

## Sustainable Management of the Forest Estate

What Do We Mean and How Do We Get There?

### Key Concepts:

- Sustainable resource management means policies and practices that will ensure that a given area of land continues to generate a relatively constant stream of specific benefits at a desirable level, over a long period.
- Forests generate tangible and intangible benefits that accrue to and are valued by individuals, communities, institutions and corporations. Sustainable management is a relative concept based on the perceived values of, and desired benefits from, a given area of forest.
- Most uses of the forest undermine, or preclude, other uses (e.g., logging and tourism are largely incompatible). No single forest management system can generate all possible tangible and intangible benefits simultaneously.
- Sustainable forest management is a compromise that reconciles competing uses, and must be responsive to changes in values ascribed to the forest by individuals and political and corporate representatives.
- All consumptive uses of forest resources will impact biodiversity. When the level of use exceeds the point where the stream of desired benefits from a given area declines progressively, that use is unsustainable. A use that generates a sustainable stream of benefits may be undesirable, if it reduces the flow of economic benefits below an acceptable level.
- Sustainable forest management is a scale dependent process. At small scales (<100 ha), over short time frames, no single system can generate all desired benefits. At larger scales over longer time frames, multiple forest units can be managed differently, and in combination generate the full range of benefits.

### What Is Sustainable Resource Management?

**S**ustainable resource management is a much used and much misunderstood term. This is not surprising as the term is actually short-hand for a complex socio-political process that must reconcile competing land uses to generate a stream of benefits over time that satisfy the needs, and reflect the values, of both present and future generations, without adversely affecting the landscape's capacity to generate such benefits. Sustainable resource management is not, as is often thought, a single array of policies and practices that when combined generate all possible tangible and intangible benefits, simultaneously, from each plot of land. Rather it is a set of policies and practices each of which favors a particular resource use or uses, at the expense of others, that when implemented in combination over a large enough area, generate the full range of desired benefits at desired levels. Deciding what range of benefits, at what level, to generate from a given area, over a defined time period, is the socio-political challenge that faces all nations. ■

### Our Values Determine What We Manage Sustainably

**T**he grass covered hills surrounding the Italian city of Parma have supported herds of dairy cattle since the Roman Empire, and, over a period of at least 2,000 years, have generated a relatively constant stream of cheese, from the cows milk, and dried ham, from pigs fed on the whey bi-product of cheese making. No one can argue that these pastures have not been managed sustainably. Yet, archeological evidence shows that these same grazing lands were once forested and that conversion to pasture resulted in a loss of biodiversity and a decline in people's access to forest products. The concept of resource use sustainability is tricky because its interpretation depends on the value one places on particular resources, in a given area, over a certain time period. Thus pastures of Parma are managed sustainably for cheese and ham production, but not for forest resources. ■

### All Resource Use Has An Impact

**E**ven if human resource use does not result in the complete transformation of one land cover to another and the replacement of one set of benefits for another, harvesting of wild resources always changes the age and size structure of the exploited population, and the relative abundance of that population within the harvested area. Only if all wild resources within an area were harvested simultaneously at a level that reflected their age/size distribution and relative abundance within the area, would biodiversity measured in terms of evenness and richness not change. This is unlikely as not all wild resources are valuable to humans. The challenge in sustainable resource management is to agree upon how much and what kind of change, if any, in the resource base is acceptable as a result of consumptive or non-consumptive resource use. As all resource uses change the resource base in some way, the key is legislating and enforcing thresholds beyond which the change is considered unacceptable. ■

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## Sustainable At What Scale?

**S**ustainable resource management is also scale dependent. Hunter-gatherers in tropical forests typically exploit resources within their immediate vicinity using simple and relatively inefficient technology. They tend to move to a new area only when resources are depleted, and return rates have fallen below subsistence levels. At one scale, hunter-gatherer practices are unsustainable in that they overexploit resources within their short-term foraging area. Yet the hunter-gatherer cycle of resource overexploitation, abandonment and recovery when viewed within a larger landscape (i.e., their home range) has been sustainable for millennia. No single approach to management can generate all desired benefits, and satisfy all sustainable resource management criteria, in all patches of forest simultaneously. However, separate patches of forest within a large landscape can be managed differently to sustainably produce different combinations of tangible and intangible goods and services, that in aggregate generate all the benefits desired by all stakeholders, and satisfy the criteria advocated by most sustainable forest management protocols. ■

## Getting to Sustainability

**A**ny attempt at sustainable resource management must (1) reflect that all uses of resources result in changes in the population of exploited species, (2) specify what resources are to be sustainably managed and what resources we are willing to deplete or lose outright in any given patch of managed forest, (3) acknowledge that land use practices that may be unsustainable at one scale, may, in combination, be sustainable at a larger landscape level, and (4) characterize the size of the stream of products that is both economically and culturally desirable, and that can be produced relatively consistently over time by the ecosystem. The latter is particularly important, because if a given landscape cannot under any circumstance generate a stream of products at a desirable level, then sustainable management of this tangible or intangible product is untenable, at this particular scale. ■

▶ No single forest management system can be expected to generate all possible benefits simultaneously within the same block of forest.

## Competing Values of Central African Forests

**I**n the Congo Basin, forests are important presently for their value as sources of, *inter alia*, timber, agricultural land, bushmeat, non-timber forest products (NTFPs), biodiversity, and climate regulation. If every patch of forest could simultaneously generate all such values then managing the forest would not be a challenge. Unfortunately, many land uses tend to undermine or preclude other simultaneous land uses that would capture other values of the forest. For example, a forested landscape planted with coffee to generate income for families and national governments may no longer be a forest filled with food or medicines that can be harvested for local use or for sale; a forest where wildlife are hunted for meat generates food and income for families today, but may jeopardize future families' likelihood of capturing the same values; and a forest set aside as a national park, is, most likely, no longer accessible to loggers to harvest and sell the trees and to provide a source of employment. ■

## Choosing What to Manage Sustainably

**S**ustainable management of the forest estate has to be benefit oriented and must also be a process of compromise. Management for agriculture might involve a 15-20 year forest-fallow rotational farming system, that would maintain regrowth forest cover on the majority of the land for a time period sufficient to rebuild soil nutrients such that the productivity of agriculture without external inputs would be maintained over the long-term. This system



▶ National parks and reserve ensure that most forest species will survive for future generations, but preclude many other uses of the forest such as agriculture and intensive logging.

would generate sustained benefits in terms of agricultural products, and might also produce quantities of bushmeat and NTFPs, but is unlikely to generate trees suitable for timber, and has severe adverse impacts on the biological diversity of the farm-fallow area. Similarly, incorporation of tree crops such as cacao and coffee into household level farming systems may provide a sustainable source of supplementary income for farmers, may reduce incentives to clear forest for commercial root-crop production, and may offer woody habitat for forest birds. Yet, forestland dominated by tree crops is less likely to support commercial logging or large mammals, and may compete with some NTFPs for sunlight and soil nutrients.

Decades of research and subsidies appeared to have demonstrated that natural forest management (i.e., timber production forests that do not result in significant changes in tree species composition and relative abundance) for timber is both economically and ecologically unworkable. Yet, it may be possible to manage timber harvesting to generate a relatively constant stream of marketable wood, knowing that tree species richness and evenness will change, while ensuring that logging practices do not result in significant changes in animal species richness and evenness. Thus, sustainable forest management for timber, may need to compromise plant diversity, NTFP harvesting, and agriculture for economically viable wood production, but may not necessarily compromise large animal species diversity within logged landscapes.

Sustainable forest management for biodiversity (i.e., to conserve the full assemblage of plant and animals species and their relative species composition, and size/age class distribution) is likely to impose the most severe restrictions on all other possible uses of the forest, because even low level consumptive use may unacceptably impact populations of large, slow growing and reproducing species such as apes, elephants, and emergent trees. ■

► Sustainable forest management is a compromise process that must reconcile competing forest uses — clearing forest for agriculture.



## Sustainable Management: A Combination of National Level Zoning and Site-Level Planning

**S**ustainable management of the forest estate must be an evolving, adaptive two-tiered, transparent, inclusive, democratic, consensus building process. The first tier determines, through open public debate and effective negotiation by all stakeholders, what mix of forest management systems are to be applied to which areas of forest, to generate what tangible and intangible products, to benefit whom, over what time period. This national scale zoning process would subdivide the forest estate into resource use areas, the aggregate size of which reflects their relative value according to the stakeholders. The second tier is a site-level process that designs each forest use system such that it generates the desired level of particular tangible and intangible products consistently over time, but does so without unnecessarily compromising alternative uses and the generation of other benefits. FSC certification is one such site-level process for planning sustainable timber production within a logging zone. Protected area management plans are the equivalent process within areas zoned as parks and reserves. Both tiers must be dynamic and adapt to varying conditions, because people's needs and perceptions of the value of forests change over time, as does the forest's capacity to generate desired products. ■

### What Can You Do About It?

#### Everyone

Stop thinking and talking about sustainable management of forests as a one-size-fits-all approach to reconciling conflicting land uses within the Congo Basin.

Help facilitate the socio-political negotiations needed to conduct an inclusive, democratic, adaptive, national forest zoning and site-level resource use planning process within each Central African nation.

► Though bushmeat is an important source of protein and income for poor rural and urban families, commercial hunting is most often unsustainable and soon wildlife will disappear from many forest areas.



## For More Information

### Technical Reports:

Higman, S., S. Bass, N. Judd, J. Mayers, and R. Nussbaum. 1999. *The sustainable forestry handbook*. London: Earthscan Publications, Ltd.

Jenkins, M. B. and E. T. Smith. 1999. *The business of sustainable forestry: Strategies for an industry in transition*. Covelo, CA: Island Press.

Maser, C. 1994. *Sustainable forestry*. Delray Beach, FL : St. Lucie Press.

Seymour, F. J. and N. K. Dubash. 2000. *The right conditions: The World Bank, structural adjustment, and forest policy reform*. Washington, D.C.: World Resources Institute.

## CARPE ... What Is It?

Central African Regional Program for the Environment (CARPE)

Launched in 1995, the *Central African Regional Program for the Environment (CARPE)* engages African NGOs, research and educational organizations, private-sector consultants, and government agencies in evaluating threats to forest integrity in the Congo Basin and in identifying opportunities to sustainably manage the region's vast forests for the benefit of Africans and the world. CARPE's members are helping to provide African decision makers with the information they will need to make well-informed choices about forest use in the future. BSP has assumed the role of "air traffic controller" for CARPE's African partners. Participating countries include Burundi, Cameroon, Central African Republic, Democratic Republic of Congo, Equatorial Guinea, Gabon, Republic of Congo, Rwanda, and São Tomé e Príncipe.

### Web site:

<http://carpe.umd.edu>

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