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### Sustainable forest management: maintaining human creativity

by *K. F. Wiersum*

Sustainable forest management is usually defined as the process of managing permanent forest land to achieve one or more clearly specified productive and/or ecological management objectives without undue reduction of its inherent values and future productivity and without undesirable effects on the physical and social environment. Sustainable forest management should thus guarantee the continuity of all recognised principal functions of a particular forest, without undue effect to other (global) functions.

This definition illustrates that the current development of sustainable forest management pays specific attention to the maintenance of forest functions (products & environmental services). Although it is recognised that various types of forests may be present, the types of forests to be considered are not further specified. In developing criteria for sustainable forest management, two types of forest are normally considered, i.e. natural forests and timber plantations. This distinction reflects that forests can be conceived either as a basically natural ecosystem or as a man-made agroecosystem.

Recent research has demonstrated that in addition to man-made timber plantations, a large variety of other man-made forest types are present in tropical countries. These forests have gradually developed as a result of an evolutionary continuum in interactions between local communities and forests (Wiersum, 1997). During this evolution a process of co-domestication of forests and tree species took place (Table 1). Most of these human-created forest types have until now scarcely been acknowledged by forest science. As illustrated by a recent book on the nature of forests in the West African forest-savanna edge (Fairhead & Leach, 1996), the origin of such man-made forests is often not recognised and ecologists and foresters have often ignored positive human influences on forest composition. The usual perception is that local communities are either destroyers of forests (by necessity or ignorance) or conservers of ancestral forest lands. The option that they may also be active manipulators of forests is not usually considered. Little attention has been given to the possibility that local communities have enriched forests with tree species valued by them or even reconstructed forests to suit their needs for specific forest resources, while maintaining many of the characteristics of natural forests in respect to structure and biodiversity. In many cases, such manipulations are not directed at timber species, but rather at fruit species or species providing commercial non-timber forest products.

At present many of these indigenously-developed forest types have mainly local significance; some also play an important role in the commercial production of non-timber forest products (De Foresta & Michon, 1997). For instance, in Indonesia the majority of rubber is produced in "jungle rubber" gardens. It can be expected that in the future these

forest types will become increasingly important. As indicated by the example of rubber, many of the indigenously-developed forest types are eminently suited to the production of non-timber forest products and with the growing attention to such production, their role is likely to increase. Moreover, with the decreasing area of natural forests subject to timber logging, also the relevance of these forests for timber production will likely increase. Already now it can be observed in a country such as the Philippines that timber sales from tree species such as coconut, rubber and Jackfruit, which are often grown in forest gardens or mixed-species village plantations is rapidly increasing. In contrast to commercial tree estates these indigenously-developed domesticated forests are characterized by a mixed-species composition. They often play an important role in biodiversity conservation, eg with respect to the preservation of a wide variety of genotypes of locally-valued tree species. These forest gardens illustrate the local relevance of biodiversity.

It is generally agreed that one of the criteria for sustainable forest management should be that the forest-related needs of local communities are taken into account and that they can be actively involved in managing forests. As indicated by the presence of the various types of indigenously-developed forests, these criteria should be extended to include the notion that forest management by local communities may result in the development of various types of modified or reconstructed forests, which to an important degree ecologically resemble natural forests. These forests are not static, but gradually evolve in response to changes in production factors, institutional and marketing conditions, and changing relations between forests and other land-use systems. Although many of such smallholder forests are not located on officially designated permanent forest lands, they can still be considered as being sustainably managed.

In order to obtain a better scientific understanding of the relations between local communities and forest environment, and the various indigenous methods of forest management, the Forestry Department of Wageningen Agricultural University is carrying out a research programme on "Community forestry development and rural transformations in tropical countries". This research focuses on the identification of different types of indigenously-developed forests and of the various factors which influence both their dynamics and sustainability. The basic premise underlying the research is that to understand the full scope of human effects on forests, people should not be conceived as an unnatural external factor to forests, but rather as a highly specialized ecological agent acting within the forest. People may have either positive or negative influences on the forests; these influences are time and location dependent. It is expected that this research programme will provide fundamental information to raise awareness on the need to operationalize the term sustainable forest management not only with respect to timber production from professionally managed production forest estates but also with respect to the wide variety of indigenously-developed forest types. This means that the concept of sustainable forest management should incorporate the notion that not only the ecological integrity and social functions of forests should be maintained, but also the indigenous ingenuity and creativity in conserving, enriching or even reconstructing forests.

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