

SECTION 1: OVERVIEWS

1 INCORPORATING INDIGENOUS KNOWLEDGE IN FORMAL FOREST MANAGEMENT: ADAPTATION OR PARADIGM CHANGE IN TROPICAL FORESTRY?

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1.1 INTRODUCTION

During the last two decades much attention has been given to the adaptation of formal forest management towards the forest-related needs of local people in tropical countries. These new approaches to forestry started in the late 1970s as a result of the identification of the 'poor man's energy crisis' (e.g. Eckholm, 1975). It was recognised subsequently that the forest use of local communities was not restricted to (fuel) wood, but included many other non-wood products such as food, medicinal products and livestock fodder (e.g. Falconer and Arnold, 1991; Hladik *et al.*, 1993). Moreover, local communities were seen to value forests for cultural reasons in addition to utilitarian reasons. Alongside these emerging insights into specific forest-related needs of local communities, it was accepted that the fulfilment of such needs is best assured when local communities are actively involved in forest management. This understanding was based on both pragmatic and normative considerations. On the one hand it was considered that involvement of local people would improve utilisation of human resources, and hence would be instrumental in improving forest management. On the other hand, it was considered that community development should not only focus on meeting forest-related needs of local people, but also on providing the means for local people to fulfil their own needs. The result was the so-called social forestry strategies that gradually evolved from the early 1980s and aimed not only at adjusting forest management towards the needs of local people, but also at encouraging their self-reliance (Wiersum, 1999a).

The first social forestry strategies were based on scaled-down versions of conventional professional forestry practices (here the term 'professional forest management' is used to refer to forestry systems that are managed by professionally trained people, without necessarily implying a level of skill). But from these early efforts increased understanding emerged about the role of trees in the livelihood strategies of local people. It was found that local communities not only exploit forests to meet a variety of household needs but that, in many cases, they also actively manage forests and trees. Due to the importance of forest resources for the local communities, they have developed their own specific forest management systems. Management practices include purposeful protection of native forests, transformation of native forests into resource-enriched forests, establishment of mixed forest plantations and establishment of agroforestry systems in which crop and/or livestock production is integrated with care for forest resources (e.g. Anderson, 1990; Shepherd, 1992; Wiersum, 1997a).

Moreover, it was found that many local communities had developed their own institutions for controlling access to, and exploitation of, forest resources (Fisher, 1989; Poffenberger, 1990; Arnold, 1998).

In order to understand community perspectives and practices regarding forest resources, increasing use is being made of actor-oriented research approaches. These approaches are based on the assumption that knowing and active actors have the capacity to identify problems, process information and make strategic decisions in dealing with other people as well as resources (Long, 1989). One of the premises of the actor-oriented approach is the idea that local people, on the basis of local needs and knowledge, may develop their own indigenous methods for forest utilisation and management, and that these methods are not necessarily similar to those considered by professional foresters. The specific nature and development relevance of indigenous knowledge about management of natural resources has received increasing attention since the early 1980s (Richards, 1979; Brokensha *et al.*, 1980). Since that time, forestry science studies have focused increasingly on the nature and specific characteristics of indigenous forest management, assessing the possibility of merging indigenous and professional forest management (e.g. Gomez-Pompa, 1991; Redford and Padoch, 1992; Kajembe, 1994; Clarke, 1994; Van Leeuwen, 1998; Pandey, 1998; Wiersum, 1999b). As a result, much new information concerning specific features of indigenous forest utilisation and management has become available during the last decade, and significant progress has been made in understanding ways in which local communities use, maintain and/or augment forest resources, the dynamics of these systems, and the significance of such systems for forestry development.

This chapter questions whether recognition of the need to incorporate indigenous knowledge into professional forestry should be considered a paradigm change in forestry. The concept of paradigm relates to an internally consistent set of values, concepts, methods and actions, which tell scientists and professional practitioners within a certain discipline what is important, legitimate, and reasonable to carry out without having to refer to lengthy normative and methodological discussions. It refers to a set of (often subconscious) mutually supporting group commitments of scientists and professional practitioners on the nature of a scientific discipline, the types of problems to be considered and the relevant methodologies for research and development. The concept was originally proposed by Kuhn (1970) in reference to natural science, but has since been applied to describe implicit assumptions underlying and guiding practical science and professional practice (Chambers, 1993; Blaikie *et al.*, 1996; Wiersum, 1999a).

1.2 MEANING AND RELEVANCE OF INDIGENOUS KNOWLEDGE

The study of indigenous forest management is often considered to belong to the domain of research on indigenous knowledge systems. Knowledge systems concern the way people understand the world, and interpret and apply meaning to their experiences. Such knowledge is built through the complex process of selecting, rejecting, creating, and transforming information, and is inextricably linked to the social, environmental and institutional contexts in which it occurs (Arce and Long, 1992). Indigenous knowledge systems are those that have evolved within local communities and have been handed down by cultural transmission. Over time, external information may become incorporated, and indigenous knowledge should therefore not be considered

as being isolated from external influences. Neither should it be considered to concern only traditional knowledge dating from the past, since it also includes local knowledge that has evolved more recently in response to changing conditions and needs. However, since indigenous knowledge emanates from specific environmental and cultural contexts, it is often unique to a specific culture or society. In many tropical regions, indigenous knowledge is a major element in local decision-making processes relating to the use and management of natural resources and in the organisation of specific management practices. Indigenous knowledge reflects a society's intimate understanding of its ecological and social environment (Warren, 1991).

Scientists, policy-makers and development project planners are increasingly convinced of the need for protection and conservation of indigenous knowledge of natural resources. Such knowledge is considered relevant because its use incorporates three types of values (Warren, 1991):

- *encyclopaedic value*: indigenous knowledge systems involve a large variety of (often location-specific) information on options for using and managing natural resources, which are not yet described scientifically;
- *efficiency value*: indigenous knowledge provides information which can be blended with professional knowledge in making the process of technology generation and transfer more effective;
- *emancipation value*: the incorporation of indigenous knowledge and practices in development projects supports efforts to enhance active participation and to stimulate self-determination of local communities.

Appreciation for these three kinds of values varies amongst users of indigenous knowledge. For instance, development workers may appreciate the encyclopaedic value of indigenous knowledge as useful information to be used in the rehabilitation of land-use types (such as shifting cultivation) that were formerly considered unsustainable. Encyclopaedic value can also be appropriated by commercial firms for developing new technologies, e.g. by using indigenous knowledge about medicinal plants for developing new medicinal products. Development workers may also appreciate the efficiency value of indigenous knowledge and consider it as a means of improving communication practices, by using local idioms and classifications, in the introduction of modern management. Alternatively, the efficiency value of indigenous knowledge may be used by them as a starting point for negotiation processes, in which locally-specific management practices are construed between local people and external organisations. Finally, social activists may especially appreciate the emancipation value of indigenous knowledge, by viewing it as a means of empowering local people to exercise their own management skills (Blaikie *et al.*, 1996).

Hence, although indigenous knowledge is increasingly considered an important element in developing sustainable forest management, there are divergent interpretations of why indigenous knowledge is important. Interpretations vary according to different views of the nature of the development process emerging primarily from state-sponsored professional organisations, market forces or local communities (Blaikie *et al.*, 1996). These different positions are not specified in many statements regarding the importance of listening to indigenous knowledge. Consequently, many discussions of the importance of indigenous knowledge use the term 'indigenous knowledge' as a sensitising concept

rather than an operational concept. This is reflected in discussions in which a dichotomised vision of the presumed nature and value of indigenous and ‘Western’ professional knowledge is presented. Such polarisation may be defensible on two grounds. Firstly, it may serve as a means of being more sensitive to the needs and value of indigenous knowledge (cf. Li, 1996). Secondly, it may serve as a means of drawing attention to critical differences between indigenous and science-based professional knowledge in development endeavours (Mazur and Titilola, 1992; Blaikie *et al.*, 1996) and power (Agrawal, 1995). However, this polarisation limits understanding of the operational nature of indigenous knowledge and its relation to forest management. Therefore before reviewing the significance of incorporating indigenous knowledge in formal forest management, this paper discusses the relationship between indigenous knowledge and indigenous forest management.

1.3 PRINCIPAL COMPONENTS OF INDIGENOUS FOREST MANAGEMENT

In studies of natural resource management, the term indigenous knowledge is often used in a rather loose way. Often a clear distinction is not made between indigenous knowledge and indigenous practice. In many instances it is considered that indigenous knowledge can be inferred by observing which type of practices are carried out, and no attention is given to the complex relation between knowledge and practice. Also, clear differentiation is often not made between the practices of forest use and forest management. Many (ethnobotanical) studies focus primarily on identifying which forest products are collected and for what purposes. Little attention has been given to the question of whether forest products are collected freely from an abundant resource, or whether forest resource use is controlled as part of a conscious management system. However, studies are increasingly focusing on practices used by local communities to consciously protect forest resources or even manipulate forest vegetation so as to increase the availability of the principal forest resources.

Some authors have tried to be more specific by identifying various components of indigenous knowledge about natural resources. For instance, Berkes (1999) considers that ‘traditional ecological knowledge’ consists of three interrelated components:

- local people’s *beliefs* about their relationship with the natural environment,
- biological *knowledge* of soil conditions, species and their growing conditions, and possible uses,
- actual exploitation and management *practices*.

The first component, local people’s beliefs, indicates that indigenous use and management of natural resources should not be considered a specialised activity with intrinsic significance, but rather an element of the local community’s overall relationship with their environment. Most indigenous forest management systems are a component of integrated farming systems, and forest management practices are intricately linked with crop production and livestock production processes. Consequently, many indigenous forest management systems include elements that scientists consider to be agronomic, horticultural or silvicultural (Colfer *et al.*, 1997; Michon and De Foresta, 1997; Wiersum, 1997b). Moreover, forest management systems are closely interlinked with a community’s cultural system.

The cultural setting greatly influences the way in which local people perceive their natural environment as well as their relationship to that environment (Umans, 1992). Such basic world-views involve not only utilitarian considerations regarding the role of forests in integrated land-use systems, but also religious and spiritual perceptions of the environment. The maintenance of sacred forests is a clear manifestation of such cultural perceptions (Doornewaard, 1992; Ramakrishnan, 1996; Lebbie and Freudenberg, 1996).

It has been argued that local communities view forests in a holistic way (e.g. Posey, 1985). This is the case if one considers that indigenous forest management is intricately linked to a community's cultural understanding of their environment as well as the daily livelihood systems of local people. However, the notion that indigenous communities have a holistic view of their forest should not be interpreted to mean that they value the forest as an integrated ecosystem. Rather, management is based on "a selective respect towards a culturally conceived nature" (Persoon, 1991) and the indigenous management practices are directed at the locally valued forest resources in the form of either specific patches of forest or specific tree species (Wiersum, 1997a).

The second and third components (biological knowledge and actual exploitation and management practices) of the traditional ecological knowledge mentioned by Berkes (1999), indicate that indigenous management is also based on biological knowledge about the presence and use options of forest resources as well as on technical knowledge of various types of management practices. However, Berkes (1999) neglects other factors affecting decisions to put knowledge into practice. This process involves considerations not only of biological and technical features, but also of institutional factors such as regulations on access to forest resources, rules on exploitation of forest resources, and marketing conditions (Fisher, 1989; Arnold and Dewees, 1995; Wiersum, 1997a; Munyanziza and Wiersum, 1999). Therefore forest management involves not only biological and technical knowledge, but also knowledge of its socio-political environment. In many studies of indigenous knowledge concerning forest management this last type of knowledge is not addressed explicitly. Instead, most studies focus on the types of products being harvested and/or the exploitation and management practices undertaken, rather than on the institutional reasons supporting such practices. So, when information is presented as indigenous knowledge but no explicit attention has been given to the question of how different types of knowledge interact in the process of deciding whether to implement a specific practice, the information in fact represents observable practices rather than indigenous knowledge *per se*.

Another important but often neglected feature of indigenous management of natural resources is its dynamic nature. Although the term 'indigenous' refers to knowledge or practices that have been generated within local communities, it is often equated with traditional knowledge and practices which have remained more or less stable (Fisher, 1989). However, many examples show that this is not the case and that over time indigenous knowledge adapts to changing social, economic and environmental conditions (e.g. Gilmour, 1990; Shepherd, 1992; Ghimire, 1994; Arnold and Dewees, 1995; Wiersum, 1997b). Furthermore, indigenous practices may be based not only on indigenous knowledge but also on experimental skills.

Although much indigenous knowledge is common to (certain groups of the) rural community, individual variation occurs depending on the experimental skills of certain people (Johnson, 1972).

1.4 CONCEPTUAL FRAMEWORK FOR CHARACTERISING INDIGENOUS FOREST MANAGEMENT

In order to overcome the often-limited interpretation of the relationship between indigenous knowledge and indigenous forest management and to allow systematic analysis of the various factors impacting on indigenous forest management, there is a need for identification of a common framework for conceptualising forest management. Such a framework should not only help in understanding the various components of indigenous forest management, but should also allow systematic comparison between indigenous and professional forest management.

This framework can be based on the definition of forest management as the process of making and implementing decisions about the use and maintenance of forest resources and the organisation of the related activities (Duerr *et al.*, 1979). Forest management thus involves the combination of two types of arrangements, i.e. social arrangements and technical arrangements (Wiersum, 1997a; 1999a). Social arrangements consist of agreement on:

- (i) who are legitimate forest users of a specific piece of forest,
- (ii) a structure for making decisions about management objectives, and
- (iii) the type of practices to be performed as well as control over the implementation of decisions.

They also include the ability to exclude outsiders from having unauthorised access to forest resources. Within local communities the definition of legitimate forest users and the agreements on forest boundaries are often based on social norms rather than on formal administrative decisions. Such local institutional arrangements are an essential foundation for indigenous forest management. They may be augmented by either a formal or informal organisational framework for making decisions about the types and intensities of forest exploitation and silvicultural practices to be carried out, and about control over the proper implementation of those practices (Fisher, 1989). Technical forest management practices cannot proceed without these social arrangements. Such technical practices aim at efficient use and manipulation of forest resources. They may involve regulations on the controlled use of these resources, as well as measures to consciously protect resources and to enhance the production capacity and regeneration of the resources (Wiersum, 1997a). Hence, indigenous knowledge on forest management involves not only biological and technical knowledge and practices, but also knowledge of social relations and institutional practices.

As discussed above, forest management should not be conceived of as a specialised activity, but rather as being embedded in a specific cultural setting. Indigenous forest management is an important component of the communities' integrated land-use system. Moreover, forests may not only have utilitarian value, but may also be incorporated in religious and emotional value systems.

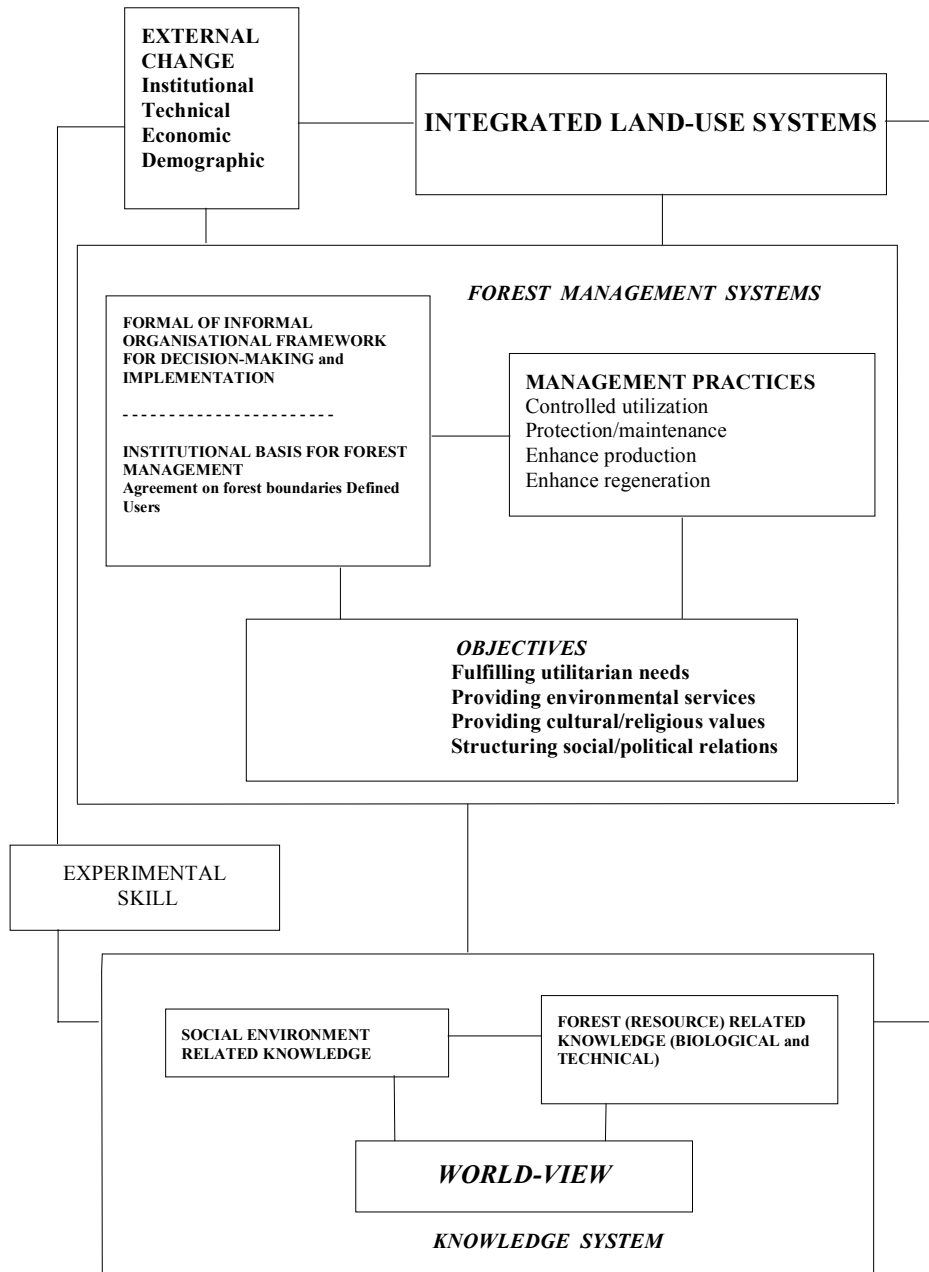


Figure 1.1: Conceptual model of forest management as a knowledge and action system.

Table 1.1: Comparison of ‘ideal-type’ norms for professional and indigenous forest management (adapted from Wiersum, 1999b).

	Professional	Indigenous
Basis of management		
* Rationale	Commercial production and conservation Segregation of forestry and other land-use	Integrated multiple resource use No strict segregation between forestry and other land-use
* Types of forests considered	Cultural values mostly recreation- and biodiversity-related (Semi) natural forests and timber plantations	Cultural values religiously- and spiritually-related All kinds of (semi) natural and cultivated woody biomass, including forest gardens and other agroforestry systems
* Main products	Timber and selected commercial non-wood products	All kinds of wood and non-wood forest products
* Main environmental services	Watershed protection, Legally sanctioned	Microclimate, soil fertility
* Major forest resources considered		Locally identified, user-group specific
* Unit of management	Spatial unit climate control	Specific resources management, local water supply
Main management practices		
* Basis for controlling use	Legal control	Social and cultural controls
* Harvesting techniques	Mostly tree felling and coppicing	Pruning, pollarding, leaf/bark harvesting common
* Harvesting schedules	Systematised for efficient production	Mostly opportunistic based on livelihood considerations
* Artificial regeneration	Nursery raised seedlings and seeding	Transplanted wildlings, seed dispersal by livestock, cuttings, some seeding
* Planting pattern	Systematic	In micro-niches
* Stimulation of production	Stand-oriented	Tree-oriented

This cultural setting influences the way in which forests are perceived, and what are considered to be relevant objectives in maintaining these forests. Thus forest-related knowledge systems should not only be conceived of as relating to cognitive elements concerning the biological, technical and social components of forest management, but also as relating to the basic world-view which guides the behaviour of the people with respect to their social and cultural environment.

The various components of forest management, in the context of an integrated knowledge and decision-making system regarding the organisation and implementation of measures for the use and maintenance of forest resources, are summarised in Figure 1.1.

From this conceptual model it can be inferred that when comparing the features of indigenous and professional forest management systems, several factors have to be considered, including:

- The normative basis for forest management
 - The basic world-view concerning the rationale of forest management
 - Considerations of relevant forest resources and objectives for forest management
 - Institutional arrangements for forest management
- The type of forest exploitation and management practices being used and how they have resulted in specific forest types.

Table 1.1 summarises the main ‘ideal-typical’ differences in features of indigenous and professional forest management. As illustrated in this table, these differences involve not only cognitive factors such as botanical features regarding forest use and forest structure, technical features regarding management practices and social features regarding the institutional framework for forest management, but also normative factors such as the cultural setting and the rationale of forest management.

1.5 INCORPORATING INDIGENOUS KNOWLEDGE IN FORMAL FOREST MANAGEMENT: ADAPTATION OR PARADIGM CHANGE?

As discussed in the introduction, the last two decades have seen increasing attention given to incorporating indigenous knowledge of forest management in formal forestry. It has been proposed that this development involves such an essential change in thinking about what forestry should entail, that it should be considered as a paradigm change rather than an adaptation in the process of evolution of forestry. In contemplating whether a paradigm change is involved, one should consider that the concept of paradigm refers to an assortment of group commitments, and that the concept is not therefore unequivocal. Consequently, when assessing whether incorporation of indigenous knowledge in formal forest management can be conceived as a paradigm change, it should be clarified which set of normative assumptions are considered to be involved. Depending on what are considered the dominant values in developing forestry, three different perspectives on the significance of incorporating indigenous knowledge in formal forest management may be distinguished; namely, that it involves either an adaptive change, an institutional change or a paradigm change.

The ‘adaptive change’ perspective

According to this perspective, the group commitments underlying forest management focus on the need to protect and manage forest resources for human benefit. As illustrated by the conceptual framework of forest management (Figure 1.1), the characteristics of indigenous and professional forest management are essentially similar. Consequently, the differences between these approaches can be considered as being mainly empirical. Moreover, several technical features of indigenous forest management in tropical countries have, in the past, been incorporated in (professional) forest management systems in temperate regions.

Hence, differences between indigenous and professional forest management vary according to the social and historical setting in which they emerged, indicating that the forest-related needs and actions of human societies are location- and time-dependent. Recognition of the value of indigenous knowledge of forest management should therefore be considered as acknowledgment of the need to further diversify formal forest management and to optimally adapt to location-specific conditions. The adaptive change perspective does not reflect essential differences in perception of the nature and value of forest management *per se*.

The 'institutional change' perspective

Advocates of this perspective consider that group commitments displayed in indigenous and professional forest management are concerned not only with relationships between human society and forests, but also with relationships between people. These human relationships can be reflected in the institutional arrangements for forest management. A major characteristic of indigenous forest management differentiating it from professional forestry is its institutional setting. The 'rules' of indigenous forest management and professional forestry are based on different norms regarding the role of forests and the organisation of forest management. Recognition of the value of indigenous knowledge regarding forest management should be seen as an indication that major changes need to be made in the practices and institutional arrangements of formal forestry. However, in this perspective the ultimate aim of forest management, to fulfil the forest-related needs and demands of human society, is not essentially affected. Incorporation of indigenous knowledge into professional forest management essentially entails an institutional change about how to structure forestry.

The 'paradigm change' perspective

Proponents of this point of view consider that group commitments underlying indigenous and professional forest management relate not only to forest management practices and their institutional setting, but also to perceptions of the role of knowledge in forestry development. Recognition of the need to incorporate indigenous knowledge in formal forest management indicates more than a need for further diversification in forest use and management practices, and for change in institutional arrangements. Instead, it signifies the need to reconsider the role of knowledge in developing forest management. Forest management decisions should no longer be informed by the presently dominant paradigm which considers state-sponsored scientific institutions and professional knowledge to be progressive. In this view scientific knowledge should be transferred to local communities, whose own knowledge is non-scientific, outdated, irrational or even superstitious.

Instead, the new paradigm emphasises the intrinsic value of indigenous knowledge and its role in shaping the identity of local societies. Indigenous knowledge should be considered a medium of empowerment, enabling local people to exercise their management skills and technical knowledge and to obtain greater control over their own development.

These three perspectives incorporate in specific ways the three types of values of indigenous knowledge identified earlier. The 'adaptive change' and 'institutional change'

perspectives incorporate the *encyclopaedic* and *efficiency* values of indigenous knowledge, respectively. The 'adaptive change' perspective considers that professional management organisations either appropriate the indigenous knowledge or use it as a means of expressing local voices. The 'institutional change' perspective considers that professional organisations should both esteem indigenous knowledge and try consciously to incorporate features of 'rehabilitated' indigenous management systems into their own formal systems. To do so efficiently requires major institutional adjustments in the formal system. For instance, the change from the conventional approach in forestry development projects of transferring professional technology to local communities, to an approach of blending professional and indigenous knowledge requires a rethinking of the structure of the forestry administration (Wiersum, 1999a). The 'paradigm change' perspective gives the *emancipation* value of indigenous knowledge a major role, whereby it is valued as an input to a negotiating process between local people and external agents or as a medium of empowerment for local people.

Hence it can be concluded that no unequivocal answer can be given to the question of whether incorporation of indigenous knowledge in formal forest management signifies a paradigm change in forestry. Rather, the answer varies according to interpretations of what is at stake.

1.6 CONCLUSION

Forest management concerns the process of making and implementing decisions about use and maintenance of forest resources in order to meet forest-related needs of human societies and organisation of the related activities. Forest management can be characterised as a knowledge and action system. Conventionally in forestry only the management systems in state-legitimised forests and under professional administration were considered. However, as epitomised by the emergence of the term indigenous forest management a much wider array of arrangements is possible. This term can be considered a sensitising concept indicating that the conventional view of forestry as a professional activity needs to change, and that more attention should be given to local communities' understanding of the role of forests in their livelihood systems and to the wide variety of conditions under which forest resources are managed.

The terms professional forest management and indigenous forest management should not be considered as referring to two systematically different approaches to forest management, but rather to empirical variations in social and technical arrangements for forest management.

This is illustrated by the fact that the basic features of both management approaches can be conceptualised in a similar manner. Regarding the role of indigenous knowledge in contributing to this variation three alternative views are possible.

According to the first point of view, indigenous knowledge about forest management is related primarily to biological and technical features of forest management. This knowledge is valued mainly for its *encyclopaedic* value. Consequently, the incorporation of indigenous knowledge into formal forest management schemes would represent an adaptive change in forestry leading to its further diversification.

The second point of view on the relevance of indigenous knowledge to forest management focuses not only on biological and technical features but also on institutional arrangements. In this case, indigenous knowledge is equally valued for its *encyclopaedic* and *efficiency* value. The efficient use of the indigenous knowledge regarding biological and technical features will not be possible without changes in the prevailing institutional norms for forest management. Hence, the incorporation of indigenous knowledge in formal forest management is considered as representing not only the need for inclusion of new biological and technical elements in forest management, but also the need for institutional change in forestry.

The third point of view stresses the *emancipation* value of indigenous knowledge regarding forest management. In this case incorporation of indigenous knowledge in formal management is not based on consideration of how forest management can be best improved, but on consideration of who should decide how forests should be managed. In this view it is not the knowledge concerning the biological, technical or social features that is at stake, but the relation between knowledge and action. The adoption of this perspective by professional forestry might represent a paradigm change.

So the question of the significance of the incorporation of indigenous knowledge in formal forest management can be interpreted in different ways. Forest management is increasingly characterised by a normative pluriformity regarding the values which it should incorporate (Wiersum, 1999a). The change from forest management as an activity of a predominantly professional society, authorised by a national government, to an activity that is characterised by normative pluriformity could be considered as the most significant paradigmatic change in forestry. It is no longer possible to conceive of forestry as being characterised by one coherent set of normative assumptions, nor for forest managers to base their activities on a standardised set of measures. Rather, professional foresters must learn to deal with different normative perspectives regarding the role of forestry and how to negotiate between adherents of different views concerning what to consider as legitimate forestry activities.

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