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IMPLEMENTATION OF FOREST-RELATED DECISIONS OF THE UNITED NATIONS CONFERENCE ON ENVIRONMENT AND DEVELOPMENT AT THE NATIONAL AND INTERNATIONAL LEVELS, INCLUDING AN EXAMINATION OF SECTORAL AND CROSS-SECTORAL LINKAGES

Programme element I.3: Traditional forest-related knowledge

Report of the Secretary-General

SUMMARY

As requested by the Ad Hoc Intergovernmental Panel on Forests at its second session (E/CN.17/1996/24), the present report has been prepared for substantive discussion of programme element I.3, "Traditional forest-related knowledge" (TFRK), of the programme of work of the Panel. This report contains a general overview covering the nature of traditional knowledge, its relationships with property rights and the distinctions that it is necessary to recognize as regards integrating traditional knowledge into forest management. It describes recent progress and status concerning traditional knowledge with regard to management of forests, biodiversity prospecting and sharing experiences. In the last section, the report reviews the main obstacles to further progress in the wide application of TFRK and provides a set of conclusions and options for action for discussion by the Panel.

Within the overall context of sustainable development and taking into account how traditional knowledge and practices in their broadest sense could be applied to sustainable forest management, this report proposes that TFRK is diverse and composed of many linked features including:

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(a) Information about the various physical, biological and social components of a particular forested landscape;

(b) Rules for using them without damaging them irreparably;

(c) Relationships among their users;

(d) Technologies for using them to meet the subsistence, health, trade and ritual needs of local people;

(e) A view of the world that incorporates and makes sense of all the above in the context of a long-term perspective in decision-making.

This report indicates that TFRK has diverse meanings and potential usefulness to global society, but that most of the knowledge concerned cannot, and the rest should not, be taken from its holders without their consent. It must therefore be accessed through negotiation and partnership. Most TFRK has little value outside the environment where it arose, however, and is likely to be most valuable only as a means to achieve on-site sustainable forest management. Accomplishing this requires that the holders of TFRK be involved in:

(a) Holders' partnerships, in which local people as well as the State agree holders' regimes for forest land;

(b) Planning partnerships, in which traditional and other forms of knowledge are used together in making decisions on the use of forests;

(c) Management partnerships, in which the partners collaborate to put their plans into effect.

Some forms of TFRK have meaning outside their local context and can have a role in other areas including commercial biodiversity prospecting. They can be made available on a contract basis between the holders and prospectors. Other forms of TFRK, including planting and harvesting systems, plan varieties and technologies, have less or no commercial potential but are nevertheless the intellectual property of their originators and holders. To protect TFRK, a comprehensive approach to intellectual property is needed, the aim of which would be to ensure a fair return rather than to exclude or monopolize. Formal agreements are needed to establish the right of collective holding of such knowledge. Further study and consultation are needed to establish the right of collective holding of such knowledge. Further study and consultation are also needed to define the wording of such formal agreements.

Since most TFRK cannot usefully be digitized, the role of computer database technology will be limited mainly to the sharing of anecdotal information through the Internet, and certain specific tasks linked to biodiversity prospecting.

It is suggested that the Panel give priority to actions addressed to finding ways to ensure:

(a) That groups possessing TFRK are recognized so that they can enter into access agreements concerning TFRK;

(b) That the relevant TFRK is recognized as the common property of the group entering into the access agreement;

(c) That all access to TFRK is through an access agreement with its holders, where these can be identified;

(d) That access agreements define the terms for the three main circumstances in which access to TFRK might be sought, namely (a) where the aim is to manage a forest by partnership between the people who live there and the government, (b) where the aim is to invent patentable products for commercial use and (c) where the aim is to share knowledge freely with others.

The main obstacle to achieving such settlements is likely to be the difficulties involved in negotiating consensual agreements with a variety of groups identified as holders of different types of TFRK. The Ad Hoc Intergovernmental Panel on Forests provides a unique opportunity for Governments that have taken this path to reassure others that TFRK is indeed useful in managing forests sustainably as well as in locating potentially valuable new products, and that a fair and equitable sharing of benefits arising from such knowledge can only support each country in its efforts to achieve sustainable development.

CONTENTS

INTRODUCTION

1. At the second session of the Ad Hoc Intergovernmental Panel on Forests (see E/CN.17/1996/24, sect. IV.B.2), the Panel emphasized that the substantive discussion should focus principally on the terms of reference for this programme element as determined by the Commission on Sustainable Development, taking into account the relevant paragraphs of the Non-legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests (Forest Principles) 1/ and the relevant chapters of Agenda 21, 2/ as well as other relevant intergovernmental processes, in particular the Convention on Biological Diversity. 3/

2. Relevant chapters of Agenda 21 include chapter 11 ("Combating deforestation") and chapter 26 ("Recognizing and strengthening the role of indigenous people and their communities"). Elements 2 (d), 4, 5 (a) and 12 (d) of the Non-legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests (Forest Principles) are also relevant.

3. Recalling the terms of reference given by the Commission on Sustainable Development for this programme element, 4/ the following articles of the Convention on Biological Diversity are also relevant. By these, Parties agree, as far as possible and appropriate, and subject to national legislation, to:

(a) "Respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices" (art. 8 (j));

(b) "Protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements" (art. 10 (c));

(c) "Encourage and develop methods of cooperation for the development and use of technologies, including indigenous and traditional technologies, in pursuance of the objectives of this Convention" (art. 18.4).

4. At its third meeting in November 1996, the Conference of the Parties to the Convention on Biological Diversity will consider ways and means to implement article 8 (j) of the Convention. It will also examine the links between forests and biological diversity in accordance with its decision II/9, paragraph 2 (b). 5/ In this context, it should be noted that this report takes into consideration paragraphs 8, 9, 16 and 17 of the Statement on biological diversity and forests from the Convention on Biological Diversity to the Ad Hoc Intergovernmental Panel on Forests of the Commission on Sustainable Development (E/CN.17/IPF/1996/9 and Corr.1, annex).

5. The present report was prepared jointly by the secretariat of the Convention on Biological Diversity and the secretariat of the Ad Hoc Intergovernmental Panel on Forests, Division for Sustainable Development, Department for Policy Coordination and Sustainable Development of the United Nations Secretariat. This report seeks to provide the basis for substantive discussion, by the Panel at its third session, of programme element I.3, in accordance with the guidance provided by the Panel at its second session (E/CN.17/1996/24). The secretariats also received valuable contributions in the form of submissions from Governments, from intergovernmental and non-governmental organizations with relevant expertise, and from individual experts.

6. The approach applied in this report assumes that no ecosystem can be managed sustainably without ecological knowledge and clear management aims. The knowledge involved may be drawn from global or local experience, while the management aims are determined by the society doing the managing, based on its own sense of priorities. Within the context of sustainable development, the social actors in each society can be thought of as partners in a common endeavour. Where people belonging to different societies influence forest management aims at the same time, the clarity of those aims can be lost unless partnerships exist among relevant interested parties. How to create and operate such partnerships at the local, national and global levels is thus just as critical an issue in sustainable forest management as how to obtain and use knowledge, whether traditional or otherwise.

7. Partnerships by definition are based on free negotiation, informed consent and agreement among equals. The focus in this report on a partnership-based approach follows the position in favour of participatory management regimes as adopted by the Forest Principles, by Agenda 21, and by the Convention on Biological Diversity. The range of possible partnerships in forest management include those between nations, nations and corporations, nations and local people, and between other combinations of interested parties depending on circumstances.

8. Section I of this report provides a general overview, including a review of the technical, economic and social issues that arise. Sections II and III provide a review of progress and status, and obstacles to further progress, respectively. Section IV recalls the issues that the Panel, at its second session, identified as meriting further development and offers a set of conclusions and options for action.

I. GENERAL OVERVIEW

A. Nature of traditional forest-related knowledge

9. Traditional knowledge (TK) is the information held in human memory that is accessible, by recall and the practice of learned skills, in a useful way in day-to-day life. In this context, the term "traditional forest-related knowledge" (TFRK) is often used to mean "a blend of knowledge and experience integrated within a coherent world view and value system". "Traditional" means "handed down from one generation to another", and in the case of TFRK,

traditional knowledge usually encompasses knowledge that has been accumulated by societies in the course of long experience in a particular place, landscape or ecosystem. It can be contrasted with cosmopolitan knowledge, which is drawn from global experience and combines "Western" scientific discoveries, economic preferences and philosophies with those of other widespread cultures.

10. The open-endedness of these words helps to explain the diversity of the literature on TFRK, which encompasses the spiritual experiences, philosophies, politics, technologies, subsistence activities and external relations of all forest-dwelling peoples whose lifestyles are strongly influenced by their own traditions, and who are often included within the broad category of indigenous people. However, not all those who possess TFRK are indigenous in the sense implied here and in the usage of other forums. Principle 5 (a) of the Forest Principles recognizes this in distinguishing between indigenous people and their communities, and "other communities and forest dwellers". Working definitions of traditional knowledge stress the links among traditionality, cultural distinctiveness and the local environment to which each culture is adapted.

11. As people use a forest ecosystem, they may learn how to harvest its resources without destroying it as a whole, even while changing its structure and species composition through selective planting, weeding, coppicing, burning and fallowing. For each place and level of technology, a stable relationship may arise between forest and social actors, but this stability will not survive the introduction of new hunting techniques (for example, firearms), tree-felling equipment (for example, chainsaws) or trading opportunities (for example, roads and markets). Traditional forest-dwelling people, however, use many species in many different ways, according to many different social rules. Some aspects of each approach are likely to be more resilient than others, and these will evolve in traditional forest-related knowledge, innovations and practices, which if related to sustainable forest management will tend to have much to teach other societies.

12. For any given level of technology, resources that are exclusively used by small numbers of people who cooperate with one another are safer than those used by many, competing people. Thus, any measure that limits to a particular group the right to exploit a living resource will tend to promote its sustainable use. This is because the group with access to the resource will have more opportunity than others to learn about it and about how to use it productively. That group will also have an incentive to use it for its own long-term benefit and hence to use it cautiously and more-or-less sustainably. Exclusive access, knowledge and a long-term perspective are the key ingredients that may allow the sustainable use of resources. This depends, however, on the remaining in force of the social rules that govern access and on technology's changing at a rate no faster than that at which those social rules can adapt to it.

13. As a group accumulates TFRK, it will develop a culture that is increasingly distinct from all others. Many similarities will persist, however, owing to common cultural and genetic inheritance from other peoples, and adaptation of other groups to the demands of similar ecosystems. Each culture thus contains some traditional knowledge that is uniquely local, and some that is widely shared. The two kinds of knowledge are deeply intermingled and embedded in the culture as a whole. Most elements will make little sense if they are removed

from a cultural context - when stored, for example, in a computer database. Many can pass easily into new cultural contexts, however, if the recipient culture is open to new ideas and particularly if it has grown up in a similar environment - one, that is, in which the imported concepts make sense.

14. It is suggested, therefore, that TFRK be made up of the following linked features:

(a) Information about the components of a particular forest ecosystem, such as its soils, trees, animals, streams, hunting grounds, old fallow and sacred sites;

(b) Rules for using them;

(c) Relationships among their different users;

(d) Technologies for using them to meet the subsistence, health, trade and ritual needs of local people;

(e) A view of the world that makes sense of such information, rules, relationships and technologies in the context of a long-term perspective in decision-making.

15. These aspects of TFRK have different kinds of meaning for global society, and can be used in various ways. New data about forest ecology or the behaviour and growth rates of forest organisms, for example, might suggest new ways to design, implement and monitor forest management systems. Sharing TFRK might help forest managers avoid procedures that impact unnecessarily on local social systems. Rules on how to grow and harvest forest organisms or to use forest soils without damaging them might improve forestry and agroforestry systems. Clues on how to keep harmonious social relations among competing groups might help relieve stresses in other societies, including urban societies. Traditional technologies may be more benign environmentally or socially than newer ones, and might be used more widely.

16. All this raises three issues for nations that wish to find ways to use TFRK in forest management:

(a) Little of the knowledge will be meaningful outside its local context, so only some is likely to be helpful in solving practical problems elsewhere;

(b) Most TFRK is so deeply embedded culturally that it can be retrieved only through such traditional means as the trances of shamans, healing rituals, dances, stories, initiations and other practices that are not amenable to scientific study;

(c) The aim of promoting cultural transmission of TFRK from traditional societies to cosmopolitan ones requires that the former be willing to give and the latter to receive new ideas. This, requiring mutual respect and understanding, cannot occur while feelings of inequality between the two kinds of society persist.

B. Traditional forest-related knowledge and property rights

17. An increasingly large part of the global economy is now based on buying and selling information, so the nature and future of intellectual property are often considered a central issue. This can obscure the fact that all economic activity rests ultimately, and for most people directly, on management of ecosystems, the abuse of which has consequences for achieving development objectives. Even so, intellectual property is an important issue that impacts on the use of TFRK in several ways (Gadjil and Devasia, 1995; Walden, 1995; Convention on Biological Diversity, 1996; Programme for Traditional Resource Rights, 1996; Kay, 1996).

18. There are two main themes within the cosmopolitan approach to intellectual property. First, patent laws have been devised to create temporary monopolies in the supply of certain novel goods and services. The aim of these is to safeguard the investments that often lead to technical and product innovation in an industrial context. Patent laws typically require that to be eligible for protection an invention must be new, useful and non-obvious, and must be described in detail in the application. These requirements appear to rule out the patenting of naturally occurring items that have not been modified by people, but this exclusion is narrowing in the light of court rulings and international agreements. The Agreement on Trade-Related Aspects of Intellectual Property Rights, including Trade in Counterfeit Goods, as contained within the agreements of the Uruguay round of multilateral trade negotiations, 6/ for example, allows countries to exclude "plants and animals other than micro-organisms" from patentability (art. 27 (3b)), but this subparagraph will be reviewed in 1999.

19. The second theme involves the creation of rights to plant varieties that have arisen as a result of selection by people. The different (but complementary in intent) concepts of plant breeders' rights and farmers' rights are designed to protect a general interest in the use of varieties. The intent is not to exclude or monopolize, but rather to promote sharing, use and further development of the varieties concerned while recognizing the original source of materials.

20. Alternative intellectual property rights regimes suitable for the needs of local communities that collectively possess TFRK have been proposed, taking into account the way in which traditional knowledge is acquired as the common property of a people and hence constitutes an integral and inalienable feature of its culture. One such proposal (Nijar, 1995) rejects the application of industrial patent law to innovations based on TFRK, and seeks to resist the turning of traditional knowledge into a traded commodity because this can erode community solidarity. It asserts that commercial use of TFRK can occur but only at the absolute discretion of its holders, and that the State's main role is to safeguard and protect the rights of those holders. It also describes a community intellectual rights act to cover all uses of traditional knowledge. This and other proposals show the extent to which current views on property, innovation and trade may have to be reconsidered if the views of indigenous and traditional communities are to be reflected in global agreements. The balance of opinion is that the application of patent law to TFRK itself is to be rejected while accepting its usefulness and suggesting improvements where

particular inventions are based on TFRK and developed to marketability (as, for example, in the case of certain pharmaceutical products).

21. It has also been suggested that the concept of plant breeders' rights be revised and extended to apply to traditional knowledge systems, creating national sui generis (unique) arrangements for recognizing a general interest of the holders in each knowledge system as a whole. Several authors stress that such rights must reside in groups rather than individuals, since traditional knowledge arises through the efforts of past, present and future members of a particular society. The concept of farmers' rights as defined in resolution 5/89 of the Conference of the Food and Agricultural Organization of the United Nations (FAO), adopted 29 November 1989 at the Twenty-fifth Session of the Conference, 7/ and the provisions of the Convention on Biological Diversity support this view. Furthermore, it would not be ethical to employ an individual to reveal traditional knowledge without the consent of the society involved. Since TFRK cannot otherwise be taken from its holders involuntarily, and the holders are the group, it must be correct for holding by the group to be recognized in law and for access to TFRK to occur only by agreement between the holders as a group and the person or institution seeking to obtain access.

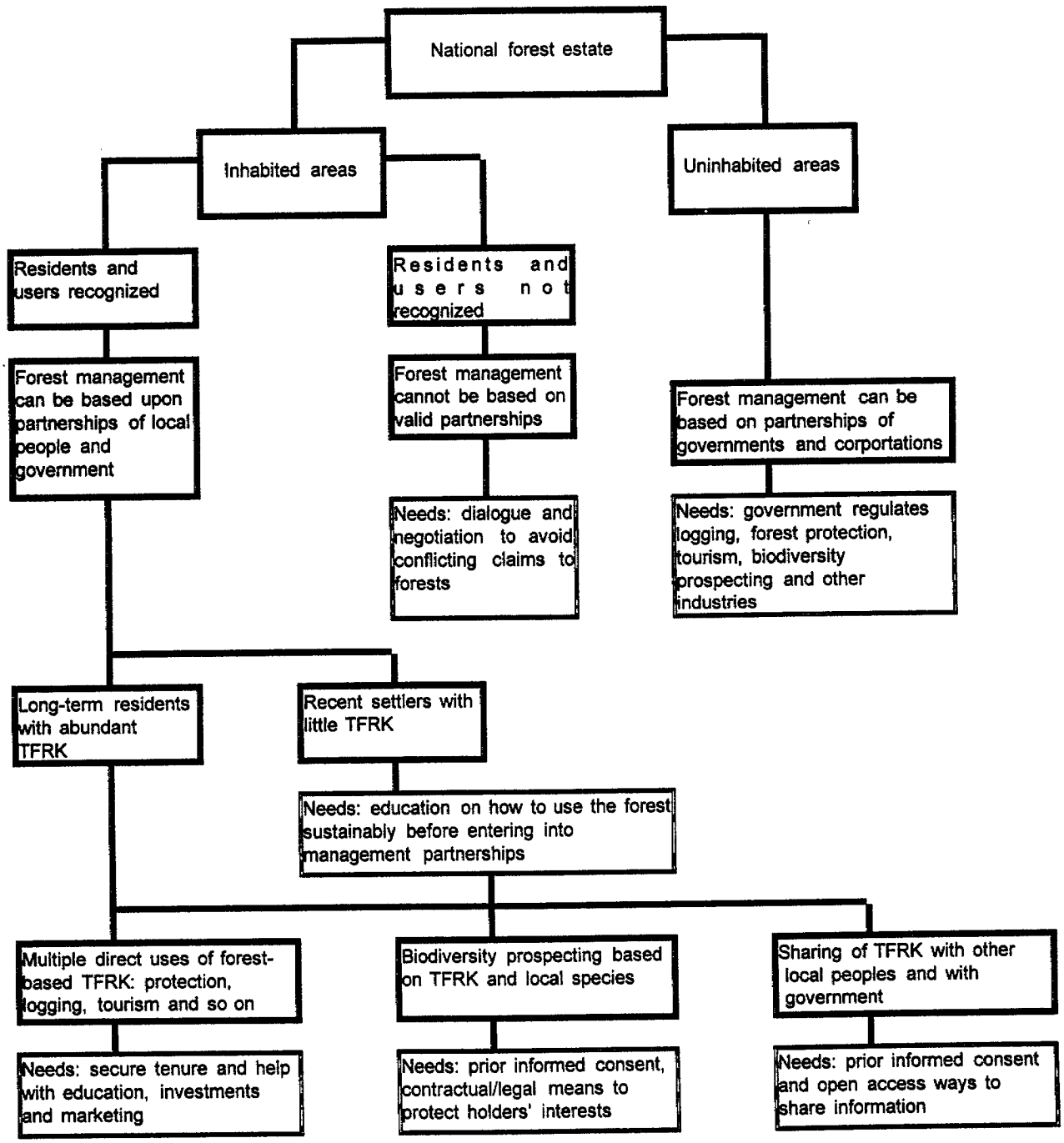
22. If TFRK and practices are to have a role both in maintaining the way of life of the people who possess it, and in managing forests sustainably, then there is a need to translate them both into policy and into practice.

23. Partnerships involve agreement and cooperation between people who are equals but have complementary needs, so the negotiation of partnership agreements for managing forests has the implication that local people, Governments, researchers, interested public and private sector enterprises and all other interested relevant parties will treat one another respectfully. This applies equally to biodiversity prospecting and other research contracts. In any contractual arrangement it is up to the parties to decide what is fair, but minimum standards can be mandated by law, and communities and Governments can cooperate to enforce the contracts and to deter unethical practice.

C. Key distinctions in forest management

24. In its recommendation to establish the Panel, the Commission on Sustainable Development recognized that a central concern was to avoid further damage to natural forests by unsustainable human activities. 8/ As the Panel noted at its second session when discussing programme element I.2, the underlying causes of deforestation and forest degradation are diverse, interrelated and rooted in ecological, social, economic factors that extend beyond the forest management sector or the locations of forests themselves. Enough is known about the causes of forest damage to define a simple framework that takes into account the nature and potential role of TFRK as well as contemporary forest science. Thus, in principle a country's forest estate can be divided into inhabited and uninhabited areas, though in practice this may be difficult (figure I).

Figure I. Key distinctions in forest management



25. Inhabited forest areas are subject to customary rights, located within indigenous lands and territories, or are used by forest-dwelling people, while uninhabited ones are not encumbered by such usage or holders' claims. However the notion of uninhabited forest areas should be viewed with extreme caution for two reasons. First, there continue to be cases of national Governments' becoming aware of the existence of isolated indigenous forest-dwelling communities in areas considered uninhabited. Second, the areas effectively utilized by many indigenous and traditional communities for hunting, collecting or ceremonial purposes are often far more extensive than Governments and planners recognize.

26. If such uninhabited areas exist, the nation as sole holder of the resource could, if appropriate, enter directly into planning and management partnerships with other social actors (national and international) in order to use the forest in accordance with its national policies and with internationally agreed guidelines and best practice. The aim of such partnerships would be:

(a) To allocate forests to different kinds of use (spatial planning process);

(b) To manage them for protection, production of timber, watershed benefits, tourism revenues or biodiversity prospecting (management process);

(c) To ensure that the planned use of one area does not adversely affect the use of other areas (environmental impact assessment (EIA) process).

27. As the locations of all habitations and associated claims to use the forest in a country are recognized, the full extent of human occupancy of its forest estate will become clear. Where occupation is established, it is possible for government to take advantage of the fact by establishing partnerships with local people to manage the forest sustainably (figure II). This is the main context in which TFRK can be of use to Governments.

28. There are three general options for local people with respect to using their knowledge to help achieve sustainable forest management, whereby:

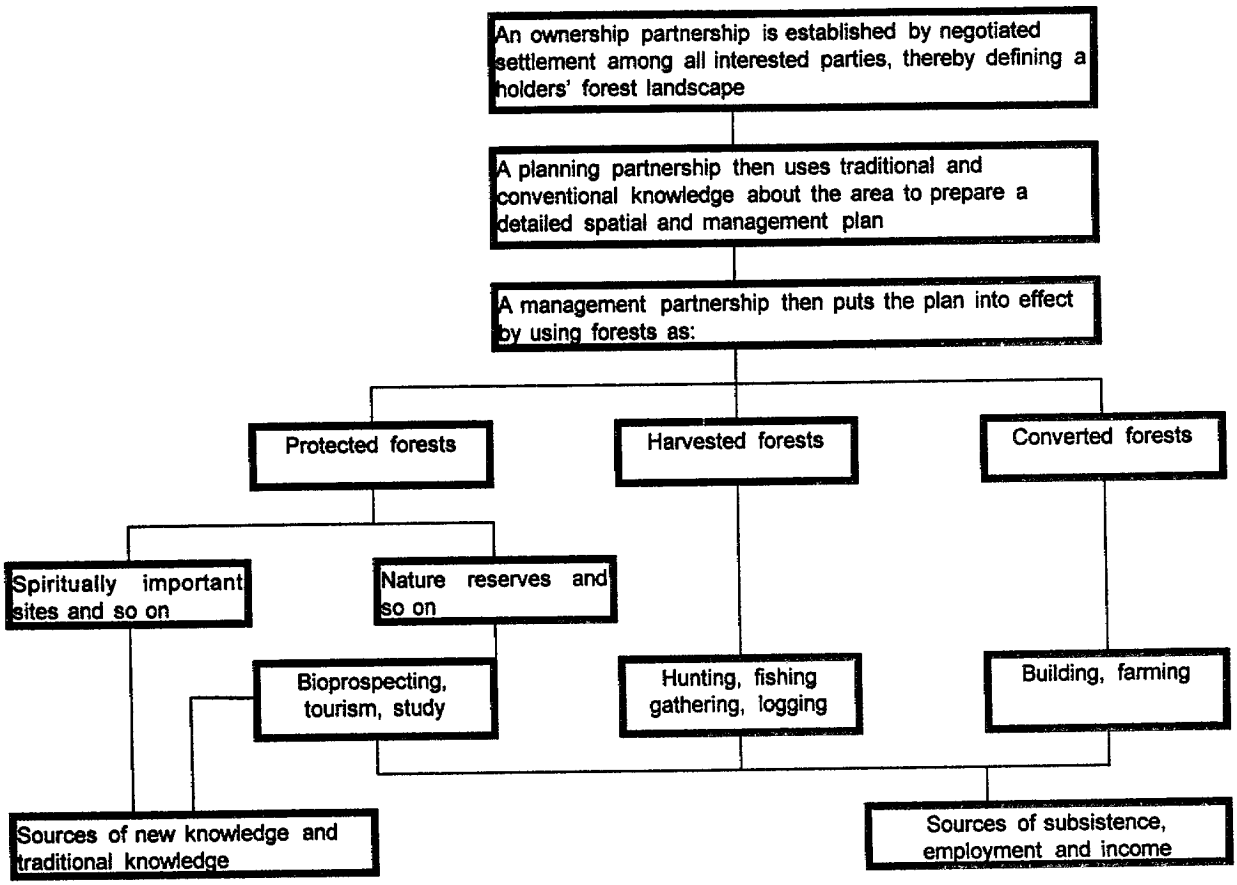
(a) TFRK may be involved in the direct management of local forests;

(b) TFRK and local species may be used in the process of biodiversity prospecting;

(c) Good ideas on forest management derived from TFRK can be shared with others.

29. None of these options can be accomplished entirely without external communications, technical assistance, investment or access to markets, so a partnership approach is appropriate to all three. They have different technical and capital requirements, however, and have different consequences for the flow of benefits. The rest of this report describes the implications of this in all three cases, suggests how appropriate arrangements can be made, reviews progress, identifies barriers to further action, and proposes ways in which those barriers might be overcome.

Figure II. Managing inhabited forested landscapes



II. RECENT PROGRESS AND STATUS

A. Direct management of forests

30. Figure II traces the sequence of events concerning how traditional knowledge and practices in their broadest sense could be applied to the sustainable forest management of an inhabited landscape. It is envisaged that this would begin with the agreement of an holders' partnership for the landscape concerned. This means an arrangement that recognizes the complementary roles of government and local people in the area concerned, and that lays down procedures for dialogue and the settlement of claims among them. This can have policy implications, as it relates to the distribution of responsibility for forest management.

31. Descriptions of decentralization and conservation processes in Colombia, Costa Rica, India, Indonesia, Kenya, Nepal, Nigeria, the Philippines, the Russian Federation and Zimbabwe are contained in a recent World Bank study (Lutz and Caldecott, in press). The study concluded that local empowerment and the strengthening of local institutions were preconditions for managing ecosystems according to local needs using TFRK, but the forms they took varied greatly and could not be prescribed in detail. The study came to the following four main conclusions, which should be borne in mind during any process of decentralization since these conclusions indicate that serious risks can be generated both to people and to forests:

(a) Precipitate and unplanned decentralization can neutralize national and global influence, while giving powers to local societies that may lack adequate skills and the accountability to use those powers properly;

(b) Second, redistributing power may be seen as a threat by some groups, prompting them to resist change. Thus, mediating bodies trusted by all sides will be needed to smooth the transfers of power, and support from law and policy will be needed to help the newly empowered locality sustain itself;

(c) Third, there is the risk that a locality that is no longer sheltered by a national Government may become vulnerable to groups wishing to exploit it. Where national Governments are no longer able to control such threats, localities must be helped to communicate and collaborate to prevent them from being singled out and overwhelmed one by one;

(d) Finally, uncertainties in the process mean that there is always a risk that the need to protect nature reserves may be forgotten for a time. In the tropics especially, irreversible damage to the components of biodiversity can occur swiftly, so resources for protecting habitats and ecosystems must be supplied throughout the process.

32. Once a settlement of the holders' partnership has been achieved, planning partnerships can be established. Interested parties collaborate to understand the landscape using traditional, local and global approaches to the discovery and use of knowledge. Examples of this process include the planning of multiple-use landscapes in East Kalimantan, Indonesia, and in the Canadian Arctic, based on social mapping, participatory rural appraisal, and global

positioning and geographical information systems (GPS/GIS) (Saunier and Meganck, 1995; Sirait and others, 1994; Brooke, 1993). Such procedures also involve adopting guidelines for managing the landscape's ecosystems sustainably for various purposes, and adapting them to local conditions in the light of traditional and other knowledge. Detailed rules for operating a management partnership should emerge from this process, helping to guide the landscape's use in practice.

33. There are three main options for using land in a forested landscape:

(a) As converted forest (for example, for farms, tree plantations, buildings and other infrastructure);

(b) As harvested forest (for example, for logging, hunting, fishing and gathering);

(c) As protected forest (divided into sacred areas that cannot ordinarily be used by living people, and nature reserves that can be used for such purposes as tourism, biodiversity prospecting, education and research).

34. There may be some overlap between these categories (for example, some parts of a nature reserve might be available for hunting and gathering, but not for logging), and detailed zoning may be required depending on planned use (for example, for stand-specific logging regimes). The emphasis will also vary among locations depending on the outputs sought, ranging from biodiversity protection to subsistence use (harvesting wild meat, medicinal plants, food plants and so forth), ecotourism (harvesting revenue from visitors interested in nature and local culture), precision logging (for example, felling rattan canes or special woods) and logging for general-purpose timber. The details cannot be prescribed, and must emerge from dialogue among knowledgeable people in the context of planning and management partnerships.

35. Cases where all steps in this process have been followed, so that Governments and local people have worked as partners in forest management, include that of "conservation areas" (that is to say, large multiple-use landscape units with an emphasis on sustainable use of resources) in Nepal, Australia, the United States of America, Canada, Indonesia and Costa Rica. The same principles apply to reforestation (for example, joint forest management areas in India), wildlife management (for example, CAMPFIRE districts in Zimbabwe) and timber production (for example, west coast beech forests in New Zealand). Thus the evidence is strong that once Governments have recognized the nature and value of TFRK and accepted the need to manage resources through local partnerships, then such arrangements will be both feasible and effective (OPCE, 1995; Pye-Smith and Feyerabend, 1994; Western, Wright and Strum, 1994; Fisher, 1995; FDC, 1996).

36. Many studies show that local people are well aware of the nature of many of the resources in their environments, and know how to manage them well. Traditional knowledge, innovations and practices, and authority over certain resources are often possessed by individuals, by women or men, by clans, or by groups descended from residents of particular villages (for example, in parts of Switzerland). Harvesting rates may be regulated by access controls of a wholly

traditional kind (for example, molong among the Penan of Borneo) or reinvented but based on older forms (for example, sasi among the peoples of Maluku in Indonesia) or else they may contribute a new response to changing circumstances (for example, in the Niger delta of Nigeria, where one community has devised a "three-years-on-nine-years-off" logging cycle for certain trees). It is most feasible to maintain such control over land and trees, which are easier to claim and mark than wild animals.

37. Traditional people do not know everything, however, nor are they able to regulate every use of every component of a forest. Gaps in knowledge and control mean that they are unable to manage a forest to the limit of its productive capabilities in every dimension. Broad margins for error are built into traditional systems, and depend on social measures to limit the number of users, and on regulation of the timing and extent of access to certain areas.

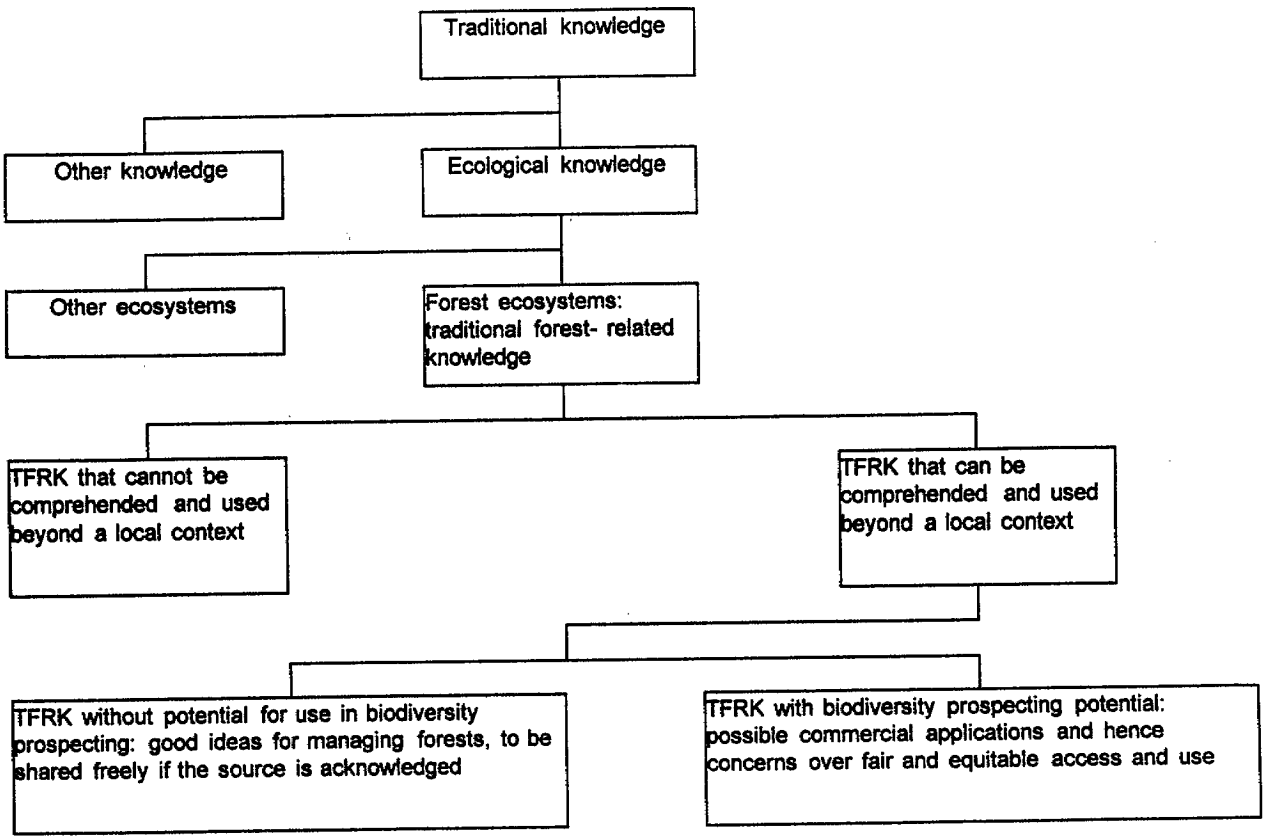
38. These measures are able to achieve sustainable use provided the underlying conditions remain fairly constant. However, a management system based on TFRK can unravel quickly if population density increases, if access controls break down, or if new technologies are introduced that allow goods to be sold on external markets. Conversely, there are ways for a stable, TFRK-based system to be maintained while selectively importing new ideas and investments to increase the range of materials harvested and the revenues obtained. These ways require that the possessors of the TFRK, innovations and practices concerned maintain their authority to decide how the forest is used, and are able to decide for themselves which ideas to import and which investments to undertake, and when.

B. Biodiversity prospecting

39. The Panel at its second session recognized that traditional forest-related knowledge, innovations and practices, especially as they related to sustainable forest management and the use of non-timber forest products, constituted an important body of experience that was relevant for the fulfilment of its mandate. The present subsection refers to the subject of the use of non-timber forest products as part of the overall issue of biodiversity prospecting.

40. TFRK can be divided into the forms that cannot be understood and used beyond their local context and those that can be so understood and used. The latter can then be divided into forms with and without commercial potential (figure III). The latter category comprises good ideas for managing forests, which everyone may agree to share freely provided the source is acknowledged. Some forms of TFRK, however, can help biodiversity prospectors create new goods and services that might be patented and sold.

Figure III. An approach to the classification of traditional forest-related knowledge



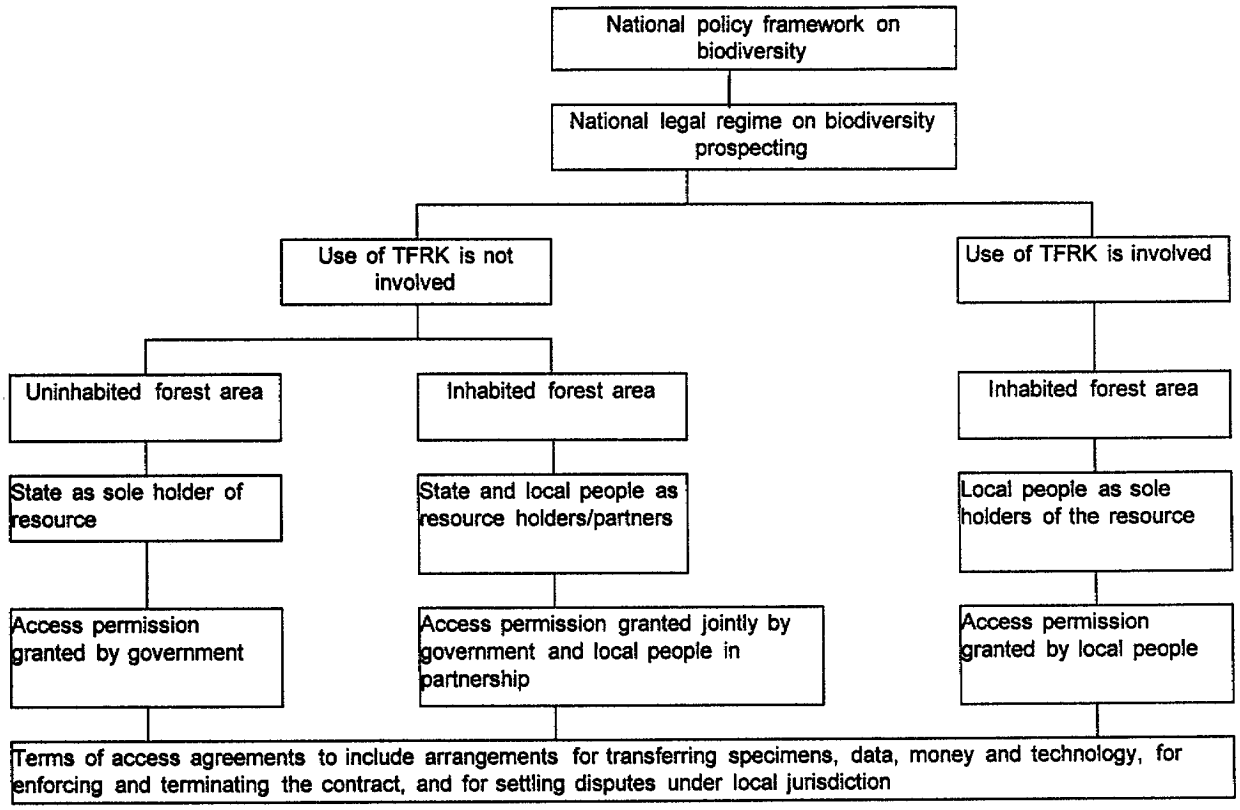
41. In this context, articles 8 (j) and 15 of the Convention on Biological Diversity introduce important guidelines. In particular, article 8 (j) provides that the wider application of the knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles should entail the approval and involvement of the holders of such knowledge, innovations and practices, as well as the equitable sharing of the benefits arising from the utilization thereof. Holders of TFRK are thus entitled to make the sharing of such knowledge, innovations and practices contingent upon satisfactory benefit-sharing arrangements. This notwithstanding, there may be cases where traditional communities, for well-founded cultural reasons, choose not to reveal their knowledge.

42. The value of ethnobiological knowledge in guiding those wishing to identify certain kinds of naturally occurring chemicals within wild species is now well established. In the case of medicines, traditional preparations are used to treat many ailments, including all kinds of infection, asthma, diabetes and hypertension, and these preparations often have real effects on pathogens and symptoms. This is because over millions of years plants have evolved chemical defences against predation and disease, which therefore affect animal physiological systems and inhibit fungal, bacterial and viral growth or reproduction. TFRK can be employed to guide the practical choice of those species most likely to exhibit the desired properties from among the thousands of species that may be present in a forest. Such information can save much time and money when used as an alternative to the random screening of specimens. These savings can be of great commercial significance and consequently raise significant access and equity issues.

43. These issues revolve around prior informed consent, or whether people wish to use their own TFRK for biodiversity prospecting and, if so, how and on what terms. Other issues should not arise until this basic decision has been made after free, full and informed discussion. The reason for this is that the aims involved will affect the details of how data are to be collected, managed and used. For example, the procedures when the aim is to record TFRK for the direct use of local people and the teaching of children, will be very different from those when the aim is to make money. Although computer databases might have a role in meeting the first aim, there are also viable alternatives including apprenticing young people to experienced shamans and healers and promoting work between them and schoolteachers. If income is sought, however, then other needs come into play.

44. Foremost among such needs is the need for a national policy framework and a supportive national legal regime requiring all biodiversity prospecting to occur through valid and enforceable contracts between the holders of TFRK or, in the case of local species in inhabited forests, the holders/partners (figure IV). For countries that are Parties to the Convention on Biological Diversity, such policy and legislation should by definition be consistent with the terms of the Convention. The law should specify the minimum terms of such contracts, for example the form of material and data transfer agreements, the kinds of payments and technology transfers that must be negotiated, the legal nature of the parties, procedures and jurisdiction for enforcing the contracts and for settling disputes locally with the participation of the holders/partners, and arrangements for terminating the contract.

Figure IV. Pathways to biodiversity prospecting



45. International agreements can have an important role in requiring, for example, that the holders of TFRK connected with a patent application certify that they are satisfied with the process by which it was obtained. It would also be helpful if descriptions of inventions submitted in patent applications were to be required to include an account of the location of origin and social context of the material used in developing the new product, including its past use by people.

46. Few countries yet have both a national policy framework and a legal instrument for biodiversity prospecting as well as local institutions capable of negotiating and enforcing research and development contracts with commercial partners. In this context, Costa Rica, which has an advanced system for biodiversity prospecting, has chosen not to use TFRK as a source of information until the indigenous people who possess it are ready to become involved on their own terms. Other countries have a framework law (for example, Executive Order 247 of May 1995 of the Philippines), but other aspects of the process are still being debated. Meanwhile, the Costa Rican biodiversity prospecting approach remains an important starting-point for any group wishing to devise its own way forward in this area (Reid and others, 1993; Caldecott and Lovejoy, in press).

47. Another set of experiences is that of Shaman Pharmaceuticals, a United States-based biodiversity prospecting firm that specializes in using TFRK to identify materials for further investigation as potential pharmaceuticals (WCMC, 1994; King, Carlson and Moran, 1996a, 1996b; Moran, 1996). The company is committed by its access contracts to return a share of profits to the peoples from whom it obtains TFRK, and all the peoples with whom it has ever worked will share equally in those profits regardless of the source of any particular product. The company has established the Healing Forest Conservancy (HFC) for the purpose of working with informant peoples to identify acceptable forms of revenue-sharing and to test them through pilot projects. The kind of return most often requested from HFC is help in clarifying resource tenure, but technology transfers through training programmes are also sought after. Each group also has the opportunity to request payments in cash if they so wish.

C. Sharing experiences

48. Enough cases are now on record to suggest that anyone who does not take into account relevant TFRK in planning forest management is unlikely to be doing an effective job. In the Caprivi region of Namibia, for example, attempts were made to overturn the traditional practices of early burning in silvipastoral systems and oxen-drawn ploughing in agroforestry ones. As predicted by local people, these approaches resulted in serious fire damage and soil erosion and are now being reversed. Similarly, in Ontario, Canada, logging companies ignored TFRK-based predictions that summer logging would damage fish stocks and that large-scale clear-cutting and poisoning of aspen as "weed" trees would adversely affect the supply of moose, beaver, blueberries and medicinal plants for local people. Corrections based on TFRK were then introduced at little financial cost to the companies, but at great social and economic advantage to the holders/partners collectively.

49. Meanwhile, at Ekuri in Cross River State of Nigeria, the British Government has been supporting a community forest project that demonstrates how to build management partnerships based on secure resource tenure and TFRK on the one hand, and on appropriate levels of advice and encouragement on the other (Dunn, Otu and Morakinyo, 1996; Morakinyo and Hammond, 1996). Some of the lessons learned were revealed when the Ekuri people, upon being asked to advise another village trying to solve its own problems of forest depletion, said that the people there should:

(a) Be united and prepared to work hard;

(b) Believe in themselves and start self-help projects after full discussion of their own problems and opportunities;

(c) Ensure prudent and realistic management of all the village's resources;

(d) Work with government departments and other outside groups to obtain help with transport and marketing, training and technical advice, financing, and monitoring and evaluation.

50. The above suggests the existence of a class of TFRK that, while of negligible commercial significance, is likely to be of widespread benefit if shared. There is at least a need for TFRK perspectives to be incorporated in standard forest management training. A pioneer institution is the Faculty of Forestry of the University of British Columbia in Canada, which in 1995-1996 opened a pilot course in "First nations' perspectives on forest lands", and held a workshop to identify how to include aboriginal perspectives and management partnerships in the other courses taught by the Faculty. At least three other Canadian universities are following suit (Simon Fraser, Victoria and Toronto), but clearly there is a long way to go and most other countries have yet to begin.

51. Another way to share TFRK is to rely on networks of concerned groups and institutions to collect information in collaboration with indigenous people, and to make this available through newsletters or on the Internet. A list of access points to existing networks is given in the annex to this report, and these could constitute a public-access interactive database, for example, as a specialized service associated with the clearing-house mechanism for technical and scientific cooperation of the Convention on Biological Diversity.

52. If TFRK is to be stored in a computer system and rendered accessible on the Internet, an agreement with the holders of the knowledge concerned would be appropriate. This is the third kind of access agreement that follows from recognition of collective property rights over TFRK. Since here the aim is to share rather than to sell knowledge, the terms would presumably be limited to confirming the holders' right to exclude certain kinds of information from storage and dissemination, and duly acknowledging sources.

53. Not all forms of TFRK can be managed using modern techniques, however. Traditional and cosmopolitan knowledge are both ultimately derived from data, comprising observations about the world. In the case of TFRK, data often relate

to seasonal and other changes in the environment which may, for example, indicate the availability of a resource or the timeliness of a ritual. From the Western scientific perspective, data often consist of numerical, categorical and other types of observation that can be held and manipulated in databases.

54. The two sources of data demand different approaches to management and communication. Technologies designed to manage Western scientific data are largely unsuitable for TFRK. Thus, the knowledge of a forest-dwelling community cannot be committed to a computer database without losing many of the understandings implicit in the narrative material. Almost by definition, TFRK applies to the locality in which it is obtained and may be meaningless elsewhere. Nevertheless, there is a role for exchange of TFRK between separate forest-dwellers and managers in similar environments, and between generations in communities where normal TFRK exchange processes have broken down. In such cases, the exchange of TFRK should be treated as a two-way process aiming to blend new knowledge with what is already known. Interactive forums such as workshops and meetings are essential, since the facts may not make sense without being adapted to local conditions.

55. Since most TFRK cannot usefully be digitized, the role of computer database technology is likely to be limited mainly to the sharing of anecdotal information through the Internet, and certain specific tasks associated with biodiversity prospecting. In these cases, translation and data security are respectively the main design issues. Digital mapping (using GIS and GPS) combined with social mapping will have an important role in establishing forest holders' planning and management partnerships, and anecdotal information can be culturally and geographically located in the same system to assist in forest management tasks. Precise design specifications would require further study and consultation.

III. OBSTACLES TO FURTHER PROGRESS

56. The chief needs are for the identities of groups that possess TFRK to be recognized in law, and for the TFRK itself to be legally recognized as the common property of the group in each case. Once these measures are accomplished by national Governments, it will be possible to access and use TFRK by agreement with its holders. These agreements would be of various kinds, depending on the kind of partnership to be established, with forest management, biodiversity prospecting and information-sharing partnerships being the main options.

57. Certain common stumbling-blocks have emerged from the experience of countries that have sought to make such arrangements. In the process of deciding, for example, which areas of forest are truly uninhabited and which are not, there is the problem that the definition of forest habitation or use may not be one that is shared by both the nation and the claimants. The latter may consider that habitation is established because they have used the area for hunting, as a source of emergency food, as a place for initiating youngsters, as part of an extended fallow system, or as a resting place for their ancestors. Negotiations to settle such misunderstandings are inherently delicate and can be delayed by many factors.

58. The possession of TFRK can mean, for instance, that local people clearly distinguish places with different soil fertility, value as hunting grounds, or spiritual significance despite their superficial similarity. These factors may be completely lost on government negotiators who have only a general understanding of the location concerned. Other problems may arise from differences in perceived transaction costs between the two sides, for example when a government uses expensive senior officials to negotiate with local people who have a different sense of the value of the time spent negotiating. The idea of compensation may also be perceived differently by the two sides, since some cultures may see compensation in ritual terms as a fine to correct a spiritual imbalance rather than as a source of money. Evidence of respect paid by a government team to local people might in some other cases mean more to them than would a financial settlement alone.

59. Specific proposals have been made for establishing "an Ombudsman's Office that would not only advise indigenous and local communities on the protection of their resource rights and on benefit sharing, but represent them in their complaints relating to infringements of their resource rights" (WGTRR, 1996). Another option for facilitating settlements would be to create an arbitration and conciliation mechanism. The creation of such mechanisms would be helpful to groups seeking the fair and equitable settlement of conflicts of interest over forest and other resources.

60. Many forest areas have recently been occupied by settlers from urban or agricultural milieux who have been attracted by economic opportunities at the forest frontier or driven there by poverty or landlessness. Other new arrivals in a forest may have been displaced by development projects elsewhere. In any such case, the newcomers will have little or no TFRK that is useful in their new location. The sustainable use of a living resource depends on the number of users being limited by social rules to those who understand the resource well enough to be able to use it properly. Such rules are devised and such knowledge is accumulated in a particular place by a particular people. Suddenly replacing those people with others who lack appropriate rules and knowledge can result only in resource destruction, and this is indeed a major cause of undesirable forms of deforestation worldwide (Collins, Sayer and Whitmore, 1991; Sayer, Harcourt and Collins, 1992; Harcourt and Sayer, 1996; United Nations Environment Programme, 1995).

61. This major problem could be avoided if Governments were to adopt effective policies that discouraged colonization of forest frontiers or displacement of people from forest areas. Where new settlement has already occurred, however, and cannot be reversed, Governments could promote the education of settlers in how to live in their new environment without damaging it. This would create an important role for environmental education within communities on the forest frontier, and suggests that surviving traditional people in the area could have a vital role in showing newcomers how to live there sustainably. This has been proposed as a major need in Irian Jaya (Indonesian New Guinea), for example, where aboriginal peoples are now outnumbered by transmigrant settlers from elsewhere in Indonesia (WWF, 1995).

62. A constraint on the formulation of TFRK access agreements for biodiversity prospecting is the need for legal and other forms of technical advice by

Governments that are contemplating a policy framework and legal instrument, and by peoples who are trying to negotiate an equitable bioprospecting contract with commercial groups. The National Biodiversity Institute of Costa Rica (INBio) has a record of providing such advice on request (for example, to the Philippines and Indonesia) but neither INBio nor any other institution could be expected to do so on a large scale without additional resources to meet the demands on its staff and computing time (Caldecott and Lovejoy, in press). A well-funded international network of expert institutions and individuals (for example, United Nations University/United Nations Educational, Scientific and Cultural Organization (UNESCO) Chairs on TFRK) would go far to relieve this important constraint.

63. There are several obstacles to the sharing of information among the holders of different traditional knowledge systems, and among them and cosmopolitan forest managers and others. They include difficulties in translation among the many languages involved, a lack of common standards for storing, accessing and disseminating relevant information, and a lack of technology and training of the right kind to provide all TFRK holders with Internet access.

IV. CONCLUSIONS AND PROPOSALS FOR ACTION

64. The Panel at its second session (E/CN.17/1996/24) noted that a series of issues concerning the provision of technical, technological and scientific advice on traditional knowledge, innovations and practices of forest use and conservation merited further development (para. 88), identified matters that should be addressed (para. 89) and noted the need for the effective protection of indigenous rights and for the equitable sharing of benefits (para. 90). All these issues have been addressed above in sections I, II and III of this report. The Panel may wish to use section IV for guiding the debate on this item of the agenda and for identifying the most appropriate conclusions and proposals for action.

A. Meaning of traditional forest-related knowledge and property rights

65. TFRK can provide a strong basis for sustainable forest management for two main reasons. The first involves the quality of the information and interpretative systems possessed by local people after living in a forest for several-to-many generations and the second draws on the strength of their commitment to sustainable forest management that results from having such knowledge. This is relevant for qualitative aspects of forest assessment as considered in programme element III.1. (a).

66. The main obstacle to TFRK's being legally recognized as the common property of certain social groups is likely to be the difficulties involved in negotiating consensual agreements with a variety of groups identified as holders. International forums such as the Ad Hoc Intergovernmental Panel on Forests provide a unique opportunity for Governments that have taken this path to reassure others that TFRK is indeed useful in managing forests sustainably and in locating valuable new products, and that accessing it on fair and

equitable terms can only benefit each country in its efforts to achieve sustainable development.

67. Most TFRK will mean little outside the environment where it arises and is likely to be most valuable as a means to achieve on-site sustainable forest management. Since TFRK cannot reasonably be taken from people without their consent, and is the common property of distinct groups of people, this should be acknowledged by Governments and others who wish to use such knowledge. Of those forms of TFRK that do have meaning outside their place and culture of origin and potential usefulness to global society, some have no potential for commercial application, but are nevertheless the intellectual property of their holders.

68. It is recognized that there are three main areas in which TFRK access agreements seem necessary which may be described in the following terms:

(a) If forest-dwelling people are to be involved as other than labourers in managing the forests where they live (as must be the case if TFRK is to have a role), this should be based on partnership agreements. Since the use of any resource needs clarity concerning its holders, plans for its use, and management of that use, managing an inhabited forest will require holder, planning and management partnerships;

(b) If forest-dwelling people are to be involved in biodiversity prospecting (as they must be if TFRK is to be used to identify materials with commercial potential), this should be based on agreements that guarantee a fair return from any resulting commercial application;

(c) If forest-dwelling people are to share their ideas and experiences with others, this should be based on agreements that allow them to control the release of information and that acknowledge their contribution.

Proposals for action

* To invite Governments and TFRK-holding groups to consider entering into formal agreements by which TFRK can be accessed.

* To establish comprehensive approaches to intellectual property that allocate to the holders of traditional forest-related knowledge, innovations and practices, rights and protection comparable to those offered under existing intellectual property regimes.

B. Establishing partnerships

69. The most substantial contribution of TFRK is likely to be in defining sustainable forest management techniques at a local level.

70. For indigenous people, their communities and other communities and forest dwellers to participate fully in such partnership agreements and to offer their TFRK for the benefit of other interested parties, certain conditions will need to be met. Holders of TFRK will need to feel secure in their land tenure arrangements; reassured that they have been accorded status equal to that of the

other members of the partnerships; convinced of a common purpose compatible with their cultural and ecological values. Furthermore, any special needs regarding participation should be catered for.

Proposal for action

* To urge developed countries and international organizations to support capacity-building activities for creating partnership agreements for sustainable forest management with indigenous people, forest dwellers and local communities (including, for example, negotiation skills, understanding of the sustainable forest management agenda and outside interest in TFRK, legal support) and mechanisms for compensating the real costs of participation (forgone labour or social investments, as well as routine expenses).

C. Participatory approaches

71. Indigenous people, forest dwellers and local communities must play a key role in defining participatory approaches to forest and land management, including resource management institutions, land-use systems and conflict resolution. This fact is of paramount importance for the successful implementation of future activities in Panel programme elements I.1, I.2, I.4 and I.5. There is a growing body of literature on participatory methodologies and traditional knowledge, based in large part on direct project experience obtained by donor agencies, and non-governmental, indigenous and community organizations.

Proposals for action

* To urge Governments to promote and provide the opportunities for full participation of indigenous people, forest dwellers and local communities in forest and land management, consistent with principles 2 (d) and 5 (a) of the Forest Principles.

* To urge countries and international organizations to support the preparation of technical guidelines on TFRK application to assist national and local Governments on how such knowledge and experience can be brought together. These guidelines should focus on participatory partnerships to bring TFRK into the development, implementation and planning of local-level sustainable forest management, including areas such as legal and administrative frameworks, identification of interested parties, capacity-building for participants, structure and procedures of participatory bodies, conflict resolution mechanisms, compensatory mechanisms for community or non-professional participants, and options for storage and retrieval of TFRK.

* To urge countries to organize series of national, regional and international expert consultations for promoting establishment of TFRK partnerships and application of participatory planning methodologies. Experts would be identified from international agencies and donors, Governments, indigenous and local community organizations, researchers, non-governmental organizations, and others with direct experience of participatory projects involving TFRK.

D. Management of traditional forest-related knowledge

72. As has been noted throughout this report, there are difficulties surrounding the acquisition, storage, retrieval and dissemination of TFRK outside its place of origin. These difficulties reside in the nature of TFRK, overwhelmingly site- and culture-specific, and in the fact that most TFRK is not amenable to being digitized, stored in databases or accessed through clearing-house mechanisms. It is not clear to what extent TFRK originating in one ecological and cultural context can be made available for sustainable forest management purposes in another, nor what the real level of benefits might be. It seems reasonable to suppose that, if such exchanges are to take place, they will be more meaningful if they occur through face-to-face contact and verbal transmission rather than codified communication channels. The Panel may wish to explore further the feasibility and modalities of such exchanges.

Proposals for action

* To urge donors and international organizations to support the establishment of regional and national institutional systems dedicated to undertaking systematic studies on TFRK and to promote its wide understanding and use.

* To urge countries, national institutions and academic centres to incorporate TFRK in standard forest management training as a way to sensitize forest managers on how to access TFRK, on the benefits of using it and on the dangers of ignoring it.

* To encourage donors and international organizations to assist financially and support existing networks promoting sharing of TFRK among concerned groups and institutions in collaboration with involved indigenous people.

* To promote digital mapping (using GIS and GPS) combined with social mapping for establishing forest holding; assist planning and management partnerships; and assist in the location of cultural and geographical information required to support sustainable forest management schemes.

E. Prospecting biodiversity and sharing of benefits

73. Those aspects of TFRK that may assist in the identification of new products with commercial value fall within the purview of the Convention on Biological Diversity, since TFRK is a subset of the "knowledge, innovations and practices" referred to in article 8 (j) of the Convention and the genetic resources of forest ecosystems are a subset of the genetic resources referred to in article 15. The Panel will note that the Conference of the Parties to the Convention will consider at its third meeting, inter alia:

(a) Possible options for developing national legislative, administrative or policy measures, as appropriate to implement article 15 (Access to Genetic Resources);

(b) Impact of intellectual property rights systems on the conservation and sustainable use of biological diversity and the equitable sharing of benefits

derived from its use in order to gain a better understanding of the implications of article 16 (Access to and Transfer of Technology), paragraph 5;

(c) Knowledge, innovations and practices of indigenous and local communities: implementation of article 8 (j).

Proposal for action

* The Panel may wish to consider ways and means to incorporate the results of the consideration of these issues by the Conference of the Parties to the Convention on Biological Diversity into its conclusions, and proposals for action to the Commission on Sustainable Development.

F. Traditional forest-related knowledge and indigenous people

74. The terms of reference for this programme element identify "forest dwellers, indigenous people and other local communities". Principle 5 (a) of the Forest Principles states: "National forest policies should recognize and duly support the identity, culture and the rights of indigenous people, their communities and other communities and forest dwellers." The recognition of the identity, culture and rights of indigenous people and their communities has been accorded specific priorities and processes within the United Nations system.

Proposals for action

* Recalling the need to take account of other relevant intergovernmental processes, the Panel may also wish to note the ongoing consideration of relevant matters within the Commission on Human Rights, in particular its consideration of:

(a) Report of the Special Rapporteur on the protection of the heritage of indigenous people (E/CN.4/Sub.2/1995/26);

(b) Technical review of the United Nations Draft Declaration on the Rights of Indigenous Peoples (E/CN.4/Sub.2/1994/2/Add.1);

(c) Report of the Working Group on Indigenous Populations on its thirteenth session: consideration of a permanent forum for indigenous people (E/CN.4/Sub.2/1995/24, sect. VII).

* The Panel will recall that chapter 26 of Agenda 21 contains a programme for recognizing and strengthening the role of indigenous people and their communities. Much of the material in that chapter is of direct relevance to this programme element and the Panel may wish to refer to its recommendations.

Notes

1/ Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992, vol. I, Resolutions Adopted by the Conference (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex III.

2/ Ibid., annex II.

3/ See United Nations Environment Programme, Convention on Biological Diversity (Environmental Law and Institution Programme Activity Centre), June 1992.

4/ See Official Records of the Economic and Social Council, 1995, Supplement No. 12 (E/1995/32), chap. I, sect. D, annex I, sect. III.

5/ See A Call to Action: Decisions and Ministerial Statement from the Second Meeting of the Conference of the Parties to the Convention on Biological Diversity, Jakarta, Indonesia, 6-17 November 1995 (UNEP, January 1996), decision II/9.

6/ See Legal Instruments Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations, done at Marrakesh on 15 April 1994 (GATT secretariat publication, Sales No. GATT/1994-7).

7/ See Report of the Conference of FAO, Twenty-fifth Session, Rome, 11-29 November 1989 (C 89/REP) (Rome, FAO, 1989), para. 108.

8/ See Official Records of the Economic and Social Council, 1995, Supplement No. 12 (E/1995/32), chap. I, sect. D, para. 200.

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Annex

NETWORK ACCESS POINTS

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WWW: http://www.physics.iastate.edu/cikard/cikard.html
Centre for International Research and Advisory Networks (CIRAN):
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Centre for Traditional Knowledge, Canadian Museum of Nature:
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Fourth World Documentation Project (FWDP):
WWW: http://www.halcyon.com/FWDP/fwdp.html
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Honey Bee Network:
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Indigenous Knowledge Systems List (INDKNOW):
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Indigenous Peoples' Biodiversity Network (IPBN):
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Mexican Research, Teaching and Service Network on Indigenous Knowledge (RIDSCA):
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Nigerian Centre for Indigenous Knowledge (NIRCIK):
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Philippine Resource Center for Sustainable Development and Indigenous Knowledge (PHIRCSDIK):
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Regional Program for the Promotion of Indigenous Knowledge in Asia (REPPIKA):
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Russian Resource Centre for Indigenous Knowledge (RURCIK):
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South and Meso American Indian Rights Center (SAIIC):
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Sri Lanka Resource Centre for Indigenous Knowledge (SLARCIK):
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Uruguayan Resource Centre for Indigenous Knowledge (URURCIK):
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Venezuelan Resource Secretariat for Indigenous Knowledge (VERSIK):
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Working Group on Traditional Resource Rights (WGTRR):
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