

Chapter 10

Agroforestry and environmental governance

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Abstract

Environmental governance is in a state of change throughout the developing world. Power and authority are shifting from national offices to global and regional fora and to local user groups. Regulatory approaches to environmental management are gradually being augmented by incentive- and market-based approaches. Private organizations and firms are becoming more involved in the provision of such environmental goods as water, energy and timber, and environmental services like conservation and watershed protection. Forest conservation is no longer seen as the only appropriate means to achieve environmental conservation, nor is afforestation seen as the only way to reverse environmental damage. Integrated approaches to ecosystem and landscape management, which include local residents as important partners, are being given more emphasis. These trends are creating new opportunities and constraints for agroforestry. While there are very few pieces of legislation or rural institutions that focus solely on agroforestry, there are many laws and rural institutions that shape farmers' incentives to plant and manage trees in their agricultural landscapes. This chapter reviews the five policy issues that have greatest impact on agroforestry: land and tree tenure, forest classification, biodiversity and forest conservation, environmental service reward mechanisms, and global environmental governance. Targeted applied research and engagement in local policy processes increases the beneficial impacts of agroforestry development within local policy terrains and contributes to policy reform at the national and global levels.

Introduction

Environmental governance – including all policies and institutions affecting the state of the environment – is in a state of change throughout the developing world, with significant consequences for on-farm tree planting and management. Changes are occurring in several dimensions. Formal authority is shifting from national forestry agencies to decentralized multistakeholder committees and local user groups. Rules and prohibitions are gradually being augmented by incentive- and

market-based approaches to environmental management. Private firms are becoming more involved in the provision of such environmental goods as water, energy and timber and environmental services like biodiversity conservation and watershed protection. Integrated approaches to ecosystem and landscape management, which include local residents as important partners, are being given more emphasis in international agreements and the programmes of influential international organizations (Tomich et al. 2004).

While few developing countries have specific laws or policies on agroforestry, a range of environment and development policies and structures of administration and governance affect the practice. Here we follow the Leakey (1996) definition of agroforestry as a “dynamic, ecologically-based, natural resource management system that, through the integration of trees on farms and in the landscape, diversifies and sustains production for increased social, economic and ecological benefits”. This definition has three direct implications for governance. First, agroforestry involves the deliberate management of trees, including tree planting and various intensities of farmer management of trees in multiple function landscapes. Second, it depicts agroforestry as a natural resource management system that includes land use practices and the institutions (including rules, regulations and norms) that shape those land use practices. Third, the definition explicitly recognizes agroforestry as a land-use system practiced at the farm and landscape scales. Institutions and policies that govern land use and environmental management at those scales will affect farmers’ incentives to plant and manage trees.

At the farm scale, the most important institutional arrangement affecting agroforestry is property rights. Property rights to land and trees on farms shape farmers’ expectations of whether and how they will be able to appropriate long-term benefits from investing in tree management and planting. Property rights are also important at the landscape scale since property rights regimes (state, common or open access) governing tree resources outside of individual farms affect the use of those resources and the incentives for farmers to plant trees on farm. One of the key determinants of property rights to trees outside of private farms is the system of forest classification

and governance. State systems of forest governance generally reflect a combination of state control of valuable forest resources and concern for the public interest in the environmental services that they provide.

As property rights and forest governance systems have evolved over the last two decades, other governance arrangements have become important. The focus of biodiversity conservation has widened from looking solely at protected areas to including their boundaries and the surrounding landscape. Agroforestry is recognized as having unfulfilled potential to contribute to biodiversity conservation at the landscape scale. Environmental service reward mechanisms are being explored in some locations, with agroforestry often seen as a desirable land use from the perspective of biodiversity conservation, carbon sequestration, renewable energy production and reversal of land degradation. The growing importance of global environmental agreements is increasing motivation for some of these environmental service mechanisms. The widespread implementation and national ‘domestication’ of global environmental agreements provides a mix of opportunities for and constraints to agroforestry.

This chapter reviews evidence concerning links between agroforestry and the five components of environmental governance described in the previous two paragraphs: i) property rights to land and trees; ii) land classification; iii) biodiversity and forest conservation; iv) environmental service reward mechanisms; and v) global environmental governance. Table 1 summarizes information on the links between each of these components and agroforestry.

The World Agroforestry Centre (ICRAF) works with a range of partners to implement a three-pronged approach to address these policy challenges. Firstly, we seek

to enhance understanding of the links between agroforestry, forestry, protected area management and social objectives related to the environment. In some cases, the results challenge conventional wisdom and conventional approaches to environmental management. Widespread dissemination of key principles and empirical findings is achieved through scientific publications and engagement in local, national and international policy fora. Secondly, we seek to broaden understanding of how policies and institutions affect the incentives of farmers to manage and plant trees in high-priority situations. Commonalities and contrasts tend to emerge across research sites, implying that there are no universal policy solutions. Thirdly, in high-priority situations we work with policy makers and policy shapers to promote reform or effective implementation of policies and regulations that have high impact on the effectiveness of agroforestry. The following sections summarize links to agroforestry, relevant research findings and policy impacts for the five components described in Table 1.

Property rights to land and trees

A large body of literature on the relationships between property rights and tree management has grown up during the 25 years since the Centre was founded. While economic theory indicates straightforward relationships between tree planting and land tenure security, the evidence indicates complex interrelationships between management of natural vegetation, tree planting, perceptions of land and tree tenure security, gender relations and the operations of customary and formal tenure arrangements. Uncovering the more complex relations requires research approaches that draw upon institutional economics, social and economic theories of innovation

Table 1. *Characterization of the links between five components of environmental governance and agroforestry.*

	Relation to farmer incentive to deliberately manage trees	Location of policy making relative to farmer	Trends in policy and governance context
Property rights to land and trees	Farmer assurance of future benefits from current investments; farmer incentive to obtain tree products on own farm or elsewhere in the landscape	Local norms; decentralized government agencies; national policies	Gradual individualization; decentralized state agencies generally becoming more important
Forest classification and governance	Farmer incentive to obtain tree products from forest areas; farmer incentive to manage and protect nearby forests	Decentralized forest agencies; national forest agencies	Decentralization of state agencies; some movement away from command and control approach
Buffer zone and landscape approaches to conservation	Incentives/disincentives to manage trees near protected areas; types of trees allowed and encouraged in different parts of the landscape	Decentralized conservation/forest agencies; national forest agencies; international conservation pressures	Mixed success with integrated conservation and development projects; landscape approaches still largely experimental
Environmental service mechanisms	Most environmental service mechanisms involve tree and vegetation management by individual farmers, groups and/or local governments	Regional dialogue for watershed services; national policies and international mechanisms for biodiversity and carbon	Becoming part of government approaches in many countries in Latin America; small experiments in other regions
Global environmental governance	UNFCCC ¹ , UNCBD ² , UNCCD ³ and GEF ⁴ all have significant forestry components, with inadequate provision for smallholder agroforestry; no specific forestry convention since the Rio conference in 1992	National ratification and domestication of global agreements and funding opportunities	UNFCCC has progressed furthest in explicitly considering potential of agroforestry and smallholders

Source: Authors' summary from this chapter and literature review.

¹ United Nations Framework Convention on Climate Change

² United Nations Convention on Biological Diversity

³ United Nations Convention on Combating Desertification

⁴ Global Environment Facility

and collective action, and a variety of quantitative and qualitative research tools. Much of this research has been conducted in association with the Collective Action and Property Rights Initiative of the Consultative Group on International Agricultural Research (CGIAR) (Meinzen-Dick et al. 2002).

In the 1980s and early 1990s, much of the evidence on the links between agroforestry and property rights in Africa emerged from joint efforts by ICRAF and the Land Tenure

Centre at the University of Wisconsin–Madison (Bruce 1989; Fortmann 1985; Fortmann and Bruce 1988; Place 1995 and Raintree 1987). Bruce (1989) summarizes the results of these studies by noting that agroforestry projects may be associated with several problems of land and tree tenure. Firstly, a project may disturb or destroy rights to other important uses of the land or trees. Secondly, customary tenure systems that provide multiple uses of land and tree resources may make it difficult for individual farmers

to protect tree seedlings. Thirdly, some categories of intended clients may be unable to participate in a project because they do not have the right to plant or own trees. This includes landless people and women in some societies. Fourthly, farmers may undertake tree planting as much to establish rights to land as for the direct products of the trees.

In the mid-1990s, ICRAF, the International Food Policy Research Institute (IFPRI) and Tokyo Metropolitan University engaged

national partners from across Asia and Africa in studies of the effects of land tenure on tree management at the farm and community scales (Otsuka and Place 2001; Suyanto et al. 2001). Several important results have emerged from these and other similar recent studies. Firstly, most customary land rights systems provide sufficient tenure security to encourage deliberate tree management in at least some land use niches (although some state-imposed tenure systems have actively discouraged tree management or created de facto open access situations that encourage overuse and under-investment in long-term tree management). Secondly, land tenure security, tree planting and management of natural vegetation are interdependent in many customary societies in Asia and Africa. Because both clearance of natural vegetation and tree planting are markers of land improvement, it is possible to observe both reduced and increased tree cover as land rights become more individualized (Place and Otsuka 2002; Suyanto et al. 2001). Unruh (2002), for example, describes the importance of cashew trees for marking land claims in post-conflict Mozambique. Thirdly, many African and Asian societies and national governments have property rights systems biased against women planting and managing long-term agroforestry investments such as timber trees and woodlots (e.g. Fortmann 1998). Even in such systems, however, women are often able to benefit directly from short-term agroforestry investments such as improved fallows (Gladwin et al. 2002), processing and marketing interventions that add value to agroforestry products and intra-family allocation mechanisms that distribute the benefits and costs of longer-term investments. Agroforestry interventions targeted to particular niches of land controlled by

women, such as home gardens, may be adopted in the short term, but in the long term may encourage men to try to wrest control of such lands (Schroeder 1999).

Property rights to land and trees have a large impact on farm tree management in the Lampung province of Sumatra, Indonesia. Suyanto et al. (2005) found that areas designated as protected forests had more frequent and devastating fires during the Suharto era than in the years since 1998, when the regime fell, implying that there now is less deliberate use of fire as a weapon to claim property rights. Fay and Michon (2003) describe part of the political motives and ideology underlying government expropriation of large areas of land previously used by individual families and governed by indigenous ethnic groups. Fortunately, the greater political freedom ('reformasi') and decentralization that have developed since the fall of the Suharto regime have created opportunities for enhancing farmers' tenure security and revitalizing customary institutions. ICRAF/AMAN/FPP (2003) describe the outcomes of these processes for the disenfranchisement and loss of land rights for millions of indigenous Indonesian people. Scientists from the Centre have actively contributed to the restoration of indigenous rights in Indonesia (see Box 1). In northern Thailand, Centre scientists and collaborators (e.g. Care-Thailand) are increasing recognition of the property rights of indigenous communities by helping upland tribal groups to develop accurate maps of their village domains. This active engagement in policy processes as a facilitator, supplier of empirical evidence and supporter of indigenous practitioners of agroforestry is a hallmark of the Centre's approach to agroforestry policy (van Noordwijk et al. 2001).

Box 1. Promoting indigenous rights in Indonesia

Scientists from the World Agroforestry Centre have actively contributed to the restoration of indigenous rights in Indonesia. Our research and engagement with policy processes in the mid/late-1990s contributed to the first community forest law in Indonesia: a historic decree by the Indonesian Minister of Forestry that recognized and protected the rights of the Krui community to collective rights to damar agroforests. We have also promoted the subsequent recognition of the right of the Government to designate a forest for such special purposes and facilitated dialogue among indigenous groups. The direct effect was that 15 000 households in the Krui area were granted more secure rights to over 35 000 hectares of agroforest land; the indirect effect was that it became easier for indigenous communities throughout Indonesia to register rights to agroforest lands.

Source: ASB 2001

Forest classification and governance

Classification of forestland is a related aspect of environmental governance. Throughout the developing world, large tracts of land have been declared as state forests. There are two key components of this designation: state and forest. Both have implications for farmer incentives to plant and manage trees. Centre research in this area is motivated by the general question: how can forest policies be reformed to

harmonize the stewardship of trees in the landscape and on individual farms?

Colonial-era forestry was designed around the needs of the colonial state, i.e. promotion of exports and large industry and control over local communities. Policies of extraction and central control had their roots in the feudal systems of medieval Europe. Policies designed to protect the environmental values of forests by excluding people began in Europe only in the early 1900s and spread to colonial areas in the later stages of the colonial era (Fay and Michon 2003). Anthropologists such as Cronon (1996) have shown that many forested landscapes now considered to be pristine primary forests have, in fact, had long histories of human impact. Forced displacement of people from conservation areas has led to the impoverishment of tens of thousands of former forest dwellers in the Congo Basin (Cernea and Schmidt-Soltau 2003) and to long-term conflict between rural people and governments in much of Southeast Asia (Fay and Michon 2003; Tomich et al. 1998).

A large body of research and experience has accumulated on central forest management and the advantages and disadvantages of devolution to municipal governments and local community groups (Agrawal and Ostrom 2001; WRI 2003). Three major concerns have been expressed about state forest management: i) some state agencies and agents have used their positions as forest regulators as platforms for extraction of resources through concessions to commercial companies and/or bribes; ii) state agencies are accused of not understanding or respecting the ways that local communities and indigenous people use and manage forests; and iii) many state forests are highly degraded. As a consequence, there has been undue suffering for many forest

dwellers. Although state forest authorities continue to operate in many countries, some countries have experienced real devolution of authority away from central authorities toward communal management and co-management regimes. Different variants have developed in different places: joint forest management in India, extractive reserves in Brazil, community forest user groups in Nepal, and community forests in Cameroon (see also Box 1).

In the last few years, Centre scientists in Indonesia have given more attention on the 'forest' part of state forest management. Fay and Michon (2003) argue that the forestry regulatory framework has been inappropriately applied to large parts of Indonesia and other countries in Southeast Asia. In many instances this classification has, in fact, been an *a posteriori* justification that suits the dominant political and economic interests and disenfranchises smallholders, while favouring large-scale plantations and forest concessions. Farmers practicing agroforestry have suffered as a result. Fay and Michon (2003) argue that the forestry regulatory framework should instead be reserved for areas that clearly protect 'public environmental services' such as watershed protection and biodiversity conservation. Areas that don't generate such environmental services should be reclassified under the less-restrictive agrarian regulatory framework.

The Forest Codes of francophone West Africa are renowned for the disincentives they provide for participatory forest management and agroforestry. Some of them have changed since the 1990s, with the pace of change varying from country to country (Russell et al. 2001). Cameroon introduced community forestry in the late 1990s and several lessons have been learned from its experience. Niger passed its new Forestry Act in April 2004. A new forestry code for

the Democratic Republic of Congo is still under consideration with much discussion on the role of communities in a situation where all land and resources continue to be legally the property of the state. Ashley et al. (2005) shows that continued uncertainty about forest classification is creating disincentives for agroforestry and forest management in Cameroon and Mali.

Buffer zone and landscape approaches to conservation

There is now general agreement that conservation of valuable natural resources and biodiversity requires the designation of protected areas and better management of the land surrounding them. Agroforestry contributes to landscape approaches to conservation by enhancing the diversity of vegetation in farming areas, increasing the habitat value of land-use mosaics around protected areas, and reducing pressure on protected areas. Schroth et al. (2004) conclude their review of the potential for agroforestry to contribute to biodiversity conservation with the statement that "...the effective integration of agroforestry into conservation strategies is, however, a major policy and institutional challenge".

Attempts to address that institutional challenge have been undertaken in several countries, including Nepal and the Philippines (see Box 2). In 2003/4, Centre researchers conducted studies of the policy terrain affecting agroforestry in several protected areas (national parks or classified forests) in Cameroon, Mali and Uganda. Key conclusions from the studies were as follows (Ashley et al. 2005):

- policy and institutional support to agriculture and agroforestry in buffer zones tends to be very minimal;
- extension and development agencies that support agroforestry in buffer zones

tend to focus on a small number of exotic trees, putting little emphasis on the indigenous trees that would be better suited from an ecological perspective;

- reserved species laws, originally designed to conserve indigenous tree species, tend to provide disincentives for agroforestry; and
- the overall policy and regulatory terrain tends to have many inconsistencies between forestry, environment and land policies.

Centre scientists are following up these studies with targeted research and development projects around protected areas in several countries, including Cameroon, Indonesia, Kenya, the Philippines, Thailand and Uganda. The fundamental question still being asked is: where and how do the integration and segregation options for human–environment interaction have greatest potential to meet conservation and rural development objectives? (van Noordwijk et al. 1997.)

Environmental service mechanisms

During the past decade, there has been increased interest in mechanisms linking supply and demand of environmental services. The environmental services of greatest interest include carbon sequestration, watershed protection and biodiversity conservation. The different environmental services have largely different populations of demanders and suppliers. Carbon sequestration is a global environmental service being financed by emitters of greenhouse gases in the context of the United Nations Framework Convention on Climate Change (UNFCCC) (see next section). The global benefits of carbon sequestration are basically the same no matter where the carbon is sequestered. This contrasts with environmental service mechanisms for watershed protection. In any particular watershed, there may or may not be specific populations (e.g. urban water users) or individual actors (e.g. hydro-power companies) who demand watershed protec-

tion, and specific populations of land users who can supply those services. Biodiversity conservation falls somewhere between these two extremes; those who demand biodiversity conservation often demand conservation of species and ecosystems at both global and local levels.

Several factors account for increased interest in environmental service reward mechanisms. Firstly, many organizations are looking for new ways to finance conservation. Secondly, changes in the regulatory environment and liberalization of markets are resulting in increased private-sector participation in conservation, domestic water supply and carbon offsets. Private firms appear to be more interested in market approaches to protect the integrity of their resource base. Thirdly, international environmental agreements are creating space for more market-oriented approaches.

The Clean Development Mechanism (CDM) of the UNFCCC creates new opportunities for developing-country farmers to benefit from their contributions to carbon sequestration and renewable energy. Interest in agroforestry has increased since a report by the Inter-Centre Panel on Climate Change (IPCC 2001) indicated that changes in land use from annual crops to agroforestry is one of the most promising approaches for sequestering carbon through CDM-approved afforestation. Although the carbon sequestration value of agroforestry has received greater attention to date, there is also evidence that agroforestry has good potential to generate renewable energy in the form of biomass and biodiesel that could qualify for the CDM if it can be shown to replace non-renewable sources (Venema and Cisse 2004).

Simple calculations show that the monetary value of the carbon sequestration

Box 2. Buffer zone approaches in Nepal and the Philippines

In Nepal, the Worldwide Fund for Nature and the King Mahendra Trust for Nature Conservation created a rosewood plantation/agroforest around the Royal Chitwan National Park, a valuable conservation area for native forest and wildlife, including the endangered tiger. As part of the Biodiversity Conservation Network, this approach was monitored for its effectiveness in both conservation (reducing pressure on park resources) and contribution to local livelihoods. An additional benefit was empowerment of local communities in park management (WWF 1997).

In the Philippines, the World Agroforestry Centre was part of a group of organizations that conducted research and development around the Mount Kitanglad National Park, one of the most important biodiversity areas in the country. The Landcare approach to land management, which links community groups, municipal governments and research organizations, was tested in the conditions prevailing around the park boundaries. Hundreds of farmers joined sub-village Landcare chapters around the edge of the Park. After several years, this approach has led to improved agricultural production, increased tree cover, and a substantial reduction in encroachment into the Park (Garritty et al. 2002).

benefits of most tree production systems are small in relation to the value of the timber produced. However, Chaco et al. (2002) and Tomich et al. (2002) have used data from the Alternatives to Slash and Burn (ASB) programme in Indonesia to predict how carbon sequestration payments would change the relative returns to alternative land use systems. Their results indicate that carbon payments could be sufficient to increase returns to smallholder agroforestry systems to levels comparable to those generated by oil palm plantations. This makes agroforestry attractive to CDM since projects must be shown to add value to the existing situation. Pilot carbon sequestration schemes with smallholder farmers are currently in progress in several developing countries, with the most experience accumulated in Latin America. The Centre is currently involved in pilot carbon sequestration schemes in Kenya, the Philippines and Uganda.

Experience to date shows that institutional and governance factors determine the feasibility, performance and impacts of environmental service mechanisms. Formal institutions are often designed in ways that require market participants to incur transaction costs that cannot be feasibly met by individual smallholders (Landell-Mills and Porras 2002; Krey 2004; Chaco et al. 2002). Moreover, where land rights are unclear, environmental service mechanisms might compel powerful people to usurp otherwise marginal lands and evict poor land users (Grieg-Gran and Bann 2003).

The Rewarding Upland Poor for Environmental Services (RUPES) project was established in 2001 to address possibilities for environmental service mechanisms in Asia, with particular emphasis on potential for the upland poor to benefit from the mechanisms. The project conducts action

research at pilot intervention sites across Asia to examine the provision of environmental services, decide who benefits and who pays, and determine the institutional and policy environment to enable fair and equitable distribution. An inclusive view is taken on payment, including rewards that provide upland farmers with enhanced land tenure security in exchange for following land use agreements (RUPES 2004).

Global environmental governance

The Rio Convention of 1992 marked a sharp increase in the importance of global environmental governance, including several conventions and mechanisms that have direct and indirect relevance for agroforestry. The United Nations Convention on Biological Diversity (UNCBD), the UNFCCC and the United Nations Convention on Combating Desertification (UNCCD) are the most important for agroforestry.

The UNCCD has a Thematic Program Network (TPN) in Asia and Africa on agroforestry and soil conservation. The World Agroforestry Centre has provided technical input on agroforestry to the TPN for Africa and is increasing its links with the TPN for Asia. The TPNs can also benefit from greater consideration of the links with environmental governance. In other words, while tree-based solutions have great technical potential for the problems of land degradation, harnessing that potential requires institutional arrangements that appropriately share benefits and costs, foster local collective action in tree management and provide individual farmers and farm communities with appropriate incentives. Comparative studies on agroforestry in the drylands of South Asia and Africa can provide valuable information. One success story that may be replicated is the 'Ngitili'

system for farmer-managed natural regeneration (Barrow and Mlenge 2003).

The UNCBD has adopted an expanded programme of work on forestry that has many connections with agroforestry, including raising awareness of the problems of invasive alien species. Recent Centre research in the Baringo area of Kenya is exploring how policies and institutions can shape the benefits and costs associated with the alien invasive tree species *Prosopis juliflora*. One approach to more effective management of *P. juliflora* would be to organize collective harvesting and processing of charcoal made from its wood.

The Centre has been engaged in the UNFCCC for over 5 years. In 2001, the IPCC issued its third assessment report on climate change, with a strong endorsement of the potential for agroforestry to contribute to increased carbon stocks in agricultural lands, while contributing to the welfare of smallholder farmers: "Agroforestry can both sequester carbon and produce a range of economic, environmental and socio-economic benefits. For example, trees in agroforestry farms improve soil fertility through control of erosion, maintenance of soil organic matter and physical properties, increased nitrogen, extraction of nutrients from deep soil horizons and promotion of more closed nutrient cycling" (IPCC 2001).

The Centre influences CDM policy processes in several ways. Firstly, we seek to provide scientific data and information on the relations between agroforestry systems and greenhouse gases, including carbon and nitrogen compounds. Secondly, we seek to understand the potential for agroforestry to buffer farmers against climate risks. Thirdly, we seek to evaluate how smallholder farmers could be involved in carbon

sequestration projects, and the implications of alternative mechanisms for exploiting this potential. Finally, we provide relevant information to a variety of stakeholders at international, national and local levels.

Conclusions and implications for future research and development

Environmental governance shapes the context in which farmers make decisions about where and when to invest time and resources in planting and managing trees. Farmers are encouraged to protect existing vegetation and invest in new agroforestry systems when they have secure rights to the products generated by the trees, when there are certain markets for those products, and when they capture value from the positive environmental services that their trees generate. Land and tree tenure, forest classification, conservation policies, environmental service mechanisms and global environmental agreements are components of environmental governance that affect those incentives through various pathways. They are also policy levers that are used by governments to advance forest conservation, environmental protection, economic growth and other national objectives.

Most developing countries have had regimes of environmental governance that stressed forest conservation by central agencies without due regard for the value of the environmental services produced by those forests, the performance of the regulatory agencies or the negative impacts of forestry laws on farmers' incentives to practice agroforestry. Changes in environmental governance are unfolding in many developing countries, with some decentralization of governance institutions and more emphasis on the environmental effects of

land use outside of forests. In many cases, the result is a very uncertain and uneven policy terrain, particularly regarding the relatively new discipline of agroforestry. The review presented in this paper suggests that additional research is needed on the following:

- The landscape and watershed level effects of different types of property rights in farm areas and different configurations of property rights in non-farm areas. Suyanto et al. (2005) has taken this approach to fire management in Sumatra; Swallow et al. (2001) outline a similar approach for watershed management; and Ashley et al. (2005) do the same thing for protected area landscapes.
- Appropriate negotiation platforms for multi-functional landscapes. van Noodwijk et al. (2001) have made major contributions to this with their work on negotiation support systems.
- The potential for environmental service mechanisms that enhance the supply of environmental services and the welfare of smallholder agroforesters in multifunctional landscapes. The Centre is gradually expanding work on environmental service mechanisms from specific locations in Southeast Asia to key locations in Latin America and South Asia.
- The ways that global environmental agreements can be modified or implemented to maximize the potential for agroforestry to synergize the objectives of the agreements with that of reducing poverty.

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