

**FOREST BOUNDARY PLANTING IN FOREST
MANAGEMENT AND CONSERVATION: A CASE STUDY
FROM TANZANIA'S EAST USAMBARA
MOUNTAINS**

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RESUMEN

Los recursos forestales de los montes Usambara del este en la región Tanga del noreste de Tanzania son de gran valor. Históricamente, el área ha sido el objeto de investigación pura en botánica y zoología. Solamente en la última década, se ha iniciado una investigación aplicada multidisciplinaria para abordar los problemas del manejo y de la conservación de los recursos forestales. Esfuerzos para promover la participación de la comunidad local en el manejo y la conservación han sido introducidos recién en los últimos cinco años. Este artículo muestra como ha sido impulsada la participación de la comunidad en el manejo y la conservación de los recursos forestales de los montes Usambara del este. También muestra en que medida las plantaciones en los linderos de los bosques forman parte de esta estrategia.

RÉSUMÉ

Les ressources forestières des montagnes de l'est de l'Usambara, dans la région de Tanga, au nord-est de la Tanzanie, sont d'une importance et d'une valeur exceptionnelles. Historiquement, la région a été le point de concentration d'une recherche botanique et zoologique considérable, mais c'est seulement au cours de la dernière décennie qu'une recherche pluridisciplinaire appliquée a été lancée pour répondre aux problèmes de gestion et de conservation des ressources forestières. Des efforts pour promouvoir la participation de la communauté locale à la gestion et à la conservation de la forêt ont seulement été introduits au cours de ces cinq dernières années. Ce document succinct donne les grandes lignes des moyens par lesquels la participation de la communauté à la gestion et à la conservation des ressources forestières dans les montagnes de l'est de l'Usambara a été encouragée, et se concentre sur les plantations à la limite des forêts dans le cadre de cette stratégie.

INTRODUCTION

The forest resources of the East Usambara Mountains in Tanga Region north-eastern Tanzania are of outstanding importance and value. Historically, the area has been the focus of considerable pure botanical and zoological research, but it is only within the last decade that applied multidisciplinary research has been initiated to address the problems of the management and conservation of the forest resources. Efforts to promote local community participation in forest management and conservation have only been introduced within the last five years. This brief paper outlines the ways by which community participation in the management and conservation of the forest resources of the East Usambara Mountains has been fostered, and focusses upon

forest boundary planting as part of this strategy.

The Importance of the Forests of the East Usambara Mountains

Although much of the East Usambara Mountains was once covered with forest, the vegetation pattern has been significantly altered by man, particularly in the last hundred years. Expansions in estate and smallholder agriculture, industrial logging, pit-sawing activities, increased demand for NTFPs (Non-Timber Forest Products) and a reduced effectiveness in the control of forest exploitation by Forest Department staff have all contributed to a depletion in the composition and extent of the forest resource. That which remains is of outstanding importance and value for a number of reasons.

The East Usambara Mountains collect, store and release water of importance to the inhabitants of the Regional Capital, Tanga (population about 130,000 in 1988) and neighbouring towns and rural areas. They also protect essential watersheds for the agriculture of the Region.

Although it is a controversial issue, there is some evidence that forest destruction in the East Usambara Mountains has resulted in multiple changes to the climatic characteristics of the area.

The East Usambara Mountains have an extremely abundant and highly endemic flora and fauna of global importance. These include timber species such as *Ocotea usambarensis*, *Milicia excelsa*, *Khaya nyasica* and *Newtonia buchanii*, as well as *Cephalosphaera usambarensis*, which is used in plywood manufacture. As well as producing valuable timber, a multitude of other forest products are available including: firewood, building poles, domestic utensils, medicinal plants, edible fruits, edible fat and dyes to meet the subsistence requirements of at least 50,000 people.

The forest resources in the East Usambara mountains (encompassing the Amani Botanical Garden) are also important in terms of their use as sources of tree seed and/or vegetative planting material; their aesthetic value (including potential for tourism); and their potential for educational purposes.

Recent Approaches to the Conservation and Management of the Forests

The approaches to the management and conservation of the forest resources of the East Usambara Mountains have evolved during the planning and implementation of the East Usambara Agricultural Development and Environmental Conservation Project between 1983 and 1990¹. Project implementation has primarily been restricted to 13 villages in Amani Division in the southern and central parts of the East Usambara mountains.

¹ The Project is executed under the authority of the Regional Development Director, Tanga Region. It is implemented by the Ministry of Agriculture and Livestock Development (MALD) in collaboration with the Ministry of Lands, Natural Resources and Tourism and the World Conservation Union (IUCN). Funding has been provided by the MALD's Food Aid Counterpart Fund (FACF), a Special Action Programme of the European Economic Community and the Tanga Region Government. Assistance from the Forest and Beekeeping Division has provided collaborative personnel and access to nurseries.

Direct and indirect approaches to forest management and conservation have been followed since project implementation started in 1987:

- i) Direct Approaches including control of pit-sawing, Forest Reserve boundary plantings and the establishment of Village Forest Reserves;
- ii) Indirect Approaches including the establishment of on-farm nurseries, village plantations and improved land use practices such as the development and promotion of spice-crop agroforestry systems and planting of macro-contours.

In both approaches every effort has been made to involve local communities in planning and implementation, although inevitably there has been much variation in the degree to which successful community participation has been engendered. The involvement of local communities has been possible through the efforts of forestry and agricultural extension workers at village, ward and division levels in conjunction with a Village Coordinator based in each village. Monthly extension meetings are held to discuss progress and problems associated with the various conservation activities conducted in the villages.

As one of the three main direct approaches to promoting forest conservation, the planting of Forest Reserve (FR) boundaries is seen as an important activity. Redemarcation of some of the FR boundaries has assisted in the control of illicit pit-sawing activities, as well as in limiting agricultural encroachments (commonly for cardamom cultivation).

Forest Reserve Boundary Planting

Boundary planting of FR in Tanzania, as in many countries in Africa, has been the traditional domain of the Forest Department. However, many of the FR boundaries in the East Usambara Mountains had been neglected for many years, primarily for want of maintenance funds. As a consequence, several instances of encroachment had occurred.

In 1988, a programme of replanting FR boundaries was initiated by the Project. To date more than 100 kilometres of FR boundaries have been redemarcated with exotic, non-invasive tree species. In open areas, plantings have been predominantly of teak (*Tectona grandis*) stumps in double rows, or blue gum (*Eucalyptus* spp) seedlings. Teak is confined to lower altitudes. Shaded areas are planted with seedlings and/or stem cuttings of *Cedrela odorata*. In most cases, three metre spacing has been employed. Mortality rates of seedlings six months after transplanting have varied between 25 and 40%, increasing to 45-60% at 18 months after transplanting. The main reasons for seedling mortality have included human interference, baboon damage, fire, competition from weeds and pest and disease attack.

The approach adopted in the replanting of the FR boundaries was based on the following preparatory steps:

- i) The identification of and contact with all farmers who possessed smallholder plots immediately bordering or in the vicinity of the FR boundary. This was accomplished with assistance from the relevant village authorities.
- ii) Meetings to identify which farmers were willing to assist in the boundary planting work.

- iii) Normal daily labourer wage rates (TShs 60 in 1988, TShs 80 in 1989 and TShs 100 in 1990) were paid to willing farmers for all forestry operations (boundary clearing, seedling planting, weeding, beating up, etc).
- iv) Farmers agreed to inform the Forest Assistants and Forest Attendants supervising the work of seedling survival rates and of any malicious damage identified.
- v) Farmers with contiguous small-holder plots agreed to carry out the weeding on their side of the FR boundary without cost. Seedling survival rates were significantly higher along these boundaries.

During the boundary planting of one FR (Amani Sigi, which comprises about 1,140 hectares with some 9 kilometres of boundary to be redemarcated), more than 50 farmers were identified and contacted. Of these farmers, some 20 actually participated. Overall, approximately 30% of farmers contacted have assisted in the boundary planting of FR. Particular difficulties have been encountered in trying to demarcate the surveyed but as yet still ungazetted boundaries of proposed FR. Furthermore, without rigorous post-planting maintenance of seedlings (beating up, spot weeding and slashing) the farmers have rapidly lost interest in boundary planting. Maintenance of FR boundaries is critical for at least the first 2-3 years after establishment.

In two instances, farmers have deliberately sabotaged FR boundary work by inverting recently planted teak stumps. These explicit political statements were made by farmers for specific reasons. In one case, they had had their (illicitly planted) cardamom slashed by the Forest Division, whilst in the other, they feared the loss of established agricultural plots. From the project's point of view, the involvement of farmers in FR boundary planting has given the following important benefits:

- i) Clarification and/or greater awareness regarding the position and functions of the boundaries and the areas they protect.
- ii) Increased survival rates of seedlings planted along boundaries contiguous with farmers' agricultural land.
- iii) Increased vigilance vis-a-vis illicit pit-sawing activity within FRs.

The importance of clearly demarcated boundaries (not just of FRs) cannot be over-emphasized. One of the most frequently employed loopholes of licensees is to claim ignorance of their position whilst involved in illegal pit-sawing operations.

During 1990/91 it is hoped to conduct several trials in establishing buffer strips of fast growing, non-invasive tree species along the boundaries of FRs that are contiguous with agricultural land. These strips will be 10 - 20 m in width and will be established with the participation of the farmers concerned. It is hoped that the buffer strips will serve two functions, notably, boundary demarcation and future supply of building poles and/or fuelwood to assist in meeting subsistence requirements.

Concluding Remarks

The involvement of farmers in long term issues such as the protection and conservation of forest resources is not an easy task. This is particularly true in areas where maintaining subsistence agricultural production has traditionally been based on the continued clearance of forested, publicly accessible land. This should not, however, preclude any attempt to involve farmers in identifying sustainable land use practices.

The control of any illegal exploitation of forest resources is an essential prerequisite to the introduction of other forest conservation measures. Demarcating the forest boundaries is a necessary feature of this control process. Although there is a need to address the administrative and legal problems which hinder effective control of forests in Tanzania, the East Usambara Project has made some positive achievements. It is suggested that there needs to be greater profit-sharing (in cash and/or in kind) at the village level of any future forest exploitation.

Project experiences suggest that the most important components of any attempt to foster greater local involvement in the management and conservation of forest resources are as follows:

- i) to establish an effective extension system to facilitate regular contact and consultation with all relevant groups;
- ii) to be prepared to listen, to discuss and to learn from the farming community. Subsistence farmers, foresters and agriculturalists alike do not necessarily have all the answers to the problems they face but it is often the farmers themselves who are closest to them;
- iii) to be prepared to experiment with innovative ideas and to learn from mistakes;
- iv) to accept that long term forest conservation work does not have significant short term results;
- (v) and to be resolute in counteracting illicit exploitation of forests.

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