

## editorial

### THE PEOPLE AND PLANTS INITIATIVE IN 2002 - A BRIEF HISTORY AND CONTINUED JOURNEY

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The People and Plants initiative was born in 1992 to raise capacity for the involvement of communities in conservation. One of my projects at the time was Centres of Plant Diversity, a large-scale survey by WWF, IUCN and the Smithsonian Institution in Washington to identify prime global sites for plants. The argument was that, since resources available for conservation are scarce, the identification of a network of major sites would allow a concentration of effort and a better chance of enabling a large proportion of the diversity of plant species to survive. Accounts for the 234 Centres of Plant Diversity identified were prepared by numerous contributors from many countries. One of the sections in the accounts of the sites was labelled 'Threats'. It soon became obvious on reading these accounts that there was a major international gap in conservation. Almost everywhere local communities needed to be engaged much more centrally in conservation programmes.

The concept of the People and Plants initiative grew out of discussions between Tony Cunningham, Gary Martin and myself. The other two, unlike myself, were by then both experienced ethnobotanists. UNESCO and the Royal Botanic Gardens, Kew agreed to join WWF as partners, the three organisations being seen as having complementary strengths.

People and Plants has engaged in numerous activities to build capacity in ethnobotany. Ethnobotany was identified as a keen discipline to promote because of its multidisciplinary nature straddling across the natural and social sciences. It deals with all aspects of the relationships between people and plants.

Plants growing locally, both cultivated and wild, are central to the livelihoods of most rural people in the tropics and sub-tropics. They provide people with food, fuel, construction and craft materials, medicines and many other products. Local people, especially those specialising in particular types of resource, have great stores of knowledge about the values, uses, ecology and methods of management of plants.

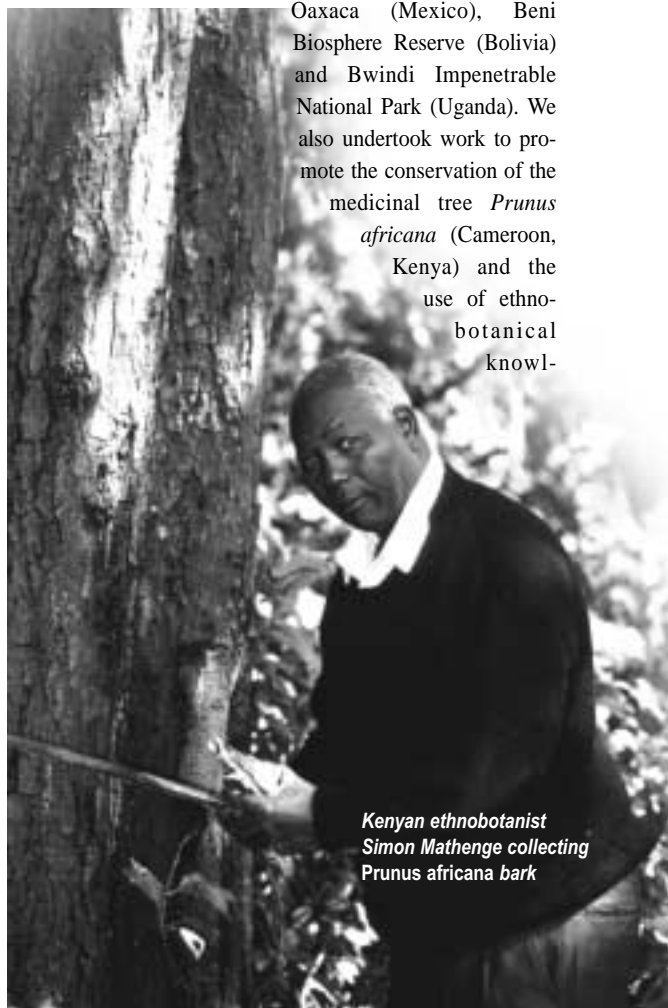
Much ethnobotanical work in the past and even today has been of a largely academic nature, often with a focus on recording the local uses of plants without any practical follow-

up. The study of medicinal plants used by more indigenous people has been a particular field of attraction.

Ethnobotany, like any science, can be used for various purposes, good or ill. Our aim in People and Plants has been to develop and promote applied ethnobotany - that is ethnobotany used to promote the sustainable and equitable use of plant resources, and the conservation of plant diversity. We are concerned about the mounting problems of shortages of plant resources faced by many communities and of threats to survival of biological diversity. We know the urgency of finding balances between the demands of the present and those of the future, and between local needs and those of wider society.

Field projects were mounted initially in the Sierra Norte,

Oaxaca (Mexico), Beni Biosphere Reserve (Bolivia) and Bwindi Impenetrable National Park (Uganda). We also undertook work to promote the conservation of the medicinal tree *Prunus africana* (Cameroon, Kenya) and the use of ethnobotanical knowl-



Kenyan ethnobotanist  
Simon Mathenge collecting  
*Prunus africana* bark

## *The People and Plants Initiative in 2001 - a brief history ...*

edge for recording plants and their distributions on Mt Kinabalu - Projek Etnobotani Kinabalu (Sabah, Malaysia). We managed to secure funding during a second phase of the programme (1996-2000), from the Danish International Development Agency (DANIDA), the Darwin Initiative (UK), the Department for International Development (DFID), the European Union (EU), the MacArthur Foundation, the National Lottery Charities Board (NLCB, UK), the Royal Ministry of Foreign Affairs of Norway and the Tropical Forest Program, US Department of Agriculture. This allowed the development of a more systematic structure with integrated programmes of activities in several regions and countries. WWF mounted field programmes in Africa, the Himalayas and South-east Asia, with Tony Cunningham, Yildiz Aumeeruddy and Gary Martin responsible as Regional Coordinators. Local Coordinators were engaged in Uganda (Dominic Byarugaba), Pakistan (Ashiq Ahmad), Nepal (Anil Manandar) and Malaysia (Rusaslina Idrus, Agnes Lee Agama). UNESCO ran complementary programmes in the Himalayas-Hindu Kush in association with the International Centre for Integrated Mountain Development (ICIMOD) in Kathmandu and in Africa. Robert Höft has played a central role in developing the African work of UNESCO. The WWF South Pacific Programme Office independently started its own People and Plants programme. Kesaia Tabunakawai has played a key role in developing projects in Fiji, the Solomon Islands and Papua New Guinea; there has been close collaboration with the wider initiative.

Each national or regional programme of People and Plants has had its own peculiarities, suited to local circumstances. However, all share the basic concept of building capacity in applied ethnobotany through engaging in 'action research' on real-life conservation and development problems. Various classes of issue have been tackled under People and Plants. The most significant of these are: (1) the resolution of conflicts over the use of plant resources at the interface between people and protected areas; (2) the promotion of sustainability in trade in wild plants - for example those yielding materials used for making crafts or as medicinals; (3) the enhancement of local botanical cultures; and (4) searches for new economic opportunities for local communities based on plants.

We have supported the training of young professionals to work with those local people who use or manage plants. We are keen advocates of the strength of partnerships between scientists or specialists in other 'modern' disciplines and local people who are knowledgeable about plants. We believe that applied ethnobotanists need to collaborate with local people at all stages of their work - for the initial identification of problems, during the gathering of information and analysis of data and in deciding on the significance of the results and how they should be applied. Young professionals trained under the programme have benefited from local supervision. Additionally, the Regional Coordinators of the programme have served as further sources of advice. They have been instrumental in

monitoring and encouraging progress and in spreading useful approaches and methodologies.

In addition to individual training, the national and regional programmes of People and Plants have built capacity in applied ethnobotany through mounting local and national workshops, running courses and organising exchanges. In these ways, we have been able to reach wider audiences. Communities, researchers and forest managers have been able to share experiences and learn about new methods. Efforts have been made to 'return results' to communities, for instance through the use of drama and popular publications.

Our success in actually achieving conservation or sustainable development on the ground has been mixed. There are many factors which influence progress in conservation at particular sites, many out of the control of projects. All countries have environmental policies and laws. Among the many policy areas of relevance to our field projects have been regulations permitting or prohibiting communities to harvest forest resources, approaches to the development of healthcare (for instance with integration of pharmaceutical and traditional herbal medicine in some countries), protocols for researchers and the level of royalties due to the government for harvesting forest products. We have tried to identify lessons from our field experiences to inform those responsible for setting policy at higher levels.

Activities under a multi-regional project have been designed to allow the sharing of experiences, approaches and methodologies between regions and countries. We publish four series of publications - books, Working Papers, Handbooks and Discussion Papers - the details of which are given elsewhere in this Handbook. We have tried to make every effort to make publications widely available, being aware of the shortages of information in many developing countries. Publications have been produced in English, with several also in other languages, notably Chinese, French and Spanish. Much of the editorial work on these publications has been undertaken by Martin Walters, Robert Höft and Gary Martin. Our series of conservation books has had its ups and downs. The original publisher Chapman and Hall sadly ceased business. The series is now in the hands of Earthscan, which has a special interest in environmental matters. The Working Papers have been published and distributed by UNESCO. The idea of a series of Handbooks was conceived by Gary Martin, with the first seven issues being thematic and containing information on issues and institutions, and opinions presented. With Gary now moving on from the People and Plants team, we have decided that the series should continue, but with a different purpose and format, focusing more on our own work.

We have launched our own website, which now constitutes a very useful resource for information in Ethnobotany and Economic Botany. Largely through the forward-thinking of Tony Cunningham we have started to produce videos, mainly to demonstrate field approaches and methods. We are entering into an arrangement with the Natural History Book Service to make these videos more widely available.

### The present programme

People and Plants entered its third 4-year programme phase in January 2001. There have been a number of institutional changes. WWF-UK has replaced WWF-International as responsible for the programme within WWF. There has been clarification of the role of the Royal Botanic Gardens, Kew, which is concentrating on information aspects of the programme notably hosting the website and providing information in support of field activities. Funding for the work has been received by WWF and UNESCO from the Department for International Development (DFID, UK) and the Ford Foundation, but parts of our planned programme still await financial support.

We are continuing with major national projects in Nepal and Pakistan. The project in Nepal is being coordinated by Yeshi Choden Lama based at the WWF office in Kathmandu. As previously, Yildiz Aumeeruddy is continuing her role as an international advisor. The project in Pakistan is coordinated by Project Director Ashiq Ahmad Khan of WWF Pakistan, with Zabta Khan Shinwari as Project Coordinator. Professor Pei Shengji of the Institute of Botany, Kunming, China is serving as international advisor. Both of these projects are taking forward work started under the previous phase of People and Plants and are described in greater detail elsewhere in this Handbook. The main focus of the work in Nepal is conservation, sustainable production and use of medicinal plants. The main issue being explored in Pakistan is how to involve communities in forest management to better ensure forest conservation and continuing supplies of forest products.

One of the major purposes of our current work in Africa is take forward a campaign to promote the use of 'Good Woods' by the carving industry in Kenya. Shortage of slow-growing hardwoods in Kenya has already forced woodcarvers to move through a succession of species as current favourites become depleted. Smaller sizes of trees are being used and forests degraded. Our aim is to break through this spiral of decline by achieving a switch to sources of wood that can be sustained. In collaboration with the carvers, we are now placing special emphasis on the development of a system of labelling for carvings. The idea is to link this back to areas where wood is produced sustainably. We have already identified alternative species of trees which are available in quantity and which yield suitable wood. These are neem, grevillea and mango, all fast-growing and, as it happens, introduced. There are opportunities for farmers to develop new tree-crops. We are now working with the Soil Association, a recognised certifier under the Forest Stewardship Council, to develop ways of certifying trees on farmland.

In Uganda, we are exploring how to support the development of integrated health-care. People in Uganda, as in many other countries, use both orthodox and traditional, mainly plant-based, medicine. It makes sense to develop national healthcare systems drawing on all medical traditions. The link to nature conservation is through the need to maintain supplies of medicinal plants.

Efforts are being made during this final phase of People and Plants to draw out 'lessons learnt' for wider dissemination. We are exploring how best to identify 'recommended approaches and practices' and how to promote them. We are concentrating on three case-study themes: (1) conservation and wood-carving; (2) conservation and sustainable use of Himalayan medicinal plants; and (3) plants and the interface between people and protected areas. We intend to use our findings to promote effective networks for plant conservation, especially in the tropics, with their existence continuing beyond the life of People and Plants. The lead is being taken by Tony Cunningham, with Yildiz Aumeeruddy taking special responsibility for the case-study on Himalayan medicinal plants.

We shall continue to produce further publications and videos. Several new titles in our conservation book are nearing publication, and we have plans for more Working Papers and videos. Some of the publications will appear in Chinese or Spanish. The website will be further developed.

As the WWF Programme Coordinator of People and Plants, I would like to express my appreciation for the efforts of the many people who have contributed to the programme. I believe that People and Plants is playing a small part in helping to meet some of the major conservation challenges of today. Personally I have learnt a lot from my colleagues and will surely continue to do so.

*Thank you.*

*Alan Hamilton  
Programme Coordinator for WWF*



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## **People and Plants Handbook: Issue 8** **The newsletter of People and Plants**

The People and Plants Handbook is a source of information on applying ethnobotany to conservation and community development. Previous issues have been thematic. This issue is different, focusing mainly on our own work under the programme. Our intention is to draw attention to the range of materials which we have produced, and to encourage their use. We are also particularly anxious to receive your news and advice about our current activities, in particular relating to approaches and methods for the development of 'best practices' and for the teaching of applied ethnobotany.

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## PEOPLE AND PLANTS COUNTRY PROJECTS: AN INTRODUCTION TO OUR FIELD PROJECTS

The field programme has had to cut back from that originally planned, due to financial constraints. This is much regretted with respect to Sabah (Malaysia), the South Pacific and Kenya, because we know that the work planned there would have contributed significantly to the development of local capacity in applied ethnobotany. In each case we are aware of the presence of well motivated and knowledgeable people who have much to offer. The projects which were planned would have covered important classes of conservation issue not tackled elsewhere in the programme.

An outstanding conservation question in Sabah is how to conserve forest biodiversity and ensure sustainable use of forest resources in the face of massive pressure from industrial logging. The South Pacific is a region where applied ethnobotany has special and hopeful opportunities to contribute to conservation and development, given that nearly all of the land is under communal ownership. Kenyan forests are particularly vulnerable because of their small total extent and political pressures for degazettement. I would like to thank Rusaslina Idrus, Agnes Lee Agama, Balu Perumal, Geoff Davison and Kesaia Tabunakawai, among others, for their tremendous contributions to People and Plants in the past, and hope that they can find new ways of supporting the ground-breaking work which they have started.

Despite these lost opportunities, People and Plants is moving forward with extensive field activities in a variety of conservation contexts. We are continuing with a demonstration project at Ayubia National Park, Pakistan, with the particular goal of gathering information useful to the Forest Department and communities as they move towards collaborative management. We are undertaking several small-scale activities to try to take some of the pressure off the forests, namely promotion of tree nurseries and more efficient wood-stoves, and environmental education. We are supporting staff in a number of universities to train ethnobotanists to build up a body of professional talent in applied ethnobotany. This will be vital for the success of future conservation.

Nepal has long accepted the principle of community involvement in the management of its forests and Himalayan pastures. However, there has been relatively little emphasis on non-timber forest products. Our focus is on the conservation and sustainable use of medicinal plants, an important issue in Himalayan Nepal where people rely mainly on plants as sources of medicines and where many families gain substantial income from the sale of wild-collected medicinal plants. Our main case-study site is Shey Phoksundo National Park, where we are working with local communities to develop management systems for medicinal plants appropriate to local social, economic and cultural circumstances. In parallel, we are supporting the development of local health-care based on the Tibetan tradition, for example through assistance with the creation of new health-care centres. The innovative approach of this project is engaging considerable attention. We are now trying to distil lessons from this experience and promote the conservation and sustainable use of medicinal plants and related improvements in health care more widely in the country.

Our project in Uganda, like that in Nepal, focuses on medicinal plant conservation in relation to health care. Attention is being directed particularly to the development of traditional health care as an integral part of the national health-care system. Our activities follow up early work by People and Plants on the use of medicinal plants at Bwindi Impenetrable National Park, including assess-

ments of the sustainability of collection. The project is being implemented largely by the Department of Community Health at Mbarara University of Science and Technology, a university founded on the principle of serving the needs of rural communities.

We are now reaching the concluding of a training programme for applied ethnobotanists from eastern and Southern Africa. Robert Höft provides an account in this Handbook of the reasons why such training is so urgently needed. He draws on a case-study at Ragati Forest, Mt Kenya. Robert provides anecdotal evidence which demonstrates why local communities have to be involved in forest management in tropical Africa. He shows convincingly that there is much need for more ethnobotanists, professionally trained to work effectively with communities and departments of governments.

Alan Hamilton

## WORK IN PAKISTAN

### Towards forest conservation and sustainable plant use

The purpose of the present 4-year phase of the project is to strengthen the abilities of communities in Pakistan to conserve biodiversity and use plant resources sustainably. It is a capacity-building project in applied ethnobotany, aimed at building individual capacity, curricula and networks, and at achieving practical results.

Ayubia National Park (ANP) is a model research project site. It is recognized as one of the best patches of moist temperate forest in Pakistan. Located in the western Himalayas, the site is considered to be globally important for biodiversity conservation, the species diversity among both animals and plants being high.

The vegetation of ANP is a mixture of coniferous and broad-leaved tree species, including *Pinus wallichiana*, *Abies pindrow*, *Cedrus deodara*, *Taxus baccata*, *Quercus dilatata*, *Aesculus indica*, *Ulmus wallichiana*, *Prunus padus* and others. However, due to human intervention, populations of broad-leaved species such as *Quercus* and *Ulmus* have declined. Being very resilient, *Pinus wallichiana* and *Abies pindrow* have colonized large areas, leaving seemingly little space for broad-leaved species to grow.

About 42,000 people live close to the park, and have great dependency on the park for timber, fuelwood and fodder. The area receives heavy snowfall in winter and, due to the harsh climate, fuelwood consumption is very high. About half of the population rears livestock to meet their requirements of milk, and to plough their fields for cultivation. Cattle are grazed in the forest during the summer and are stall-fed on stored fodder during the winter.

As no cheaper substitute is available for either fuelwood or fodder, and its illegality, poor local people, especially women, regularly visit the park to cut grass and collect non-timber forest products such as fuelwood, mushrooms and wild vegetables. Some of these practices are badly affecting the park's vegetation, as conflicts with guards force the women to collect as much as possible quickly without any concern for further supplies of the resources. Illegal trade of timber from the park is also on the rise, which is causing heavy damage to the vegetation. The situation is becoming worse day-by-day and the park's vegetation will soon no longer be in a position to sustain the pressure of the ever-increasing population in the surrounding area. In addition, Guzara forests (a legal category of forest designation) outside the park lack a clear status, plant resources in Guzara have declined due to an absence of clearly-defined tenure and management.

Considering the importance of these forests for biological diversity and the complexity of resource use, WWF-Pakistan implemented the first phase of the current project in 1997. The project focused at first on providing a good base of factual information relating to patterns of plant use, creation of an atmosphere of trust between project workers and communities and encouragement to local communities and government agencies to achieve better communication. In addition to work at local level, the project site was also used during this initial phase for national training courses in applied ethnobotany, so that the project could benefit from the experiences of the participants and *vice versa*.

The project has moved to address the more immediate needs of the local communities and to reduce the pressure on resources in the park by establishing nurseries of multi-purpose tree species for the creation of private fodder/fuelwood plantations. Fuel-efficient stoves have been introduced, and an awareness programme instigated to raise local awareness of the importance of using plant resources sustainably. The current second phase of the project is concentrating on contributions to:

- (1) achieving greater sustainability of plant-resource use at Ayubia National Park;
- (2) the wider development of applied ethnobotany internationally, including the establishment of a People and Plants Partnership programme;
- (3) strengthening professional and institutional (especially educational) capacities in applied ethnobotany in Pakistan.

The Ayubia National Park component has been maintained as a model, one aim being to encourage the development of agreements between the communities and the Forest Department for the joint management of Guzara forests. The intention is actually to develop a model which could be adopted by the Forest Department. The Ayubia project team is operating from an office near the park.

The first meeting of the Advisory Group constituted for the second phase of the project was held on May 8th, 2001. The roles of the Advisory Group are to provide guidelines for the project, review the performance and evaluate all proposed grants. The Advisory Group will continue to meet periodically.

The first Thematic Workshop on Ethnobotany Applied to Participatory Forest Management was held on May 7-8, 2001. The purpose of this workshop was to determine the role of ethnobotany in improving Forest Management in Pakistan. Proceedings are available. The main objectives of the workshop were:

- (1) to review the Forest Management system in the context of recent developments in various conservation approaches/tools, especially ethnobotany;
- (2) to formulate recommendations, based on the experience of participants, that may help the relevant agencies to improve upon the existing management of forest resources. Papers delivered at the workshop were on:
  - ◆ Overview of Forest Management in Pakistan
  - ◆ Role of Ethnobotany in Participatory Forest Management
  - ◆ Participatory Forest Management in China: case-study from Yunnan Province
  - ◆ JFM and its Implementation in light of the lessons learned from other countries
  - ◆ Processes towards participatory forest management and roles for ethnobotany
  - ◆ Review of JFM/Participatory Approaches: a Review
  - ◆ IUCN's approach to JFM
  - ◆ Analysis of joint and traditional/conventional Forest Management in NWFP
  - ◆ Joint Forest Management and Policy reforms in NWFP
  - ◆ Local communities and biodiversity conservation in Ayubia National Park.

These presentations were followed by group discussions and the formulation of recommendations. A second Thematic Workshop (on land tenure and resource ownership) is planned for August 2002.

## Resource centres

Six resource centres of reference materials are to be established at strategic locations around the country. Four such resource centres are already established: Quaid-I-Azam University, NWFP Agriculture University Peshawar, AJK University Muzaffarabad and Karachi University.

## Grants for training, research and reviews

Nine short-term grants (3 months) and three long-term grants (2 years) have been awarded. It is anticipated that work under some of the small grants will evolve into larger studies to be appointed by the longer-term grants. Many of the grants are for students registered at M.Sc. or M.Phil. levels. One grant supports an exceptional student at PhD level to work on fodder at Ayubia (where she will also contribute to practical conservation activities). Assistance is provided to supervisors to enable them to visit field sites.

## Review of ethnobotany in Pakistan

The review will include identification of priorities for future work in applied ethnobotany. Possible topics for sections of the review were finalized by the advisory group. Scientists will be invited to contribute. Sections proposed include:

- ◆ the historical background of ethnobotany in Pakistan
- ◆ community-based ethnobotanical work in Pakistan
- ◆ capacity building in applied ethnobotany
- ◆ indigenous knowledge of plant use
- ◆ indigenous knowledge about wild relatives of major crops.

## Introduction of Applied Ethnobotany course in Universities

The project promotes teaching of applied ethnobotany in universities and colleges, partly through the provision of grants to prepare case-studies for use as curriculum materials. Basic syllabi for two universities, North West Frontier Province (NWFP) Agricultural University and Azad Jammu & Kashmir (AJK) University, have already been developed, and these are being taught. A national workshop on curriculum development was held with the participation of the majority of teaching staff of all universities in Pakistan as well as international participants contributing. Networking among scientists and professors in all the universities of Pakistan is being encouraged and resulted in the formation of the Pakistan Ethnobotanical Society (PES). Key areas for a national review of ethnobotany in Pakistan have been identified. An advisory group is helping to guide the Project.

## Ayubia National Park component

Work on Ayubia National Park is under way to develop this as a model of conservation strategy involving all stakeholders. Advisory committees, both male and female, are established in each village, and the terms of partnership with all stakeholders are signed and implemented. Pressures on natural resources are reduced through two main strategies:



- (1) Nurseries of fast-growing tree species (*Robinia pseudoacacia*). Plants are transplanted onto private farmlands to provide additional sources of firewood.
- (2) Providing fuel-efficient stoves that save more than 40% of wood, at subsidized rates.

The major research activities at ANP are: a study of pair-wise ranking of various important fodder species from the park; a study of the extent of damage to various timber species caused by biotic factors; design for a study of village environmental history and analysis of the agricultural calendar.

Nursery raising of fast-growing multipurpose species was started again in 2001, and 15 more nurseries have been started with the help of local communities, in addition to 52 nurseries already established over the last two years. Based on local preference and recommendations of the project's International Advisor, some other multipurpose species like *Ailanthus altissima* (Darawa), *Salix* spp. (Bins), *Aesculus indica* (Bankhor), and *Populus* spp. (Sufeda) have also been selected for nurseries, in addition to *Robinia pseudoacacia* (Kikar). The nurseries were also fenced for protection against damage by livestock. Initially some seedlings in nurseries suffered due to the drought, but later conditions became favourable with the arrival of monsoon rains.

The distribution of a design of fuel-efficient stove selected from among the eight designs introduced by the project was continued in the target villages. By June 2000, 87 such stoves had been installed in these villages. The target is to produce and distribute 200 more stoves in collaboration with NRCP, Galliat. The trained fuel-efficient stove manufacturer will continue to produce these stoves locally, and these will be installed by the project staff. These stoves will be provided to the people on a 50% price subsidy.

The project further developed linkages with an ERNP Project called Natural Resource Conservation Project (NRCP), Galliat which already has a joint partnership with the Ethnobotany Project in promoting the use of fuel-efficient stoves in Malachh and Toheedabad villages. NRCP has now agreed to increase the number of fuel-efficient stoves to 300 from an initially agreed 200 stoves. It has also committed support to the project by providing seedlings of multipurpose tree species and fruit trees for plantation in the target villages. This partnership established between the two projects will not only be beneficial for both the projects in achieving their goals but will also have a big impact on the conservation of resources at the park.

### Promotion of indigenous knowledge through children

In addition to excessive collection of fuelwood and fodder, another major issue in the area is that local knowledge related to resources is fast eroding, probably due to outward migration and the influence of urban culture. The result of this is that people do not have a strong link with wild plant resources and therefore lack the incentives for protecting them. Health-care facilities in the area are poor, due to lack of infrastructure and the non-availability of traditional medicines.

With this in mind, the project also decided to involve school children in different educational activities, to raise their awareness and to revitalize indigenous knowledge. In order to achieve this, ethnobotany clubs were established in local schools. These were used as a forum for the children to learn more about the plants around them and their importance, through various activities designed by the project. In addition to other benefits, these clubs also provided the students with extra-curricular activities.

The general objectives of the Ethnobotany Clubs are to: enhance and propagate children's knowledge about the plant resources of Ayubia National Park; to develop skills among children so that they can identify plants and the problems related to their unsustainable use; to bring positive

attitudinal change among the students for the success of future conservation initiatives in the project area.

After the establishment of Ethnobotany Clubs in six schools, various activities were undertaken by the project over the last four years. These focused mainly on plant identification and learning about the uses of plants. Lectures on the importance of plant resources at the Park and the need for their sustainable use were delivered in schools by the project staff.

The students were provided with display boards with photographs of useful plants from the park with captions showing their names (both local and scientific) and local uses. They were also provided with notebooks and asked to collect new plants and to record information about these plants after consultation with their elders.

Visits to the park were arranged for the students, to improve their observation skills and to identify plants. During these visits, students were also informed about various conservation issues at the park. Training workshops were also arranged for male and female teachers in environmental education to build their capacity to run the environmental education programmes in their schools. Quiz competitions and debates were set up among member schools on issues related to the degradation of plant resources, and students were given prizes for best performances. A booklet was also developed, based on the indigenous knowledge of plants, to revitalize this knowledge among children in order to make them realize the need for conservation.

### Benefits to livelihood security and relief of poverty

It is hoped that the project will improve the local economy and livelihoods of the people. The introduction of multipurpose tree species and fuel-efficient stoves will help to ensure regular availability of fuelwood and fodder which are the basic subsistence needs. Sustainable use of forests and preservation of the natural environment will promote tourism and thus create more jobs for the local people, which will help reduce poverty in the area. Plant products like mushrooms and wild vegetables will be available in abundance in the protected natural environment and thus have a positive impact on both the local economy and livelihoods. The project conducted a workshop on off-season vegetables and provided seeds and vegetables. Local people also obtained jobs with the project itself, and some were involved in manufacturing fuel-efficient stoves and nursery raising, which also had a positive impact on the local economy.

### Meeting with community representatives

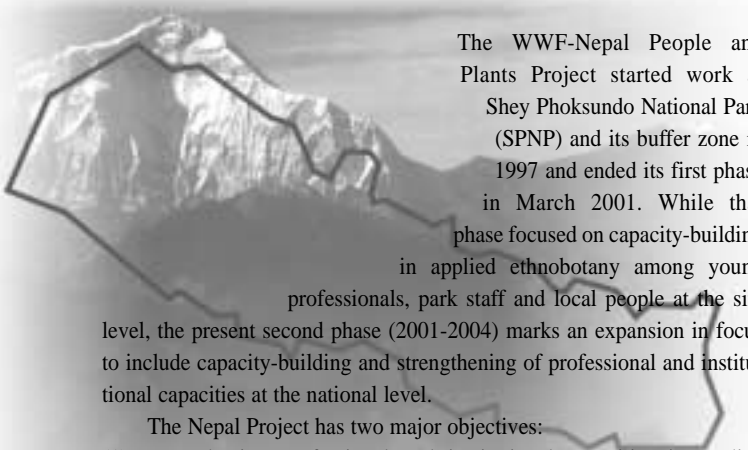
In May 2001 a meeting was arranged by WWF-Pakistan (Nathiagali Office) with local stakeholders to restructure the Project Advisory Committee (PAC). Community representatives, mostly from the villages of Malachh and Pasala, participated in the meeting. The achievements of the project and future plans were discussed. New members were selected, and the purpose and role of the PAC was identified. A schedule of meetings was also set. Local People praised the role of the project in identifying their concerns relating to use of plants and the practical steps taken by the project to address various related issues. People also showed their interest in the rehabilitation of Guzara forests and establishing fruit orchards. Prof. Pei and Dr. Alan Hamilton also shared their experiences with local people regarding JFM. It was decided to:

- (1) make the PAC an effective and representative committee;
- (2) hold another meeting with senior officials of the custodian departments to discuss issues related to the JFM of Guzara forests.

Zabta Shinwari

## WORK IN NEPAL

### Medicinal plant conservation and sustainable use



The WWF-Nepal People and Plants Project started work at Shey Phoksundo National Park (SPNP) and its buffer zone in 1997 and ended its first phase in March 2001. While that phase focused on capacity-building in applied ethnobotany among young professionals, park staff and local people at the site level, the present second phase (2001-2004) marks an expansion in focus to include capacity-building and strengthening of professional and institutional capacities at the national level.

The Nepal Project has two major objectives:

- (1) strengthening professional and institutional capacities in applied ethnobotany in Nepal and contributing to the wider development of ethnobotany both nationally and internationally;
- (2) strengthening management systems for medicinal plants and primary health care at SPNP and other localities in Nepal.

A new field officer, Mr Tilak Dhakal, was hired in March 2001 to facilitate SPNP field activities. Tilak has extensive experience in community development, especially in the field of health care. The major targets of the project specifically for SPNP remain the development of a community-based management system for medicinal plants and the improvement of local health care through building up the capacities of amchis (traditional doctors) and women.

A second Traditional Health-care Centre (THCC) has been initiated at Dho Tarap in Upper Dolpo, following up the establishment of an initial centre within the park during the first phase of the project. There is strong commitment of the Cristal Mountain School at Dho Tarap to help with the coordination of this project, and it was decided that the THCC would be built in an area which is adjacent to the school. Mr. Tilak Dhakal has been providing training in Primary Health Care to a group of women in Phoksundo VDC. However, although some progress has been made, some field activities have been delayed due to the tragic demise of the Nepalese Royal Family in June and the consequent instability in the country. The strong presence of Maoist guerillas in Dolpo has also affected activities, particularly with the cancelling of a field trip due in June 2001. This had some effect on the training of members of the Medicinal Plant Management Committees responsible for monitoring the impact of the use of medicinal plants by the Traditional Health Care Centre at Phoksundo VDC, and on the monitoring of permanent field plots in the high pastures known as Gunasa. The finalisation of the Operational Plan of the THCC has also been delayed.

At the national level, a meeting was held in June for the development of curricula in applied ethnobotany in Nepal and a group was formed with

representatives of key institutions in Nepal related to the training and management of medicinal plants. This involved Tribhuvan University, the Institute of Forestry, the Asia Network for Small Agricultural Bioresources (ANSAB), the Department of Plant Resources, the Research Centre for Educational Innovation and Development (CERID), the Ethnobotany Society of Nepal (ESON), and the King Mahendra Trust for Nature Conservation (KMTNC). The aims of this group are to:

- ♦ review present curricula in ethnobotany, and discuss prospects for curriculum development;
- ♦ conduct a review of ethnobotany in Nepal;
- ♦ participate actively in national training workshops;
- ♦ participate in an international workshop on curriculum development in Pakistan in May 2002.

Decisions concerning the national capacity-building activities of the project were taken at the meeting and led to the announcement of the availability of MSc research grants, information about which was then circulated to relevant university departments. Candidates were selected in September 2001 and field work initiated in October 2001. Among the grantees, a young professional, Ms Shobha Sherpa, was selected to carry out further research on the trade of medicinal plants in Kanchenjunga. She has already completed a master's degree on medicinal and aromatic plants in the Kangchenjunga Conservation Area.

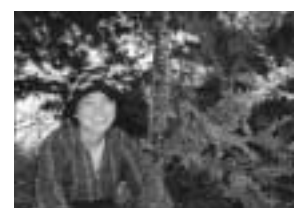
A first national training workshop in applied Ethnobotany on the theme 'Community-based Approaches to Conservation of Medicinal and Aromatic Plants in Nepal', was held at the Institute of Forestry, Pokhara (9-12 October 2001). This proved very successful.

The People and Plants Project team has attended two workshops, one being on the 'Conservation Assessment of Medicinal Plants' (CAMP) and the other on the sharing of national and regional experience in the conservation of medicinal and aromatic plants in January 2001. This was organized by the Medicinal and Aromatic Plants Program in Asia (MAPPA) of the International Development Research Centre (IDRC). At the regional workshop for sharing experience, the project team presented a poster about its project at SPNP and, in particular, a method for the rapid assessment of the vulnerability of medicinal plants used by the traditional health-care centre.

A major achievement to date was the publication in December 2001 of a book 'Medicinal Plants of Dolpo: Amchis' Knowledge and Conservation' by Yeshi Choden Lama, Suresh K Ghimire and Yildiz Aumeeruddy-Thomas, in collaboration with the Amchis of Dolpo. Copies were distributed at a Conference of the Himalayan Amchi Association in January 2002. Besides chapters on ethnoecology, the Dolpo amchi medical tradition, trade and conservation issues and guidelines, this book contains descriptions of 100 species of medicinal plants, with information on their ecology, uses and conservation status. The book is in English and Tibetan.

The project is moving ahead relatively smoothly in spite of the political instability in Nepal. In particular, the launching of activities at the national level is proving a success. However, it remains very important to maintain a strong focus at the field level. Indeed, the two THCCs and the development of community-based management systems will still require support and further institutionalisation before they are fully autonomous.

*Yildiz Aumeeruddy-Thomas  
and Yeshi Lama*





## WORK IN UGANDA

### Primary health care and medicinal plant conservation in Bwindi, SW Uganda

A four-year project linking primary health care with medicinal plant conservation has now become operational. It is being implemented largely by the Department of Community Health, Mbarara University for Science and Technology and will operate around Bwindi Impenetrable National Park. It builds on earlier studies supported by the People and Plants Initiative on the sustainable and safe use of medicinal plants from multiple-use zones within the national park as well as surrounding areas.

#### Background

Traditional African systems of health care and 'modern' medicine are based on different views of health and disease. Traditional medicine takes a holistic approach, with disease or misfortune seen as the result of an imbalance between the individual and the social environment. This contrasts with the technical and analytical approach taken by modern biomedicine. It is therefore not surprising that the use of traditional medicines continues, even where modern medical care is available. This difference in outlook is also a reason behind the often uneasy relationship between traditional and modern medicine.

Well-trained traditional healers fill an important gap in the psychological health-care system, which is generally neglected in modern biomedicine. The belief that nothing happens by chance, but is subject to influence by others, whether people in the present or ancestral spirits, is central to this aspect of plant use. For perfectly logical reasons, it is important to determine the cause of a particular illness or misfortune. Determining the root cause of such problems and guarding against them is the role of the diviner rather than the herbalist, with diviners using plant and animal species for their important symbolic value. Traditional midwives have a separate role again, using a wide range of herbs and playing an important role in home childbirth throughout Africa.

Given the complementary roles of traditional herbal medicine and modern biomedicine, it would seem important to strengthen research on the medicinal values of plants, among the reasons being:

- ◆ to achieve local community or national self-sufficiency in health care through the promotion of locally available and culturally acceptable herbal medicines;
- ◆ to reduce over-consumption and/or abuse of pharmaceutical drugs and encourage more rational drug use through the promotion of herbal drugs as safer alternatives. This requires that health-care personnel recognize how and what people use traditionally. It also means being aware of cases where people use modern pharmaceuticals in a traditional way;
- ◆ to reduce national dependence on costly, and usually imported, pharmaceuticals;
- ◆ to record toxic traditional medicines so that traditional healers might be persuaded to substitute them with safer plants or reduce quantities administered; and finally
- ◆ to find and promote safe and effective traditional medicines for common illnesses such as childhood diarrhoea.

Traditional healers have been recognized in Uganda and some other African countries. Also, African universities and public and private institutions are today involved in research into traditional medicine. However, progress in achieving goals such as those above has been very slow. Despite the scientific relevance of the clinic-oriented approach and research studies on the scientific validation of herbal drugs, the results of

this research have made little contribution either to systems of public health or to improvements in traditional medicine. Two main reasons are suggested for this failure:

- (1) the high cost (in terms of both time and money) of the scientific validation of even a single herbal medicine. This means that, in spite of raised expectations, few results can be achieved;
- (2) the low level of coordination among the many interested parties involved in the laboratory studies of medicinal plants.

#### Goals and purpose of this project

The purpose of this four-year project is to strengthen the abilities of communities to conserve biodiversity and use plant resources sustainably (Box 1). The project aims at developing capacity in ethnobotany for primary health care and medicinal plant conservation around Bwindi Impenetrable National Park (BINP), through field projects, training, institutional development, the production and distribution of information and materials, and promotional activities. Two grants are supported:

- (1) a Master's study on the topic of ethnoepidemiology linking public health and plant use; and
- (2) a PhD study on patients' health-seeking behaviour and the choices made at clinics between traditional healers and allopathic health care.

In this way, the opportunity arises to contribute not only to ecosystem health and conservation, but also to public health and the integration of traditional healing methods into Uganda's national health system.

Due to the political circumstances, little research was carried out in south-western Uganda during the Amin/Obote period, but, since the mid-1990s, projects have been on the increase. These include studies related to a campaign against human onchocerciasis, on measures taken in food preparation, fermentation and use herbal medicines to treat diarrhoea, on HIV epidemiology and on the control of tuberculosis. There also have been recent studies on the determinants of nutritional status, child mortality and the attendance and patient satisfaction at eye clinics in south-western Uganda.

Support has previously been given by the People and Plants Initiative to 13 students at MSc level and 1 at PhD level for work on critical issues of resource use at BINP. Studies of particular relevance to the use of medicinal plants have included work by:

- ◆ Kamatenesi Mugisha (1997) on the utilization of the medicinal plant *nyakibazi* (*Rytigynia* spp.) in the multiple-use zones of the national park;
- ◆ Medius Kyoshabire (1998) on medicinal plants and herbalist preferences around BINP; and
- ◆ Balaam Mugisha (in prep.) on the efficacy of three species of anthelmintic plants.

According to traditional healers living adjacent to BINP, malaria, respiratory tract infections (RTI), internal parasite infestations and diarrhoea are among the most common health problems.

The current human onchocerciasis (river blindness) campaign in Uganda takes a practical, long-term, community-directed approach based on the drug ivermectin. Where it succeeds in providing treatment at the desired level of coverage (i.e. 90% of the annual treatment objective, which is itself equivalent to all those individuals eligible to take ivermectin), this is due to the involvement of community members in programme planning and execution (and the resultant sense of pride in community ownership). Public health-care programmes can be similarly effective based on the support of traditional healers and local community support. For example:

- ◆ Internal parasite infestations: Internal parasite infestations amongst people are high in the BINP area. Based on stool samples, researchers found that 89% of people had roundworms (*Ascaris*) and 34% whip

## BOX 1. PROJECT GOALS AND ITS LINKS WITH THE WIDER PEOPLE AND PLANTS PROGRAMME.

The project component on primary health care and medicinal plants conservation follows up on earlier work by the 'People and Plants' programme in Bwindi, SW Uganda (see [www.rbgkew.org.uk/peopleplants](http://www.rbgkew.org.uk/peopleplants)). It aims to:

- ◆ build capacity in applied ethnobotany and community health care in Uganda for the sustainable use of medicinal plant resources and the provision of primary health care services;
- ◆ strengthen the capacity of Mbarara University for Science and Technology (MUST), particularly its Department for Community Health;
- ◆ increase local recognition of the Institute of Tropical Forest Conservation (ITFC) through provision of direct benefits to adjacent communities.

worms (*Trichurus*). Herbal medicines, particularly the bark of *Rytigynia* species, are used to treat these infestations.

- ◆ Eye disease: Traditional healers can be valuable in the identification of eye diseases and can help to provide an understanding of the cultural beliefs and practices relating to them. In some cases they can deliver eye care at community level. Although some traditional treatments for eye diseases can produce ocular damage and visual loss, many practices are not harmful, and some, such as the use of *Aloe ferox* leaf sap to treat conjunctivitis, may be beneficial.
- ◆ Malaria: In Tanzania, a recent study showed that most of the interviewed traditional healers were very familiar with signs and symptoms relating to malaria, as it is defined by western medicine. Many healers were aware of the different manifestations of malaria and gave them different local names, which match the scientific categories for the different types of *Plasmodium falciparum* malaria, such as cerebral, clinical or febrile type and gastrointestinal malaria. Differences between traditional healing ideas and western medical knowledge were founded on concepts of causation, and in the fact that severe malaria in children may not be so perceived. A similar situation appears to be the case around BINP, although this requires further investigation.
- ◆ Diarrhoea: In a survey of over 4,000 children of up to two and-a-half years of age in south-western Uganda, poor nutritional status and diarrhoea were found to be related to specific socio-economic and environmental factors. The most important of these factors were similar in many communities around BINP. These include the distance from a health unit, living in a household unable to hire labour and living in one in which family members worked on other people's land. The influence of the lack of access to medicinal plants from BINP needed for the treatment of diarrhoea is unknown.
- ◆ Dental care using chewing sticks: Dentists are scarce in many parts of Africa, particularly in rural areas. Although diet plays a major role in the incidence of dental caries, the practice of dental hygiene is also considered to be important. While toothpaste and toothbrushes are widely used by those with a high level of formal education, toothpaste consumption is still low and chewing sticks are commonly used in many parts of the country, particularly West Africa. In other areas, even if people prefer to use toothbrushes, toothpaste is not used because of its high cost or local unavailability. The continued access to popular and effective sources of chewing sticks, which have antibacterial properties, is important as a primary health-care measure. Several plants are used for dental care around Bwindi.
- ◆ Childbirth: Traditional Birth Attendants (TBAs) and traditional healers form an important link in the chain of health personnel providing primary health care in Uganda. In spite of the establishment of hospitals and health centres, it is to these traditional healers and TBAs that the majority of people turn in times of sickness and childbirth. It is

therefore important that due regard be paid to the activities of these traditional practitioners.

The project provides a good opportunity to make the connection between ecosystem health and public health. These links are increasingly well known from other localities with regard to parasitic diseases. In South America, for example, the incidence of Chagas' disease increased when the insect host (*Triatoma infestans*), which preferentially sucks blood from forest animals, began increasingly to infest the houses of impoverished Andean migrants. This occurred progressively as forest lands were cleared for farming and as forest animals were reduced by hunting and habitat loss. Links between habitat change, agriculture and onchocerciasis are also well known. This is as relevant to south-western Uganda, where there is an active annual, mass, community-directed, ivermectin-treatment programme (CDITP) against onchocerciasis.

In montane south-western Uganda, local people, whether healers or not, widely recognize the recent increase in cases of malaria, which was formerly absent from these highlands. The cause of this increase is thought to be primarily climate change resulting from the cultivation of valley bottoms and the extension of settlements rather than more general global warming. These environmental and demographic changes have been compounded by periods of high rainfall, such as the abnormally heavy rainfall that favoured a severe epidemic in 1994. A recent study assessed the effect of land use change on malaria transmission in the south-western highlands of Uganda. It compared mosquito density, biting rates, sporozoite rates and entomological inoculation rates between eight villages located along natural papyrus swamps and eight villages located along swamps that had been drained and cultivated. Since vegetation changes affect evapotranspiration patterns and thus local climate, they also investigated differences in temperature, humidity and saturation deficit between natural and cultivated swamps, finding that on average all malaria indices were higher near cultivated swamps, although differences between cultivated and natural swamps were not statistically significant. However, maximum and minimum tempera-



tures were significantly higher in communities bordering cultivated swamps. The average minimum temperature of a village was significantly associated with the number of *Anopheles gambiae* s.l. per house. On this basis, it was suggested that the replacement of natural swamp vegetation with agricultural crops led to increased temperatures, which may be responsible for elevated malaria transmission risk in cultivated areas.

### The next steps

Besides Mbarara and Makerere Universities as well as UNESCO, representatives from THETA (Traditional and modern Health practitioners together against Aids and other diseases) and JCRC (Joint Clinical Research Centre), among others, will help to guide the project. This will ensure that the work conducted fills existing gaps and contributes to generating meaningful and applicable results.

A first group of 4th-year students from the Community Health Department have completed their community placement in Bwindi. The findings of the research will help to formulate more precisely the subjects of the two research projects. Interviews for the two study grants will be held. Meanwhile UNESCO has prepared a draft document to ensure that research protocols recognize the Intellectual Property Rights (IPRs) of research participants, particularly traditional healers, as stipulated by the Convention on Biological Diversity (CBD).

**Robert Höft  
and Tony Cunningham**

*Ekibina kiengozi kihikire omukazi  
wenda bakuza omwirwario ningashi  
owomuzarisa owekiragaju*



## WORK IN KENYA

### TOWARDS COMMUNITY-BASED FOREST CONSERVATION

Since 1998 the UNESCO Nairobi Office has supported twelve Master's or PhD level students from eastern and southern Africa to conduct research applied to conservation and rural development.

With funding from the Norwegian Royal Ministry of Foreign Affairs, the students have worked on practical questions relating to natural resources management. The research aimed at studying current systems of forest management, identifying scarce and valuable resources and, through discussions with resource-users, finding ways of managing these resources more sustainably. All researchers focused on the conservation of forests as these are threatened by uncontrolled harvesting, encroachment and conversion to agriculture.

The progressive degradation of Kenya's forests, for example, is alarming. Kenya is a country with a low forest cover. These forests, however, provide vital resources, income to neighbouring communities and unknown possibilities for future uses. What is currently being observed is a continuous reduction in forest area and quality.

Students funded within the UNESCO component of People and Plants are therefore required to work closely with national and local authorities as well as forest resource-users. This article describes research and community development activities from Ragati Forest on the foothills of Mt. Kenya. The following are excerpts from interviews published by a newspaper in Kenya.

*"For the last ten months I have gathered information on forest resources collected by local communities"* says Florence Ngari, who has since completed her dissertation at the Botany Department of Kenyatta University (KU). *"The main resources collected by women include fuel wood, fodder, forest manure, thatching material, basketry material and medicinal plants. Amazingly, some resource-users get a value of up to KSh 20,000 [approximately US\$ 275] per year from the forest."* This figure does not include income from charcoal or timber, as these are usually male activities.



Ms Ngari surveyed the quantities of the various forest resources gathered by 34 households who had agreed to collaborate in this study. The focus was on non-timber forest products. These resources are often overlooked and undervalued and, unlike timber trees, management systems are rarely established.

*"A valuation of resources from forest ecosystems often fails to take account of the full spectrum of forest products and services since many of these have been perceived as being insignificant or non-marketable"*, explains Ngari.

She adds that local resource-users increasingly face difficulties to obtain the required products. With forests being converted to agricultural areas or illegally 'creamed' for valuable hardwoods, people have to travel larger distances to obtain products and even they can be of poorer quality.

"The forest edge is being pushed up the slopes of Mt. Kenya, out of people's reach" deploras an elderly lady who remembers having easy access to firewood in the vicinity of her home.

"The forest down here is of poor quality. I am worried about the survival of some of Kenya's rare plant species", Ms Ngari continues. "One plant in the coffee family, *Ixora scheffleri* ssp. *keniensis*, locally known as 'Muthioya', is found in Ragati and nowhere else in the world. It is so rare that botanists feared that it was already extinct. I found that the tree still grows in some forest islands but it is highly valued for charcoal. We have to find out more about this species and inform local resource-users about its uniqueness", she adds.

To obtain accurate scientific information on the distribution of 'Muthioya' in Ragati is the task of Ms Rebecca Ngumburu: "I have a grant from UNESCO to follow up on Ngari's research. We have to know how many individuals of this extremely rare plant are still left, where they grow and how they can be propagated".

Using high-tech equipment which allows Ms Ngumburu to locate her precise geographic position in the forest, she has sampled the area systematically, counting and measuring these rare plants.

While underway for the whole day both Ms Ngari and Ms Ngumburu have to leave their young children behind. "Our work is physically demanding", they disclose after a five-hour walk in rugged terrain, "and it is psychologically very difficult to do such research while leaving the baby behind. But we are motivated because our research can benefit the people and the country".

To really benefit people locally, it has been realized that one must inform them of the results of such studies and discuss possible solutions. UNESCO therefore organised several workshops in Ragati, during which the scientists held discussions with local resource users. Ms Ngari informed them of the outcome of her research and led a discussion on their view of sustainable resource management.

"We are very pleased to be informed and consulted", says a workshop participant. Like the scientists, the resource-users are also concerned about the future of this forest. "It used to be our forest, now it is 'mali ya serikali' [government property]. We have no say on what happens in the forest. If we had land we would plant trees for harvesting in the future".

Following the socio-economic and ecological surveys conducted by postgraduate researchers, and the discussions of problems and possible solutions, four community groups have registered in Ragati. A women's group, a youth group, a group of elders and a group of charcoal burners have formed and set up nurseries to produce the trees they require themselves. Nursery space has been provided by the local Forest station as well as by individuals from the community.

In 1999, UNESCO started discussions with the Kenyan Forest Department (FD) to define the conditions under which registered community groups can be allowed to plant their trees on land belonging to the Forest Department. Advantages for FD would have been the income from land lease and the production of trees without using FD resources and consequently reduced illegal activities in natural forests. The community groups would benefit from producing and harvesting forest resources, reduced dependency on FD licensees, and security of supplies. Before agreements were concluded, the area was in June 2000 gazetted as a National Reserve to be managed by and under the authority of the

Kenya Wildlife Service (KWS). Meanwhile UNESCO is in discussion with KWS concerning the lease of land to the same community groups, for the above mentioned mutual benefits. However, regardless of the managing authority, the community groups have increased cost and labour with no immediate returns until the trees are ready to harvest. UNESCO therefore assists them to overcome these difficulties and advocates the interplanting of so-called carrier species, fast-growing trees that provide income after only three to five years.

The agreements being coined in Ragati are likely to provide examples to be followed in other areas in the country. UNESCO hopes that they could also increase local people's responsibility for the natural forests and the environment at large.

Robert Höft



*Ixora scheffleri*



Florence Ngari discussing results of her MSc study with local resource users

## MT. KENYA BIOSPHERE RESERVE: CONSERVATION CONCEPTS ON TRIAL

### Background

Situated on the Equator, Mt. Kenya is an extinct volcano which rises to 5,199 m. The entire massif covers an area of approximately 271,000 hectares. It consists of a belt of moist Afromontane forest (1,800-3,200 m), which - depending on exposition, altitude and rainfall - is characterized by camphor (*Ocotea usambarensis*), pillar wood (*Cassipourea malosana*), pencil cedar (*Juniperus procera*), olive (*Olea europaea* ssp. *africana*), podo/East African yellow wood (*Podocarpus latifolius* and *P. falcatus*), bamboo (*Arundinaria alpina*) or kosso/rosewood (*Hagenia abyssinica*). At around 3,200 m the forest is replaced by a zone with tree-like heather (*Erica* spp.), which in turn gives way to the moorlands. These marshy grasslands are dominated by tussock grasses and sedges. The most striking feature of the Afroalpine zone are the giant lobelias (*Lobelia telekii*) and giant groundsels (*Dendrosenecio keniodendron* and *D. battiscombei*).

A low scrub dominated by everlastings (*Helichrysum* spp.) characterizes the areas underlain by shallow soils up to 4,000 m, above which altitude the vegetation cover fades out with few plant species adapted to the extreme climate termed "summer each day, winter every night".

The number of vascular plant species occurring above 2,000 m is estimated to be approximately 800. There are at least 11 strict endemic plant species and more than 150 near-endemics. The forests of Mt. Kenya may contain another 100 regional endemic plants.

### Resources

The mountain is an important catchment reserve with numerous minor streams supplying water to the people cultivating the lower slopes. These streams feed into the Tana and Uaso Nyiro rivers, which together supply water to more than a quarter of Kenya's human population and more than half of its land area. Mt. Kenya's tourism potential has been growing steadily, with park revenue just over 1 million shillings in 1987 and almost 5 million shillings in 1991.

The forests on the lower slopes are exploited for timber. Large-scale felling and the establishment of monoculture plantations of Mexican pine (*Pinus patula* and *P. radiata*) and cypress (particularly *Cupressus lusitânica*) have depleted much of the natural forest on the lower slopes. Illegal small-scale felling and charcoal production still take place in the forest.

### Protection status and management

The zone above 3,100 m has been a National Park since 1949 and includes two corridors extending into the lower zone, bringing the total area of the park to 715 km<sup>2</sup>. It is surrounded by the Mt. Kenya Forest Reserve (199,538 ha) which was declared a protected area in 1932 and upgraded to National Reserve in June 2000. Since 1978, an area of 71,759 ha, almost identical to the National Park, has been nominated as a Biosphere Reserve. No zonation system was established at the time. Much of the forest at lower altitudes had been selectively logged and is disturbed or secondary. Some 18,800 ha are under forest plantation. The World Heritage site (142,020 ha), inscribed in 1997, encompasses the entire Mt. Kenya National Park and an equally big area of the National Reserve above the 2,400 m contour line.

Introduced by the colonial administration in the first decade of the 20th century, the 'shamba system' (derived from the SE-Asian Taungya system) deployed resident

labourers to cultivate plots of land allocated to them and to interplant forest trees with food crops. Currently, the Kenya Forest Department (FD) allocates forest plots to farmers for a period of five years. They are allowed to plant crops for two years; in the third year they are supposed to interplant tree seedlings provided to them by FD and to tend them for another 2-3 years until the lease ends.

An agreement has been reached between the Kenya Wildlife Service and the Forest Department to jointly manage selected forests in Kenya. For Mt. Kenya Forest Reserve, a joint management team was established in 1993, which collaborates on law enforcement, fire fighting and problem animal control. Following the Kenya Indigenous Forest Conservation Programme (KIFCON 1991-94), a project on Indigenous Forest Conservation and Management (COMIFOR, 1995-1998) established a detailed map of Mt. Kenya's forest types and developed management recommendations.

### Cultural significance

In the Kikuyu culture, Mt. Kenya is the home of God.

"According to the tribal legend, we are told that in the beginning of things, when mankind started to populate the earth, the man Gikuyu, the founder of the tribe, was called by the Mogai (the Divider of the Universe), and was given as his share the land with ravines, the rivers, the forests, the game and all the gifts that the Lord of Nature (Mogai) bestowed on mankind. At the same time Mogai made a big mountain which he called Kere-Nyaga (Mount Kenya), as his resting-place when on inspection tour, and as a sign of his wonders. He then took the man Gikuyu to the top of the mountain of mystery, and showed him the beauty of the country that Mogai had given him. While still on the top of the mountain, the Mogai pointed out to the Gikuyu a spot full of fig trees (mikoyo), right in the centre of the country. After the Mogai had shown the Gikuyu the panorama of the wonderful land he had been given, he commanded him to descend and establish his homestead on the selected place, which he named Mokorwe WA Gathanga. Before they parted, Mogai told Gikuyu that, whenever he was in need, he should make a sacrifice and raise his hands towards Kere-Nyaga (the mountain of mystery), and the Lord of Nature will come to his assistance." (Jomo Kenyatta: Facing Mount Kenya, 1938)

Mt. Kenya also includes numerous sacred lakes, rivers, trees, saltlicks and ceremonial sites. Many of these have been destroyed or desecrated through (partial) destruction and conversion of forest area.

### The 'actors'

Mt. Kenya is in the centre of one of Kenya's most densely populated areas with about 200,000 people living along the forest boundary. Deep soils derived from volcanic ashes and metamorphic rocks support intensive agriculture.

The main agricultural produce from Mt. Kenya's

slopes include tea and coffee, potatoes and cabbages. Most small-scale farmers are able to produce agricultural surplus for supply to the cities. Increasing population pressure led to settlement by people in the forest. In the late 1980s, an increasingly restrictive forest management was implemented and forest dwellers were forced out of Mt. Kenya Forest Reserve. Most of them were resettled along the road reserve adjacent to the forest land.

Institutions involved in the management of Mt. Kenya's resources and the administration of the human population include the Kenya Wildlife Service (KWS), the Forest Department (FD) and the County Councils. The unconditional gazettment of the former Forest Reserve as a National Reserve, triggered by alarming reports on forest destruction, transferred the management of the entire system to KWS. County Councils administer trust land outside the reserved area and decide on land issues.

### Zonation: defining management regimes

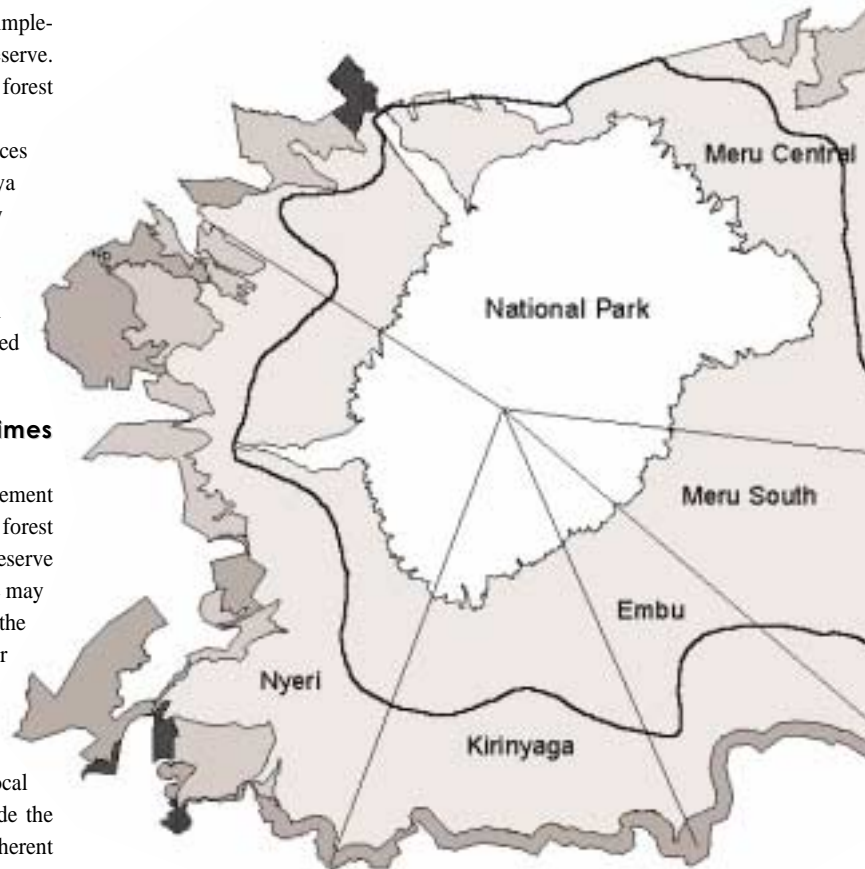
Efforts are currently underway to clarify the different management regimes of the land types of Mt. Kenya. Public concern about forest destruction and the need for a periodic revision of the Biosphere Reserve status have led to a re-consideration of the current boundaries. These may lead to an increase of the strictly protected area: currently, only the national parks area, i.e. 71,500 ha, is strictly protected. Another 70,520 ha of the National Reserve are part of the World Heritage site, but lack a management plan. The remaining National Reserve area has in the last decades suffered from *ad hoc* management decisions of rotating foresters, often with limited knowledge of the local ecological and social conditions. Current activities therefore include the preparation of a management plan for Mt. Kenya forest and a coherent zonation system in which the parts of the Forest Reserve which are designated as World Heritage site or core area of the Biosphere Reserve are protected, while those defined as buffer zones provide resources for the local and national needs.

### From research to management action

Few quantitative studies existed on the forest resources used by forest-adjacent residents, their needs and the impact of resource harvesting. In a number of subsequent research projects supported by *People and Plants*, detailed information was gathered on the species and quantities of plant material harvested for fuelwood, basketry, medicine, thatch and fodder. The extent of charcoal production in the forest was also mapped and the species preferred were listed. Incidentally, not only was *Ixora scheffleri* ssp. *keniensis*, which had been feared extinct, rediscovered in the course of these studies but it was also found to be highly valued for charcoal production.

Results of these studies were presented to participating community members and the conclusions arising from discussions were as follows:

- ◆ people, and particularly women, were extremely unhappy about the relationship with representatives of Forest Department and Kenya Wildlife Service. Extra payments and sexual favours were allegedly being requested for services and resources that were due to be provided for free or for a set fee;
- ◆ the licensing system was reported to be subjective and dependant of the applicant's relationship with the officials;
- ◆ there was no attempt by government to clarify its procedures or price scales;
- ◆ forest extension services were difficult to access for men and virtually absent for women;



- ◆ in summary, Forest Department was perceived as corrupt and incompetent and was considered to not even pretend to provide the services it was supposed to furnish.

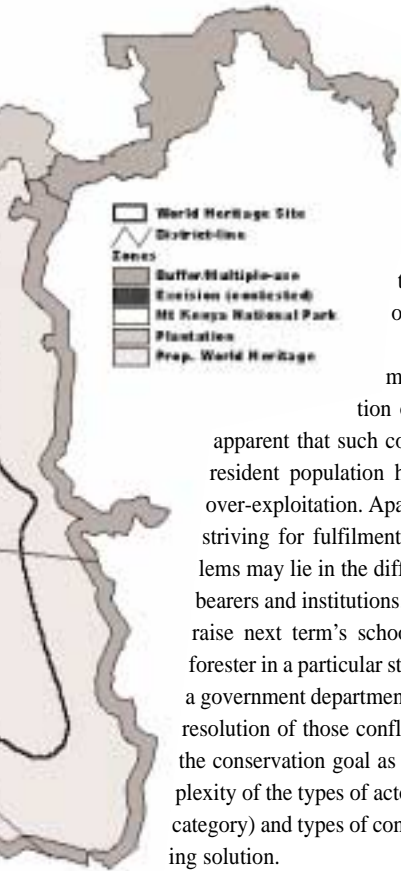
Local resource user groups were anything but keen to enter discussions with the Forest Department and subsequently with the Kenya Wildlife Service. However, through the mediation of the *People and Plants* project user groups were encouraged to negotiate ways of satisfying their needs for forest products. As a consequence, a pilot project is now underway in which e.g. groups of former charcoal producers plant the fast-growing *Casuarina cunninghamiana*, which yields excellent charcoal, on bare forest land. Equally, women's groups start plantations with trees of their choice (primarily for firewood and fruits) on degraded forest land. The groups applied for long-term leases which would entitle them to manage the trees according to the group's decisions with FD playing an advisory role.

### Short-term benefits

Resource user groups have begun to invest in tree planting, with economic returns beginning to accrue only after 3-5 years. Meanwhile, other income-generating activities have been set up including sales of tree seedlings (e.g. Kei-apple, *Dovyalis caffra*, is under high demand for the establishment of hedges), collection of seeds for sale, beekeeping, increased diversification of agricultural produce and eco-tourism.

### Existing conflicts

It is not surprising that various types of conflicts arise between the various players depending on or managing Mt. Kenya's resources. Conflicts exist between individuals (such as farmers vs landless people),



with representatives of managing institutions (e.g. forest user vs FD Officer) and among institutions (e.g. County Councils promoting forest excisions to settle landless people vs the forest conservation goal of FD and KWS). Their existence tends to dominate all management/conservation activities, thereby inhibiting both sustainable development and conservation.

It is obvious that ultimately development cannot be achieved without conservation of the natural resource base. It is equally apparent that such conservation cannot be assured without the resident population having economic alternatives to resource over-exploitation. Apart from conflicts originating in individuals striving for fulfilment (including economic success), the problems may lie in the different time-horizons of individuals, office-bearers and institutions. These reach from the individual's need to raise next term's school fees through the three-year term of a forester in a particular station to the long-term conservation goal of a government department. development one could conclude that the resolution of those conflicts would have positive repercussions on the conservation goal as well as on development. Due to the complexity of the types of actors (many of which fall into more than one category) and types of conflicts, no single measure can lead to a lasting solution.

Let us look at conflicts that exist between two individual forest resource users, e.g. a beekeeper and a charcoal burner: the beekeeper requires standing trees to hang the hives as well as flowering trees for bee fodder to produce honey for sale. Operating in the same area, the charcoal producer will fell suitable hardwoods and turn them into charcoal for sale. While they both strive for an income from forest produce, their activities are incompatible.

### Activities underway to reduce the conflict:

Beekeepers who are trained to adopt new techniques (e.g. use of modern hives instead of loghives from forest trees; honey harvesting without tree felling and use of fire) are being recognized as conservation agents who can assist in reducing forest destruction.

Charcoal burners usually operate at night in difficult situations and have a rate of efficiency as low as 10% (i.e. 10 kg of wood produce 1 kg of charcoal). The distance away from the transport routes and likelihood of being detected dictates their choice of tree species. This leads to the use of less than ideal species for charcoal production and therefore poor quality charcoal which fetches lower prices and compels the charcoal burner to produce more. Efforts underway make groups of charcoal burners responsible to set up and manage plantations of trees particularly suited to charcoal making. This move from an illegal to a legal and from a despised to a recognized situation is attractive. However, although fast-grow-

ing species are being used, it requires a period during which additional sources of income are required. Marketing of tree seedlings from self-managed nurseries is helping to bridge this period.

### From conflict to collaboration

Conflict, if not resolved at the onset, develops into complex hostility and antagonism between the affected players, creating an environment conducive to forest over-exploitation and destruction. The knowledge that the effects of decisions about forest management made today will be seen after 25 years have made conservationists call for clear, transparent and rational decisions to be made. Results of decisions made in the mid 70s, like power-rationing as a result of forest cutting, shortage of timber from indigenous trees, and local species extinction, are now being felt. With the negative results having a real impact, stakeholders have come to see and respect each other's roles and needs, and many of them are opting for collaborative conservation ventures. The most notable examples are: the involvement of local communities in forest management as outlined in the new forest bill, and the memorandums of understanding between the Forest Department and KEFRI, Nyayo Tea Zones and Kenya Wildlife Service.

### Lessons learned

1. Forest resources are finite. Many resources have a variety of uses. Some types of uses are destructive (i.e. kill the plant) while others are not. Management systems must consider the competition for the same resource by different users and balance harvesting pressure with the species' potential for sustainable yield. Attention must thereby be given to the global conservation status of the particular species.
2. Resource use conflicts can best be addressed by open discussion and negotiation between the different interest parties. However, in such discussions the overall goal of conserving a species should be given priority to short-term economic advantages. For the identification of critical issues it is critical to have a group of experts (including local experts) from different disciplines.
3. Government mills tend to grind slowly. It is important to pursue a case over months and even years. Approval of a request may depend on a particular combination of individuals in certain offices.

Robert Höft



## BEST PRACTICE

### WORK TOWARDS A NEW PROGRAMME ONCE THE PEOPLE AND PLANTS INITIATIVE ENDS

Since July 1992, the People and Plants Initiative (PPI) has promoted ethnobotany for plant conservation through the production and distribution of several series of publications (see catalogue elsewhere in this issue), training videos and a website. These materials have been produced mainly in English, but also in Bahasa Malaysia, Chinese, French and Spanish. Many publications have been distributed to our mailing list of over 5,000 people, most of whom are working at field level in developing countries. In addition, through hands-on supervision, funding and field support, 35 young professional ethnobotanists have been trained to MSc level, 30 of these in Africa. Other results of this programme are the establishment of five national or regional ethnobotanical networks, curriculum development in nine university courses and contributions to national and international conservation policy.

People and Plants certainly has had its successes, but it was never intended to be a permanent programme. On 31 December 2004, the People and Plants Initiative will end. People who are aware of this have raised the question: what is the best way in which work of the type promoted by PPI could continue?

Nationally and locally, particularly in the tropics where the bulk of the world's biodiversity is located, despite the efforts of PPI and other innovative programmes, there is an urgent need to build up capacity at both the professional and community levels. Appropriate training is vital to address problems related to the sustainable and equitable use of wild plants, and processes leading to the conservation of plants and habitats. Field-based training, with dedicated, skilled mentors is also an excellent way of enhancing the self-esteem of local trainees in an appropriate cultural context. Recognition of indigenous knowledge and the opportunities and constraints of doing good science in the field are an essential part of this process. People trained in this way are vital for carrying forward the implementation of measures to achieve conservation and sustainable resource use.

For this reason, we are working towards the establishment of a programme for Community-based Plants Conservation. This will be set up by 31 December 2004, with a core membership of experienced and dedicated individuals from a range of institutions who have a common interest in assisting the development of integrated, ecologically and culturally-appropriate management

of natural systems through supporting training, research and information dissemination.

The programme will be coordinated from an office based in a developing country, following the very successful structure and practices of the Tropical Soil Biology and Fertility (TSBF) Programme, established in 1984, which is based at ICRAF in Nairobi, Kenya. Recognizing that a long-term commitment is needed to effect meaningful change in the complex area of community-based conservation, we will plan this programme on an initial 10-year time-frame.

As steps towards this new programme, we are undertaking studies into how more effective practices for the conservation and sustainable use of plants can best be identified and promulgated. We have chosen three themes for this purpose: conservation and sustainable use of Himalayan medicinal plants, conservation and woodcarving, and plant use and protected areas. Case studies are being completed on those two themes so that evidence-based "best practice" models can be developed on these themes.

Tony Cunningham

### THEME 1: WOODCARVING AND CONSERVATION - APPROACH TAKEN

At a subsistence level, woodcarving provides a wide range of household products (bowls, stools, utensils) and culturally significant items (drums, masks, snuff containers, headrests, kava bowls and specific stools designs) across many cultures. Subsistence-level production has had limited impact on populations of carved wood species. Over the past 40 years, however, reports of increasing scarcity of commercially carved woods have become more frequent. Increased scarcity of favoured woods for carving has occurred across a wide range of social, economic and cultural circumstances, with great variation in land and resource tenure or political circumstances. It has also occurred across tree species with varied growth-forms, growth-rates and reproductive biology. Examples of species which have been locally overexploited are: *Intsia bijuga* and *Cordia subcordata* (Fiji; Vanuatu; Samoa); *Brachylaena huillensis* (Kenya); *Dalbergia melanoxylon* (Malawi; Kenya), *Alstonia scholaris*, *Dalbergia latifolia*, *Diospyros celebica*, *Zanthoxylum rhetza* (Indonesia); *Pericopsis angolensis* (Malawi); *Polyscias fulva* (NW Cameroon); *Bursera* spp. (Oaxaca, Mexico; Indonesia); *Erythrina vespertilio* (Central Australia) and *Holarrhena floribunda* (Ghana).

Increased scarcity of woodcarving species has multiple causes. Where woodcarving species

are sourced from closed canopy forests, reduction in forest area through clearing forests for commercial or subsistence farming purposes has been a major contributor to reduced supplies of carved hardwoods. Some woodcarving species have declined due to their use for sawn timber or for other commercial uses. Sandalwood extraction for essential oils, rather than for woodcarving, has been the main reason for the decline of sandalwood populations in Hawaii (*Santalum freycinetianum*), Juan Fernandez (*S. fernandianum*), Fiji (*S. yasi*) and India, West Timor (*S. album*). In other cases, however, populations of carved wood species have increased, leading to a sustained supply of wood for carving. This has been due to deliberate tree planting or human dispersal of seed, such as *Trichilia emetica* in south-eastern Africa or the invasion of introduced, naturalized species, such as *Azadirachta indica* in East Africa or a government-initiated planting campaign of *Paraserianthes falcataria* in Indonesia.

The objectives of this series of thematic case-studies are twofold. First, through analysis of specific characteristics and situations of different carving enterprises, to understand how, when and why woodcarvers respond to carved wood scarcity. Second, to use the results of this analysis to lead to more informed decisions on resource management (whether by local communities or the state), production of woodcarving species (agroforestry, plantations), policies related to the commercial carved wood trade (forestry, tourism, development, CITES) and to the wider debate on the role of non-timber forest product (NTFP) harvesting as an incentive for habitat conservation.

In each case-study, research studies of the woodcarving industry aim to provide information useful for achieving a long-term future for woodcarvers through wise use of wood resources - as our Kenyan woodcarving video and campaign put it: a search to "save the wooden rhino". Some of the different case-studies in which we have been or are involved are as follows:

#### Kenya

The Kenyan woodcarving industry is a rural development success, but it now faces collapse through shortage of locally available hardwood stocks. Focussed mainly on exports, this industry has grown significantly over the last 80 years. The annual value of exports has expanded from £75,000 (at 1950s rates) to US \$20 million today, over half of which is exported to North America, with most of the remainder to Europe and Japan. Remarkably, this entire industry was started in 1919 by one man, Mutisya Munge, at Wamunyi in the Machakos District. Today, it is a thriving



business involving 60,000 carvers who support an estimated 350,000 people. The increasing demands of the market, coupled with the fact that many of the species used are slow-growing hardwoods, has led to the depletion of some of the favoured species. Surveys conducted under a People and Plants project have documented this decline, particularly as regards mpingo or 'ebony' (*Dalbergia melanoxylon*) and muhugu or 'mahogany' (*Brachylaena huillensis*) (Obunga and Sigu, 1996). Many of the carvers are aware of the problem of hardwood supply and the threat this poses to their future livelihoods. Some carvers have sought alternatives through cultivation or by testing the suitability for carving of other tree species. All of the most suitable alternative species identified are exotics (e.g. neem, jacaranda, grevillea, mango). One of these species, neem (*Azadirachta indica*), has become invasive in coastal forests.

Apart from sustainability of the wood base, further conservation issues include the possible genetic erosion of targeted species (as some populations are decimated or destroyed) and degradation of the Kenyan coastal forests. The latter are internationally recognised for their importance for biodiversity conservation, having many endemic species. Today only isolated coastal forest remnants remain. These face many pressures, one of which is exploitation of valuable hardwoods for woodcarving. Based on counts of logs bought by Kenyan woodcarver co-operatives, Simon Choge of the Kenya Forestry Research Institute (KEFRI) has shown that over 40,000 trees are felled each year for the carving industry. Most of these are forest species. Research by the East Africa Wild Life Society, funded by People and Plants, has shown that almost half of the muhugu logs used by the carvers at Mombasa and Malindi are hollow. Destruction of such trees poses a threat to conservation of biodiversity in the Kenyan coastal forests because of the importance of these hollows as nest sites or shelter for small mammals, birds and reptiles, several of which are endemic to this globally threatened forest habitat.

### Uganda

In contrast to commercial woodcarving in Kenya, Vietnam, India and Fiji, where hardwood species are favoured, the Ugandan carving industry uses softwood species, primarily trees in the fig family (Moraceae). Several are keystone species providing an important food source for birds, bats and primates, which are also the major agents for dispersal and pollination. They are also favoured trees for hole-nesting birds such as hornbills.

The main items which are made are traditional musical instruments: drums, harps, tubefiddles and xylophones. These are exported and sold to tourists as well as being sold locally to schools, churches and local musical groups, who keep alive Uganda's vibrant music tradition. Drums in particular are musical instruments of great significance in most African societies,



where they are used to alert people to meetings, weddings, funerals, dancing competitions, and offered as gifts during give-away-ceremonies. The Baganda proverb "Teziraya ngoma", meaning that drums are not beaten without a reason, exemplifies this. Despite changes in lifestyle, drums are still commonly used today, including for praise and worship in churches.

While subsistence production has limited negative impacts, the same is not true of large-scale commercial trade in these carvings made from favoured tree species: and the commercial trade in carved musical instruments made from rainforest canopy trees such as *Antiaris toxicaria* has grown rapidly in recent years. This increase has raised concern about the effect of this commercial trade on populations of the tree species and ecology of the small remnant tropical forests in Mpigi district. Drum makers are also concerned about the growing scarcity of these favoured tree species and the increasing time taken in locating them for harvest.

For these reasons, an MSc study funded through the WWF/UNESCO People and Plants Initiative was carried out to assess the impact of the drum-making industry on the natural (wild) population structure and supplies of *Antiaris toxicaria*, *Erythrina excelsa*, *Ficus mucoso* and *F. exasperata*, *Funtumia africana*, and *Polyscias fulva* in central Uganda. This was done in Mpanga, Degeya and Lufuka forest reserves, sites which have had different management regimes over the past 50 years.

Specifically studied were the impact on the population structure and size-class distribution of these species of highest demand, their regeneration rates and the current supply of these species. Finally, a species that can be introduced for on-farm cultivation was identified as a way of meeting local consumer demand for wood. The results showed that in all cases, the intensity of use and concentration on only a limited number of the most favoured drum-making tree species have led to some localised over-exploitation. There were significant differences in the number of mature individuals of *Antiaris toxicaria*, *Erythrina excelsa*, *Ficus mucoso*, *Ficus exasperata* and *Funtumia africana* in all the forests studied. *Polyscias fulva* however showed no significant difference in the number of mature individuals sampled in the three forests.

*Antiaris toxicaria* was the most common and abundant drum-making tree species in all the forests studied. *Polyscias fulva* was found to be among the occasional-rare tree species, especially in the mature stage.

To guarantee future supply of wood and realise the full potential of the drum-making industry with minimum further negative impacts on the forests, a move to on-farm production of the desired species like *Polyscias fulva* was recommended. This will have to go hand in hand with raising awareness of the drum-makers and seeking greater support from the Uganda Forest department and its staff.

Obunga, R. and G. Sigu. 1996. Sustainable development of woodcarving industry in Kenya. Unpublished progress report for the WWF/UNESCO/KEW People and Plants Initiative, National Museums of Kenya, Nairobi.

Patrick Omeja Aria, Joseph Obua and  
Tony Cunningham

### Zimbabwe

Woodcarving is of economic importance in many tourist areas of Zimbabwe. People and Plants has undertaken a study of the woodcarving industry in Binga district, an area where the People and Plants Initiative has also provided

training in resource monitoring to local women basketmakers. This work on woodcarving builds on earlier work by Wavell Standa-Gunda in the Masvingo area and a short-term study of the industry along the Victoria Falls-Bulawayo road by Frank Matose and colleagues (1996).

The woodcarving industry is certainly of high economic value to men in Binga district, where there has been a rapid increase in the number of stalls marketing woodcarvings along the Kamativi to Binga road. There are several points of concern about the wood species being used. The first concern is whether the use of favoured species such as *Azelia quanzensis* and *Sclerocarya birrea* is sustainable or not. If the use of these two species is unsustainable, then this may have serious long-term implications for rural subsistence in this area, as these (and possibly other woodcarving species) are multiple-use trees whose other values have been well documented for their importance in rural livelihoods in southern Africa. *Azelia quanzensis*, for example, is used for grain-stamping mortars, and *Sclerocarya birrea* is a highly productive fruit-bearing tree, a major source of Vitamin C (present in the fruit pulp), and oil and protein (in the fruit kernel) (Cunningham, 1985). Both species characteristically have poor recruitment, primarily due to the palatability of young seedlings (browsing) and to sensitivity to fire.

## Bali, Indonesia

The commercial development of the woodcarving industry in the tropics has occurred to its greatest extent in Bali, Indonesia, which accounts for the bulk of the US\$45 million worth of carvings exported from Indonesia annually. In terms of the value and size of exports, Bali is probably followed by Kenya (US\$20 million/year; 40,000-60,000 carvers), and then by India. The woodcarving industry in Bali is characterized by a wide range of types of seller, ranging from large exporters with galleries to small family businesses who show exceptional innovation, carving diversity, skill and sensitivity to new marketing opportunities. Ironically, despite the size and long cultural tradition of woodcarving in Bali, no systematic studies appear to have been previously undertaken.

In partnership with the Center for International Forestry Research (CIFOR) and working through WWF Indonesia, People and Plants is supporting a study being carried out by the Forest Products Research Centre, Bogor (Dr.



Pipin Permadi). The aims of this study are to:

- ◆ gain an understanding of the history, structure and economic value of the woodcarving trade in Bali;
- ◆ identify the species used, and how (and why) these have changed over time;
- ◆ use these data for the CIFOR Worldwide Comparison of Non-Timber Forest Products;
- ◆ review the policy issues and impacts on woodcarving industries in Bali;
- ◆ contribute to long-term study of best practice on woodcarving industries in Bali.

What we know at this stage is that woodcarving is a major income-generating activity in parts of Bali (Ubud, Sanur) and a source of export revenue closely connected to tourism. Around 19 tree species are commonly used for woodcarving in Bali and, in common with other parts of the tropics where commercial woodcarving has developed, favoured species have been depleted. Balinese examples of this are *Zanthoxylum rhetza* and *Manilkara kauki*. As a result, a long-distance trade has arisen to support the demand for hardwoods, with the importation, for instance, of *Santalum album* from Timor, and *Diospyros celebica* from Sulawesi.

Encouragingly, however, major parts of the woodcarving industry are now based on cultivated species. At the high quality end of the spectrum, large, high-priced carvings are made of *Swietenia mahogani* and *Samanea saman* (up to US\$120,000-160,000 for carvings taking 2-3 years to complete). *Swietenia* wood is mainly

imported from Java, where it is sourced from roadside and enrichment plantings (and, to a lesser extent, from plantations). At the lower quality end of the spectrum of carvings is a wide range of products made from *Paraserianthes falcataria*, a species used on a large scale only during the last 10 years. *Paraserianthes* is grown locally on steep slopes or with coconut palms along the margins of roads and fields. In this way, Bali appears to represent a remarkably encouraging example where, despite massive clearing of forest for farmland, a landscape characterized by a high density of people and a huge commercial carving trade, the bulk of the trade is based on a secure supply of cultivated trees (*Hibiscus similis*, *Paraserianthes falcataria* and *Swietenia mahogani*).

## Pacific islands: Fiji

In 1998, tourist visitors to the Pacific region (primarily to Fiji, New Caledonia and French Polynesia) were projected to rise from 880,000 in 1987 to 1 million in 1999, with a consequent increase forecast in the sale of craft products. Although the number of tourists visiting Fiji has decreased following political events in 2000, commercial exploitation of the carving tree *Intsia bijuga* is still significant. Management recommendations developed with those resource-users will be one of the major outputs of this study which ideally will be implemented through support to local communities at a pilot study level.

The participation of wood traders, woodcarvers and villagers in sites where these species occur (or occurred) is central to this study and its products. The focal species are firstly, *vesi* (*Intsia bijuga*), the sole wood source for kava (or yagona) bowls and other products. This is the most sacred tree in Fiji, yet has been seriously overexploited by the commercial timber trade. Secondly, *nawanawa* (*Cordia subcordata*), the second most important carving species, also overexploited in many parts of Fiji for the commercial trade in carvings. These two wood species, and the problem of their overexploitation are not unique to Fiji, but are also found on many other Pacific islands (Trobriand Islands,

Samoa, Tonga, Vanuatu, Pitcairn and Henderson Island). Both species are also used medicinally, compounding the social and cultural implications of population depletion.

The number of Fijian idioms comparing the hardness of *Intsia bijuga* wood and human qualities or expressions linked to *Intsia bijuga* are one example of the cultural importance of this species. For example, the chief of a particular area might be referred to as "as strong as walls of vesi" or as "strong as the vuni vesi [*vesi* tree]". Other traditional idioms are to say "Sa ciri na vesi" (the canoe is afloat) as a reply to a good-night greeting from a chief or "Sa bale na vesi" (when a chief is dead). One could argue, therefore, that loss of this wood resource also links to cultural loss should large diameter *vesi* (*Intsia bijuga*) trees (the reference point of these expressions) cease to be available.

Significant beneficiaries will be local communities at pilot study sites where 'flagshi' woodcarving species, which have immense cultural and commercial importance (for making canoes, kava bowls and household products), have been or are being overexploited. Local people and community leaders will play a key role in developing management plans for the sustainable management of these resources. Communities elsewhere with a similar interest in managing their resources will be provided with tools developed through the Project and sometimes from the involvement of people trained under the Project. NGOs working at the community level with resource owning and user communities will benefit from acquiring approaches and techniques useful for working with local communities on natural resource issues.

Cunningham, A.B. 1985 The resource value of indigenous plants to rural people in a low agricultural potential area. PhD thesis, Faculty of Science, University of Cape Town

Matose, F. Mudhara, M. and P. Mushove. 1996. Woodcraft production along the Bulawayo-Victoria Falls road. Institute of Environmental Studies working paper series, University of Zimbabwe.

**Tony Cunningham**

## THEME 2: CONSERVATION AND SUSTAINABLE USE OF HIMALAYAN MEDICINAL PLANTS - APPROACH TAKEN

### Introduction

The Himalayas, an uninterrupted mountain range of 3,500 km from Afghanistan through to Pakistan, India, Nepal and Yunnan in China, hosts a very large diversity of medicinal plants - an estimate of 7,000 species of medicinal plant has been made (Shengji 1998). With floristic elements from the Indian sub-continent and Central Asia, the diversity of this mountain ecosystem is further differentiated due to extreme altitudinal variations, intricate links between relief and climate, which are at the origin of a large number of habitats and micro-habitats (Dobremez 1976). Himalayan medicinal plants form part of the pharmacopoeia of all major traditional medical systems of the region - Ayurveda, Siddha, Unani, Tibetan (Sowa Rigpa) and Chinese - and con-

11,694 tons in 1993/94 (Bhattarai 1997). In certain areas of Nepal almost 50 percent of village populations are engaged in collection and sale of medicinal and aromatic plants (MAPs) (Olsen and Helles 1997). In Gorkha District, 25-100% of households in a given village participate in commercial collection of medicinal plants; 15-35% of the income of poor households in the northern and central parts of this district comes from their sale (Olsen 1998). Over 90% of the total export is to India, mostly in crude form (Bhattarai 1997). From India, products are re-exported to other countries, either in crude form or after primary processing, in addition to being used in the Indian Ayurvedic pharmaceutical and aromatic industries (Edwards 1996, Bhattarai, 1997, Olsen 1997). Germany, which is the major importer of medicinal plants in Europe, imports 10,055 tons of "vegetable materials used in pharmacy" from India (Lewington 1992). A survey conducted by the International Development Research Centre (IDRC) (Holley and Cherla 1998) shows that the harvesting of medicinal

plants in India is unsustainable and inequitable. Besides, the complexity of the trade circuits has rarely been studied in detail, except for a few case-studies in Nepal (Edwards 1996, Olsen 1998). This makes it difficult to make decisions at the national level for improving this situation. Olsen and Helles (1997) show that the flow of information along the trade chain is very



Traditional Health Care Centre Inauguration, Shey Phoksundo National Park, June 2000.

tribute also to a large number of less formal folk medicines. Besides being a major livelihood resource through contributing to local health, the trade of medicinal plants from the Himalayas to the plain areas is very old and forms part of a secular system of product-exchange. Over the last two decades, pressure on these often very vulnerable plants has increased dramatically. This is partly due to the new trend in Western countries for natural products and medicines, which has now expanded at the global level. The Ayurvedic industry, indeed, today produces not only medicines but also many cosmetics and food products which contain medicinal plants. In Nepal the amount of medicinal plants exported has increased from 3,448 tons in 1989/90 to

poor; collectors in production and source areas have little knowledge of changes of prices on the Indian market and are thus totally dependant on prices established by middlemen. However the simplistic idea that direct market links should be established between collectors and industries should be approached with caution because a very large number of people are economically and socially dependant on these complex trade links. Economic incentives and policies related to trade of medicinal plants are based on many assumptions which do not necessarily lead to sustainability, nor to equitability (Holley and Cherla 1998). Olsen and Helles (1997) have identified the policy situation in Nepal in relation to the medicinal plants sector as being ill-adapt-

ed to social and economic realities, "making the poorest poorer". In India, medicinal plant collection has been identified as being a more common activity among the poorest sections of the society than among richer people. People tend to abandon this activity as they get access to better opportunities such as in agriculture or other enterprises (Holley and Cherla 1998). There is at present very little knowledge of growth rates, life cycles, regeneration patterns and overall ecological requirements of most Himalayan medicinal plant species in trade (Lama *et al.* 2001). It is thus difficult to make management guidelines based on a sound knowledge of the resource.

It is within this context that work on best practices of Himalayan medicinals has been launched. The major question is: what can be done to develop more effective approaches and practices for the conservation, sustainable and equitable use of these resources? A main component of this work is to commission a number of case-studies in different Himalayan countries. These case-studies will deal with different aspects, from sustainable harvesting techniques, to *in situ* cultivation and socio-economic strategies of collectors. Two case-studies are already underway, and more are to follow throughout 2002. Collaboration and exchange of experiences and information with other organisations involved in sustainable use of Himalayan medicinals will also be a major part of the work. People and Plants will be organising jointly with the IDRC-Canada, Medicinal and Aromatic Plants programme in Asia (MAPPA) a regional workshop in December 2002.

### What are wise practices?

We are taking a step-wise approach to the development of wise practices. We start here by listing some of the specificities of the Himalayan region and their implications for wise practices. We then turn to the characteristics of the plants themselves, including their ecological features, the impact of harvest and post-harvest practices and the effects of trade, again trying to draw out implications for wise practice. We then list some tentative conclusions about specific wise practices.

In order to develop wise practice approaches for the sustainable use of Himalayan medicinal plants (HMPs), the following steps have been followed:

(1) identifying the specificities of the

Himalayan region (political, cultural and social) and related implications for management of HMPs

- (2) identifying specificities of HMPs and related implications for their management
- (3) listing major subject areas/approaches developed in the region to address the issue of sustainable management, assumptions and lessons learned
- (4) listing major interest groups to work with or who require information on this subject
- (5) drawing lessons and priorities for work in the region on HMPs in the context of the People and Plants wise ('best') practices project.

### The Himalayan region

The Himalayan region is characterized by:

- ◆ very large areas of non-arable land compared to arable land
- ◆ high biophysical diversity
- ◆ rich cultural diversity
- ◆ high poverty



Suresh Chinute identifying dried medicinal plants samples at the clinic.

- ◆ political and economic marginalization
- ◆ a diversity of political situations
- ◆ remoteness and lack of communication facilities.

The above factors have many implications as regards management. First, because of the paucity of agricultural areas in mountainous regions, major livelihood resources, such as fodder, fuelwood and medicinal plants are bound to be extracted, to a large extent, from the wild. In addition to agriculture, herding and trade, this extractive activity is a major component of the local economy, hence the need to focus on *in situ* management. Although many NGOs, national statements and international conservation groups consider cultivation as a possible solution, land is generally limited to the production of food to ensure basic livelihood security and very few

people in the region, especially among the poorest sections of the population, can risk cultivating medicinal plants on agricultural lands, especially considering market fluctuations.

High biophysical diversity implies a high complexity in management of resources, including the need to prioritize species which are rare and highly vulnerable to harvesting compared with species which are very common and more resilient to harvesting.

The cultural and social dimension requires much attention including in relation to traditional health-care systems which are well developed in the region but also regarding knowledge and know-how related to the management of resources. Many cultures are highly localized, sometimes varying from one valley to another. Taking the cultural and social dimension into consideration is a major challenge as solutions are bound to be highly site-specific. However it is important to note that none of these cultural groups lives in isolation, and that secular trade links often based on strong social linkages exist between culturally different groups (Fisher 1987). It is thus possible to think in terms of transfer of knowledge and know-how between different groups at the horizontal level, and both intercultural and cross-cultural avenues should be further explored.

Policies, throughout the region, are set by centralized governments. However, there are high contrasts between countries such as Pakistan, Nepal and India where control by the government is exerted through a system of taxes and royalties as well as a ban on a certain number of species, and a country such as Bhutan where trade of medicinal plants (except for a few species) is totally restricted. No country in the region except for India has to date established a Medicinal Plants and Non-timber Forest Products Board. Management guidelines for Non-timber Forest Products (NTFPs) are often not well developed. Nepal, India, Pakistan and China are signatories to CITES (Convention on International Trade of Endangered Species of Fauna and Flora) and in principle should enforce its recommendations. In reality it is well known that to be able to do so a high level of capacity building would be required, for forest guards and protected areas staff, to customs personnel, in order to be able to identify the species which are on the CITES appendices. Practically, this seems impossible to achieve. There are great problems of enforcing CITES and other legal forms of

trade control in this region. It is thus notable that species such as *Nardostachys grandiflora*, which should not in principal be exported in raw form from Nepal to India, is in fact generally exported raw. The ban on collection of species such as the wild orchid *Dactylorhiza hatagirea* or the fungus *Cordyceps sinensis* has generally led to large amounts of these species being exported illegally. In Bhutan the ban on *Cordyceps sinensis* and many other highly restricted species has had the effect that ten times as much of any species is harvested illegally as is harvested legally (Shawe 1997). The overall situation of existing centralized policies and their impact on medicinal plants shows that joint management systems between the state and local communities would be more suitable, in order to enforce control on resources. In India and Nepal, Joint Forest Management (JFM) and Community Forestry, which is based on a user group approach, have laid the groundwork for developing sound guidelines for the management of NTFPs. In Nepal however, inclusion of specific management and operational plans for NTFPs (such as medicinal plants from high mountains) in Community Forestry management plans is a very recent initiative and only a few Community Forestry User Groups are operating with such guidelines (CECI 1999; ANSAB 1999).

Poor people are highly dependent on wild resources and much attention needs to be given to finding solutions which address specifically the conditions of the poorest sections of society. This is a major issue because the poorest have little influence in decision-making at the community level. Yet if any effort is made to add value to the medicinal plants sector, such as micro-enterprise development, it is questionable to what extent poor people would actually benefit from such initiatives. Moreover, the assumption that it is mainly poor people who are involved in medicinal plant collection is only a broad generalization. Studies underway by Shoba Sherpa at Kanchenjunga Conservation Area in Nepal suggest that, on the contrary, rich herders, who often accompany their herds in high pastures, collect medicinal plants as a side activity. The overall social and economic strategy of medicinal plant trade collectors and how this relate to ethnoecological knowledge of the resource may differ markedly from one area to another, and has been very little studied. It is thus important to develop a number of studies in different areas on this subject. Moreover how these social and economic strategies relate to access to and control over resources is also a key area, the understanding of which would help in guiding wise approaches and the development of wise practices.

### Himalayan medicinal plants and preliminary conclusions about their management

Himalayan medicinal plants (HMPs) are characterized by a high biological diversity in terms of the overall number of species; intra-specific genetic diversity has been very little studied. Endemism in the Himalayas is relatively high due to the very dissected landscape and strong isolation of Himalayan valleys. Out of 7,000 species of flowering plants, Nepal for example, has about 300 endemics (Shrestha and Joshi 1996), which is about 5%. In terms of life-forms, studies conducted in the context of the People and Plants project in Dolpo, at altitudes ranging from 2,500 to 5,000 m, show that 74% of medicinal plants collected both by trade collectors and by traditional practitioners are herbs (Ghimire et al 2001, Lama et al. 2001). These herbs are divided into two large categories - perennial herbs and annual or biennial herbs. Most often, it is the underground part of the perennial species which is collected (Bhattarai 1997, Lama et al. 2001). The turnover period of perennial species is much longer than for annuals. This turnover period (how long it takes from the seed to production of a rhizome of collectable size) is not known. A morphological study of growth patterns of two major traded species, *Nardostachys grandiflora* and *Picrorhiza scrophulariiflora* by Suresh Ghimire (Ghimire et al. 2001) shows that growth patterns of these two species are very different, and that this factor has major implications on regeneration rate as well as on recovery after harvesting. In addition to diversity in growth patterns, species of medicinal plants vary in type of habitat, distribution pattern, microclimatic requirements, density and frequency.

Himalayan medicinal plants range from common to very rare species. Common species are often annuals which tend to be widely distributed, fast-growing, regenerate well from seed, grow in monsoonal climatic conditions and are often found in lower temperate to sub-alpine zones. Rare species usually have restricted distribution, are often perennial, do not reproduce well from seed, grow slowly and are found generally under more arid climates. They are mostly located in alpine, trans-Himalayan zones.

Out of the 407 medicinal plant species collected in Dolpo, 330 were found to grow in the sub-alpine and alpine zones above 3,000 m. Some of these species also grow below 3,000 m. (Lama et al. 2001). This result (compared to what is known for Nepal) gives a new picture of the diversity of high-altitude medicinal plants; until now only 140 were known to grow in sub-alpine and 45 in alpine zones (Malla and Shakya

1999). This indicates that not much work has been done in high-altitude areas to date in Nepal and much more remains to be discovered. Very little is known about use pattern, ecology and growth-rate, and even less about the conservation status of these high-altitude HMPs.

Implications for management are:

- (1) the need to concentrate on rare and threatened species. The groups of species which appear to be of high priority are (i) endemic species; (ii) alpine, slow-growing, perennial herbs which are traded in large volumes; (iii) annual species which have a restricted distribution and which are traded in high volumes;
- (2) consideration should be given to parts collected as well as to amounts traded to prioritise species;
- (3) management guidelines should be applicable at the species level. Ecology, growth patterns and response to harvesting of each species has to be understood.

### Harvesting and post-harvesting practices

It is generally assumed that people living in source areas have better knowledge of how to manage resources than do outsiders. However it has also been argued that indigenous communities, under pressure of population growth and changing life patterns, may over-exploit those same resources (Godoy and Bawa 1993). Studies conducted under our project at Shey Phoksundo National Park, show that traditional Tibetan doctors (amchis) do have extensive knowledge of the intrinsic characteristics of medicinal plants and have over time developed harvesting practices which tend to be sustainable. Lay people in the same area however do not have the same level of knowledge, and may in some cases mismanage resources. None of the amchis nor lay people from their communities are trade collectors because they live within the national park where medicinal plant collection for trade is restricted and to some extent controlled. On the contrary, people who have more recently migrated to this area and who live in the buffer zone of the park seem to extract medicinal plants without any apparent long-term consideration for regeneration of the resource (Ghimire et al. 2001). A more detailed survey of social strategies of trade collectors in relation to ethnoecological knowledge and issues of access to these resources is underway. Post-harvesting practices throughout the region are known to be very poor, with major problems of storage and consequently large amounts of wastage.

We have provisionally concluded that elements of wise approaches and practices for the

conservation and sustainable use of Himalayan medicinal plants should:

- (1) draw on the existing local knowledge by specialist users (e.g. amchis);
- (2) draw on the results of ecological and morphological research, including growth patterns and rates;
- (3) establish formal systems of access and control over resources based on joint management systems between the state and local communities (where there are protected areas);
- (4) work with those people who are actually involved with resource collection (whether poor or rich), as well as working at the overall community level where decisions are not necessarily made by those who collect resources.

## Trade

Problems related to trade and the impacts of trade on conservation and development include:

- ◆ little information is available on price variations in production areas;
- ◆ products are exported raw without adding value that could benefit the communities;
- ◆ there can be conflicts of use and management between collectors for trade and local health practitioners;
- ◆ trade requires large volumes of products;
- ◆ the trade circuits are highly complex, and national rules and regulations are often not respected;
- ◆ there is much secrecy, especially when species are illegally collected;
- ◆ adulteration is common, and closely related species are often lumped under the same trade name.

Major ways of mitigating the negative impacts of trade on the sustainability of resources at the source are to:

- (1) work with collectors in the context of Community Forestry or Joint Forest Management to develop management plans for collection;
- (2) make information about prices and market fluctuations available to collectors to enhance their power in negotiations;
- (3) add value to the products within the local community while making sure this does not alienate local communities through the development of costly enterprises and does not affect the resource base. Such approaches have been attempted by NGOs in Nepal such as the Asia Network for Small-Scale Agricultural Biotechnologies (ANSAB) and the Canadian Centre for International Studies and Cooperation in Nepal (CECI-Nepal);

- (4) encourage cultivation. This has been attempted by many projects, but to our knowledge there are no major projects which have proved able to yield large quantities of slow-growing, high-altitude species. *In-situ* enrichment planting should be encouraged due to limited access to agricultural lands.

At the national and international level, systems of green labelling and certification or kite-marking should be developed which return benefits to collectors for their management efforts. This is a particularly difficult issue as it would require some control over the chain of custody, which means having full traceability from point of harvest to point of sale.



Gyatso Bista with a *Meconopsis paniculata*

## Himalayan Medicinals: Some tentative conclusions about wise practices

The following tentative conclusions about wise practices are provided to stimulate discussion with interested parties. Depending on the situation, it may be realistic at field level only to work on some of these aspects.

1. Work should focus on in situ management of wild resources.
2. Rare and vulnerable species should be given the highest priority. The groups of species which appear to be of highest priority are (1) endemic species; (2) alpine,

slow-growing, perennial herbs which are traded in large volumes; (3) annual species with restricted distributions and which are traded in high volumes. Consideration should be given to parts collected and amounts traded to identify particular species of concern within these general groups.

3. Management guidelines should be developed on a species-by-species basis. Where this is not possible, then on some conservative estimates on groups of species e.g. slow-growing, bad seeders with densely packed rhizomes that make non-destructive harvesting more difficult.
4. Transfer of knowledge and know-how between different social groups at the horizontal level should be strongly encouraged.
5. Centralised national level control and regulations are generally inadequate, and joint management systems between the state and local communities should be envisaged.
6. Understanding the social and economic strategies of collectors for trade and how this relates to ethnoecological knowledge as well as to issues of access and control over resources in order to make sound management decisions.
7. Wise harvesting practices should build on the existing local knowledge and know-how of specialists with additional information from scientific studies on growth patterns, ecology and impact of use;
8. Management should focus at the user-group level i.e. those people who are actually involved with resource collection (whether poor or richer people) in addition to working at the overall community level where decisions are not necessarily made by those who collect resources.
9. The trade/collectors link may be improved through: (1) developing a system of information regarding prices and market fluctuations and developing collectors' negotiation power; (2) adding value to resources, while making sure not to threaten the resource base; (3) developing in situ cultivation.

## Some general thoughts on the meaning of wise practices and how to develop them

Projects aiming at developing sound practices are plentiful in the Himalayas and cover a large range of practices including, among others, added-value processes, cultivation and domestication, organizing collectors groups and developing guidelines for sustainable collection practices, developing policy regulations and econom-

ic incentives such as fair trade and certification approaches. Case-study analyses will be conducted in the context of a regional workshop which will be held in late 2002. During this workshop consideration will be given to cross-analysis of existing cases, using a common set of indicators.

We are developing a list of major themes underlying project development in the region relating to medicinal plant management and conservation. Assumptions of all interest groups and lessons learned to date lead to defining more precise areas of interest. These would require further exploration in the context of new projects. The list of major themes, assumptions and lessons learned is given below [see p.26]. This is not the final output,

but a format for reflection and to assist in giving direction to new and existing initiatives in this field.

From our own case-studies and other studies in the region, a list of characteristics and field-grounded indicators is being developed to analyse and draw lessons. Some of these indicators identify for example: participatory processes; institutional background and linkages between different interest groups; processes for prioritization of species; level of understanding of local social strategies.

Eventually, the aim is to develop over-arching guidelines for wise practice that address the major areas of ecological and social sustainability and equitable distribution of benefits, i.e. realistic practices that conserve Himalayan medicinal plants to the benefit of the health of people, both locally and globally.

*Yildiz Aumeeruddy-Thomas*

### THEME 3: PEOPLE, PLANTS AND PROTECTED AREAS - APPROACH TAKEN

Protected areas are seen by most conservationists as of central importance to the conservation of biological diversity. There are various categories of protected area, the principal axes of variation

being according to the amount and type of use allowed within them and the type of management authority. Protected areas may be administered solely by central or local governments, communities or private owners, or various combinations thereof. Certain protected areas lie within areas of outstanding global importance

tected areas which lie under government authority has the advantage that the wealth of knowledge about local nature often held by local people becomes available in the search for satisfactory balances between protection and use, and for the later involvement of local people in systems of monitoring.



*Women in Himachal in Himachal Pradesh showing their vermicompost pits*

for biological conservation, recognised as Biosphere Reserves, Centres of Diversity for plants or other groups of organisms, centres of narrow endemism, or other designations.

A central issue with many protected areas concerns the balance between protection and use. Sometimes, some use is necessary to maintain their valued features. Practical problems of management revolve particularly around the rights and responsibilities of those people who live in or near the areas. Local and indigenous people are often dependent on wild natural resources to sustain their livelihoods, whether used directly or through sale. Local natural environments can constitute major elements in senses of local identity. All or parts of protected areas may be seen by local people as their own lands, which can conflict with official designations.

Resources of wild plants are typically very important to people having more subsistence-based economies. They are used for construction of buildings, the manufacture of furniture and crafts, as food or medicine, and for many other purposes. A focus on the links between people and their local plant worlds, whether in protected areas or otherwise, is extremely valuable for finding local solutions to questions of conservation and use, workable in particular contexts. The engagement of local people in decisions about the management of those pro-

The approach to the involvement of communities in the management of protected areas varies between countries, sites and the particular authorities responsible for different categories of protected area. While generally recognised to be vital, approaches and methods to tackle issues surrounding plant use are often undeveloped. There is

much to learn through the identification and sharing of more effective practices, hence the inclusion of this third theme in our best practice portfolio. Although People and Plants has been engaged in this subject at several sites, we have only just started to develop the topic more systematically, and welcome help from others with a similar interest.

The study of protected areas and plant use is a vast subject, considering the very large number of protected areas in the world and the huge variety of local contexts. There are major variations in the purposes of protected areas, their contributions to biological conservation in the wider context, their degrees of fragility in respect to use, the level of pressure inside or outside the areas on wild plant resources, the social, economic and cultural characteristics of associated communities, types of management arrangement, the existence of 'learning mechanisms' embedded as integral parts of management systems and government policy. How then can progress be made when faced with such complexity?

Formulation of recommendations for more effective practices is certainly challenging, but there are important reasons why it should be attempted. Managers and communities involved with protected areas are often quite isolated, have many demands on their time, and are frequently faced with problems for which immedi-

ate solutions are required. Surely, it can be argued, it must be possible to produce some clear guidelines, appropriately framed for these audiences, which will assist them with their tasks? Policy-makers too can benefit from careful analyses relevant to their responsibilities, though obviously here also the language used for recommendations has to be one with which they are familiar. And finally, professionals involved at the 'coal-face', having to work at the level of detail actually needed to find answers to specific issues, require guidance in this new field of conservation and sustainable use. *People and Plants* has already contributed significantly in relation to this latter group, for instance through the publication and distribution of its books on field methods in applied ethnobotany.

A further consideration in developing this theme is the desirability of integration with other activities of WWF-UK (which is supporting this research along with the Department for International Development - DFID) and its international partners. Through doing so, the work has the potential to contribute directly to the objectives of WWF at specific sites. WWF runs a number of conservation-and-development projects (ICDPs) aimed specifically at finding workable local balances between conservation and resource use in the context of protected areas. Many of these sites are home to charismatic large mammals, the conservation of which is a prime aim of WWF. We contend that a significant key to the successful conservation of large animals is often to work on plant use. Local people may have rather little interest in the conservation of large animals, or may even see them as a nuisance, but almost invariably they have a strong interest in plant resources because they are so vital to their everyday lives. Local arrangements worked out for plant matters can contribute significantly to the conservation of animals. This is because the costs and benefits of conservation may be perceived as being more equitably distributed across different sectors of society, and because the presence of local institutions, evolved to serve plant management, can also act as foundations to build the involvement of communities in wider conservation.

The use of plants growing within protected areas may or may not be desirable when considering wider conservation perspectives. Analysis of each case is needed in terms of biological, ecological, social, economic and cultural sustainability. On the whole, it is an advantage for biological conservation if some use of plants by local people is allowed in protected areas, because this retains links between people and

details of the local natural world, so important for the success of conservation in the longer term. In some cases, collaborative research between local resource-experts and scientists may show that sustainable collection of certain plant resources within protected areas is feasible, for instance in relation to the types and quantities of species used, their methods of harvesting, steps taken to promote regeneration and the existence of institutions within the communities capable of regulating the harvest. In other instances there may be a need to substitute collection of plants in protected areas with provision of alternative resources elsewhere - a useful result from collaborative research because it provides a clear focus for development efforts.

We are currently considering concentrating our work in this theme in two ecoregions, the Albertine Rift Ecoregion of Central Africa and the Terai Ecoregion, lying along the border between India and Nepal. We feel that there should be important lessons to learn from comparison between protected areas in these two regions because of the contrasting nature of their vegetation types. Protected areas in the Albertine Rift Ecoregion carry species-rich wet montane forest, while the Terai vegetation consists of botanically simpler seasonally-dry forest or woodland. We have some familiarity with both regions. We have contributed to the evolution of new management arrangements and undertaken extensive training at Bwindi Impenetrable National Park, Uganda (Working Papers 4 and 5). We have also previously undertaken a comparative analysis of joint forest management across the two regions (Working Paper 7).

While we expect valuable lessons to emerge from this comparison between two ecologically contrasting regions, the choice of these particular ecoregions has the further advantage that they both hold a number of protected areas, each with its own particular conditions. This will enable us to refine the analysis further, for instance in terms of national policies, variations in the degree of local pressure on wild plant resources, details of the management systems, and so on.

We see this research as a first step, working in a local context, yet bearing in mind more general principles relating to protected areas and plant use. We have no doubt that this important topic will continue to be a major area of conservation debate and experimentation far into the future.

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Alan Hamilton*



## **Theme 2: References relating to conservation and sustainable use of Himalayan medicinal plants**

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## HIMALAYAN MEDICINALS: SOME MAJOR SUBJECT AREAS, ASSUMPTIONS AND LESSONS LEARNED

The following is a synthetic view of the major underlying themes of projects in the region, with assumptions and lessons learned. The assumptions listed under the different subject areas are not necessarily those of the projects themselves. They include assumptions noted by various stakeholders including conservation agencies, development NGOs and enterprise workers.

### Traditional health-care systems: linkages with biological conservation

#### Assumptions:

- (1) The strong link and dependency on medicinal plants for health is a major incentive for conservation.
- (2) Traditional health practitioners have developed time-tested sustainable practices for collection of medicinal plants.
- (3) Environmental health is closely related to human health.

#### Some lessons learned from existing experiences:

- (1) Collection of medicinal plants for health care may not be sustainable if a well-defined system of management of medicinal plants is not set up, including recognition of local institutions, and formal tenure over resources.
- (2) Highly knowledgeable health practitioners are a small group compared to lay people and there is a need for transfer of knowledge.
- (3) Greater visibility of traditional health-care systems at the national level is needed if these systems are to be developed as culturally appropriate and safe systems, as well as contributing to conservation of biodiversity.

### Poverty alleviation: linkages with biological conservation

#### Assumptions:

- (1) Poverty leads to unmanaged and unsustainable extraction of wild resources.
- (2) Increased income reduces pressure on natural resources.

#### Some lessons learned from previous experiences:

- (1) Adding value to resources, for instance through micro-enterprise development does not necessarily lead to reduced collection pressure.
- (2) Many experiences do not address the poorest sections of societies as, for instance, with *ex situ* cultivation.
- (3) Many debates on improved equity in the NTFP industry are in favour of improving the benefits to local harvesters. For the moment they are only paid for the price of the resource. Their contributions to conservation and sustainable management should be better compensated.

### Linkage between legal access and higher tenure over resources and conservation

#### Assumptions:

- (1) A higher level of tenure increases the incentive for conservation (this argument has been debated for all wild resources).
- (2) Medicinal plants are generally considered as a free-access resource.

#### Lessons learned from previous experiences:

A range of experiences of joint forest management and community forestry in Nepal and India show that a higher level of protection is achieved if people have a sense of ownership of the resource. However, only relatively degraded forests have been handed over by governments under joint or community forest schemes. Little is known of the ability of local communities to manage highly vulnerable resources. In many cases conflicts of power within communities lead to the most powerful sections of the communities having more rights. Women in particular are often not well represented among decision-makers.

The Dolpo case-study (see under country projects in this Handbook) shows that, in certain cases, medicinal plants are not in a situation of open access, but under the control of local institutions based at village level. At Dolpo these institutions need to be re-enforced.

### **Wild cultivation, *in situ* cultivation, *ex situ* cultivation**

#### **Assumptions:**

- (1) For many people working in conservation or from an enterprise benefit-driven perspective, *ex situ* cultivation is seen as a means of decreasing impact on wild resources while bringing benefits to communities.
- (2) It is often assumed that collection from the wild cannot be sustainable.

#### **Lessons learned:**

- (1) *Ex situ* cultivation does not solve the problem of the poorest section of the society who lack access to land.
- (2) Not all species can be cultivated sustainably.
- (3) In the Dolpo case-study, amchis and lay people have, on their own initiative, decided to make cultivation trials *in situ* rather than in agricultural fields.

### **Competition between grazing and medicinal plant production in sub-alpine and alpine areas**

#### **Assumptions:**

- (1) Grazing negatively affects the production of medicinal plants.
- (2) To date there is no system regulating access to medicinal plants in high pastures.

#### **Lessons learned/knowledge to date:**

The Dolpo case-study shows that high levels of trampling affect the growth of *Nardostachys grandiflora* and other species, such as *Jurinea dolomiae*, *Delphinium himalayai* etc. Some species, such as *Picrorhiza scrophulariiflora*, seem tolerant of low levels of trampling (Ghimire *et al.* 2001).

### **Sociological and ecological strategies of commercial collectors - a diversity of situations in the Himalayan region**

#### **Assumptions:**

- (1) Collectors, depending on their social background and status in the local society as well as connections with the trade circuit, may develop different strategies for the collection of medicinal plants.
- (2) Collectors vary in their level of knowledge of the plants, their biology, ecology, regeneration rate, distribution etc.

#### **Lessons learned:**

The Dolpo case-study has revealed that there was a major difference in strategy of harvesting between traditional practitioners (amchis), local lay people who collect for their own use and trade collectors.

*Yildiz Aumeeruddy-Thomas*

## WOODCARVING CAMPAIGN IN KENYA

It is clear to all stakeholders involved that the Kenyan woodcarving industry needs to be placed on a sustainable footing. There are two main reasons to promote sustainability: first, to secure the livelihoods of thousands of carvers and their dependants; and second, to conserve globally important biodiversity in forests in Kenya and other East African countries. There is no doubt that placing such a large woodcarving industry onto a sustainable basis is a challenging task, involving a multitude of interventions.

At a workshop held in December 1997, a 20-year vision of necessary steps was developed jointly by all stakeholders. One of these steps concerns the use of a marketing initiative involving certification of 'Good Woods' as a tool to switch demand away from slow-growing hardwoods to fast-growing exotics. All 'Good wood' species currently identified in Kenya are introduced species whose wood is acceptable to, and already used by, Kenyan carvers. As a follow-up, a course on certification of Kenyan woodcarving was held in Kenya in March 1999, with agreement reached to develop a certification system.

Certification is considered to be a potentially powerful tool that can provide the economic incentive for a shift away from reliance on the ecologically damaging and unsustainable exploitation of the hardwoods. Certification of woodcarvings also has the potential to be the entry point for wider timber certification of plantation and natural forests in East Africa. From the point of view of consumers, availability of certified 'Good Wood' carvings provides an ethical choice, because unsustainably- and sustainably-produced carvings can be distinguished. People and Plants has initiated a campaign to promote certification of carvings, aimed at Europe and Kenya, the main target audiences being importers and tourists. Apart from working with carvers and the relevant government and non-government institutions in Kenya, People and Plants currently has an additional partner in Woodmark/Soil Association, a certifier approved by the Forest Stewardship Council (FSC; [www.fscoax.org](http://www.fscoax.org)). Experience gained in the process will have great value for application in other countries where woodcarving industries face similar problems of wood scarcity.

### Carving certification: current status

Considerable progress has already been made towards certification of Kenyan carvings. The goal is to achieve FSC certification of woodcarving timber produced through agroforestry systems on farms and in plantations. In future there may be the potential to certify carvings coming from natural populations of such woodland species as mpingo (*Dalbergia melanoxylon*), managed through coppice rotation. However, in the shorter term, certification in Kenya will have to be restricted to 'Good Wood' species, because hardwood stocks are very depleted and recovery is slow due to very slow growth rates. Furthermore, the management of natural forests requires major improvements if the forests are to achieve certification. Great interest in certification has been expressed by the Chief Conservator of Forests of the Kenya Forest Department, providing hope that a more favourable institutional environment for sustainable forest management is developing in the country. There are additional benefits to developing certification for on-farm trees, apart from those accruing to the carvers. Trees on-farm can have environmental benefits and the sale of trees for carving will also supply valuable income to the farmers. We are now working together with Oxfam Kenya that will help with the organisation and training of farmers for certification.

On the ground, a number of favourable conditions for certification already exist and further steps are being taken:

- ◆ Large stocks of alternative 'Good Woods' are available, in particular neem (*Azadirachta indica*) and old mango trees (*Mangifera indica*) at

the coast, and grevillea (*Grevillea robusta*) and jacaranda (*Jacaranda mimosifolia*) in Central Kenya.

- ◆ Several large co-operatives have moved towards greater use of 'Good Wood'. This is largely due to temporary shortage of hardwoods and, in particular, the absence of large diameter logs, but partially also due to awareness raised by People and Plants and specific orders by the Ten Thousand Villages program, a large importer to North America.
- ◆ FSC is aware that there is a need to modify its certification standard to make it more suitable to small-scale, community-based timber producers. Currently the site-based certification system which is designed to ensure sustainable forest management, predominantly favours large-scale forestry operations. An FSC technical committee is currently working on the modification of the FSC standard in order to achieve a separate standard for low to medium intensity managed forests (SLIMF). Already, group certification of small woodland owners, or even certification of wood from cuttings from street trees is possible. This is very pertinent to the present case where there are no extensive plantations of 'Good Woods' and material for carving will initially come from small-holdings. It should be possible to achieve certification for a group of farm properties growing 'Good Wood' in a defined geographical area such as a district or sub-district.



- ◆ Examples of ethical sourcing already exist. For example the Mennonite Central Committee (MCC) has for the past three years been placing orders exclusively for 'Good Wood' carvings.
- ◆ Five major woodcarving co-operatives already have a detailed system of record-keeping for logs bought and carvings sold. The chain-of-custody required for certification will only need simple modifications of existing practices.
- ◆ Experience of raising 'Good Wood' as well as hardwood species already exists in nurseries associated with some of the co-operatives. The oldest nursery, owned by the Makindu Carvers Co-operative, has been running for 10 years.
- ◆ Awareness-raising amongst carvers, tourists and importers, through drama, production of a poster, videos, a slide pack and exhibitions has already taken place.
- ◆ Kenya Airways screened a short (10-minute) People and Plants video as part of in-flight awareness-raising for people visiting Kenya.
- ◆ Two scoping visits by FSC accredited certifiers SmartWood and

Woodmark/Soil Association took place in January 2000 and May 2001 respectively. Recommendation aimed at achieving compliance with FSC Principles & Criteria (P&C) are currently being implemented in preparation for a future full assessment by an FSC certifier.

Many conditions are favourable for certification, but considerable barriers related to the FSC certification system and carvers' attitudes and ability to carve 'Good Woods' exist. In general, there is still the need for much more training, awareness-raising and ultimate shifts in attitude and behaviour of the carvers and the co-operatives. Market-led demand for 'Good Woods' has not yet been significant enough to achieve a major shift away from hardwoods. Carvers still have insufficient incentive to switch to 'Good Wood' because illegally cut hardwoods are in most cases still available, and there is no price differential between hardwoods and 'Good Woods', because illegal sourcing means the true market value is not reflected in the price. Moreover, carvers like carving hardwoods because no curing is required and the fine grain makes it easier to carve. In order to compete in western markets that demand a high-quality product, carvers have to adapt their carving methods, which involves careful drying and slightly different carving skills to avoid cracking or moulding. We are now actively working on overcoming these problems, with the help from the OXFAM GB Market Access Unit and OXFAM Kenya who will provide advise on how to improve market readiness from a quality assurance and also from a business skills point of view.

One of the major obstacles to acceptance by FSC of certification of 'Good Wood' trees produced on small holdings is that it is difficult to prove the 'on-site' benefits to conservation. This is one of the requirements under Principle #6 of the FSC 10 Principles & Criteria. Normally, the certification of a plantation or forest management unit requires the conservation benefit to be within the site to be certified. This will be difficult under the current pilot scheme, which aims at certifying a group of smallholders, from Malindi District, producing a small number of neem trees per year on each of their farms. Although on-site (on-farm) conservation benefits can be demonstrated to some extent this is

missing the point. The greatest advantage of 'Good Wood' certification lies in the 'off-site' benefits. One potential beneficiary from the replacement of hardwoods such as muhugu (*Brachylaena huillensis*) by neem is Arabuko-Sokoke Forest Reserve (ASF), located in Malindi District. Covering some 50,000 ha, ASF is the largest remaining tract of high-diversity coastal forest in Kenya. It has frequently been the source of illegally cut hardwoods, with detrimental effects on forest health and biodiversity; hardwood trees are homes to endangered and endemic animals, such as the Sokoke Scops Owl (*Otus ireneae*) and the Golden-rumped Elephant Shrew (*Rhynchocyon chrysopygus*). Discussion with FSC and Woodmark/Soil Association on



David Maingi explaining the use of good wood to carvers

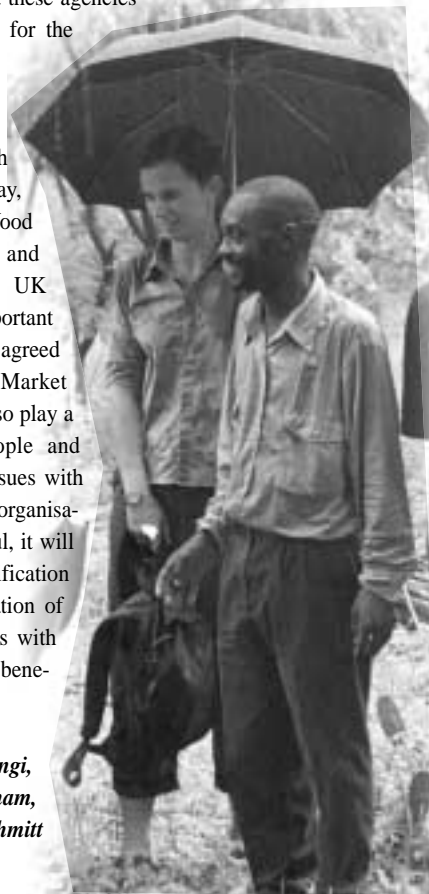
missing the point. The greatest advantage of 'Good Wood' certification lies in the 'off-site' benefits. One potential beneficiary from the replacement of hardwoods such as muhugu (*Brachylaena huillensis*) by neem is Arabuko-Sokoke Forest Reserve (ASF), located in Malindi District. Covering some 50,000 ha, ASF is the largest remaining tract of high-diversity coastal forest in Kenya. It has frequently been the source of illegally cut hardwoods, with detrimental effects on forest health and biodiversity; hardwood trees are homes to endangered and endemic animals, such as the Sokoke Scops Owl (*Otus ireneae*) and the Golden-rumped Elephant Shrew (*Rhynchocyon chrysopygus*). Discussion with FSC and Woodmark/Soil Association on



'off-site' vs. 'on-site' benefits are currently taking place to find a solution that is acceptable under the current FSC Principles and Criteria (P&C), and that can realistically be achieved on the ground in Kenya.

A group certification of a number of smallholders is the ultimate aim. This requires a Group/Resource Manager to manage and take responsibility for compliance with FSC requirements. This manager will also overlook the chain-of-custody certificates of the co-operative and the woodcutters. The challenge is not only to find a capable and highly motivated individual, but also to fund the post in the first few years until enough money can be raised from a premium paid for certified carvings, and to find an institutional home. The current institutions involved in the management and conservation of ASF and its surrounding farmland are the Forest Department, Kenya Wildlife Service, Kenya Forest Research Institute, Agricultural Extension Service and the international NGO BirdLife. A consortium of some, or all, of these agencies would make the best home for the Group Manager. This requires that these agencies take an interest in and responsibility for the success of this certification initiative.

Much work is still needed in training carvers, woodcutters and farmers to understand and comply with the FSC P&C. This is well under way, and led by Mr David Maingi, Good Wood Project Officer, based in Nairobi, and recently secured funding from the UK Darwin Initiative will allow this important initiative to be continued. A recently agreed collaboration with Oxfam GB's Market Access Unit and Oxfam Kenya will also play a crucial role in complementing People and Plants' expertise in sustainable use issues with marketing, business skills and farmers organisation and livelihood issues. If successful, it will set an important precedent for certification applied to woodcarving, and certification of wood coming from non-forest sources with great environmental as well as social benefits.



*Robert Höft, David Maingi,  
Tony Cunningham,  
Susanne Schmitt*

## SOME KEY INSTITUTIONS RELEVANT TO WOODCARVING

### Kenya Forestry Research Institute



Kenya's forests and trees are important to the country, as they provide a valuable base for industrial development, while playing a crucial role in the conservation of water, soils, flora and fauna.

The demand for information and technologies for effective forests/tree development, conservation and management in Kenya led, by an Act of Parliament in 1986, to the establishment of the Kenya Forestry Research Institute (KEFRI) as a statutory research body. Under this Act, the institute is mandated to undertake scientific research and development with application to forestry and allied natural resources, to enhance the socio-economic welfare of Kenyans.

The institute undertakes priority research under Natural Forests, Farm Forestry, Drylands Forestry and Industrial Plantations Programmes. The institute has well-defined links to and collaborates with other national and international organizations on matters of forestry research. Research on the management of natural forest and woodland vegetation and the products therein is a priority area of focus.

For the past six years, for example, KEFRI has been actively involved, in collaboration with the WWF/UNESCO/Kew People and Plants Initiative, with the socio-economic concerns of the woodcarving industry in Kenya. The studies have focused on the impacts of the over-exploitation of carving-wood on forest habitat and species conservation, as described earlier in the Handbook.

*Simon Choge and Dr Bernhard Kigomo*

### International Federation for Alternative Trade

The International Federation for Alternative Trade (IFAT) is a federation of producers and 'alternative' trading organizations (ATOs) which was formed in 1989, following a conference of alternative trading organizations in The Netherlands. Since then, IFAT has grown steadily as a global network, with developing country organisations now representing about two-thirds of the membership. In IFAT, buyers and producers of handicrafts and food products from the developing countries come together to create an 'alternative' way of doing business that is beneficial and fair. IFAT has two main objectives. Firstly, to improve the livelihood and wellbeing of disadvantaged people in developing countries; and secondly, to change unfair structures of international trade. IFAT, which is facilitated by a full-time secretariat in the UK, and an elected committee of five, is the only global grouping of ATOs which represents both North and South. Its day-to-day work is funded entirely through membership fees.

Website: <http://www.ifat.org>.



### Ten Thousand Villages

Ten Thousand Villages (TTV) provides vital, fair income to Third World people by marketing their handicrafts and telling their stories in North America. TTV works with artisans who would otherwise be unemployed or underemployed. This income helps pay for food, education, health care and housing. Thousands of volunteers in Canada and the United States work with TTV in their home communities.

Ten Thousand Villages is a non-profit program of the Mennonite Central Committee (MCC), the relief and development agency of the Mennonite and Brethren in Christ churches in North America. Ten Thousand Villages has been working around the world since 1946 to purchase crafts from craft groups that are concerned for their members, promptly and at fair prices, so as to promote fair trade. TTV is one of the members of IFAT and a member of the Fair Trade Federation (FTF), a coalition of more than two hundred craft producers, wholesalers and retailers. FTF seeks to develop a workable agenda for handicrafts and agricultural products within the context of fair trade. TTV has been a key organisation involved in the Kenyan 'Good wood' campaign.

*Tony Cunningham*



## **Fauna & Flora International (FFI) - conserving wildlife since 1903**

Fauna & Flora International (FFI) is the world's longest established international conservation body and one of only four organizations working globally to conserve a broad spectrum of species and ecosystems. It currently supports more than 140 projects in over 60 countries world-wide. In some of the countries where FFI operates, such as Kyrgyzstan and Liberia, it is the only international conservation organization with an active presence. FFI regularly works in neglected or difficult locations including, where necessary, conflict and post-conflict zones.

In the course of promoting sustainable conservation practices around the globe, FFI addresses many audiences through a variety of media. One of its main goals is to share the accumulated knowledge that results from nearly 100 years of involvement in conservation, building partnerships, promoting best practice and actively encouraging dialogue between organizations. For almost a century, the Society has disseminated information on practical, science-based conservation work through *Oryx - The International Journal of Conservation*.

FFI projects embrace not only the more obvious flagship species such as the Asian elephant, mountain gorilla and Arabian oryx, but also more obscure species like the Antigua racer - arguably the world's rarest snake - and other urgent, but neglected causes including bats and the world's 8,000 threatened tree species.

Basing its activities on local needs, FFI equips local partners with the means to develop appropriate solutions. By ensuring the active participation of all stakeholders, FFI enables local people to realize their own aspirations for their environment and long-term future. The vast majority of its projects arise in response to needs identified by local people.

FFI's approach to building the capacity of its partners includes raising significant levels of funds (four times its own turnover) in support of their budgets. Throughout the last 30 years it has continued to give money to local organizations through the 100% Fund, the Society's primary grant-giving mechanism. In the three decades since it was established, this unique fund has supported over 800 projects.

As part of its operational activities, FFI conserves threatened habitats by purchasing land and placing it under local ownership. FFI embraces the link between wildlife conservation and poverty alleviation in its work. By pioneering innovative concepts such as sustainable nature-based business initiatives, it is meeting the challenge of reconciling the often-conflicting needs of conservation and development without compromising sustainability.

The Society views corporate partnership as a powerful strategic tool in the implementation of conservation goals and has spearheaded moves to engage the corporate sector in global biodiversity planning. Its Global Business Partnership seeks to realize the greatest conservation gain by working closely with those companies whose activities - including mining, agriculture, forestry, energy and transport - have the greatest impact on our natural environment.

One of the projects that FFI has been working on is 'SoundWood', a programme aimed at reducing the consumption of rare hardwoods such as ebony and rosewood which are extensively used for musical instruments. The SoundWood Guide to the Guitar, a 12-page guide featuring guitar companies and their respective efforts to reduce the pressure on threatened tree species, is a product of that programme.

To learn more about Fauna & Flora International's activities, please visit their website at: <http://www.fauna-flora.org>

## CURRICULUM DEVELOPMENT

### Purpose and practice in the teaching of ethnobotany

People and Plants is currently gathering experiences and recommendations relating to the teaching of ethnobotany. We request interested people to send us their views.

Ethnobotany, as any discipline, can be employed for different purposes. It is a premise of the People and Plants Initiative that ethnobotany has a fundamental role to play in conservation and the promotion of the sustainable use of plant resources. Ethnobotany is a cross-disciplinary subject spanning the natural and social sciences. Its approaches and methods allow exploration of relationships between plants and societies. Its application to the identification and resolution of problems of botanical conservation and sustainable use of plant resources allows the knowledge, wisdom and practices of local societies to be made available in the search for better ways of managing the environment.

The history of Botany illustrates the roles of culture and the wider economy in guiding the directions that a science can take. Modern Botany has its origins in Medicine, the earliest botanic gardens in Europe being physic gardens associated with medical schools. An interest in plant collection and classification accompanied the spread of the European empires, also a time of great interest in assessing the values of different plants for their potential contributions to economic development. Botanic gardens were established in tropical countries as testing grounds for crops. Today, the focus of attention has tended to shift towards molecular biology, an exciting modern field of intellectual endeavour with the additional spur of the possibilities of economic rewards from applications of biotechnology. 'Whole plant' Botany has become a marginalised subject both in schools and in universities in many countries. Botany departments have been merged into departments of Biology. Taxonomy is in decline and there are fewer and fewer botanists actually able to identify plants. This is ironic given the widespread international acknowledgement of the need for detailed botanical work to find answers to numerous pressing problems of conservation and sustainable use.

Ethnobotany is a new science that originated towards the close of the 19th century. It is related to Economic Botany, an older discipline concerned more narrowly mainly with determination and description of the economic uses of plant products. Earlier ethnobotanical studies were often mainly concerned with making lists of useful plants, especially medicinal plants and especially those used by more indigenous peoples. Recent trends have included recognition that all societies, and also groups of people within them, can fruitfully be the subject of ethnobotanical studies, greater rigour in terms of quantification and hypothesis-testing, and a growing recognition of the value of Ethnobotany in development.

### People and Plants experience in capacity-building in applied ethnobotany

The principal purpose of the People and Plants Initiative is to build international capacity in Applied Ethnobotany, professional and institutional, and also through the identification and promotion of more effective practices.

We have trained directly over 35 people to MSc level or equivalent under the programme. A result of this engagement is that we have developed a model of the requirements for 'ideal' training in applied ethnobotany, elements of which include:

- ◆ training should be in the countries where the trainees are likely later to work;

- ◆ there should be substantial periods of field work undertaken in participation with local resource-users;
- ◆ the research should be orientated towards finding answers to real-life problems. Studies can often usefully contribute towards meeting the objectives of larger conservation-and-development projects; and
- ◆ mentoring by established expert ethnobotanists is very desirable, especially given the cross-disciplinary nature of Applied Ethnobotany, its youthfulness as a science and the value of experience for the identification of priorities.

The development of teaching at national level in Applied Ethnobotany is a major aspect of institutional development in Ethnobotany. The People and Plants Initiative has so far helped to establish or develop nine courses in Ethnobotany in three continents, evidence that educators worldwide are now coming to recognise the possibilities of the discipline. However, it has become apparent that considerable benefits would accrue if those developing courses in different institutes could have the opportunities to learn from one another - a motivation for the more systematic work on development of courses in Applied Ethnobotany, as we are now undertaking.

### Our approach to curriculum development

With limited resources at our disposal we have decided to gather experiences and ideas about the teaching of ethnobotany through a series of workshops and studies. This will lead eventually to production of a working paper, and the placement of materials on our website. The following workshops and studies have been undertaken or are planned:

- ◆ A meeting was held on August 20-21 2001 by Professor Pei Shengji at Kunming Institute of Botany, Chinese Academy of Sciences, to discuss curricula in Ethnobotany for China. Sonia Lagos Witte and WWF-UK organised a workshop on 21-23 February 2002 of the Grupo Etnobotanico Latinoamericana (GELA) at the Jardín Botánico Nacional Rafael Ma. Moscoso, Dominican Republic.
- ◆ A workshop was organised on 3-4 May 2002 by WWF-Pakistan and WWK-UK at Nathiagali, Pakistan, mainly to bring together experiences and ideas from Pakistan, but with attendance also from Uganda. Written contributions were received from several people unable to attend.
- ◆ Dr John Kessy of Sokoine University of Agriculture, Tanzania, has undertaken a survey of experiences and views about the teaching of Ethnobotany in Kenya, Uganda and Tanzania, concentrating on departments of Botany and Forestry.
- ◆ A workshop will be held in September 2002 at the meeting of the International Society of Ethnobotany in Ethiopia to discuss curriculum development in ethnobotany.

Applied Ethnobotany can be taught in various types of department. The practical application of Ethnobotany quickly reveals the artificiality of the traditional way in which the Plant Sciences are classified in modern academia. The reality of socio-ecological systems in rural communities is that agricultural systems are not dissociated from forestry systems. Medicine, based largely on herbal ingredients in developing countries, is often not much divorced from other aspects of Applied Botany relating to diet and good living. There is often no sharp division between the 'domesticated' and the 'wild' nor between the cultivated and the totally unmanaged. We have decided to focus on three types of department for work under the present project: Botany, Forestry and Medicine. We hope to shine light on the extent to which courses in Ethnobotany need to be tailor-made to meet the requirements of different departments.



## The challenge of interdisciplinarity

Ethnobotany has sometimes been regarded as a 'soft option', but this is certainly not the case if the intention is to produce graduates capable of working effectively with communities. There are many issues with which the developers of courses must grapple. Satisfactory solutions will often be compromises between different ideals.

Some of the major problems surround the question of interdisciplinarity. Ethnobotanists need to have an adequate knowledge of several subjects, conventionally divided between the natural and social sciences. Lists of desirable subjects to cover in Ethnobotany have been prepared by a number of authors, these often daunting compilations including, for example:

- ◆ scientific knowledge of plants, especially taxonomy and applied ecology;
- ◆ knowledge of rural societies, including social structures and decision-making processes, land tenure and resource rights;
- ◆ perceptions, values and uses of plants;
- ◆ principles concerning sustainable use of wild plants;
- ◆ plants in agricultural and forestry systems;
- ◆ plants in health care;
- ◆ plant trade;
- ◆ national and international policy related to conservation and sustainable use of plant resources;
- ◆ approaches and methods in field work in Applied Ethnobotany;
- ◆ interpersonal skills such as communication and conflict-resolution; and
- ◆ ethical issues in Ethnobotany.

A challenge in teaching Applied Ethnobotany is that all aspects of the subject are interconnected. Applied Ethnobotany should be regarded as a cross-disciplinary rather than a multi-disciplinary subject. Experience suggests that it is not enough for the diverse subjects which contribute to Ethnobotany to be taught separately by experts in their disciplines: the teachers themselves must think and teach in cross-disciplinary ways. This is a challenge for many teachers, themselves often trained in isolated specialities. It requires continuing exploration on their parts of knowledge and concepts outside the areas in which they are specialists. They need to be able to extract, from a diverse range of disciplines, aspects of the subjects which are of particular relevance to practical work with communities on plant resources.

Problems encountered in teaching Ethnobotany have parallels in Forestry. Until the last decades, the teaching of Forestry often revolved around 'scientific forestry', a term coined for methods designed to maximise wood yield and quality. Today, the education of foresters is often approached in a much broader way. Multi-purpose forestry is in vogue, with an added emphasis on non-timber forest products and the perceived need to involve a range of stakeholders, especially local communities, in forestry issues. A consequence is recognition of the importance of developing inter-personal skills, such as the abilities to communicate and negotiate. The question for the curriculum developer in Ethnobotany, as in Forestry, is how to accommodate a myriad of demands within the time and other resources available.

Some educators have proposed radical ways to tackle the problems of teaching Ethnobotany or similar cross-disciplinary subjects. In general, these advocate reduction of the taught component of courses to a core of more fundamental concepts and theory, and place increased emphasis on self- or group-learning, especially through exercises which involve exploring solutions to real-life issues. Students are encouraged to learn how to

expand their knowledge or skills, or to bring in specialists on particular subjects into problem-solving teams, as necessary to tackle the issues at hand.

In practice, those teaching Applied Ethnobotany may find it difficult to go far in adopting problem-orientated and self- or group-learning approaches to the teaching of Ethnobotany, however desirable these may seem in theory. Very importantly, resources are often limited. A problem-based approach seems to require access to considerable supplies of money, transport, literature and individual tuition, all of which can be difficult to find. A self-motivated exploratory attitude to education, which certainly needs fostering around the world, can be hard for students used to educational systems in which rote-learning has been the norm.

## Some questions

Readers are invited to send their views on the teaching of Applied Ethnobotany. Your experience and opinions on all aspects are welcome, including:

- ◆ the purposes of courses or programmes in Applied Ethnobotany;
- ◆ the length of courses and their levels in educational systems (e.g. undergraduate, postgraduate, in-service);
- ◆ problems of teaching a cross-disciplinary subject;
- ◆ approaches taken to staffing (e.g. related to multi-disciplinarity) and staff development;
- ◆ problems of rigour (how can Ethnobotany be developed to be a 'mature science');
- ◆ entry requirements for programmes or courses;
  - the core subjects of programmes and courses, and their contents;
- ◆ the desirable mix of teaching methods (e.g. lectures, demonstration laboratory and field studies; individual or group research, tutorials, literature studies);
- ◆ desirable background or skill courses (providing background information or desirable extra skills);
- ◆ key references;
- ◆ assessment methods;
- ◆ resource requirements and their availability (e.g. literature, equipment, transport, money); and
- ◆ particular requirements of courses in departments of Botany, Forestry and Medicine.

Please send your comments to:

*Alan Hamilton*  
WWF Coordinator of the People and Plants Initiative

## OUTLINE CONTENT OF A COURSE IN ETHNOBOTANY FOR CHINA

This outline was developed during a meeting held on August 20-21, 2001, at the Kunming Institute of Botany, the Chinese Academy of Sciences, Kunming, China.

### Chapter 1: Introduction

- Section 1. Definition
- Section 2. Objectives and significance
- Section 3. Nature of ethnobotany
- Section 4. Research components
- Section 5. Research tasks

### Chapter 2: Development History

- Section 1. The birth and development of ethnobotany - from aboriginal botany to applied ethnobotany
- Section 2. Historical roots of Chinese ethnobotany and its modern development
  - The roots of ethnobotany
  - Material Medica (since 403-221 BC "San Hai Jin")
  - Ancient Ethnoflora (e.g. "A Fourth Century Flora of Southeast Asia", 306 AD)
  - Chinese Flora of Economic Plants (1960s)
  - Modern ethnobotany (since 1982 in China)

### Chapter 3: Typology and Branches of Ethnobotany

- Section 1. Typology of ethnobotany
  - Regional Taxonomic groups
  - Classification units
- Section 2. Branches of ethnobotany
  - Anthropological ethnobotany
  - Botanical ethnobotany
  - Regional ethnobotany
  - Medical ethnobotany
  - Palaeo-ethnobotany
  - Forest-ethnobotany
  - Ethnoecology
  - Ethnogenetics

### Chapter 4: Relationships between Ethnobotany and Related Subjects

- Section 1. Botany
- Section 2. Ecology
- Section 3. Cultural anthropology
- Section 4. Agronomy, forestry and horticulture
- Section 5. Economics

### Chapter 5: Principles and Methods of Ethnobotany

- Section 1. Principles of ethnobotany
- Section 2. Ethnobotanical field methods
  - Field documentation methods
  - Methods of description
  - Specimen collecting
- Section 3. Ethnobotanical laboratory studies
  - Taxonomic identification
  - Data analysis
  - Information-bank establishment
- Section 4. Quantitative ethnobotany

### Chapter 6: Traditional Culture and Plants

- Section 1. Plants in cultural belief
- Section 2. Plants and medical culture
- Section 3. Food culture and plants
- Section 4. Plants and architectural culture
- Section 5. Plants in folklore culture
- Section 6. Culture and natural landscape
- Section 7. Social norms and conservation ethics

### Chapter 7: Folk Nomenclature and Classification

- Section 1. Nomenclature
- Section 2. Classification

### Chapter 8: Traditional Uses of Plant Resources

- Section 1. Uses for livelihood
- Section 2. Economic uses
- Section 3. Medical uses
- Section 4. Cultural uses
- Section 5. Ecological uses

### Chapter 9: Traditional Management of Plant Resources

- Section 1. Value and knowledge systems
- Section 2. Wild plant harvesting and management
- Section 3. Agroforestry and home-gardens
- Section 4. Resource tenure and management system

### Chapter 10: Traditional Knowledge and Biodiversity

- Section 1. Cultural diversity and biological diversity
- Section 2. Traditional conservation strategies and methods

### Chapter 11: Ethnobotany and Community Development

- Section 1. Community institutions
- Section 2. Roles of ethnobotany and of ethnobotanical exchanges
- Section 3. Participatory community development
- Section 4. Rural women in community development

### Chapter 12: Ethnobotany and the Development of Plant Resources

- Section 1. Traditional knowledge and development of plant products
- Section 2. Ethnic culture and eco-tourism
- Section 3. Traditional knowledge property rights

### Chapter 13: Medical Ethnobotany

- Section 1. History and definition
- Section 2. Scientific basis of medical ethnobotany
- Section 3. Traditional medical systems
- Section 4. Traditional medical knowledge
- Section 5. Cultural interpretation of traditional medicine
- Section 6. Methods of study
- Section 7. Traditional medicine and new drug development
- Section 8. Conservation of traditional medicine

### Chapter 14: Forest Ethnobotany

- Section 1. Different forest values
- Section 2. Scientific basis and methods of study
- Section 3. Traditional management of forest resources
- Section 4. Traditional uses of forests

植物

森林

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Eco-protection forests  
Cultural forest landscapes  
Timber forests and fuel-wood forests  
Non-timber forest products (NTFPs)  
Underground forest cultivation

Section 5. Managing forest plant diversity and conservation

Section 6. Traditional agroforestry systems

Section 7. Social forestry

Section 8. Swidden agriculture and forest restoration

### Chapter 15: Ethno-ecological Knowledge

Section 1. Traditional ecological knowledge and environmental management

Section 2. Traditional ecological knowledge and nature conservation

Section 3. Ecological values and ethnobotany

Section 4. Traditional knowledge and eco-security

Section 5. Ethnoecological knowledge and environmental education

### Participants at the meeting

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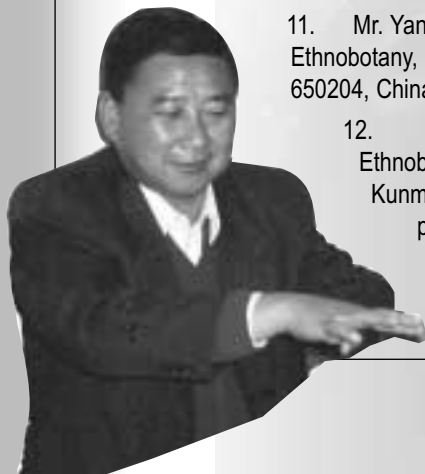
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as possible.***

**People and Plants Conservation Series**

This series of handy books is designed to provide practical guidelines for those involved in conservation and community development. The individual titles treat a range of issues, approaches and methods, and together they are useful for guiding work relevant to the Convention on Biological Diversity. The emphasis is very much on the reconciliation of conservation with the needs and traditions of local people. So far seven books have been published in the series, with another three or four to be published over the next few years.



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**ETHNOBOTANY: A METHODS MANUAL**

Gary J. Martin; 1995.  
Original publisher: Chapman & Hall. Out of print. New edition planned (Earthscan).  
Editions: English, Bahasa (Malaysia), Chinese and Spanish.

Contents: data collection and hypothesis testing; botany; ethnopharmacology and related fields; anthropology; ecology; economics; linguistics; ethnobotany; conservation and community development; references; further reading; index. This manual has proved extremely useful for stimulating work in ethnobotany, with much interest expressed by a wide-ranging audience. The Bahasa and Chinese manuals have been strategically distributed by WWF-Malaysia and the WWF Programme Office for China, as well as by Professor Pei Shengji of the Kunming Institute of Botany.

.....

**PLANT INVADERS: THE THREAT TO NATURAL ECOSYSTEMS**

Quentin C.B. Cronk and Janice L. Fuller; 1995.  
Original publisher: Chapman & Hall. Re-issued by Earthscan, 2001.  
Editions: English, Spanish.

Contents: the nature of plant invasion; how invasion occurs; action against invasive plants; case-studies of some important invasive species; representative invasive species; appendices; glossary; references; index.

.....

**PLANTS AND PROTECTED AREAS: A GUIDE TO IN SITU MANAGEMENT**

John Tuxill and Gary Paul Nabhan; 1998.  
Original publisher: Stanley Thornes. Re-issued by Earthscan, 2001.  
Editions: English, Chinese, Spanish.

Contents: why conserve plant resources *in situ*?; *in situ* plant conservation: who is involved?; working with local communities; setting priorities and planning for management; monitoring and evaluating plant resource management; traditional agriculture and plant conservation; further reading; a model for quantifying the threat of genetic erosion; schematic background for collecting background information on crop varieties; references; index.

This practical and multidisciplinary book facilitates better management of protected areas, and illustrates new approaches to conservation of plants within their natural habitats. It highlights the collaboration necessary between the conservation professionals and local communities involved, and focuses on how to set priorities and plan for monitoring and evaluation of plant resource management.



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### APPLIED ETHNOBOTANY: PEOPLE, WILD PLANT USE AND CONSERVATION

Anthony B. Cunningham; 2001.  
Publisher: Earthscan.  
Editions: English, Chinese, Spanish.

Contents: conservation and context: different times, different views; local inventories, values and quantities of harvested resources; settlement, commercialisation and change; measuring individual plants and assessing harvesting impacts; opportunities and constraints on sustainable harvest: plant populations; landscapes and ecosystems: patterns, processes and plant use; conservation behaviour, boundaries and beliefs; striving for balance: looking outward and inward; acronyms and abbreviations; further reading; references; index.

Wild or non-cultivated plants are crucial to the lives of a large portion of the world's population, providing low-cost building materials, fuel, food supplements, medicines, tools and sources of income. Despite their importance, their vulnerability to harvesting and other social impacts is not well understood. This is the first practical guide to be published on how to manage wild plants sustainably.

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### UNCOVERING THE HIDDEN HARVEST: VALUATION METHODS FOR WOODLAND AND FOREST RESOURCES

Bruce M. Campbell and Martin K. Luckert (eds); 2002.  
Publisher: Earthscan.  
Editions: English

Contents: towards understanding the role of forests in rural livelihoods; quantitative methods for estimating the economic value of resource use to rural households; understanding local and regional markets for forest products; an introduction to approaches and issues for measuring non-market values in developing economies; economic decision-making frameworks for considering resource values: procedures, perils and promise; participatory methods for exploring livelihood values derived from forests: potential and limitations; searching for synthesis: integrating economic perspectives with those from other disciplines; expanding our conceptual and methodological understanding of the role of trees and forests in rural livelihoods; acronyms and abbreviations; references; index.

This manual is about the economics of plant resources, based on rural households in developing countries -- a subject of central importance to conservation and development. For conservation of plant resources to succeed, it is essential to understand their importance for local people and their livelihoods. This practical and accessible handbook shows how to do this for a non-technical readership. It describes the diverse products and services provided by forests and woodlands - the hidden harvest - and sets out clearly the range of economic and other approaches to valuing them. From this it explains how better-informed decisions on resource allocation and conservation can be made. With contributions from ecologists, economists and sociologists, reflecting the interdisciplinary nature of successful natural resource management, the manual shows how to untangle the complicated network of benefits from forests, and uses the full portfolio of approaches in valuing them. These include the analysis of household livelihoods and plant-based markets, non-market valuation and decision frameworks such as cost-benefit analysis.

## TAPPING THE GREEN MARKET: MANAGEMENT AND CERTIFICATION OF NON-TIMBER FOREST PRODUCTS

Patricia Shanley, Alan R. Pierce, Sarah A. Laird and Abraham Guillén (eds); 2002.  
Publisher: Earthscan.  
Editions: English

Contents: introduction; the rise of certification, the current state of NTFP certification programs and future prospects; the process of drafting and revising guidelines for NTFP certification; field testing results in Mexico, Bolivia and Brazil; NTFP species profiles from around the world; the core elements of NTFP certification; conclusions and recommendations; appendix 1: generic guidelines for assessing the management of non-timber forest products; appendix 2: species-specific NTFP certification guidelines for production of maple syrup; appendix 3: list of acronyms used; appendix 4: resource directory; references; index.

There is rapidly-growing interest in, and demand for, non-timber forest products (NTFPs); they provide critical resources across the globe, fulfilling nutritional, medicinal, financial and cultural needs. This book explains the use and importance of certification and eco-labelling for guaranteeing best management practices of NTFPs in the field.

## BIODIVERSITY AND TRADITIONAL KNOWLEDGE: EQUITABLE PARTNERSHIPS IN PRACTICE

Sarah A. Laird (ed); 2002.  
Publisher: Earthscan.  
Editions: English

Contents: Section I Biodiversity research relationships. Section II Biodiversity research and prospecting in protected areas. Section III Community relationships with researchers. Section IV The commercial use of biodiversity and traditional knowledge. Section V National policy context. Section VI Conclusions and recommendations. Directory of useful contacts and resources; contact information; acronyms and abbreviations; glossary; references; index.

Biodiversity research and prospecting are long-standing activities taking place in a new legal and ethical environment. Following entry into force of the Convention on Biological Diversity in 1993, and other recent policy developments, expectations and obligations for research and prospecting partnerships have changed. However, to date there are few guides to integrating these concepts with practice.

This book provides practical guidance on how to arrive at equitable biodiversity research and prospecting partnerships. Drawing on experience and lessons learned from around the world, it provides practical case-studies, analysis and recommendations in a range of areas that together form a new framework for creating equity in these partnerships. They include researcher codes of ethics, institutional policies, community research agreements, the design of more effective commercial partnerships and biodiversity prospecting contracts, the drafting and implementation of national 'access and benefit-sharing' laws, and institutional tools to distribute financial benefits.

## BOTANICAL DATABASES FOR CONSERVATION AND DEVELOPMENT

Michael Berjak and Jeremy Grimsdell; 1999.  
Publisher: WWF.  
Editions: English.

Contents: This large-format publication is an introduction to the use of databases in botanical projects. The material is presented in an uncomplicated manner, and very little previous knowledge is assumed from the reader -- either about databases or about computers. The book is aimed at botanists who have little direct experience of databases but understand that they may be of use in their work. A demonstration diskette is included, providing an introduction to operating a database package. This has been designed to illustrate the main principles of all the main database operations. Available from WWF, and downloadable from the People and Plants website.

**For details of these and other publications, visit: <http://www.rbgekew.org.uk/peopleplants>**

**For books in the People and Plants Conservation Series contact the UK publisher: Earthscan  
120 Pentonville Road  
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email: [earthinfo@earthscan.co.uk](mailto:earthinfo@earthscan.co.uk)  
<http://www.earthscan.co.uk>**

**or, in North America, visit:  
[www.styluspub.com](http://www.styluspub.com)  
email: [stylusmail@presswarehouse.com](mailto:stylusmail@presswarehouse.com)  
call toll free: 800 232 0223  
fax: 703 661 1501**

**For details of the Spanish language editions, visit:  
<http://www.chasque.net/nordan>**

## WORKING PAPERS

The People and Plants Working Papers form an occasional series, and are published by UNESCO. They provide information on specific ethnobotanical case-studies, mostly relating to fieldwork projects undertaken by People and Plants researchers. Such case-studies can be of great value for those working at sites with similar issues, or on the same themes at other places. Information is provided in some depth, to demonstrate the level of detail that is often necessary in finding practical solutions in plant conservation. Each paper is designed to provide information and to generate fruitful discussion on key issues in the sustainable and equitable use of plant resources. They may be downloaded from the website.

The Working Papers have been very well received and extensively used by conservationists, lecturers and natural resource managers in developing countries. They are distributed to about 4,000 people on the People and Plants mailing list. All Working Papers are published in English and some also in other languages (French, Spanish).

### 1 African medicinal plants - setting priorities at the interface between conservation and primary health care

Cunningham, A. B.; 1993

English, Spanish

Contents:

Introduction

Medicinal plant use in Africa

Policy priorities for conservation and primary health care

Conclusions

References

Appendix 1: African medicinal plants observed in trade

Appendix 2: Plant species mentioned in text

Sustainable management of traditional medicinal plant resources is important, not only because of their value as a potential source of new drugs, but due to reliance on traditional medicinal plants for health. The vast majority (70-80%) of people in Africa consult traditional medical practitioners (TMPs) for health care. With few exceptions, traditional medicinal plants are gathered from the wild.

Although reliance on TMPs may decline in the long term as alternative health-care facilities become available, increasing demand for popular herbal medicines is expected in the foreseeable future. Over the same period, certain vegetation types that were sources of supply of traditional medicines will drastically decline, due to forest clearance for agriculture, afforestation of montane grasslands, uncontrolled burning and livestock grazing.

Exclusion from core conservation areas adversely affects TMPs who previously gathered medicinal plants in those sites. In addition, supplies of herbal medicines to TMPs are affected by competing resource uses such as timber logging, commercial harvesting for export and extraction of pharmaceuticals, and use for building materials and fuel. This creates a growing demand for fewer resources, in some cases resulting in local disappearance of favoured and effective sources of traditional medicine, and reduced species diversity.



### 2 Sustainability of harvesting *Prunus africana* bark in Cameroon - a medicinal plant in international trade

Cunningham, A. B. and Mbenkum, F. T.; 1993

English

Contents:

Introduction

Geographical distribution and values of *Prunus africana*

*Prunus africana* and medicinal plant trade from Cameroon

Forest conservation and harvesting bark from the wild

Alternatives to bark harvesting from wild populations

Conclusion

Recommendations

References

The Afromontane hardwood tree *Prunus africana* (Rosaceae; African Cherry, Red Stinkwood) is a multiple-use tree species with local and international economic and medicinal value. Bark is the major source of an extract used to treat benign prostatic hyperplasia, an increasingly common health problem in older men. All bark is taken from wild *Prunus africana* populations in Afromontane forests of Cameroon, Zaire, Kenya and Madagascar. *Prunus africana* has a remarkable ability to withstand bark removal. Despite attempts at sustainable bark harvesting from wild populations however, tree die-offs and felling of trees are frequent in high conservation priority sites. This occurs in Afromontane forest "islands" surrounded by savanna that provide habitat for important endemic birds, mammals and plants in both Madagascar and Africa. *Prunus africana* is an important fruit-bearing tree in Afromontane forest, providing a food source for endemic birds such as Bannerman's Turaco and Cameroon Mountain Greenbul, and endemic primates such as Preuss's Guenon. Research in Malaysian rain forests has shown that selective logging for hardwood timber results in reduced numbers and carrying capacity for fruit-eating birds such as hornbills. Destructive harvesting of *Prunus africana* may have a similar effect in Afromontane forest. This is made more serious by the limited area this forest type covers in Africa and Madagascar. An initial assessment is made of cultivation as an alternative source of supply and recommendations for practical action to promote the sustainable use of *Prunus africana* bark are given.



### 3 Local representations and management of agroforests on the periphery of Kerinci Seblat National Park, Sumatra, Indonesia

Aumeeruddy, Y.; 1994

English, French, Spanish

Contents:

Introduction

General presentation of Kerinci

Conservation of the environment seen through the prism of local representations

The bases and dynamics of agroforestry systems in Kerinci

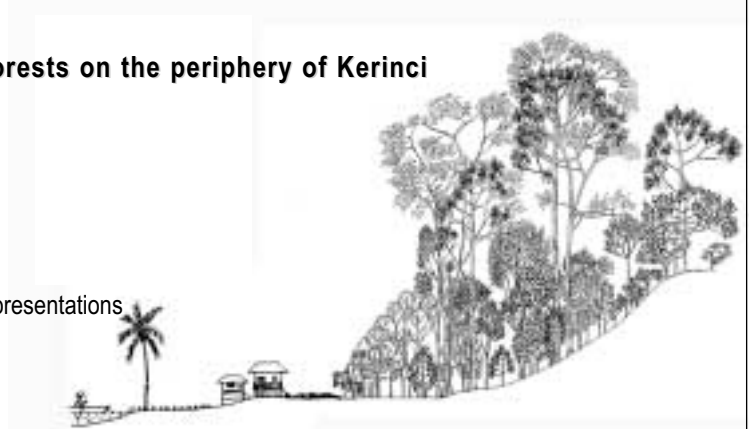
Dynamics of agroforestry at Kerinci

Conclusions

References

Appendices: useful plants in Temedak village forest, Keluru; plants of pelak agroforests in Jujun and Keleru; examples of the diversity of Rutaceae and Zingiberaceae used in Kerinci.

The zones surrounding parks and forest reserves are the sites of many conflicts between conservation managers and local populations. Although economic compensation may have been envisaged in the form of development projects, management of these peripheral zones encounters the problem of divergence between conservation managers and village communities in their perceptions, modes of representation and systems of appropriating resources. The work presented in this paper examines these divergences in Kerinci, an agrarian valley with approximately 300,000 inhabitants that is encircled by Kerinci Seblat National Park, a protected area of some 15,000 km<sup>2</sup> in Sumatra, Indonesia. As the conservation authorities intend to develop agroforestry to limit pressure on the park, agroforestry dynamics were examined from the perspective of the modes of representation, appropriation and exploitation of resources in Kerinci society. An historical overview of the evolution of the agricultural landscape from the beginning of this century shows the impact on the agricultural landscape of the development of export crops, particularly cinnamon (*Cinnamomum burmani*).



### 4 People, park and plant use - recommendations for multiple-use zones and development alternatives around Bwindi Impenetrable National Park, Uganda

Cunningham, A. B.; 1996

English, French

Contents:

Introduction

Bwindi Impenetrable Forest: conservation importance and vegetation change

Creating guidelines for multiple-use zones

Results and recommendations

New natural products with commercial potential

References

Acronyms

Appendix: plant list

In the large, forested areas of the Zaire and Amazon basins, human densities are low, and disturbance by 'forest peoples' creates rather than reduces diversity, forming a mosaic of vegetation types at different stages of recovery after disturbance. Afromontane forests are at the opposite extreme. Situated in one of the most densely populated areas of Uganda, the remaining forests formerly occupied by the Batwa have become the focus for harvesting of plant resources by the farmers who cleared them. They have also become the subject of national and international conservation efforts.

Afromontane forests in western Uganda, and Bwindi Impenetrable Forest in particular, are now fragmented islands, surrounded by rural farmlands. Under these circumstances, sustainable forest management differs greatly from the use of low species diversity, highly productive reedbeds or thatch-grassland, where harvesting is seasonal, obvious and easy to manage. Recovery from harvesting in productive annual systems is also short, due to annual production of above-ground biomass. Instead of the short rotation applied in reed cutting, sustainable harvesting of forest for timber is usually aimed at rotation times of 50-200 years.

This report focuses on resource use and management issues relating to wild plants and multiple-use zoning in Bwindi Impenetrable National Park. Foresters usually group products into two categories for forest management purposes: major forest products (such as timber, fuel-wood or other wooden products), and minor forest products (all non-wooden products). The results and recommendations of this report are presented first for the latter category, involving mainly specialist users of non-wood products, including wild plant resources, honey, basketry and bamboo use. The various uses of wood, the major forest products, (e.g. blacksmiths, carved wooden handcrafts, beer boats, building poles, bean stakes) are then considered.





## 5 Conservation through community use of plant resources - establishing collaborative management at Bwindi Impenetrable and Mgahinga Gorilla National Parks, Uganda

Wild, R.G. and Mutebi, J.; 1996

English, French

Contents:

Introduction

History of resource use and conservation in Bwindi Impenetrable and Mgahinga Gorilla National Parks

The collaborative management process at Bwindi Impenetrable National Park

The potential of collaborative resource management in Uganda

Conclusion

References

List of acronyms

Since 1988, the Development-Through-Conservation (DTC) project undertaken by CARE International in collaboration with government institutions, local communities, other NGOs and donors has been attempting to reconcile local needs with forest conservation at Bwindi Impenetrable and Mgahinga Forests, which were declared National Parks in 1991 after previous protection as Forest Reserve and Animal Sanctuary, respectively. These two parks are Afromontane forest blocks, remnants of a forest which once extended over much of south-west Uganda and into Rwanda and Zaire. There is an acute need for forest resources among the dense human populations surrounding the parks (200-400 people per km<sup>2</sup>) and virtually no forest now remains outside the park boundaries.

In 1992 at Bwindi, staff from the park and the DTC project with residents of three of the civil parishes adjoining the park embarked on a pilot process of planning and evaluating resource use. This process has resulted in written agreements being signed for collaborative management of forest resources. At Mgahinga Gorilla National Park, this process began in 1993.

Crucial to the process of collaborative management are community organisations which have the confidence of local people, such as the abataka (citizen's group), the engozi (stretcher groups) and the local Resistance Councils (RCs) as well as the knowledge of local resource-users such as herbalists, basketmakers and beekeepers.

In working with communities, tools were drawn and adapted from Participatory Rural Appraisal and Logical Framework Analysis. A system for rapid assessment of the vulnerability of useful species was tested, which combines social and biological data drawn from scientific literature and the knowledge of local resource-users and ecological principles, in order to identify species where the margin between sustainable use and over-exploitation is narrow.



## 6 Quantitative Ethnobotany - applications of multivariate and statistical analyses in ethnobotany

Höft, M., Barik, S. K. and Lykke, A. M.; 1999

English

Contents:

Introduction

Classification and ordination techniques

Applications of cluster and principal component analysis

Comparisons of several means

Applications of general linear models

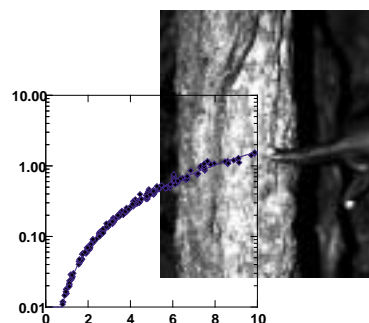
References

Appendix

Some wild plant resources are severely threatened by habitat loss and species-selective overexploitation. In addition, indigenous knowledge about the uses of wild plant resources is rapidly disappearing from traditional communities. In the context of conservation and sustainable and equitable use of wild plant resources, quantitative ethnobotany can contribute to the scientific base for management decisions.

In the past, most ethnobotanical studies have recorded vernacular names and uses of plant species, with little emphasis on quantitative studies. In this working paper, a selection of multivariate and statistical methods particularly applicable to the analysis of ethnobotanical field data is presented. The working paper aims at assisting researchers and students to recognise the appropriate method to analyse their data and to develop management recommendations from scientifically sound conclusions.

The techniques presented include cluster and principal component analysis, regression analysis, analysis of variance, and log-linear modelling. Multivariate and statistical analysis requires computerised statistics and graphics programs. Basic technical knowledge to use such tools as well as basic understanding of statistical terms are important requirements to get most benefit from this publication.



## 7 Joint Management in the Making - reflections and experiences

Aumeeruddy-Thomas, Y., Saigal, S., Kapoor, N. and Cunningham, A. B.; 1999

English

Contents:

Introduction

Major issues in Joint Management

Methodologies and approaches

Examples of joint management systems

Conclusion

Annotated bibliography

Subject index

List of institutions and addresses

As human needs and numbers increase, so do land-use conflicts at the interface between local communities and protected areas. Such conflicts are common, and practical examples of successful conflict resolution are rare - particularly where human population densities are high.

One of the most extensively implemented success stories under extremely difficult circumstances of conflict between state (forest) departments and local communities has been participatory planning processes for Joint Forest Management (JFM) in India. Methods developed for participatory planning processes for JFM in India have been well publicised in the past four years, influencing field workers in Africa and Latin America. Conversely, field workers outside India have developed methods not yet used in India that could be of use there, and have received less media attention.

This working paper is not meant to be a fixed blueprint for joint management of forests, but rather seeks to identify trends, concerns and methods, and initiate further discussion and contributions on this subject. The annotated bibliographical references are included to give the reader an extensive view of the diversity of experiences in these different fields of activity. Some references included in the text are not in the annotated bibliography which is far from being exhaustive and also because some major references became available only after the work on the annotated bibliography was completed.



## 8 Ethnobotany of the Loita Maasai: towards community management of the Forest of the Lost Child; experiences from the Loita ethnobotany project

Maundu, P., Berger, D., Saitabau, C. ole, Nasieku, J., Kipelian, M., Mathenge, S., Morimoto, Y., Höft, R.; 2001

English

Contents:

Introduction

The Maasai: an overview

The Loita Maasai

Plant inventory and uses

Conservation and tourism potential

Recommendations for future research and management

References

Appendix: Plants of Loita arranged in families

The Loita Ethnobotany Project was initiated in 1995 to enable the Loita community to develop a locally directed management plan for Loita Forest. The project followed the registration in 1994 of the Loita Naimina Enkiyo Conservation Trust whose objective was to protect and manage the forest heritage held as trust land by the Narok County Council.

Within about 30 months, the Project trained about 15 young local participants on research and resource monitoring techniques; raised awareness among the local population of the dangers faced by the forest and some plant resources; collected and identified the most common plants of Loita; established a local herbarium; documented the uses of over 250 species of plants; identified species locally endangered by overexploitation; and contributed to the development of a proposal to prepare a management plan for Loita Forest.



## 9 Projek Etnobotani Kinabalu: the making of a Dusun ethnoflora (Sabah, Malaysia)

Martin, G. J., Lee Agama, A., Beaman, J. H. and Nais, J.; 2002

English

Contents:

Introduction

Floristic and ethnobotanical projects at Mount Kinabalu

Productivity of community-based botanical inventories

The making of a Dusun Ethnoflora

The palms of Mount Kinabalu (Sabah, Malaysia)

Ethnobiological inventories, biodiversity loss and erosion of local knowledge

References

Mount Kinabalu, famous among botanists for its remarkable floristic richness and high level of plant endemism, is located in the Malaysian state of Sabah in northern Borneo. It is one of 234 sites designated as primary centres of plant diversity in the world (Davis *et al.* 1995). Centrally located in the Flora Malesiana region, it rises to 4,094 m above sea level, and is the highest mountain between the Himalayas and New Guinea. It is the centerpiece of Kinabalu Park, a 753 km<sup>2</sup> protected area created in 1964, renamed as a State Park in 1984 and designated a World Heritage Site in 2000.

This working paper provides some of the results of a community-based inventory of useful plants carried out from 1992-1998 that was at the heart of the Projek Etnobotani Kinabalu, an ethnobotanical research and training project at Mount Kinabalu. Over this period of six years, seventeen local collectors from nine communities (or kampungs) made more than 9,000 uniquely numbered plant collections at more than 500 sites around Kinabalu Park, and recorded ethnobotanical data from fellow villagers. The community participants obtained specimens from a broad range of natural and anthropogenic vegetation types around their communities.



## 10 An economic evaluation of medicinal tree cultivation: *Prunus africana* in Cameroon

Cunningham, A. B., Ayuk, E., Franzel, S., Duguma, B. and Asanga, C.; 2002

English

Contents:

Introduction

Methodology

Results

Diminishing wild stocks

Domestication of *Prunus africana*

Conclusions and recommendations



Wild populations of *Prunus africana* are currently the sole source of bark and bark extract exported from Africa and Madagascar to Europe. Bark exploitation has caused serious damage to wild populations, including trees inside forests of high conservation value. This working paper reports the results of an economic feasibility study, investigating different planting systems for *Prunus africana* cultivation. Results of a comparison between the flow of costs and benefits from small-scale production of *Prunus africana* and *Eucalyptus camaldulensis* show that *Eucalyptus* cultivation is 30% more profitable than *Prunus* production. However, because of the high value of *Prunus africana* as an ingredient in many local medicinal treatments, its use in making tools, its value for poles and firewood, and the fact that crop yield is much less affected by the presence of *Prunus* trees in the fields, than by the presence of *Eucalyptus*, farmers might rather invest in the cultivation of *Prunus africana*. Recommendations are made regarding clarification of Cameroonian forestry law, provision of relevant information to farmers and the initiation of an out-grower scheme involving the pharmaceutical company that buys the bark.

Robert Höft and Martin Walters

## PEOPLE AND PLANTS HANDBOOKS

The People and Plants Handbook was initiated in January 1996 to provide a handy source of information on ethnobotany, conservation and development, and to enable ethnobotanists and others in developing countries to be in touch with one another and with a wider global network.

Specifically, the objectives of the Handbook are to: (1) promote ethnobotany applied to conservation and development through the dissemination of information on specific themes to ethnobotanists, especially in developing countries; (2) enable such ethnobotanists to be better in touch with one another and with useful institutions worldwide.

English versions of issues of the Handbook are currently sent to about 4,000 colleagues and institutions in over 80 countries, and Spanish versions (*Cuadernos de Pueblos y Plantas*) to some 1,500 colleagues and institutions, principally in Latin America and Spain. The first five issues in English are now out of print, but are available at People and Plants Online.

The Handbook is maintained in the third phase of the People and Plants Initiative, but is changing from a 'thematic' to a 'best practices' focus, reflecting news of People and Plants activities.

### **Issue 1. Keeping in touch: journals, networks, newsletters, organisations and professional societies**

Gary J. Martin and Alison L. Hoare, editors. January 1996.

English and Spanish

This first issue is a general introduction to sources of information - international programmes, professional societies, networks, resource centres, journals and newsletters - which may not be known to everyone.

### **Issue 2. Protecting rights: legal and ethical implications of ethnobiology**

Gary J. Martin, Alison L. Hoare and Darrell A. Posey, editors. July 1996.

English and Spanish

How can we ensure that our work will benefit the causes we have targeted, while avoiding appropriation of results for unintended purposes not in the interest of local people and long-term management of resources? This issue seeks to provide answers by putting the reader in touch with the many international programs, national organizations, working groups and other sources which can help tackle these complex questions.

### **Issue 3. Returning results: community and environmental education**

Gary J. Martin, Alison L. Hoare, editors. March 1997.

English and Spanish

This issue deals with the topic of what do with the results of ethnobotanical studies. Should they be returned in the form of pamphlets, posters and guidebooks, or should we rely on new and old forms of communication that stimulate continued oral transmission?

### **Issue 4. Measuring diversity: methods of assessing biological resources and local knowledge**

Gary J. Martin, Alison L. Hoare and Agnes Lee Agama, editors. December 1998.

English and Spanish

Dedicated to methods and tools for assessing biological resources, this issue looks at the theme of using all of the senses common to humanity to assess biological resources. These senses are reflected not only in the ways that local people identify plants, but also in how they name them.



### Issue 5. Cultivating trees

Gary J. Martin, Agnes Lee Agama and Roger Leakey, editors. June 1999.  
English and Spanish

The inclusion of trees within farmland has been a tradition going back through the ages. Ethnobotanical knowledge is therefore at the very heart of agroforestry, something we have only realized recently in developing agroforestry as a modern science. Ethnobotany has a part to play in the development of very new opportunities for the implementation of more socially- and environmentally-friendly land-use systems. These can go a long way towards the alleviation of poverty in both rural and urban populations of tropical and sub-tropical countries, by enhancing the quality and productivity of marketable tree products. At the same time, it is anticipated that agroforests will mitigate against land degradation through the integration of trees into agroecosystems that can mature as a climax vegetation.

### Issue 6. Managing Resources

Gary J. Martin, Sasha Barrow, Anthony B. Cunningham and Patricia Shanley, editors.  
May 2001

English and Spanish

It is widely recognized today that the future of most conservation areas largely depends on the support of the surrounding local communities. As a result, there is added emphasis on sustainable resource use and a broader approach involving land-users in bioregional management at an ecosystem level. Good management requires wide social acceptance of management plans and regulations. Achieving this in turn requires an understanding of the social, economic, ethical, religious and political factors that either encourage resource conservation or lead to resource depletion.

### Issue 7. Growing Diversity

Gary J. Martin, Sasha Barrow and Pablo B. Eyzaguirre, editors.  
September 2001

English and Spanish

Over time, humankind has used more than 7,000 edible plant species, but now only about 150 crops are commercialized on a significant global scale and world food security is increasingly dependent upon just a handful of crops. Narrowing the base of global food security limits livelihood options for the rural poor, particularly in marginal areas. The focus of research and development must broaden to include a wider range of crop species and varieties, and it is here that ethnobotany has an important role to play.

### Issue 8. News from People and Plants

Martin Walters, editor. 2002

This current issue summarizes the work of People and Plants, detailing some of its aims, achievements and aspirations, including reports of field projects from around the world. It also sets out the information generated by the initiative and published in various formats and languages.



*Martin Walters*

## VIDEOS

The People and Plants Initiative has five reasons for producing low-budget videos as a training and awareness-raising tool to supplement its books and other publications. Firstly, the videos demonstrate the value of applied ethnobotany to a much wider audience. Secondly, they enable young developing country researchers (rather than expatriate researchers) to 'talk' through the video medium to foresters, protected area managers, resource-users or other young researchers in similar circumstances. Thirdly, these training videos are produced at 6-10 times lower cost than those by a professional company, with better control to ensure factual content. Fourthly, they can introduce people to written material (books, key publications) by suggesting extra reading at the end of the video. Finally, the use of video to show applied ethnobotanical projects reaches many more people than publications, so forms a useful tool in influencing people's opinions of issues.

Video production is also versatile, enabling original footage to be re-edited for a different audience. One example is the 10-minute video "Carvers, Conservation and Consumers". This was edited into a shorter form for a different audience, from the training video "Saving the wooden rhino", which illustrates methods for studying woodcarving markets. "Carvers, Conservation and Consumers" is being used by the "Ten thousand villages programme" at their retail outlets in the USA and Canada as well as to raise tourist awareness of about carvings and conservation by Kenya Airways and at hotels in Mombasa, Malindi and Nairobi.

Two new videos have been produced. The first deals with the achievements of the People and Plants Initiative as a global programme, and the second with work on medicinal plants conservation in Nepal. Details of these videos are given below. Footage for the sixth video in the series, "Beneath the skin: methods for studying bark use" has been completed and work is being done on the script so that the editing will be completed by the end of 2002. Ironically, although bark is so widely used for fibre, paper, medicines, spices such as cinnamon or a source of tannins, methods for studying bark use are poorly known: something that this new video will help address.

### **People, Gorillas and Forests: ethnobotanical methods and multiple-use management in Uganda**

Duration: 27 minutes

Theme: This video describes steps towards involvement of communities in the management system of Bwindi Impenetrable National Park. To an extent, conflict is inherent in any conservation programme based on protected areas, particularly where the short-term sacrifices towards the long-term goals of conservation are expected to be paid by local people, rather than being more evenly spread regionally or internationally. Integrated Conservation and Development Areas (ICDPs) are an experimental approach to resolving some of these conflicts, and an integrated approach is being applied at Bwindi-Impenetrable National Park in Uganda. In this case, the concept of multiple-use zones in protected areas has been supported. These are zones where local community members have the opportunity to responsibly use selected resources, such as collect medicinal plants, species used for basketry and to practice beekeeping under stipulated rules. The video illustrates the process whereby multiple-use arrangements were worked out carefully and collaboratively, based on an awareness of priorities for both conservation and communities, and monitoring methods used by P&P supported researchers.

### **Saving the Wooden Rhino: ethnobotanical methods and Kenya's woodcarving industry**

Duration: 25 minutes

Theme: The largest value and volume of African carvings in international trade comes from Kenya, and the bulk of these carvings are exported to North America, primarily to the USA. This video illustrates methods used to assess the history and the impact of the carved wood trade and why there is a need for responsible sourcing of woodcarvings. It illustrates the history of the Kenyan woodcarving industry from two perspectives. On one hand, the Kenyan woodcarving industry as an incredible rural development success, on the other, as a major ecological problem. The video illustrates methods used in a series of research projects funded by the People and Plants Initiative, supporting researchers at the National Museums of Kenya (NMK), East African Wildlife Society (EAWLS) and Kenya Forestry Research Institute (KEFRI). It ends by introducing the concept of certification and the common interest carvers should have in a sustainable future of carved wood use - for no wood means no work. This video has been very versatile in its use, having been seen for example by woodcarvers at Wamunyu (Kenya), 200 woodcarvers in the Masvingo area, Zimbabwe and 200 woodcarving retailers at Nanyuki (Kenya). It has also been shown twice on Kenyan national television (to several million people) as well as being used by at least five African universities.



## Carvers, Conservation and Consumers: three ways to save Kenya's woodcarving industry

Duration: 10 minutes

Theme: This is a popular production describing the threats to the sustainability of the hardwood carving industry in Kenya, and the steps being taken to improve the situation. All over the world - and particularly in Europe, North America and Japan, there are thousands of shops selling beautiful wooden carvings: wooden zebras, elephants and leopards charm the customers who buy them. Very few of the carving importers, shop-owners or the many people buying these carvings realize the ecological impact of this trade. The message of this video is "choose carvings carefully". The 'ecological footprint' of the wooden rhino can be a very heavy one, not only for forest habitat or rare East African wildlife, but ultimately for the wood-carvers themselves. By buying carefully and ordering carvings of alternative woods such as neem (*Azadirachta indica*), mango and jacaranda, buyers can make a choice - and a difference.

## People and Plants in Practice: conservation through ethnobotanical training

Duration: 25 minutes

Theme: This video shows some of the practical outcomes of the global People and Plants Initiative for field conservation, starting with botanical inventory as one of the most basic, yet most necessary, steps for conservation and resource management. It then illustrates the types of approaches taken in combining training and research on solutions to field conservation problems. It covers People and Plants projects in Africa, Asia and the South Pacific where applied ethnobotanical work takes place in key sites representing eight of the Global 200 priority ecoregions, five of which are critically endangered. Because the link between people and plants is so fundamental to the conservation of both biological and cultural diversity, it concentrates on the core of our capacity building: training in applied ethnobotany, providing people with inter-disciplinary skills highly relevant to conservation action. The video ends with an answer to the question: what happens when the People and Plants Initiative ends?

## Medicinal Plants in the Hidden Land of Dolpo: working with Himalayan healers at Shey Phoksundo National Park, Nepal

Duration: 26 minutes

Theme: Tibetan health-care traditions and their links to landscape and culture are central to the medicinal plants conservation programme supported in Shey Phoksundo National Park in the alpine meadows of the Eastern Himalaya, Nepal. With the cultural perception that the people's health is linked to that of the environment, medicinal plant conservation and health care are closely inter-related in the Dolpo region. In addition, local traditional healers, or amchis, are not only responsible for provision of health care, but also for environmental management, such as the regulation of grazing in alpine pastures. The new challenge being faced is a large-scale commercial trade of medicinal plants from this area of Nepal to India and elsewhere, with at least 40 tonnes of medicinal plants exported from the Shey Phoksundo National Park area in 1996/97. An example given in this video is the reduction of local self-sufficiency in popular and effective herbal medicines such as *Nardostachys grandiflora* and *Picrorhiza scrophulariifolia*. The video shows the work of People and Plants, which since 1997 has been studying systems of management used for medicinal plants by local amchis and investigating how they can be strengthened.

## Feedback on videos

The results of questionnaires sent out with the first three videos have been very useful for the development of this series. Interestingly, responses to the length of videos was sharply divided between African respondents and those from Europe/USA. African respondents either replied that the length of the video was "about right" (52%) or "too short" (some wanting them to be 60 minutes or more long, with more detail). A significant number of respondents from Europe or the USA, however, although representing a small proportion of the total sample, considered the video to be "too long" -- a view also encountered in discussions with other viewers from Europe/USA. We suggest that this represents a conditioning to 'sound-bite' sized information as against an African preference for longer, more detailed dialogue. Respondents from European/USA backgrounds also suggested an oral translation (voice-over) of the voice of mzee James Mukula (rather than his voice in Kikamba, plus sub-titles) in the video Saving the wooden rhino. There were two reasons for this. Firstly, the fact that the sub-titles appeared small on small TV screens (corrected in the 10-minute version). Secondly, the lack of cultural sensitivity to the fact that it would have been rude (from an African cultural perspective) to have a narrator 'interrupt' the Kikamba speaking mzee (elder) and this would have made the video less credible.



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## WHO SUPPORTS THE PEOPLE AND PLANTS HANDBOOK ?

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Department for  
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## PEOPLE AND PLANTS ONLINE

One of the best sources of information about the People and Plants Initiative is provided by our website. People and Plants Online is at:

**<http://www.rbgekew.org.uk/peopleplants>**

This website contains full details of projects worldwide, as well as information about all our publications. The website also acts as a gateway to selected useful information about ethnobotany, with many links to other on-line information courtesy of the Royal Botanic Gardens, Kew. We believe that this is one of the best internet-based sources of information about ethnobotany worldwide. A special feature of our is the web-newsletter which is updated about every 2 months, with an archive of earlier newsletters. Visitors may also subscribe, cost-free, to this news service, and will then receive the newsletter by email as a convenient reminder to re-visit the site. WWF itself has now developed a research section on its own website which also links to the website of People and Plants. This may be found at:

**<http://www.wwf.org.uk/researcher/programmethemes/plants/index.asp>**