

***Developing biometric sampling systems and optimal
harvesting methods for medicinal tree bark in southern Africa***

ZF0192

March 31st – April 11th 2003

South Africa, Zambia and Malawi

Jenny Wong
Wild Resources Limited
Robinson Building
Deiniol Road
Bangor
Gwynedd
LL57 4BZ
UK

1 Introduction

Late in 2002 the Forest Research Programme (FRP) put out a call for projects on the biometrics of non-timber forest product assessment with an emphasis on medicinal plants. In response to the call Wild Resources Limited presented a concept note involving a wide range of partners and products designed to address biometrical problems in the assessment of medicinal bark, tree fruit, mushrooms and herbs. This was judged by FRP to be overly ambitious and expensive and it was agreed that a Project Memorandum Form (PMF) should be prepared for medicinal bark. The change in emphasis was accepted by the team and a PMF developing work undertaken in Republic of South Africa (RSA) and extending it to Malawi and Zambia was prepared. Since the team had not been able to meet and all except the South Africans had not seen the existing experiments the PMF contained only initial ideas of the experiments to be undertaken. It was noted that an important component of the project would be a project initiation meeting where the details of the experiments and other activities could be decided. FRP judged that the PMF was insufficiently detailed for it to be accepted for funding though the proposal was of sufficient merit to warrant investment in a project preparation workshop.

Funding for a workshop was therefore made available with the following objectives:

- to refine a draft project memorandum to FRP,
- to explore alternative sources of funding, and
- to contribute intellectually and materially to a FAO expert workshop on the development of guidelines for biometric NWFP assessment in Sub-Saharan Africa.

The first two of these were accomplished during a project preparation workshop held from the 31 March to 11 April 2003 in RSA, Zambia and Malawi. The intended FAO workshop will be held at a later date and will probably take the form of an e-conference. The bark workshop participants were requested to review the report of the NWFP assessment case studies which will be presented at the e-conference.

2 Project proposal workshop

The intention of the workshop was to familiarise the team with the bark harvesting project previously undertaken in RSA, to decide on species, experimental protocols and sites and to consider other issues that would contribute to the project. To this end the project team travelled to a series of bark harvesting sites in RSA and potential sites in Zambia and Malawi. The people listed in Table 1 attended the workshop according to the schedule in Table 2. During the workshop, discussions were held with a great many people (see Table 3) all of which greatly enhanced the understanding of the project team and prompted the addition of a more comprehensive and meaningful socio-economic component to the project.

This report provides an overview of the findings of the workshop and should be read together with the revised PMF which is the main workshop output.

Table 1 Workshop participants

Initials	Name	Affiliation
JW	Jenny Wong	Wild Resources Limited, UK
JH	John Hall	School of Agricultural and Forest Sciences, University of Wales Bangor, UK
GD	Gareth Davies	Wild Resources Limited, UK
FM	Fabien Malambo	School of Natural Resources, Copperbelt University, Zambia
GM	Gerald Meke	Forest Research Institute, Malawi
CG	Coert Geldenhuys	ForestWood, RSA
FN	Francois Ndeckere	NWFP branch, FAO, Rome
WV	Wessel Vermulen	Scientific Services, Department of Water Affairs and Forestry, RSA
CK	Christoph Kleinn	School of Forest Assessment and Remote Sensing, University of Göttingen, Germany
EB	Eric Boa	CABI Bioscience, UK

Table 2 Itinerary

Date	Place	Activities	JW	JH	GD	FM	GM	CG	FN	WV	CK	EB
30 Mar	Cape Town	Arrive										
31 Mar	Groenkop	Inspection of bark harvesting experiments and 100% inventory	√	√	√	√	√	√	√	√	√	√
	Saasveld	Planning workshop – outputs	√	√	√	√	√	√	√	√	√	√
1 Apr	Saasveld	Planning workshop – activities	√	√	√	√	√	√	√	√	√	√
2 Apr	Saasveld	Planning workshop - timetable and funding sources	√	√	√	√	√	√	√	√	√	√
3 Apr	Witelsbos	Inspection of bark harvesting experiments and PSP	√	√	√	√	√	√	√	√	√	
4 Apr	Nzimankulu	Visit to inventory site, browsing enclosure and coppice monitoring. Inspection of illegal bark harvesting.	√	√	√	√	√	√	√			
5 Apr	Durban Market	Discussions with Sisamimpilo Association (bark traders) Visit to market	√	√	√	√	√	√	√			
6 Apr	Travel to Zambia		√	√	√	√	√	√				
7 Apr	School of Natural Resources, CBU	Negotiations with Dean	√	√	√	√	√	√				
	Kitwe	Discussions with Herbalists Association and visit to forest	√	√	√	√	√	√				
	Forest Research Division	Discussions on possible contribution to project (PSP enumeration)	√	√	√	√	√	√				
	Mwekera	Visit to proposed field site for 100% inventory and harvesting experiments	√	√	√	√	√	√				
8 Apr	Kaloko Trust	Discussions of possible collaboration on field studies inventory, coppice regrowth monitoring and experiments	√	√	√	√	√	√				
9 Apr	FRIM	Visit to office, discussions with FRIM staff	√	√	√							
10 Apr	FRIM	Discussions with Director	√	√	√	√	√					
	Liwonde	Visit to proposed field site with herbalists from local village	√	√		√	√					
11 Apr	Zomba Market	Discussions with herbalists in market	√	√	√	√						
	National Herbarium	Discussions on collaboration with indigenous knowledge collection	√	√	√	√						
12 Apr	Blantyre	Departure										

Table 3 People consulted

Country	Venue	Names	Roles
Republic of South Africa	Groenkop study site	Diana Rau	Technical assistant on existing bark project
	Nzimankulu Forest	Technical officers (x3)	Scientific services, DWAF
	Durban herbal market	Dominic Mitchell	Independent consultant working with Sisamimpilo Association
		Zodwa Khamalo	Market chairperson
		Virginia Hlengwa	Sisamimpilo Association chairperson
		Victoria Khamala	Sisamimpilo Association committee members
		Sylvia Dlamini	
		Committee members x 2	
Zambia	School of Natural Resources, CBU, Kitwe	Peter Fushike	Dean
		Felix Njovu	Forest Economist
	Kitwe	Dimas Musonda	Vice chairman of provincial group
		Rogers Kaonga	Secretary
		Christine Chali	Chairlady of Kitwe group
		Annie Musonda	Inspector for Kitwe group
		Louis Mithi	Information and publicity officer, Kitwe group
		Floyd Mwila	Co-ordinator for CBU
	Forest Research Division, Kitwe	Catherine Ngvulu	Director
	Kaloko Trust	Alex Njiragoma	Project manager
		Jameson Mbunda	Forester
		Eness Kabosha	Agricultural extension officer
		Esther Chulu	Healer
		Lwiimba	Healer
		Jimmy Kalyaba	Healer
Malawi	Forest Research Institute	Dennis Kayambazinthu	Acting Director
		Tembo Chanyenga	Indigenous woodland management
		Clement Nchimia	Seed and tree improvement
	Liwonde Forest	Chimwayi	Herbalist and village chief
	Machinga Forest District Office	Mr Thungwila	District Officer
	Zomba market	Herbalists x 3	Street traders
	National Herbarium	Cecilia Maliwichi-Nyirenda	Research officers
		Montfort Mwanyambo	
		Zacharia Magombo	
		Enoch Mlangeni	

3 Logframe development

Detailed consideration of the project logframe was undertaken over three days at the Forestry School at the PE Technikon Saasveld campus by all workshop participants. Eric Boa very ably chaired the meeting as the most senior independent person present. The meeting worked on the logframe and the questions and issues raised by the FRP on the PMF.

The meeting agreed that the four outputs were appropriate and did not need to be changed. However, although the thrust of the activities remained the same, the project intentions were clarified by the addition and modification of the activities.

The project team agreed with the reviewer that the treatment of local bark harvesting practices was inadequate and this component of the project was considerably strengthened. In Durban the team had an opportunity to meet with the Sisamimpilo Bark Harvesting Association and Dominic Mitchell; the free-lance socio-economist who has worked with Sisamimpilo for the past three years. It was always the intention to work with Sisamimpilo and to do some socio-economic work with them. However, during the course of the meeting and subsequent meetings with herbalists in Zambia and Malawi it became increasingly apparent that there was a need and indeed opportunity to further develop the socio-economic component of the project. The areas

of particular interest are; national and regional market chains, institutional development and socio-economic impact of sustainable bark harvesting by Sisamphilo and the identification of entry points for regulated bark harvesting in Zambia and Malawi. To reflect the increased importance of socio-economics in the project a fifth output was added to the project 'Institutions for sustainable bark harvesting'. Dominic Mitchell was invited to join the project team to lead the socio-economic activities.

It was suggested that there was a need to consider tree health and wound responses in more detail within the project and this was accepted by the team. To this end it was agreed that two activities would be added to the project and a further collaborator in the form of Jolanda Roux of the Forest and Agriculture Biotechnology Institute (FABI) of the University of Pretoria. FABI supported by Eric Boa will undertake a survey of fungal pathogens appearing on the wood exposed by bark harvesting. This will lead to assessments of the risk of tree mortality from pathogen attack. To support this John Hall has agreed to undertake a literature review of bark harvesting and tree wound response.

In response to FRP requests for elaboration of the measures of success for the project the team considered various alternatives. It was agreed that the clients for the project outputs would be forest management facilitators as represented by Forestry district staff and NGOs. It was suggested that it should be possible to establish a baseline of the provision of training and advisory materials on bark and medicinal plant harvesting in the client institutions. Success for the project would be the institutionalisation of the project outputs, particularly the proposed handbook by client institutions.

As a consequence of the reduced budget it was agreed that part of the FAO component would be dropped. The omitted activities were intended to test the relevance of generic lessons arising from the project to three other products. Although the project will concentrate on bark harvesting a short publication detailing the generic lessons for publication by FAO will still be prepared. FAO wishes to be kept involved in the project but will only lead on the publication and dissemination of publications. It is suggested that the bark harvesting handbook will be published by the FAO Harare office for dissemination within the SADC region. The generic report will be published from Rome for global consumption. FAO have agreed to contribute funds to cover the publication and dissemination of the principal project outputs.

The time and budgetary constraints of the project mean that it will be very difficult to organise and fund a Project Maturity workshop. However, it was suggested that it might be possible to organise a FAO SADC-wide workshop after the end of the project. This would serve to disseminate the project publications and raise awareness of the regional significance of the medicinal plant trade.

4 Project administration

It was always the intention for the project to work closely with identified client institutions and to contribute where possible to existing forest management initiatives. To this end each of the three lead collaborators has contacted several organisations in their country with a view to involvement in the project. There is general support for the aims of the project, a recognition of the importance of medicinal plants and a willingness to contribute to the project. Managing a project with a large number of collaborators can be problematic so a lead collaborator and institution has been identified for each country. They will in turn manage their in-country collaboration and be responsible for sub-contracts where required. The following organisations have expressed an interest in being involved with the project.

RSA - Coert Geldenhuys – ForestWood cc

- DWAF
- Dominic Mitchell
- Sisamphilo Association

-
- Sub-contracted technical staff

Zambia – Fabien Malambo – CBU

- Forest Research Division
- Kaloko Trust

Malawi – Gerald Meke – FRIM

- National Herbarium
- Department of Forestry
- Mulanji Mountain Conservation Trust

Overall co-ordination of the fieldwork in southern Africa will be undertaken by Coert Geldenhuys. Other inputs will be managed directly by Wild Resources and includes:

RSA - Jolanda Roux – FABI

UK – John Hall – SAFS

UK – Eric Boa – CABI

Germany – Christoph Kleinn - Göttingen

FAO – François Ndeckere

DWAF and FAO are making contributions in kind to the project in the form of staff time, logistics and publication costs. Budgets have been prepared with each of the lead collaborators and daily charge out rates, subsistence and transport rates agreed. In addition budgeting, accounting and reporting procedures have been explained and agreed with the lead collaborators.

It has been agreed with all responsible for fieldwork that as far as possible local people particularly those involved with bark harvesting will be engaged on field teams. Daily rates for this type of work has been agreed. In addition a small sum will be made available at the end of the project to be used to make a contribution to the development of the community in appreciation of their contribution to the project.

5 Use and trade in bark

During the workshop we talked to many people directly involved in bark harvesting. Most of these people where harvesting for medicinal purposes but we were informed that the heaviest bark utilisation in Zambia and Malawi is for bee-hives, coffins and for fibre. It was agreed that medicinal use would be the primary focus of the project but that bark harvested for other uses would be included when encountered.

The Durban market it appears that there are considerable quantities of bark and this represents at least half of the material offered for sale. However, the use of roots seems to be at least as important as bark in Zambia according to the evidence of recent harvesting encountered in the forest. The Herbarium in Zomba reported that 90% of herbalists report collecting roots with only 14% collecting bark. The project will retain its focus on bark harvesting but the extent of root harvesting will be recorded in the inventories.

The three countries apparently occupy different positions in relation to bark demand, harvesting intensity and trade. Understanding these differences can provide entry points for institutional arrangements for sustainable bark harvesting. From the brief discussions held in each country the following profiles emerged. It is the intention to examine bark harvesting practices and market chains in more detail to identify the best entry points for bark management and also the socio-economic impact of changing harvesting systems.

RSA is in the situation where the small indigenous forests are under intense pressure to supply urban demand. Here many herbalists buy wholesale from the Durban market and the

harvesting and trade is dominated by market traders who are themselves not herbalists. The Sisamimpilo Association has been formed among the market traders who can negotiate with DWAF for harvesting permits. It seems that many Sisamimpilo members originate from the villages close to the forests where harvesting is undertaken by family members. Market chains are therefore short and Sisamimpilo could control harvesting in the forest. The existing bark project identified market traders as the best entry point for sustainable bark harvested and consequently little work has been done with either rural or urban based herbalists in terms of sustainable bark harvesting. Sisamimpilo is relatively young and is struggling to develop institutional structures in response to the changing relationship between the traders, DWAF and the forest. This provides us with an opportunity to examine the winners and losers in the new institutional arrangements and the extent to which bark harvesting practices are changing as a consequence.

Malawi has little forest and high rural population. The many herbalists report that they collect their own materials but will buy plants they can't locate from fellow herbalists. There are a few stalls in Zomba market which are used as dispensaries with only a small amount being sold to other herbalists. There is commercial collection from the forest on contract to South African or Malawi dealers for the Durban and other RSA markets. Herbalists sell the material in a processed form (ground and sieved) at low prices as a supplementary income. The herbalist we spoke to reported selling 80kg of material to South African traders every few months. The same herbalist reported that two species had already been lost from the area and others were endangered though it was not clear that this was solely because of medicinal harvesting. There are a few larger scale harvesters supplying RSA. The District Forest Officer in Machinga reported that he had issued a single annual license for medicinal collection for which he charge 1000 kwacha (~£5). The licensee was to his knowledge exporting at least 800 kg of medicinal material a year to RSA. It was reported that much of the exports from Malawi do not reach the Durban market but are traded from town to town in rural areas in northern RSA. In Malawi herbalists associations are many, weak and ineffective, traders are not organised or easily located so the best entry point might be the local herbalists/collectors especially in co-management forest blocks.

Zambia has a strong national Association of herbalists that was constituted by government 25 years ago and is reputed to have 40,000 members. To practice in Zambia a herbalist has to carry an Association membership card and follow a code which includes best plant harvesting practices (unfortunately we were not able to see these). Misdemeanours are investigated by the association and violations are punished by removal of membership and even prosecution by the police. Members are permitted to enter any Forest Reserve to collect medicines. Most collection is for personal use with sharing between herbalists but reputedly no commercial trade or sale. However, we were in Copperbelt and given the voraciousness of the South African demand it seems likely that commercial collection is present in the east of the country. It also transpired that all of the Association members we spoke to (the Kitwe and Copperbelt Executives) had personally visited the Durban market though it was not clear if they had been buying, selling or visiting for training. Harvesting intensity even close to Kitwe did not appear to be excessive but even so the Association intends to establish 'farms' in each region for medicinal plants. In this case the best entry point would probably be the Association with an emphasis on developing sustainable management for bark with the possibility of meeting local demands and perhaps export to RSA.

On the basis of these findings, it was decided that the project should investigate some of these trade chains especially the RSA dominated trade which probably draws from or influences trade across the whole of southern Africa. Our Malawian collaborator has offered to track cross-border trade at the Manza border with Mozambique and Mwani border with Zambia. This will be complimented with internal market chain analysis and discussions with herbalists and foresters. This trade has apparently not been previously quantified.

6 Experimental protocols, site and species selection

Bark harvesting experiments on three species were initiated in the Groenkop and Witelsbos study sites in July 2001. Both of these sites were visited by the project team to evaluate the protocols and to review the results.

The experiment had five treatments (five trees per treatment):

- season (dry and wet),
- tree size (10-19, 20-29 and 30+ cm d)
- strip width (5, 10 and 20 cm) x 1 m long
- bark removal (complete and on the other side of the tree only the outer bark)
- tree seal was applied to the lower half of each strip

Experience with these experiments indicates that it is possible to determine the response of the tree to harvesting after six months and certainly after a year. It is clear that trees have characteristic responses to bark harvesting. Within the three species tested three response types can be identified: edge growth, sheet growth and no response (see below).

There is a need to do a full analysis of the experimental data including the most recent assessment. This has been included as an activity within the project as is continued monitoring of the experimental trees. It was also apparent that a better understanding of wound response and bark anatomy would greatly assist the interpretation of results so a literature review of these topics was also included as a project activity.

Initial evaluation of the experimental treatments indicates that strip width and tree size did not noticeably influence the type or rate of response. Partial bark removal was difficult to do, only provided small amounts of bark, was difficult to assess and caused about 20-30% of the treated bark to die. The application of a proprietary tree seal to the wound did not prevent insect attack or fungal growth and in several cases appeared to inhibit bark regrowth.

It was agreed that the protocol for the proposed project would not need to be as complex as the existing experiments. In particular it will not be necessary to consider partial bark harvesting as this will not provide sufficient product for commercial collection and in many cases it is the inner bark which is required. Strip width did not influence response and all that is needed is an indication of the type and rate of response so a single strip width will be used.

Results of seasonal effects are not yet available from RSA but it seems likely that season will have an influence because of the presence of sap in the bark, increased risk of fungal attack in the rainy season and the effects of surface desiccation in the dry season. Therefore season will be retained as a treatment and the enhanced risk of fungal attack investigated by FABI.

The objectives for the extension of these experiments in the proposed project are to determine the rate and type of bark harvesting. It is hypothesised that this will be influenced by species, season and bark maturity and therefore these are the treatments in the experiments.

Since the number of treatments has been reduced to two (season and tree size) the number of trees in each block will be increased to 20 to give greater power in the analyses. Thus 80 trees will be required for each species tested. The final selection of species to be used in the experiments will be dependant on the availability of trees within the study sites which won't be determined until preliminary site surveys are completed. However, the species will most probably be drawn from the lists given in Table 4. These lists were drawn up in consultation with the herbalists and from existing sources such as the lists of medicinal plants prepared by the Kaloko Trust and the

National Herbarium in Malawi. All are preferred bark species that occur in sufficient density within the forest for experimental treatment.

Visits were made to six potential experimental sites and all were considered suitable for the project. In order to provide a comparison with RSA, a seventh site, Mulanji Mountain was selected without a field visit. The arrangement of sites permits the examination of species responses across that part of its range within the three countries as shown in Table 4.

Table 4 Site and species for bark harvesting experiments

Country	Site	Notes	Species
RSA	Groenkop	South – north transect in montane forest	<i>Ilex mitis</i>
	Witelsbos		<i>Prunus africana</i>
	Nzimankulu		(<i>Ocotea kenyensis</i> to supplement <i>O. bullata</i> ?)
Malawi	Mulanji Mountain	East – west transect in miombo woodland	<i>Rapanea melanophloeos</i>
	Liwonde		<i>Xymalos monospora</i>
Zambia	Kaloko Trust		<i>Brachystegia spiciformis</i>
	Mwekera		<i>Dalbergia nitidula</i> <i>Julbernardia paniculata</i> <i>Parinari curatellifolia</i> <i>Pseudolachnostylis maprouneifolia</i>

In addition to the purely experimental approach, it is also acknowledged that herbalists have been harvesting bark for generations and their knowledge and practices represent a considerable body of accumulated wisdom. In order to facilitate an exchange of knowledge it was decided to include activities designed to collate traditional harvesting practices. This will involve interviews with a wide range of herbalists and other bark harvesters (for bee-hives, fibre etc). Where possible traditional practices will be trialed at the experimental sites to facilitate comparison with the experiments.

During the workshop it was possible to make a few observations of harvesting practices. In RSA bark is harvested with an axe or panga and the bark removed and sold as sheets (see frontispiece). In Zambia we observed herbalists using a wood carving adze to chip bark from the eastern side of the tree. Depending on the type of medicine to be made either all the chips or only those that fell inner bark upwards are collected. We did not observe harvesting in Malawi but the material offered for sale to RSA traders was ground and sieved rather than sheets. Observation of the damage caused by these practices suggested that the adze is easier to control and causes less trauma to the edge of the bark remaining on the tree.

7 Data handling and analysis

Experience with the FAO NWFP assessment project suggests that the Zambian and Malawian collaborators have severe constraints on their ability to handle and analyses large quantities of data. The project will seek to provide significant capacity building in this area. The project will provide desk-top computers for both institutes along with copies of project software to ensure compatibility. Support in terms of training visits will be provided during the life of the project. The final analyses and interpretation of the results will be undertaken in a workshop context to ensure that everyone has the opportunity to learn and contribute. One person from each collaborating institute will be invited to the workshops this means three people from Zambia, two from Malawi and four from RSA. Three analysis workshops are planned, one to be held in each country; local knowledge and market chain workshop in RSA, inventory protocols in Zambia and modelling in Malawi.

8 Modelling and determination of management alternatives

Devising sustainable management systems for bark does not simply entail determining the harvesting frequency on each tree but consideration of the dynamics of the species over long time periods and the impact of harvesting on tree mortality and fecundity. There are opportunities to collate data of this type from existing PSPs and monitoring studies in RSA, Zambia and Malawi.

There is a proposal with DWAF for funding for re-enumeration of the indigenous forest PSPs, these data will provide growth, regeneration and background mortality rates. The project will also fund the re-assessment of Nzimankulu Forest where an inventory was done in 2000 for bark harvested species. This re-assessment will provide data on the mortality rate in trees damaged by bark harvesting. In this forest trials were established of coppicing ability and growth rates. These will be monitored to provide coppice re-growth data.

In Zambia the project will provide funds for the re-assessment of three fire PSPs by the Forest Research Division. The Kaloko Trust established a 50 year rotation for charcoal production from natural miombo woodland in 1999. Each coupe in 1 ha in size with coppice re-growth being managed to provide the next crop. The project will fund detailed measurements of the coppice on each coupe to give an indication of coppice growth rates and stool mortality.

There are a number of established silvicultural experiments in natural miombo forest in Malawi. The project will fund the re-assessment of the control plots of these experiments. This will entail enumeration of three plots on three different sites being nine plots in all.

All of these data will be used to devise a yield modelling system for bark under a range of different management scenarios; periodic stripping, coppice re-growth and mature tree felling and stripping. It seems likely that there will need to be two parametrizations of the model for afromontane forest and miombo woodland. The model will be of use for strategic decision making at either the species or site level and will help to identify critical gaps in knowledge. This work will be lead by Christoph Kleinn.

9 Inventory and mensuration

The most critical data for management planning is the quantification of the population of a species within the managed area. This usually entails an inventory of the species in which the size and number of individuals is estimated from a statistical sample and the quantity of product represented by the population estimated usually using a regression estimator. Designing an inventory for an individual species, especially those which are relatively rare is problematic. The project intends to address this problem through a combination of computer simulation and field tests. The computer simulation will test various sampling strategies including adaptive cluster sampling on data derived from a complete census of a forest. These data are available for the southern section of Groenkop in 14.3 x 14.3 m cells covering an area of 25 ha. No such data exists in Zambia or Malawi. The project will undertake a 100% census of all species greater than 5 cm in 20 x 20 cells for a 1 x 1 km block of Mwekera Forest. The simulations will be linked to the species distributions which will be determined. Test inventories will take place at selected sites in RSA, Zambia and Malawi and the results used to advise on optimal sampling strategies for individual tree species in different environments.

Quantifying the amount of bark on the bole of a tree is a classic forest mensuration problem and is easily done once bark thickness and bole dimensions are known. However, if whole tree harvesting is advocated then it is necessary to develop bark volume tables for branches and coppice shoots. The project will undertake a few small studies on bark allometry in each country. The charcoal coupes of the Kaloko Trust and selection logging in RSA provide an ideal opportunity for bark allometry studies. At other sites less destructive sampling will be done though a few trees will be felled for detailed measurement where possible.

10 Outputs and dissemination

The plans for project outputs changed as a result of the reduction in the project budget and the instruction from FRP to hold over more peripheral work. It was agreed by the workshop that it remained important to develop training to accompany written materials as this would be necessary for uptake of new field methods. Preparing suitable training materials and experience it is hoped will also increase the chances of adoption of the new methods by the forestry departments and NGOs. Cost savings were therefore made on the testing of generic advice for NTFP inventory and management arising from experience with bark. The cost of publication is now coming from FAO making a significant saving to the project.

11 Project awareness raising

It is important that the project clients and collaborators are aware of the intended activities and timetable. During the workshop it was possible to meet with all the collaborating institutions and they strongly support the project. However, there is a need to spread awareness within these institutions and also to other clients. This will be achieved through the publication of a short flyer outlining the work of the project. This will be written in an accessible style and translated into appropriate local languages. The lead co-ordinator in each country will take responsibility for contacting the project clients they identified at the workshop.

12 Alternative sources of funding

The FRP terms of reference (TORs) for the workshop included consideration of alternative sources of funding for the project. The team considered the whole project to be of interest to other donors but that it would need to be re-packaged to meet their requirements. Several components of the project could be supported by other donors or projects.

RSA

- Application has been made to DWAF to fund PSP re-measurement, this is likely to be successful
- There is potentially support for training aspects of the project from DANIDA
- It may be possible to obtain support for community-based work from the bi-lateral DFID programme (unfortunately it was not possible to contact Paddy Abbott to discuss this possibility further)

Zambia

- The current IFAD project may be able to support some of the activities
- FINNIDA is providing training support and may be able to assist with training and dissemination

FAO

- Might be able to fund some activities under the Technical Co-operation Programme (TCP) which can provide up to USD 300,000 but this would have to be requested by the government and the application process is highly politicised

International agencies

- The INCO programme of the EU might be a potential funder but application processes are complex and no-one present knew if or when a suitable call would be forthcoming
- ICRAF (Malawi) expressed an interest in the project and have offered to assist with sourcing funding for the project
- The Copperbelt University has an on-going project with CIFOR and it is possible that they would be able to assist with seeking funding but they have no funds of their own
- The PROTA (plant resources of tropical Africa) programme in Wageningen does not have funds but might be willing to bring the project to the attention of potential donors
- RELMA publish books on plant use and may be able assist with publications

- USAID has projects in RSA but this involves lots of internal politics and is mostly concerned with carbon. The best way of attracting funds from USAID would be to link bark harvesting with AIDS or the DAI (development alternatives initiative).
- GEF may be interested in the conservation aspects of bark management as several species are CITES or red databook listed. However, the application process is very protracted
- GTZ is only funding bilateral activities and in Malawi they have no natural resources projects
- Darwin may also be interested in supporting work on threatened species such as Warburgia (on threatened list for RSA), Ocotea (endemic and protected in RSA) and Prunus (CITES appendix II)
- The IUCN SUI (sustainable use initiative) should be interested in the project but do not have funds but might be willing to sponsor the project to other donors

13 Contact details

Dr Coert Geldenhuys
Director
ForestWood cc
PO Box 228
La Montagne
Pretoria 0184
South Africa
Tel/Fax: +27 12 803-3277
e-mail: cgelden@mweb.co.za

Mr Wessel Vermeulen
DWAF IFM,
Private Bag X12
Knysna 6570
South Africa
Tel: +27 44 382 5466
Fax: +27 44 382 5461
e-mail: vermeuw@dwaf.gov.za

Mr Dominic Mitchell
Fakisandla Consulting
PO Box 259
Hillcrest 3650
Durban
South Africa
Tel: +27 31 765 6670
Fax: +27 31 765 7126
e-mail: interaf@iafrica.com

Mr Gerald Simeon Meke
Researcher
Forestry Research Institute of Malawi
P.O. Box 270, Zomba, Malawi
Tel: +265 524866 / +265 9911503
Fax: +265 524782
e-mail: Gmeke@frim.clcom.net

Mr Mazuba Fabian Malambo
Lecturer
Copperbelt University
School of Forestry & Wood Science
P.O. Box 21692, Kitwe, Zambia
Tel. +260-2-230923/225761
Fax: +260-2-222469
e-mail: fmalambo@cbu.ac.zm

Dr John Hall
Senior Lecturer
School of Agricultural and Forest Sciences
University of Wales, Bangor
Gwynedd, LL57 2UW
Tel: 01248 382446
Fax: 01248 354997
e-mail: j.b.hall@bangor.ac.uk

Prof. Dr Christoph Kleinn
Chair of Forest Assessment and Remote Sensing
Institute of Forest Assessment and Yield Management
Forestry Faculty of the Georg-August University
Busgenweg 5
D-37077 Goettingen
Germany
Tel: + 49 551 39 34 73
e-mail: Ckleinn@gwdg.de

Dr Eric Boa
CABI Bioscience
UK Centre
Bakeham Lane
Egham
Surrey
TW20 9TY
UK

Tel: 01784 470111
e-mail: e.boa@cabi.org

Mr François Ndeckere
NWFP branch
FAO
Viale delle Terme di Caracalla
00100 Rome
Italy
Tel: +
e-mail: francois.ndeckere@fao.org

Dr Jolanda Roux
Senior Researcher
Tree Pathology Co-operative Programme
Forest and Agriculture Biotechnology
Institute
74 Lunnion Road
University of Pretoria
Pretoria 0002
South Africa
Tel: +27 12 420 3855/3938
e-mail: jolanda.roux@fabi.up.ac.za

Catherine Nguvulu
Principal Research Officer
Forest Research Division
PO Box 22099
Kitwe
Zambia
Tel/Fax: +260 2 224110
e-mail: seedcentre@yahoo.com

Alex Njirangoma
Projects Manager
Kaloko Trust
PO Box 71737
Ndola
Zambia
Tel: +260 2 621317
e-mail: kaloko@zamnet.zm

The Director
National Herbarium and Botanical Gardens
of Malawi
Zomba
Malawi

Virginia Hlengwa
Chairperson
Sizamimpilo Association
PO Box 259
Hillcrest
3650 Durban
South Africa

Jenny Wong & Gareth Davies
Wild Resources Limited
Robinson Building
Deiniol Road
Bangor
Gwynedd
LL57 2UW
UK
Tel: 01248 372211
e-mail: Jenny.Wong@wildresources.co.uk
e-mail: Gareth.Davies@wildresources.co.uk