

# Forestry, non-forest sector policies and the environment: a review

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## Abstract

Environmental conservation is intimately tied to both economic development and sustainable management of natural resources. Convergence and complementarity of environmental and developmental functions of forest management and their sustainable utilisation is a challenge for both developing and industrialised countries. Nationally forests are seen as a consumable commodity but at an international level forests are scarce resources and their non-commodity values matters particularly with respect to climate change mitigation and bio-diversity conservation. In this regard this paper reviews two aspects: an assessment of influence of non-forest sector (external) policies on forests; the initiatives taken by international community for forestry development in developing countries.

*Keywords:* forestry, non-forest sector policies, environmental markets, bio-diversity conservation

## 1. Introduction

The concern for the environment has been paralleled by a concern for the future of the world's forest resources because there are number of similarities in the relationship between forestry and the environment (Dembner, 1990). The effort to explain the process of deforestation, and environmental degradation, in general, varies between three basic approaches: neo-Malthusianism, neo-classical economics, and political economy.

Neo-Malthusians situate the causes of environmental degradation in the quantitative imbalance between human population growth rates and rates of renewal in the stock of organic matter necessary for human survival. They argue that population growth is the main cause of poverty, which also underlies environmental degradation. Neo-classical economics provides an approach centring on the notion of general equilibrium, in which markets acting on the collective instincts of rational individuals (who are self-interested and utility maximizing) determine the efficient or optimal

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allocation of resources under restrictive conditions. They argue environmental degradation follows from distortions in the market function when these conditions are not satisfied. The political economy approach (which draws on neo-Marxist political economies) states that, the state, in its alliance with multinational capital and domestic elites, pursues development policies that both directly despoil the environment and worsen the life of rural people. It claims, at the local level, impoverished farmers drive into fragile forestlands and degrade the environment to survive (Browder, 1995).

Changes in the environment affect everyone but the rural poor in developing countries are often the hardest hit by those environmental changes because they have few or no reserves to permit them to adapt to the new circumstances. Therefore, new approaches to sustainable development place greater emphasis on the integration of the forestry sector in rural development and the balance between socio-economic and environmental needs. Such integration of the forestry sector in rural development is beneficial not only at the local level but also at national and global levels. However, policy measures and activities of other sectors (non-forest sectors) also affect the ability of forests to perform economic, social and environmental roles. Experience has shown that there are difficulties in other sectors in developing policies and actions which complement or support sustainability of forests, and “in many countries non-forestry policies have caused greater deforestation than mis-directed and mis-applied forestry policies have” (Repetto, 1988, p. 26). Thus the influences of non-forest sector policies on forestry, with respect to development and environmental goals, have to be identified and analysed.

This paper therefore gives a review at two levels based on recent literature, first, an assessment of the influence of non-forest sector (external) policies on the forest sector; second, a discussion of the initiatives taken by the international community for forestry development in developing countries, with respect to global environmental markets (for CO<sub>2</sub> emission and debt-for-nature-swaps) and the conservation of (forest-based) biodiversity resources. The paper is organized as follows. Section 2 discusses the non-forest sector policies that affect forests. Section 3 discusses the global environmental markets. Section 4 discusses the policy instruments for conservation of bio-diversity. Section 5 provides a summary of the paper.

## **2. Non-forest sector policies that affect forestry**

Forests and forest-based activities contribute to the economy, food security, energy supply, environmental stability and social well-being. The major areas of concern in forestry are management, conservation and sustainable forest development, the promotion of sustainable patterns of production and consumption of forest goods and services, social aspects of forests, and institutional strengthening and capacity building. However, policy decisions taken outside the forestry sector affect the forestry sector in different ways, although there is a degree of overlapping between these policies. A given external policy could have a positive or negative impact on forest development depending on the way the policy is operated, the instruments used and the behaviour of the groups influenced by the policy.

De Montalembert (1995) provides an assessment of various external policies (non-forest sector policies) that affect forests. In identifying the impacts of such policies,

the effects are considered as positive or negative, not merely from a conservation perspective. Broadhead (2001) further assesses the influence of such policies on forests but with real examples. His study identifies the ways in which forestry sector policies threaten the other sectors. Repetto (1988) and Repetto and Gillis (1988) provide some country specific examples for the effect of non-forest sector policies on forestry. Following are some common examples of non-forest sector policies that affect the forestry sector sometimes in positive and sometimes in negative ways.

## **2.1 Policies promoting national economies**

Macroeconomic policies such as fiscal, monetary, trade, infrastructure and industrial policies can increase the demand for forest products and stimulate production, investment and trade. They can also promote reforestation and create employment opportunities in rural and industrial areas in short to medium term. However, the same policies may also foster deforestation, over harvesting and the unsustainable use of resources. They can also minimize expenditure and investment on forestry, and reduce government attention and resource allocations to forestry. For example, a World Bank review of the forestry sector in Argentina revealed how inefficient macroeconomic policies led to low or negative growth rates that contributed to the loss of native forests. Several of the effects were reducing alternative job opportunities for poor rural families and increasing the attractiveness of subsistence agriculture in or close to native forest areas. The inefficient policies also lowered the priorities attached to national conservation of native forests (World Bank, 1993).

## **2.2 Policies improving welfare and alleviating poverty**

Policies designed for improving the welfare of people and alleviating poverty (such as population, crop and livestock, rural development, tourism and energy policies) require an assessment of the extent to which they promote security of land tenure, access to resource and products, and participation of rural people and native groups in sustainable forestry.<sup>2</sup>

For example, a FAO/World Bank agricultural review in Ecuador recommended national policy changes for land use and tenure for activities which were not directly related to the forestry sector but which had an effect on it. A clear need was identified to improve land utilization so as to take migratory pressure off the tropical moist forests (FAO/World Bank, 1993). Another example is irrigation and power generation policies in Sri Lanka that showed how the pressure of poverty and unemployment can lead to deforestation, because of the priority given to fast yielding economic development programs at the expense of the forest sector (Abeywickrema, 1987).

## **2.3 Trade liberalization policies**

It is argued that trade barriers of industrial countries to forest products have been partially responsible for inappropriate investments and patterns of exploitation in Third World forest industries. It is expected within the context of the General Agreement on Tariffs and Trade (GATT), the International Tropical Timber

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<sup>2</sup> The forestry sector itself has considerable opportunity to contribute to the achievement of these policy objectives, for example, through agro-silviculture, non-wood forest products for human and animal consumption, medicinal products, fruit, soil protection, off-farm income generation and employment in small-scale forest-based rural enterprises and agro-tourism and recreation.

Agreement (ITTA) will establish negotiations between exporting and importing countries. This agreement should reduce tariff and non-tariff barriers to processed wood imported from tropical countries, and rationalize incentives to forest industries in those countries (Repetto 1988, p. 40). Trade agreement (or trade liberalization) can stimulate supply and demand for forest products and the resulting competition can lead to improved quality of forest products trade.

The environmental protectionism in trade policies such as green labels and bans on tropical forest woods could have beneficial effects on forestry, in that these policies could favour a reduction in the supply, trade and demand of specific forest products from natural forests. However, the protectionism policies could also produce deforestation and permanent conversion of forestland into other land uses because of the decreased economic value of the resource base.

#### **2.4 Environmental protection policies**

The effects of policies for conserving the environment and protecting natural resources would be transfers of productive forestland to other categories such as national parks and reserves in a short-term. These policies can consequently reduce the availability of forest products. However, the long-term effects of these policies would favour the adoption of silvicultural practices that integrate biological diversity and ecosystem conservation in sustainable forest management. The long-term effects would also raise and diversify productivity and create more economically and environmentally efficient forest industries (De Montalembert, 1995).

#### **2.5 Natural resource use policies**

Policies for increasing processing efficiency or intensifying the utilization of natural resources are in line with new macroeconomic policies. Many developing countries and countries in transition to market economics have privatized existing public enterprises in an effort to achieve higher technical and economic efficiency and to favour a more rational use of forest resources. Public concern about the use of resources, the intensification or relocation of processing operations and the globalization of markets have significant impacts on forestry over the medium to long term. For example, inefficient industrial and fiscal policies resulted in rapid deforestation in the Philippines, where the government's inability to capture a larger share of the available rent promoted rapid deforestation by encouraging timber harvest throughout the country (FAO, 1994).

#### **2.6 Policies related to forestry institutions**

Insufficient political attention to forestry may result in weak forestry institutions that are unable to interact with or to establish and maintain an adequate policy dialogue with other land-use sectors. This is particularly true for many Latin American countries where policies that determine the role and the structure of public administration about management of natural resources and public lands are particularly influential on forestry development (Morell and Anziani, 1994).

Under the structural adjustment program, adopted by many developing countries, the responsibilities for environmental and natural resources management (including forest

tenure and user rights) are being redistributed and may be devolved outside the government forestry sector. The public forestry institutions now have taken the responsibility of guiding national forestry development under the principle of sustainability, and are integrating efforts and providing support to the participants of different agents and rationalizing forestry policies and strategies with the other sectors. They also promote political and public awareness of forestry issues and support national and international forestry negotiations and agreements (De Montalembert, 1995).

The above examples which demonstrate both positive and negative impacts on the forestry sector illustrate that the policy linkages between the forestry sector and the other socio-economic sectors (i.e. non-forest sectors) should be identified to promote and improve the outcome of interaction between them. Thus appropriate mechanisms should be established to internalize the costs of the impacts that the non-forest sector policies could have on forestry.

The examples collected by Broadhead (2001) suggest that one of the main factors determining the effects of external policies on forestry at the national level is the abundance of forest itself (total forest area). This is a factor which reflects the stakeholder's value of resources as being more important than the limited control policy makers have on the resources. Further, his overall observations support the fact that policies with negative impacts on forestry are more common than those with positive impacts, and this impact is higher in countries with high forest cover than in low forest cover countries regardless of income level.

### **3. Global environmental markets**

A fundamental problem with tropical forest conservation is global appropriation failure (Pearce and Brown, 1994). Most benefits of rainforest conservation are shared globally, such as carbon storage, biodiversity conservation and existence values.<sup>3</sup> These benefits are not appropriated by the resource users, who take the decisions that determine the fate of the forest. The user's decisions do not reflect the global benefits of conservation, and forest conservation becomes questionable. The key issue is then how to create mechanisms which allow the resource users, both at the local (micro) level and national governments, to capture some of global benefits of conservation.

Since a convincing explanation of (excessive) deforestation from a global perspective is global appropriation failure, the logical situation is to create international markets for transferring some of the "willingness to pay" for forest conservation to the resource users in tropical countries. The large political and practical impediments to this suggestion make us -- at least in the foreseeable future -- rely on domestic policy reform, and international pressure and assistance to move the policies in a conservationist direction. It is therefore a continuous discussion -- not least in the aftermath of the Rio conference in 1992 -- on how to create mechanisms at the international level which can promote resource conservation in developing countries. Some of these measures are related to foreign aid and green conditionality. Other measures are related to creating international markets for CO<sub>2</sub> emissions and debt-for-

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<sup>3</sup> Existence value refers to the value people attach to an environmental resource in addition to its use value.

nature swaps. Initiatives like the debt-for-nature swaps are, however, small and not likely to change the overall trends.

### **3.1 Debt-for-nature swaps**

Debt-for-nature swaps are, simply stated, contracts between a tropical forest country and another party (NGO, private company, or government) where part of the country's debt is bought up, in return for the conservation of a natural area in the tropical country (Hansen, 1989). The direct effect of the contract is that a particular area (habitat) is protected. The indirect effect is that reduced debt may have a number of additional positive consequences for the country, including more environmental conservation, through several possible channels. The contract makes it possible to fully compensate the owners or users of the protected areas. In this way the government could solve the problem of conservation versus development without resistance from local land owners or users.

The deal may also strengthen the capacity to manage land resources in a more sustainable manner (Panayotou, 1993).<sup>4</sup> An analysis by Zagonari (1998) suggests that the debt-for-nature swap and the debt-for-development swap can be combined. But the debt-for-nature swaps should be adopted when the less developed countries (LDC) are characterized by a small stock of forests and a large stock of debt, whereas the debt-for-development swaps should be agreed upon when the LDC shows a large stock of forest but a small stock of debt.

The first debt-for-nature swap was adopted in Bolivia in 1987 between Conservation International, a US conservation group, and the Bolivian government. Since then, based on World Bank reports, it is stated that thirty-one debt-for-nature swaps have been completed in fifteen countries, mostly in Latin America. And, by 1993, about \$128 million had been raised for environmental projects through debt-for-nature swaps at a cost of \$47 million to environmental groups. However, it is apparent that the extent of debt-for-nature swaps is still miniscule compared with the level of developing country debt (Didia, 2001).

The evidence shows that until now the market for debt-for-nature swaps seems to be very thin in terms of the volume traded, and costly in terms of transaction costs. They are largely based on good-will by groups in the North, devoid of strong self-interest on the part of the groups buying the debt. Hence, a more recent focus has been to look at the possibility of creating global markets for tropical forest conservation such as international markets for CO<sub>2</sub> emissions, where both parties have a direct economic interest in the deal.

### **3.2 International markets for CO<sub>2</sub> emissions**

The main global benefit of tropical forest conservation seems to lie in its carbon storage function. Monetary estimates are typically in the range of US\$ 2-3 000 per hectare, based on the costs of similar reductions in CO<sub>2</sub> emissions in rich countries (Pearce, 1994). This compares very favourably to an annual output value of one

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<sup>4</sup> Some have, however, suggested that the debt-for-nature swap will let western countries take control over natural resources in developing countries, so called eco-colonization.

hectare of forest converted to agricultural land for only a few hundred dollars. Thus, if the developing countries were paid for letting their forest act as carbon sinks to reduce CO<sub>2</sub> emissions and halt the greenhouse effect, this would in many cases outweigh the costs of forsaking all other uses.

A larger scale arrangement would be needed to make a significant impact. Consider a proposal which has been around for some time in the debate: all countries agree on a CO<sub>2</sub> agreement, and each country is given a certain amount of emission quotas, which can be traded in an international market. The agreement should include both emissions due to fossil fuels, as well as emission (absorption) of CO<sub>2</sub> due to changes in biomass (including de-/re-forestation). This would create strong incentives for forest-rich countries to conserve their forest. They could now liquidate standing forest by preserving it and selling (or buying less) CO<sub>2</sub> quotas, not by cutting down the forest. Even with evidence about the greenhouse effect, a binding international CO<sub>2</sub> agreement is not likely in the near future.

Consider as an alternative a stabilisation at 20 percent below current emission levels, as recommended by the Toronto conference in 1988, where the tradable quotas are given to each country in proportion to their population. This would imply huge costs to the rich countries. The United States, for example, would have to buy quotas every year for an equivalent of 6 percent of their GNP (Kverndokk, 1993). This also explains the resistance so far from countries like the US against any binding climate agreement (although the US position has softened up recently).

Further, the adoption of the Kyoto Protocol in December 1997, in accordance with the United Nations Framework for Convention on Climate Change (UNFCCC), highlights the extent of international concern about global climate change and represents an important first step in limiting the problem. Significantly many developed countries have collectively agreed to reduce their greenhouse gas emissions to at least 5 percent below 1990 levels for the first commitment period, 2000-12 (Fisher, 1999). However, the United States has expressed reluctance to support an international climate change agreement until China, India and other developing countries adopt emission controls (Baumert and Kete, 2001).<sup>5</sup>

Another problematic issue with the per-capita allocation of quotas is that forested countries would be severely punished for cutting trees. They could question why they should be punished for reducing their forest cover, given that other (more developed) countries have done the same decades or centuries ago? Any realistic quota distribution must take into account a number of factors such as population, present emission levels, etc. It is also noted that the implementation of forestry options alone is, in general, not likely to stabilize the atmospheric concentration of greenhouse gases or balance countries' total CO<sub>2</sub> emissions budgets. All options for reduction of atmospheric CO<sub>2</sub>, including those involving the forestry sector, should be given full consideration (Andrasko, 1990).

Projects in the forestry sector, i.e. Land-Use Change and Forestry projects (LUCF), more generally have the potential to help mitigate global warming by acting as sinks

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<sup>5</sup> In fact, when it comes to global climate change, United States (US) focuses so much attention on the large portion of the world that has contributed relatively little to global warming.

for greenhouse gases, particularly, CO<sub>2</sub>. However, the participation of LUCF projects in mitigation markets seems to be constrained by high transaction and abatement costs (Cacho *et al.*, 2002).

Bergensen (1995: 57) concludes in a review of possible global climate regimes that “while the theoretical attractions (of tradable quotas) are indisputable..., the practical and institutional obstacles to such systems remain formidable...It may take a decade or two before governments in North and South muster through enough joint ambition and joint political will to permit joint implementation”. In the meantime, the main role of Northern governments will be to provide technical assistance, capital and technology, in particular to the energy, forestry and agriculture sectors, and to push for domestic policy reforms.<sup>6</sup>

#### **4. Policy and instruments for conservation of biodiversity**

One of the major associated problems of tropical deforestation is depletion of forest-biodiversity resources. These resources are also essential for the very survival of human beings on the planet. Estimates show that the tropical forest ecosystem provides habitation for between 50 and 90 percent of all species on earth. Biodiversity conservation has also been recognized as one of the major issues in sustainable development by the international community, including policy makers and scientists (WCED, 1987). Although there has been increasing international concern for biodiversity conservation, specially under the United Nation’s Rio de Janeiro conference and subsequent Convention on Biological Diversity (CBD) in 1992, it is still not clear what institutional arrangement and policy options can effectively promote conservation and sustainable use of biological diversity.

Many analysts believe that ambiguous policies and programs focused on the agrarian sector worldwide are the main reason for the present crises of biodiversity conservation. Biodiversity conservation issues have close linkages with development policies in that there is pressure for land conversion (deforestation) and depletion of forest based biodiversity resources.<sup>7</sup> The policies of open access for natural resource exploitation and public good nature of environment and forest resources result in biodiversity loss. There is at least a general consensus among ecologists and natural scientists that maintaining a minimum level of biological diversity is vital for the functioning of ecosystems and of the food chain for humans (Gowdy, 1997). However, not all analysts and decision-makers (so called economists) give equal value to the conservation of biological diversity, particularly when implementing policies and programs for economic development.

It is generally recognized that failure to properly understand the economic aspects of biodiversity resources and failure to reflect their social values in the market arena are

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<sup>6</sup> Norway has already entered an agreement of joint implementation through the Global Environmental Fund (GEF) with Poland (converting from coal to natural gas) and Mexico (energy efficient lighting). Private sector initiatives are also on their way, for example, on forest rehabilitation in Indonesia, Ecuador and Costa Rica (Pearce, 1994).

<sup>7</sup> The term biodiversity denotes biological diversity, which is used to describe the number, variety and variability of living organisms in a given assemblage (Pearce and Moran, 1994). Biodiversity has several levels: genetic diversity, species diversity, ecosystem diversity, etc. It is reported that about half of the world’s species are contained in just seven percent of the planet’s land surface (WRI, 1997a).

the other reasons for the crisis of biodiversity conservation. Therefore, it is useful for experts from all disciplines to be concerned with the economic ramifications of biodiversity conservation. The recent development of ecological economics as a separate discipline, combining the efficiency notion of economics and a system perspective of ecology, can be viewed as a positive step in this direction.

The conditions for formulation of economic and regulatory policies as well as the attitude of institutions with regard to conservation and use of forest and biodiversity resources seem to be poor in developing countries. For example, excessive subsidies to farming activities, excessive intervention in product markets, low stumpage fees on forestry, inadequate provision of property rights for natural resources, failures to recognize traditional common property management institutions in the policy making process and so on.<sup>8</sup> The nature and extent of government failures vary across countries and the traditional methods of regulation and government intervention for conserving biological diversity seem ambiguous.

Generally, the cost of biodiversity conservation is imposed on local communities, while most of the benefits accrue to a much broader constituency. Thus, an economic and institutional analysis of biodiversity conservation projects is important for better policy formulation, and to compete for the attention of governments and commercial decision makers to support interests in nature conservation and sustainable development (WRI, 1997b). Further, policy or government failure with regard to biodiversity conservation occurs when the policy intervention necessary to correct the underlying market failure problem is inappropriate (Barbier *et al.*, 1995). Sometimes government policies aiming to correct one kind of market failure cause another, for example, a subsidy on farming that increases conversion of land and increases the loss of ecological resources.

Policy failure contexts in developing countries are also different from those encountered in developed countries, because the policy making institutions are themselves often in the infant stage in developing countries and public participation in the decision making process is frequently lacking. The extent of conservation and sustainable use of forest and ecological resources also depend largely on the public institutions of a nation in terms of how it decides about resource use, allocation, distribution and ownership, and benefits sharing from such natural resources (Perrings *et al.*, 1994).

Furthermore, efforts to conserve biodiversity in developing countries must be complementary to overall economic development. Just as efficient and sustainable use of natural resources is essential to economic development, efforts to improve overall economic performance can provide incentives for increased conservation. For instance, the “nutrient mining” behaviour of farmers in the case of frontier agriculture in developing countries is one of the key factors leading to deforestation and depletion of biodiversity. For this type of situation, investment to improve agricultural productivity is one of the best alternatives to the problem of managing the biodiversity (Barbier *et al.*, 1995).

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<sup>8</sup> However, the situation in developed countries is not much different from the developing countries in the case of biodiversity conservation, because in developed countries, consumption and use of natural resources are at a much higher level which in turn further aggravates pressures on the natural resource base worldwide.

The issue of biodiversity conservation is, however, a problem of managing global environmental resources through application of local solutions. With respect to this, the Global Environmental Facility (GEF) was recently created to fund activities to protect biodiversity and natural habitats that would provide cost-effective benefits to the global environment. The GEF is administered by the World Bank, the United Nations Development Program (UNDP) and the United Nations Environment Program (UNEP). The GEF funds projects that otherwise would not be funded by individual nations because of the lower measurable benefits captured by the individual nations (Munasinghe, 1992; CBD, 1996).

## 5. Summary

This paper reviews and discusses the issue of non-forest sector policies that affect forestry sector and the environment. The analysis in Section 2 highlights the importance and complexity of policy linkages between the forestry sector and other socio-economic sectors on sustainable forest development. Policy interaction seems particularly important for macroeconomic and land-use policies. Thus future efforts in conservation and development of forests depend on the ability to establish a coherent policy environment between forestry and the other socio-economic sectors, where forests are fully recognized as a valid, competitive land-use option wherever appropriate. Section 3 analyses the efforts taken by the international community for the conservation and management of forests with respect to markets for CO<sub>2</sub> emission and the debt-for-nature swap. It appears that the incentives for these markets are still at the infant stage because of the high transaction costs involved. Lastly, section 4 analyses policy options and the instruments used for the conservation of bio-diversity resources in developing countries. Creation of Global Environmental Facility (GEF) seems to be a significant effort in conserving (forest-based) biodiversity, and it could provide cost-effective benefits to the global environment.

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