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Leakey, R.R.B. 2017a. Definition of agroforestry revisited. In: *Multifunctional Agriculture – Achieving Sustainable Development in Africa*, RRB Leakey, 5-6, Academic Press, San Diego, California, USA.

Reprinted from:

Leakey, R.R.B. (1996). Definition of agroforestry revisited, *Agroforestry Today*, **8**(1), 5-7.

# Definition of Agroforestry Revisited

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Agroforestry has been defined in several ways (Nair, 1989). ICRAF's current definition is a collective name for land-use systems and practices in which woody perennials are deliberately integrated with crops and/or animals on the same land-management unit. The integration can be either in a spatial mixture or in a temporal sequence. There are normally both ecological and economic interactions between the woody and non-woody components in agroforestry. This definition has served well and helped agroforestry to become recognized as a branch of agricultural science in its own right (Sanchez, 1995).

Agroforestry practices come in many forms but fall into two groups – those that are sequential, such as fallows, and those that are simultaneous, such as alley-cropping (Cooper and others, 1996). In all, some 18 different agroforestry practices have been recognized by Nair (1993), although each has an infinite number of variations. Thus, at the moment, agroforestry is viewed as a set of stand-alone technologies that together form various land-use systems in which trees are sequentially or simultaneously integrated with crops and/or livestock. In agroforestry research, practices are often applied after diagnosis and design, participatory research or characterization studies, as appropriate, depending on the social, economic and environmental problems in an area.

Agroforestry is generally practiced with the intention of developing a more sustainable form of land use that can improve farm productivity and the welfare of the rural community.

My problem with the current view of agroforestry is that many people still see it as a set of distinct prescriptions for land use. As a result, it falls far short of its ultimate potential as a way to mitigate deforestation and land degradation and thus alleviate poverty. A different view, however, is that agroforestry practices can be seen as phases in the development of a productive agroecosystem, akin to the normal dynamics of natural ecosystems. Over time, the increasing integration of trees into land-use systems through agroforestry can be seen as the passage towards a mature agroforest of increasing ecological integrity. By the same token, with increasing scale, the integration of various agroforestry practices into a landscape is like the formation of a complex mosaic of patches in an ecosystem, each of which is composed of many niches.

These niches are occupied by different organisms, making the system ecologically stable and biologically diverse. Filling some of these niches with species that provide important environmental

services or economically valuable products or both should result in land use that is both more sustainable and productive. Furthermore, the benefits with increasing scale from the farm to the landscape and the region are exponential, since the ecological and social benefits of diversity on a landscape scale are considerably greater than the sum of the individual farm-scale benefits.

Within this ecological framework, farmers can manipulate and manage their trees to take advantage of the benefits of the processes in ecosystem services or products, by breaking the process of agradation – or ecosystem development – at any point, or by allowing a mature agroforest to develop. Fallowing and relay cropping, for example, make use of the benefits of early successional stages of ecosystem development, while complex multistrata systems approach a mature vegetation, such as the commercially valuable damar agroforests of Sumatra (see article this issue p. 8).

Therefore, I suggest that agroforestry should be reconsidered as *a dynamic, ecologically based, natural resource management system that, through the integration of trees in farm- and rangeland, diversifies and sustains smallholder production for increased social, economic and environmental benefits.*

If the above concepts are accepted, then agroforestry researchers and extension workers have a challenge – to start the process of integrating a number of the current agroforestry practices into productive and sustainable land-use systems that alleviate poverty. Contrary to the alternative of monocultures, over time and space these land-use systems become more complex, biodiverse and both ecologically and economically resilient to the normal patterns of climatic variability and pest and disease outbreaks. It is worth noting that in some areas of high population density, farmers are already ahead of the game, and are already practising this kind of agroforestry.

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