the Mpingo Conservation Project

Principal report to the BP Conservation Programme on disbursement of the 2004 Consolidation Award made to the Mpingo Conservation Project

Citation: MCP (2006) Principal report to BP Conservation Programme on disbursement of the 2004 Consolidation Award. Mpingo Conservation Project, Tanzania.

enquiries@mpingoconservation.org
www.mpingoconservation.org

Executive Summary

This report is submitted in partial fulfilment of the terms and conditions of the BP Conservation Programme Consolidation Award of $75,000 made to the Mpingo Conservation Project in 2004. It is concerned specifically with the activities funded by and undertaken as a result of the Consolidation Award.

That award was made in response to a proposal to establish a permanent field base in Kilwa District, southern Tanzania, with the purpose of engaging in community forest conservation efforts under the flagship of the East African Blackwood tree, *Dalbergia melanoxylon*, or Mpingo in the local Swahili tongue. The tree's timber is one of the most valuable in the world, with billets of top quality heartwood obtaining up to $18,000 per cubic metre in the export market. Its high value stems principally from its use to make musical instruments, especially clarinets and oboes, but is also used locally for wood carvings, which are popular with tourists and professional Tanzanians alike.

The East African Coastal Forests close to the Indian Ocean are recognised as a globally important biodiversity hotspot, and the fragments in southern Tanzania are some of the least studied of all. However the new Mkapa Bridge over the River Rufiji and other infrastructure improvements in the area threatens the whole of Lindi Region with large-scale deforestation.

Previous expeditions by the Mpingo Conservation Project (MCP) had established that current exploitation of mpingo was not sustainable, a situation only likely to worsen, and that illegal felling was widespread. Regional and District forestry officials lacked the resources to properly enforce forest regulations. Commercial extinction of mpingo was a strong possibility if harvesting continued uncontrolled. However new changes in the forests policy and legislative framework in Tanzania opened up the possibility of rural communities taking control of and benefiting from their local forest resources. Limited access routes mean that local communities are in a position to police their forests where law enforcement officials are not, and the income thereby derived from logging licences could make a significant contribution towards improved livelihoods in villages with substantial stocks.

The MCP therefore proposed to develop practical community forestry schemes in line with the new participatory approach. This work had been started in Kilwa District under the Utumi Project, but this was terminating prematurely after only 3 years, leaving a vacuum which the MCP sought to fill. In addition, the MCP proposed to complement the practical conservation with research into remaining priority issues; current stock levels (on a district-wide basis) and growth rates of the tree, plus launching a campaign to raise awareness of the issues of mpingo exploitation and conservation at local, national and international levels.

New Emphasis and Strategy

In the initial phases of the project, and after consultation with key partners some subtle but important changes were made in the MCP's strategic approach. The key focus of mpingo conservation through research, awareness-raising and community support remained but previously the MCP expected to work largely independently of local structures. Instead it developed a closer affiliation with Kilwa District Council and the PFM programme, and in effect, it became a facilitating, practical and capacity-building arm of the District PFM programme for a specific target area within the wider zone of PFM operations taking place in the district. In addition, while mpingo remains the project's flagship species, its interests broadened out to encompass all the major high-value timber trees found in Kilwa district.

Under the new emphasis the flagship concept has gained a dual meaning; that in addition to being a flagship for the habitat, mpingo is also a flagship for all the high-value timber trees growing in this same habitat. Sustainable harvesting and management of mpingo should also encourage and assist sustainable harvesting and management of these other hardwood species. All of these species have the potential to contribute to local livelihoods, and if economic benefits accrue to rural communities from all of them, then the potential scope of the MCP is considerably wider, and the potential conservation impact that much greater.

Achievements to Date

The achievements of the MCP Kilwa Field Office thus far are:

- Established office, recruited staff and provided staff accommodation
- Supported the boundary dispute conflict resolution process involving Ruhatwe and Migeregere
- Funded and supported the PFRA field surveys and analysis, and drafting of byelaws and the Village Forest Management Plan for Kikole
- Raised awareness of CBFM in Target Area 2 villages (Migeregere & Kisangi Kimbarambara)
- Initiated CBFM in Kisangi Kimbarambara
- Supported District to introduce CBFM to other expansion villages
- Provided intensive support to KiFaCE
- Completed the field work and main analysis for the district-wide stocks assessment of high-value timber trees
- Designed a new integrated participatory monitoring programme, and established some base line plots in Mitaurure FR and Kikole Village
- Designed, produced and trialled an education pack for local use within villages in Kilwa
- Given a press conference to publicise the project nationally, and made one additional press release
- Produced and distributed a wall calendar, with the theme of forest conservation, in collaboration with the Wildlife Conservation Society of Tanzania
- Improved and expanded the project website
- Opened communications channels with mpingo loggers and sawmills
- Trained district staff in improved PFRA techniques and provided on-the-job training and assistance with IT skills
- Drawn up a Memorandum of Understanding with UDSM Botany Dept to facilitate student projects on mpingo-related issues
- Contributed to various national PFM policy initiatives
- Succeeded in a joint application with FFI for funding from the Darwin Initiative, safe-guarding the project's future until March 2008

Community Forestry

Working alongside officials from Kilwa District Council (KDC), whose work is funded by the national PFM Programme, the MCP has developed CBFM principally in four target villages. Two, Ruhatwe and Kikole, where the Utumi Project had previously worked, comprised Target Area 1, while two more, Migeregere and Kisangi Kimbarambara, featured in the PFM expansion programme, and were designated Target Area 2. This work was affected by various funding delays which afflicted the PFM programme, and a shortage of district cars to reach the target villages. An additional challenge was posed by the ongoing boundary conflict between Migeregere and Ruhatwe villages, and at the heart of which lies Ruhatwe's proposed VFA.

Nonetheless progress has been made in all four villages. Kikole village should shortly receive official approval of its Village Forest Management Plan, enabling it to move into full implementation. The MCP has played a leading role in attempting to reconcile the villagers of Migeregere and Ruhatwe, and although distrust remains on both sides, there are signs they recognise the overwhelming benefits of resolving the conflict and moving forward together. The concepts of CBFM have been introduced to both Migeregere and Kisangi, and some of the crucial initial steps in the CBFM process have been completed in Kisangi. Complementary to all this work has been the strong support the MCP has afforded to KiFaCE, a dynamic local CBO, based mainly in Ruhatwe and Kisangi, but active in all four of our target villages.

Research Outputs

The MCP has completed a district-wide timber stocks assessment for Kilwa District. Refinements should follow on acquisition of better land-use data sources, but results obtained thus far provide a good basis for management of timber extraction in the district. Total stocks of mpingo are between one and two million trees, with approximately half of them legally harvestable. The estimated volume of the harvestable mpingo is around 250,000m³, although only 170,000m³ is obtainable at the preferred market size. The survey produced figures for other commercially harvested species, although smaller sample sizes led to wider confidence intervals. The rapid transect methods used in the assessment were over 5 times more efficient than a recent inventory that used traditional sample plots. The innovative study design was found to be suitable for large scale assessments such as this, and could profitably be deployed in other parts of East and Southern Africa.

The project has also completed establishment of permanent plots and collection of baseline data which will form the basis of an ongoing monitoring programme to track growth rates of mpingo, and monitor the effectiveness of the community forestry schemes. The monitoring programme has been fully integrated into the CBFM process, and community participation maximised. Some simple results should be readily understood by local villagers, allowing them to see for themselves how their management of the forest is making a difference.

Awareness Raising

The MCP has produced three leaflets for distribution in local villages. One is an introductory leaflet about the value of mpingo and the MCP's work; the second is a booklet about forest conservation and the third sets out the steps to develop and implement PFM in a village. Production costs have been kept low to allow printing in large numbers and thus a wide distribution. Reaction in our four target villages has been favourable, and the two hour educational session in village schools has proved very popular.

A wall calendar for 2006 was produced jointly with WCST and distributed regionally and nationally within Tanzania. The calendar features photographs of the project's activities and promotes the message of sustainable exploitation of forest resources and community participation. For the international audience the MCP's website continues to be developed, and an awareness-raising campaign among classical musicians in the UK was kicked off shortly with an anniversary dinner which celebrated the project's tenth birthday in November 2005.

Project Evaluation

A comparison against the logical framework in the original proposal to BPCP shows the following progress:

- VFAs in TA1 properly functioning – *partial success*
- CBFM introduced to TA2 – *partial success*
- Mpingo education pack for use in CBFM produced – *success*
- Strategy for village control of timber stocks outside core VFA areas and evaluation of potential for certification – *postponed till 2007 under Darwin funding*
- Increased capacity of district forestry staff to develop CBFM – *partial success*
- Long-term monitoring programme of mpingo in TA1 and TA2 established – *achieved as far as possible*
- Total mpingo stocks in Kilwa District estimated – *success*
- More research into mpingo issues by UDSM staff and students – *some progress*
- Increased awareness of mpingo conservation nationally and internationally – *results imminent*
- First harvest of mpingo from TA1 – *some progress, but probably 2-3 years away*

The project has also been able to adapt to local requirements in carrying out additional work, such as the support given to KiFaCE, a local community-based organisation working on environment and development issues.

Of the four principal criteria for success, only one (further funding secured) will be met inside the 18 month to two year initial time frame. However good progress towards the other criteria has certainly been made despite the numerous delays to the PFM programme in Kilwa district which have greatly slowed the community forestry work. Many challenges lie ahead, but the project has good reason to celebrate the successes achieved thus far, and be optimistic for the future.

Contents

Introduction

What is this report?

This report is submitted in partial fulfilment of the terms and conditions of the BP Conservation Programme Consolidation Award of $75,000 made to the Mpingo Conservation Project in 2004. It is concerned specifically with the activities funded by and undertaken as a result of the Consolidation Award. It draws substantially on the Initiation Phase Report (May-Sept 2004) and subsequent Quarterly Progress Reports, but for those interested reference should also be made to them for information as to how the project developed over time. Despite some significant alterations made since to the project goal and plan (see below and the Initiation Phase Report for more information), this report takes as its principle reference point the original project proposal submitted to BP in January 2004, and compares performance against that, as well as the updated proposal, completed in July 2004, which was submitted to Kilwa District Council.

Who is this report for?

This report is principally for the management team of the BP Conservation Programme and its various partners. While it contains information which may be of general interest, it focuses specifically on the disbursement of the 2004 Consolidation Award, and readers wanting an overall picture of the project are referred to other project reports and the web-site. The report goes into some depth on the research outputs, but again other reports contain a fuller description.

Accompanying documents

The following additional documents complement this report and either have been or will be lodged with the BP Conservation Programme. Many will be made available on the project website.

- Tanzanian Mpingo 96 Final Report *(expedition partially funded by BP Conservation Programme)*
- Tanzanian Mpingo 98 Full Report *(expedition received free fuel from BP Tanzania)*
- Mpingo 99 Full Report *(expedition received free fuel from BP Tanzania)*
- Mpingo Survey 2000 Full Report *(expedition received free fuel from BP Tanzania)*
- Mpingo Carvings Investigation 2001 Full Report
- Mpingo 2003 Full Report *(still pending at the time of writing)*
- Full Report on the 2004 Kilwa Timber Stocks Assessment
- Analysis of a PFRA Method for Surveying Timber Stocks
- Subsequent reports detailing results of the monitoring programme.
- A forthcoming unified report tying together all of the above research and that by others into a single comprehensive account.
- Educational leaflets about value of mpingo under PFM and the steps to PFM *(in Swahili)*
- A5 Educational Booklet about forest conservation *(in Swahili)*
- Report on Payment of Meeting Attendance Allowances to Villagers participating in PFM activities
- Updated Kilwa Field Office Project Proposal *(July 2004)*
- MCP Kilwa Field Office Progress Report – Initiation Phase *(May-Sept 2004)*
- MCP Kilwa Field Office quarterly Progress Reports *(Oct 2004 until Mar 2006 and beyond)*
- Final Supplementary Report to the BP Conservation Programme *(to contain final & complete financial report)*
- Summary & Photographic Report to the BP Conservation Programme *(to comprise a summary of this report with photos of the project's work)*

Glossary of terms

BPCP	–	BP Conservation Programme
CBFM	–	Community-Based Forest Management (used in the specific context of PFM to refer to operations taking place outside of existing government reserves)
CBNRM	–	Community-Based Natural Resource Management
CBO	–	Community-Based Organisation
CEPF	–	Critical Ecosystem Partnership Fund
CFCN	–	Community Forest Conservation Network – a national forum, also known as *Mjumita*, giving a voice to local communities with regards to forest conservation. Individual "Networks" are CBOs or other supra-village groupings.
CITES	–	Convention on International Trade in Endangered Species
Danida	–	Danish International Development Agency (international donor)
DBH	–	Diameter at Breast Height (1.3m), a basic measurement of trees
DC	–	District Commissioner, the President's representative in the district, appointed by PO-RALG.
DED	–	District Executive Director, chief executive officer of the district administration
DFO	–	District Forestry Officer
DGIS	–	Dutch Ministry of Foreign Affairs (international donor)
DMWT	–	District Multi-disciplinary Working Team
DNRO	–	District Natural Resources Officer
DT	–	District Treasurer
EAT	–	Environment Africa Trust, a dormant UK charity with which the MCP has merged
FBD	–	Forestry and Beekeeping Division, part of MNRT
FFI	–	Fauna & Flora International (partner NGO of the MCP in the UK)
FSC	–	Forest Stewardship Council, international NGO promoting timber certification and producing guidelines on requirements to be FSC certified.
FR	–	Forest Reserve
HSL	–	Harvestable Straight Length, the length of trunk of a timber tree that is straight and free from faults, also applies to major branches of mpingo.
JFM	–	Joint Forest Management (used in the specific context of PFM to refer to operations taking place in and around existing government reserves)
KDC	–	Kilwa District Council
KiFaCE	–	Kilwa Farmers for Conservation of the Environment, a CBO based primarily in Ruhatwe and Kisangi-Kimbarambara villages, with a few members from Kikole and Migeregere.
MCP	–	Mpingo Conservation Project
MNRT	–	Ministry of Natural Resources and Tourism, Government of Tanzania
NTFP	–	Non-Timber Forest Products, e.g. fruits, mushrooms and medicines, but also firewood and charcoal which are not part of the formal timber trade.
PFM	–	Participatory Forest Management (a programme of the FBD)

PFRA	–	Participatory Forest Resource Assessment (an inventory of VFA resources carried out by villagers themselves & a vital step in PFM)
PO-RALG	–	President's Office – Regional and Local Government, the branch of central government charged with over-seeing and reforming various levels of local government in Tanzania.
PRA	–	Participatory Rural Appraisal – a means of helping communities to assess their own issues, resources available, and local management options
TA1	–	Target Area 1 (villages targeted by Utumi; Ruhatwe & Kikole)
TA2	–	Target Area 2 (selected villages for CBFM expansion; Migeregere & Kisangi-Kimbarambara)
TFCG	–	Tanzanian Forest Conservation Group – mostly works on JFM in high-biodiversity spots in the Eastern Arc and Coastal Forests, but also coordinates the CFCN.
TNRF	–	Tanzania Natural Resources Forum – a forum for NGOs and individuals interested in the wise use and management of natural resources in Tanzania.
UDSM	–	University of Dar es Salaam
Utumi	–	*Utunzaji wa Misitu* (Forest Conservation) – a Danida funded project developing CBFM & JFM which operated in Kilwa from 2000 to 2004.
VEO	–	Village Executive Officer
VFA	–	Village Forest Area – sometimes called a Village Forest Reserve (VFR), but we prefer VFA which avoids the exclusionary connotations of the word "reserve".
VLC	–	Village Land Certificate
VNRC	–	Village Natural Resources Committee
WCST	–	Wildlife Conservation Society of Tanzania
WDC	–	Ward Development Committee, comprising the Ward Executive Officer, Village Secretaries, any ward extension officers, and any religious leaders of the ward.

Some brief remark of explanation of the confusing terms PFM, CBFM, and JFM is appropriate. While most literature refers to the concepts of community-based forest management (CBFM) or natural resources management (CBNRM), CBFM is here used with the specific meaning it has under the Tanzanian Government's PFM programme to refer only to schemes for community participation and management of the local natural resources *outside* of any pre-existing local or national government protected areas (forest reserves). It can be contrasted with JFM which applies to *joint* management by local communities in partnership with the government agency responsible for the protected area. In this context, the general term PFM is more or less synonymous with the use of CBFM or CBNRM in the wider literature.

It is also useful to have some understanding of the hierarchical arrangement of local government in Tanzania. Below the national government are the Regional Administrative Secretariats, whose function is mostly advisory. Next are the District Councils which are democratically elected, one councillor from each Ward, plus a few special seats reserved for women. Associated with the each District Council is a substantial executive function. It is these district executives, i.e. civil servants, supervised by the democratically elected councils, who are responsible for much of the devolved implementation of PFM and other national government programmes. Both Regions and Districts are led by a Commissioner, who is the president's representative in that area. However, while the DC remains the political figure-head in the district, the district administration is led and managed by the District Executive Officer (DED), who is accountable to the council rather than the DC.

Districts are divided into Divisions, although these are becoming less important, and have been proposed for abolition. In Kilwa District there are 6 divisions. Divisions are then sub-divided into

Wards, each of which is represented by a single councillor on the District Council. Each Ward is typically made up of 3-5 Villages. These administrative villages are the basic units of government activity, and are likely to contain several sub-villages and hamlets. The main settlement in each official Village is itself one of the sub-villages.

Divisions, Wards and Villages each have their own, government-appointed Executive Officer, who, analogous with the DED in the district, is charged with organising and implementing various government initiatives in the village. Villages have a Village Government, which is made up of the primary Village Council and various specialist committees. The Village Government is led by an elected Chairman (analogous to the DC) and Secretary, and is overseen by quarterly meetings of the Village Assembly, comprising the entire adult population of the Village. Separate committees are formed to address particular issues. Each of these will also have an elected chairman, secretary, and treasurer where appropriate. Sub-villages are also likely to have a Sub-Village Council along with a Sub-Village Chairman etc.

Background

The following is largely adapted and updated from the project proposal submitted to BPCP in January 2004.

What is Mpingo?

Mpingo is the Swahili name for *Dalbergia melanoxylon,* the East African Blackwood. The tree is a common component of the open miombo woodland which covers large areas of southern Africa, but now only grows in commercially viable quantities in Tanzania and Mozambique. Estimates for the time taken for mpingo to reach timber size vary widely, but 70 to 100 years is the most widely quoted figure (Gregory *et al.* 1999).

The dark lustrous heartwood is one of the most expensive timbers in the world. It is used by African people to make utensils and tools, and traditional carvings such as those made by the Makonde people, so popular with foreign visitors. In the West, the principal use of mpingo wood is in the manufacture of musical instruments – clarinets, oboes and other woodwind – for which its oiliness and texture make it the finest material. A new use is the export to China and Japan for use in parquet flooring (Jenkins *et al.* 2002). Trees with very deeply fluted and gullied boles, branch knots, or holes or rotting regions within their heartwood (all common occurrences) are unsuitable for supplying the woodwind trade (they cannot yield a piece of heartwood large enough for the production of a clarinet section, for example), although carvers tend to incorporate the natural twists and turns of the wood into their works (Lovett 1987).

Whilst there is little danger that mpingo will become biologically extinct it is vulnerable to commercial extinction. The supply of high quality wood is limited and will be exhausted if exploitation of the species continues uncontrolled[1] (Ball 2004). Unlike the ivory once used for piano keys, there is no acceptable alternative for top quality woodwind instruments. In recent years Kenya's stocks have been completely exhausted (such that carvers there must now obtain their wood from Tanzania, Cunningham 1998). In 1986 at least 50% of mpingo harvested in Tanzania was estimated to have been felled illegally (Moore & Hall 1987), while in 2004 TRAFFIC calculated that only 4% of timber (of any species) extracted from southern Tanzania was properly licensed (Milledge & Elibariki 2005). Today most exports come from northern Mozambique and southern Tanzania, and some estimate that there will soon be no harvestable wood left in Tanzania in with consequent loss of income to the local economies (Hall 1988).

Conservation Initiatives

After an aborted UNEP project on mpingo (UNEP 1988), there was a move in 1994 to propose mpingo for inclusion in Appendix II of CITES. However the proposal sponsored by the German and Kenyan Governments was withdrawn as the African range states wished to consult further and compile additional information (FFI 2002). Attention has instead been focused on developing sustainable management and production of the species, possibly leading to certification under the Forest Stewardship Council.

In 1992 Fauna & Flora International (FFI) founded the *Soundwood Programme* to address the problems of unsustainable exploitation certain timbers resulting from high demand by the musical instrument industry. The project has had considerable success in raising awareness of the issues in the West and supporting educational efforts in schools. The *Good Guitar Guide* has been a significant achievement in promoting good practice amongst guitar manufacturers and shifting consumer opinion in favour of 'environmentally sound' instruments. The Soundwood Programme was a key part of the

[1] This is the consensus view; the definitive answer requires reliable figures for harvesting – TRAFFIC have begun a monitoring programme (see Milledge & Kaale 2005) – and a region-wide inventory, which the MCP undertook with BPCP funding, see below.

joint FFI/UNEP-WCMC *Global Trees Campaign*. Tanzania is one of the priority countries selected for attention in the Global Trees Campaign.

One of Soundwood's first activities was to organise a workshop in Maputo in November 1995. This endorsed the idea of conservation through sustainable exploitation and made various suggestions for taking matters forward. In particular the workshop highlighted the dearth of quantitative ecological data on the tree, and the urgent need for research to rectify this (FFI 1996). It was out of this call for action that the Mpingo Conservation Project was born. Six expeditions later the project is at the heart of a small group of organisations and individuals working towards mpingo conservation. In 2001 mpingo was given priority status by TRAFFIC East Africa for on-going monitoring, and they produced a study on illegal timber trade in southern Tanzania (Milledge & Kaale 2005). Unfortunately the Soundwood Programme has recently been down-graded by FFI due to poor response from potential sponsors.

In recent years the Tanzanian government has made various changes to the law enshrining the principles of community involvement in the management of their local natural resources. The new Forest Policy was formally introduced in 1998, and was legally codified under the Forest Act of 2002. Both the Policy and the Act build upon the Village Land Act of 1999, which provides the legal framework for villages to gain legal authority to manage natural resources upon their village lands. Once village land has been legally demarcated, the village is granted a Village Land Certificate (VLC) at which point the District Forestry Officer cannot grant licences to extract forest resources without the expressed written permission of the village government. Then under the Forest Act, villages can designate an area of forest as a Village Forest Area (VFA) and write a management plan governing the use of it, to which both the village and government agents must abide.

Since the new Forest Policy was published several hundred of these plans have been written, but very few have actually been approved and come to fruition. Moreover most of these are concerned with catchment forests from which all high-value timber trees have long since been removed. The Forest Act sanctioned the transfer of ownership of timber trees in the VFA to the local community when covered by an approved Village Forest Management Plan. This allows local people to benefit directly (in terms of licence fees) from the timber in forests growing around them, giving them an incentive to care for the forest and to guard against illegal felling.

Kilwa District and its Forests

Kilwa District is part of Lindi Region in the south-east of Tanzania. Lindi Region is the main area for mpingo harvesting in the country, and where the Mpingo Conservation Project's previous research had concentrated. It is among the poorest areas of a poor country. Until recently it was isolated from Dar es Salaam and the richer north by the Rufiji River which could only be crossed during daylight by a single ferry, and did not operate at all during the wet season. However the region's relative isolation is now coming to and end with the recent completion of the bridge over the River Rufiji. The national government intends soon to upgrade the road all the way from Dar es Salaam to Lindi and on to Mtwara.

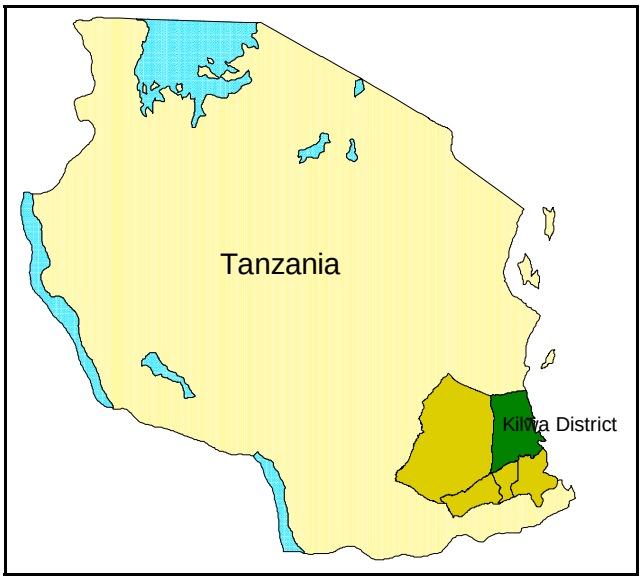


Figure 1. Kilwa District in relation to Lindi Region and the rest of Tanzania

Kilwa District covers some 13,000+ km² in total[2]. The land seldom rises above 500m elevation and rainfall averages just over 1000mm per year (Gregory *et al.* 1999). Kilwa was classified by White (1983) not in the main miombo grouping, but as part of the Zanzibar-Inhambane regional mosaic, which includes the coastal forests belt of East Africa. These forests are now recognised as a major biodiversity hotspot; they are one of WWF's Global 200 ecoregions, and together with the Afromontane forests of the Eastern Arc Mountains, comprise one of Conservation International's 8 hottest hotspots. A total of 776 species across all taxa are listed as endemic to the hotspot, including Kretschmer's Longbill *Macrosphenus kretschmeri*, known to occur in the forests of Kilwa (Burgess & Clarke 2000). The coastal forests in Kilwa District are amongst the least studied of all, and more endemics will probably be discovered.

Currently Lindi Region is one of the most heavily forested parts of Tanzania, a situation largely created by the historically poor communications both to and inside the region. And yet even before construction of the bridge TRAFFIC estimated around 42,000m^3 of timber crossed the Rufiji each year (Milledge & Kaale 2005), around one sixth (7,000m^3) emanating from Kilwa District.

Whilst vital developments, the new infrastructure improvements threaten a major escalation of logging and large-scale deforestation of the region. "Accelerated harvesting occurred almost immediately the bridge was opened." (Milledge & Elibariki 2005) Kilwa is already seeing significant inward migration, and trucks were reported crossing the new bridge every night laden with illegal timber (Paul Nyiti, WCST, *pers. comm.*). Because of its high economic value, mpingo is one of the first species suffering a drastic decline in stocks. Kilwa is the northernmost district in Lindi Region, and the closest to Dar, and so the obvious place for a management strategy to begin.

The Utumi Project

The Utumi Project was a Danida-funded initiative, from 2000-2004, to implement the new forest policy in Lindi Region and increase the capacity of forestry staff there, and thereby to counteract the unwanted effects of the Rufiji bridge on the threatened coastal forests. It was a project with a specific regional focus, and provided a high level of support in the two districts (Kilwa and Lindi) in which it operated. In its three years of operation, Utumi achieved some impressive results introducing PFM to local villages, and substantially increasing the capacity of the local district institutions (and the District Forestry Offices in particular) to carry out this sort of work. In Kilwa, Utumi worked in a total of six villages; three around Kitope Forest Reserve developed JFM in coastal forest, and three others developed CBFM in areas of miombo woodland on village land.

The initial plans for Utumi set out to fund and develop the project over a period of 15-20 years during which time it would be rolled out across other districts in Lindi Region, but retaining a high level of support and engagement with all districts. Then Danida reviewed their aid to forestry practises in Tanzania, and decided to instead focus their attention on a nationwide programme of PFM, based on the success of Utumi and the MEMA Project in Iringa. As a result of this, Kilwa District Forestry Office now receives substantially reduced funds which are channelled through the FBD and then out to the district councils. Active support from Danida in terms of on-site technical assistance was withdrawn altogether.

In its last year the Utumi Project shifted on to more short term goals of completing the village forest management plans with the hope that they could be operational by the end of the project. This was not quite achieved, and the tighter deadlines led to a slightly rushed approach. The Utumi Project was officially wound up in June 2004, shortly after the MCP arrived in Kilwa, with village byelaws still awaiting approval at ward level, the penultimate step in approving management plans.

Why Mpingo?

Ball (2004) proposes that mpingo would make an excellent flagship species for conserving the forests and woodlands of southern Tanzania. It is a prominent tree after which the Forestry & Beekeeping

[2] UNPF (1997) reported 13,920 km^2. Other data sources figures vary, depending perhaps on how much tidally exposed rock, mangrove etc is included.

Division named their new headquarters, with a presence in local, national and international markets; it is a symbol to which both local people and the international community can relate. Moreover it is (still) sufficiently common that local people could be persuaded to identify the health of the forest with the health of mpingo.

Growing mpingo in plantations is very risky due to the long rotation time (Gregory *et al.* 1999). Therefore conserving mpingo in the wild seems to be the best solution to prevent commercial extinction and guarantee a livelihood for local people. Mpingo is the only species in the area that commands this level of interest in the West. Once a sustainable harvesting regime is in place a programme focused partly on mpingo could secure its long-term funding through a small premium payable by clarinet and oboe consumers who purchase instruments made from well-managed timber. This could be reinforced by the eventual certification of the timber to FSC standards (FFI 2002).

Aims & Objectives

As the Initiation Phase Report described, the aims and objectives of the MCP in Kilwa under went some subtle but important shifts in emphasis in the first couple of months of implementation. This section reviews that change and draws heavily upon the Project Aims section in the Initiation Phase Report.

Original Aims

The original proposal to BPCP gave our overall aim as:

> *… to continue and expand the work of Utumi in Kilwa District, and for the MCP to make the transition from an expedition-based organisation to a project with an established, long-term, on-the-ground presence, opening up new opportunities for research and to develop a stronger partnership with UDSM.*

And then listed the following specific objectives:

- Support implementation of new Village Forest Areas (VFAs) in TA1, using management plans developed under the Utumi project
- Expand Community-Based Forest Management (CBFM) to two villages in TA2, neither previously covered by Utumi
- Develop an mpingo component to the village awareness building programme
- Design a strategy for management of high-value timber stocks growing on other village lands
- Further the capacity of Kilwa District forestry staff with technical training, both in field operations and appropriate IT skills
- Assess potential for CBFM to meet FSC certification requirements
- Establish a long term monitoring programme of mpingo in the above areas of operation, and with local participation in the monitoring process
- Determination of a new estimate for total mpingo stocks in Kilwa District
- Establish a more formal partnership with the University of Dar es Salaam, facilitate undergraduate student projects in the area focused on matters related to mpingo conservation and encourage further international student collaboration.
- Raise awareness of mpingo nationwide in Tanzania through a desk calendar
- Develop publicity materials (leaflets and poster displays) for fund-raising in the UK and USA

The long term objective is to oversee the first sale of sustainably managed mpingo from village to sawmill, and thence to a small-scale woodwind manufacturer in the UK.

New Emphasis and Strategy

Since the original project proposal, and after consultation with key partners, some subtle but important changes were made in the MCP's strategic approach between May and July 2004, and as the exact nature of support needed in Kilwa became clearer. The key focus of mpingo conservation through research, awareness-raising and community management remained but previously the MCP expected to work largely independently of local structures. Instead it developed a closer affiliation with the Kilwa District Council and the PFM programme, and in effect, it has become a facilitating, practical and capacity-building arm of the District PFM programme for a specific target area within the wider zone of PFM operations taking place in the district and managed by the DFO.

There are a number of reasons for this change of approach. Firstly, the project was designed away from its context. It has now been adapted to incorporate local requirements. Secondly, the original proposal under-estimated the scope and financial resources to be dedicated to the new national PFM Programme. Under this programme districts involved, including Kilwa District, will receive substantial funds, disbursed through the central government, to develop community-based forestry initiatives. The MCP had initially expected that it would directly replace a number of activities instigated by the Utumi project which will now take place instead under the PFM Programme.

Thus the MCP repositioned its programme to work alongside that of PFM, and rather than a direct replacement for Utumi. This means that the MCP is operating in a context of a wider programme at the national as well as local level, which should substantially increase the chances of success. Emphasis was placed on supporting community management of high-value timber trees and working alongside the PFM Programme, not in replacing Utumi. However, the loss of technical support to the district administration after the end of the Utumi Project which was highlighted in the original proposal to BP remained, and replacing that continues to be a core element of the MCP's presence in Kilwa.

The ideas and techniques which together constitute the PFM approach have been developed through 20 years of experience in community forestry in Tanzania and elsewhere. However, most of that work (at least in Tanzania) has been carried out in small forests, preserved principally for catchment purposes and additionally, in some cases, to guarantee a continued source of poles for building and firewood. The concept of sustainable utilisation of timber resources, which lies at the heart of the MCP's philosophy, has probably never been very far away from PFM practitioners' thoughts, but until the recent Village Land Acts and Forest Acts there has not been the necessary enabling legislation, and thus there has been no prior attempt to put this idea into practice. This then has become the key focus and niche occupied by the MCP's work in Kilwa. And while mpingo remains our flagship, the project's focus has expanded to encompass all the major high-value timber trees. The research programme was opened out to include these additional species, and the community forest conservation activities realigned to concentrate on the management of the high-value timber stocks within the overall context of PFM.

A Timber Flagship

Ball (2004) successfully argued the case for mpingo as a flagship species in the usual sense of a flagship for conservation of its (forest) habitat. Under the new emphasis the flagship concept has gained a dual meaning; that in addition to being a flagship for the habitat, mpingo is also a flagship for all the high-value timber trees growing in this same habitat. Sustainable harvesting and management of mpingo should also encourage and assist sustainable harvesting and management of these other hardwood species. All of these species have the potential to contribute to local livelihoods, and if economic benefits accrue to rural communities from all of them, then the potential scope of the MCP is considerably wider, and the potential conservation impact that much greater.

The following nine timber taxa (eight species and one genus) have been selected as the core focus for the MCP's activities in Kilwa. All are high value and threatened with over-utilisation in the district.

- Mpingo – *Dalbergia melanoxylon*
- Msekeseke – *Swartzia madagascariensis*
- Mninga – *Pterocarpus spp. (P. angolensis, P. holtzii & others)*
- Mvule – *Milicia excelsa*
- Mpangapanga – *Millettia stuhlmanii*
- Mkangazi – *Khaya anthotheca*
- Mhama – *Combretum imberbe*
- Mkongo – *Afzelia quanzensis*
- Msufi pori – *Bombax rhodognaphalon*

Revised Objectives

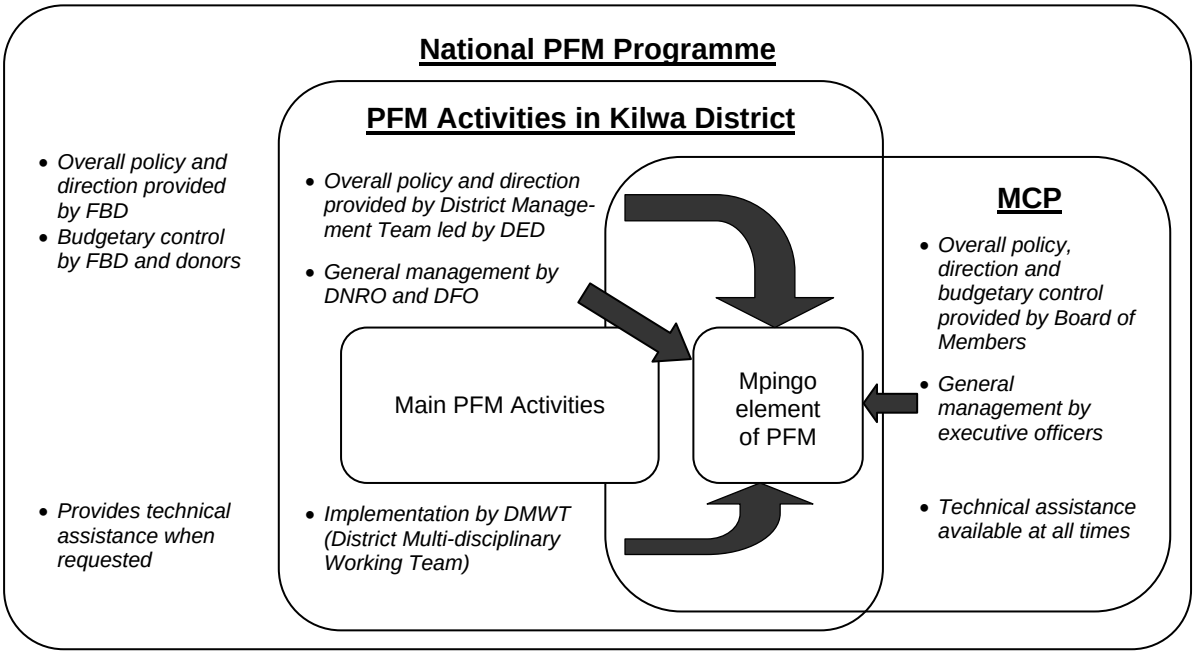
In accordance with the above shift in emphasis the objectives of the BPCP funded work were revised as follows:

- Support implementation of new VFAs in TA1.
- Support expansion of the CBFM programme to the villages in TA2.
- Develop an mpingo component to the PFM village awareness building programme.
- Design a strategy for management of high-value timber stocks growing on other village lands.
- Further the capacity of Kilwa District forestry staff with technical training, both in field operations and appropriate computing skills.
- Assess potential for certain high value timbers in community managed forests to meet FSC certification requirements.
- Establish a long term monitoring programme of populations/stocks of selected high value species, including mpingo, in above areas of operation, and with local participation in the monitoring process.
- Estimation of total stocks of mpingo and other high value species in Kilwa District.
- Establish a more formal partnership with the University of Dar es Salaam, facilitate undergraduate student projects in the area focused on matters related to mpingo conservation and encourage further international student collaboration.
- Establish firmer links with Tanzanian NGOs and CBOs.
- Raise awareness of mpingo nationwide in Tanzania through a wall calendar.
- Develop publicity materials (leaflets and poster displays) for awareness and fund-raising in the UK and USA.

It was still hoped the culmination of all of the above would be to oversee the first sale of sustainably managed mpingo from village to sawmill, and thence to a small-scale woodwind manufacturer in the UK.

The Role of the Mpingo Conservation Project

The Initiation Phase Report contains a detailed analysis of the organisational structure of the KDC administration, alongside which the MCP works in Kilwa District. The diagram below, adapted from the Initiation Phase Report, sets outs the position of the Mpingo Conservation Project within the wider PFM programme, and its activities in Kilwa District.



Community Forestry

PFM Implementation in Kilwa District

Participatory Forest Management in Kilwa began with a mangroves project in the mid 1990s, but it was not until the Utumi Project started work in 2001 that PFM work inland commenced. Utumi established the basic concepts of PFM in the district, getting it accepted as a way of moving forward and providing training to key officers. Utumi introduced the District Multi-disciplinary Working Team (DMWT) as the prime facilitating group, involving representatives from the Community Development Office, Land Office and Agriculture Office along with those from the Natural Resources department in the implementation of PFM. See the Background section above for more information on Utumi.

Utumi's work was split between JFM in a coastal forest area and CBFM in miombo woodland. The JFM work took place in the three villages, Marandego, Somanga Simu and Kinjumbi, surrounding Kitope Forest Reserve in the northern part of the district. Recently the district has developed a micro-finance scheme there funded under PFM, but otherwise there have been few developments since Utumi finished. However this situation may be relieved a little in the future when the MCP takes responsibility from TFCG for coordinating CFCN Forest Networks in Lindi region, including the existing one at Kitope.

In the miombo areas Utumi worked in three villages: Ruhatwe and Kikole, adjacent villages in Kikole Ward, relatively close to Kilwa Masoko (the district administrative centre), and Kipindimbi, which is further away. The main incentive for choosing these three villages was their pre-existing Village Land Certificates (VLCs), which is an important step in CBFM, and the legal foundation for everything that follows. This saved Utumi some time getting going, although it turned out the VLCs and the choice of villages were not without their problems. Before the end of the project, Utumi also facilitated an introduction to CBFM for seven more villages in miombo areas, and to which CBFM could be expanded under the new national programme. There was some debate as to whether all seven were suitable, particularly the politically difficult Migeregere, see below, but in the end all were adopted into the expansion plans. Kipindimbi, like the three JFM villages, is geographically distinct from the MCP's main target areas, and work has basically stopped there too.

Since the end of the Utumi Project Danida has continued to support PFM activities in the district through the new national PFM Programme. Under this programme money is channelled through national government structures[3] down to implementing districts. The idea is a good one – to develop institutional capacity at all government levels rather than have parallel structures all over the country wherever there are functioning projects – however it is not without its problems. There was a long initial delay in the first transfer of funds to Kilwa when the FBD failed to complete one piece of paperwork and it took six months to work out where the problem was. In this time PFM work in the district ground to a virtual halt, although the MCP was able to fund the PFRA at Kikole.

The first PFM transfer finally arrived early in 2005, but then hit problems of district staff changes. In the last six months there had been two changes of DED, the District Treasurer (DT) had retired, and the local bank manager suspended, generating much confusion over the correct bank account details. PFM operations were not ready to start until April 2005, by which time we were well into the rainy season, restricting fieldwork. After that some activities have started but progress continued very slowly as a result of ongoing problems releasing funds from the DT's department, primarily due to under-skilled and unmotivated staff. Close follow-up by the DFO could mitigate this, but that was not always possible.

[3] The exact path it takes is not fully clear, but our understanding is that all donor money provided in this way has first to be paid to the Ministry of Finance. For it to be released to districts the technical agency responsible, in this case the FBD, has to give its approval that the district has met its obligations to receive the money. However from there it must then be channelled through PO-RALG, as the only agency of the national government which deals directly with regional and district authorities.

A second major drag on progress of PFM in Kilwa was the shortage of vehicles. Both Utumi Project Landcruisers were handed over to the KDC administration at the end of Utumi with the understanding that they should be used primarily for PFM activities. However there are many competing demands for scarce transport facilities, and the old Utumi cars were frequently requisitioned for other purposes. It was difficult to argue against this practice when there were no funds for PFM, but then equally hard to stop once it had started. The MCP's car was thus used extensively for general PFM operations in the first twelve months, although mostly that has been in our Target Area villages. The twin issues of funds release and car availability worked together to slow many activities, and prevented adequate planning. The influence of the MCP in these matters was limited and they are politically sensitive issues, in which the project could not be seen to be interfering too much.

Thankfully, in the latter half of 2005 things picked up. A new forest officer joined the department at KDC, and was put in charge of the PFM programme, and he managed to push through the bureaucratic mess surrounding the funds release procedure, bringing it down to 2-3 days. When the new District Treasurer arrived in early 2006, this was reduced even further, with funds now sometimes available within 24 hours. Vehicle availability improved after a visit by staff from the national coordination unit for PFM at the FBD in September 2005. Now one of the two ex-Utumi cars is almost permanently available for PFM work.

For all its faults, the current PFM programme is the principle funding for all forestry work in the district. The roughly $70k annual budget thus also covers community work in mangrove areas, clearing boundaries around government forest reserves, as well as continuing and expanding the above-described work of the Utumi Project.

Target Areas 1 & 2

Our practical conservation work, assisting the Kilwa District administration to develop community forestry along CBFM guidelines, is focused on the four villages that make up Kikole ward. Two of those villages, Ruhatwe and Kikole, had received substantial attention from the Utumi Project, and were supposedly close to implementation when the MCP arrived in Kilwa District. They were designated the two villages in Target Area 1. The forest in this area is mostly miombo woodland mosaic with small fragments of East African Coastal Brachystegia Forest and East African Coastal Groundwater Forest variants (*sensu* Burgess & Clarke 2000).

The two villages for Target Area 2 were selected, after consultation with the District Forestry Officer, from the seven designated for expansion of the PFM programme. Migeregere was chosen as one of the two villages in TA2 as a previous MCP expedition, *Tanzanian Mpingo 98*, had been based there, camping on the edge of the village for seven weeks. We thus were already familiar with the village, and hoped to show some real continuity from our previous work. Migeregere also occupies a strategic position, being the first village reached on leaving Nangurukuru on the main road to Liwale[4], see Figure 2, and you must pass through it to reach Ruhatwe and Kikole.

Although Mavuji was provisionally listed for TA2 in the original proposal to BP, Kisangi Kimbarambara was selected as the second village in TA2 after the project began developing its links with KiFaCE (see page 50 below), since many KiFaCE members come from Kisangi. It is also the fourth and final village in Kikole ward, potentially simplifying some administrative issues. Logistically, however, it is separated from the other three villages by the Matandu River, and is reached by a different access road (track).

[4] Although it is a main road shown on national road maps of Tanzania it is in poor condition, unsurfaced the whole way, and is frequently impassable during the wet season. For all these reasons, and due to the depressed economy of the region, traffic is generally light. Logging trucks make up a substantial proportion of vehicles using the road.

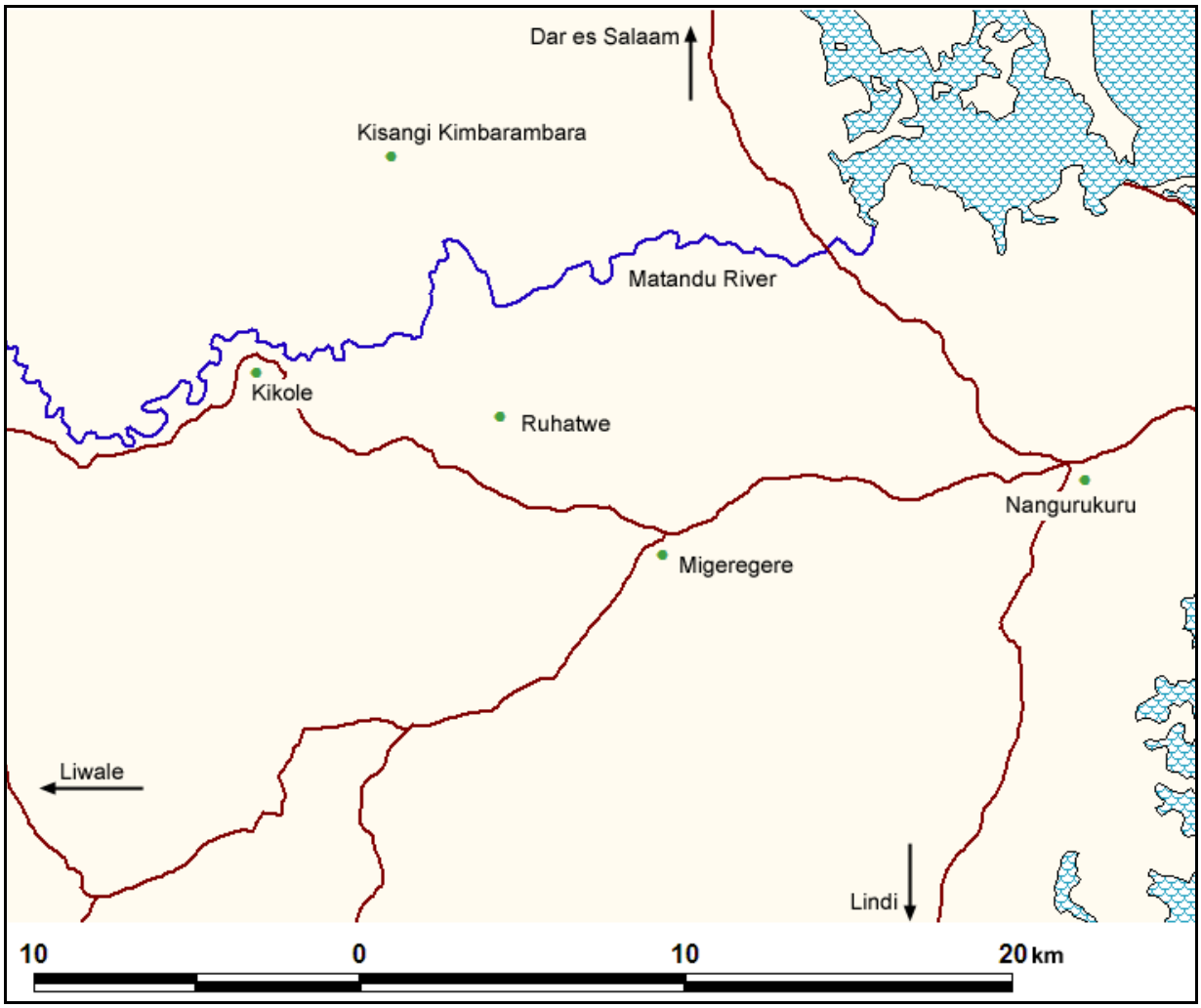


Figure 2. Location of the four villages of Kikole Ward plus the town of Nangurukuru.

Ruhatwe & Migeregere

Although, according to our original classification, Ruhatwe is in Target Area 1 and Migeregere in Target Area 2, they are here treated together. This is because the main focus of the MCP's work in those two villages has been resolving the boundary conflict existing between them. This may or may not have been a serious issue before the Utumi Project arrived, but it was not obvious to the Utumi staff until it was too late. Regardless of its history, the dispute was greatly exacerbated by the selection by Ruhatwe village of the land south of the Liwale road, and close to the hamlet of Mbate for their VFA, see Figure 3. While the official map of Ruhatwe shows Mbate and all this land inside Ruhatwe's borders, the land was customarily used by Migeregere people as well as those from Ruhatwe, while the people of Mbate voted in Migeregere, not Ruhatwe, and most local services (e.g. famine relief) were administered to Mbate through Migeregere, not Ruhatwe.

Notwithstanding the confused status of Mbate, the conflict has been characterised by experienced district staff as being principally about control over the natural resources found on that land (it is not prime farmland), of which revenue from forest products is only a part. In the mid 1990s an oil and gas exploration company sunk a test drill south of Mbate (at one corner of the proposed VFA), and ever since local people have harboured the vain hope that they may one day become rich from revenues earned from fossil fuel extraction. All of which may have been made much worse by Utumi's apparent neglect of Migeregere in favour of Ruhatwe, and the growing involvement in logging of some Migeregere villagers. For more background on the dispute see the Initiation Phase report.

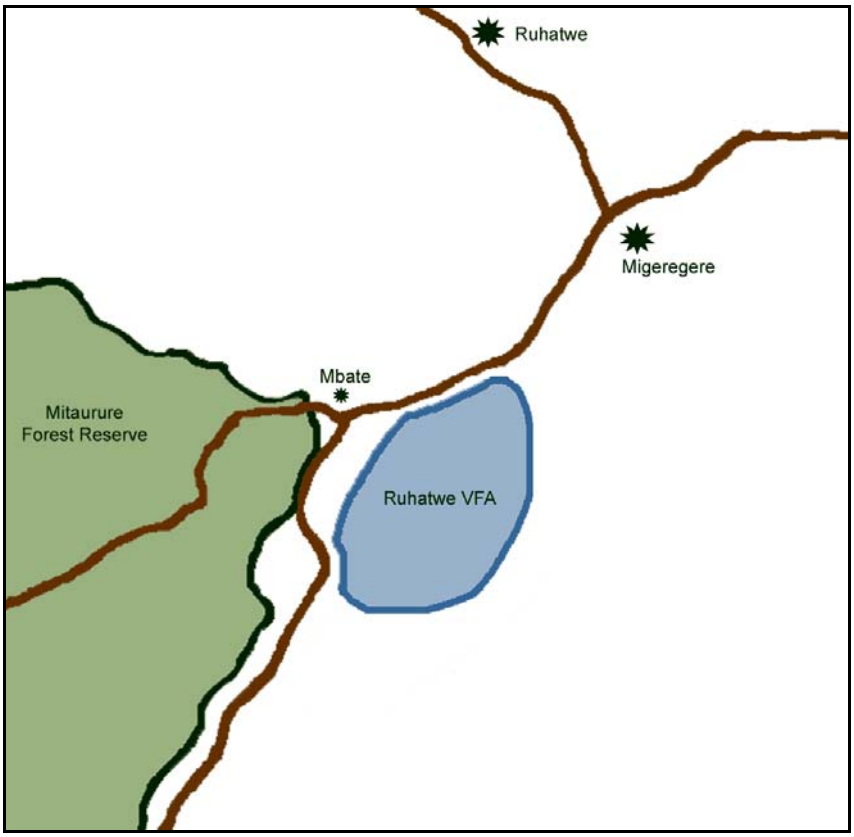


Figure 3. Sketch map showing relative position of Migeregere, Ruhatwe and Mbate, plus access roads and the disputed Ruhatwe VFA.

The villagers at both Migeregere and Ruhatwe made it clear from the start that they considered the only authority capable of resolving the dispute was the District Commissioner[5]. It took some time, but eventually a date was arranged in February 2005 for the DC to address the assembled village governments and elders of the two villagers at Mbate hamlet, the centre of the dispute. Prior to this the MCP spent some time in both villages preparing the ground, and warning them that it was likely they would have to give up something in order to progress, and that cooperation was better than perpetual stand-off.

The DC's final decision was something of a surprise to everyone, although it is a good reflection of natural justice. He declined to specifically support Ruhatwe's existing land tenure rights, and instead said the natural resources on the disputed land must be shared equally between the two villages. Then the precise location of the boundary between the two village administrative areas should be urgently reviewed by the District Land Officer, in consultation with both villages, and the administrative status of Mbate hamlet should be put to Kilwa District Council for discussion. Although his decision was not expected, the DC's ruling that resources (and revenue) should be shared echoed our own practical plans for progress, and reflected the fact that Ruhatwe was in no position to enforce regulations pertaining to the proposed VFA, which is relatively distant from the village, while Migeregere's position straddling the road to it gives them much more control. The cooperation of villagers from Mbate is also vital.

Since then, the MCP and KDC having been working to implement the DC's decision. The MCP put together a rough plan to make the solution legally binding, and a joint committee has been formed from the VNRCs of each village[6]. The DC's proposed resolution omitted many details, in particular exactly

[5] The extent of the DC's actual judicial powers in a matter such as this are unclear. The Village Land Act of 1999 describes Ward Land Committees as being the first court of petition. However, historically DCs did have these sorts of powers, and the DC remains the preeminent political figure in the district; hence the villagers' first choice of arbiter.

[6] Migeregere resisted giving Mbate specific representation since they viewed that as the first step as taking Mbate away from them, but thankfully one Mbate villager was voted on to the joint committee, so that issue has been side-stepped for the time being.

which land should be included in the joint management agreement. Subsequent to the Mbate meeting it became clear that the proposed VFA was not the only disputed land, with the two villages arguing over logging around another sub-village, Mpilipili, called Lumumba by Migeregere. At the DFO's request, the loggers moved to a less controversial location, allowing time for the resolution to be carefully thought through.

Initially progress was slow. Despite some positive reactions and moves on both sides, elements on both sides were reluctant to compromise; a sign post marking the VFA was torn down, probably by those involved in logging at Migeregere. A break-through was finally achieved in early 2006 when, at the villagers' request, the MCP acted as a mediator at a meeting of elders from both villages. Work has since begun on agreeing new boundaries, and which areas exactly should be jointly managed by the two villages. Further compromises between both sides will still be necessary, and there are some hard-liners on both sides continue to make far-reaching claims, but progress is being made, and relations between the two villages appear to be thawing. The final resolution will need ratification from both village assemblies.

Of the two villages, Migeregere were the harder to work with because of the high rate of employment in logging and the later introduction of PFM to the community. However when the villagers, perhaps inspired by our awareness raising campaign (see p.44), demanded more money for the timber being extracted, the logging company refused and moved on, leaving some 2,000 logs lying in the field, uncollected and unpaid. This bruising experience pushed the village at last to make a genuine commitment to PFM, where previously they had been lukewarm at best[7].

The MCP greatly increased its standing with Migeregere villagers when it offered to help them with the final tranche of TSh 100,000/- (roughly US $90) which they needed to contribute to the construction of a new borehole in the village – something which they desperately needed. The project paid a total of TSh 200,000/- to both villages for boundary clearance work around the Joint VFA, half of which went directly to the well construction account.

Migeregere occupies a highly strategic position, straddling the Nangurukuru to Liwale road, one of only three main routes in the district leading inland. With negligible timber stocks in Kipatimu division in the north, Migeregere is therefore in the position to regulate something like 50% of the timber emanating from the district[8]. Hence the potential rewards are high if Migeregere can be properly integrated into the PFM programme in Kilwa. Moreover Migeregere is one of the largest villages in the district by land area, much of which had substantial timber stocks before the latest phase of logging, and thus Migeregere has the capacity to be a genuine success story for PFM and the MCP, and also a salutary example to other villages of how collaboration with illegal loggers can hurt a village in the long term.

Moving forward the project hopes to develop other parts of the respective village lands as potential VFAs so that any future friction over jointly managed areas does not overshadow all the PFM work in the two villages. As community members become more involved and the prospect of significant returns from the endeavour become more substantial, older grievances maybe forgotten or put aside in the collective interest. In the case of Ruhatwe it is to be hoped that the MCP can in this way pick up some of the old enthusiasm and momentum left behind by the Utumi Project, while in Migeregere the potential rewards should become clear for all to see.

Kikole

Kikole is the other village in Target Area 1, having previously received assistance under the Utumi Project. Unfortunately the village's first choice of an area for a VFA was later found to overlap with Mitaurure Forest Reserve, and so the village had to select a new location, although second time around they understood better the aim and benefits of a VFA, and chose an area of land closer to the village, and therefore easier to control. At the start of the MCP's BPCP funded work, Kikole were ready to

[7] Not least because of the perceived injustices dealt them when Ruhatwe laid claim to the forest south of Mbate for their VFA.

[8] In practice a check-point would also be needed at Kiranjeranje in the south since it is possible to loop round via Nainokwe, Likawage and Nanjirinji.

conduct a PFRA of their new proposed VFA, and with the PFM funds held up in the Ministry of Finance, the MCP funded the assessment. The exercise went well, although it took considerably longer than was budgeted under PFM, especially the participatory analysis.

The next step was to draft the management plan and byelaws, which was completed satisfactorily. The byelaws, once agreed by the VNRC, need to be voted on and approved by first the Village Assembly, and then the Ward Development Committee (WDC). However it is the responsibility of the VNRC to push these byelaws forward for consideration, and with district and project staff elsewhere this proved to be a lengthy hold-up before progress resumed. The byelaws were eventually approved by the WDC in September 2005. One final hurdle remains; debate and (hopefully) approval by a meeting of the full district council. This itself was held up by the delayed elections. Now the new council has been sworn in it is expected to be one of the first pieces of business to be presented to them. After that the MCP hopes to begin exploring with Kikole the potential for the community to manage timber resources outside the relatively small VFA, and thus to accrue the significant benefits of PFM, i.e. timber licence fees, across a substantially larger area.

Kisangi Kimbarambara

Work started in Kisangi, the second village in Target Area 2, in May 2005. It started by introducing CBFM concepts to the villagers through the village general assembly. The concept was warmly welcomed by the enthusiastic community members. This was followed by elections or village representatives to the VNRC, on which the MCP gave guidance, and the newly elected members were given a short training on their roles and responsibilities.

The next step was a PRA where forest related and non forest (general) problems were listed, discussed and critically analysed. During this exercise a participatory village map was drawn. Villagers indicated in the sketch map how they planned to use their village land (a participatory land use plan). An area of forest with good stock of valuable trees and far from human settlements was proposed for Kisangi's VFA, and a brief reconnaissance survey was mounted.

Under the 2002 Forest Act, a village wanting to develop CBFM requires legal recognition of the lands under its control in the form of a Village Land Certificate (VLC). First villagers must agree on their boundaries with neighbouring villages, and the MCP helped facilitate meetings with representatives of adjacent villages. After agreeing borders, they prepared meeting minutes signed by both parties appropriate to each section of the boundary. Copies of the minutes were submitted to KDC District Land Office, a pre-requisite for a village wanting to be surveyed.

The process of surveying the village lands took one week. Though boundaries were already agreed, Kisangi and neighbouring villagers were involved in the survey team to witness the practical exercise. This is very important to avoid disputes in the future. The boundaries were marked, beacons installed, and an official village map is being prepared by district land office to be taken to the Ministry of Land for approval before the village get the Land Certificate. Now the village boundaries are clearly known, the right of Kisangi Kimbarambara to manage the natural resources occurring on their village land can be defended in a court of law.

Following that, the boundaries of the village's chosen VFA were surveyed and demarcated. The next step is to conduct a thorough PFRA, for which some preparatory planning and practical work has already taken place, but which must now wait until the end of the rainy season.

Further Expansion: Target Area 3 villages

The MCP has provided KDC general technical assistance with expanding their PFM programme, even when it has extended outside the core target areas. This has allowed the project a glimpse of some of these villages, and provided an opportunity to plan for future expansion. Of the 5 villages currently starting on CBFM work which are outside TA1 and TA2, Nainokwe perhaps has the most significant stocks of mpingo, and is thus a strong candidate for serious attention from the MCP starting in 2006 under funding from the Darwin Initiative.

The MCP has also spent sometime working in the three villages of Liwiti, Nainokwe and Mavuji which surround an area of high-biodiversity coastal forest. This forest patch was highlighted by surveys carried out under Utumi as being particularly rich in biodiversity, but currently un-protected. The new Kilwa DED, who has worked in other districts with a long history of CBNRM, is keen to establish a Local Government Forest Reserve as part of her legacy to the district. The MCP is recommending this part of coastal forest as suitable if the local communities agree, and in which case the new reserve will be under JFM from the start. Indeed the local communities will have the final say on where exactly the reserve boundaries should be. A proposal is being prepared to solicit funds for the work once agreement has been reached.

Stocks Assessment

Up-to-date data on timber tree stocks in Kilwa District is not available. There was an inventory in 1970, and another in the 1990s for which no figures were released to the District.[9] Since then, District logging licence records show that the volume of timber felled has increased, as has the diversity of species for which licences have been obtained. In order to determine what off-take can be sustainably supported, and how long current logging pressure can be sustained, it is essential to know how much timber there is in the District, both of mpingo and other valuable hardwood species.

Previous MCP work had given detailed data about mpingo stocks and habitat correlates in relatively small areas, however attempts to extrapolate to wider areas had introduced too many variables. A major objective of the MCP under BP Conservation Programme funding was to estimate stocks across the whole of Kilwa District.

By relating located timber stocks to other factors, such as habitat type, determined from pre-existing GIS, this information can be used to predict stocks levels elsewhere in an efficient manner.

Note this chapter presents a summary of findings only. For more detailed results, and a full description of the methods used to obtain them, please see the separate paper *Rapid Stocks Assessment of Mpingo & Other Timber Species for Kilwa District*.

Field Methods

Kilwa District extends over more than 13,000km², and so a rapid, efficient methodology was required in order to estimate timber stocks district-wide. The methods used were based on those adopted by Ball (2003) on *Tabebuia spp.* in Brazil which trades accuracy for speed. The resulting analysis cannot be said to be very accurate for sub-divisions of the overall survey area, but yields results for the whole study area without requiring a massive investment in field time.

Transect walks have a substantial efficiency advantage over discrete sample plots since there is no separate travelling time; staff are surveying the entire time from start to end of the transect. This advantage is extended if transects start and end at roads rather than randomly located points in the bush, a strategy which also makes logistics easier. Instead, therefore, of using random sampling, the field team deliberately selected transects which crossed an area of bush from one road or track to another, aiming to distribute these transect walks roughly evenly across the district. Transects were planned using a 1960s road map of the District[10], and the planners had at best a hazy idea of the likely habitat between the two points, so reducing bias.

In total, 28 transects were walked between 31st August and 17th November 2004, covering a total length of approximately 160km. Each transects was completed in a single day. Their locations are shown on Figure 4.

A GPS waypoint reading was taken at the start and end of each transect, and at each point the field team observed the vegetation type to change. These waypoints thus divide the transects into one or more Transect Segments, each with its own recorded habitat description, while the GPS waypoints allow the straight line distance calculation of length of each segment. Habitat descriptions

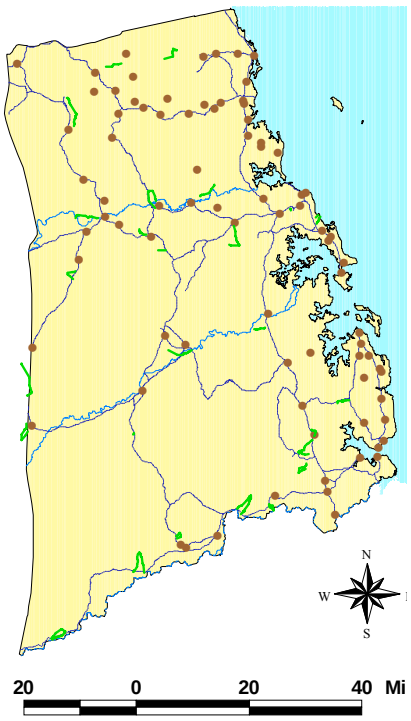


Figure 4. Location of transects walked (in green) with main roads and rivers of Kilwa district.

[9] FBD-commissioned partial inventories in 2005 only covered certain forest blocks, and omitted large parts of the district.

[10] Although much as changed since then, the roads have generally not shifted their routes significantly, so reliable planning is possible.

were left up to the field team to record freehand, resulting in over 300 different descriptions recorded in 390 transect segments. Descriptions were later classified according to analytical requirements.

We recorded all timber trees seen within 10m of the transect line, and with an estimated DBH of at least 25cm, and down to 10cm for mpingo *Dalbergia melanoxylon*. However, in most of the analysis mpingo trees estimated to have a DBH of 10cm or 15cm are ignored. The 10m transect width was the maximum which allowed easy spotting of timber trees down to 10cm DBH in all vegetation types.

Most large timber trees are relatively straight forward to survey, but mpingo is frequently multi-stemmed, and its convoluted growth patterns often mean that the section of the stem at breast height would not be the target of loggers, but some section higher up. Thus for each qualifying timber tree we noted the DBH of each stem, and the diameter and the (potentially harvestable) Straight Length (SL)[11] of each Stem Section which might interest loggers. From the two recorded dimensions we can calculate a resulting Straight Volume (SV) for each Stem Section. Where mpingo stems over 10cm DBH were unsuitable for harvesting we recorded a reason why they could not be harvested, i.e. because they were partially crooked, branched, dead or a stump.

In order to maximise surveying speed all measurements were estimated by eye rather than actually measured. Three precautions were taken to minimise estimation errors:

1. All members of the field team underwent training before commencing the work.
2. Additionally all surveyors completed a calibration course of 170 trees whose actual measurements were known. The results were used to adjust actual estimates.
3. Diameter estimates were recorded to the nearest 5cm and straight lengths to the nearest 50cm, which is quicker and easier for a trained surveyor than demanding estimates to the nearest centimetre.

The intent was to stop at each recorded tree for as short a time as possible, and not to depart from the transect line unless necessary to gauge harvestability.

Land Cover Data

We used two different sources of land use (vegetation cover) data. The first is the 1:50,000 topographic and land cover maps available from the Ministry of Lands[12]. These remain the only large scale maps easily obtainable for Tanzania. Village locations are no longer reliable, having been considerably altered during the Ujamaa programme of villagisation in the 1970s, but most other features are broadly accurate. In a random selection of 44 waypoints, the tree cover recorded by field surveyors was found to be broadly consistent with the vegetation cover depicted on the 1965 maps in 64% of cases.

Classification	Total Cover (ha)	Percentage Cover
Forest	142,203	10.70%
Scattered Trees	127,584	9.60%
Scrub	720,318	54.20%
Settlement	46,515	3.50%
Thicket	31,896	2.40%
Water	15,948	1.20%
Woodland	244,536	18.40%
TOTAL	**1,329,000**	**100.00%**

Table 1. Vegetation cover of Kilwa District estimated from 1965 Maps.

Vegetation is classified into 12 different types on the 1965 maps, although some of these had negligible appearance in Kilwa District. A crude estimate of total cover for each vegetation type was obtained by counting map squares across all the sheets covering Kilwa District. Table 1 lists the main categories of land use in the district according to the 1965 maps.

[11] This is the same as the Estimated Straight Length (ESL) measure introduced by Gregory *et al.* (1999).

[12] Series Y742, Edition I-TSD based on aerial photography carried out in 1965-6 by Spartan Air Services of Canada.

Our second source of land use data was a series of ArcView GIS shape files generated from composite LandSat TM images with a 30m x 30m resolution taken in 1994-5. The images had already been interpreted into land-use classes and merged by technicians as part of a national mapping project of 1997. The shape files were merged using ArcView GIS and clipped according to the boundaries of Kilwa District, to produce Figure 5. Table 2 lists the various categories of land use in the district according to the 1995 LandSat images.

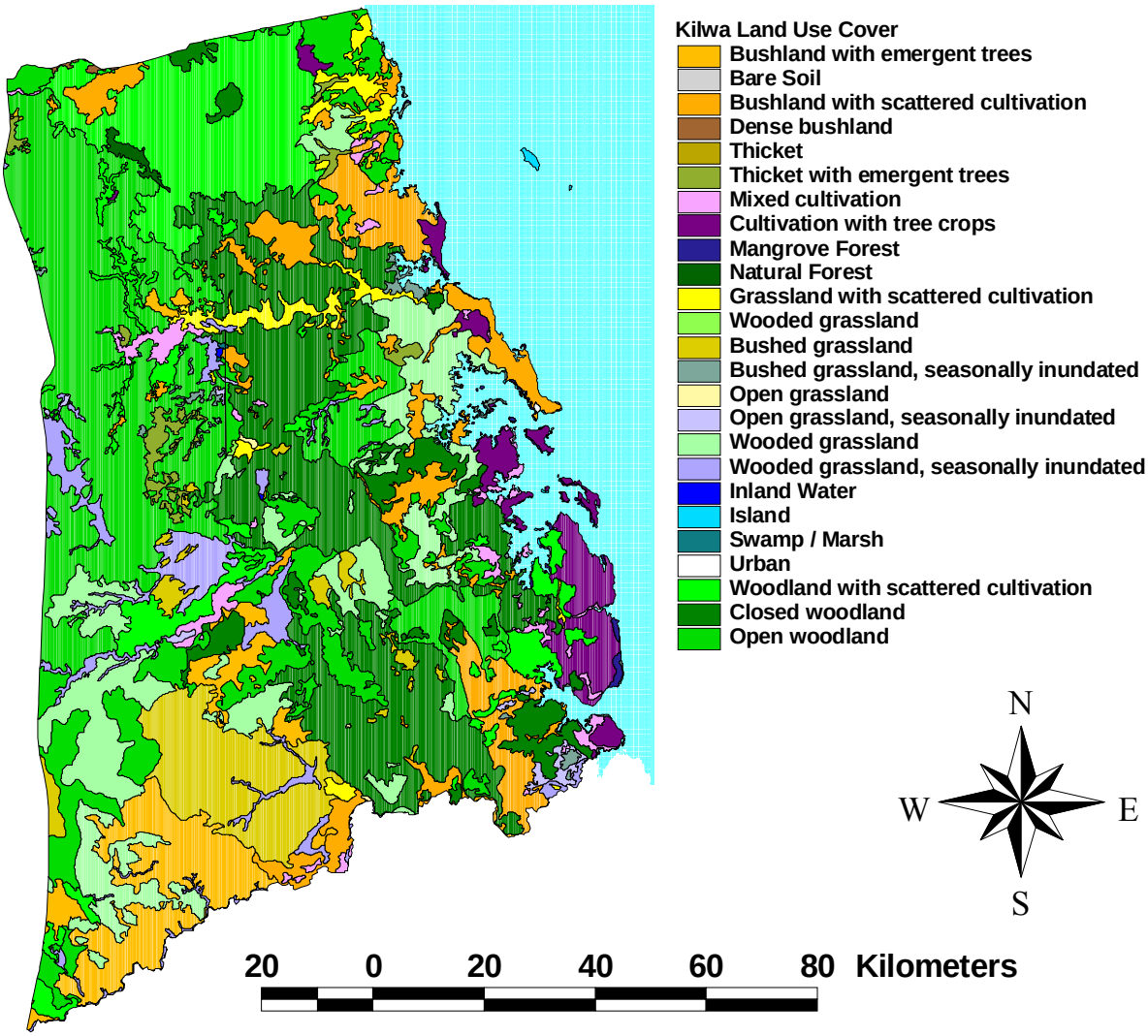


Figure 5. Land Use Cover in Kilwa District from 1995 LandSat images.

Not all land cover 1995 LandSat classifications listed were found to be surveyed, but all those not surveyed e.g. mangrove, could be reasonably assumed to have zero stocks of the timber species under consideration.

Super Class	Classification	Total Cover (ha)	Percentage Cover
Bushland	Dense Bushland	639	0.05%
	Bushland with scattered cultivation	109,338	8.44%
	Thicket	299	0.02%
	Thicket with emergent trees	13,414	1.03%
	Bushland with emergent trees	76,543	5.91%
Cultivated Land	Mixed Cultivation	20,935	1.62%
	Cultivation with tree crops	42,976	3.32%

Super Class	Classification	Total Cover (ha)	Percentage Cover
Forest	Mangrove *	4,153	0.32%
	Natural Forest	2,763	0.21%
Grassland	Open Grassland	618	0.05%
	Bushed Grassland, seasonally inundated	7,535	0.58%
	Open Grassland, seasonally inundated	5,176	0.40%
	Grassland with scattered cultivation	24,923	1.92%
	Wooded Grassland	130,850	10.09%
	Wooded Grassland, seasonally inundated	46,534	3.59%
	Bushed Grassland	76,407	5.89%
Open Land	Bare Soil *	210	0.02%
Urban	Urban Areas / Airfields *	157	0.01%
Water	Inland Water / Lake *	238	0.02%
	Swamp / Marsh *	223	0.02%
Woodland	Woodland with scattered cultivation	146,773	11.32%
	Closed Woodland	253,929	19.59%
	Open Woodland	331,587	25.58%
TOTAL		**1,296,220**	**100.00%**

Table 2. Vegetation cover of Kilwa District according to 1995 LandSat images.
*** indicates land uses assumed to have zero stocks of timber species under consideration.**

Close inspection of Table 1 and Table 2 shows that there is some disagreement on the total area of Kilwa District. This may be partially down to errors in estimating half squares on the 1:50,000 maps, but is likely to be indicative of real discrepancies. Given a 30 year gap between data collection, shifts in coastline, an ill-defined western boundary of the District, and differences in how areas such as mangrove forests are recorded are all likely to have an impact.

The above-mentioned consistency of the 1965 maps with habitat descriptions recorded during field surveys suggests that land-use cover has not changed markedly in last forty years. We therefore attempted to correlate the land use classifications of the two data sources. However it is clear that some of the 1995 LandSat classifications substantially overlap the boundaries of the 1965 cover types, making any reconciliation impossible.

Data Analysis

The survey data from the fieldwork and the land use data presented above were entered into MS Access for analysis. There the data was calibrated, and compared to different harvesting models. A complete description of the statistical analysis is to be found in the full report on the stocks assessment, available separately on the MCP web-site. There follows a brief summary.

Calibration

The calibration course allowed us to adjust for a number of errors. These included:

- Variation in the perceived transect width whereby surveyors sometimes reported trees as far away as 13.9m from the transect line.
- Incorrect estimation of stem diameter and straight length.
- And consequent error in the estimated straight volume of a stem section.

Analysis of the data from the calibration course also allowed us to calculate confidence intervals for the above.

Harvesting Models

Our surveying counted all timber trees with a DBH of at least 22.5cm, and mpingo with DBH at least 7.5cm. Not all of these are legally harvestable, see. However, as Milledge & Kaale (2005) and others have showed, there is often a large discrepancy between what is legally fellable, and what in practice is actually felled. To reflect this, a number of different harvesting models were defined:

- **Market Preference** – could provide a log with at least the minimum market preference diameter and length.
- **Legally Harvestable Now** – where both the DBH and HSL exceed the minimum legal requirements.[13]
- **Potentially Legally Harvestable Later** – where the HSL exceeds the minimum legal requirements, but DBH may be lower (such that as the girth increases with age the tree might be legally harvestable in future if not now). Not all such individuals will necessarily reach harvestable size.
- **Illegally Cuttable Now** – where the DBH and HSL are such that, even if not legal, commercial loggers may find a market at sawmills.
- **Usable Locally** – only the smallest trees are of no interest to local people who do not require commercial standard timber.

An additional dummy harvesting model, **All**, includes any timber tree recorded regardless of harvestability, and is useful for population estimations. Model dimensions for each species are set out in Table 3.

Model	*Dalbergia melanoxylon*	*Swartzia madagascariensis*	*Pterocarpus spp.*	*Milicia excelsa*	*Millettia stuhlmanii*	*Khaya anthotheca*	*Combretum imbibe*	*Afzelia quanzensis*	*Bombax rhodognaphalon*
Market Preference	0.35 x 1.2	0.4 x 2.1	0.55 x 3.66	0.55 x 3.66	0.55 x 3.66	0.55 x 3.66	0.55 x 2.1	0.55 x 2.1	0.55 x 3.66
Legally Harvestable Now	0.24 x 1.2	0.24 x 2.1	0.45 x 2.1	0.55 x 2.5	0.45 x 2.5	0.55 x 3.66	0.24 x 2.1	0.55 x 2.1	0.55 x 3.66
Potentially Harvestable Later	0 x 1.2	0 x 2.1	0 x 2.1	0 x 2.5	0 x 2.5	0 x 3.66	0 x 2.1	0 x 2.1	0 x 3.66
Illegally Cuttable Now	0.20 x 1.0	0.24 x 2.1	0.35 x 2.1	0.55 x 2.1		0.55 x 3.66	0.24 x 2.1	0.35 x 2.1	0.55 x 3.1
Usable Locally	0.10 x 1.0		0.25 x 1.2	0.4 x 0.9	0.1 x 1.8		0.15 x 0.3	0.25 x 1.2	0.1 x 1.8

Table 3. Harvesting model definitions; minimum diameter (m) x minimum log length (m).
Source: GoT (2004) and district forestry staff.

Determining Harvestability

Since none of the trees recorded in the survey were actually measured we cannot often be certain whether they would actually be harvestable according to any given model. Although the adjusted estimates are reasonable approximations of the true dimensions two factors combine to make a simple comparison with minimum harvesting criteria especially problem prone:

- Many of the criteria equal or are very close to the centre figure of an estimation size class.
- Adjusting for researcher estimation trends increases or decreases the central estimate a small amount.

For example is a *Pterocarpus* with estimated DBH 45cm (i.e. between 42.5 and 47.5cm) actually harvestable? If it was recorded by a researcher who consistently underestimates diameters by 5% then

[13] There is no legal minimum diameter for harvesting *Millettia stuhlmanii*, but in practice very few individuals of less than 45cm diameter were being felled, and so this figure was used as the *de facto* minimum.

the adjusted estimate will be 47.25cm, implying the tree is legally harvestable (assuming the HSL is sufficient), but if it was recorded by a researcher who tended to overestimate diameters by 5% then adjusted estimate would be 42.86cm, implying the tree is not legally harvestable.

This acute sensitivity to the identity of the researchers rules out simple reliance on the adjusted point estimate. Instead a probabilistic solution must be adopted. After adjusting for over- or under-estimation trends, percentage errors for estimating each dimension and for each researcher were analysed from the calibration data and found to be roughly normal.

For any given tree dimension we can thus construct a normal distribution of the likely actual dimension from the estimated figure, setting the mean to be the adjusted estimate, and a standard deviation scaled up by a factor equal to the adjusted estimate. Table 4 lists the parameters used to generate these distributions for the two principle surveyors[14]. From the appropriate normal distribution can be obtained a simple probability that the actual dimension exceeds any given threshold. Hence an estimated probability that any stem section recorded by the field surveys is harvestable according to a given model can be obtained by simply multiplying the probabilities that it fulfils the diameter criterion with the probability that it fulfils the minimum straight length criterion.

Researcher	AG	JM
DBH		
Adjustment Factor (A)	0.79	0.91
Fixed Intercept (B)	8.83	5.42
Standard Deviation	14%	18%
SL		
Adjustment Factor (A)	0.98	0.94
Standard Deviation	37%	38%

Table 4. Adjustment factors and standard deviation in percentage error for different researchers estimating physical dimensions of harvestable trees.

Combining these probabilities in large data sets leads to expected total figures for the harvestability of trees and stem sections. Since, as with any such survey, only a small part of the area under consideration was sampled[15] this does not alter the fundamental probabilistic nature of the results, although it does have a bearing on the resulting confidence intervals. The expected harvestable volume of a tree follows from the probability of harvestability and the adjusted estimate of straight volume.

The error rates on the harvestability probabilities was further assessed using data from the calibration course, and an adjustment formula deduced to correct for the consistent under-estimation of the likelihood of harvestability which both principal surveyors exhibited. Methods were also derived to compute confidence limits for the estimates of number of harvestable trees and the total expected harvestable volume.

Results

Recorded timber trees

Table 5 presents a summary of the trees observed by species. It can instantly be seen from this that *Swartzia madagascariensis* and *Khaya anthotheca* were too rare for any meaningful results to be computed, and data set size problems may arise for *Combretum imberbe*, *Milicia excelsa* and *Bombax rhodognaphalon*, especially when dealing with sub-sets of the data on a habitat-by-habitat basis. Mpingo was by far the commonest of these trees seen.

[14] The two principal surveyors accounted for over 90% of the estimates, and so we have confined our discussion and analysis to those two.

[15] I.e. the final results will be obtained by extrapolating out the totals obtained from the survey data.

Species	Total Freq.	Mean DBH	Max DBH	Proportion Legally Harvestable
Dalbergia melanoxylon *	432	36	104	48%
Swartzia madagascariensis	6	40	48	90%
Pterocarpus spp.	176	41	152	22%
Milicia excelsa	36	38	64	7%
Millettia stuhlmanii	277	33	56	1%
Khaya anthotheca	6	62	128	33%
Combretum imberbe	20	43	88	27%
Afzelia quanzensis	94	43	97	7%
Bombax rhodognaphalon	46	53	142	26%

Table 5. Summary encounter data for surveyed species. DBH figures in cm, and refer to largest stem only. Legally harvestable probabilistic measure included as an indicator of what proportion of each species were large size. Due to nature of calculation this may not represent a whole number of trees.
*** For consistency figures for *Dalbergia melanoxylon* only include trees down to estimated DBH of 25cm. A total of 608 *Dalbergia melanoxylon* were seen with a DBH of 20cm or greater, of which 41% were legally harvestable.**

Size distributions for each of the four commonest species are shown in Figure 6. There is a notable lack of smaller *Pterocarpus spp.*, and also to a lesser extent of *Afzelia quanzensis* and the less common species taken together. Figure 6 also explains the extremely low proportion of *Millettia stuhlmanii* which are legally harvestable given in Table 5 as a combination of a healthy population of smaller individuals combined with demanding *de facto* minimum harvesting requirements.

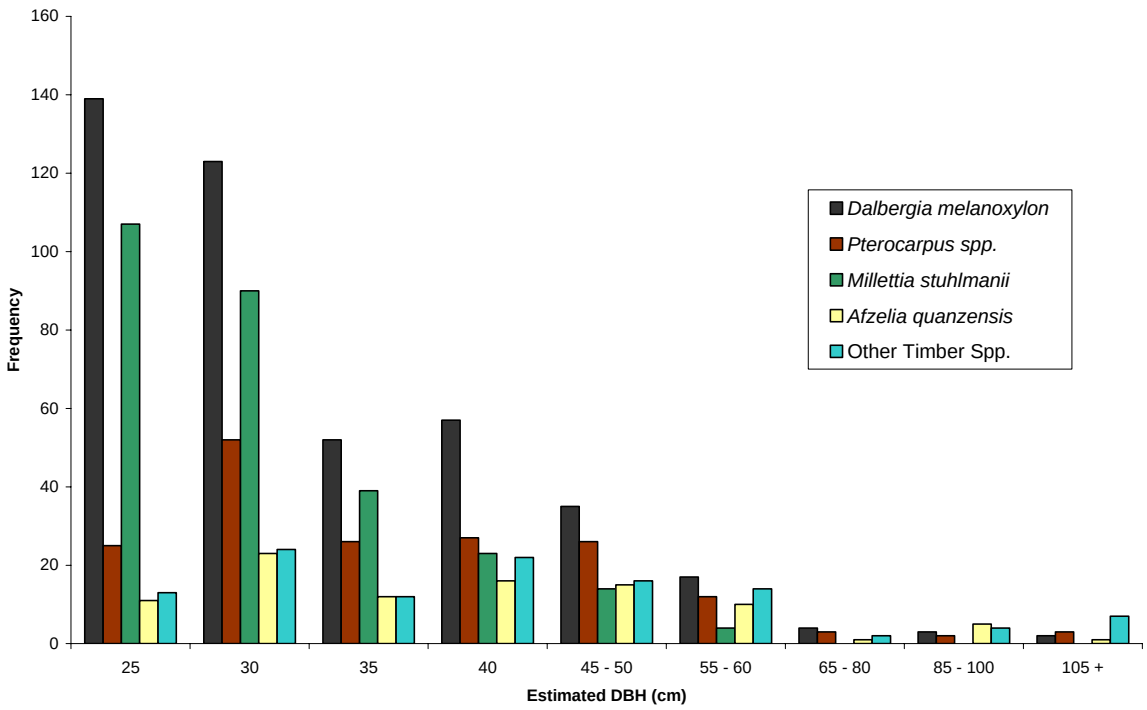


Figure 6. Size distribution of observed timber trees. DBH of largest stem used. Note varying class widths. For consistency excludes mpingo with DBH less than 25cm.

Minimum sample sizes by land cover

Inspection of the data shows that mpingo *Dalbergia melanoxylon* was most wide-ranging in its habitats, occurring in all seven of the land cover classes derived from the 1965 topographic maps, and in various categories of Bushland, Grassland, Woodland and Cultivated Land in the 1995 LandSat classification. In contrast the three least common species, *Swartzia madagascariensis*, *Khaya anthotheca* and *Combretum imberbe*, were each found in only one or two land cover classes in both land cover classifications. Other species exhibited an intermediate habitat diversity.

Estimates of total stocks of the least common species can thus be based on simply those few land cover classes in which they appear. The small total number seen of each species will inevitably place a wide confidence interval on the reported results.

The land cover classifications we have may not be the most appropriate for determining a total count of the species. We examined every example of where the total number of trees recorded in a land cover class was less than 10. If the surveyed area was also small, a new merged land cover category was created, merging the under-surveyed land cover category with other similar ones. To avoid any inappropriate merges of unlike habitats (for the species concerned), we computed the Poisson probability of encountering the actual number of timber trees observed in each constituent land cover category of each newly created merged category, and the merge was rejected if the probability lay below 5% or above 95% (i.e. a two-tailed test at 10%). This caused a number of potential land cover merges to be discarded.[16] The remaining land cover combinations, which were accepted, are listed in Table 6.

Data Source	Merged Land Cover	Component Land Covers	Applicable Species
1965 Maps	Thicket & Scrub	Thicket Scrub	*Pterocarpus spp., Afzelia quanzensis*
1995 LandSat	All Bushed & Wooded Grassland	Bushed Grassland Wooded Grassland (both possibly seasonally inundated)	*Dalbergia melanoxylon*
	Cultivated Land	Mixed Cultivation Cultivation with Tree Crops	*Dalbergia melanoxylon*
	General Thicket	Thicket – with and without Emergent Trees	*Dalbergia melanoxylon, Pterocarpus spp., Afzelia quanzensis, Bombax rhodognaphalon*
	Thicket & Dense Bushland	Dense Bushland Thicket – with and without Emergent Trees	*Millettia stuhlmanii*
	Open Woodland (maybe scattered cultivation)	Open Woodland Woodland With scattered cultivation	*Afzelia quanzensis*
	Dry Bushed & Wooded Grassland	Bushed Grassland Wooded Grassland	*Pterocarpus spp.*

Table 6. Merged Land Cover Classes, their component land cover classes, and applicable timber species.

Comparison of land cover classifications

Variation can be expected between the figures for total stocks calculated according to different land cover classifications[17]. For this purpose we simply examined the total estimated population of each tree species. The results are set out in Table 7.

Comparisons of the figures for the two land cover classification showed considerable variation for some species such as mpingo (where the two confidence intervals were almost completely inconsistent), and much less for others such as *Bombax rhodognaphalon*. Consistency even varied with model; despite the lack of consistency for the *All* model, the estimates thus obtained for mpingo which

[16] One exception is in the All Bushed & Wooded Grassland category for mpingo, where the conclusion of the Poisson tests that mpingo grows in both bushed and wooded grassland, and in seasonally inundated wooded grassland, but not in seasonally inundated bushed grassland was rejected as nonsensical from an ecological perspective, and the merged land use retained. This problem may have been caused by the land cover classifications being obtained subsequent to the field work, and then the transect segments classified according to contemporaneous habitat descriptions, which may not have always included all relevant detail to the Hunting Technical Services classification of land cover. Alternatively it could just be regarded as a classic example of a Type I error.

[17] On just surface area alone the 1965 Topographic Maps report a surface area for Kilwa District 2.5% larger than that obtained from the 1995 LandSat Image.

is harvestable now, were reasonably consistent. It is likely that other land cover classifications would produce different patterns of inconsistency.

Species	Land Cover Classification			
	1965 Maps		1995 LandSat	
Dalbergia melanoxylon *	1,286	(1,066 - 1,575)	1,750	(1,478 - 2,096)
Pterocarpus spp.	374	(285 - 508)	510	(387 - 677)
Milicia excelsa	188	(116 - 313)	127	(85 - 210)
Millettia stuhlmanii	1,094	(877 - 1,380)	748	(616 - 923)
Combretum imberbe	189	(87 - 355)	355	(174 - 644)
Afzelia quanzensis	424	(305 - 604)	334	(242 - 473)
Bombax rhodognaphalon	147	(100 - 228)	133	(90 - 196)

Table 7. Estimated populations in thousands of timber trees with DBH exceeding 25cm (* 20cm for *D. melanoxylon*) in Kilwa District. 85% Confidence Intervals given in brackets after expected means.

It is thus probable that the choice of which land cover classification gives the most accurate stocks estimate varies from species to species. Without any evidence to favour one classification over another the only sensible solution we reported the average of the two figures as our point estimate. When reporting confidence intervals we followed the precautionary principle and listed the more extreme figures in each case (so that the two boundaries almost always stemmed from different classifications).

Total stocks of mpingo

Results for mpingo are presented in Table 8. The confidence level on the number of harvestable trees is 80%, except for the dummy *All Trees* harvesting model for which the confidence level is 85%. The confidence level on the figures for harvestable volume is 85% in all cases.

We estimate the total population of trees (with DBH ≥ 20cm) to be somewhere between one and two million trees, but the number of legally harvestable trees is roughly half that. The number of trees with dimensions at market preference is half that still, although there is only a one-third further reduction in harvestable volume. The surveying methodology was not capable of differentiating between the requirements for the *Illegally Cuttable Now* and the *Usable Locally* models, hence their almost identical results. The small apparent increase in harvestable volume from the *Potentially Legally Harvestable Later* model to the *Legally Harvestable Now* model is a data anomaly which should be ignored – the difference is well within the reported confidence limits for both models.

Model	Num Harvestable Trees (x 1,000)		Harvestable Volume (x 1,000 m^3)	
Market Preference	350	(234 - 611)	171	(121 - 253)
Legally Harvestable Now	771	(516 - 1,116)	257	(205 - 346)
Potentially Legally Harvestable Later	855	(598 - 1,194)	252	(215 - 309)
Illegally Cuttable Now	1,006	(678 - 1,419)	281	(237 - 357)
Usable Locally	1,010	(679 - 1,422)	281	(237 - 358)
All	1,518	(1,066 - 2,096)	296	(248 - 374)

Table 8. Total expected number of harvestable trees and total expected harvestable volume of mpingo in Kilwa District harvestable under different models, with confidence intervals (see note above).

Stocks of other species

Total stocks of other surveyed species under the *Legally Harvestable Now* model are set out in Table 9. The confidence intervals are generally much wider, with *Pterocarpus spp* being a notably exception

due to the large number of trees surveyed. These results and those for the *Market Preference*, *Illegally Cuttable Now* and *All* models are graphically presented in Figure 7 and Figure 8.

Species	Num Harvestable Trees (x 1,000)		Harvestable Volume (x 1,000 m^3)	
Pterocarpus spp.	151	(83 - 280)	197	(109 - 415)
Milicia excelsa	16	(4 - 68)	70	(42 - 123)
Millettia stuhlmanii	11	(3 - 42)	14	(9 - 19)
Combretum imberbe	125	(22 - 466)	65	(26 - 130)
Afzelia quanzensis	27	(12 - 78)	45	(30 - 70)
Bombax rhodognaphalon	55	(22 - 146)	319	(214 - 440)

Table 9. Total expected number of legally harvestable trees and total expected harvestable volume in Kilwa District by species, with confidence intervals (see note above under *Total stocks of mpingo*).

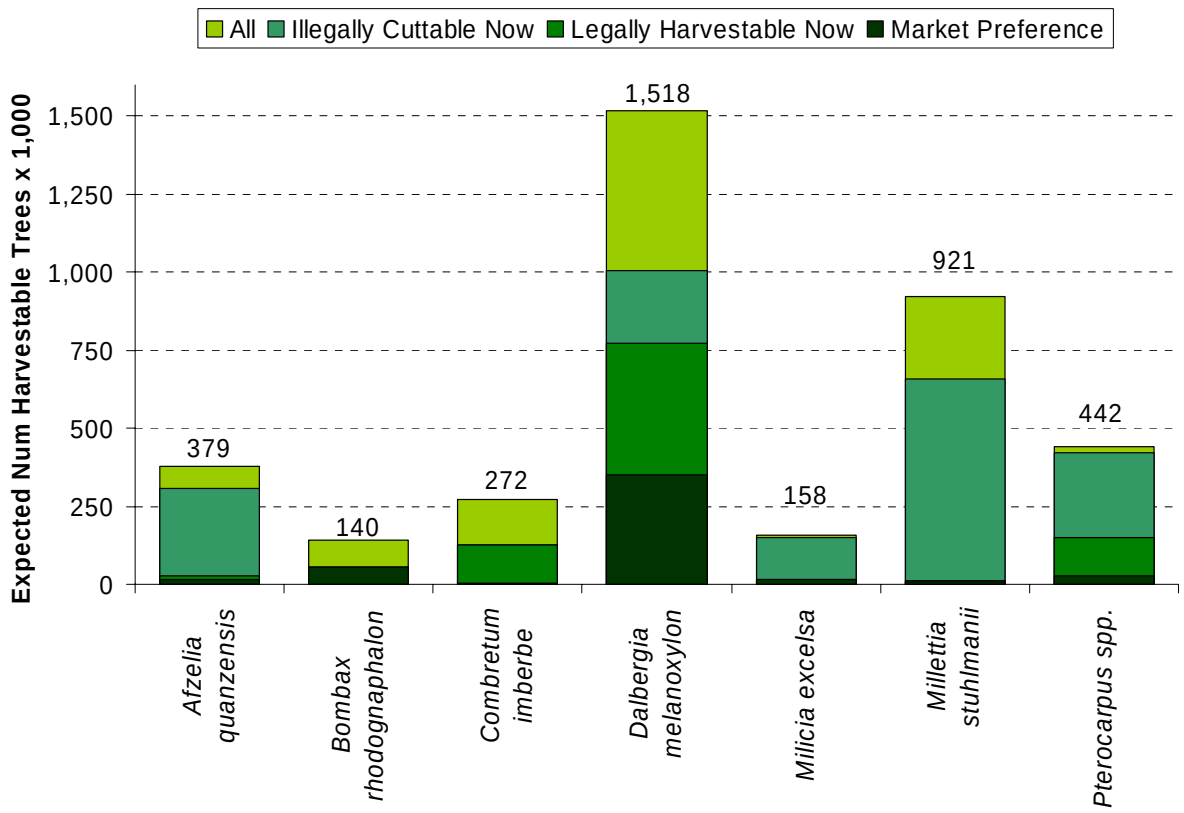


Figure 7. Expected number of harvestable trees in Kilwa District by species under four different harvesting models.

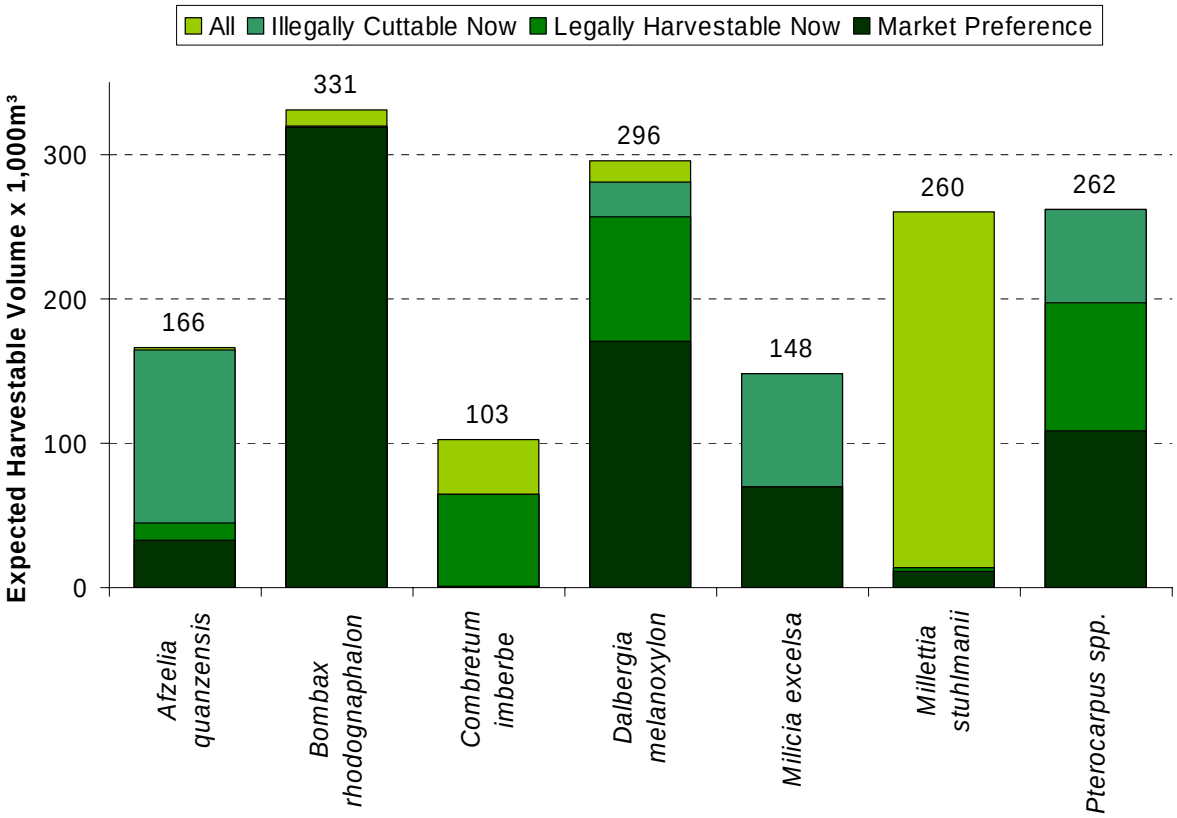


Figure 8. Expected harvestable volume in Kilwa District by species under four different harvesting models.

Conclusions

Despite heavy harvesting pressure in recent years, the assessment clearly shows that substantial timber stocks remain in Kilwa District. Of the eight species other than mpingo that we inventoried, we surveyed sufficient numbers of six species to be able to say with confidence that commercially harvestable specimens are still widespread. Mpingo is widely found and numerous, despite recent logging. There is a large volume of other exported hardwoods such as *Milicia excelsa*, timber such as *Pterocarpus* spp. for the Tanzanian market along with much *Bombax rhodognaphalon* available for domestic construction.

However caution must be applied in interpreting the results, first due to the considerable variation in answers given when using the different land cover data sources, and secondly because of the concerns about increasing pressure on forest resources along the main trunk road to Dar es Salaam and land clearance for agriculture in the northern part of the district. With the exception of *Millettia stuhlmanii*, the stocks figures reported are all substantially larger than the survey team expected, and it remains to be seen whether more detailed analysis will lead to significant amendments.

Further analysis, which the Mpingo Conservation Project intends to carry out, should include:

- Sourcing (and assessing) alternative land cover data for the District
- Analysis against geological and soil characteristics
- Exclusion of protected areas
- Adjustments for areas which have undergone substantial land cover change
- More detailed analysis by land cover categories on a species-by-species basis, and compared to known ecological characteristics of the species concerned.

Notwithstanding the reservations about the results obtained, our experience suggests that the methods we employed are well-suited to the task in similar situations. Critical to its successful application is

topography and ground vegetation that permits easy passage on foot and does not obstruct vision. Field workers need to be well trained and significant attention must be paid to calibrating surveyor estimates if exact measurements are not taken. However the land cover (or geological) data used will have the biggest impact on the results. Best results will be obtained if the geographical data is both accurate – i.e. up to date, and locally ground-truthed – and classified in a manner which is relevant to the purpose – i.e. classification boundaries reflect the ecological characteristics of the surveyed species.

Concerns about accuracy of the figures need to be put into context. Our survey team spent a total of less than 100 man days in the field (counting only trained surveyors), whereas the field team for the partial inventory commissioned by the FBD racked up over 160 man days in the field[18] covering only one third of the district (Malimbwi *et al.* 2005). Moreover cost constraints on the FBD study limited the numbers of sample plots with the result that queries remain about the results for some forest blocks. Concentrating on targeted forest blocks can realise substantial efficiency savings, but woodlands and forest cover most of Kilwa District, and so the approach is less appropriate. Moreover proper selection of forest blocks itself becomes an important part of the exercise if the results are to be extrapolated. Some of the forest blocks surveyed by the FBD team had already been harvested, and recent logging has not been confined to these blocks, although this maybe an enforcement failure rather than a planning error. In contrast we focused on fewer, known target species, where the FBD team collected data on a number of unexploited species.

We can quantify the efficiency of any survey in terms of effective area assessed per man day in the field. Using the rapid transects described in this study we achieved an efficiency rate of >130km² per man day, compared to <24km² per man day achieved by the FBD inventory team. Our method is thus at least 5 times more cost effective than the sample plot based approach adopted by the FBD team.

[18] The FBD report does not explicitly state man days, however it does report a total of 80 'crew days' in Kilwa, where each crew comprised at least 2 crew leaders (Diploma or Degree holders), and additional supervision is provided by a Forest Officer.

Monitoring Programme

Participatory Forest Resource Assessment

Conducting a Participatory Forest Resource Assessment (PFRA) is an important step in establishing a VFA. It also should lay down the baseline for any future monitoring programme. For this reason we have fully integrated the MCP the monitoring programme with the PFRA, so that it should be one and the same process for future villages embarking on CBFM in Kilwa District.

Existing PFRA best practice, as established by the Utumi Project, focused on use of sample plots to assess forest resources. However trial plots established by the MCP early on under the BPCP funding had raised a suspicion that results might be inadequate for useful calculation of timber harvesting quotas. We conducted a statistical analysis of the sample plot-based surveying methods used by Utumi and found our theoretical analysis bore out our initial fears. Taking the results of the *Tanzanian Mpingo 98* expedition (Gregory *et al.* 1999) as a baseline we demonstrated that expected confidence intervals for the density would be of the same order of magnitude as the mean estimate unless many more time-consuming plots were surveyed. The theoretical analysis was further supported by use of Monte Carlo simulations which showed that clustered distributions would exacerbate the problem, adding more plots to the number required before one can be confident (at 80% level or higher) that the estimated density is close to the real density (within 25%).

An alternative technique for assessing timber stocks using ~10m wide transects was proposed, and the basic methodology was trialled with members of Kikole VNRC in September 2005. This proved successful, demonstrating villagers can collect data in this way, but highlighted the fact that even this technique requires substantial surveying effort in order to obtain worthwhile estimates. Thus it could prove suitable for the TA2 and TA3 villages that have expressed a desire to set aside a sizable percentage of their village lands ($10km^2$+) as a VFA, but for a VFA the size of Kikole's (450ha), simply counting the actual number of harvestable mpingo trees is probably a better option. We hope to shortly use the technique as our principal means of assessing timber stocks in Kisangi VFA, which has high stocks of widely-dispersed timber trees.

To supplement assessing timber stocks we are setting up vegetation monitoring plots inside and outside the VFAs (see below) and shall be compiling a list of the species present in the VFA, to give a more complete picture of the area, its resources and conservation interest.

Modelling timber production in mpingo

It is not known how long mpingo takes to reach harvestable size in natural woodland. Estimates vary from 40 to 200 years, with most authors suspiciously suggesting the 70-100 years typical of tropical hardwood species (Gregory *et al.* 1999). A more accurate estimate is needed for sound decision-making e.g. how much timber can a village expect to obtain over the next ten years from their forest, and so is it worth investing in daily patrols to safeguard this resource? However, if mpingo is found to be fast-growing, our model will suggest whether planting it is economically and socially viable activity for villagers to undertake.

We intend to model the production of harvestable timber and, to this end, will only be monitoring trees growing in natural woodland that are potentially harvestable. To our knowledge, this has not previously been attempted.

We hope to produce a model of mpingo girth, based on a monitored sample of over a hundred trees, ranging in size from 10cm CBH, through to harvestable adults[19]. As well as simply tracking increases in girth, monitoring mpingo trees should give us information on the effects on mpingo timber production of factors such as the burning regime. This is important both for juvenile mpingo (how tall

[19] In Kilwa District, the largest logging company is currently harvesting trees with a DBH of at least 35cm, which is the basis of our *Market Preference* model, see previous chapter. Hence we are monitoring trees of up to 35cm DBH.

does the above-ground growth need to be to survive fire?), and larger specimens (does damage from passing bush fires make trees unharvestable?). We are also interested in the harvestability of multi-stemmed mpingo; are multi-stemmed trees harvestable? Is re-growth after the main stem is cut potentially harvestable?

It would be relatively easy to mark and monitor a hundred mpingo trees in one area. However, it is unwise to base a growth model on such data as many of the trees are likely to be genetically identical, and the data might not be representative of other habitats in which mpingo grows. As a result several monitoring plots have been established, each consisting of a cluster of about forty trees.

To help interpret these data sets we will produce, from a smaller monitored sample, a parallel model for mninga (*Pterocarpus angolensis*), a more 'classic' single-stemmed timber tree, which is also widespread, and widely used in Kilwa District. Our stocks survey suggested that frequent burning and intense logging pressure mean that few juvenile mninga trees are growing to replace those large trees being felled. Unfortunately, we anticipate that it will be ten years or more before a robust model can be developed from our data.

Procedure for marking and measuring an mpingo tree

When making repeated measurements over time considerable more precision is required than quick appraisals typical of a snapshot survey. The exact point of measurement must be precisely determined, so the same point can be measured again in the future, and a fixed procedure for taking the measurement adopted. Here we are concerned with measurement of girth. This should be at breast height (BH) if that is part of the section to be harvested. The flaking layer of outer bark is first removed using a blunt knife before the circumference is measured using a tailor's tape, following standard forestry conventions for measuring CBH. After that the tree is marked at the measured point using yellow paint. The number of the tree is written on a cleared patch of bark below where the girth was measured, and the stem number (if necessary) is marked above where the circumference was taken. Repeat measurements must be made on the same mark.

An MCP trial in Migeregere, where 18 trees have been re-measured after 6 years, has shown that if all flaking bark is removed before the tree is painted then the circumference mark is likely to be visible for 6 years, although re-painting before then is recommended for ease of deciphering the trees' painted number.

Assumptions of tree monitoring

- Removing outer bark and painting trees does not affect their growth rate, e.g. by making the trees more vulnerable to fire damage, pests or diseases.
- The physical process of monitoring the trees does not indirectly affect their growth rate, e.g. by damaging surrounding vegetation.
- Repeated circumference measurements are made in the same way as the initial measurements, i.e. there is no systematic error in measurement. For example, the depth of bark over which subsequent measurements are made will only be affected by the trees' age, not the severity of fires, nor the enthusiasm of the surveyor for bark removal.
- Resources are available for subsequent monitoring of the trees.
- Trees sampled are representative of those the growth model will be applied to.
- Management and weather conditions in the period to which the model is applied, either produce statistically similar growth to the monitoring period, or the resultant difference in timber production can be predicted.

Progress to date

The BPCP Proposal project listed an output of establishing plots for monitoring mpingo growth rates in TA1 in late 2004. TA1 was not ready for this at that time so we revised and delayed our plans. In the 2005 dry season we measured and marked 160 mpingo trees over six sites to provide a data set that we hope is representative of our Target Areas. These sites are all dense clusters of mpingo trees to

facilitate easy monitoring, rather than being delimited plots *per se*. Two sites are within the extensive lands of Migeregere (TA2), two sites are in Kikole (TA2: inside and outside the VFA), one site is in Mitole (part of the District's PFM programme, and a possible candidate for TA3), and one site is in Ngea village (a newly designated village that is keen to enter the PFM programme). We have also measured and marked 50 *Pterocarpus angolensis* trees in Mitaurure Forest Reserve and in Kikole. All trees, except those in Mitaurure FR, have been marked in collaboration with the village leaders and VNRC members who will be making management decisions about the mpingo on their village land.

Earlier it was anticipated marking a large sample of juvenile mpingo stems ('seedlings'). Trials of this in Mitaurure Forest Reserve proved the work to be fiddly and frustrating. Although it is important to understand the dynamics of small mpingo stems (e.g. how many years growth does it take for a stem to be able to withstand fire?), we decided to prioritise monitoring larger stems, with the intention of later adding smaller stems to the programme, probably with the work to be carried out by MCP and forestry staff.

Monitoring vegetation

A common way to record the condition of a forest is to measure the basal area, which is calculated by measuring the DBH of all woody vegetation[20]. Consequently, measuring basal area is the core activity in the monitoring plots. It also provides an additional reason to walk through the forest with a team of VNRC members and facilitators, during which time the forest resources, management options and possibilities for the VFA can be discussed *in situ*. Under our monitoring programme, six 20x20m monitoring plots are to be located inside and adjacent to each VFA, with additional plots in national Forest Reserves[21].

In addition to recording the basal area and species present in the plots, disturbance by animals and use by humans (commercially and to meet local needs) are also recorded. The recording form is thus kept simple so that data can be recorded in a truly participatory way. Emphasis is put on recording the useful trees present, rather than an exhaustive list of all the species. Qualitative and quantitative information on species present, vegetation height, disturbance and perception of the plot are also to be recorded in collaboration with the villagers.

An important component of the monitoring plots is making a photographic record of the plots, taking a photograph from each corner marker post. This will fulfil many roles. Firstly, as a means of locating plots if the marker posts are missing, secondly, as a visual baseline to compare the vegetation under different protection regimes (both for the villagers and MCP) and also as a tool for discussing forest management. To this end we intend to make two displays of each set of photographs, one for village use, and one for MCP and Forestry Office use.

When more villages have entered the PFM programme we will have sufficient quantitative data for statistic analysis of temporal changes in basal density under different protection regimes. Villagers will be able to see – in graphs and pictures – directional changes in 'woodiness'.

To date plots have been set up in Kikole VFA, on Kikole general land and in Mitaurure Forest Reserve.

Procedure for establishing a monitoring plot

Monitoring plot location is determined in advance when possible. For plots on village land, a participatory map is used as the basis for plot location. Landmarks such as streams and notable trees are used so that villagers can find the plots themselves without resorting to using a GPS. A fixed offset factor is used so that the plots are not located in unrepresentative areas of dense shade or 'nice miombo' e.g. 'walk south for two minutes from the large baobab on top of the hill'. Plots in government Forest Reserves can be laid out in a grid using a GPS.

[20] E.g. PFM Guidelines suggest using basal area as an indication of the condition of a VFA as it provides much useful and analysable information on tree stocks and regeneration (MNRT 2004, pp. 2 and 22).

[21] The plots in Mitaurure Forest Reserve are 40x40m but these were felt to be unnecessarily large.

Plots are marked using posts and ropes. At least one of the posts used is metal, so that it remains even if there is a severe bush fire. If possible all the posts should be metal. Thick blue nylon ropes are used to mark the plot edges. These ropes are removed once the plot data has been recorded; they are not left in the field.

The SE corner of the plot is used as the base post from which the rest of the plot is laid out. This must be a metal post. A compass is used to guide the placement of ropes marking the plot edges. From trials we found the best method to be for one team member to walk north for approximately 25m, guided by another team member standing at the base post with a compass. Once they are due north a third team member walks towards them with the rope. The ropes used are 21m long i.e. a 20m length with extra for tying at both ends. If the point where the post is to be located is occupied by a tree, then this is painted with a blue ring instead of using a post. The other posts are laid out in the same way.

Plot photographs are taken; the first one is a group photograph of the monitoring team holding a sign with the plot location taken from the base post looking into the plot. This photograph helps ensure that the subsequent photographs can be identified. One photograph is then taken from each post working clockwise round the plot, i.e. from the SE post looking north, from the NE post looking west etc.

Trees close to the boundary of the plot are marked using white paint. Large trees outside the plot are marked with a cross. Trees just inside the plot are marked with a white circle.

While one team member is carrying out the above tasks, the others begin to fill in the monitoring forms, which are written in Swahili. In accordance with standard PRA practice, two copies are filled in; one to remain in the village, the other one is for MCP / KDC use. One facilitator works with the villagers helping them to fill in the preliminary questions on the form, then to measure CBH. We found that simply using a tailor's tape is the best way to do this, as they are familiar and cheap. However, care needs to be taken that the measurement is not made in inches, nor from the wrong end of the tape, and that measurements are taken, as much as can reasonably be expected, according to standard practice. Once a stem has been measured, it is marked using chalk, so that at the end the team can check that all the stems have been measured.

Assumptions of vegetation monitoring

- Marking of plots neither affects neither how the vegetation is managed nor the activities of animals.
- Surveying activities do not significantly damage plot vegetation.
- Sampled plots are representative of the area in which they are located, i.e. plot selection is not biased (e.g. to 'nice looking miombo').[22]
- Resources are available to facilitate subsequent monitoring of the plots.

[22] Achieved by the offset factor.

Awareness Raising

Village Education Programme

Awareness-raising in the villages is more important than we initially realised. It was highlighted by both the FBD extension officers and in Utumi's internal evaluation of its achievements as being key to the success of CBFM. The Forest Act of 2002 was a paradigm shift in the management of the country's forest resources, enabling the transfer of management rights and responsibilities to villages participating in the national PFM programme. News of these changes however has not yet reached many, if not most, of the potential beneficiaries, nor have many of those anticipated to be facilitating their implementation learned of their full scope.

Awareness-raising is important at different levels; within the district administration, with the core villagers who are members of the VNRC and/or Village Council, and with the rural population as a whole. It is envisaged that Village Natural Resource Committees (VNRCs) act as the main implementers of CBFM. The villages we are working in did not have a VNRC prior to the arrival of PFM so this committee has to be established. Once set up, the committee needs to acquire a lot of knowledge, and many new skills. The national PFM programme has a budget for VNRC education, but as Utumi found, these committees need all the support they can get.

Bringing information to the village population as a whole is another challenge. The VNRC is elected by the village to represent their interests in perhaps the most valuable resource the village has; its forested land. However, village committees tend to be made up for the same people; powerful families in the village, the educated, government supporters and those who enjoy meetings. If the VNRC is to succeed as a democratic institution then it needs to be freed as much as possible from existing power structures. Under PFM the Village Natural Resources Committee (VNRC) is responsible for revenue collection for all activities taking place inside the VFA. Thus the village as a whole needs to be able to hold the VNRC to account, and to do this they need to have some understanding of the committee's function, what resources they have as a village and how valuable those resources are. Prevailing low education levels amongst rural people add to the difficulty when presenting a new and complex message.

In order to properly manage and control their forests, villagers need to know about the value of the timber trees on their village land. Before the advent of PFM the value of trees was just the amount of money they got for felling a tree, plus a tiny TSh 100/- (about 10 US cents) contribution loggers made to village funds. However the value to the village of a large mpingo log felled under licence under PFM is nearly TSh 10,000/- (about US $10), plus the piece rate paid to the loggers. This is the key message of the first small leaflet we prepared. Once this information started to circulate in the villages, they realised that mpingo and other trees were a much more valuable asset, and started to turn away loggers not willing to pay more than TSh 100/- per log.

To supplement this leaflet we also prepared an education booklet in Swahili entitled *Our forest for our community*, on forestry and environmental issues. This helps the villagers towards a basic scientific understanding of the role of trees in a healthy ecosystem, while at the same time building on the existing bank of traditional knowledge. It is clear when walking in the forest with a typical villager that they know the trees (their names and uses) much better than any of us do. That knowledge though needs to be augmented with an understanding of the value of those trees in ecosystem functioning and the value of forest products to outsiders who have fewer trees, both of which are necessary for forest management under PFM.

The third leaflet is on the steps towards setting up a VFA. This was written to help villagers, particularly VNRC members and other leaders, to understand the many necessary stages involved and thus take the lead in the process.

These leaflets are printed in black ink on coloured paper, so are cheap to produce. They are also colour-coded which allows them to be easily distinguished. They are being distributed throughout our

target villages and also in other communities in Kilwa District where the PFM programme is starting. So far two main groups have been targeted; the VNRC and the village primary school. In our education sessions the facilitators talk through the contents of the leaflet and distribute copies to all in attendance.

Sessions in the schools use the introductory leaflet and the environmental education booklet, plus colourful Swahili language booklets donated by WWF-Tanzania. One reason for working with the schools is that the children distribute materials to outlying hamlets and farms at no cost, helping us to penetrate beyond the village centre, and reach as many households as possible. In a typical school session the children are brought together in the largest classroom. The focus first is on environmental issues, then on forests and then on mpingo. In some schools the children already have a good understanding of environmental issues and even know some songs about the environment. But in others the material taught is new.

One such session, in Kikole Primary, was filmed by a crew working on behalf of BP UK. The children are shown clapping and singing a song about the mpingo tree that was originally written by the MCP in 1998. Although the film was made to show BP's commitment social and environmental programmes in Africa, we have been provided a copy of the raw footage shot that we can edit ourselves and use in villages.

Following the national elections in December 2005, many new councillors were elected to Kilwa District Council. The MCP therefore collaborated with the DFO in organising a two day workshop to explain PFM and promote the administration and project's joint work in this area. Overall the workshop went very well, and our profile with councillors and senior management within the administration was considerably enhanced. We can hope for strong support in future for the wider PFM programme, and the MCP's own activities.

National Publicity

The value of exposure in the national media in Tanzania is considerable. In mid-2004, a logging scandal broke and dominated front-page headlines in some newspapers for a whole month, and was a major factor leading to the imposition by the MNRT of a logging ban from July 2004 to August 2005. More locally, some villagers from around Kitope FR, where the Utumi Project had developed a JFM initiative, frustrated at the lack of progress approving their management plans complained to a visiting journalist. The resulting coverage in a national newspaper prodded senior officers in KDC into giving greater attention to the issue. The management plans are now expected to be approved shortly.

So far, with the assistance of BP Tanzania, the project has held one press conference to announce the start of the BPCP funded work, and put out a press release announcing the award of the Darwin Initiative grant. Another press conference is planned for some time in 2006 to mark the end of the BPCP funding and to describe achievements. The first press conference generated articles in several national newspapers in Tanzania as well as a radio report. Some journalists expressed interest in making a follow-up field visit, but were encouraged to wait until the project had made more progress with the central community forestry work. The project has also featured in several reports by a local TV and radio journalist who doubles as the Catholic priest for Kilwa Masoko.

The project has provided a number of articles for publishing nationally. We updated an old article on the MCP and Sebastian Chuwa's African Blackwood Conservation Project in northern Tanzania which was then published in the Daily News. Other articles have been provided to WCST's *Miombo* newsletter (Swahili edition), TFCG's *Arc Journal*, and *Misitu ni Mali*, the in-house magazine of the Forestry and Beekeeping Division, all pending publication.

Another way in which the MCP will reach out to the national media is through the Forest Working Group of the Tanzania Natural Resources Forum (TNRF) which the MCP has joined. This newly formed group has been established with a specific goal of developing advocacy on forestry issues, and giving the protection of an umbrella organisation to member NGOs to push certain messages which may not be popular with some sections of the government. The problems of uncontrolled, mostly illegal logging in southern Tanzania was selected as the first priority issue to be addressed by the

group, and the MCP is playing a key role in developing and refining the message, as well as providing some of the crucial data on which the advocacy will be founded.

Under the original proposal to BPCP we were scheduled to produce a calendar for 2005, but decided to postpone this to allow us to collect more photographs and produce a better product. The design was also changed from a desk calendar to a wall calendar, so that more people would see it. We approached the Wildlife Conservation Society of Tanzania and agreed to jointly produce a calendar, so that we shared the cost and can access WCST's wider distribution network.

The calendar is glossy, brightly coloured, and A2 in size, so is eye-catching and appealing to villagers. We hope that the calendars may therefore stay up well beyond their basic functional period, reminding recipients of one of our core messages each time they look at a calendar. Each of the four pages (there are 3 months to a page) is based around a different theme: Biodiversity, Ecosystem Services, Participation and Sustainable Use respectively. On each page various illustrative photographs from WCST and MCP field projects are complemented by a prominent slogan and some smaller explanatory text. The photographs on the pages about participation and sustainable forest use feature local people from our target area, and hence are very popular in our target communities. All of the 400 copies we received have been distributed, bar a half dozen remaining for visitors to the project.

International Publicity

Roughly one year into the BPCP funded work, FFI downgraded its *Soundwood Programme*, laying off the one remaining member of staff still dedicated to it full time, and reducing the programme to inactive status. After more than ten years, *Soundwood* was still running at a loss when instead it had been expected to be a major fund raiser, and lacking any serious field component until the MCP Kilwa Field Office opened, it was a strong candidate for rationalization. However the programme is not officially ended, and FFI hope it could still be revived if there is strong enough interest.

Although this was a major blow – *Soundwood* provided a natural home for the MCP – it was not without a silver lining. *Soundwood*'s failure to raise sufficient funds was a bar to further investment. By downgrading *Soundwood* to inactive status, FFI simplified the situation, making it clear that if future funds are to be raised from the Western classical music fraternity, as has always been envisioned, the MCP will have to take the lead responsibility, at least for the time being. In merging with the Environment Africa Trust (EAT) in the UK[23], the MCP has obtained the necessary charitable status to do this. It may well be that the MCP's smaller, more flexible nature may even be better suited to developing such a fund-raising component. Our small size means that initial expectations will be necessarily lower, negligible UK overheads (we have no office to maintain) means that a greater proportion of funds raised can go directly towards conservation efforts, and we have an active field programme to promote.

For the MCP's work in Tanzania the implications of this switch in responsibility are relatively small. Facts and figures, stories and photographs are still required for an international awareness-raising drive, but now the principal users of this material will be internal to EAT-MCP rather than external, at FFI. In September EAT-MCP took on a UK Representative with strong links to classical music world who it is hoped will lead the funds- and awareness-raising drive in the UK and Europe. He has been supplied with a number of photographs to use in presentations plus a collection of relevant facts including both bad news (the threats) and good news stories (our field successes).

The publicity campaign was launched in November 2005, when the project celebrated its 10th birthday with an anniversary dinner back at the place it was born, Emmanuel College, Cambridge. The evening included some short presentations with slides by project staff plus recitals by a trio of professional oboists. The event was very successful, and indirectly helped the MCP secure an interview with BBC Radio 3 which was aired in January 2006.

The MCP was also contacted by a photographic agency working on behalf of Yamaha in Japan, and requested to supply a high resolution image of an mpingo tree. The MCP acceded with an

[23] See Logistics section, p. 64.

accompanying request that the project would welcome a dialogue with Yamaha about how they source the wood they use in their instruments. And although designed more to promote BP's community investment programme, the above-mentioned film commissioned by BP UK may generate additional interest in the project.

The other major media channel which the MCP exploits is the internet via its website at *www.mpingoconservation.org*. The current site design was put in place following a major overhaul at about the time the original proposal to BPCP was submitted, and the overall design is likely to stay the same for the time being. The content of the site, however, is under continual development, with more pages being added as and when the field team have time to write them. An exercise to re-engineer the site has facilitated this, making it easier for team members with less technical know-how to add new pages, as well as resolving some browser compatibility issues. A page specifically targeted at musicians was put up in time to support the afore-mentioned interview on BBC Radio 3, which included a plug for the project web-site.

Many more pages about our current activities (rather than the earlier expeditions) are planned, and more reports and other outputs will be added. The goal is to create a major resource for anyone involved in CBFM, and which will thus raise the profile of the project amongst technical people. In contrast some of the key, basic messages will be revised to make them more accessible and less wordy for casual browsers, who we hope may visit in response to some other piece of publicity. To support all this, under the Darwin funding the site should shift its hosting away from the Project Coordinator's personal pages, thus increasing the amount of storage space and bandwidth available, and at the same time solving the problem of the Google listing which does not cope well with the frame-based pass-through technique used by our bargain-basement domain name provider.

Supply Chain Liaison

Loggers & Sawmills

The project has held meetings with both the Kilwa branch of Uwambali (Lindi Loggers' Association) and representatives of Mahmood International, one of the main companies involved in the commercial harvesting of mpingo for the export trade, and who are very active in Kilwa District. All these meetings emphasised the desire of the MCP to work constructively with the loggers, and that the project is dependent on their cooperation to succeed. If the loggers refuse to fell timber in community managed forests then the communities will never benefit from CBFM in the way the project envisages. Maintenance of a good working relationship with loggers and sawmills is thus crucial to the success of the project.

On the surface, at least, a good channel of communication has been established with Uwambali. In a spirit of openness and cooperation Uwambali members were given copies of the education leaflets before they were handed out in villages. They also appeared to accept that sustainable harvesting of the forest meant a long-term future for their jobs, which would be jeopardised if all the forest were logged out in the next 10 years. A substantial number of Uwambali members hail from Lindi region, and we expect this argument to hold much more strongly for them than migrant loggers who do not have long term ties to the region. We are now holding quarterly meetings with the association to keep them informed of progress, and as a forum for airing of any issues arising.

However this rosy picture does not hold universally true. At numerous times during our work we have encountered various rumours as to the "true intentions" of the project, usually suggesting we intend to steal the district's natural resources from under the noses of the local people, and we believe most of these rumours originate with people involved in the (illegal) logging business who fear they have something to lose. This situation is not particularly unusual for a community conservation project (A Kahemela *pers. comm.*), and so while it presents a challenge it is not undue cause for alarm. We are combating the rumours as best we can with our education programme, and by just refuting them whenever we get the opportunity, although the best rebuttal will simply be evident from our actions over the course of time.

It certainly seems that despite several meetings with the local representative, these rumours reached the Director of Mahmood International, leading to a tricky meeting. Our offer to help establish a new niche market for sustainably harvested mpingo taken from community managed forests had piqued the interests of the director. Informal sources through FFI suggest that there is currently severe downward price pressure afflicting the international market for mpingo billets, probably brought about by an increase in supply from Tanzania over the last 5 years competing for a fairly static level of demand (Jenkins *et al.* 2002). However the director remained sceptical as to whether a market for sustainably harvested mpingo could be developed.

It is still too early to tell whether we have the right strategy for working with loggers and sawmills. At present the MCP probably represents no more than a slight annoyance to loggers. In the longer term, as the CBFM work starts to have greater effect, and opportunities for licence fee evasion decrease, we can expect a greater level of conflict. Then the project will need to find the right balance between standing firm against those who want to strip the district of its timber resources as quickly as possible, and those others who are prepared to cooperate so long as they can continue to earn a reasonable living from their chosen profession. If demand from musicians for "eco-friendly" instruments can be stimulated then sceptical saw-mill owners may overcome their distrust of conservation initiatives, and be more interested in working with the Project.

Wood Carvers

Although the central strategy of the MCP is focused on developing a market for sustainably harvested mpingo for the international musical instrument market, the use of mpingo by artisanal wood carvers is a second major market that cannot be ignored. It has previously been estimated that it could account for roughly half of the mpingo felled in Tanzania (Moore & Hall 1987), and, in contrast to the static demand for musical instruments, this market is probably still expanding. Mwenge Carvers' Cooperative in Dar es Salaam is the largest market for carvings in Tanzania (West & Malugu 2003). The carvers there are organised into an association, Chawasawata (Tanzania Carvers Association), and some are concerned for the long term future of mpingo as a carving medium (Mauki 2004). In response Chawasawata have plans for an mpingo plantation near Mkuranga, 40km south of Dar.

Encouraging the use of sustainably managed timber at Mwenge would add a useful second market to villagers in Lindi Region managing their local forests and help prevent market abuse by saw millers who may otherwise be the only buyer in their area. There is also hope in the success of WWF's Goodwood Project in Kenya, which has helped carvers to take responsibility for the situation themselves, use alternative woods and to ensure a sustainable supply of timber (Cunningham 1998, P Sumbi *pers. comm.* 2004).

The project has therefore developed joint initiative with WWF-Tanzania, drawing on WWF's experiences in Kenya and the MCP's species focus and ability to coordinate with village forest areas in southern Tanzania as they come on line. The initiative began with a study tour to the Goodwood sites in Mombasa, taking a small group of carvers and store owners from Mwenge to see how the Goodwood Project worked, and how it benefited people in the carving business. Following that we held a workshop in Dar to discuss with a larger group of stake-holders various options to move forward.

We envisioned marketing carvings certified as being made from sustainably harvested mpingo to international tourists (who are more likely to put such concerns above price when choosing a souvenir). Waste from left over from processing certified timber at sawmills could be transported to Mwenge and used to make smaller carvings. Additionally we hope to encourage diversification in the tree species used by carvers to include timber from such commonly planted trees as coconut palm, mango and neem. Over time simple laws of supply and demand would push mpingo into a higher value niche market, with cheaper carvings from other species being available to those for whom price is a major factor in purchasing decisions, or who are not determined to buy an 'ebony' carving.

Training & Capacity Development

CBFM Techniques

A key element of the MCP's mission in Kilwa is replacement of the high level of technical support for CBFM that the District received under the Utumi Project. While some of this is accomplished simply by providing to an under-resourced forestry department extra manpower and trouble-shooters able to conceive of new, alternative solutions, the MCP has also contributed by refining CBFM techniques and training staff on their use. Some of the refinements have stemmed directly from the MCP's experience in field research, and the actual results of that research.

The fundamental principles of participatory development are well established, and were not new to members of the District Working Team. Where the MCP was able to make a significant difference was in the relatively new discipline of Participatory Forest Resource Assessment (PFRA). The MCP facilitated a visit to Kilwa by a consultant brought in by the national PFM Programme, and played a major role in following national workshop on PFRA. While the Utumi methods of PFRA were highly praised by the consultant as some of the most genuinely participatory of those being practised around the country, there was clear room for improvement, especially with regards to the long investment of time required of all those involved, including the villagers. In addition a statistical analysis of the sampling intensity using data from the *Tanzanian Mpingo 98* expedition showed an extremely wide confidence interval on estimations of timber density, which would lead to miserly harvesting quotas, if the precautionary principle were followed, or unrealistic income expectations at the other extreme (Ball 2005). See the *Participatory Forest Resource Assessment* section under the *Monitoring Programme* chapter for more details.

The MCP has since trained around a dozen technical officers, many new to the district, in improved PFRA techniques. These emphasised the importance of the qualitative forest walk over quantitative surveying, especially with regards to general management decisions. The number of time-intensive surveying plots was reduced to the minimum required for an on-going monitoring programme, see above section, and rapid transects, similar to that used in the district-wide stocks survey, were trialled for assessing harvestable timber stocks. These rapid transects can also be used by forestry staff to assess stocks in any area of interest such as possible concession blocks.

IT Skills Development

In the BPCP proposal it was envisaged that there would be ample time in the rainy season to help District staff develop their IT skills so that they are better able to manage PFM implementation. In 2004-5, as it turned out, we found ourselves kept busy on other project matters. Despite this we have provided IT advice on specific tasks and programmes, system management and general support regularly throughout the project, giving advice to Forestry, Natural Resource, and other KDC personnel. Without the MCP's support the District would have had to buy in advice from Dar es Salaam, which would have had a high cost, both in terms of time and money. And over the course of the project MCP staff have themselves improved their IT skills, and are now better able to help KDC staff take advantage of available computing resources.

The PFM programme had funds available for IT and over the last two years the two secretaries and accountant working in the forestry office have both spent a fortnight on training courses in Dar es Salaam. In order to progress up the pay scale secretaries have to undergo such training. While away from station on a training course staff also receive the obligatory *per diem* stipulated by the government. For these two reasons this external IT training is popular. However, much of the training is highly inappropriate, for example courses on MS PowerPoint when there was not a single data projector in the whole district.

The MCP has proposed an alternative to the DED for in-service training, which would allow staff to remain at station and thereby not interrupt normal work. She thought that so long as the necessary number of hours had been spent on training, then there should be a way for this training to be

recognised. Natural Resources staff themselves said that they cannot use computers as well as they would like, and would like to learn more, which is not possible within the PFM programme. It is apparent that, even without more computers, if more staff could carry out daily tasks such as writing letters, and filling in tables on a computer, then PFM work could proceed faster. It is hoped that during the 2005-6 wet season we shall be able to follow this up, and provide this training in a way that is acceptable to all parties.

KiFaCE

Kilwa Farmers for Conservation of the Environment (KiFaCE) is a dynamic young CBO based in Kikole Ward, although most of its members are from Ruhatwe and Kisangi Kimbarambara, with only a few from Migeregere and Kikole. It was originally set up by some primary school teachers at Ruhatwe and Kisangi, and is now sufficiently popular that it has a waiting list of people wanting to join (they have restricted the total membership). KiFaCE's formation was encouraged by Utumi, but they do not regard themselves as a creation of Utumi.

The MCP has so far supported KiFaCE in three different ways:

1. Project staff helped draft a constitution so that the CBO could formally register with the District Council, and provided a letter of introduction to the bank.
2. The MCP sponsored representatives to attend the CFCN annual forest network fora in 2004 and 2005 (see also below).
3. The MCP helped KiFaCE to draw up and submit a proposal to CEPF for funding to support CBFM in Kikole ward. Unfortunately delays at WWF-EARPO in setting up a coordination unit to process small value requests from CBOs have stymied any further progress. However the MCP is very hopeful that once the coordination unit is established the application will be looked on extremely favourably.

Community Forest Conservation Network

The Community Forest Conservation Network (CFCN), otherwise known as *Mjumita*, is an initiative originally hosted and supported by the Tanzanian Forest Conservation Group (TFCG), but now splitting off as an independent organisation. It was founded in 2000 to give a voice to communities and grass-roots participants in forest conservation, and acts as a forum for community members themselves to share experiences and best practice. For some messages this peer-to-peer learning can be far more effective than the more didactic exchange between an extension worker and his target audience. As of August 2005 the CFCN had 26 Local Area Conservation Network (LACN) member groups[24] comprised of more than 1460, and the network has links with 25 NGOs and development projects (TNRF 2005).

One of the LACN member groups is KiFaCE, and another was formed by the 3 villages around Kitope FR as a result of the JFM work done there under the Utumi Project. The MCP sponsored attendance at the 2004 and 2005 CFCN Annual Forest Forum by two representatives of KiFaCE, and expects to repeat that support in 2006 and beyond. One member from KiFaCE was elected on to the CFCN national steering committee. Under a recent informal agreement between TFCG, the MCP will take responsibility for coordinating LACN member groups in Lindi and Mtwara regions, and provide training to their members. This will give MCP staff an opportunity to visit some other districts, make contacts with local administrators, and thus take the first steps in a possible future expansion out of Kilwa District.

[24] LACN member groups should be supra-village, each comprising members from more than one village.

Student Projects

Sponsoring Tanzanian students to conduct field studies on mpingo-related subjects was listed in the original proposal to BPCP. It has several potential benefits:

1. It represents a relatively cheap and easy way to expand our knowledge in non-priority areas.
2. Strengthens the MCP's links with the universities.
3. Encourages awareness of mpingo and sustainable harvesting amongst today's students, who will be tomorrow's decision makers.
4. Brings new people into the project; exceptional students could be offered jobs after graduating as the project expands.

In order to obtain the maximum benefit the project aimed to sponsor fieldwork required for either a BSc dissertation project or an MSc thesis. This would ensure that adequate analysis and a report would follow the fieldwork. Most Tanzanian students seek sponsorship for their entire course, however funding is often insufficient to conduct much fieldwork, and more ambitious project ideas must be abandoned unless the student can find an additional source of funds. It is this sort of gap that the MCP sought to fill with funding to cover the specific costs of fieldwork only.

However this kind of sponsorship would appear to be relatively rare in Tanzania. Students are not accustomed to look for it, and lecturers are not used to dealing with it. In addition, and partly perhaps as a result of its unusual nature, university lecturers were not happy with a loose, informal relationship which characterises such sponsorship in the UK[25]. Instead a formal Memorandum of Understanding was required, and this takes time to produce, although it has the benefit of tackling potential cultural misunderstandings in advance by making it clear exactly what is expected of each party.

The MCP attempted to develop the concept first with the Botany Department at the University of Dar es Salaam (UDSM), where the project had better links. Once the idea was fully explained, reception was good, but here we encountered an additional problem with the university's semester timetable. Third year students normally carry out fieldwork for their major project while continuing with lectures between January and May, and for this reason they are restricted to the area around Dar, while there is no procedure for keen students to conduct fieldwork in the vacation between their second and third years, such as British students on expeditions may do. Also, students taking a wildlife ecology course must join a compulsory field trip to Mikumi National Park in August-September.

Despite the above problems, the MCP looks set to agree an MoU with UDSM Botany Department. Unfortunately it was completed too late to sign-up students for the 2005 vacation, and so the programme will instead commence in 2006. We also had a number of enquiries from MSc students, but none who were able to produce an appropriate proposal and budget. We did have a brief visit from one British student contemplating studying for a PhD on linkages between community conservation initiatives and poverty alleviation, with the MCP as one possible case study, but could not locate funding for the full study.

Policy Input

Since establishing the Kilwa Field Office, the MCP has developed good links with the national PFM programme office at the Forestry and Beekeeping Division (FBD) in Dar, enabling us to take part in and contribute to national level discussions of policy and best practice. MCP field staff have attended workshops on a SWAp (Sector Wide Approach) for the Forestry Sector, PFRA Best Practice, PFM Research (identifying gaps and areas for priority attention), and Monitoring and Evaluation of Biodiversity Conservation Projects in the Eastern Arc Mountains / Coastal Forests Hotspot (the latter organised by CEPF). Our comments were incorporated into a high-level review of the PFM programme, and we have also assisted with the current revision of PFM guidelines and overall best practice. We were specifically asked by the FBD to produce a report on the controversial payment of

[25] Whereby individual lecturers coordinate such activities and provide a link between sponsors and students without taking official responsibility, which generally remains with the student.

meeting attendance allowances to community members participating in PFM, see accompanying documents.

It is in the area of refining PFRA techniques that the project's policy contribution is most notable. The project played an active role first helping host the international consultant brought in to help on this aspect, and then at the following workshop, where the PFRA methods the MCP had inherited from the Utumi Project were heralded as best practice. Since then, as outlined in the section above on our Monitoring Programme, the project has considerably refined these techniques drawing on the results and experience of our previous research to design a new approach which is better suited to CBFM areas where timber harvesting is expected to provide a significant income to the village, and also to integrate it fully into a long term participatory monitoring programme. In this respect we believe the MCP is at the cutting edge of CBFM practice development. The MCP is also in the process of translating into Swahili, simplifying and adapting the national PFRA guidelines produced after the 2004 workshop into a booklet suitable to give to villagers working on CBFM. The project was recently asked for advice by the FBD as to what materials should be included in a PFRA toolkit for other districts, and the project is expecting to assist in national training on PFRA techniques, some of which will take place in Kilwa District.

The MCP is also contributing indirectly to national policy development by its membership in the two stakeholder groups, the Forest Working Group at Tanzania Natural Resources Forum (TNRF-FWG) and the Community Forest Conservation Network. By coming together with other conservation-minded NGOs and CBOs the project is availing itself of a strong platform to advocate certain policy changes. The TNRF-FWG has already been co-opted into the forthcoming revision of the National Forest Policy, the 2002 Forest Act and accompanying regulations. One addition the MCP especially hopes to obtain is regulation requiring complete transparency of timber felling licences granted at the village, and thus prevent village elites from corrupting the CBFM process.

Project Progress & Achievements

Original Project Plan

The BPCP funded work was originally intended to run over an initial period of two years. The following tables, reproduced from the proposal to BPCP[26], set out a rough time-line for the various components, although in practise considerable variation on this was expected; "The principal determinant of when activities take place will be the district's own programme for activities occurring under the PFM programme and the availability of the DMWT" (revised proposal, July 2004).

Activity	**2004**	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	**2005**	Jan	Feb	Mar	Apr	May
Logistics & Hand-over from Utumi		X	X												
Intensive Support to TA1 VFA implementations				X	X	X	X	X	X	X	X	X	X	X	X
Awareness Raising in TA2				X	X	X	X	X	X	X	X	X	X	X	X
Prepare and trial mpingo education pack			X	X				X	X						
Mapping of TA2					X	X	X								
PRA, VFA designation and election of VNRC in TA2									X						
PFRA Training in TA2															X
Preliminary survey of Kilwa forests						X	X								
Establish monitoring plots in TA1							X	X	X						
Design and produce calendar				X	X			X							
Design publicity material for UK use											X	X	X		
Assess mpingo stocks in TA1 for initial harvest									X						
UDSM Student Projects														X	X
Progress report															R

Activity	**2005**	Jun	Jul	Aug	Sep	Oct	Nov	Dec	**2006**	Jan	Feb	Mar	Apr	May
Reduced support to TA1 VFA implementations		X	X	X	X	X	X	X	X	X	X	X	X	X
Investigate strategy for timber outside VFAs							X	X				R		
PFRA Questionnaires in TA2		X												
PFRA Inventory in TA2		X	X	X	X	X								
PFRA Inventory Analysis in TA2					X	X	X	X						
Write management plans for TA2								X		X	X			
Formally declare VFAs in TA2														X
Evaluation of CBFM – certifiable?						X	X			R				
Expedition to estimate mpingo stocks in Kilwa			X	X	X									R
UDSM Student Projects		X	X									R		
Make arrangements for initial mpingo harvest						X	X	X		X	X			
Prepare for next phase or wind-down												X	X	R
Oversee first mpingo harvest from TA1														X

Key:- X = activity R = report

The revised project plan in the July 2004 proposal adjusted the timing of many of these activities to fit better with the District's own plans under the PFM programme, which optimistically foresaw a rapid expansion of CBFM into TA2. Delays in the release of funds and staff turnover meant the District's plans were too ambitious, as consequently were our own.

At a fairly early stage we came to the conclusion that, when facing budgetary pressures[27], it was preferable to cut short our programme rather than compromise on necessary expenditure. The justification for this was that without further funding to extend the project, the core programme of community forestry would be left hanging. The research and awareness-raising outputs could stand on their own, but for our long term vision to be realised, the BPCP funding would never suffice on its

[26] Some of the terminology has been adapted to fit with that in current use.

[27] Generally a result of additional items not included in the original budget.

own. Even before the UK team members arrived in Tanzania, therefore, we were making contingency plans to curtail the BPCP funded work to 18 months. This was not yet certain when the proposal was updated in July 2004, which therefore still featured a two year project plan, but had become official policy by the time the Initiation Phase Report was produced in October 2004. No new project plan was produced then, although the stage 2 application form for the Darwin Initiative (completed January 2005) included a new set of milestones, taking into account expectations at that stage.

Expected Outputs & Success Criteria

That proposal listed the following expected outputs:

- Education Pack produced for trialling (Jul 2004)
- Promotional calendar (Nov 2004)
- Village Forest Management Plans for TA2 (Feb 2006)
- Report on potential for certification of the CBFM & evaluation of current operation (Jan 2006)
- Strategy for timber conservation outside VFAs (Mar 2006)
- Report of the Mpingo 2005 inventory expedition (May 2006)
- Hand-over or progress report (May 2006)

The final and most important result, we hoped, would be the first harvest and sale of sustainably managed mpingo. However it was noted that this, and the management plans for TA2, may be delayed if the villages are not ready; "it is counter-productive to push the local communities faster than they are willing to go" (original proposal to BPCP).

The project was to be judged a success if one or more of the following happen:

- Successful mpingo harvest by May 2006 or shortly after
- CBFM in Ruhatwe and Kikole proceeding well, and with adequate support
- VFAs in TA2 successfully declared
- Further funding secured

Achievements to Date

The achievements of the MCP Kilwa Field Office thus far are:

- Established office, recruited staff and provided staff accommodation
- Supported the boundary dispute conflict resolution process involving Ruhatwe (TA1) and Migeregere (TA2)
- Funded and supported the PFRA field surveys and analysis, and drafting of byelaws and the management plan for Kikole (TA1)
- Raised awareness of CBFM in TA2
- Initiated CBFM in Kisangi Kimbarambara (TA2)
- Supported District to introduce CBFM to other expansion villages (potential TA3 communities)
- Provided intensive support to KiFaCE (TA1 & TA2)
- Completed the field work and the main analysis for the district-wide stocks assessment of high-value timber trees
- Designed a new integrated participatory monitoring programme, and established base line plots in Mitaurure FR and Kikole Village
- Designed, produced and trialled an education pack for local use within villages in Kilwa
- Designed, produced and distributed a wall-calendar on forest conservation (joint with WCST)
- Co-hosted a workshop for Kilwa District councillors, promoting PFM and the MCP's work
- Given a press conference to publicise the project nationally, and made one additional press release

- Improved and expanded the project website
- Opened communications channels with mpingo loggers and sawmills
- Trained district staff in improved PFRA techniques and provided on-the-job training and assistance with IT skills
- Drawn up a MoU with UDSM Botany Dept to facilitate student projects on mpingo-related issues
- Contributed to various national PFM policy initiatives
- Succeeded in a joint application with FFI for funding from the Darwin Initiative, safe-guarding the project's future until March 2008

Analysis against the Project Plan

As the Initiation Phase Progress Report noted, difficult communications between the UK and Kilwa in the run up to the start of the project, held up progress on first arrival in Kilwa with the result that hand-over from Utumi was not properly completed until July 2004, although fortunately the Utumi Project Manager was around until he was relocated in November of that year. As is discussed elsewhere in this report, this period involved a certain re-alignment of the project and its priorities which was wholly welcome, but it did put back the planned activities, and proved a slightly frustrating delay to starting community work. Fieldwork was also delayed until COSTECH Research Permits had been issued to the British staff in August 2004.

Other significant factors which have substantially delayed progress since include the lack of working PFM funds between July 2004 and March 2005, staff availability through the second half of 2004[28], and latterly the twin issues of slow release of funds from the district and competition for use of cars[29]. These two problems made forward planning with our district partners fraught with difficulty, and thus even the one motor vehicle we could rely on, the MCP car (assuming it has not gone to Dar for repairs), was not always used to its greatest potential. Although these problems have substantially receded, and the project now has two cars, forward planning remains difficult.

Support to TA1 VFA implementations (intensive phase: July 2004 – May 2005, reduced support thereafter)

As discussed in the Community Forestry section above, neither TA1 VFA was actually up and running upon the project's arrival in Kilwa, and for differing reasons are still short of full implementation. Nonetheless, both villages did receive a substantial amount of support from the project between September 2004 and February 2005; in the case of Kikole this was direct support for their PFRA, while at Ruhatwe the support was both direct in terms of pushing forward the conflict resolution process, and indirect in the case of the work undertaken with the CBO KiFaCE. Ironically, as some of the severest problems with the administration of PFM eased in May/June 2005, attentions were diverted elsewhere and the level of support dropped off. In considering the boundary conflict, though, it is worth bearing in mind that of the two villages, Migeregere have generally been the more difficult to work with, and so have received more attention in trying to resolve the problem.

Awareness raising in TA2 (July 2004 – May 2005)

As a preliminary stage of the PFM process this phase was given undue emphasis in the original proposal to BPCP. Utumi had effectively already undertaken this work, and the remaining elements were merged into the education pack, see below.

[28] Our Community Forestry Officer, who should have been spear-heading our PFM work, was involved as a key witness in the prosecution for illegal use of forest products in his home region of Kilimanjaro. This involved attending numerous court hearings, many of which were cancelled on the day they were due to take place, and the project supported the officer's regular return trips to Moshi, costing us around 25% of his time. In addition the KDC Forestry Office was short-staffed, with 2 assistant forest officers continuing their education. One returned to his district duties in July 2005, and another officer was hired around that time, and who has since been assigned principally to PFM.

[29] See discussion under *PFM Implementation in Kilwa District* in the Community Forestry section.

Prepare and trial mpingo education pack (June – Dec 2004)

The education pack suffered from lack of staff during the period originally set aside for its preparation (June/July 2004), and then re-aligned priorities which saw its ready date repeatedly moved back. The first leaflets were not finally printed until July 2005, with the first village education day taking place in Migeregere (TA2) in August 2005. As noted above in the Awareness Raising section, this delay was probably a mistake, since heightened awareness could have done much to increase support for the project and demand for CBFM in general, as well as acted as a brake on logging, at least in key target areas. However since its inception the education pack has undoubtedly proved a success, which the project will be continuing to develop.

Develop CBFM steps in TA2 (Aug 2004 – Feb 2006)

The July 2004 revised proposal brought the target completion date for this work forward to March 2005, while the Darwin Initiative application aimed for October 2005. Neither of these targets, nor the original one of February 2006 are likely to be met, even in Kisangi Kimbarambara which presents fewer complications than Migeregere. The main causes of this are the overall delays to the PFM programme in Kilwa district as outlined above. However, if matters improve there is no reason why both cannot be brought fully up to speed with working management plans by mid 2006, assuming the Migeregere-Ruhatwe boundary conflict can be solved.

Stocks assessment (Sept 2004 – May 2006)

The original plan for this envisaged some preliminary surveys by the main field team, followed by intensive fieldwork by a student expedition from UEA in 2005, with a report to follow in 2006. However after the methodology was revised, it was mutually agreed with the expedition leader, that the work was better suited to a smaller team, and could thus be done by the main field team. Most of this work, the one-day rapid transects together with training and calibration work, was completed between September and November 2004. Since then GIS and statistical analysis has proceeded in the office when time was available. The Darwin Initiative application listed these to be done in June 2005, but this was later put back to March 2006 under pressure from other commitments. A complete report of the stocks assessment work should be ready by May 2006 as originally scheduled.

Establish monitoring plots (Oct 2004 – Dec 2005)

This has largely been achieved, at least in its original form which focused primarily on tracking mpingo growth rates. The major effort on the stocks assessment caused the date for initial establishment of the monitoring plots to be put back from 2004 to 2005. The major effort on the stocks assessment and delayed progress on core PFM activities caused the date for initial establishment of the mpingo monitoring plots to be put back from 2004 to 2005. To date 160 mpingo trees have been marked, which should just be adequate for the production of a growth model about ten years hence, depending on the measured growth rate. Additionally 50 mninga trees have been marked. However we plan to continue to mark further trees in 2006 to improve our understanding of mpingo's growth rate in different conditions.

In order to monitor the effectiveness of VFAs we are also setting up vegetation monitoring plots inside and outside VFAs, and in forest reserves. Early work focused on developing and refining the methodology, to integrate it fully with PFRA, and to maximise community participation as well as utility of results, broadening it into a general monitoring programme for the CBFM. This fitted with the aim of achieving greater consistency by establishing and subsequently monitoring plots during the late dry season (September to November of each year) as discussed in the main section on the Monitoring Programme of this report. Plots have been established in Kikole VFA (TA1), but not yet in Ruhatwe's due to the continuing sensitivity over the boundary issue. As the programme is fully integrated with the PFRA step in CBFM development, plots in TA2 villages cannot yet be set up. Control plots in Mitaurure FR, using an earlier methodology, have also been set up.

Design and produce calendar (July – Nov 2004)

This initiative was put back from the 2005 calendar to the 2006 one to avoid a rushed job in condensed time scales, and produced in partnership with WCST.

Publicity material for UK use (Jan – Mar 2005)

As noted above, the demise of the *Soundwood Programme* at FFI left the field team temporarily without any customers for such publicity material. The merger with EAT has given renewed impetus to this aspect, and various electronic resources have been provided to the MCP's new UK Representative. This will continue as and when required for funds- and awareness- raising in the UK and Europe.

UDSM Student Projects (Apr – July 2005)

As the discussion beginning on page 52 makes clear, the student projects initiative did not come to fruition during the BPCP funding. However it is hoped that all the necessary work has been completed to pave the way for future students from UDSM or elsewhere to develop projects based on mpingo starting in 2006.

Evaluation of CBFM – certifiable? (Oct 2005 – Jan 2006)

Owing to the relatively slow progress of the CBFM, an evaluation now of potential for certification under FSC guidelines would be a little premature. Under the Darwin Initiative funding this has been re-budgeted and pushed back until December 2007.

Prepare for initial harvest of mpingo (Dec 2004 – May 2006)

Again, the slow rate of progress has put paid to any plans for an initial harvest by May 2006, but the timetable set out in the Darwin Initiative application which foresees potential for such a harvest by October 2007 is more realistic, and remains very achievable if cooperation from all the various parties in the supply chain can be obtained.

Further funding obtained

No specific target date was set for this, although by implication the end of the 18 month to two year duration of the BPCP funding set an unavoidable deadline. The initial application for Darwin Initiative funding was made in October 2004, with the stage 2 application form submitted in January 2005. News that the application had been successful was received in May 2005, ensuring that at least one of the original success criteria had been profitably achieved. The application, joint with FFI, is worth GBP £140,000, of which over 80% is coming to the MCP.

Then in January 2006, the project concluded an agreement with FFI to receive GBP £10,000 over 2006 and 2007 from a DGIS grant – *Resources for Improved Livelihoods* – to FFI's Biodiversity and Human Needs Programme. The money was used to purchase a second vehicle for the project; the DGIS money will cover its costs when used to support our community development programme.

Conclusions & the Way Ahead

Project Evaluation

Logical frameworks provide an important tool in helping to plan projects, but also to evaluate their success in relation to the original objectives. There follows a point-by-point evaluation of each of the expected results listed in the logical framework in the original proposal to BPCP.

0. Project management established.

What should have been a relatively simple, procedural result gained new significance as the project realigned its aims and objectives, and better positioned itself in the context of the national PFM programme. These changes offer the project much greater opportunities to effect real change towards sustainable utilisation of timber species – but also pose new challenges which will need to be borne in mind as implementation progresses. Mpingo, as a species will receive less attention, but it remains our flagship and the species most likely to command high prices under community management.

However it is also true to say that the MCP has found its niche, and an important niche at that, as it is the only NGO active in PFM in Tanzania which is focusing on sustainable harvesting of timber trees under CBFM rather than the more biodiversity-centric JFM. When a recent review of PFM in Tanzania criticised it for being too focused on conservation and not enough on utilisation, the MCP could be seen as already forging ahead, grappling with some of the complex issues surrounding sustainable utilisation, and pioneering a new approach.

1. VFAs in TA1 properly functioning.

This result cannot be said to have been achieved, since the necessary precondition, namely proper establishment of the VFAs was not met before the MCP arrived, and could not be met since. In the case of Ruhatwe this was due to the major issue of the boundary conflict. In the case of Kikole it was due to hold-ups under the preceding Utumi Project, followed by slow progress under the national PFM Programme. Thus although success cannot yet be reported on this result, that is a result of circumstances beyond the project's control, and the MCP can justifiably point to some notable advances in these villages, achieved principally at the behest of the project.

2. CBFM introduced to TA2.

While CBFM principles have been introduced to TA2 villages, success in terms of approved management plans remains around a year away, or even more in Migeregere if the boundary conflict is not resolved soon. Nonetheless considerable progress has been made; and substantially more progress than would probably have been possible without the MCP. However we are a long way from being able to judge whether the key assumption that "Village Forest Management Plans create new useful VFAs in TA2" can be met, and therefore whether this work can make a long term contribution to the overall goal of the project.

3. Mpingo education pack for use in CBFM produced.

This result has been achieved. Electronic copies and paper samples of the education pack have been provided to BPCP. Informal feedback suggests that local people are responding well to the education programme. More work needs to be done to push out the education pack into more villages, and a framework put in place to better evaluate its success.

4. Strategy for village control of timber stocks outside core VFA areas and evaluation of potential for certification.

This work is only just starting in TA1 villages, and the evaluation of the appropriateness of certification has been put back under Darwin funding until 2007.

5. Increased capacity of district forestry staff to develop CBFM.

Considerable investment has certainly been made in training local staff and developing capacity of KDC Forestry Office. However evaluating the stated indicator as to whether tasks are completed more quickly is almost impossible due to the slow rate of progress on CBFM. No PFRA exercise has been carried out in Kilwa since we introduced the refined methodology. The new techniques were certainly designed partly with the intention of reducing the time commitment required of both District staff and community members, so we can be optimistic that this will be achieved in the future.

Other than solving the obvious problems with the slow release of money, in relation to which the MCP has to proceed cautiously due to political sensitivities, the major target on the office side is improving local IT skills. As discussed above, our first attempt to introduce this met with a certain amount of resistance, but a renewed effort is planned for the 2006 wet season with priority being given to those staff most interested.

6. Long-term monitoring programme of mpingo in TA1 and TA2 established.

The monitoring programme has been designed and trialled, and plots established at Kikole in TA1 and Mitaurure FR. Over 100 mpingo trees and 40 *Pterocarpus angolensis* trees have been marked, providing the baseline data from which growth models can be produced. Further funding has been obtained to add to these data sets, and ensure the marked trees remain marked. This fulfils the essential requirements of a baseline, and will allow initial results to be reported in 5-10 years time. Additional trial plots are dependent on further progress in the CBFM. The first step has also been met in fulfilling the stated assumption that "Funding continues until good quality models can be constructed with the results."

7. Total mpingo stocks in Kilwa District estimated.

This result has been achieved. Later refinements may follow, but the basic requirement has been met, and is already proving useful. How much this information can assist the overall goal depends partly on the assumption that "Most of these stocks can be protected using CBFM before they are harvested." Meeting this assumption is dependent on a successful education programme spreading out across the entire district, and rapid expansion of CBFM.

8. More research into mpingo issues by UDSM staff and students.

This result has yet to be accomplished, but several necessary steps towards its fulfilment have been completed. The assumption that "Students are motivated to choose projects working with mpingo" does not appear to be critical; administrative, financial and location issues are all greater concerns.

9. Increased awareness of mpingo conservation nationally and internationally.

Measuring our success in this is extremely difficult, however the promotional calendar, and the press conference and release will have raised some awareness within Tanzania, while the anniversary dinner in the UK plus BBC Radio 3 interview have begun to push the message out internationally. Moreover it is probably fair to say that the sheer presence of the MCP, and its participation in various national conservation initiatives, has raised the profile of the issue within the scientific and conservation community, which is an important audience, and one which can play a key role in helping to fulfil the assumption that any increased "Awareness translates into action and funds."

10. First harvest of mpingo from TA1.

This result is still probably 2-3 years away. However some work has been made to liaise with local loggers and sawmills who will play a critical role in fulfilling this objective.

Additional Work

The support given to KiFaCE in particular, is one example of how the project has adapted to local needs and undertaken additional work not listed in the original proposal. The workshop for councillors,

press releases and contributions to the national policy dialogue are other examples, as are the various small, and generally undocumented ways in which the project has provided technical assistance to the Kilwa DFO. While none of these additional achievements on their own, or even together, would justify a project of this magnitude, they should not be ignored when evaluating the overall success of the project. All should help advance the overall goal of the project, and without the effort put into the application for funding from Darwin, none of this work would be continuing.

Overall Goal

The stated purpose of the BPCP funded project was to:

Continue and expand CBFM work of Utumi Project in Kilwa District, and answer key outstanding research questions on mpingo.

With an overall goal in mind to:

Use mpingo as a flagship species to conserve the forests and woodlands of southern Tanzania.

While some of the results are behind schedule, all the work done demonstrably contributes to the stated purpose of the project. The original proposal to BPCP listed a number of assumptions that are critical for the project to claim some measure of overall success in relation to its long term goal:

1. CBFM is effective at combating illegal tree felling.
2. Tanzanian Government continues to support CBFM initiatives.
3. Deforestation does not proceed so quickly that there are few more areas worth conserving using CBFM.
4. Research results are meaningful and further funding allows them to be incorporated into CBFM practice.

It is yet to be seen whether the first holds true. Utumi were not successful in moving on loggers active in their target villages, but the MCP has had some success in this regard. However with only a relatively small area currently under development for VFAs, the real strength of CBFM in combating illegal logging is yet to be tested. Commensurate with this question is the very real concern about the current pace of logging in Kilwa District (assumption 3), which presently stands to out-pace the expansion of CBFM several times over.

However the other two assumptions look good. Both the Tanzanian Government and the donor community show every sign of having a long term commitment to CBFM. Moreover the MCP itself has obtained further funding which will allow it to incorporate some the very meaningful research results into its developing PFM programme.

Conclusions

Of the four principal criteria for success on which the original proposal to BPCP sought the project to be judged, only one (further funding secured) will be met inside the eighteen month to two year initial time frame, while the proof-of-concept first sustainable harvest of mpingo from a community managed forest remains two to three years away. Progress towards the other criteria has certainly been made, but the numerous delays to the PFM programme in Kilwa District have greatly slowed work on this core component. Nonetheless significant achievements have been made in other areas, less dependent on our partnership with the local government authorities. The stocks assessment, once refined, will represent a major advance in our understanding of current stocks and patterns of distribution of mpingo and other high value timber species, and the participatory monitoring programme, fully integrated into the CBFM/PFRA process, yet with the capability to provide vital objective data on growth rates, should yield important data for both modelling timber stocks and long term evaluation of the success of CBFM. The education programme, although, delayed and thus still in relatively early days, is already showing great promise with a good response from communities.

There is no denying that the original proposal was extremely ambitious, and was commented as such at the time by reviewers (S Oldfield *pers. comm.*). After eight years of expeditionary research, the MCP

sought to launch itself into active, practical conservation and make an impact. So although some of those ambitions have yet to be achieved, there is much that the Kilwa Field Office has accomplished in its first year and a half, and under BPCP funding. Not least is the transition itself from a loosely organised group of people involved in an episodic series of student expeditions, to a fully fledged conservation NGO with a supporting charity in the UK. This is not an easy transition to make, nor one many sponsors would consider. The BP Conservation Programme, through its 2004 consolidation award, therefore gave the MCP a unique opportunity, and which the MCP does not intend to waste.

In retrospect it can be seen that the goals which the MCP did achieve were the easier goals, in the sense of fewer and smaller external dependencies. The capacity for the research and education components lay mostly within the project, and thus made delivery relatively easy. The harder, but ultimately most important objective of developing and successfully implementing CBFM has a much greater political dimension, and the work must be undertaken in close partnership with the district authorities. This high level of mutual dependency is partially a result of funding restrictions, but in contrast to a go-it-alone approach has the significant advantage that any resulting conservation initiatives are much more likely to have crucial buy-in from KDC, and therefore long term support and sustainability, whether or not MCP can obtain on-going funding.

In forging its partnership with KDC, however, the MCP faced a significant hurdle in terms of its constant comparison to the preceding Utumi Project. Whereas, under the BPCP funding, the MCP had a budget of $75,000 intended to last 1½ years, Utumi had spent around $3 million in 3 years, albeit across two districts. Some of money went into investments which have clearly benefited the MCP such as the good, air-conditioned office of which the MCP was given free use. Other noteworthy investments were in less tangible areas such as introducing participatory concepts and approaches to KDC staff.

However some of the $3m was spent on general capacity development of the KDC, which in practice means plentiful money for various training courses and workshops (always accompanied with generous *per diems*), and infrastructure improvements such as a new wall around the KDC offices compound and enhancements to lodgings for some KDC staff. For example, Utumi paid all the office staff a Christmas bonus of $50. In this way the Utumi Project was seen by all to be generally “benefiting the District”, and no doubt made their job a lot easier.

Unfortunately the MCP did not have any such budget available, and thus had to counter an impression of meanness among some KDC staff. Utumi also did not have to battle tight budgets in its field operations, and was thus freer to get things going, and to be more active than was possible for the MCP, especially when the project car was in need of repairs. The grant from the Darwin Initiative has introduced some more budget flexibility, and the MCP has since launched a number of small schemes designed to improve political support for the project within the KDC administration. It is hoped these will earn the project some firmer foundations, although it will never be able to compete with the memory of Utumi.

Looking Ahead

As time passes, and the communities begin harvesting the forests themselves, the composition of the forest is likely to change. This could be in two ways: one, that stocks of valuable timbers become scarcer, or two, the opposite – that because of the economic benefits accruing from certain timbers, the communities start planting schemes in the hope of producing profitable timber in the future. Other less valuable tree or shrub species may not be encouraged or may be actively removed. With increased awareness of the benefits of the forest will come increased utilisation. Strong management practices, including laws which can be enforced and good education, will be essential in ensuring the forest is not stripped.

Technical support is essential in natural resource management planning. This is one of the main areas in which the MCP can play a key role in supporting the CBFM transfer process. That, inventories and training, promotion of sustainable use practice, plus technical and financial support for natural resource based enterprises; advice on how to access markets and what capital investments to make.

It will be interesting to see whether the recognition of the land and its resources as the villagers' will provide a means of accessing credit, the land and trees being an asset. Securitising land use as an asset in this was as a means of obtaining credit is a possible future development but could lead to some village areas being converted using the funds obtained and developed in different forms. This may mean the wider village area becomes less forested as other forms of agriculture are developed, perhaps more intensive, as well as cottage industries that are not necessarily reliant on the area remaining a forest habitat. For example, a community may wish to apply for a loan to develop a road and/or create a local market place with stalls, all of which would expose the village to more development and put the forest at risk if not properly managed.

Forging business partnerships will be a key aspect in developing markets. Participating villages will need assistance in finding buyers for the timber they hold in their VFAs, and support in demanding an equitable price for their timber which is often undervalued at the village level. Since it is hoped enforcement will be better in the VFAs, it is inevitable this would lead to an increase in the loggers' costs, and they will want adequate recompense in the form of higher prices from timber buyers. However promotion of sustainably harvested and well-managed timber requires transparency in the chain of custody and confidence in the buyer that the premium is justified. Certification should be the end goal, but buyers, sellers and middle-men will need assistance getting there, and some intermediate solutions, since certification is probably a decade away in southern Tanzania.

The MCP must also face the danger that it will become to some extent a project island within a larger CBFM project island, and that may generate jealousy in other communities. The Ruhatwe-Migeregere boundary conflict is an object lesson in the potential problems which may arise when these emotional issues are not addressed. However the restricted area effect may cut both ways, for example, by encouraging other villages to seek control of timber resources. Either way, the MCP needs to be wary of the longer term consequences of developing project islands.

Developing VFAs and encouraging community ownership and utilisation of forests is likely to change the ecological nature of the forests themselves. Outside the VFAs vegetation may be disturbed for agriculture, or cleared for charcoal. In pursuing a strategy of community conservation the project is accepting that the forests will not be maintained in some notional pristine state. The monitoring programme should help track any changes that are induced.

In conclusion, it is important to realise the context in which the MCP and the PFM programme is working. While extensive deforestation is taking place, and while the transfer from state owned forests to community managed forests may be a positive and practical move to reduce this issue, it cannot prevent deforestation from continuing in the meantime. However, the context is one of an area of considerable forest cover and a wide range of timber species which may be utilised for many years ahead. Compared to some less fortunate areas of the globe, and despite the new bridge over the Rufiji River, the project is still relatively early in commencing its work. There is good cause to have great hopes for the future.

Logistics

Institutional Registration

The MCP was legally registered in Tanzania as a Non-Governmental Organization (NGO) No. 12929 in December 2004. Application forms were obtained from and returned to the Register of Civil Societies in the Ministry of Home Affairs together with supporting documents: a list of founding members, CVs and photos of executive officers, two copies of the constitution and the minutes of the meeting approving the constitution. A letter of support from the "parent ministry" concerned, the Ministry of Natural Resources and Tourism in our case, was also required. The application was processed and accepted in two weeks, with an official certificate of registration then provided on payment of application and registration fees ($630). There is an additional annual registration fee of $40.

To facilitate further fund-raising, especially from non-institutional sources, the project is merging in the UK with the Environmental Africa Trust (EAT), a dormant registered charity.

British team members have research permits from the Tanzanian Commission of Science and Technology (COSTECH). The application and annual renewal process takes about 3 months. Permits cost $300 per person. The COSTECH permit automatically entitle the holder to reduced price (class C, $120) residence permit from Immigration (Ministry of Home Affairs). In future the project hopes to move to the more general employee (class B) residence permits, which it should be able to obtain through its NGO registration, and at a lower total cost compared to the COSTECH route.

Kilwa Office

The Project has been provided one room, previously used by the Utumi Project, as office space by Kilwa District Council. It is part of an annex to the Natural Resources Department offices which was originally built (and paid for) by Utumi, and as such is in good state of repair and fully equipped with office furniture, including air conditioning. The office space is provided rent free, but the Project contributes to the running costs, and shares the burden of the utility bills, except for the telephone line, which was transferred to MCP ownership at the request of the DED.

The adjacent room houses the department secretaries and equipment including a photocopy machine and a desktop computer with a printer and scanner, use of which is shared with the Project, which in turn shoulders some of the running costs, e.g. printer cartridges. With the office being within the main KDC office complex it has been easy for project staff to liaise with its partners in the district administration, and facilitates cooperation on PFM.

Field Activities

Car

The project has a second-hand Nissan Safari 4WD vehicle. With only a single car for the majority of the BPCP funding period it has not been easy to get more than one activity done at a time, although sometimes it has been possible to get use of one of the ex-Utumi vehicles. The car has been intensively used for both PFM activities and MCP programmes. Car maintenance costs have been very high because of the age of the car and the poor state of the roads, although that between Dar es Salaam and Kilwa is gradually being surfaced. Because of this we have experienced frequent mechanical difficulties requiring regular repairs. Unfortunately the ability of the mechanics in Kilwa is limited, and so only minor maintenance is carried out there, with the car being driven to Dar for major repairs which are not within local mechanic's ability to fix. The frequency of such trips varies with the faults arising, but it is often not much more than one month between them. In February 2006, the project purchased another vehicle – a Toyota Hilux twin-cabin pick-up – also second-hand, with funds from DGIS provided via FFI.

Field Equipment

Driving from Kilwa Masoko to the field every day is not very efficient use of time, and so most of the field work requires camping. The project has four three-man tents, although no more than two people are put in each tent. Other project field equipment includes first aid kits, GPS units, and tailors' tapes for measuring DBH. We borrow compasses and 50m measuring tapes from the store room created by Utumi. Plot markers and other apparatus required for the monitoring programme are detailed in the relevant chapter above. For village meetings and training purposes a flip board, flipcharts and marker pens are used.

Modus Operandi

Organisation of field trips starts at least two days beforehand to get everything ready. Arrangements for day trips usually take less time than overnight camping trips. Where elements of the trip are being covered by KDC under the PFM budget, extra time must be allowed due to complicated procedures for obtaining diesel. A *Field Trip Checklist* and *Field Equipment Checklist* ensure that important steps or equipment do not get forgotten, or left until too late.

Project staff are almost always accompanied by District staff during field work. Work is usually from Monday to Friday, though there occasions when staff work on weekends if a particular activity has not been completed in weekdays and requires to be done before the following week. Day trip work starts from around 8:30am and lasts up to 6:00pm depending on how far away the working area is.

Health & Safety

Due to their proximity to the Selous Game Reserve, large mammals are common in Kilwa District forests, with elephants, buffalos and lions posing a particular threat. To ensure safety in the field we are usually accompanied by an armed District game guard. Snakes are also an acknowledged hazard, although, in contrast to earlier expeditions, they have rarely been seen in the last 18 months.

As a precaution, a GPS way-point is recorded whenever starting a forest walk so the route back can be easily traced in case people lose direction in the bush. If the GPS fails to work, local people with good knowledge of the area can direct staff on their way, and we carry a compass as a backup. Local guides often come with team on field work, although usually the game guards are sufficiently familiar with the forest that the team is not dependent on local guidance.

Necessary medical supplies are always taken on field trips. There are two first aid kits, one which remains permanently in the car, and the other taken with the team in the forest. In addition to the usual pain killers and anti-histamine, the kit contains anti-malarial drugs. The coastal area of Tanzania is particularly prone to malaria, and Project staff have suffered from a number of malaria attacks, although swift treatment has ensured that none have become life-threatening.

In case of emergencies, a list contact numbers for each member of staff is kept at the project house and in the first aid kits.

Accounts

These accounts cover the period from the start of the BPCP award funded work in May 2004 until the end of December 2005. A final set of accounts will be provided when all the funds from the award have been exhausted. These final accounts will also include an analysis of expenditure by output.

Exchange Rates

The Consolidation Award received from BPCP was USD $75,000, but while some expenditure was in US Dollars, most was in Tanzanian Shillings (TSH) or British Pound Sterling (GBP). For the sake of simplicity, the MCP initially adopted the following standardised exchange rates for accounting purposes.

- GBP £1 = USD $1.80
- USD $1 = TSH 1,100/-

Deviations in rates obtained on any currency exchange were then accounted as a transaction charge (occasionally a gain). For example if USD $110 was converted into TSH 110,000/-, then a loss of TSH 11,000/- or USD $10 would have been recorded. This system was in place until end June 2005.

From July 2005 the project had to adapt to fit with the Darwin Initiative accounting rules which do not make provision for transaction costs, and which must instead be subsumed as a small overhead into every expense which are all reported in GBP, the Darwin denominated currency. Thus if GBP £100 was converted into TSH 190,000/- (which would be a loss of 8,000/- under the previous system), and half of this, 95,000/- was spent on one item, then under Darwin it would be declared as costing GBP £50 with no separate exchange rate loss. In order that the accounts be consistent, the Darwin protocol was therefore adopted from July 2005 onwards. In the period July – September 2005, the effective reporting rates thus varied between:

- GBP £1 = USD $1.72 to $1.75
- USD $1 = TSH 1,125/- to 1,145/-

Since at this point the entire remaining sum of the BPCP award had been converted into GBP and then TSH (accounted at the old standardised rates, with additional charges incurred), expenditure from July 2005 in the accounts below is reported at the GBP cost converted back into USD at the old standardised rate. This ensures that the accounts will eventually total the $75,000 value of the award, but it does mean that certain items (such as permit fees) whose cost is denominated in USD have a slightly adjusted final cost. For example, the residence permits for British staff members for 2005-6 cost $240, but these USD were purchased with TSH which had been obtained from GBP, and so under the Darwin accounting system are recorded as costing an effective £139.88, or $251.79 at the standardised rates. The Project has made no charges to exchange losses or gains after end June 2005 to allow for this, so the adjusted figure is reported.

Expenditure to Date

Item	USD $
Staff Field Allowances	17,565.19
Non-Staff Field Allowances *(to District Administration officers assisting us)*	1,821.72
Permits *(visas, research & residence permits, NGO registration)*	2,234.76
Vehicle Purchase *(including initial repairs to make road-worthy)*	15,666.55
Vehicle Running Costs *(diesel, oil, maintenance, insurance, taxes)*	11,379.10
International Travel	3,621.12
Local Transport *(bus, train, taxis)*	1,831.77
Accommodation *(house rent & utility bills, furnishings, use of room in Dar)*	4,397.22
Hotels & Guest Houses	1,639.05
Office *(utility bills, stationery, computer equipment)*	4,003.75
Printing Education Pack	109.71
Field Equipment *(camping gear, surveying tools, monitoring plot markers)*	545.39
District Expenses *(support for local forester, entertainment of important staff)*	376.41
Field Expenses *(local guides, village meeting expenses)*	361.99
Staff Expenses *(insurance & medical costs)*	1,909.16
Finance *(exchange rate losses and bank fees)*	1,655.00
GRAND TOTAL	**69,117.91**

Note cents figure does not sum perfectly due to rounding errors.

Remaining Funds

The remaining $5,882.09 is budgeted to be spent mostly on staff field allowances, vehicle running costs, office, hotels and local transport.

The Team

Principal Field Team

Project Co-ordinator – Steve Ball MA MSc FRGS
MSc in Applied Ecology and Conservation at the University of East Anglia (UEA), specialising in tropical forest conservation, and with GIS training.
Founder of the MCP, leader of the *Tanzanian Mpingo 96* and *Tanzanian Mpingo 98* expeditions, and expedition director of *Mpingo Survey 2000*.

Community Forestry Officer – Jonas Timothy Dipl
Diploma in Forestry from Olmotonyi Forestry Training Institute.
Experienced Forest Officer and ornithologist specialising in CBFM, previously with Kilimanjaro Catchment Forest Project.
Member of the *Tanzanian Mpingo 96*, *Tanzanian Mpingo 98* and *Mpingo 99* expeditions.

Research Officer – Anne-Marie Gregory MA MSc
MSc in Tropical Agricultural Development from Reading University, specialising in small-scale development in sub-Saharan Africa.
Co-leader of the *Tanzanian Mpingo 98* expedition and lead author of that report.

Operations Manager, Kilwa – Jasper Makala BSc
BSc in Forestry from the Sokoine University of Agriculture.
Professional forester, previously working in carbon credit plantations.

Community Development Officer – Nuru Nguya MA
MA in Rural Development from the Sokoine University of Agriculture.

Support Staff

Technical Adviser – Paul Harrison MSc

Communications Officer – James Laizer Dipl

Research Officer – Demetrius Kweka MSc

UK Treasurer – Annie Smith MA MSc

UDSM Liaison – Henry Ndangalasi PhD

References

Ball, S.M.J. (2003) Exploiting a keystone species: timber vs. ecotourism, *Tabebuia heptaphylla* in the northern Brazilian Pantanal. MSc thesis, CEEC, University of East Anglia, UK.

Ball, S.M.J. (2004) Stocks and exploitation of East African Blackwood: a flagship species for Tanzania's Miombo woodlands? *Oryx* **38**(3): 266-272.

Burgess, N.D. & Clarke, G.P. *eds)* (2000) Coastal Forests of Eastern Africa. IUCN, Gland, Switzerland.

Cunningham, A.B. (1998) Ecological footprint of the wooden rhino: depletion of hardwoods for the carving trade in Kenya. http://ftp.rbgkew.org.uk/peopleplants/regions/kenya/hardwood.htm *(accessed on 14 August 1999)*.

FFI (1996) The proceedings of the Maputo Workshop; Towards Sustainable Exploitation of *Dalbergia melanoxylon*, 6-9th November 1995. Fauna & Flora International, Cambridge, UK.

FFI (2002) Sustainable Production of African Blackwood - *Dalbergia melanoxylon*. Report of the Technical Workshop. Fauna & Flora International, Cambridge, UK.

GoT (2004) Third Schedule of the Forest Act of 2002 in Government Notice No. 153 published on 21/5/2004. Government of the United Republic of Tanzania,

Gregory, A.-M., Ball, S.M.J. & Eziefula, U.E. (1999) Tanzanian Mpingo 98 Full Report. Mpingo Conservation Project, Fauna & Flora International, Cambridge, UK.

Hall, J.E. (1988) A report on a mission to analyse the sawmilling practices of the mpingo wood industry in Tanzania with a collection of small grant proposals aimed at the conservation of the mpingo resource. UNEP, Nairobi.

Jenkins, M., Oldfield, S. & Aylett, T. (2002) International Trade in African Blackwood. Fauna & Flora International, Cambridge, UK.

Lovett, J. (1987) Mpingo - the African blackwood. *Miombo* **2**(3): 5.

Malimbwi, R.E., Shemwetta, D.T.K., Zahabu, E., Kingazi, S.P., Katani, J.Z. & Silayo, D.A. (2005) Kilwa District Forest Inventory Report. Forestry and Beekeeping Division, Dar es Salaam, Tanzania.

Mauki, F. (2004) 'Mpingo' tree on brink of extinction. Guardian on 27/07/04, Dar es Salaam, Tanzania.

Milledge, S.A.H. & Elibariki, R. (2005) The Status of Logging in Southern Tanzania. TRAFFIC East/Southern Africa, Dar Es Salaam, Tanzania.

Milledge, S.A.H. & Kaale, B.K. (2005) Bridging the Gap - linking timber trade with infrastructural development in Southern Tanzania: Baseline data before completion of Mkapa bridge. TRAFFIC East/Southern Africa, Dar Es Salaam, Tanzania.

MNRT (2004) Guidelines for Participatory Forest Resource Assessment and Management Planning *(Draft)*. Forestry and Beekeeping Division - Participatory Forest Management Programme, Ministry of Natural Resources & Tourism, Dar Es Salaam, Tanzania.

Moore, K. & Hall, J.E. (1987) Report of a mission to assess the management and conservation of *Dalbergia melanoxylon*, or the mpingo, in Tanzania. UNEP, Nairobi, Kenya.

TNRF (2005) Building an Advocacy Network for Forestry Stakeholders. Meeting minutes of the Forestry Working Group, 5th August 2005. Paper presented at Tanzania Natural Resources Forum.

UNEP (1988) Don't stop the music. Save mpingo. United Nations Environment Programme, Nairobi, Kenya.

UNPF (1997) Lindi Region Socio/Economic Profile. United Nations Population Fund, Dar es Salaam, Tanzania.

West, V.W. & Malugu, I. (2003) Mpingo Carvings Investigation 2001 Full Report. Mpingo Conservation Project, Fauna & Flora International, Cambridge, UK.

White, F. (1983) The vegetation of Africa. A descriptive memoir to accompany the UNESCO/AETFAT/UNSO vegetation map of Africa. UNESCO, Paris, France.