Conserving biological diversity through the Integrated Conservation and Development Project approach: with field examples from the Uluguru Mountains, Tanzania

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Background

The ICDP project has been recently usefully defined (Newmark and Hough 2000) as follows. ICDPs attempt to link conservation of biological diversity within a protected area to social and economic development of outside that protected area. Incentives are typically provided to the local communities in the form of shared decision-making, employment, revenue sharing, limited harvesting of plant and animal species, or provision of community facilities such as dispensaries, schools etc in exchange for the communities support for conservation. Although there is considerable debate about, for example, whether such projects are only about biodiversity conservation (rather than broader natural resource management issues) or whether issues such as schools and dispensaries etc should be included within an ICD, this is a useful definition for most such projects.

The design of such projects require that those coming from a natural resource management background (biologists and foresters etc) and those coming from a human development background (social scientists and development scientists) are able to pool their ideas and approaches to achieve the conservation of an area of high importance for biological diversity.

This paper covers some theoretical and real-life situations that are encountered when ICD projects are being designed and implemented. It also provides some examples from a DANIDA funded project in Tanzania of some of the activities and challenges that are faced on the ground in an ICD project. It is hoped that some of these issues can assist in the future design of ICD projects under DANIDA.

Categories of Project Approach.

In very broad terms there are three major categories of project approach to conservation in African countries:

- The 'social-anthropological' approach – where 'indigenous' peoples are allowed to continue their practices in harmony with their local environment and are actively involved in the protection of natural resources (and by implication – biodiversity);

- The ‘hard-line protectionists’ command and control approach – where people are excluded from a defined area and suffer penalties if they break the ‘rules’. This is of course linked to the wilderness concept, where a relatively pristine ecosystem is maintained free of people);

- A more recent “progressive’ conservationist approach, where the integrity of the protected area (national park, forest reserve, sacred grove or whatever) is maintained through local people’s involvement in management, including self-regulation. The people supposedly derive sufficient benefit from the area as an incentive to contribute to such control.

In reality these approaches exist along a gradient from strict protection through to social management (see diagram). Strict Nature Reserves and most National Parks would come of the left, and community based management approaches to the right. The ICD Project approach and its many variants would come closer to the centre of the gradation, with the degree left and right of the centre dependent on the degree to which resource protection and community issues are important.

CATEGORIES OF INTERVENTION (more protection on left)

Hard-line Protectionist	*Progressive*	*Social-Anthropological*

EXAMPLES

Strict Nature Reserve	*ICDP*	*Community Based*
National Park	*Joint Forest Management*	*Management*
Wilderness		

In African nations the ‘hard-line protectionist’ approach has been more difficult to maintain as pressures grow and governments can no longer finance the necessary control. However, in many of the resource management agencies in Africa this is still perceived as the best way to manage resources, something that seems to be supported in a recent analysis (Kramer *et al*., 1997; Bruner *et al.,* 2000).

The ‘social-anthropological’ approach of leaving the people and natural resources in equilibrium, has been become a concern of a number of social scientists seeking a fairer path to conservation in Africa (IIED, 1994; Borrini-Feyerabend and Buchan, 1997; Neumann, 1998). These approaches seem most effective in areas where people have a great affinity to and reliance on the habitat and its species. Examples are in the traditional ‘sacred’ forests of Africa (e.g. Posey, 1999; Spear, 1978), in the Congo Basis where Pygmy hunters live in the forest and maintain the habitat, while at the same time deriving their necessary materials from it, and potentially in other habitats such as the forest/savanna mosaic habitats of West Africa (Fairhead and Leach, 1995).

There has been much recent literature on the ‘ progressive’ approach for African conservation, where elements of protection, development and benefit sharing are

encompassed within a conservation project. One of the problems is that there are few direct examples of successful long-term project interventions, although there are a number of overviews of the issues (Anderson and Grove, 1987; Rodgers, 1993; Caldecott, 1998). Most literature from Africa relates to projects where large animals provide revenue and hence a driving force for sharing wildlife for conservation and development needs (MacKinnon *et al*., 1986; McCracken, 1987; Lewis *et al*., 1990; Hannah, 1992; Pimbert and Pretty, 1995; Leader-Williams *et al*., 1996). There are few forestry examples (see Wells, 1994; Wiley, 1997; Rodgers, 1998; Kajembe and Kessy 2000; Lukumbuzya 2000), and even fewer of the existing projects are dealing with forest areas containing globally important biodiversity resources. Hackel (1999) points out the difficulties of these approaches with poverty stricken people where short term concerns are likely to override long term benefit sharing opportunities. Asian experience with Joint Forest Management has been largely with rehabilitating degraded forest-land, and involves much extractive use. These programmes have been quite successful and have been advocated as a model for Africa, but again the experience with forests of high biodiversity value is limited (Sanjayan *et al.,* 1997; Wells *et al*., 1999).

Some characteristics of better ICD projects in Africa

The potential link between development benefit and conservation status has led to a series of Integrated Conservation and Development Projects – ICDPs, around the world. Their experiences over the last ten years have led to a number of 'lessons learned' reviews. Hannah (1992) summarised the experiences of early ICDP projects in Africa, and further relevant information is found in several other publications (Sayer, 1991; Barrett and Arcese, 1995; Fisher, 1995, Alpert, 1996; Caldecott, 1998; Larsen *et al.,* 1998; Oates, 1995; 1999). Early reviews were not able to demonstrate much success, but believed that this might be due to the short period of operation of most projects. Later reviews have become more critical still and have indicated that the ICD approach has failed and should be replaced by other activities, ranging from Community Based Management (e.g. suggestions in Newmark and Hough 2000), through traditional protection (Oates, 1999), to direct payments to local communities to compensate for their loss of opportunities (Ferraro, in press). We believe that the ICDP approach is still valid and can achieve some conservation gains, but that the following issues are very relevant.

<u>Protection components are included</u>.

In the reviews by Hanna (1992) and Wiley (1997) it was concluded that adequate protection was an important part of any ICDP and needs to be adequately funded if the other aspects of the project, such as sharing benefits from the resources, are to succeed.

These results are somewhat at odds with a more general discussion on the failure of command and control (C&C) policies, and the need to move to a new paradigm of community resource management (*e.g*. Gadgil, 1992; Wily, 1997). Unfortunately, the literature suggests that these extremes are the only tenable positions that can be adopted. This is an over-simplification of the facts. Further, the contention that C&C

is failing is an overstatement. Most reserves are still there, most resources are intact, most people respect the boundaries, and they appreciate the need for the reserve (Newmark and Hough, 2000). Moreover, traditional community-based resource management, as in most forms of traditional management, had command and control systems. This might appear to be more benign than Government's rule of law, but social ostracism is a powerful force in traditional society. The potential importance of balancing protection through government and local institutions has also been pointed out (Schrijver, 1997).

Policies are favourable.

As with most other conservation work, the policies of the country where the project is located are very important. If they are not conducive to collaborative management agreements, then ICD project interventions may be impossible. For example, changes in the Forest Policy of Tanzania from a protectionist 1953 policy to a 1998 policy (Govt. Tanzania, 1998) which encourages the creative involvement of local communities offers scope for projects in Tanzania to experiment more with Joint Forest Management and other issues which can form components of a ICD.

There are adequate links between Conservation and Development.

A recent review (Wiley, 1997) showed that the assumption that providing improved D for development will lead to an improved C for Conservation within ICDPs is often false. ICDPs must therefore focus on conservation, through either continued government controls or sufficient local people's regulatory mechanisms. The development aspects of the ICDP must support the conservation objectives. Local communities are dynamic and complex and a development activity, such as encouraging banana growing to develop stable agriculture to prevent shifting cultivation, might within a few years become so successful that the same local communities start rapidly clearing forests to grow more bananas (see below). Making and monitoring these links is hard and adequate resources need to be within the ICDP to do it, which they are generally not. The lack of links between the D and the C is one of reasons why ICDPs have been criticised in recent literature (e.g. Oates, 1999).

The synergy between conservation and development activities is critical to the success of an ICD Project. This means that every rural development intervention in an ICD Project should support forest conservation (with a clearly identified linkage that can be monitored), whilst forest conservation activities should aim to maximise potential benefits for local people within limits set by biodiversity conservation objectives (i.e. the interests of external stakeholders). However, much simpler ICD models also exist, for example collaborative management agreements for a forest area, with monitoring and policing would also be an ICD project, even though there were no development activities.

Preliminary assessment of collaborative forest management possibilities by projects situated in the Uluguru (DANIDA) (Moshi, 2001), East Usambara (FINIDA) (Stocking and Perkin 1992), Pare (GEF) and West Usambara (GTZ) Mountains in

Tanzania have shown that villagers often continue to have a strong interest in short-term extraction benefits and clearing the forest for farmland, rather than investing in longer-term conservation responsibilities. Devising a system where the long-term benefits of management of the resources outweigh the short-term advantages of destroying them, poses a serious challenge to the design of any ICD project. Part of this problem is that incentives to receive public goods (free natural resources) offered by ICDPs are insufficient to change individual behaviour patterns and hence short-term goals may still predominate (Gibson and Marks 1995; Noss 1997).

Local communities are involved fully.

This has been stated many times, but is often very difficult to achieve as the communities themselves are not homogeneous, even within a single village and there is a strong tendency for outside projects to end up working with the most powerful of local elite in the area. Some successful ICD projects have been based on initiatives undertaken by local community groups or local Government management authorities, with financial flows from tourism. Examples are mainly from projects involving wildlife management (e.g. Zimbabwe, see paper in this symposium issue), although the Jozani forest in Zanzibar, the Arabuko forest in Kenya generate some tourist income from people visiting the forests (see Burgess and Clarke 2000 for details). Tourism does offer one hopeful avenue for exploration with local communities, and the benefits of these funds are being shared increasingly, for example at Kilimanjaro in Tanzania and Bwindi in Uganda (Wild and Mutebi, 1996). In African forests, the benefits from pit-sawing, collection of building materials and fuel could also be shared between the local communities and management authorities, and hence provide an incentive for conservation, but in practice they are still harvested illegally at unsustainable rates in most places (Rodgers, 1993; Wild *et al*., 1999).

Ecological Monitoring is included

Most ICD projects have not been established with an adequate ecological monitoring component (Wells *et al*., 1992; Kremen *et al*., 1994). This means that it is often impossible to assess whether the Development activities within an ICD have achieved their overall goal of reducing the threats to valuable natural resources of the area (which can be biodiversity, water catchment, mammal populations etc.). One reason for this absence is a considerable reluctance on the part of donors to fund what they might perceive as pure biology, and another reasons is that the actual design of such monitoring programmes are quite complex and can be expensive to implement. Targeted ecological monitoring programmes focussed on key species, and key issues (forest area remaining, forest condition, level of hunting etc) may offer a valuable way forward with this issue in many ICDPs.

Project lifespans are adequate

The length of project support is a critical issue. A 3-year project phase might be effective to solve immediate problems such as infrastructure development, boundary encroachment and reserve gazettement, and provide an immense boost to morale in under-funded and often partly inactive government natural resource departments. However, a three year project will not be able to achieve a shift from direct control by

government to one where there is a role for sharing control between government and the communities (Kiss, 1999). Such a process might take 10-15 years and might need mediation from an international or national NGOs or CBOs, with a monitoring role after that. Funding mechanisms that allow this need to be developed and ways in which any revenues can also be shared also worked out.

In 30-50 years from now we should look for a major change in attitudes to natural resources and the integration of habitat areas into the land ownership pattern as a valued and respected part of the landscape.

Examples from Africa of projects which have operated for a reasonable length of time and achieved some degree of sustainability are the Kilum-Ijim projects in Cameroon managed by BirdLife International and the Jozani Chaka Bay project in Zanzibar Tanzania, managed by CARE Tanzania (last see Burgess and Clarke 2000). In contrast, high funding and short-term projects cannot achieve a long-term sustainable situation, for example the KIFCON project for the conservation of Kenyan Natural Forests which was closed after its first phase (for political reasons).

Systems for long-term financing are developed

The funding of conservation through the ICDP approach needs to have both a long-term perspective and to permit long-term planning and the involvement of important stakeholders. As an example, the Uluguru Mountains, in eastern Tanzania contain globally important biodiversity values and are the most important water catchment area in Tanzania. Therefore it would be logical to expect that they would receive money from the international community and the Tanzanian government to conserve the biodiversity values, and also from the water users to protected their water sources and future business opportunities. But, like many other places globally, the Ulugurus have not received much funding for conservation, and there is no mechanism in place to ensure that the funding that is provided will continue into the future. Indeed, despite a number of studies of the economic value of water catchment and biodiversity (Pearce and Moran, 1994; Costanza *et al*., 1997), these values are often not appreciated at national and local levels where the resources are regarded as free goods capable of unlimited utilisation (McKean, 2000).

There are at least two things preventing the development of long-term funding mechanisms for sites such as the Ulugurus.

The first is that there is no legally established mechanism whereby donors (or companies and individuals) might contribute money to a body that has the responsibility to manage those funds and to use a part of them for conservation work in the Ulugurus. Such 'trust funds' have been established at some sites in Africa, for example at Bwindi in Uganda, and seem to offer one way to avoid the boom and bust cycle as projects come and go. It is important that the way to establish such 'conservation trusts' is better known and that progress is made in this direction involving the Tanzanian Government and other potential partners (NGOs, INGOs, IGOs etc). The issue of control and accountability would be very important in such a trust fund.

The second problem is that there is no legal mechanism whereby the water users might be expected to contribute to the management of the water sources, because it is in their own interests to do so. A modest levy on the major water users would produce adequate funds to safeguard the forests of the Ulugurus, and also to assist the development of the local populations. Such systems have been already developed where tourists provide a considerable income, for example tourist revenue on Kilimanjaro is used to both manage the park and also to provide infrastructure to the surrounding communities.

A direct and powerful link could also be made at the local level between the forests, the water, and the money being received for development. It could also be possible that the trust fund mechanism could administer the funds derived from the water tariff. However, the final conclusion here is set within the current context of aid dependency in Tanzania. In a less dependent country it might be argued that the water should generate development, the development should lead to increased government tax revenues, and these funds are then used by government to look after the water catchments and the people living around them.

Focus on the Uluguru Mountains

At the level of a single site it is much easier to illustrate the themes that might be chosen for intervention within an ICDP. Here we have chosen the Uluguru Mountains in eastern Tanzania as an example because a DANIDA project is already located in the area, it has been the focus of recent biological research by Danish teams, and further interventions in collaboration with the existing DANIDA support are planned by GEF.

Conservation Importance

It is first important to establish the conservation importance of the area. If it is not important then an ICDP should not be considered. Fortunately recent reviews (Lovett and Wasser, 1993; Burgess *et al*., 1998; Olson and Dinerstein, 1998; Mittermeier *et al.* 1998; Stattersfield *et al*. 1998; Myers *et al*. 2000) have proven that the Ulugurus are one of the most important areas for conservation in Africa and are a part of one of the top 25 areas for conservation globally. These mountains are also one of the most important in Tanzania for their water catchment functions; their waters feed the river which provides the capital city with its water supply.

Conservation Activities

If a biologist were sent to plan the conservation of the Uluguru Mountains they would be struck by the facts that the major part of the biodiversity is located in the natural forests and grassland plateau areas on the top of the mountains (Figure 1), and by the fact that the agricultural areas below these forests have a much lower biodiversity value, although they still possess some values. They would also note that the forest is now almost entirely confined to the reserved lands (in this case a Catchment Forest Reserve) and the boundary between the reserve and the farmland areas is in almost all areas a straight line. They would deduce that there has been considerable

deforestation in the area (Figure 2). They might also know that there is evidence that disturbance in the Eastern Arc mountain forest results in a lowering of the number of endemic species (e.g. Lovett, 1999). Analysis of available biological data would show how the endemic species are distributed in the Ulugurus (Figure 3). Analysis of forest cover data would show that forest has been lost from the lower altitudes of the mountain (Figure 4), where many endemic species are found (Figure 3) and that most of the forest outside the reserve has been cleared for farmland (Figure 2). Analysis of water catchments in Tanzania would show that the forests of the Ulugurus have the most important water catchment function in the country as they provide water to the commercial capital Dar es Salaam and the regional capital Morogoro.

The remaining areas of forest in the village lands are small, and often (in the great majority) being converted to farmland. They would also note that the forest within the reserve shows signs of pitsawing of the valuable hardwood timber species and in many areas there is abundant evidence of collection of building poles, firewood and trapping of animals by the local people found outside the reserves. Reading the laws of Tanzania they would find that all such activities within the catchment reserve are illegal in order to maximise the water supply benefits of the forests of the millions of people found downstream of the major rivers that originate in these mountains.

Looking narrowly at the problems the biologist might be tempted to draw up a set of focal activities such as are indicated on Box 1. Many of these activities would work perfectly well if the management agency had enough resources and the area was sufficiently isolated from the local communities to make it work. However, in the modern era many people are located within close proximity to important reserves, and they are using the resources in the reserve, as they have been exhausted in the lands outside. As populations have increased and as attitudes have changed, then some of the traditional conservation approaches have become less fashionable.

Development Activities

If a development worker were sent to the same area with the brief to develop set of project activities a different set of priorities would emerge. It would quickly be noted that the local populations are poor and suffer many of the problems associated with poor education, poor healthcare, poor infrastructure (especially roads), poor farming methods, lack of available building and fire wood, and a serious lack of income generating opportunities to get out of the cycle of poverty. It would also be noted that food security is not a real problem as the high and stable rainfall allows food to be produced all year, thus providing a considerable opportunity to solve many of the social problems in the area. Development of the agricultural potential and marketing of these products to improve the lives of the local people and develop the area might seem feasible and something which should be vigorously promoted.

Further study would show that the Waluguru people on the mountain practice matrilineal inheritance and hence the women are a very important target group for any project as they control the land. Moreover, the Waluguru would be shown to be divided into their own system of clans, some of which formerly held allegiance to local chiefs. A potential conflict would then become evident between the traditional management authorities in the mountain, and the more recently imposed authority of

the government, via the village leaders. As the village government is the normal start-point for external projects working with the government resource management agencies, then further potential conflicts would be noted between the project implementers and the villagers, who are the supposed target of most of the development interventions. Considerable anxiety might then emerge about who the development project should work with, village government, or clan leaders. The biologist would have probably failed entirely to discover these issues, or to appreciate their potential significance.

Simple planning approaches

A simplistic list of possible conservation and development interventions in the Ulugurus might then be developed as a list of the ideas proposed by the biologist and the development worker (Box 1).

Box 1: Simple list of conservation and development activities, Uluguru Mountains

CONSERVATION ACTIVITIES

- Maintenance of the catchment Forest Reserve (especially involving making sure the boundaries are well marked).

- Development of systems for control of forest harvesting (either through government control, or through participatory mechanisms).

- Biological monitoring of the rare and/or endemic species found in the reserves.

- Provision of alternatives to the harvest of natural products from the reserves in the farmlands outside the reserves.

- Education about the value of the forests as water catchment sources, and as repositories of potentially valuable genetic resources. At all levels from Central Government through to Village government and farmers.

- Insistence on the continuing respect for the Policies and Laws of the country, which are generally positive towards conservation.

DEVELOPMENT ACTIVITIES

- Enhance food production to provide income-generating and self-development opportunities for the local people.

- Enhance food marketing opportunities to further enhance income generating opportunities for the local people.

- Provide education opportunities so that more people can develop better agriculture, better marketing and also establish small local industries.

- Provide improved roads so that access to the area for transport of food products, people, medicines, and educationists is enhanced to improve living standards in the area.

- Provide improved health care opportunities for the local people, especially to treat common and simply treated diseases.

- Provide opportunities for family planning so that people can make choices over the number of children they have and hence better plan their education and future opportunities.

- Provide opportunities for equal participation by men and women, although in Uluguru Mountains the women are already in a powerful position as the owners of the land in all the traditional villages.

This approach is not ideal for developing a set of project interventions that are likely to work in symbiosis to achieve both conservation of the biodiversity and development of the human population. More sophisticated planning, involving a number of different stakeholders, is required to achieve this.

Moreover, because interventions have been designed in isolation there may also be differences in understanding various aspects of the overall project. For example, if the conservation objective is forest preservation then confusions can arise about what is forest. To the biologist this generally only means that natural forest with a closed canopy which has apparently never been touched by man. To the non-biologist, the same term may describe a plantation of introduced *Eucalyptus* or *Acacia* trees. The first might have globally important biological values and the second would have practically no biological value.

Further misunderstandings can occur when the number of biological species is used as a criterion for conservation investment in a natural forest ecosystem. It is often pointed out by non-biologists that the farmland, plantation woodland, small wetland agricultural mosaic has more species than the patch of dense natural forest. What this fails to address is that the farmland species are typically widespread and adaptable and are hence of low conservation priority. This is not the case in the dense patch of natural forest habitat which often contains species found no-where else in the world and which are specialised to the conditions in that location. If that single patch of habitat is removed then one or more species might become extinct.

A final problem is the issue of sustainability of the planned activities. Again even the word sustainability can mean very different things to different people. Biologically sustainable use of a fragment of natural forest might only entail using it for the collection of medicinal plants, and perhaps very limited collection of firewood and building poles. Higher, and hence biologically unsustainable, use of the habitat would reduce the biological values; there is good evidence for such effects in the Tanzanian forests (Mwasumbi *et al*., 1994; Lovett *et al*., 2001). However, sustainable use of an area of *Eucalyptus* plantation might entail regular cutting of the trees down to their stumps when they reach a useful size for poles, followed by regeneration from

these stumps. Here the sustainability is only dictated by the regeneration ability of the tree species concerned, and so long as the tree cover remains the system is commercially sustainable.

More detailed planning approaches

Poor experiences with some of the earlier ICD projects which were often designed using the above approach has led to intense emphasis on the design process in the expectation that good design will lead to better results. An example of the approach is now being implemented by the NGO CARE, which has an ICD unit that can gather skills from both the biological and development disciplines.

For example, GEF consultants have been at the Uluguru Mountains during 2000 with the existing DANIDA supported project and various stakeholders to devise a large-scale integrated ICD programme (not project) for the entire Ulugurus area. Within this programme there is aimed to be sufficient scope to allow different projects to come together in the common understanding that they are contributing to the conservation of the forest biodiversity and the well-being of the local populations. The stakeholders who have assisted in the design of the programme have included the national and District government officers, representatives of the village government, and then a range of other stakeholders selected by the community to represent their interests. This has included school teachers (both sexes), peasant farmers (both sexes), leaders of CBOs, traditional chiefs and other similar people. It was not possible to obtain representation by many of the current forest user groups at these stakeholder meetings (hunters, pitsawers, herbalists, fuel and pole wood collectors). This is a problem, but the reasons are understandable – under current law their activities are illegal and even promises of potential benefits in the future are insufficient to overcome their fears of being arrested.

A series of three workshops (and a smaller working group) eventually produced the attached framework for a large scale ICDP in the Ulugurus (Box 2). All activities in this diagram are supposed to be directly supportive of forest conservation, and two separate major donors are envisaged (DANIDA and UNDP/GEF), with a number of smaller donors also contributing to separate and shared activities.

The overall framework for this project can also be used to develop a detailed Monitoring and Evaluation Plan for the same project (Box 3). Here the ICD designers are forced to consider what measurable data might indicate if the project is reaching its goal, purpose, outputs and activities. It is relatively straightforward to design schemes for collecting data to measure the outputs and activities, but it is much harder to measure the higher-level project purpose and goals (which may in any case take years to achieve). Such a measuring mechanism can assist in understanding if the project is achieving its indicators, and whether this also leads to better conservation in the area.

These kinds of approaches to planning may assist ICD projects to achieve more in the future.

Conclusions

There are several key characteristics of an ICD project. These are as follows:

These are natural resources management projects that operate in and around areas of high biodiversity value, but which also attempt to generate benefits for the local communities. In an ICD project the set of conservation and development activities should be complementary and synergistic, and it is likely that the input will have to last for 10 years or more if the larger scale objectives are to be achieved (not just the indicators of the activities). Importantly, protection of the natural resources of biodiversity value is required in order to ensure that these values are not lost at the same time as the human development is assisted.

A key issue in an ICDP is integration. Seeking the integration of stakeholder interests is one of the current challenges of ICD project designers, and many efforts are being made to achieve this difficult task around important sites. A further point to note is that the balance of Conservation and Development activities can vary widely between different ICD projects and what actually happens on the ground depends on local situations, and the capability of stakeholders. Thus a project that seeks to address the interests of local people in the natural forest (which from their perspective are development interests) at the same time as trying to conserve biodiversity (to serve interests at national and international levels) is an ICDP irrespective of the balance of C and D activities. In the extreme case you might have co management and law enforcement with no traditional development activities – this is still an ICDP.

A fundamental issue is that of making the local communities aware, and for them to be convinced of, the direct link between the conservation of biodiversity and their own welfare – economic, social and cultural. In other words it is important for the communities to derive a direct benefit from the existing forest reserves or other protected areas. In this case education, and joint management agreements are very important, along with ownership issues, shared responsibility and shared benefits. All these elements should be incorporated within an ICD project.

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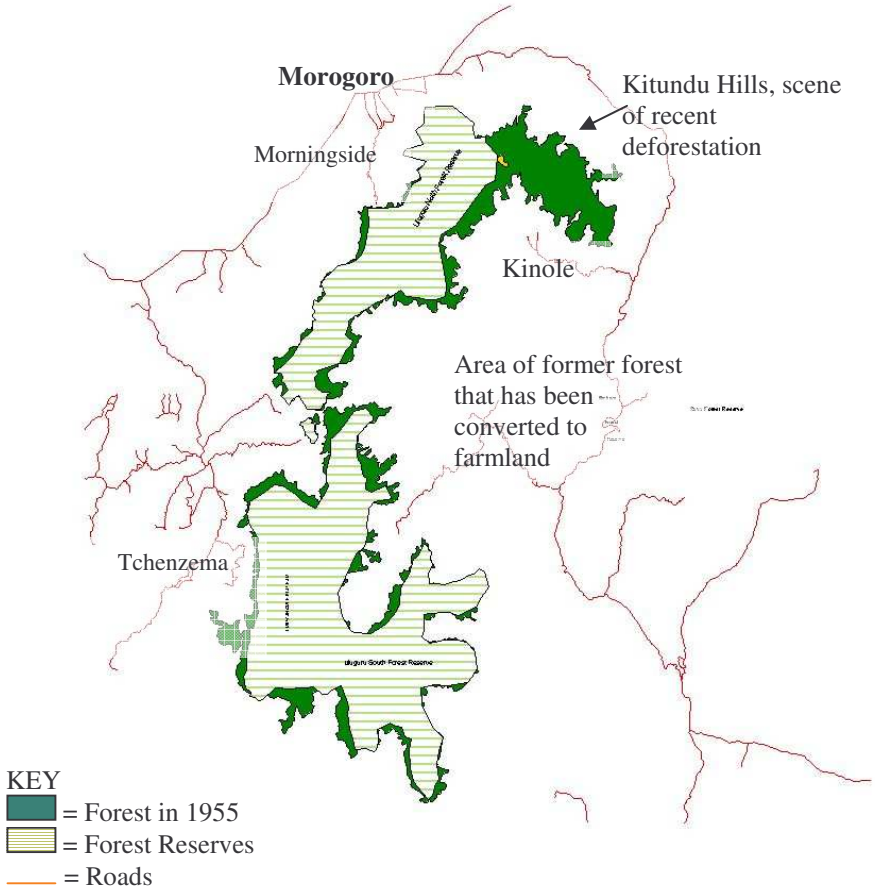

Figure 1. Forest cover(dark) in 1955 in the vicinity of Uluguru North (top), Bunduki (middle) and Uluguru South (bottom) Catchment Forest Reserves. Forest is now almost confined to the Forest Reserves (lined), except on the southern margin of Uluguru South, and some fragments.

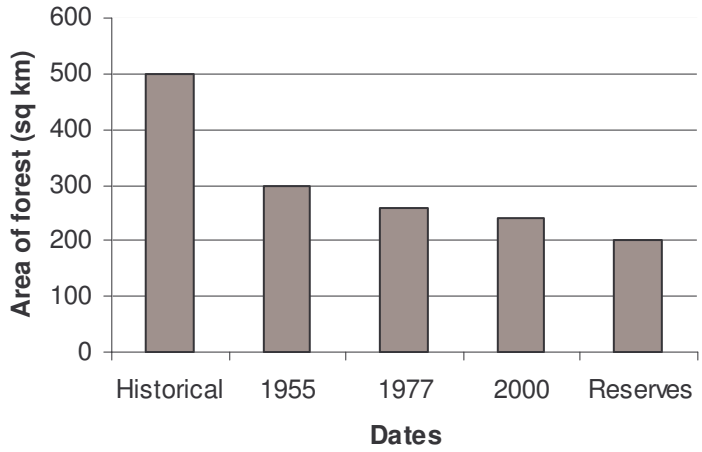

Figure 2. Changes in the area of forest on the Uluguru Mountains. 'Historical' is estimated from climate and the extent of lowland forest patches which are assumed to have been originally joined. Estimates for 1955 and 1977 are based on aerial photographs, and for 2000 on ground surveys. 'Reserves' is an estimate of the minimum forest area if the present reserves are maintained, with little encroachment, but all forest outside is lost (around 20 sq km of the Uluguru Forest reserves is upland grassland and some is rock).

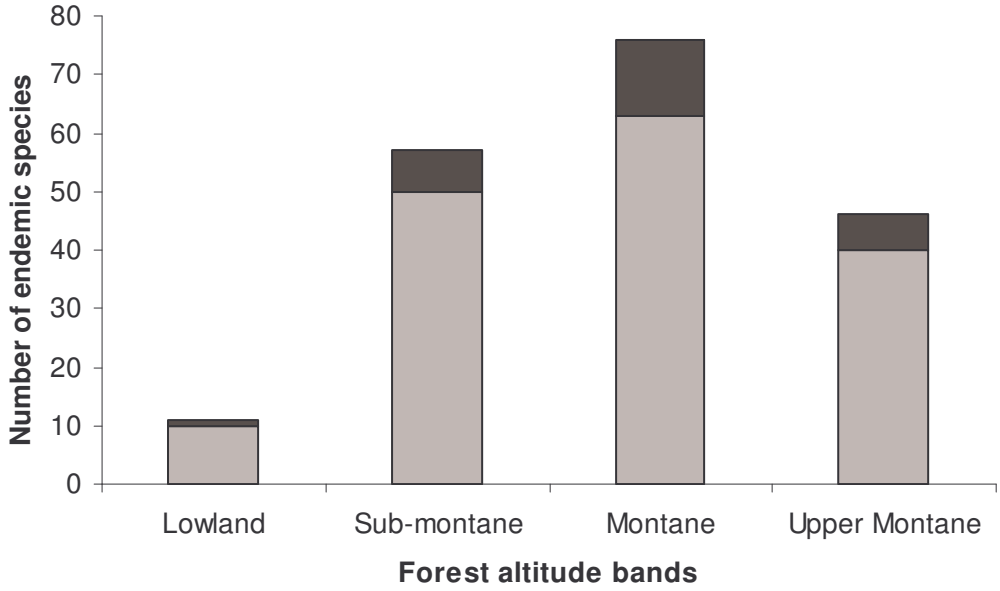

Figure 3: Altitudinal Distribution of Uluguru Mountains Strict Endemic Plants (grey) and Strict endemic Animals (black). Most are forest species and lowland forest ranges from 0-800m, sub-montane forest from 900-1500 m, montane forest from 1500-2100 m and upper montane above 2100 m.

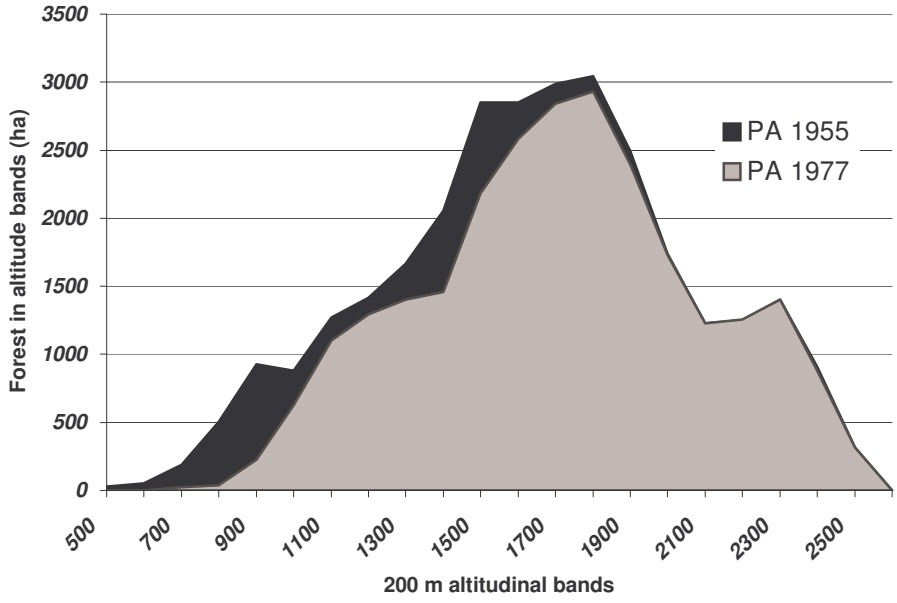

Figure 4. Altitudinal distribution of montane forests in the Uluguru Mountains, 1955 and 1977, illustrating the greatest forest loss between 700 and 1700 m, largely in the range of sub-montane forest, and very little forest loss above this altitude.

x 2: Uluguru Mountains Environmental Management and Conservation Programme: Objectives and Major Activities

Overall Goal							
Sustainable conservation of the Uluguru Mountain forests with their associated locally, nationally and internationally significant biodiversity and water catchment values, while at the same time improving welfare of forest-adjacent communities							
Purpose							
Improved forest management and conservation and improved land husbandry practices in the Uluguru mountain forests and adjacent villages implemented by local communities, government authorities and other stakeholders							
Programme Components *and Outputs*							
PA Management	*Joint Forest Management*	*Agriculture/Agroforestry*	*Small enterprise/Marketing*	*Information/Education*	*Institutional Development*	*Legal, Policy, advocacy*	
Well managed and protected catchment forest reserves and their biodiversity and hydrological values better understood	Joint forest management and other resource use arrangements established	Capacity building of communities in sustainable land use management	Develop selected income generation opportunities in the Uluguru mountains (emphasising sustainable use of forest resources)	Create conservation awareness with education campaigns for local communities, politicians, schools and opinion leaders	Capacity of partners in planning and management of land, conservation, agriculture, forestry and environment enhanced	Information in Kiswahili on reserve boundaries, policies and acts (relating to land ownership) distributed, and land ownership issues clarified.	Increased awareness among politicians and decision-makers on the importance of the Uluguru forests and establishment of sustainable financing mechanisms.
Major Activities							
Mark, demarcate and clear forest boundaries	Collect information on JFM experiences from within + outside Tanzania	Undertake studies of existing land use practices in benchmark sites	Improve tourism facilities emphasising community-management	Conservation education workshops for local leaders and local communities	Training needs assessment on technical skills of NGO and government staff	Distribution of kiswahili versions of policies and acts relating to land tenure	Conduct seminars for politicians and decision makers
Establish nurseries of native tree species	Participatory assessment of forest ownership +resource use in public/LA forests	Training in soil and water conservation and organic farming	Train tourism guides at key tourism location	Disseminate information on forests to communities (e.g. boundaries and laws)	Train local govt staff at all levels on interpretation of policies and acts	Study on land ownership and inheritance versus provisions of new land acts	Lobby politicians for establishment of long term funding mechanisms
Enhanced natural regeneration and species restoration in degraded forest areas	Develop JFM agreements for public/LA forests, and educate communities.	Establish tree nurseries for on-farm planting (central and community-managed)	Provision of materials for self-help road repairs (excl roads < 2 km from forest)	Prepare radio programmes and drama shows	Train local govt staff at district level in land use + environmental planning	Facilitate resolution of land ownership and land use conflicts at village level	Compilation of data on climate change in the Uluguru Mountains
Establish and maintain fire-breaks and fire-lines around CFR boundaries	Develop community-based monitoring systems for forests under JFM	Train farmers on agroforestry and farm forestry practices	Feasibility studies for new income generating activities based on forest resources	Prepare and distribute newsletters, leaflets and posters	Train CBOs in group organisation, management, and registration		Studies of economic values of ecosystems services, especially water catchment
Assist researchers to conduct flora and fauna inventories in forests	Support implementation of JFM and community-based monitoring systems	Train farmers on crop diversification (cash and subsistence crops)	Train local people in new income generating activities based on forest resources	Support wildlife clubs and other events at local primary schools	Conduct study of existing institutional mechanisms for management of NRs		
Facilitate a process to prepare management plans for Uluguru N and S CFRs	Undertake studies on forest resource use in Uluguru N and S CFRs	Support revival of traditional irrigation systems	Provide technical advice for marketing of NTFP's and agricultural products	Support development of TAFORI information database and library	Facilitate process to define forum for local stakeholder participation in CFR mgt		
Increase man-power, equipment and facilities for patrol and law enforcement	Develop a strategy, rules and regulations for resource use in CFRs	Establish experimentation and demonstration plots with farmers		Distribute information on tourism opportunities within + outside Tanzania	Support establishment and training of environmental committees at all levels		
Monitor biodiversity and hydrological status in	Support implementation of non-destructive use of	Facilitate farmer exchange visits			Set up a GIS at the district planning office available		

Uluguru N and S CFRs	resources in CFRs				for use by all partners		

Box 3. Example portion of Monitoring and Evaluation Scheme for an ICD project, Uluguru Mountains, Tanzania

EXAMPLE OUTPUT	Baseline	Implementation Periods					
OUTPUT	1999 Jan-June	1999 July-December	2000 January-June	2000 July-December	2001 January-June	2001 July to December	2002 January-April
3.4 Uluguru project monitors indicators of biodiversity value and forest quality in Uluguru Forest Reserves.							
ACTIVITIES							
3.4.1 To assess status of Uluguru endemic species							
Number of taxon groups where endemism assessed	1	1	2	5			
Percentage of endemic species re-located	10	10	25	75			
Number of Forest Reserves on Ulugurus surveyed	0	2	2	7			
Number of endemic (and NE) species where population counted	0	2	3	4			
	11	**15**	**32**	**91**			
3.4.2 To assess changes in forest distribution and degree of forest damage in Uluguru							
Number of years where forest cover assessed	0	0	2	3			
Number of km forest boundary assessed	0	0	20	85			
Number of km of forest disturbance transect completed	0	0	19	30			
Number of Forest Reserves on Ulugurus surveyed for status	0	0	0	7			
Number of interventions undertaken to solve encroachment	0	0	1	2			
	0	**0**	**42**	**127**			
TOTAL OUTPUT 3.4	**11**	**15**	**74**	**218**