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MOUNT KENYA: THE ECONOMICS OF COMMUNITY CONSERVATION

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1. INTRODUCTION

This paper will investigate the economic rationale for setting in place a system of community-based conservation in a protected area. Using as an example Mount Kenya it will illustrate how traditional exclusionist approaches to wildlife protection can, by economically marginalising local communities, fail to lead to a situation where wildlife resources are conserved. By demonstrating the distribution of economic costs and benefits associated with Mount Kenya Forest Reserve under different conservation scenarios, and focusing on the economic impacts of conservation on forest-adjacent populations, the paper will demonstrate how a range of economic conditions and incentives can be set in place to achieve a situation where forest resources are conserved at the same time as community economic welfare increases.

2. BACKGROUND TO MOUNT KENYA FOREST RESERVE

Mount Kenya Forest is one of the largest, most ecologically significant and commercially important natural forest areas in Kenya and is considered to be among the highest priority forests for national conservation (Wass 1995). It is also one of the most threatened forests in the country because of its commercially valuable reserves of indigenous timber, and due to the large human population living in the land-scarce area around its boundaries. Mount Kenya Forest Reserve covers an area of just over 2 000 km^2 of dry montane and montane rain forest, making it one of Kenya's largest contiguous blocks of indigenous forest. The Forest Reserve surrounds the 71.5 km^2Mount Kenya National Park, which contains the second highest mountain in Africa at 5 199 m.

Although originally gazetted to safeguard commercial timber interests, environmental protection has become an increasingly important reason for the reservation of Mount Kenya Forest. The forest has exceptional value in biodiversity terms and contains diverse vegetation including several endemic afro-alpine plant species as well as commercially valuable *Juniperus*, *Ocotea*, *Olea*, *Podocarpus* and *Vitex* timber species. It also provides habitat to a wide range of fauna including four threatened bird species and four threatened mammal species (Davies 1993). The forest forms a major water catchment area from which two of the country's five river basins rise – the Tana and Ewaso Nyiro – which together supply water to more a quarter of Kenya's human population and more than half of its land area (Wass 1995), including the five main hydroelectric power sources which together provide nearly three quarters of national electricity requirements, as well as substantial areas of irrigated and rainfed agricultural land, pastoralist rangelands and major urban centres.

The forest spans Embu, Kirinyaga, Meru, Nyeri and Tharaka Nithi Districts of the central highland zone of Kenya, one of the most agriculturally fertile and densely populated parts of the country (see Figure 1). More than 200 000 people live within 1.5 km of the edge of the forest, where levels of rural poverty are high and land is extremely scarce (Emerton 1996a). Rapidly increasing local needs for forest products and agricultural land as well as

Figure 1: Map of Mount Kenya Forest Reserve

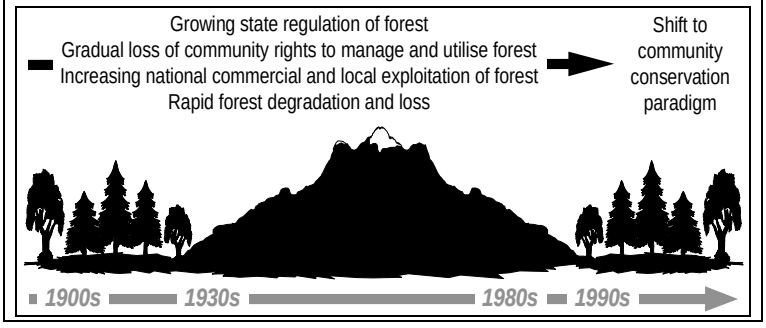
high national commercial demand for indigenous timber have placed severe pressure on forest resources. Large areas have been excised from the forest reserve for settlement and agriculture, much of the natural forest around Mount Kenya is in a critical state (Beentje 1991) and there have been major changes in forest composition and cover because of cutting of commercially valuable species and poor subsequent regeneration (Bussmann 1992).

3. HISTORY OF MOUNT KENYA FOREST MANAGEMENT

Prior to its demarcation as a government-controlled protected area, Mount Kenya Forest was managed and utilised by the tribes who lived around it, the Embu, Gikuyu and Meru. As well as containing a number of important ritual and cultural sites – and most importantly encircling Mount Kenya, the place of God, *Ngai* – the forest provided products that met the day-to-day needs of the surrounding population. A series of similar practices, rulings and institutions governed forest utilisation for the surrounding populations. Access to the forest was largely limited to territorial and clan-based groups, and settlements lying adjacent to the forest had priority rights over that part of the forest, within which forest areas and activities were allocated to different social and user groups according to their needs and opportunities (Emerton 1995a). Rights to forest products were clearly defined and regulated and access was restricted according to these rulings as well as a number of restrictions on carrying out forest use in ritual sites, involving sacred species or for certain categories of people. Although forest management was enforced at the local level, these rulings and restrictions were ultimately defined and administered in common with the management of other lands and natural resources by central decision-making bodies – for the Embu the clan elders (*Kiama kia ruru*), among the Gikuyu the clan leader (*Muramati*) and various councils (*Kiama*) and for the Meru the *Njuri-Ncheke* council of elders (M'Imanyara 1992, Rimita 1987, Were 1986)

Mount Kenya Forest has been subject to four clear phases of external management over time. These phases of management provide the context within which community-based forms of forest conservation will be initiated. As illustrated in Figure 2, since the early years of the century state regulation of the forest has gradually increased while community rights to manage and utilise forest resources have progressively decreased. Simultaneously both commercial and local demand for forest resources has grown, resulting in rapid and severe forest degradation. In response to the perceived need to halt processes of forest loss and to conserve forest resources in a way, which both involves and benefits the forest-adjacent human

Figure 2: Phases of external management of Mount Kenya Forest Reserve



population, the 1990s have seen the beginnings of a shift towards community-based forms of forest management.

3.1 1900-1930s: initiation of commercial forest exploitation

After the appointment of the first Conservator of Forests under colonial rule in Kenya, the East African Forest Regulations of 1902 were published, supported by the Forest Rules. A number of key reserved forests were declared Crown Land at this time, including Mount Kenya Forest. Mount Kenya Forest was one of the first Kenyan forests to be logged commercially, supplying sleepers for the construction of the Uganda Railway as well as providing for the timber needs of an expanding colonial administration and settler population. In the early years of the century the forest was exploited as a commercial production forest, initially freely and then under a rudimentary management plan, by European and Indian settlers and by colonial timber companies.

Commercial logging was concentrated exclusively on indigenous species from natural forest areas at this time, mainly *Ocotea usambarensis*, *Vitex keniensis* and *Podocarpus spp*. The first large timber enterprise was constructed on the north-eastern side of the forest in 1912, followed by the opening of further sawmills on the western side in 1916 (Wawiye 1992, Rheker 1992). During the 1920s a series of both indigenous and exotic plantations were established and government Forest Officers posted to the forest. Although growing rapidly, commercial forestry operations covered relatively small areas of the forest. Prior to and during this period, the primary users and managers of Mount Kenya forest were the Embu, Gikuyu and Meru tribes who occupied the area and depended on a wide range of forest resources to support their day-to day livelihood needs. Forest exploitation outside commercial logging areas was regulated and defined under a range of customary rules and restrictions.

3.2 1930s-1980s: gazettment and commercial expansion

After its declaration as a protected area in 1932 Mount Kenya Forest Reserve was formally placed under the control of the government Forest Department. The 71.5 km^2 mountain area above the forest line was later gazetted as a National Park, now managed by the parastatal Kenya Wildlife Service. While focusing on continuing commercial exploitation and recognising the environmental importance of the forest, the Forests Act of 1942 and Forestry Policy of 1957 (both subsequently revised

Box 1: Community use rights and the Forests Act

Rules and subsidiary legislation made under the provisions of the Forests Act of 1942 permitted local communities to use forest resources without license or fee by virtue of customary right and practice. For parts of Mount Kenya Forest, this specified that a local resident could:

"... take for fuel dead fallen wood for his or her personal domestic use ... collect and take wild berries and fruit for his own consumption... place and visit honey barrels ...collect and take Miugu creepers ... enter and sleep, for a period not exceeding two weeks, for genuine tribal ceremonies connected with circumcision, handing over of the ruling age grade and certain dances, and at such time take such forest produce as is required by custom for those taking part ... cut and take thatching grass at places approved by a forest officer ... (take) poles and withies required for the erection of schools and medical buildings and the requirements of paupers ... (engage in) the collection and removal of pottery clay and the burning of pottery at places prescribed by a forest officer ... (engage in) the extraction and removal of red ochre ... (engage in) the collection of Mivuno leaves for medicinal purposes ..."

(Republic of Kenya 1942)

with little amendment after Kenyan Independence) permitted local communities opportunities to utilise forest products for subsistence purposes – as described in Box 1, although firmly retaining the management and control of forest resources in the hands of the state.

The first plantations in Mount Kenya Forest reached maturity in the 1950s and 1960s, by which time natural forest areas had been extensively logged by both sawmills and pitsawyers. After being temporarily stopped during the unrest accompanying the "Emergency" period of the late 1950s and early 1960s, commercial logging of both plantations and natural forest continued on a large scale after Kenya gained Independence in 1963. Over this period local communities, who had been confined to "Native Reserves" under colonial rule and subsequently resettled on Trust Land and former European-owned farms after Independence, became increasingly sedenterised. As population grew and demand for agricultural land increased in central Kenya a number of excisions into the Forest Reserve were made for human settlement, and the scale and scope of local forest resource utilisation expanded. Mount Kenya Forest began to show signs of substantial degradation.

3.3 1980s: initiation of strict forest protection and local exclusion

Heavy commercial exploitation of Mount Kenya Forest under improved transport and communications networks in central Kenya, accompanied by rising local utilisation of forest resources from a rapidly growing and sedenterised human population resulted in severe forest degradation which worsened during the 1980s. In response to the rapid loss of forest species and increasing encroachment, the Forests Act was revised in 1982 and 1992 and a series of bans and prohibitions against natural forest exploitation were introduced during the mid and late 1980s – as outlined in Box 2 – and implemented through heavy policing of the forest and prosecution of offenders. Forest management was based on an increasingly restrictive and exclusionary system of protection.

Box 2: Bans and prohibitions against forest use introduced during the 1980s

A Presidential Directive of 1983 banned the felling of live indigenous trees on gazetted forest lands, implemented under the Chiefs' Authority Act of 1962 , the Trust Land Act of 1962 and the Local Authority Act of 1986. All exports of unworked indigenous timber were stopped in 1988 under Departmental Instruction, and a government announcement made in 1995 stated that all sales of hardwoods would soon be declared illegal. Forest grazing was prohibited under a Presidential Ban made in 1986 and enacted through the Local Authority Act. The *shamba* system of forest cultivation – a system of plantation management based on temporarily allowing combined agricultural production and plantation maintenance – was discontinued and forest 'squatters' removed under Departmental Instruction in 1988.

Despite this legal narrowing of extractive forest activities, forest utilisation continued to be intense – albeit illegal – at both commercial and subsistence levels, and rates of forest loss and degradation escalated. The forest continued to provide a major local source of local subsistence, income and employment and the national and international market in indigenous hardwoods originating from Mount Kenya Forest remained strong (Marshall and Jenkins 1994).

3.4 1990s: shift towards community-based forest conservation

It is against this background of local forest dependence, high national and international demands for indigenous timber and widescale forest degradation that recent attempts have been made to initiate community-based forms of forest conservation in Mount Kenya Forest. Purely exclusionist forms of forest protection have proved to be difficult to implement successfully, due to the extremely limited financial and staffing base of the government Forest Department.

Supported by wider moves to reform national forestry policy and practice, there has been a shift in forest management methods in Mount Kenya Forest Reserve. Most importantly, new approaches to forest management recognise the need to involve – and benefit – local people in conservation. Already the *shamba* system of cultivation in plantation areas and limited forest grazing have been reinstated and efforts made to control problem animals which destroy crops and livestock, moves which have proved popular with the large, poor and land-scarce forest-adjacent rural population. Various community consultations have been carried out since 1993 under the aegis of the joint Kenya Wildlife Service and Forest Department Memorandum of Understanding as a precursor to implementing other planned community conservation activities including the initiation of joint forest management, sharing of forest revenues with local communities and establishment of a range of on and off-farm development projects aiming to substitute for forest sources of income and subsistence (COMIFOR 1994).

3.5 The economic rationale for community-based forms of forest conservation

The current shift towards a paradigm of community-based conservation for Mount Kenya Forest Reserve is based on a strong economic rationale – that forest-adjacent communities who face binding livelihood constraints including widescale poverty, land pressure and lack of development opportunities currently have a high dependence on forest resources for both income and subsistence; and that the government Forest Department is severely under-resourced and unable to afford to effectively police and protect a large and inaccessible forest area. The participation of local communities is a practical necessity to achieve conservation of Mount Kenya Forest, is also desirable in local development terms and necessary to justify forest conservation in the light of national and local demands for forestlands to be cleared for settlement and agriculture. Unless local communities economically benefit from forest conservation in the face of these needs and pressures, Mount Kenya Forest is unlikely to be conserved in the future.

4. THE ECONOMIC BENEFIT OF MOUNT KENYA FOREST AS A RATIONALE FOR COMMUNITY CONSERVATION

Government funds are extremely limited in Kenya and needs for agricultural land, timber and land for settlement are high in the Mount Kenya region. Mount Kenya Forest competes for scarce land, money and other resources with other land uses and investment opportunities at local and national levels. Conservation is widely viewed – by central government as well as by local populations – as a less profitable option than converting or developing the forest for other land uses which are perceived to give wider and more immediate benefits to the Kenyan economy and society. In order to justify conserving Mount Kenya Forest it is necessary to demonstrate that not only can conservation compete with other land uses and investment opportunities, but that it can simultaneously generate multiple economic and development benefits at both national and local levels.

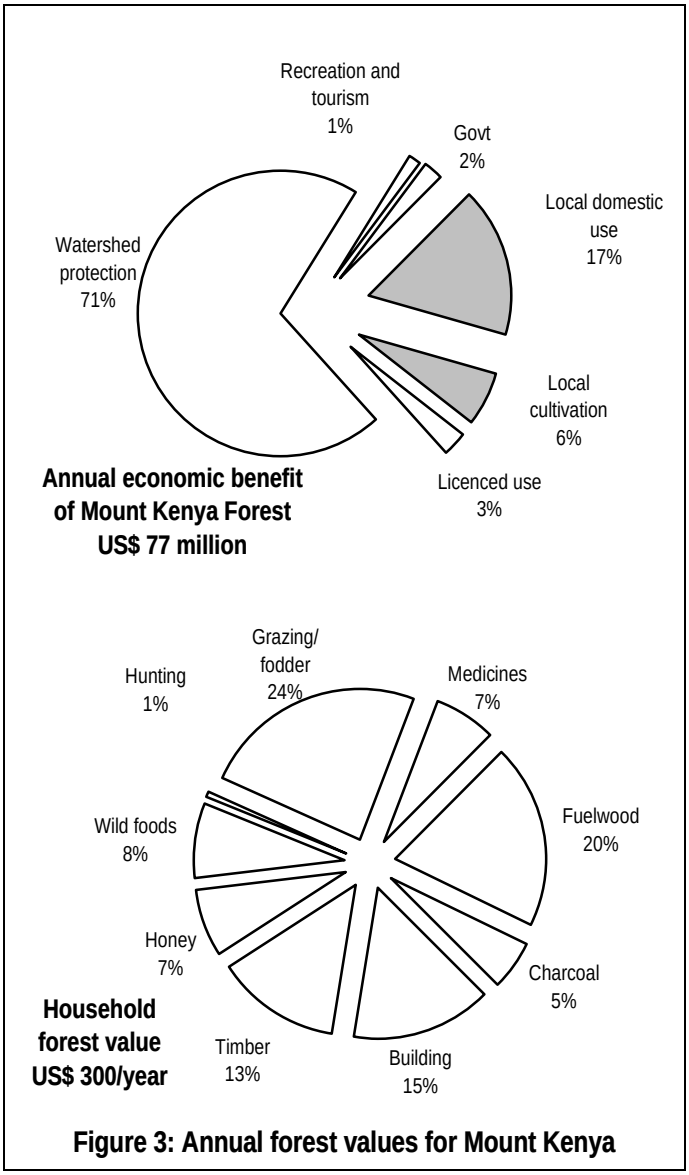


Figure 3: Annual forest values for Mount Kenya

The basic economic rationale for conserving Mount Kenya Forest is that it provides a stream of goods and services, which generate economic benefits and support economic activities that accrue to the global community, the Kenyan economy and the livelihoods of the people who live around the forest. Mount Kenya Forest and its component resources constitute far more than a static biological or ecological reserve. They form a stock of natural capital, which if managed sustainably can yield in perpetuity a wide range of direct and indirect economic benefits to human populations. Conserving the forest will maintain these economic benefits, forest degradation and loss will constitute a loss of these goods and services and impose a high cost on the national and local economy over the medium and long term.

Economic analysis of the benefits of maintaining land under forest cover – and of the costs of forest degradation and loss – provides a powerful argument for conserving Mount Kenya Forest. As illustrated in Figure 3, the total quantified gross benefits of conserving Mount Kenya Forest are worth US$ 77 million a year (Emerton 1997), composed of local forest utilisation[1], local cultivation of forest land under *shamba* system arrangements[2], other licensed utilisation of timber and non-timber forest products[3], tourist and recreational values[4], government revenues[5] and watershed catchment protection benefits[6]. Together these economic benefits support a range of employment, income and subsistence opportunities at local, national and international levels.

Box 3: Forest values for a household in Mount Kenya

Mama Mugo lives on the edge of Mount Kenya forest in Embu District. She is an elderly widow who takes care of her son's four school-age children. Her son and daughter-in-law work in Nairobi, and come home once or twice a year, usually at the time of planting maize. Although they send home money, which covers the children's' school fees and books, Mama Mugo is responsible for taking care of the family's day-to-day living expenses. Mama Mugo lives in a tea-growing area, but cultivates only maize, beans and vegetables on her 1.5 acre *shamba* because she lacks labour and space. She also keeps a grade cow and four sheep. Her crops are adequate to feed the family, and sometimes provide a small surplus for sale in the village market. She also earns income from the production of *viondo*, traditional baskets, which are sold in Embu Town through a local Women Group. This provides cash to buy tea, sugar, salt, cooking oil and other purchased goods for the family.

Like many households in the area, Mama Mugo relies on the forest for a range of subsistence items. She enters the forest every day to collect fuelwood with a group of other women from the village, and supplements this fuel with a few fallen branches from the *Grevillea* trees on her farm. Although she does not hold a license for fuelwood collection, she knows that the local Forest Guards will not arrest her if she pays them a small bribe. The women remark that it is getting more difficult to find fuelwood and so they often have to go several kilometres into the forest, or fell live trees. While she is collecting fuelwood, Mama Mugo also gathers herbs and plants to use in her role as a local midwife.

Because her farm is small, and most of the land is under cultivation, there is no space for pasture. Mama Mugo's two elder grandsons take the smaller animals into the forest to graze every day before and after school, and at the same time cut grass to be used for zero-grazing. Her youngest grandson, who is not at school yet, is employed as a herdsboy for a neighbour, and spends most of the day in the forest with his cows. He usually stays at some distance from the grazing herd, because he is afraid of being caught by Forest Guards and being beaten. While he is in the forest he often sets small traps for antelopes, and hunts birds with his catapult. This rarely brings meat to the family, because he roasts the game on the spot and consumes it with the other small boys who are herding.

Mama Mugo lives in a mud and thatch house. Timber frames for the windows and doors were purchased from the local carpenter, but the poles and thatching grass come from the forest. Although the roof poles need repairing before the rains come, she is waiting for her son to return from Nairobi so that he can obtain them from the forest. If he does not come in time, she is considering felling one of the trees on her farm, but knows that the wood will not last as long as indigenous poles and is reluctant to fell a whole tree which could be sold for cash. Her son owns sixteen beehives in the forest, but as he is absent most of the time he has hired them to a relative, who gives a proportion of the honey harvest to Mama Mugo.

Overall, forest use is worth nearly US$ 250 a year to Mama Mugo. For her, fuelwood and grazing are the most important activities, because they support the household. Although she thinks that construction materials are also valuable, they do not perform such a central role because they do not help to feed the family. She values the forest as a source of medicines for midwifery because it is a traditional practice requiring traditional remedies, but prefers to use bought drugs for other illnesses. Honey is of relatively low value because she only receives a small amount each year, and most of it is used for brewing *muratina*, a local beer, for her son and his friends. Although Mama Mugo thinks that bushmeat and wild foods have some significance, because her grandchildren eat them while they are carrying out other activities in the forest, they are snacks rather than 'proper foods'.

(From Emerton 1995a)

[1] Calculated on the basis of participatory environmental valuation of domestic resource utilisation by forest-adjacent households (Emerton 1995a).

[2] Calculated on the basis of farm income under existing forest *shamba* cultivation patterns less licence fees (Emerton 1997).

[3] Calculated on the basis of market value of forest products less licence fees (Emerton 1995a).

[4] Calculated on the basis of existing visitor willingness to pay (Emerton 1995a).

[5] Including tea zone revenues, licence fees and royalties from forest products and land rentals (Emerton 1997).

[6] Calculated on the basis of the difference between downstream production values under different riverflow regimes for Tana river basin (Emerton 1994) and soil and water conservation replacement costs for Athi river basin (Emerton 1995b).

Local and national development benefits include direct livelihood support of an average of nearly US$ 300 each for the 40 000 households who live adjacent to the forest, as described in Box 3; broad social, economic and ecological benefits to the 1 million subsistence agriculturists, pastoralists, commercial farmers and fisherfolk who live in downstream catchment areas; and benefits for the wider Kenyan population who depend on the wide range of goods and services – such as hydropower – supported by forest functions. The effects of forest degradation and loss constitute far more than the loss of forest plant and animal species – economic costs would be widespread, leading to production and consumption losses for some of the poorest sectors of the Kenyan population both within and outside the forest-adjacent area as well as making necessary a range of public expenditures to replace, mitigate or avert the results of lost ecological services and depleted human livelihoods.

District	Forest area (ha)	Cultivable area (ha)	Holds supported	Farm value (US$ mill)
Embu	18 393	7 358	1 472	7.6
Kirinyaga	29 215	7 304	1 461	7.5
Meru	53 560	26 780	5 356	21.5
Nyeri	60 402	30 202	6 040	25.4
Tharaka Nithi	39 300	11 790	2 358	9.1
TOTAL	**200 891**	**41 992**	**8 398**	**72.0**

Figure 4: Alternative value of Mount Kenya Forest for settled agriculture US$ 72 million per annum

Not only is this quantified value large, but it is in excess of the economic benefit of forest clearance and land conversion to settled agriculture – the major threat to forest status and integrity. As illustrated in Figure 4 use of forest land for agriculture is estimated to have a potential gross value of US$ 72 million a year or to be sufficient to provide for the livelihoods of approximately 8 000 households[7]. Taking into account the unquantified benefits associated with Mount Kenya Forest and their wider social and economic significance – goods and services such as carbon sequestration, micro-climate regulation, options on future possible uses and applications of forest species and products, local cultural and national and international aesthetic values – strengthens still further economic arguments for forest conservation. Economic analysis demonstrates that not only does Mount Kenya Forest generate multiple social and economic benefits, but that it can compete on economic, social and ecological terms with alternative land use and investment options.

Economic analysis of the benefits of Mount Kenya Forest also provides a basic rationale for engaging in community-based forms of conservation rather than the exclusionary protection methods used to manage the forest to date. Community benefits comprise nearly a quarter of the total benefits of forest conservation, and almost 80% of the direct use value of the forest. Excluding adjacent communities from the forest would not only be inequitable and impose high costs in local livelihood terms, but is also unlikely to be practicable. The local human population is high at over 200 000 people, and the forest and its adjacent area large and inaccessible. Given the high level of local dependency on forest products and the extremely low levels of government budgets and staffing, it is not realistic to expect that the Forest Department would be able to effectively prevent local forest access or that local communities would be willing to voluntarily forego their use of the forest. On both economic and practical grounds, a form of conservation, which involves and benefits local communities has been recognised to be the only feasible form of forest management for Mount Kenya Forest.

[7] Calculated on the basis of net returns to cultivable forest land and average settlement farm areas (Emerton 1997).

5. ECONOMIC INCENTIVES AND DISINCENTIVES FOR FOREST CONSERVATION AT THE COMMUNITY LEVEL

The preceding paragraphs have described how analysis of the economic value of Mount Kenya Forest presents both an overall justification for conserving the forest rather than allowing it to be degraded in the pursuit of other economic activities and development goals, and for following an approach to conservation which is based on community participation and sustainable utilisation rather than on strict protection and exclusion. Early attempts at community conservation saw sustainable local utilisation as the major component of community benefits. In purely benefit-based terms, allowing local communities to continue using the forest should present them with sufficient incentives to support forest conservation. They gain a substantial share of the benefits of conservation in the concrete form of forest products utilisation and the subsistence, income and employment opportunities they support. Looking at benefits alone, an approach to community conservation system, which is based on sustainable local utilisation, would ensure that the majority of forest adjacent households are tangibly better off in livelihood terms in the presence of the forest than they would be without it.

Closer examination of the economics of community conservation for Mount Kenya Forest shows that there are however a number of factors which counterbalance the apparent net benefit to the local population of forest conservation. Permitting adjacent communities to continue to utilise the forest is undoubtedly a necessary condition for effective conservation, but is unlikely in itself to be sufficient. We will examine some of these additional economic factors influencing community conservation below.

5.1 Costs of forest conservation for communities

Most importantly, forest conservation does not generate pure benefits for local communities. They bear large and significant forest-related costs. Although it is the Forest Department who must cover direct forest management costs – some US$ 0.3 million a year, this only represents a small proportion of the total costs of conserving Mount Kenya Forest. Community livelihoods around the forest are based on smallholder mixed crop and livestock production, including dairy and ranching, horticulture, wheat, tea, coffee, maize, beans and domestic vegetables. Forest dwelling wild animals, especially elephants, buffaloes, birds and monkeys, regularly cause damage to trees and crops grown in the forest-adjacent area and in forest *shambas* (Njuguna and Muriithi 1995, Ochieng 1993). It is estimated that wild animal damage to crops may occur to a total cost of US$ 1 million a year on up to 1 500 ha of farms for directly forest-adjacent dwellers (Emerton 1997).

There is also a local opportunity cost to forest conservation. If degradation continued and the Mount Kenya area was eventually cleared of forest, the next most likely land use is for forest land to be given over to smallholder agricultural settlement. This reflects the dominant existing land use in the forest-adjacent area, and would continue the process of

gradual forest encroachment and excision which has taken place over the last decades. If the Forest Reserve were cleared approximately 42 000 hectares of land would be made available for agriculture, generating food and income for farmers to a total annual gross value of US$ 72 million (Emerton 1997). As Mount Kenya Forest comprises land which was formerly under the control and usage of local communities, alienated when it was gazetted as a protected reserve, it is reasonable to allocate this cost to the adjacent population.

Considering local forest-related costs therefore adds an extra dimension to the economics of community conservation for Mount Kenya Forest. Although local populations can gain high tangible economic benefits from forest conservation – through the continued utilisation of forest resources for household income and subsistence, they also face significant costs while the area remains under forest – through damage to agricultural livelihoods and alternative uses of forest land foregone. The financial value of these costs, some US$ 73 million a year, far outweighs the US$ 18 million local income that forest utilisation represents. In the absence of additional economic benefits, which at least balance these costs, local communities are unlikely to perceive forest conservation as a net economic gain.

5.2 Policy and legislative disincentives to community conservation

Box 4: Community forest rights and the Forestry Policy

The Forestry Policy of 1957, restated in 1968, explicitly denies communities or private groups rights to gazetted forest resource ownership or management, stating that:

"... in principle the Government's view is that the existence of private rights in the Forest Estate tends to endanger the objects for which the Government manages the Estate and such rights are therefore objectionable. The Government's policy is, therefore, firstly to define and limit any existing rights, secondly to negotiate on a just and reasonable basis the final eradication of such rights and, thirdly, to allow no new rights to arise..."

(Republic of Kenya 1957)

Another set of factors which act as economic disincentives to community conservation in Mount Kenya Forest Reserve are the restrictive policy and legislative frameworks which currently govern forest management. Forest adjacent communities currently have no legitimate economic stake in the forest resources they depend on.

As outlined in Box 4, the state is unambiguously vested with monopoly control over Kenya's national forest estate – currently represented by the Forest Department and Kenya Wildlife Services in the case of Mount Kenya Forest Reserve. Although a range of effective customary institutions, rules, and sanctions existed – and still to some extent govern community forest use – in Mount Kenya Forest (see Emerton 1995a), these have never been recognised by modern law or government forest management systems. Local communities have no formal authority to manage the forest. Most extractive natural forest activities and uses of forest land have also been prohibited in Mount Kenya Forest Reserve for the last decade or so, overriding the original provisions of the Forests Act which permitted local utilisation by virtue of customary practice.

There is also little legal recourse for community members who suffer or are treated unfairly as a result of the policing measures employed by the government to achieve forest protection. Existing statutes do not confer any rights or remedies to private citizens whose rights or interests are injured by acts or failure to act by the Forest Department, and there are no conditions under which the Forest Department's action or inaction can be

held to violate the law because there are no standards for performance set in the Forests Act or other acts. Forest protection, by denying any rights or role for local communities in forest management, has to date been seen as being external to and against the interests of local communities, who have few incentives to co-operate with government in conservation activities.

Forest-adjacent populations have no formal rights to benefit from the forest, lack the authority to manage forest resources and face a series of unacceptable sanctions against forest use. Together this lack of rights to forest management and use present strong economic disincentives for local communities to engage in conservation activities.

6. ECONOMIC CONDITIONS FOR COMMUNITY FOREST CONSERVATION

Economic analysis of community conservation in Mount Kenya Forest highlights a number of ways in which current exclusionary forms of forest protection present strong disincentives for local communities to engage in conservation. It also demonstrates that by itself a purely benefit-based approach to community conservation which is founded on allowing adjacent populations to utilise forest resources is unlikely to provide sufficient local economic incentives for conservation. It is clear that attempts to implement community conservation in Mount Kenya Forest must include additional measures aimed at making sure that adequate economic conditions exist for local populations to gain from conservation.

6.1 Forest products utilisation and substitution

In the area around Mount Kenya Forest where levels of rural poverty are high, livelihoods are insecure, income and employment opportunities few and land scarce, many people exploit forest resources because other goods are unavailable or unaffordable to them (Emerton 1995a). A range of economic conditions can be set in place, which deal directly with the local livelihood needs which impinge on Mount Kenya Forest. These include, as well as permitting sustainable utilisation of forest resources, establishing a range of on and off-farm developments and enterprises which aim to improve non-forest sources of income and employment, substitute for natural forest resource use and support forest-saving technologies.

Conservation plans for Mount Kenya Forest include such activities as on-farm tree planting, formation of registered local forest enterprises, support to agricultural intensification and the provision of credit and training for micro-enterprise development (COMIFOR 1994). Making available or strengthening these non-forest alternative sources of subsistence, income and employment is undoubtedly a necessary condition for local forest resource conservation, although is unlikely to ever wholly substitute for local forest utilisation.

6.2 Overcoming legal, policy and institutional failures

Rights for bodies other than the state to manage forest resources and benefit from their utilisation form an important economic condition for community conservation in Mount Kenya Forest. Forest resource property rights provide an economic stake in conservation for adjacent communities, enable them to economically benefit from forest resources and can also establish the basis for the emergence of markets and scarcity prices for forest goods and services. A first step is granting communities legal rights to carry out forest activities which are currently banned or prohibited but could sustainably contribute to local subsistence, income and employment. The bulk of these bans and prohibitions are enforced under the provisions of general legislation which is not specific to the forestry sector and is mainly concerned with civil order and authority, or are the result of *ad hoc* Presidential Directives or Departmental Instructions – they override the sections of the Forests Act which allow forest use rights for local communities. They can be overturned relatively quickly and easily without necessitating any major amendments to the Forests Act – as evidenced, for example, by the reinstatement in 1993 of non-resident cultivation in Mount Kenya forest plantations for local community members and the recent reversal of bans on forest grazing for cattle and sheep.

More difficult to overcome is the fundamental denial of rights to forest resource ownership and management to any bodies other than the state. Forest conservation plans are however beginning to admit the existence of private interests in the national forest estate. The need for communities to participate in forest management is recognised in new institutional approaches to the conservation of Mount Kenya Forest which involve joint forest planning between government and local communities, community representation on forest decision-making bodies and local participation in forest management and protection activities (COMIFOR 1994), and is to some extent incorporated into Kenya's new national forestry policy framework, summarised in Box 5. Although it is unlikely that ownership of the land and resources of Mount Kenya Forest will ever be wholly devolved from the state, setting in place well-defined, secure and transferable rights over forest resources and their management to user groups – for example through leases, franchises or other arrangements – could provide strong economic incentives for conservation and permit a situation where communities could manage and exploit sustainable forest income generating opportunities, alone or in partnership with other groups.

Box 5: A new forestry policy for Kenya

Although the Forests Act of 1942 and Forestry Policy of 1957 still provide the legal framework within which Mount Kenya is managed, a new forestry policy for Kenya was drafted by the Ministry of Environment and Natural Resources in 1994, still to be officially adopted. This policy includes major stated objectives of supporting national government policy of alleviating policy and promoting rural development through income based on forest and tree resources, by providing employment, by promoting equity and participation of local communities. This focus is in direct contrast to the previous policy. There is generally less emphasis on government control of the forestry sector, and scope for the involvement of other government, non-government, private and community organisations in forest management.

6.3 Overcoming market failures

The most important condition for community-based conservation is that the forest-adjacent population economically gains from conserving Mount Kenya Forest. Although

the allocation of forest property rights, the continued sustainable utilisation of forest resources and support to forest-saving or non-forest alternative sources of subsistence, income and employment all provide necessary conditions to increase the economic gain from conservation for local communities, they may not be enough by themselves to ensure that there is an overall net local benefit from conservation. Establishing Mount Kenya Forest as a sustainable source of local income and employment which exceeds the livelihood costs associated with the forest and will be lost if the forest is degraded provides the ultimate community incentive for conservation.

Although it is difficult to diminish the local costs associated with forest conservation, it is possible both to raise the overall level of forest benefits and to increase the proportion of these benefits accruing to local communities. There are currently a range of market failures which limit the degree to which forest benefits are captured as real financial values or reflect full social and environmental values. As illustrated in Figure 5, under the *status quo* many of the groups who benefit from conservation bear few costs – especially commercial users of forest products, downstream water consumers and recreational visitors, who gain significant values from the forest at no charge. In contrast, other groups' – local communities and the Forest Department – gain a level of forest benefits which is disproportionate to the costs they bear. This imbalance has two implications – the groups who provide forest benefits do not financially gain because they are unable to raise cash to cover the costs that the production of such benefits incurs on them, and the consumers of forest goods and services receive forest benefits for which they pay little or nothing. This produces a situation where there exist perverse economic incentives which encourage both forest consumers and producers to over-consume, under-produce and under-conserve Mount Kenya's forest resources. Forest producers – the Forest Department and local communities – do not economically benefit from the conservation of forest goods and services, and forest consumers – commercial exploiters, recreational tourists and downstream users – bear none of the direct financial or ecological costs associated with inefficient or over-exploitation.

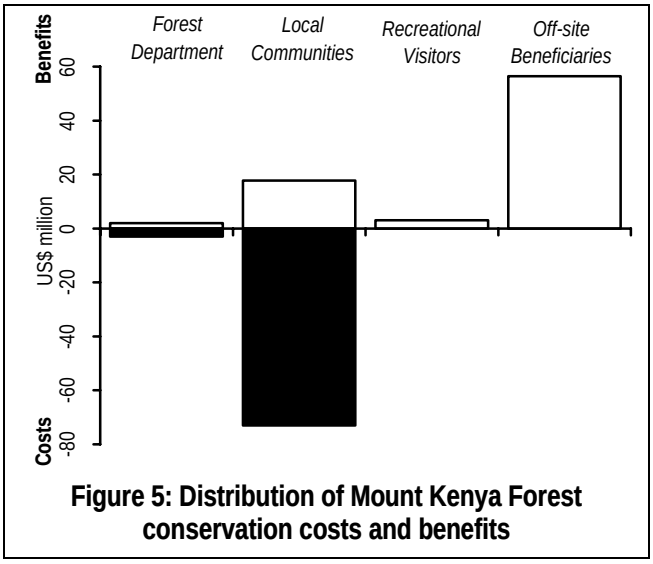
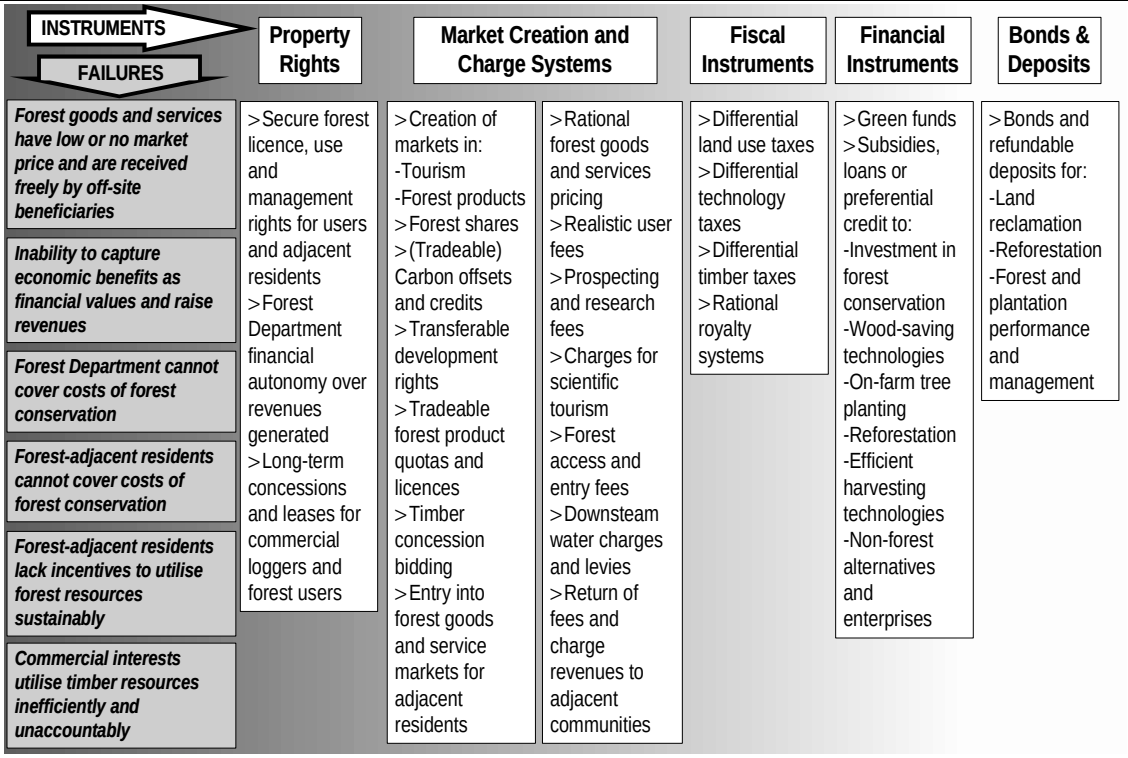


Figure 5: Distribution of Mount Kenya Forest conservation costs and benefits

As illustrated in Figure 6, there are various economic instruments by which failures and distortions in the market for forest goods and services can be overcome, and by which forest economic benefits can be captured as real financial benefits and redistributed to the cost-bearers of conservation. Despite their potential importance in providing both incentives and financing for forest conservation, such instruments have to date been

As Figure 6: Economic instruments for overcoming forest goods and services market distortions and failures



(From Emerton 1997)

largely ignored in attempts to initiate community-based conservation in Mount Kenya Forest. Although there are a range of possible new international, national and local markets in forest goods and services which could be established – such as carbon offsets, biodiversity prospecting fees, forest resource shares and various forms of bond and deposit systems – three major existing markets for forest benefits could most easily be improved in Mount Kenya Forest: those for forest products, water and tourism.

There are already a range of markets for forest products, including informal local markets in bushmeat, medicines, poles and fuel as well as large-scale commercial sales of timber products. There are reasons for arguing that adjacent communities should be able to exploit forest resources at low or zero cost for distributional reasons and on the grounds of customary entitlement. Sustainable local utilisation of forest products without charge can also provide a strong incentive for conservation. There is however no reason why off-site consumers or commercial interests should pay below-market prices for the consumption of forest goods and services whose production incurs real financial and economic costs.

Plantation timber, poles and woodfuel form the major legal market in forest produce. Timber produce fees and royalties set by the Forest Department are low in comparison to both market prices and to costs of production (Omwami 1992). Timber extracted from Mount Kenya Forest Reserve is currently obtained by commercial loggers at an average rate of US$ 9/m^3 – less than a tenth of its market value, and fees for other timber produce are similarly low. Increasing royalty rates on timber products obtained from Mount

Kenya Forest to economic levels, or introducing some form of competitive auction or license bid arrangements, could generate substantially increased revenues. A tripling of stumpage fees is recommended to bring rates in line with former levels (World Bank 1996); this, combined with collection of all royalty payments rather than the current 30% (Omwami 1992), could result in an increase in timber payments to the Forest Department of nearly US$ 0.3 million, nearly doubling existing revenues and more than covering the direct annual costs of forest conservation. Although there is currently no legal market in indigenous timber extracted from natural forest areas, before the ban on felling was introduced indigenous raw logs to an annual market value of nearly US$ 5 million were legally extracted by the 150 licensed sawmills around Mount Kenya Forest (Emerton 1995a). Reinstating indigenous timber exploitation on a controlled and legal basis could generate high revenues. In addition to expanding the income base from which Forest Department operates a variety of instruments could be employed to enable local populations to enter into forest produce markets including, as well as allowing communities direct responsibility for administering leases or collection of payments and allocating tradable rights to commercially valuable forest areas to communities, a variety of partnerships and arrangements with private sector timber companies.

Downstream populations gain immense benefits from the watershed catchment functions provided by Mount Kenya Forest. As well as the rural pastoral, agricultural and fishing populations who depend on downstream waterflow regimes, an extremely large volume of water is abstracted by commercial and urban users from the rivers rising from Mount Kenya and protected by the Forest Reserve, including large-scale cash croppers, irrigation schemes, hydropower dams, city dwellers and urban industries (Emerton 1994). Commercial and urban consumers are already charged for water use by municipal councils and for electricity consumption by the parastatal Kenya Power and Lighting Company. Although these state agencies are responsible for distributing such amenities, they do not bear the costs of maintaining the upstream water catchments which enable their provision. Even a small levy or reallocation of revenues from existing water and power charges could raise substantial cash revenues for forest conservation.

Mount Kenya National Park and the surrounding Forest Reserve form a major domestic and overseas tourism destination. Although the majority of visitors and tourists have indicated a mean willingness to pay of between US$ 10 (for Kenyan residents) and US$ 20 (for overseas visitors) for entry into the forest in addition to voluntary conservation contributions of between US$ 30-33 per visit (Emerton 1995a) and pay to enter Mount Kenya National Park, there are currently no recreational facilities and no charges made for visiting Mount Kenya Forest. This represents a major untapped source of revenues for the Forest Department, as well as a potential source of local income and employment. A decision has recently been made that fees will in the future be levied on tourist forest entry and facilities – as illustrated in Box 6 potentially worth some US$ 127 000 a year, or nearly half of current Forest Department expenditure on the conservation of the Forest Reserve.

Box 6: Proposed fees for Mount Kenya tourism

	Residents	Overseas	Total
No. visitors			
Adult	6 909	3 636	10 544
Child	768	404	1 172
Entry fee (KSh)			
Adult	100	550	4 035 610
Child	30	165	134 520
Cottages (KSh)			
Adult	60	275	1 414 289
Child	20	110	59 787
Camping (KSh)			
Adult	100	330	1 890 586
Child	30	165	89 680
TOTAL (US$)			**127 074**

Another set of economic instruments which can both finance and provide economic incentives for community forest conservation are the range of financial mechanisms which can be used to channel revenues and funds to forest cost-bearers. Developing mechanisms which will ensure that forest financial benefits are returned to local communities and the Forest Department is also an important condition for successful community-based conservation. Direct community participation in markets or collaboration with private sector enterprises and income-generation is an effective mechanism for local benefit-generation. Forest adjacent populations however generally lack access to the information, credit and training necessary to enable them to enter into markets for forest goods and services. Financial instruments such as loans, grants and funds for forest-saving or forest resource-substituting technologies and enterprises can both provide local incentives for forest conservation as well act as acting as financing mechanisms. The Forest Department itself lacks financial autonomy. Revenues earned form the Forest Reserve flow to central government, and budgetary allocations returned to the management of Mount Kenya Forest Reserve are not linked to these earnings. Establishing a clear mechanism for retaining the revenues earned by Mount Kenya Forest could enhance the financial accountability and sustainability of government forest management.

7. CONCLUSIONS: MAKING CONSERVATION ECONOMICALLY VIABLE FOR THE COMMUNITIES AROUND MOUNT KENYA FOREST

This case study illustrates how economic considerations both form the rationale for a community-based approach to conservation in Mount Kenya Forest and also set the conditions under which conservation can be made economically viable for the local population. It clearly demonstrates that unless sufficient economic incentives are provided to local communities so that they receive a net gain from Mount Kenya Forest, conservation will not take place. Under traditional exclusionist approaches to forest management, these conditions have not been met. Community-based forms of management provide a means of setting in place the economic conditions and incentive structures which will meet both community livelihood and forest conservation goals.

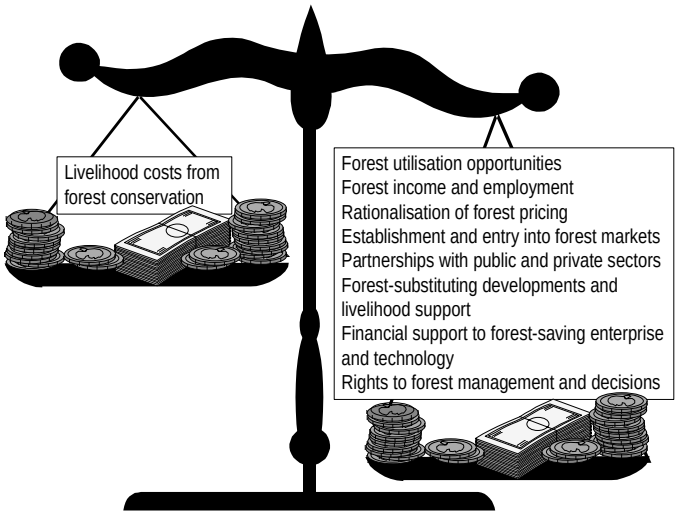


Figure 7: Economic conditions for community conservation of Mount Kenya Forest

Currently a range of legal, policy, institutional and market failures act as obstacles to the conservation of Mount Kenya Forest, and to communities economically gaining from forest conservation. Overturning these distortions, and reversing the perverse incentives they give rise to which encourage forest producers and consumers to over-consume, under-produce and under-conserve forest resources, forms a key strategy for forest conservation. A range of economic conditions must be set in place to ensure that the communities living around Mount Kenya Forest are economically better off in the presence of the forest than if it were degraded or lost. As illustrated in Figure 7, these economic conditions include maintaining sustainable levels of local forest utilisation, ensuring that forest-substituting activities and forest-saving technologies are available and attractive to local populations, improving the markets for forest goods and services so as to increase the extent to which forest economic benefits are captured as real financial values and establishing local rights to forest management and use which enable communities to benefit from forest conservation. Each of these conditions is necessary, and together aim to provide sufficient incentives, to ensure that Mount Kenya Forest is conserved at the same time as local economic welfare is increased.

A final set of economic conditions are also necessary to conserve Mount Kenya Forest. These conditions are largely external to the directly forest-adjacent area. Local communities are not the only groups with interests in the forest, or with the capacity to influence its status by their actions. Especially, commercial loggers and the threat of

large-scale encroachment into the forest for settlement and agriculture present major threats to the forest. Unless Mount Kenya is simultaneously and effectively protected against these activities, community-based approaches to forest conservation are unlikely to have any long-term impact.

8. REFERENCES

Beentje, H., 1990, *The Forests of Kenya*, Proceedings of the 12th Plenary Meeting of Aetfat.Mitt. Inst. Allg. Bot. Hamburg

Bussmann, R., 1994, *The Forests of Mount Kenya (Kenya): Vegetation, Ecology, Destruction and Management of Tropical Mountain Forest Ecosystem*, Dissertation zur Erlangung des Doktorgrades der Unversität Bayreuth durch die Fakultät Biologie, Chemie, Geowissenshcaften

COMIFOR, 1994, *Inception Report*, Conservation and Management of Indigenous Forests Project, Forest Department, Nairobi

Emerton, L., 1994, *An Economic Valuation of the Environmental Costs and Benefits in the Tana Catchment Resulting from Dam Construction*, report prepared by Acropolis Ltd and Nippon Koei for JICA, Nairobi

Emerton, L., 1995a, *Socio Economic Notes on Mount Kenya Forest Reserve*, Centre for Biodiversity, National Museums of Kenya, Nairobi

Emerton, L., 1995b, *Trade Policy and the Horticultural Sector in Kenya: an Economic Analysis of Environmental Impacts*, Policy Research Group, Nairobi

Emerton, L., 1996a, *Socio-Economic Survey Recommendations for Mount Kenya Forest*, Project Technical Paper No. 10, COMIFOR, Forest Department, Nairobi

Emerton, L., 1996b, *Valuing the Environment: Case Studies from East Africa*, African Wildlife Foundation, Nairobi

Emerton, L., 1997, *An Economic Assessment of Mount Kenya Forest*, report prepared for EU by African Wildlife Foundation, Nairobi

Marshall, N. and Jenkins, M., 1994, *The Timber Trade in Kenya*, TRAFFIC International, Cambridge

M'Imanyara, A., 1992, *The Restatement of Bantu Origin and Meru History*, Longman, Nairobi

Njuguna, P. and Muriithi, S., 1995, *Report on Game Damage Survey Mount Kenya/Aberdares*, Kenya Forestry Development Project, Nairobi

Ochieng, D., 1993, *Damage Cause by Forest Animals to Farms Adjacent to the South Western Side of Mount Kenya Forest Reserve*, Kenya Indigenous Forest Conservation Project, Forest Department, Nairobi

Omwami, R., 1992, *Review of Royalty Calculation Assessment and Revenue Collection*, Forest Department, Ministry of Environment and Natural Resources, Nairobi

Rheker, R., 1992, *Forest Management and Timber Industry at Mount Kenya*, Laikipia Research Programme/University of Berne

Rimita, D., 1987, *The Njuri-Ncheke of Meru*, Diocese of Meru Kolbe Press, Meru

Republic of Kenya, 1942, *The Forests Act*, Government Printer, Nairobi

Republic of Kenya, 1968, *Sessional Paper No. 1 of 1968: A Forest Policy for Kenya*, Government Printer, Nairobi

Wass, P., (ed.), 1995, *Kenya's Indigenous Forests: Status, Management and Conservation*, IUCN, Gland

Wawiye, J., 1992, 'History of Mount Kenya Forest management', paper presented at workshop on *Management of Mount Kenya Forest Reserve*, KIFCON/Forest Department, Nairobi

Were, G., (ed.), 1986, *Embu District Socio-Cultural Profile*, Ministry of Planning and National Development and Nairobi University Institute of African Studies, Nairobi

World Bank, 1996, 'Notes for the Kenya Forestry Development Project Mid-Term Review', World Bank, Washington DC