to the 1960s, therefore, forest inhabitants were regarded by the FC as an economic asset, with limited ecological impact. By the 1960s, however, more concern about the potential negative impacts of population expansion within the reserves was expressed, although tenants were expected to play an important role in fire control, and agriculture in certain demarcated zones was deemed acceptable. The large influx of people during the 1970s, combined with the perceived security risk during the 1980s, resulted in a much more exclusionary stance being adopted by the FC. Forest inhabitants, including former tenants, were now called 'squatters' and summarily expelled from the forest. Not surprisingly, this has resulted in

resentment and conflict. This is vividly expressed in local commentaries on forest policy, the FC and forest reserves. The next section explores such local commentaries for one reserve in Gokwe South district of the Midlands Province.

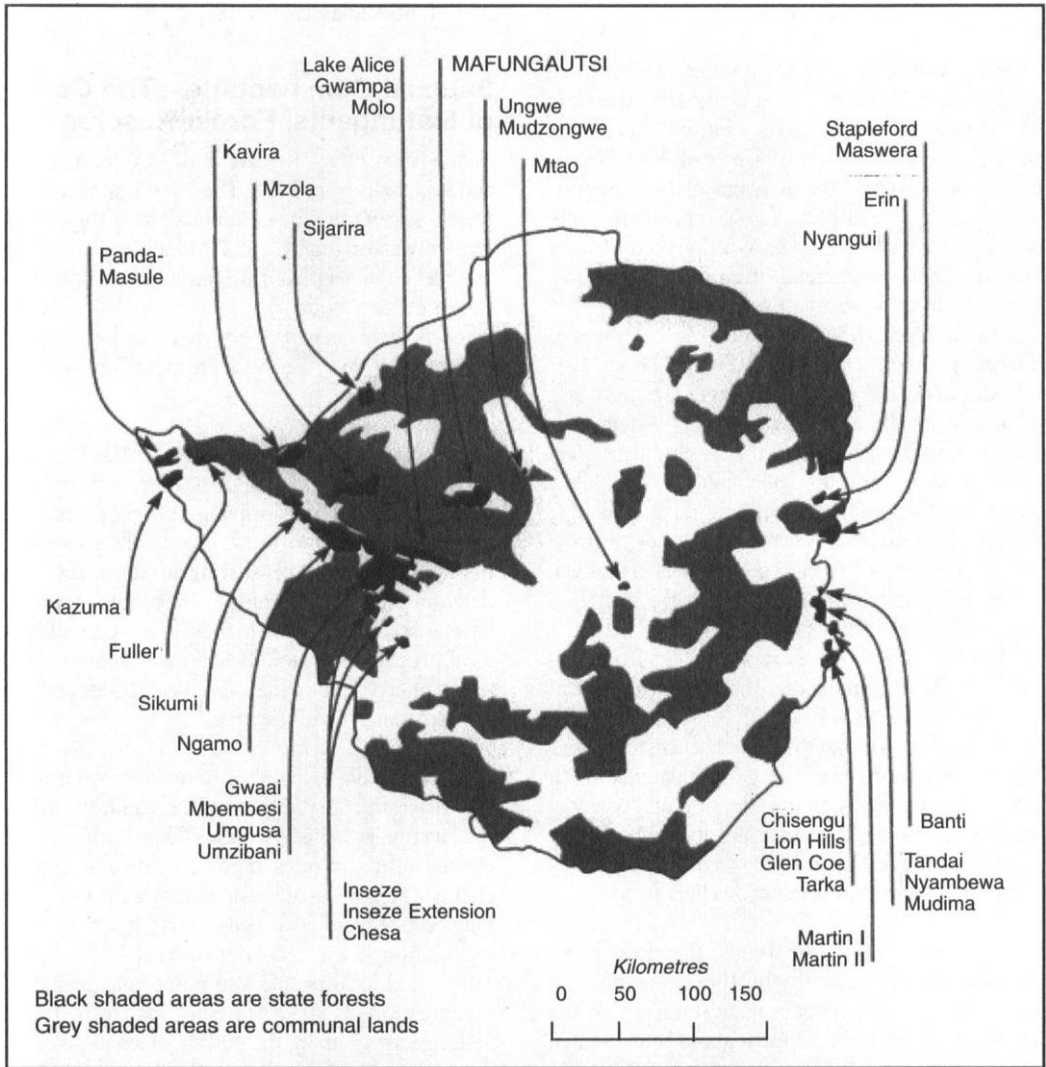
### **3 Local Commentaries: The Case of Mafungautsi Forest Reserve**

Mafungautsi Forest Reserve is 82,000 ha in extent and was reserved in 1954. The forest is 'almost completely surrounded by communal areas (Figure 1). Its size was originally 105,000 ha, but 23,000 ha were ceded to neighbouring communities upon failure to contain 'squatter' problems in 1972. Forest dwellers were later forcibly evicted in 1986 due to the ongoing civil war and the perceived security risk of 'squatters'.

The reserve was selected in 1994 by the FC management as the site for a pilot 'resource sharing' project as a means of resolving the contested and overlapping rights to forest use. In the process of negotiating a resource sharing arrangement with neighbouring communities, inevitable conflicts have arisen. What follows, then, is a review of how local people living around Mafungautsi forest view issues of ecological dynamics, social issues and the economic use of the resource.

Local people argue that they have their own ecological management systems in place, as illustrated by the riverine systems which are kept from siltation through stringent rules imposed by their local leadership. The grazing of livestock inside the forest has long been recognised as beneficial to forest management through the reduction of fuel loads (Judge 1975), and local people also point out this fact in arguing for a stake in the management of Mafungautsi. Equally, the cutting of small poles for the construction of structures like drying racks benefits the growth of commercial species by opening up the canopy (Vermeulen 1996). Lastly, local people also make the argument that agriculture, contrary to arguments by the FC, actually promotes the flow of water in rivers. People cite one major river that flows through the forest that has not flowed since the eviction of forest inhabitants in 1986 and the cessation of farming inside the forest.

**Figure 1: Map of Zimbabwe Showing the Location Communal Areas and State Forests, Including the Case Study Area Mafungausti (source: Bradley and Dewees 1993).**



One former forest tenant argued that: 'forests are supposed to provide homes for people and not trees and animals'. This statement indicates the value of forests as home to more than 800 families before 1986, whose livelihoods were closely linked to the forest reserve. Displacement has many social consequences both for those who have been displaced and those compelled to accommodate them. Whereas displacement initially appeared to be temporary, the new homes of the refugees soon became permanent settlements out of lack of choice. Displacement of former tenants has resulted in rising tensions between former forest dwellers and the neighbouring host communities. The former are alleged to encourage the degeneration of the moral fabric of the wider community by virtue of their different ways of life. Displaced people do not have as many farm related activities as more established members of the community because they have smaller fields to cultivate and must continue to rely on gathering and hunting in the forest area (Matose 1996). These different ways of life have caused tension between the two groups. Displaced people are alleged to be social misfits, as their children drop out of higher levels of primary school and do not go for secondary education. But the problem is that most displaced people do not have access to wide sources of income. Most members of the original communities sell their farm produce and thereby gain enough income to send children to school and meet their other needs. Displaced people's farm produce, by contrast, is barely adequate to meet their survival needs, so they never have any surplus for sale. They also lack remittances from outside the area, as most of the men never sought employment outside the forest. The FC used to provide employment to many of the men within Mafungautsi without the need for any educational qualifications.

Forest inhabitants' religious practices were very much centred on the forest in the past. These practices revolved around the holding of ceremonies and the performance of rites at sites within the forest at certain times of the year. One of the sites, where only a few elders and village heads were allowed, was on the eastern part of the forest. Although that area of the forest was not normally accessible to tenants, they could still perform their rites within it. Nearly every displaced person argues that the Rutope river (one of the rivers from the forest) no longer flows because their elders no longer

perform any ceremonies at designated pools to keep the water flowing. During a visit there, they were amazed that so many big pools along the river, in which big fish could previously be caught, had virtually dried up. All these practices are no longer performed because people are now estranged from the forest in which the sacred sites are located. Discussions of religious practices draw very sad faces from displaced people, as they feel they have now lost touch with their ancestral spirits, meaning that they are now incomplete beings.

The translocation of forest inhabitants to distant places has resulted in the dispersion of a once thriving community. Members of kin groups have been scattered all over Gokwe District and it is now difficult for them to maintain close ties. Among those who were displaced to further places are people who held distinct positions within their society, such as healers. Establishing social ties with members of the wider community with whom they now live has been rather difficult, especially when displaced people are continuously alleged to be the cause of moral decay and many other social disputes over land and livestock.

Forest resources play a significant role in the household economies of many people living around Mafungautsi forest, especially those living close by. The forest provides grazing for livestock, which becomes even more important in times of drought. Grazing was ranked the second most important resource of the forest after land for cultivation (Matose 1994). Results from a survey indicate as many as 78 per cent of the households living closest to the forest (less than two kilometres away) graze their livestock in the forest. The third most important resource from the forest to households was timber for construction, despite being harvested illegally. As many as 64 per cent of the households living up to three kilometres from the forest boundary used timber from Mafungautsi. Non-timber forest products such as thatching grass, broom grass, clay for homes, mushrooms, honey, *macimbi* (an edible caterpillar), fruits and game meat, were also ranked as significant (in declining order of importance).

Studies carried out in villages surrounding the reserve show how local people have a different vision for the forest landscape: one that is managed

and used by people, not simply protected by the FC. Local people argue that use is not incompatible with environmental protection and timber harvesting; indeed grazing and some other harvesting activities can be positively beneficial, they argue. A variety of institutions are key in ensuring that people gain access to a wide range of forest-based endowments and entitlements. Such institutions, ranging from religious beliefs and practices to labour organisation for hunting and gathering, conflict with current FC regulations which prevent the use of the forest without official permits.

Competing claims to legitimate authority over land and resources are at the heart of the current conflicts. The pledges of land restitution made during the liberation struggle have remained unfulfilled, and the post-independence state has imposed laws with more force than even its colonial predecessors. What right, people ask, does the FC have to manage this land? With the spirits of the land and the ancestors angered by dispossession and a lack of appropriate propitiation, people have increasingly gained the confidence to resist the impositions of the FC. Under a different framework of legitimisation offered by local discourse on the forest and the FC, the formally 'illegal' acts of 'squatting' and 'poaching' gain local legitimacy and may be supported by local leaders, spirit mediums and others.

#### **4 The Resource Sharing Option**

It is against this background of mistrust and suspicion, based on years of negative experience, that the up-hill task of developing a resource sharing, co-management scheme is set. Recognising the need to seek solutions to the conflicting and overlapping rights to forest resources, the Forestry Extension Services (FES) division of the FC, which is responsible for the management of the forest, started implementing a pilot resource sharing scheme with neighbouring communities in the mid 1990s (FES 1995). Co-management principles underlying the scheme include the sharing of responsibilities, stakeholder participation in decision-making and joint sharing of forest benefits.

Given the spatially differentiated resource use patterns, the project is focusing on settlement areas up to three kilometres away from the forest edge; those who are assumed to be most reliant on forest

resources for their livelihoods. Resource Management Committees (RMCs) are established in each village and are the structures for implementing both community and FC decisions through the formulation of plans for harvesting and marketing of various products. The committees comprise locally elected people and are responsible for the setting up of harvesting patterns and monitoring resource use by villagers, as well as reporting offenders to the Forest Protection Unit (FPU) of the FC (Ramachela 1996). Training programmes for local people through the RMCs have been devised for developing entrepreneurial skills around thatching grass marketing, bee-hive making and honey selling, as well as increasing the economic value and benefits derived from the key resources from the forest. The imparting of skills to members of the RMCs is done through linkages with a variety of government and non-government organisations.

To date, the resource sharing scheme has largely focused on non-timber products among a limited number of villages around the forest, where conflicts with the FC are not too extreme. Non-timber forest products were chosen as the initial resource focus, as the harvesting of such products does not conflict with the FC's primary objective of reserving the forest for watershed protection. Grazing of livestock in the forest and the collection of thatching grass, broom grass, mushrooms, *macimbi*, fruits and firewood are therefore now allowed according to co-management regulations. In the future, the project also intends to develop the tourism potential that exists around the forest. Potential attractions include the water-falls over one of the rivers that dissects the forest, as well as the presence of a fossil forest. To this end some infrastructure is being put in place for the accommodation of tourists (Ramachela 1996).

Whereas the project has gone some way in reducing the conflicts that used to exist in relation to forest use, there are some major challenges that remain. During discussions in the project areas, some former forest tenants commented:

'The war ended in 1987 but we are still fighting...'

'The Forestry Commission is much more interested in the welfare of trees than of people'.

These statements indicate the sentiments that many local people have towards the FC, particularly given the failure to address the most pressing demands for land and timber as part of the resource sharing scheme. About 42 per cent of people living adjacent to the forest expressed the need for land for farming. This was particularly associated with young couples and those who had moved into the forest fringes after 1986 (Matose 1994). Similarly, timber and wildlife resources are not part of the sharing scheme, whereas local people were aspiring to benefit from logging concessions for commercially valuable species.

The pilot project is seen by some, therefore, as a minor sop to local demands, and failing to address the fundamental problems faced by people living in the area. It is clear that it is the FC who is setting the terms of negotiation for the resource sharing scheme – only certain options are on the table; some, and most particularly access to land for agriculture, it seems, remain non-negotiable. This, not surprisingly, builds resentment, leading, for some, to strategies of covert resistance.

A prevalent resistance strategy is a practice referred to as *runya* in the local language. This refers to the cutting of excessively large sizes of poles for constructing granaries and other structures that would not normally be used in order to ‘hurt’ the FC. Associated with this practice is the felling of trees for which there was no end use, especially by youths herding cattle inside the forest. Yet another form of resistance is the renewal of poles around structures almost every year, when the poles could last for more than five years. This is in spite of the risk of being apprehended by the FPU.

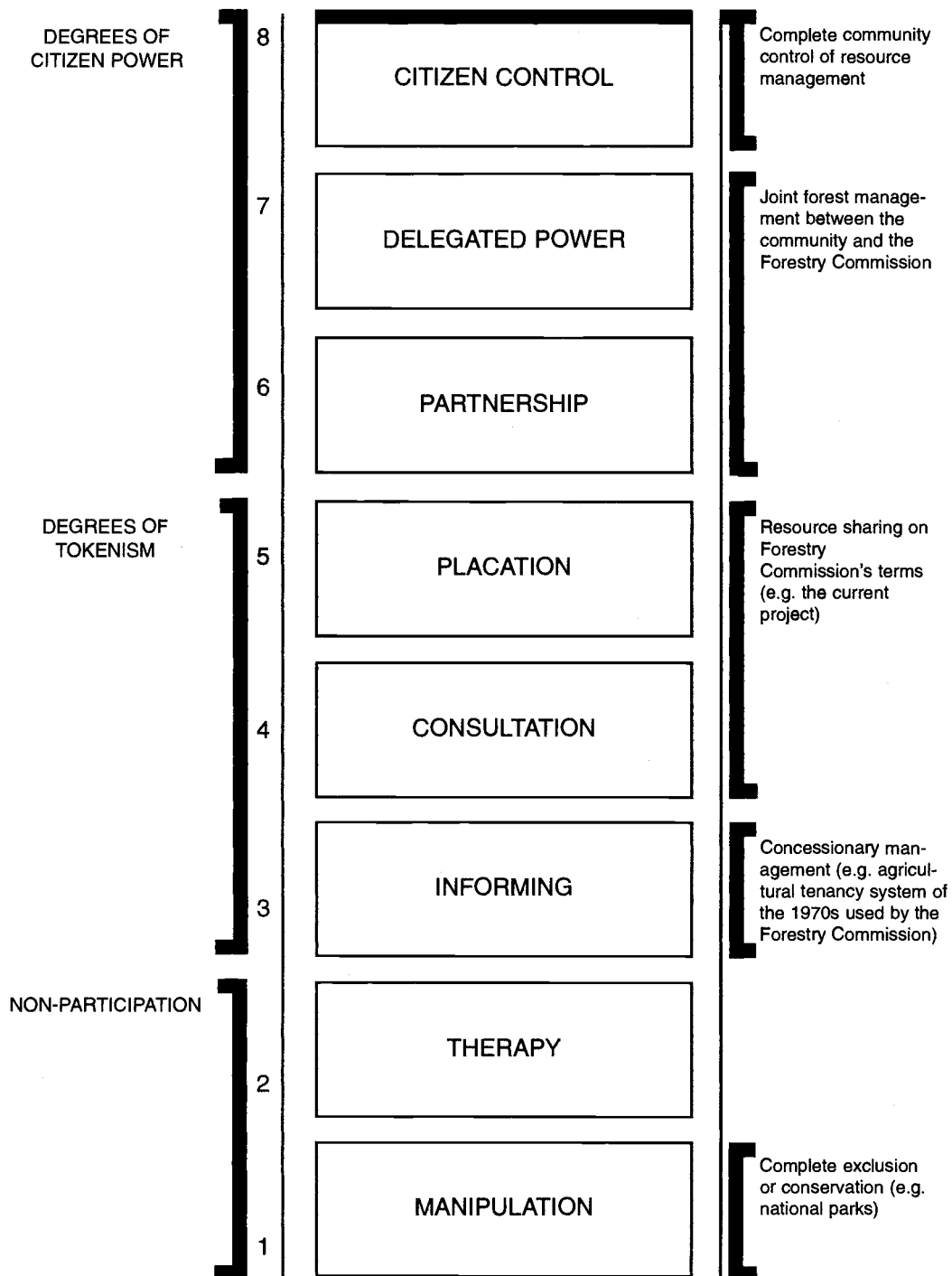
A fundamental lack of trust remains between local people and the FC. With the setting up of RMCs, the need for the FC's Forest Protection Unit to monitor resource use should theoretically have fallen away. However, the FPU continues to be in place three years after the onset of the project. This appears to contradict the co-management principles that the project represents, not least in terms of trust. If trust had been engendered, and greater power and authority over resource control and management devolved, local structures might have been better placed to monitor offenders than a unit comprising eight people with the responsibility to police over 80,000 hectares at any one time.

A fundamental question, then, is who has effective control over forest-based endowments and entitlements? This requires an assessment of the power relations between different actors in the resource sharing scheme. While the project documents for the pilot scheme are full of the rhetoric of community participation and empowerment, a more careful look at on-the-ground practice suggests that the concept of participation needs unpacking.

Arnstein (1969), uses a ‘ladder of participation’ to indicate what the concept really entails. In Figure 2, various forms of forest management have been juxtaposed on Arnstein's ladder to indicate the levels of community involvement implied by each form. The highest form of participation in which people control their own destiny would be represented by a situation in which local people manage their own resources; that is they take over forests or resources formerly controlled by outsiders like the FC. By contrast, degrees of tokenism are often evident under the guise of participation where communities have some involvement, but little power or control over forest management. An intermediate level might involve some form of partnership and would be equivalent to effective joint forest management or resource sharing. However, this could easily become either routinised consultation or simple placation, depending on the terms an outside agency offers. In other instances, local people could just be informed of the terms of participation and the form of the resource sharing arrangement by the outside agency.

Who has the authority or power to make and enforce the rules is an important distinguishing feature of these different forms of participation. Under the current resource sharing scheme this remains ambiguous and often contested. Ultimate authority, however, remains with the state and with the state institutions of the law and a range of enforcement organisations, most visibly the FPU. Local institutions are given some management roles, through the RMCs. Despite their quasi-representative nature, their authority may be questioned by some members of the community as their very existence is dependent on the FC, the organisation seen by many as the historically illegitimate controller of the forest resource. Little space is offered for alternative, local institutions in this resource management system. For example, the pilot scheme managers in the

**Figure 2: Ladder of Participation with Parallel Forms of Forest Management**





FC would find it difficult to recognise the role of spirit authority in forest management, despite the fact that a large portion of the local population view resources and their management as very much bound up with religious practice and belief (Mukamuri 1988).

Local perspectives are, of course, not uniform and different social actors draw on different meanings and interpretations of legitimate authority over resources and so, as a consequence, different institutions to mediate resource access. Legitimate command is very much associated with who people are and where they come from; in other words with how their identities are constructed. As already discussed, former forest inhabitants are seen locally as different from others, with different histories, different beliefs and customs and different institutional networks. Understanding difference is therefore key. Men, women, rich, poor, old and young may all rely on a different complex of institutional relationships in order to gain effective command over the benefits derived from the forest areas. These may be legitimated in different ways, again drawing on different and sometimes conflicting institutions, both formal and informal.

## **5 Conclusion**

This picture of conflict, diversity and difference is a far cry from the simple versions of community uniformity, untroubled participation and easy consensus often assumed by proponents of community-based resource sharing and joint forest management. So is it all a waste of time and effort? Are these attempts at getting people involved in resource management all naive attempts at the impossible? Is the prospect of people's participation

and community participation a false hope? I would argue no on all counts.

However, it must be recognised that the history of past interaction between people and forestry officials in Zimbabwe has not been wholly positive, with the result that distrust and suspicion run high. Successful participation must therefore start with the building of trust and the development of the social capabilities that allow for confidence and positive interaction. This process may well be slow, painful and fraught with difficulties. Conflicts are inevitable, both within 'communities', who, of course, are never homogeneous nor harmonious, and between local people and forest officials. Some conflicts may be easily resolved through the seeking of compromise or win-win solutions. But they may persist and be rooted in more fundamental differences of perspective or opinion. On these issues an openness, especially from the more powerful FC players, is needed which allows for different perspectives on key issues of ecological change, forest management or economic use to be explored without closing down options. This requires the acceptance of more plural forms of expertise and opinion, a willingness to challenge accepted orthodoxies or dominant 'policy narratives' and to explore, perhaps initially through adaptive testing, other options which might otherwise not be countenanced. On the part of the more powerful actors in a resource sharing scheme this requires the relinquishing of some power, offering opportunities of some level of real citizen control (cf. Figure 2). It also requires a reassessment of the dominance of scientific expertise and a willingness to explore alternative, local perspectives. These are, of course, major challenges, but ones that allow for the possibility of successful co-management and the chance of more sustainable forms of community-based development.

## References

- Arnstein, S.R., 1969, 'A ladder of participation', *Journal of American Institute of Planners*, July 1969: 216-223
- Bradley, P., and Dewees, P., 1993, 'Indigenouse woodlands, agricultural production and household economy in the communal areas' in P. Bradley, and K. McNamara (eds), 'Living with Trees: Policies for Forestry Management in Zimbabwe', **World Bank Technical Paper**, 210, Washington: World Bank, 63-138
- Bradley, P., and McNamara, K. (eds), 1993, 'Living with Trees: Policies for Forestry Management in Zimbabwe', **World Bank Technical Paper**, 210, Washington: World Bank
- Bruce, J., Fortmann, L. and Nhira, C., 1993, 'Tenures in transition, tenures in conflict: examples from the Zimbabwe social forest', *Rural Sociology*, Vol 58 No 4, Winter 1993: 626-642
- FES, 1995, Community-based natural resources management project: pilot forest management project in Mafungautsi Forest, Harare: Forestry Commission
- Hough, J., 1986, 'Management alternatives for increasing dry season base flow in the Miombo Woodlands of Southern Africa', *Ambio* 16: 341-346
- Judge, G., 1975, 'The Kalahari Sand Forests of Rhodesia: Management report', Bulawayo: Forestry Commission, 19 Chapters
- Katerere, Y.M., Moyo, S. and Mujakachi, L.J., 1993, 'The national context: land, agriculture and structural adjustment, and the Forestry Commission' in P. Bradley and K. McNamara, (eds), Living with Trees: Policies for Forest Management in Zimbabwe, Chapter 1, **World Bank Technical Paper** No 210: 11-28
- Matose, F., 1994, 'Local peoples' resource uses and perceptions of forest resources: an analysis of a state property regime', unpublished MSc thesis, University of Alberta
- Matose, F. and Clarke, J., 1993, 'Who is the guardian of the indigenous forests?' in G.D. Pearce and D.J. Gumbo (eds), **The Ecology and Management of Indigenous Forests in Southern Africa**, Proceedings of an International Symposium, Victoria Falls, Zimbabwe, July, 1992, Harare: Forestry Commission and SAREC: 62-70
- Matose, F., 1996, 'Gwaai and Mbembesi forest settlers' case: a report of a PRA exercise', Harare: Forestry Commission. Typescript 24pp.
- Matzke and Mazambani, 1993, 'Resource-sharing schemes for state owned land in Zimbabwe', Discussion paper presented at CASS/WWF Seminar series, University of Zimbabwe, August, 1993
- Moyo, S., 1995, **The Land Question in Zimbabwe**, Harare: Sapes Books
- Mukamuri, B., 1988, 'Rural environmental conservation strategies in south-central Zimbabwe: an attempt to describe Karanga thought patterns, perceptions and environmental control', Paper presented at the African Studies Association conference, Cambridge
- Murphree, 1993, 'Communities as resource management institutions', **Gatekeeper Series**, No 36, London: IIED
- Nhira, C. and Matose, F., 1996, 'Joint forest management and resource sharing: lessons from Zimbabwe', **Forest Participation Series**, No 5, London: IIED
- Pereira, H., 1973, **Land Use and Water Resources in Temperate and Tropical Climates**, Cambridge: Cambridge University Press
- Poffenburger, M. and McGean, B. (eds), 1996, **Village Voices, Forest Choices: Joint Forest Management in India**, Delhi: Oxford Universtiy Press
- Ramachela, K., 1996, 'Community co-management of Mafungautsi forestry resources', Harare: Forestry Commission internal document. Tyepscrip 60pp
- Roe, E., 1991., "Development narratives" or making the best of blueprint development', **World Development**, 19: 287-300
- Vermeulen, S. J., 1996, 'Cutting of trees by local residents in a communal area and an adjacent state forest in Zimbabwe', **Forest Ecology and Management**, 81: 101-111