

Research on Non-Timber Forest Products in Selected Countries in Southern and East Africa: Themes, Research Issues, Priorities and Constraints

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Summary

In this paper, the outcomes of a consultative meeting on non-timber forest products are reported and discussed. The meeting was organised by CIFOR and IUCN's Eastern Africa Regional Office on 15 and 16 September 1995 in Nairobi, Kenya, with the aim of discussing research priorities and information gaps related to non-timber forest products. The workshop brought together 11 people, representing forest research institutions, NGOs and other organisations involved in research related to non-timber forest products. The countries represented were Malawi, Kenya, Tanzania, Uganda and Zambia. During the meeting priority themes and issues were identified. These relate to management systems, policy and institutions, and community roles and social dimensions. Priority constraints include lack of personnel with appropriate expertise, inadequate financial resources, and insufficient data and information. A large number of solutions to overcome these constraints was discussed.

It is concluded that since the main relevance of non-timber forest products in Southern and East Africa is at the local and subsistence level, an elaboration of the results of the meeting into workable research questions and methods should be defined at that level in an iterative process of action research, involving researchers and local users and managers of the forest.

The meeting can be considered as a first, though authoritative, approximation of the needs in research on non-timber forest products in the region. It was agreed that elaboration of the findings of the meeting into specific action would be the only useful next step.

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Introduction

Background

Forests provide a large variety of products and offer diverse environmental services world-wide. However, after World War II, institutional attention focused on the production of timber, leaving aside non-timber forest products (NTFP)² and most of the environmental functions. East and Southern Africa did not escape this trend, developing forest policies that focused on industrial roundwood plantations (Kowero 1990; Aluma 1995; Mutemwa 1995; Odera 1995). The restriction of

access to plantations and other types of forest managed by government institutions frequently conflicted with customary law. Dwindling forest resources and increasing population pressures resulted in deprivation of key livelihood resources for rural populations (Mutemwa 1995; Odera 1995).

In the last fifteen years a growing interest in multiple use of forests has brought the issue of NTFP to the forefront of the research and development agenda. Hundreds of site-specific studies have been conducted (see Townson 1995 for an annotated bibliography) and a number of regional overviews have been produced (e.g., de Beer and McDermott 1989 for South-east

¹ Table on area of forest and other wooded land in the countries represented is found in Annex II.

² Discussions of the definition, categories and use of non-timber forest products can be found in several publications (e.g., de Beer and McDermott 1989; Falconer 1990; FAO 1995a). In this paper we will use the definition provided by Falconer (1990) as "any products, excluding commercially exploited timber, gathered from forests, whether for commercial or subsistence purposes".

Asia; CATIE 1992 for Central America; Anderson 1990 and Lescure 1995 for the Amazon Region; Falconer 1990 for West Africa). Again, these winds of change have affected the region, with the new policies incorporating multi-functional, multi-purpose forest management regulations (Kenya Forestry Master Plan 1994; Aluma 1995; Lowore 1995; Odera 1995)

One of the key factors in this renewed attention has been the convergence of interests between development and conservation organisations. A commonly held view is that NTFP can offer options for improving people's livelihoods while at the same time helping to conserve the forest against some of the threats posed by alternative options (see Myers 1986; Allegretti 1989; Falconer and Arnold 1989; Fearnside 1989; Peters *et al.* 1989; Bennett 1992; Nepstad and Schwartzman 1992; Panayotou and Ashton 1992; Plotkin and Famolare 1992; Redford and Padoch 1992; Clay and Clement 1993; Ros-Tonen *et al.* 1995). This assumption is at the basis of several initiatives carried out by national and international institutions and NGOs such as FAO, IUCN, Cultural Survival, WWF and Conservation International. It should be remembered that the acceptance of this assumption is not unanimous and that a number of authors have pointed out some of its flaws as well as facts that remain to be proven (see Bodmer *et al.* 1988; Browder 1992; González 1992; Redford 1992; Redford and Stearman 1993; Conklin and Graham 1995; Peters 1996; Ruiz Pérez and Arnold 1996).

In this sense, both the Center for International Forestry Research (CIFOR) in Bogor, Indonesia, and the Forest Conservation Programme of IUCN see it as their role to facilitate further exploration of how the use of NTFP can contribute to forest conservation and sustainable forest management, spelling out the conditions that favour this contribution as well as the potential conflicts and obstacles.

A prerequisite to enhance the contribution of NTFP to forest conservation and sustainable management is research that provides bottom-line information and scientific assessment of this potential. Although detailed case studies have been conducted, overall views and thorough analyses are scarce. The so-called "fuelwood crisis" of the 70s and 80s brought a number of country studies and triggered a process of plantations to meet the perceived future shortages (French 1986; Ministry of Natural Resources of Uganda

1994)³. The potential of certain types of product, like medicinal plants, is being studied (see Cunningham 1993). Regional consultations for NTFP have been carried out by FAO and IUCN (Crafter *et al.* 1996) and overviews are being produced of some key regional forest ecosystems, such as the "miombo" (Campbell 1996) that provides livelihoods for millions of people. However, we are still far from a regional or even national picture that offers an inventory, diagnosis and action-guided proposals.

Structure of the workshop and the paper

Bearing in mind the need for a diagnosis of the research on NTFP currently being undertaken by National Research Institutes (NRIs) in different tropical regions, CIFOR commissioned IUCN's Eastern Africa Regional Office (EARO) to organise a consultative meeting. This was intended to assist both institutions to further develop their programmes of activities related to NTFP as well as to identify potential national partners for collaborative work.⁴

The meeting, which took place on 15-16 September 1995 in Nairobi, Kenya, brought together researchers from Kenya, Malawi, Tanzania, Uganda and Zambia.⁵ The participants represented national and international forest research organisations, NGOs and other agencies with an interest in forest conservation and management. The aim of the meeting was to identify research priorities and information gaps in relation to non-timber forest products and to enhance co-operation between the institutions involved in these issues.

This paper reports on and discusses the outcomes of the workshop.

The first section is based on background papers commissioned for the workshop and on discussions amongst the participants. This is followed by presentation of the main themes, research issues, and priorities and constraints for carrying out research related to non-timber forest products in selected countries in Southern and East Africa.

During the discussions, the participants were first asked to identify the main, over-arching *research themes* based on their lengthy experiences as researchers and research managers. Individual oral presentations were supplemented by a strong group interaction. Eight major themes were identified (see below).

³ See Dewees 1989 for a critique of the "fuelwood crisis".

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⁵ See annex III for a list of participants.

A number of general *research issues* were identified for each research theme. Each participant separately listed those issues relevant to him/her for each theme. This was followed by a group discussion in order to synthesise and merge the full list into a reduced number of distinct issues. Each of these was then assigned a priority (low, medium, high) by every participant.⁶ In order to avoid the initial tendency to assign a high priority to every issue, participants were asked to consider the exercise in the context of limited resources and an urgent need to develop action-oriented output. The results of the prioritisation were tabulated and discussed by the group.

Having completed this process for each theme, the next step was to identify the *constraints*. Identification of individual views was again followed by group discussions to clarify and merge the list into a number of distinct factors. Finally, participants were asked to propose *solutions* to the constraints. Both constraints and solutions were grouped under a number of general headings. Given the common problems experienced by most participants and their research centres it was felt that a group discussion about the solutions was more appropriate and enriching.

In the final part of the paper, the outcomes of this exercise are discussed and suggestions presented for follow-up actions.

Research Themes, Issues, Priorities and Constraints

Research themes and issues

Eight major *research themes* were identified by the group:

- 1) Markets and marketing
- 2) Resources management
- 3) Technology
- 4) Cultural values
- 5) Policy and institutional arrangements
- 6) Community roles and social dimensions
- 7) Research on methodologies
- 8) Valuation

All themes were considered equally important in order to understand the complexity of non-timber forest products and their management.

The *research issues* within each theme were formulated at a general level. Time restrictions and the fact that most participants were research managers rather than active researchers did not allow the process to continue to an operational level of definition. The research issues and their priorities are presented in Table 1.

Table 1. Priority ranking of research issues

	Priority			Index	Rank (1-44)
	High	Medium	Low		
1. THEME: MARKETS AND MARKETING					
Research issues					
1.1 Effects on local communities, including different groups	7	2	0	80	3/4
1.2 Market opportunities for current and new products	7	1	1	76	5/6
1.3 Distribution of benefits	5	3	1	66	14/18
1.4 Influence of markets on development of non-timber products	4	4	1	61	23/27
1.5 Marketing information	4	2	3	53	34/35
1.6 Demand and supply of products marketed	2	6	1	51	38
1.7 Market organisation	3	2	4	44	41
1.8 Pricing mechanisms	2	3	4	39	42/43
2. THEME: RESOURCES MANAGEMENT					
Research issues					
2.1 Management systems and the roles of different groups	8	1	0	85	1/2
2.2 Tenure and access rights	5	4	0	70	11/13
2.3 Ecological implications of harvesting	5	3	1	66	14/18
2.4 Extraction rates: growth and yield	4	3	2	57	31/32
2.5 Biological possibilities for increasing production	3	4	2	52	36/37

⁶ Nine workshop participants took part in the ranking exercise.

Table 1 continued

	Priority			Index	Rank (1-44)
	High	Medium	Low		
3. THEME: TECHNOLOGY					
Research issues					
3.1 Potential for development of small scale, local industry	6	3	0	75	7
3.2 Inventory of technologies	5	4	0	70	11/13
3.3 Product harvesting, processing and storage	4	4	1	61	23/27
3.4 Product development potentials	5	1	3	58	29/30
3.5 Impact of technological changes	3	5	1	46	40
4. THEME: CULTURAL VALUES					
Research issues					
4.1 Identification of values	5	3	1	66	14/18
4.2 Cultural constraints/opportunities for the development of non-timber forest products	4	4	1	61	23/27
4.3 Conflicts between cultural values and existing management systems	3	4	2	52	36/37
4.4 Role of religious beliefs	2	3	4	39	42/43
4.5 Impact of changing values	1	4	4	34	44
5. THEME: POLICIES AND INSTITUTIONAL ARRANGEMENTS					
Research issues					
5.1 Effects of past and existing natural resource policies	7	1	1	76	5/6
5.2 Effects of external policies on traditional institutions	6	2	1	71	8/10
5.3 <i>De facto</i> and <i>de jure</i> ownership and user rights	4	5	0	65	19/20
5.4 Institutional framework, including inter-sectoral linkages	5	2	2	62	21/22
5.5 Incentives	4	4	1	61	23/27
5.6 Impact of commercialisation at all level	3	6	0	60	28
6. THEME: COMMUNITY ROLES AND SOCIAL DIMENSIONS					
Research issues					
6.1 Participatory/joint management	8	1	0	85	1/2
6.2 Dependence of different groups on non-timber forest products	7	2	0	80	3/4
6.3 Distribution of benefits	5	3	1	66	14/18
6.4 Role of individuals, households and communities	5	3	1	66	14/18
6.5 Relations between different groups	4	4	1	61	23/27
6.6 Population dynamics	4	2	3	53	34/35
6.7 Attitudes and social change	3	3	3	48	39
7. THEME: RESEARCH ON METHODOLOGIES					
Research issues					
7.1 Standardisation of methodologies	6	2	1	71	8/10
7.2 Development of participatory methods	6	2	1	71	8/10
7.3 Multi-resource inventory	5	2	2	62	21/22
7.4 Classification of products and units of measurement	4	3	2	57	31/32
8. THEME: VALUATION					
Research issues					
8.1 Criteria/parameters for market and non-market values of non-timber forest products	5	4	0	70	11/13
8.2 Economic contribution at all levels	4	5	0	65	19/20
8.3 Cost-benefit analysis	5	1	3	58	29/30
8.4 Maximising and realising value of non-timber forest products (emphasis on local value)	3	5	1	56	33

Table 2. Research issues with a high priority

Issues	Priority index (%)
2.1 Management systems and roles of different groups	94
6.1 Participatory/joint management	94
1.1 Effects of markets on local communities	89
6.2 Dependence of different groups on non-timber forest products	89
1.2 Market opportunities for current and new products	84
5.1 Effects of past and existing natural resource policies	84
3.1 Potential for development of small-scale industry	83
5.2 Effects of external policies on traditional institutions	79
7.1 Standardisation of methodologies	79
7.2 Development of participatory methods	79

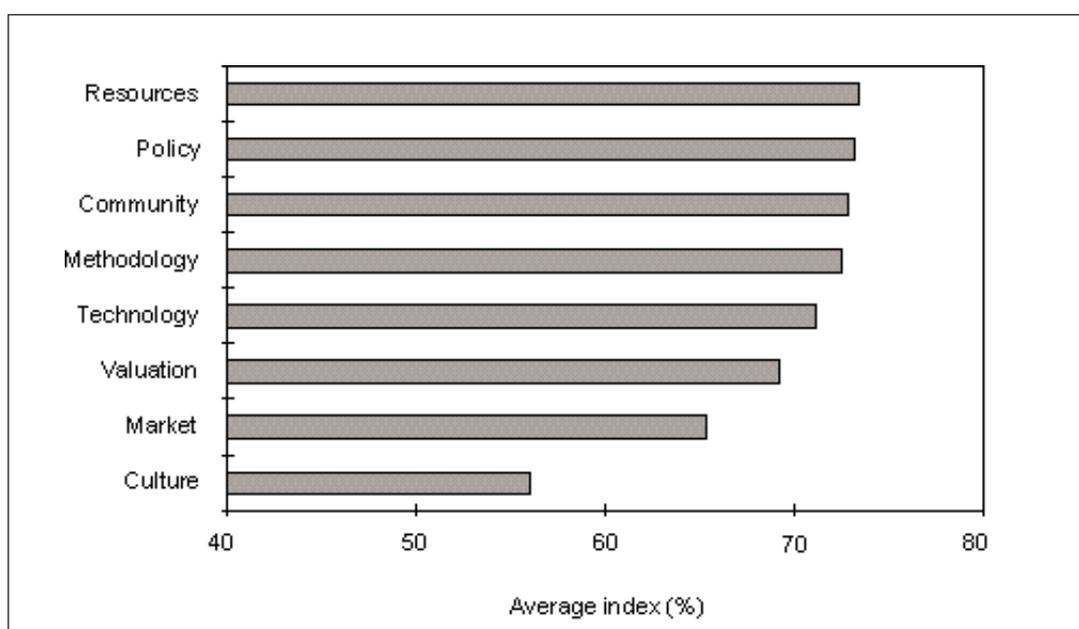
It should be emphasised that the research issues are not completely independent or self-contained. On the contrary, there are strong links between some issues that arise in different themes, as there are indeed between the eight themes identified.

Priority research themes and issues

A priority index was calculated by giving a value of 10 to high priority, 5 to medium priority and 1 to low priority. The maximum possible value for the 9 responses is 90. The priority index is the percentage of this maximum theoretical value. Table 2 shows the ten research issues which were given the highest priority. These

ten issues, 22.7 % of the total of 44 research issues identified, were allocated a high ranking by six or more participants.

As has already been noted, the eight main research themes were initially considered of equal importance for a comprehensive understanding of the potential of non-timber forest products and therefore were not prioritised. However, the index used for the issues can also be used as a proxy to identify the combined importance assigned by the group to each of the themes. Thus an average index was calculated by adding the total score for a given theme and dividing it by the number of issues. Figure 1 ranks the eight main themes according to the average importance of their research issues.

**Figure 1.** Priority research issues

Constraints affecting research on non-timber forest products

The participants were next asked to identify the constraints faced by their organisations in carrying out research. Table 3 presents those constraints identified and the number of participants who named each.

Nineteen constraints were identified, being mentioned a total of 175 times by the nine participants. The number of constraints identified for each theme varies between 7 and 10 with an average of 8.25. Some constraints, such as lack of data, expertise or financial resources, are general constraints that appeared in all the themes, whereas others, such as external influences, lack of legislation or potential mistrust are very theme specific. The number of times identified for each constraint appears in Figure 2. It can be used to assess the perceived relative importance of each.

Three types of constraint based on their relative importance are evident in Figure 2:

- The first type are constraints *commonly* experienced and affecting all themes. They include:
 - No. 1. Insufficient personnel with appropriate expertise.
 - No. 2. Insufficient financial resources.
 - No. 3. Insufficient data or information available (which in itself is a reflection of the lack of research in the area).
- The next type includes constraints that affect most themes but were identified only by some of the participants. They fall in two distinctive categories:
 - No. 4. The *low priority given by current research policies* to non-timber forest product themes and the associated perceived negative bias against research on non-timber forest products as well as lack of fora for articulating research priorities.

Table 3. Constraints for each research theme. The figure indicates the number of participants that mentioned a given constraint

Constraints	Research theme								Total
	Market	Resources	Commun.	Techn.	Culture	Method	Policy	Valuat	
1. Expertise/personnel	5	5	5	5	5	6	4	5	40
2. Financial limitations	8	4	3	4	3	5	3	3	33
3. Data/information	5	5	5	4	4	3	3	3	32
4. Low priority of policy	3	3	4	1	1	1	3	-	16
5. Inadequate methodologies	3	2	2	-	3	-	2	3	15
6. Complexity of products	3	2	-	-	-	2	-	1	8
7. Negative bias	2	-	3	1	1	-	-	-	7
8. Accessibility of research areas	-	1	-	1	-	-	-	1	3
9. Communication barriers with local communities	-	-	1	1	-	-	-	1	3
10. Complexity of society/issue	-	-	1	-	1	-	1	-	3
11. Co-ordination/collaboration	-	1	-	-	-	2	-	-	3
12. Facilities and equipment	-	2	-	1	-	-	-	-	3
13. Mistrust/sensitive area	-	-	-	-	2	-	-	-	2
14. Political realities	-	1	-	-	-	-	1	-	2
15. Externally driven technology development	-	-	-	1	-	-	-	-	1
16. Inadequate legislation	-	-	-	-	-	-	1	-	1
17. Lack of legal frame	-	-	-	1	-	-	-	-	1
18. Restrictions by global policies	-	-	-	-	-	-	1	-	1
19. Time/space fluctuations	-	-	-	-	-	1	-	-	1
Total	29	26	24	20	20	20	19	17	175

No. 5&6. The *lack of methodologies* (which is linked to the poor expertise available) and the complexity of the products.

- Finally, the other constraints (Nos. 7 to 19) are *theme specific*. These were identified only by a small number of participants.

The total number of times that constraints were mentioned per theme is quite evenly distributed, ranging from 17 to 29 with an average of 21.9.

Proposed solutions to overcome the constraints

The last part of the workshop was devoted to discussing possible solutions to the constraints identified. No prioritisation of solutions was conducted and during the discussions the solutions were slightly re-arranged; they do not follow the same grouping as the constraints. The proposed solutions are presented in Table 4.

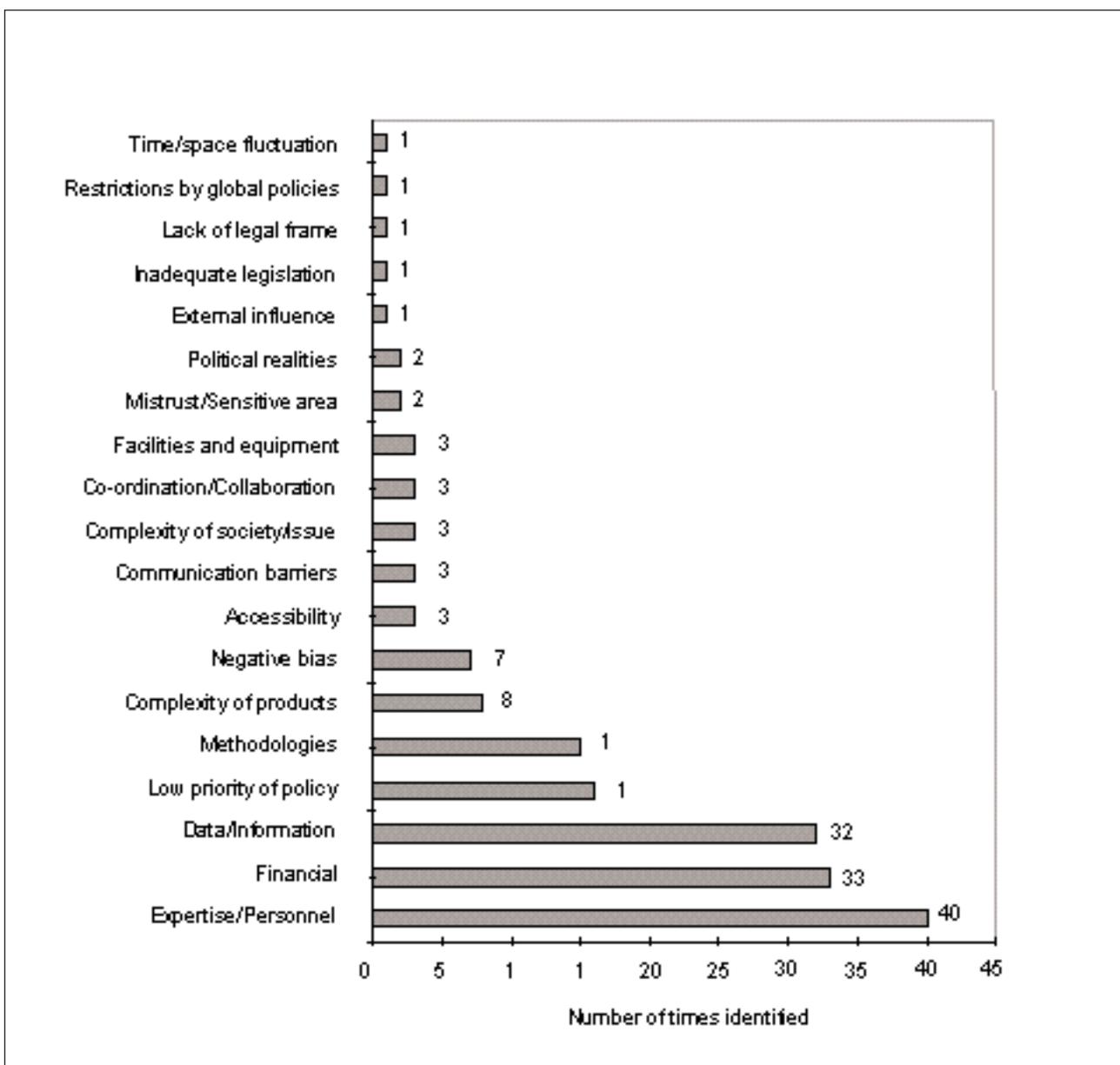


Figure 2. Relative importance of constraints on NTFP research

Table 4. Proposed solutions to overcome the constraints in research on non-timber forest products

<p>A. <i>Human resources (expertise)</i></p> <p>Training in research on non-timber forest products Training and employment of local people in research Consolidation/co-operation/exchange of expertise Recruitment of more staff Provision of incentives to scientists for research in hardship areas Prioritisation of research themes</p>
<p>B. <i>Funding</i></p> <p>Sensitisation of research funding institutions Commercialisation of research results Influencing policy on research on non-timber forest products</p>
<p>C. <i>Facilities and equipment</i></p> <p>Sensitisation of financing institutions Rationalising and sharing of available facilities Establishing new/modification of existing facilities</p>
<p>D. <i>Non-timber forest products – resource base</i></p> <p>Networking Prioritisation of products for research Development of common methodologies Design and implementation of inter-disciplinary research Synthesis and dissemination of available databases and grey literature Database integration</p>
<p>E. <i>Organisational constraints (policies, etc.)</i></p> <p>Sensitisation of relevant institutions and organisations, society and policy makers Building research projects on non-timber forest products into programmes in forestry related fields and institutions</p>
<p>F. <i>Communication</i></p> <p>Packaging and disseminating available research findings Eliciting greater participation of local communities in issues relating to non-timber forest products Improving co-ordination and rationalising participation in research on non-timber forest products – regional and global forums</p>
<p>G. <i>Others</i></p> <p>Exploring patents for traditional knowledge to protect intellectual property rights</p>

Discussion and Conclusions

Research themes and issues

A number of broad themes and directions might be identified as an outcome of the workshop. The priority issues of Table 2 and the priority research themes of Figure 1 can be used to infer the main research gaps as experienced by participants. They relate to:

- Natural resources management (issues 2.1 and 6.1)
- Policy and institutional arrangements (issues 5.1 and 5.2)
- Community roles and social dimensions (issues 6.1, 1.1, 6.2, 3.1 and 7.2)

The importance given to different methodological aspects (issues 7.1 and 7.2) reflects the perceived need for better training and qualified staff.

Only a few issues related to technology and markets (issues 1.1 and 1.2; with a clear component of product development and promotion) were considered urgent, while most of the valuation techniques and cultural aspects do not appear to be of high priority.

Many of the priorities identified overlap to some extent with the issues identified in CIFOR's framework for research on non-timber forest products (Ruiz Pérez 1995).

Constraints and solutions

Participants agreed that most of the constraints are internally determined and that they are similar to problems faced by other research activities in the region. However, a number of constraints are related to external factors, which is especially relevant for action research and development-oriented research. Examples of this include constraint no. 15, externally driven technological development, and constraint no. 18, restrictions imposed by global policies.

The proposed actions to overcome the constraints also include options common to many other types of research (Table 4: A. Human resources; B. Funding; C. Facilities and equipment; E. Organisational constraints; and elements of F. Communication). Some other suggested solutions address the distinct nature of non-timber forest products as research subjects (Table 4, D. Non-timber forest products – resource base (diversity, inter-disciplinary); G. Others (patenting); and elements of F. Communication (participation)).

The workshop process

Before drawing any firm conclusions on the information generated at the workshop, a word of caution is appropriate in relation to the role of the meeting as a research programming tool. It should be emphasised

that, although the participants included most senior staff of respected forest research institutions in the region, their small number and relatively homogeneous professional background would certainly introduce bias into the outcomes of the meeting, just as would any other composition of the group. The fact that most were foresters with extensive research management and policy design responsibilities could be reflected in the results. Therefore, the workshop should be considered as a first, though authoritative, approximation to the needs in research on non-timber forest products in Southern and East Africa, based on the analysis by nine experts – nothing more and nothing less.

In fact, an important basic conclusion of the workshop might be that not only the research topic under review (non-timber forest products) is different from the traditional forest research subject (timber) but that, in order to address the subject in a meaningful way, the mechanisms to define research questions and research methods should be adjusted as well. The main significance of non-timber forest products is at the local and subsistence level and therefore research questions and methods should be defined at that level in an iterative process of action research, involving researchers and local users and managers of the forest (Gilmour *et al.* 1987). Many, if not all, of the broad themes and issues identified during the meeting can be elaborated and refined into workable research questions through such iterative processes. The development of participatory research methods, necessary for this approach, was identified as one of the ten priority issues by the participants (issue 7.2).

Follow-up actions

The purpose of the meeting was to identify research priorities and to promote collaboration between the participating institutions. A brief review of some examples from the region of research initiatives related to non-timber forest products (Annex I) indicates that many of the themes and issues identified during the workshop are being addressed in at least one research project. Yet, the participants agreed that non-timber forest products do not yet form part of mainstream forest research programmes. On-going research and development programmes on or embracing non-timber forest products remain scarce, dispersed in different institutions and largely driven by personal interests of individual scientists.

Traditionally, forest research is being carried out by universities, forest research institutes and, for ethno-botanical studies, by national museums. More and more, this research is being complemented by activities from other “non traditional” research institutions, such as non-governmental organisations (NGOs), often as a component of forest management and conservation projects or integrated conservation and development projects (ICDPs).

Reflecting the action research approach described above, these initiatives attempt to address issues through a process in which management questions, research activities and pilot implementation go hand in hand, and whereby the link between researchers and stakeholders is (or should be) very close.

Often, but not always, the link between these action-oriented research initiatives and the traditional research programmes is absent or weak. An important step in enhancing the capacity to address research issues about non-timber forest products would be to strengthen the linkages between these various initiatives and activities, for example, through sharing information and experiences.

It was not the purpose of this meeting to design specific projects and programmes, but it was felt by

the participants that an elaboration of the findings of the meeting into specific action would be the only useful next step. It was agreed that the Kenya Forest Research Institute (KEFRI) would take the lead in this, together with IUCN's Eastern Africa Regional Office.

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Annex I

Summary of some research and development initiatives for non-timber forest products in the region

Kenya (Source: Dr. J.A. Odera)

Institutions	Programme Title	Objectives	Methods/Activities	Duration	Contact persons
Faculty of Forestry, Moi University, P.O. Box 3900, Eldoret, Kenya	-	Increase understanding of the dynamics of dryland ecosystems among Moi University students and foster appropriate research and management in arid and semi-arid areas (ASALs) of Kenya	Assessments of the benefits of vegetation to the communities around Lake Baringo	1991 to 1994	Dr. J. Kiyapi Fac. of Forestry
Kenya Energy & Environment Organisations	Indigenous vegetables	-	<ul style="list-style-type: none"> Ethno-botanical surveys Seed collection, storage and propagation Limited nutritional analysis 	Completed	Mr. L. Kang'ethe KENGO
National Museums of Kenya, P.O. Box 40658, Nairobi, Kenya	Indigenous vegetables of Kenya	Documentation of the different food plants, preparation methods and utilisation	Ethno-botanical surveys in different ecological systems and amongst different communities	1995 to 1998	Dr. C. Kabuye NMK
National Museums of Kenya	Biodiversity distribution, status and opportunities for their sustainable management	Institute research and an action programme dedicated to gathering, storing and analysing information for the sustainable use of biological resources	<ul style="list-style-type: none"> Collect and analyse bio-geographic information relevant to Kenya Establish a comprehensive data base 	Phase I: 1992 to 1995 Phase II: 1995 to 1999	Dr. R. Bagine NMK
National Museums of Kenya	Elangata Wuas Ecosystems Management Programme	Develop community-centred paradigms for sustainable management of renewable natural resources using protocols that generate benefits to the local people	<ul style="list-style-type: none"> Data collection on the use of indigenous plants Domestication of game birds and mammals Promotion of kitchen gardens and the domestication of wild food plants 	1994 to 1998	Mr. M. de Vreede NMK

Zambia (Source: Mr M. Mutemwa)

Institutions	Programme Title	Objectives	Methods/Activities	Duration	Contact persons
Tree Improv't. Research Centre Box 21210 Kitwe, Zambia	Natural variation in fruits <i>Upaca kirkiana</i> in Zambia	Examine the relationship between seed number per fruit and fruit parameters in different localities	<ul style="list-style-type: none"> • Identification of study sites and transects within protected forest areas • Seeds extraction and counting 	-	C.K. Mwamba TIRC
Div. of Forest Products Dept. of Forestry Box 20388 Kitwe, Zambia	Resins in Zambia	<ul style="list-style-type: none"> • To determine the amount and purity of resin that can be collected from pine trees at various ages • To assess the cost of the extraction • To determine recovery period of injured trees and the effect of injury on timber 	<ul style="list-style-type: none"> • Old tapping method • Distribution of species 	-	S.M. Mutemwa, FD
Div. of Forest Products Dept. of Forestry	Natural dyes in Zambia	<ul style="list-style-type: none"> • To promote the exploitation and use of natural dyes from locally available materials • To produce local substitutes for synthetic dyes 	<ul style="list-style-type: none"> • Collection of raw materials and preparation of the dyes using traditional methods • Preparation and dyeing of cloth 	On-going since 1985	S.M. Mutemwa, FD
National Council for Scientific Research	Production of <i>endod</i> (berries of <i>Phytolacca dodecanra</i>) and its application in integrated schistosomiasis control	<ul style="list-style-type: none"> • To evaluate the effectiveness of <i>Phytolacca dodecanra</i> as a molluscicide in flowing water under Zambian climatic conditions • To develop efficient and specific chemical quality control methods in commercial <i>endod</i> production • To produce a reasonable quality and quantity of refined saponin in a pilot plant • To test inter-cropping of <i>endod</i>- producing plants with other agricultural crops and determine the economic benefits of this production strategy 	<ul style="list-style-type: none"> • Studies on the harvesting of <i>endod</i> (berries) and on extraction of saponins • Propagation trials 	On-going since 1985	Dr. M.A. Shehata TIRC

Malawi (Source: Mr J. Lowore)

Institutions	Programme Title	Objectives	Methods/Activities	Duration	Contact persons
Forest Research Institute of Malawi (FRIM) P.O. Box 270, Zomba, Malawi & University of Aberdeen	The effect of fodder availability on animal weight, health and vigour	<ul style="list-style-type: none"> To evaluate the potential of forest reserves in providing animal fodder To determine the effect of fodder availability on animal health To determine the effect of grazing and browsing on forest regeneration dynamics To determine woodland carrying capacities To provide forest management guidelines to increase fodder production 	<ul style="list-style-type: none"> Participatory rural appraisals with herders to determine important fodder species Ecological studies to monitor woodland population structure and regeneration patterns in grazing paddocks Monitor cattle weight 	1993-1995	P. Abbot, U. of Aberdeen Forestry Dept. Aberdeen AB9 2UD Scotland, UK; J. Lowore & J. Probyn, FRIM
FRIM & University of Aberdeen	Seasonal woodland use studies	To determine how local communities utilise natural woodlands, i.e. what they collect, when they collect, where they collect and how much they collect	<ul style="list-style-type: none"> An intensive woodland use survey using 4 enumerators visiting 36 sample families over two years Inventory of woodlands 	1994-1995	P. Abbot, U. of Aberdeen; J. Lowore & J. Probyn, FRIM
FRIM	Caterpillars: ecological aspects, reproductive biology, nutritional properties and marketing	<ul style="list-style-type: none"> To study the biology and ecology of edible caterpillars and their breeding habits, to determine their environmental requirements To quantify caterpillar productivity To study and improve processing and marketing of caterpillars 	<ul style="list-style-type: none"> PRAs to document important edible caterpillars Experimental study plots in forest reserves and customary woodlands Laboratory studies on reproductive biology and nutritional values Studies in caterpillar marketing 	1995-1999	G. Meke & C. Chilima FRIM P.O. Box 270 Zomba, Malawi
FRIM	Indigenous fruit trees: phenology, productivity and marketing	<ul style="list-style-type: none"> To document phenology of important fruit trees To assess fruit productivity To study fruit marketing 	<ul style="list-style-type: none"> Identification of sample trees Recording of phenological changes Monitoring of fruit productivity Market research 	1996-1999	J. Lowore C. Coote & C. Bonongwe, FRIM

Malawi continued

Institutions	Programme Title	Objectives	Methods/Activities	Duration	Contact persons
Forestry Dept. P.O. Box 30048 Lilongwe 3 Malawi & FRIM	Mushrooms: ecology, productivity and marketing	<ul style="list-style-type: none"> To document important edible mushrooms To study reproductive biology and mushroom ecology To determine mushroom productivity in different woodland types To study mushroom marketing To evaluate possibilities for domestication 	<ul style="list-style-type: none"> PRAs to document important mushrooms Establishment of woodland plots to monitor mushroom ecology and productivity Market research 	1996-1999	N. Chipompha FD C. Coote, C. Bonongwe & F. Kulapani FRIM
Chancellor College U. of Malawi P.O. Box 280 Zomba, Malawi	Medicinal plants: identification and chemical analysis	<ul style="list-style-type: none"> To document important medicinal plants To determine chemical properties To produce a pharmacopoeia To intensify <i>in situ</i> and <i>ex situ</i> conservation 	<ul style="list-style-type: none"> Interviews with prominent traditional herbalists Identification of plants with high medicinal values Collection of plant specimens Laboratory analysis Plant propagation and establishment 	1980s and on-going	J. Msonthi & É. Fabiano Chanc. Coll.
Forestry Department	Bee-keeping	Teach farmers apiculture as an income-generation activity	<ul style="list-style-type: none"> Organisation of training course Provision of bee-keeping equipment 	1994 and on-going	W. Nyoni FD
Bunda College of Agriculture P.O. Box 219 Lilongwe, Malawi	Indigenous vegetables	<ul style="list-style-type: none"> To document important indigenous vegetables To develop propagation techniques To determine nutritional values 	<ul style="list-style-type: none"> Identification of important indigenous vegetables Collection of germplasm Carry out propagation Dissemination of germplasm 	1990s and on-going	M. Kwapata & Dr. Saka Bunda Coll. Agr.
SADC/ICRAF P.O. Box 134 Zomba, Malawi & FRIM	Domestication of indigenous fruit trees of the miombo eco-zone	To develop techniques for improving propagation and establishment of fruit trees	<ul style="list-style-type: none"> Ethno-botanical surveys in Zambia, Tanzania and Malawi Identification of important tree species Collection of germplasm Carry out propagation and establishment studies Monitor trials 	1989 and on-going	J. Maghembe SADC/ICRAF M. Ngulube FRIM

Malawi continued

FRIM	<i>Uapaca kirkiana</i> : biology and ecological studies	To document the ecology and population dynamics of <i>Uapaca</i> species south of the Sahara	Carry out studies on population dynamics, phenology, breeding ecology, productivity and nutritional values	1994-1997	M. Ngulube, FRIM P.O. Box 270 Zomba, Malawi
FRIM	Karaya gum-tapping studies	<ul style="list-style-type: none"> To determine optimal tapping techniques To study the ecology, population structure and growth characteristics of <i>Steculia quinqueloba</i> 	<ul style="list-style-type: none"> Study plots in <i>Steculia</i> woodlands Monitoring of gum production 	1994-1996	M. Lawrence, FRIM P.O. Box 270 Zomba, Malawi
Leicester U. Dept. of Engineering Leicester LE1 7RH, UK; Polytechnic, U. of Malawi P/Bag 303 Chichiri, Blantyre 3, Malawi; & FRIM	<i>Moringa oleifera</i> : water purification studies	<ul style="list-style-type: none"> To determine the effectiveness of <i>Moringa oleifera</i> in water purification To evaluate the most productive provenances of <i>Moringa oleifera</i> 	<ul style="list-style-type: none"> Propagation and establishment of plots of <i>Moringa oleifera</i> provenances Monitoring of growth and seed yield Seed harvesting Pilot testing of seed powder in water purification 	1992 and on-going	G. Folkard Leicester U.; Mr Mtawali Polytechnic, U. of Malawi; J. Lowore, FRIM
FRIM	Marketing of non-timber forest products	To conduct research on and develop marketing strategies for non-timber forest products	Marketing research for important non-timber forest products in Malawi	1995-1999	C. Coote, C. Bonongwe & J. Lowore, FRIM

Forest Action Network (Source: Mrs. E. Omosa)

Institutions	Programme Title	Objectives	Methods/Activities	Duration	Contact persons
WWF-Int., Conserv. Policy Div., Avenue du Mont Blanc, 1196, Gland, Switzerland & UNESCO-MAB Prog.7, Place de Fontenoy, 75352 Paris, Cedex 07 SP, France & KEW Bot. Gardens	The people and plants initiative: an initiative on ethno-botany and sustainable use of plant resources, focusing (in Eastern/Southern Africa) on coastal and afro-montane forests	To promote sustainable and equitable use of plant resources through providing support to ethno-botanists from developing countries	Implementation of ethno-botanical studies and training in: <ul style="list-style-type: none"> Kenya: Loita forest and Kaya forests Uganda: Bwindi and Rwenzori NP Kenya & Tanzania: hardwood for crafts Mozambique: medicinal plants Publications and networking	1992 - on-going	Dr. A.B. Cunningham P.O. Box 42, Betty's Bay, 7141, South Africa & Dr. R. Höft, UNESCO-MAB

The People and Plants Initiative (Source: Dr. A.B. Cunningham)

Institutions	Programme Title	Objectives	Methods/Activities	Duration	Contact persons
Forest Action Network (FAN) P.O. Box 21428, Nairobi, Kenya	Forests, Trees and People Programme (FTPP), East Africa	Improve livelihoods in developing countries through the utilisation of tree and forest resources	<ul style="list-style-type: none"> Networking Method development 	On-going since 1991	Eileen Omosa FAN

*Annex II***Area of forest and other wooded land 1990 ('000 ha)**

Country	Land Area	Forest and Other Wooded land	Forest				Other Wooded Land
			Total	% of land area	Natural	Plantation	
Kenya	56 969	16 816	1 305	2	1 187	118	15 511
Uganda	19 955	16 023	6 366	32	6 346	20	9 657
Tanzania	88 604	68 497	33 709	38	33 555	154	34 788
Malawi	9 408	3 724	3 612	38	3 486	126	112
Zambia	74 339	60 337	32 349	44	32 301	48	27 988

Source: FAO 1995b.

Annex III

List of workshop participants (positions held at the time of the workshop)

Dr. J.R.W. Aluma
Director, Forestry Research Institute
Kampala - Uganda

Ms. Janet Achieng Awimbo
Tutorial Fellow, Department of Zoology, University of Nairobi
Nairobi - Kenya

Mr. Guido Broekhoven
Forest Programme Coordinator, IUCN - Eastern Africa Regional Office
Nairobi - Kenya

Ms. Lucy Emerton
Resource Economist, African Wildlife Foundation (AWF)
Nairobi - Kenya

Prof. S. Iddi
Director, Forest and Beekeeping Division, Ministry of Tourism, Natural Resources
and Environment
Dar-es-Salaam - Tanzania

Dr. P.K.A. Konuche
Director, Kenya Forestry Research Institute (KEFRI)
Nairobi - Kenya

Dr. Godwin Kowero
CIFOR
Bogor - Indonesia

Dr. Jimmy D. Lowore
Forest Research Officer, Indigenous Forest Department, Forestry Research Institute
of Malawi (FRIM)
Zomba - Malawi

Mr. Martin Mutemwa
Chief Forest Products Research Officer, Forest Products Department
Kitwe - Zambia

Dr. J. Odera
Chief Research Scientist, Kenya Forestry Research Institute (KEFRI)
Nairobi - Kenya

Mrs. Elieen Omosa
Regional Network Coordinator, Forest Action Network (FAN)
Nairobi - Kenya

Dr. Manuel Ruiz Pérez
CIFOR
Bogor - Indonesia

Prof. A. Temu
ICRAF
Nairobi - Kenya
