

# 7 Governance and Policies for Adaptation

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**Abstract:** The chapter presents a theoretical framework for the formulation and implementation of policies for adaptation, based on the policy design approach. Using this approach it evaluates traditional and new models of forest governance and policy instruments for the adaptation of forests and people to climate change. The chapter argues that traditional governance often fails to meet the challenges of inter-sectoral coordination posed by adaptation. The high level of uncertainty about the impacts of climate change on forests at the management-unit level supports new modes of governance based on policy networks and flexible policy instruments. The national forest programme is the core instrument of new forest governance at the national level; it can promote adaptation by reducing background levels of deforestation and forest degradation through sustainable forest management (SFM). It is proposed to add adaptation as an objective of SFM, within the dynamic balance of existing economic, ecological and social goals. From a policy design perspective, at the international level better integration of the biodiversity, forest and climate-change regimes is proposed in order to raise additional funds for SFM and to reduce emissions from deforestation and forest degradation (REDD). Finally, it is found that negotiations on SFM and REDD follow different strategies of social decision-making, from which specific recommendations for appropriate policy tools can be drawn.

**Keywords:** climate-change policy, forest adaptation policy, reduced emissions from deforestation and forest degradation (REDD), inter-sectoral coordination, policy integration, new and hybrid modes of governance, national forest programmes, international regimes on forests, regime integration, social decision-making

## 7.1 Introduction

Forests suffer from the direct effects of climate change as described in chapter 3. They also suffer from indirect effects of climate change – for example, the conversion of forests to bio-fuel crops. Correspondingly, ‘adaptation’ is understood as the adjustment of forests and people to direct and indirect climate change effects in ways which moderate harm or exploit beneficial opportunities. Although almost 20 years have passed since the publication of the first report of the Intergovernmental Panel on Climate Change (IPCC) about the detrimental effects of global warming caused by the emission of greenhouse gases (GHGs), the worldwide situation has worsened. The efforts to substitute fossil fuels by renewable energy have even increased the incentives for deforestation. As forests deliver many goods and

services that help meet human needs, livelihoods are threatened if forests are adversely affected or even permanently cleared.

Forest-management measures to adapt to climate change can be supported by appropriate policy means that respect the central conclusions of chapter 6. In other words, policies will have to ensure flexibility for forest managers to respond adequately to the local conditions of the forest site, to accommodate indigenous knowledge and to consider the needs of local people regarding the provision of forest goods and services. These demands challenge the traditional nation state focusing on regulatory policy tools (command and control) and call for additional new models of forest governance based on negotiations between public and private actors. These negotiations will not be easy: while it is true that timber producers, environmentalists, indigenous people and other

forest users all agree that forests should be protected against the impacts of climate change, they still disagree quite dramatically over how to do it.

National forest policy is also challenged by the international regime on forests. The regime comprises international negotiation processes in addition to forests, notably on biological diversity and climate change, all affecting forests. The negotiations within the international climate-change regime are of particular significance for forests and for the provision of forest ecosystem services because they aim at reducing emissions from deforestation and forest degradation and simultaneously support the longstanding efforts to combat deforestation in developing countries.

The main topic of this chapter is the evaluation of traditional and new models of forest governance for the adaptation of forests to climate change at the national and international levels. At both levels deliberations are critical for the coordination of conflicting interests. The focus will be on the following two questions:

- ◆ What policies and programmes are countries putting in place in forestry and related sectors to provide for effective adaptation to climate change and how well designed are these policies?
- ◆ What steps can be taken to strengthen forest governance to ensure maximum responsiveness to climate-change impacts on forests and people?

With respect to the distinctions developed in the broader climate-change adaptation literature, this chapter provides the outline of a normative policy assessment, recommending policy designs for reducing the vulnerability of forests and communities to climate change. It is necessarily incomplete, since, as the previous chapters demonstrate, the vulnerability assessments on which a full policy assessment will eventually be based have yet to achieve the necessary precision (Smit et al. 1999, Yohe and Toll 2002, Füssel and Klein 2006).

The subsequent text is divided into four sub-chapters. Sub-chapter 7.2 presents the theoretical framework for the formulation and implementation of policies for the adaptation of forests and people to climate change. It discusses the internationally agreed paradigm of sustainable forest management under climate-change conditions and the policy design approach for assessing the likely effectiveness of proposed policy tools. In the subsequent sub-chapters 7.3 and 7.4, which represent the centre-piece of this chapter, the main ongoing policy processes for the adaptation of forests to climate change at the national and international levels are assessed by matching them with the attributes of the policy design approach. Sub-chapter 7.3 discusses the key features of traditional and new environmental governance at

the national level. Sub-chapter 7.4 deals with the main ongoing policy processes in the international regimes on biodiversity, forests and climate change. The conclusions in chapter 7.5 are drawn from discussing the results of the assessment through the policy design approach and lead to an overarching strategy of social decision-making for the adaptation of forests to climate change.

## 7.2 Theoretical Framework for the Formulation and Implementation of Policies for Adaptation

### 7.2.1 Paradigm of Sustainable Forest Management

Over the past two decades, the international forest-policy community has converged on a shared understanding of the broad goal of contemporary forest policy – what is sometimes called the policy paradigm – in the shape of sustainable forest management (SFM). SFM – or the management of forests according to the principles of sustainable development – has been formally adopted as an overarching goal for forestry by various international policy processes and agreements (including the United Nations Commission on Sustainable Development and United Nations Forum on Forests, UNFF) and as means to contribute to sustainable development, including the Millennium Development Goals. UNFF recognizes SFM as ‘a dynamic and evolving concept that aims to maintain and enhance the economic, social and environmental values of all types of forests for the benefit of present and future generations’.

At the level of a broad, overarching goal, however, SFM remains a very abstract concept. Formulating and implementing policies to support SFM always require additional policy components. These components will include: a number of more concrete goals, sensitive to national and sub-national contexts; the general policy implementation preferences of the implementing institutions (usually, but not always, national governments) that will guide the choice of policy instruments; and the policy tools or instruments themselves that will be used to reach the policy goals (Cashore and Howlett 2007, Howlett and Kern 2009). Modifying SFM policies to include adaptation to climate change means adding adaptation to the existing list of concrete goals and choosing policy instruments that can achieve the new mix of goals without compromising the overarching commitment to sustainability. Can this be done and, if so, how?



Erkki Oksanen: Boreal forest, Finland

**Photo 7.1 Sustainable forest management has been adopted as an overarching goal for forestry by various international policy processes and agreements and as a means to contribute to sustainable development.**

## 7.2.2 The Policy Design Approach and the Problem of Policy Change

Our approach to this question is guided by two theoretical elements from the policy sciences literature. First, the problem is one of policy design. In a policy design approach (Linder and Peters 1984, deLeon 1990, Weimer 1992, Schneider and Ingram 1997), the policy process is understood as the practice of formulating and implementing appropriate programmes (outputs) in a continuous, open-ended process of aligning the following five attributes (Box 7.1):

- ◆ policy goals (both the overarching goal of SFM and the more concrete objectives)
- ◆ policy tools or instruments (or the means proposed to achieve the desired ends (e.g. the prohibition or encouragement of certain practices)
- ◆ the preferences and behaviour of implementers (or internal target groups), the public or private actors responsible for implementing the instruments (e.g. forest managers, international lenders)
- ◆ the preferences and behaviours of external target groups, those persons and institutions whose behaviour the adaptive forest policies intend to influence (e.g. forest users, consumers of forest products)
- ◆ rationales, the expressed justifications for the choice of goals and instruments, including the causal beliefs and theoretical connections between policy elements.

### Box 7.1 Policies, instruments, programmes and designs

Usage of these key terms varies widely in the policy literature. This chapter uses the following definitions:

- ◆ Policies are decisions composed of two inter-related elements: policy goals and policy instruments (Lasswell 1958). Policy goals in this sense are the basic aims and expectations that organizations have when they decide to pursue (or not to pursue) some course of action.
- ◆ Policy instruments are the means used to achieve policy goals, the ‘tools of government’. Once again a wide variety of classifications of policy instruments is found in the literature. This chapter uses the distinction between regulatory (e.g. legal regulations), market (e.g. subsidies, carbon trading) and informational (e.g. monitoring and reporting, research) policy instruments (Linder and Peters 1984, Hood and Margetts 2007). It also uses the distinction between substantive in-

struments that aim directly to affect behaviour, and procedural instruments, which aim to affect the way that policy itself is formulated (Howlett 2000).

- ◆ Programmes are specific instances of the implementation of a policy, sometimes involving single instruments, for example a funding programme, but often a mix of policy instruments.
- ◆ Policy design is an approach to policy analysis that gives a central place to evaluating the choice of policy instruments and the likelihood that a particular instrument or instrument mix will achieve policy goals (Salamon 1981). The policy design approach has generated a substantial body of knowledge about the origins, nature and capabilities of different policy tools (de Bruijn and Hufen 1998, Sterner 2003).

Thus the policy design approach allows the analyst to decompose a policy output into a set of attributes and to reconstruct and assess the ‘intervention logic’ of a programme. Are the policy goals internally coherent and do policy-makers understand how to make trade-offs between them if they conflict? Are the means chosen to achieve the goals consistent with each other and mutually reinforcing? Do the policy instruments conform to the general preferences of the internal target groups (e.g. for voluntary instruments or consensus processes) and are they likely to have the desired effects on external target groups?

Second, the problem is one of policy change. The early policy design literature often seemed to assume that designers begin with a clean slate and can invent and re-invent policies at will. This assumption is obviously false and ‘policy legacies’ will continue to act as significant constraints on the policy elements that can be adopted to achieve new goals such as adaptation.

There are several features of existing SFM policy designs that are relevant to and supportive of the addition of adaptation as a policy goal. The concept of SFM supports a holistic approach to forest management, spanning the three pillars of sustainable development – social, economic and environmental. The holistic approach promotes the goal of conserving forest biodiversity and hence supports measures that will maintain forest ecosystem services and facilitate risk reduction of climate-related natural disasters. Socially, it encourages the integration of forestry and forest policy with other land users in more comprehensive planning processes, which can include stakeholders in other sectors that will impact and be impacted by adaptation measures. Economically, SFM advocates a more equitable sharing of the benefits and costs of forest management amongst the various groups who use forest products. Finally, SFM represents a more collaborative, networked approach to the governance of forests at various levels, sub-national, national and international. Thus, the internal logic of SFM policy designs is highly compatible with adding adaptation as a concrete policy goal; the main challenge is that consensus-building becomes more cumbersome.

Politically, however, pursuing SFM goals and implementing SFM policies that facilitate adaptation of forests and people to climate change (see chapter 6) are much more challenging. Firstly, the forest-adaptation measures will have to be assessed for their impacts on other land users and resource sectors, and the reverse is also true. Lasco et al. (2008) provide an analysis of some cross-sectoral impacts of forest-adaptation measures on other sectors in a watershed in the Philippines. In order to minimize the negative impacts, the adaptation strategies could be prioritized on the basis of their effects on other sectors, so that those that have positive benefits on other sectors

should receive higher priority and attempts should be made to alleviate any negative effects. Conversely, adaptive efforts in other sectors need to consider the impacts on forests and whether the overall impact is going to be positive. This poses new challenges to policy integration and planning.

Secondly, it is necessary to change target groups’ preferences from short-term actions that jeopardize adaptation to medium- and long-term thinking. Most of the adaptation strategies require additional investments, which could pose a significant hurdle to their implementation. Finally, adaptation measures may change the balance between the benefits and costs of forest management itself. For example, if profit-oriented tree species are substituted by more resilient ones to ensure ecosystem services, the beneficiaries change. All this demands a readiness to include new participants and stakeholders into the forest-planning processes at all levels, creating new challenges to design appropriate multi-stakeholder processes that will include all those affected by adaptive strategies. Overcoming these constraints will require broader and more meaningful stakeholder participation and improved policy learning. While existing adaptation strategies rightly emphasize involvement (Lim et al. 2004), doing so will tax the institutional capacities of many countries and organizations. We turn first to an evaluation of how national policies are performing in these respects.

### 7.2.3 Types of Governance

As we learn from Chapter 5, current national policies involve a mix of regulatory, economic and informational policy instruments. However, we learn from Chapter 6 that forest policy should ensure appropriate mechanisms to enable the highest possible degree of flexibility of forest management on the ground: ‘prescriptive approaches to climate change would be highly misleading, and most likely erroneous.’ Forest policy ‘must move away from prescriptive approaches to results-based approaches.’ The conclusion must be that traditional governance, focusing on a hierarchical, top-down style of policy formulation and implementation of the nation state and the use of regulatory policy instruments, will be incompatible with this demand for flexibility. The precondition for successful use of regulatory and economic instruments is a degree of certainty about causation that is not present in the case of adaptation, as the scenario models in Chapter 3 clearly indicate. These levels of uncertainty rather support new modes of governance that appreciate the participation of multiple actors in the identification and implementation of policy goals by means of policy networks (see sub-chapter 7.3.2).

	Government determines societal goals (ends)	Society determines societal goals (ends)
Government selects the means of policy	<b>Traditional governance:</b> Hierarchical steering	Hybrid types
Society selects the means of policy	Hybrid types	<b>New governance:</b> Society itself is organizing

Figure 7.1 Types of governance (modified from Jordan et al. 2005).

Figure 7.1 provides a very simple typology of the main instrument types, delineated on the basis of who determines the ends and means of policy (Jordan et al. 2005). Of course, to apply new models of forest governance does not necessarily mean that they supplant traditional policy tools such as forest regulations, subsidies or tax exemptions; they are added to the policy mix. There is an additional aspect that limits the role of traditional forest governance: internationalization. National forest policy is affected by a series of international negotiation processes on forests (see sub-chapter 7.4).

## 7.3 Policy Instruments at the National Level

### 7.3.1 Traditional Instruments

In Chapter 5 it was noted that the main purpose of traditional regulation is to maintain forest cover by proscribing deforestation and prescribing reforestation after harvest. These regulations are typically supported by further phytosanitary prescriptions and economic incentives to correct market failures. This policy mix has formed the backbone of traditional forest policy, it continues to influence contemporary understanding of SFM and is currently assumed to provide a sufficient policy framework to cover adaptation to the impacts of climate change as well. However, the current state of climate change modelling cannot yet produce accurate predictions of climate change impacts on the ground at scales that are useful to forest managers. We take this level of uncertainty to support a more flexible precautionary approach to forest management than traditional prescriptive regulation can provide.

Policy design under these circumstances must take careful note of such lack of specific information and the limitations of the data in the choice of

appropriate policy instruments. In addition, calls for the use of risk assessment tools to determine vulnerability must take into consideration the normative nature of risk assessment under these conditions of uncertainty. Finally, it is clear that there are considerable disparities of power and resources amongst the groups subject to traditional regulation, particularly in developing countries, which accounts for the uneven success of the traditional regulatory approach in these countries. Policies designed to correct these governance failures call for an instrument mix that addresses the widest range of alternative data sources, the inclusion of multiple actors in carrying out risk assessments, and representation of all target groups in decision-making and the formulation of new policies. New and hybrid modes of governance are required.

#### *National Adaptation Programmes of Action (NAPAs)*

National Adaptation Programmes of Action (NAPAs) are prepared by the least developed countries with the goal of identifying priority activities that deliver their urgent and immediate needs in adaptation to climate-change impacts. The rationale rests on the limited resources of these countries to adapt to the adverse effects of climate change. The main instrument is the provision of financial means by the Global Environmental Facility (GEF) and GEF-related other funds (see 7.4.3) for projects proposed by the NAPA. The NAPA documents also present overviews of projected climate change and associated adverse effects. The sectors considered include land-use management and forestry. However, there is evidence that the countries are not drawing on the available resources, probably because they have a different view of the urgency of adaptation to climate-change impacts in comparison with their other Millennium Goals (Simula 2008).



John Parratt: Central Malawi

**Photo 7.2 NAPAs are prepared by least developed countries to identify priority activities that respond to their urgent and immediate needs in climate change adaptation. They focus on land use management and forestry.**

For NAPAs to become really effective policy instruments, their preparation should be well integrated into the mainstream national development planning and decision-making. The design process should also be made more participatory in order to ensure that the perspectives of all stakeholders/actors are incorporated.

#### *National Adaptation Strategies*

In other developing and developed countries, where the challenge is less lack of resources than improving inter-sectoral coordination and high-level policy integration, national adaptation strategies are, again, potentially appropriate policies. In the following, Finland's National Strategy for Adaptation to Climate Change (Ministry of Agriculture... 2005) is taken as an example for similar strategies of other developed countries (e.g. United Kingdom, Spain, China). The objective is to strengthen and increase Finland's capacity to adapt to adverse impacts of climate change by describing the impacts on the main affected sectors; assessing their adaptive capacity, vulnerability and opportunities associated with climate change; and presenting immediate actions and policies for future actions. The underlying rationale is the precautionary principle for reducing the risks of adverse effects of climate change. 'Because of the inertia involved in climate change, today's decisions and actions will have impacts far into the future.' (Ministry of Agriculture... 2005, p. 10). In 2003, the Finnish Parliament established a task force with representatives from the participating ministries, with the Ministry of Agriculture and Forestry as coordinator and supported by relevant research institutes. The draft

was sent to a number of stakeholders for comment; the public respond through the internet. The core of Finland's National Adaptation Strategy is indicative adaptation measures for the most relevant sectors, divided into short-term (2005–2010), medium-term (2010–2030) and long-term (2030–2080) measures. In addition, emphasis is put on cross-sectoral issues, such as coordination and cooperation between different branches of public administration (sectoral, regional and local authorities), institutions and actors. The policy tools available to authorities include regulatory means, economic-technical measures, and informational means such as planning, environmental impact assessment, risk management, observation and warning systems, research and education.

From a policy design perspective, the major shortcoming of the Finnish National Adaptation Strategy (NAS) has been the technocratic policy-making process at the governmental level. Thus there are no concrete proposals for policies that could mitigate inter-sectoral conflicts; they are left to resolution in the 'shadow of hierarchy' (Scharpf 1993). Because deliberations on the Strategy were not devised as an open-ended process, there is very little chance of policy learning by the participants over the course of time. When revisiting the Strategy, societal interests may be included, and this may begin to transform the Finnish NAS into a hybrid or new mode of governance as described below in sub-chapter 7.3.2.

#### *Inter-Sectoral Coordination*

Similar considerations about the importance of meeting information needs for effective use of traditional policy instruments also apply to the use of economic

instruments such as financial incentives and disincentives. We will not repeat these arguments for the case of incentives. However, information needs are less significant in a third area of traditional governance activity, inter-sectoral coordination. Decisions in the forest sector are not only influenced by forest policy. Many actions taken with regard to forests occur as a result of policies elsewhere in the economy. Policies in other sectors may directly or indirectly, intentionally or unintentionally influence decisions affecting forests, sometimes more so than forest-sector policies themselves (Thompson and Christophersen 2008, World Bank 2004, Schmithüsen 2003) (Box 7.2). This is critical in the context of adaptation to climate change as policies in other sectors may reduce the adaptive capacity of the forestry sector and impede its ability to cope with climate change. The adaptive capacity of both natural and planted forests will be enhanced by policies which support and maintain the forest rather than policies which encourage deforestation. It is generally assumed that a given degree of forest structural and biological diversity at various scales is necessary for maintaining the adaptive capacity of forests to environmental change (Guariguata et al. 2007, Noss 2001). Thus, there is a

continuing role for traditional coordination, and two sectors are particularly important for adaptation of forests to climate change: agriculture and energy.

#### *Agricultural Policy*

Policies in or affecting the agricultural sector, both in response to climate change and agricultural policies in general, may have the greatest influence on forests. Changes in climate which affect agricultural production may drive farmers into new areas, resulting in the clearing of forest for agricultural land. Policies designed to support the agricultural sector under climate change may exacerbate this. However, policies completely unrelated to climate also have the potential to lead to deforestation and ultimately weaken the capacity of the forest sector to adapt to a changing climate. Any policy or change in conditions which makes alternative land uses more profitable relative to forestry creates incentives for deforestation, undermining the ability of the forest sector to adapt to climate change.

A national policy that changes the price or quantity of agricultural commodities has the potential to

#### **Box 7.2 Coordination, integration and interaction**

As policy goals become more numerous and more complex, policies begin to lose their 'single issue' character and interact in various ways with initiatives in other policy areas that were once thought to be quite distinct. For example, when forest policy was largely concerned with growing commercial wood fibre in production forests, forest policy could usually be conducted without much reference to developments taking place in agriculture, tourism and recreation, and energy and infrastructure policies. As forest policy has embraced more numerous and more complex goals, such as biodiversity conservation, poverty alleviation, the protection of indigenous rights and now adaptation and mitigation of climate change, it has become clear that policy development in these other areas will have a major impact on the ability of forest managers to meet forest policy goals and vice versa. The set of new problems created takes three distinct forms which, for the sake of consistency, are referred to by three distinct terms throughout this chapter:

- ◆ Inter-sectoral coordination is the challenge of ensuring that policy development in related policy sectors at the national level is not contradictory or counterproductive; for example, that financial incentives are not being provided for converting forests to agricultural land at the

same time as forest managers are trying to prevent deforestation (Peters 1998).

- ◆ Policy integration is the attempt to bring a new goal into an existing policy framework so that all elements of the policy framework reflect that new goal. Integration may be very ambitious; for example, the efforts to achieve environmental policy integration so that any new policy in any policy area is assessed for its environmental impacts. The attempt to bring adaptation to climate change into the SFM framework is a less ambitious example of policy integration. It can take place at the national or the international level (Briassoulis 2005).
- ◆ Regime interaction takes place when international policy regimes, such as SFM, biodiversity conservation and climate change, have overlapping goals. Ideally, the interaction will be mutually reinforcing but sometimes the effects are contradictory and need careful analysis and design. For example, some forest non-governmental organizations (NGOs) have drawn attention to the apparent contradiction between the Convention on Biological Diversity's emphasis on in situ conservation of biodiversity and the incentives provided for plantation forestry by elements of the Climate Change Convention (Gehring and Oberthür 2004).

induce changes in deforestation and land use even when the policy is not directly related to agriculture (Coxhead et al. 2001, World Bank 2004). Forest degradation and loss are often the result of policies and agendas generated far away from the site of concern (Rudel 2005). Theoretical studies have shown that an increase in agricultural prices, through mechanisms such as subsidies, exchange-rate policies and trade policies, accelerates agricultural expansion because, as farming becomes more profitable, farmers allocate more inputs to clear forests (Kaimowitz and Angelsen 1998, Takasaki 2007). Recent studies in Sumatra showed that rates of forest clearing increase when global coffee prices rise, as local coffee growers expand their land to plant more coffee (Kinnaird et al. 2003). A study of the Brazilian Amazon confirmed the negative impact on forests of measures that made agriculture more profitable. The measures ranged from currency devaluations to investments in roads that reduced transportation costs. A 20% reduction in transportation costs for all agricultural products from the Amazon, for example, was predicted to increase deforestation by approximately 15% in the short run and by 40% in the long run (or about 8000 sq km deforested annually) (Catteneo 2002). Essentially, any measure which renders agriculture more profitable can increase incentives to clear forests for farmland, and it is probable that in some countries agriculture will receive support for adaptation to climate change. It is therefore critical that communication between the agriculture and forest policy sectors is strengthened and that the likely economic, social and environmental impacts of deforestation are fully considered when climate-related policies in the agricultural sector are being formulated to make well-informed policy decisions.

While trade and price-distorting agricultural policies require attention at the level of international negotiations, policies that promote the adaptation of forests to climate change can be introduced at both the national and the local level. At the national level, the complex interactions between macroeconomic policies and sectoral policies suggest the utility of 'mainstreaming' climate-change policy, including adaptation strategies, as a way of alerting policy-makers to the negative impacts of policy changes proposed in other sectors. At the local level, there are often a variety of context-specific factors that are already promoting deforestation that can be addressed on a case-by-case basis. Catteneo (2002), for example, estimates that forest clearing as a means of establishing fraudulent land claims is a significant factor in promoting deforestation in Brazil, and that the deforestation rate could be reduced by as much as 23% if land claims were properly verified and violators evicted.

### *Energy Policy*

Forests and energy are closely interlinked. Forests are a source of renewable energy, both biofuel and biomass energy. Forests also occupy land which may be used to grow other types of biofuel crops. The way in which these sources of carbon are governed has important implications for the forests. As with agricultural policies, any policy which increases the profitability of another sector relative to forestry may result in deforestation.

Energy policies to reduce dependence on fossil fuels and emissions of CO<sub>2</sub> have resulted in the growing popularity of biofuels. Several countries now have minimum targets for biofuel use. In the short- to-medium term, biofuels are seen as a promising option to reduce greenhouse-gas emissions while improving the security of energy supplies (EU Commission 2007). Industrialized countries are increasingly dependent on biofuel imports from developing countries, for example from Brazil, Indonesia and Malaysia. Unless environmental values are adequately priced, there are powerful incentives to replace forests, and other ecosystems, with dedicated bioenergy crops (Doornbusch and Steenblik 2007). This has resulted in the removal of forests for biofuel production. This has the double effect of causing further emissions through deforestation, as well as making adaptation in the forest sector more difficult.

Besides the GHG balance, other environmental impacts need to be carefully considered when promoting energy policies. Impacts on soil degradation, resource depletion, biodiversity loss, ecotoxicity, air pollution and on water contamination have been included in a study using the Life Cycle Analysis framework (LCA) (Zah et al. 2007). According to the report, the environmental effects of the production of almost all biofuels are more harmful than those of fossil fuel production. If so many livelihood assets are negatively affected, it is likely that the overall adaptive capacity of the whole ecosystem – including natural and social systems – will be reduced. Furthermore, sustainable forest management practices sequester more carbon over a 30-year period than the emissions avoided by the use of biofuel with current technology (Righelato and Spracklen 2007). Second-generation biofuels may prove to be more efficient, but may still compete for forest land and threaten the adaptive capacity of forest systems.

Other forms of energy generation may also compete with forest land. Renewable energy such as hydropower may promote the flooding of lowland valleys and forests as an alternative to fossil-fuel consumption. The displacement of communities living in and/or relying on forests will reduce the overall resilience of the system and may lead to problems in other areas or sectors.



John Innes: Oil palm plantation eastern Sabah, Malaysia

**Photo 7.3** In recent years, there has been an increase in oil palm plantation establishment in an effort to meet the growing demand for biofuels.

The evidence presented in the previous sections above already suggests that inter-sectoral coordination is a more complex subject than usually understood. Developments in the energy sector clearly have implications for both forestry and agriculture. Developments in a number of other sectors have similar effects. Considerations such as these cast doubt on a traditional sector-by-sector approach to coordination and suggest the need for a more holistic approach. We find such an approach in new and hybrid modes of governance.

### 7.3.2 New and Hybrid Modes of Governance

As described in Figure 7.1, the traditional mode of governance gives way to hybrid and new policy designs when new participants enter the forest policy process. For example, national forest policy is affected by globalization, reducing the ability of national governments to affect outcomes in their own jurisdictions (Howlett and Rayner 2006). Forest-management planning is unable to cope with complex issues and the presence of multiple actors seeking to achieve their own goals. Implementation deficits are commonly observed in the form of disappointing results and unintended consequences on the ground.

The idea of new governance originated from the perceived failure of nation states' preference for

top-down policy-making. New governance models seek to embrace complexity and turn the presence of multiple actors from a problem into a solution. They appreciate the participation of multiple actors in the identification and implementation of policy goals. In the new governance relationship, the complexity of the problem area is matched by a form of organization that copes better with complexity: the policy network. 'Networks are loosely coupled groups of private and public actors, characterized by the recognition of mutual dependence in order to achieve their goals. Mutual recognition leads, in theory, to rapid exchange of resources, especially information about policy impacts, unintended consequences and unanticipated problems. In this sense, governance through policy networks [network governance] is part of the more general effort to empower civil society to regulate itself' (Glück et al. 2005, p. 54). Policy networks are increasingly international in scope, mirroring developments in global forest policies.

Network governance, as well as other approaches of new environmental governance, has been put forward by Agenda 21 (UNDESA 1992). They integrate the following approaches: long-term planning, target and results-oriented governance, environmental integration, cooperative governance, and participation and monitoring (Jänicke and Jörgens 2006). The application of these approaches, supplemented by multi-level governance and decentralization, to policies for the adaptation of forests to impacts of climate change at the national level, are discussed below.

**Long-term adaptive planning:** Adaptation of forests to impacts of climate change requires short-, medium- and long-term actions. Short-term actions are needed after extreme events and disturbances to provide the affected people with the most important things for survival. Fast and targeted actions are facilitated by a disaster action plan developed before the event has occurred. The disaster action plan does not only comprise a checklist of appropriate actions, but also has to ensure access to the necessary resources for protecting people during the first days until effective help comes from outside. In the medium term, the disaster action plan may contain practical advice about the adjustment to the timber market after heavy wind damages, for example, to remove the felled timber from the market and store it in irrigated timber yards, access to subsidies for reforestation with appropriate species, etc. In the long-term reliable prediction models (see Chapter 3), research about the impacts of climate change on the forest and appropriate forest-management measures are proposed. For the potentially affected people, it is important that the anticipatory measures are taken in time.

**Target and results-oriented governance:** The necessary forest-management measures and adaptation policies are drawn from observed and predicted vulnerabilities and future impacts of climate change on forests on the basis of approved prediction models. Target setting involves a learning and consensus-building process that makes actions likelier and breaks down resistance among affected parties. The proposed approaches should build upon the interests of forest managers and the affected people and require a realistic stance on dealing with foreseeable obstacles. The focus should be on key targets and a limited number of strategic goals; it is necessary to set priorities.

**Environmental integration by inter-sectoral (horizontal) coordination:** Climate-change policy aims at mitigation of GHG emissions and adaptation to climate change. Mitigation policy strives for changes in energy policy, transport policy, agricultural policy, forest policy, etc. But adaptation of forests to climate change also requires coordination with forest-based mitigation measures, as well as with mitigation and adaptation policies in other sectors. In both cases inter-sectoral coordination is impeded by traditional ‘negative coordination’ (Scharpf 1993, Høgl 2002a) that impinges as little as possible on the vested interests of affected sectors. Sectors endowed with considerable lobbying power, such as farming in developing countries, can exert severe pressure on forests and involve path dependencies. Yet, inter-sectoral coordination is possible, either

within hierarchic structures (‘coordination in the shadow of hierarchy’) or by negotiations in networks (Scharpf 1993, Høgl 2002a).

**Cooperative governance:** State actors regard private-sector target groups as essentially equal partners and build policy networks. They expect the following assumed benefits (Jänicke and Jörgens 2006): better targeted policy than regulation by legislative decree; government departments are interested in legitimizing their actions; less opposition when measures come to be implemented; parliamentary decision-making processes are by-passed and adaptive processes such as innovations can be stimulated earlier; ‘soft’, communicative and hence more readily accepted policy instruments can be applied while ‘harder’ policy tools (command and control) remain available.

**Participation:** The FAO/ECE/ILO\* Joint Committee Team of Specialists on Participation in Forestry (2000, p. 9) defines participation as ‘a voluntary process whereby people, individually or through organized groups, can exchange information, express opinions and articulate interests, and have the potential to influence decisions or the outcome of the matter at hand.’ Efficient participation also requires a procedure resting upon transparency and fairness. This calls for a structured process, a framework and a political dialogue facilitated by equality between different stakeholders (Appelstrand 2004).

**Monitoring:** Monitoring and reporting aim at periodically collecting data on politically relevant issues. The data serves as a basis for policy-making, and political actors often contest which data to monitor and publish, which survey approaches and survey intervals to apply, etc. In the context of adaptation of forests to climate change, data on SFM, impacts, vulnerabilities, afforestation, reforestation, deforestation and forest degradation are crucial (see Chapter 5). As monitoring and reporting cause substantial additional cost for surveys, they can easily be refused for economic reasons.

**Multi-level governance (vertical coordination):** Environmental governance does not only take place at the national level, but also at the sub-national and international levels. The relationships between these different layers are characterized by mutual interdependence on each others’ resources. The decision-making process in systems with several separated but interdependent arenas

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\* Food and Agriculture Organization of the United Nations / United Nations Economic Council for Europe / International Labour Organization

(e.g. national and sub-national) are characterized by the following dilemma: The decision-makers at the sub-national level have to cooperate at the national arena and, simultaneously, at the sub-national arena pursue specific interests defined by their responsibilities or constituencies. In such situations, actors tend to refer to conflict-avoiding strategies, soft norms or vague decisions avoiding interference with powerful interests (Hogl 2002b).

**Decentralization:** Decentralization is defined as ‘the transfer of powers from central government to lower levels in a political-administrative and territorial hierarchy’ (Agrawal and Ribot 1999 quoted in Glück et al. 2005, p. 61). One expects from decentralization the creation of interdependent bottom-up policy networks which ensure SFM and reduce deforestation and forest degradation. The underlying rationale is that local authorities represent local population better because they have better knowledge of local needs. When they are endowed with powers, in particular with discretionary powers over public resources, they are more likely to respond to local needs than a distant central authority (Ribot et al. 2004). However, in case studies about the decentralization reform in Senegal, Uganda, Nepal, Indonesia, Bolivia and Nicaragua, it was found that the local authorities either lacked control over significant levels of resources or shared accountability with a series of other actors who cannot be made accountable (Schroeder-Wildberg and Carius 2003, Ribot et al. 2004). Decentralization has not always promoted a more sustainable management of the forest resources or the empowerment of local communities (Colfer et al. 2008).

### *National Forest Programmes*

The core instrument of new forest governance at the national level is the national forest programme (NFP). The term ‘national forest programme’ is a

generic name for a wide range of approaches towards forest policy formulation, planning and implementation at the sub-national and national levels. As one of the most important outcomes of international forest policy dialogue, the NFP is a commonly agreed framework for sustainable forest management which is applicable to all countries and to all types of forests. The NFP is a country-specific process that provides a framework and guidance for: country-driven forest-sector development; for national implementation of internationally agreed concepts (such as sustainable forest management) and obligations (e.g. UN conventions), and for external support for forest-related development cooperation.

The goal of NFPs is the sustainable management, conservation and sustainable development of a country’s forests so as ‘to meet the local, national, regional and global needs and demands of the present and future generations’ (UNCED 1992). Adaptation to the impacts of climate change will be added to these goals, and the challenge will be to overcome both the internal and external constraints to the achievement of the existing goals created by the new one (see 7.2.2.).

The main instruments used by NFPs are all relevant to realizing the goal of adaptation. They are: participation of the relevant actors in the policy-making process instead of hierarchical governing; adaptive and iterative learning processes instead of long-term, scientifically poor forecasts; comprehensive (‘holistic’) inter-sectoral coordination of actors; and decentralization in order to facilitate the implementation of policy outputs. Many of these instruments are employed in traditional governance. However, in a new governance approach, the single-instrument approach is set aside in favour of considering a mix of mutually supportive instruments. For example, traditional inter-sectoral coordination of the kind described above takes a sector-by-sector approach. A well-designed NFP will attempt holistic coordination amongst all relevant sectors. Similar ideas are also found in other new governance approaches (Box 7.3).

#### **Box 7.3 Adaptive governance**

‘Adaptive governance ... focuses on reflexivity and learning by doing, on the most vulnerable systems that include both human and ecological systems and on the forms of collaboration and partnerships, knowledge, social learning and forms of engagement. The four basic conditions that underpin adaptive governance include: to build knowledge and understand resource and ecosystem dynamics, which requires incentives and human capacity to monitor and translate signals; to feed ecological knowledge into adaptive management processes,

whereby successful management includes continuous testing, monitoring, re-evaluation rather than optimizing based on past records; to accept uncertainty and be prepared for change and surprise, i.e. institutions are prepared for both ecosystem management changes and unpredictable changes brought about by climate change (e.g. storms, hurricanes, pests, disease outbreaks); and to support flexible institutions and multilevel governance systems through networks, operationalized through adaptive co-management, which is adaptive management with multiple level linkages and bridging organizations.’ (Boyd 2008, p. 1914).

The real challenge posed by adding adaptation goals is the addition of new actors and hence the additional burden of consensus-building. In other words, adaptation creates external constraints on what can be successfully adopted as an NFP. The implementation of the principles of an NFP requires the establishment and maintenance of a climate of mutual trust, where the participants are prepared to remain at the negotiation table and to regard the dialogue on forest issues as an open-ended process (Glück et al. 2005, Zingerli and Zimmermann 2006). The more participants, the more difficult this will be.

### *Main Challenges to NFPs*

Compared to the general goals of SFM, which drive NFPs, combating climate change has deferred questions of the specific objectives that should be achieved. However, on the basis of the IPCC reports, combating climate change is characterized by more agreement on causation. For example, the objectives for reduced deforestation and forest degradation were not included in the Clean Development Mechanism (CDM) of the Kyoto Protocol (KP). NFPs, by contrast, are specifically designed to enable participatory discussion of goals. The ongoing discussions out of which criteria and indicators of SFM have emerged provide the best example. While there is still disagreement about the best way to implement SFM, widespread agreement on specific objectives has been achieved. Adaptation to climate-change impacts urgently needs such consensus on goals, such as targets for reducing deforestation and criteria of forest health or integrity. NFPs could produce them.

Empirical evidence suggests that most NFP processes continue to restrict participation. This is the main obstacle for NFPs to achieve their promise with respect to adaptation. These restrictions should be removed as much as possible by a code of conduct that regulates the access of all interested parties as well as all organizational and procedural aspects of the negotiations, especially the decision rules. Dissenting positions must be recorded and should be considered in future rounds of negotiations. As participation in a NFP process will normally be time- and resource-consuming, actors who are well endowed with resources are likely to be favoured. Potential losers in the process are also reluctant to participate, suggesting the need for subsidizing participation. In federal states the different division of forest-related affairs (e.g. forestry, nature conservation, agriculture) between national and sub-national responsibilities can be another reason for non-participation that may be more difficult to address.

In the real world, the switch from traditional to new forest governance is not at all self-evident for

the participants. There is always the inherent possibility that the outcome of NFP processes is only 'symbolic' in terms of the core instruments (participation, long-term iterative planning, inter-sectoral coordination and decentralization). The formulation of a substantive NFP depends on impeding and supporting factors (Glück et al. 2003, Humphreys 2004). An impeding factor is one that inhibits or constrains the substantive development of these core instruments, while a supporting factor is one that contributes to the substantive development of the core instruments of a NFP. Substantive and impeding factors of NFPs are land tenure, financial incentives and political culture.

### *Land Tenure*

Secure land tenure and forest user rights are an indispensable precondition for the private sector, local communities and smallholders to invest in SFM. 'Tenure helps to determine whether local people are willing to participate in the management and protection of forests' (Banana and Ssembajjwe 2000, p. 93). Private and common property regimes enable the holders of private ownership rights to use the forest in their own interest, to protect it against impacts from outside and to adapt to unavoidable impacts of climate change. Public-sector ownership is not necessarily a supporting factor. In Greece, state forest ownership has empowered forest authorities to make decisions for the greatest collective good of society but blocked the meaningful participation of other stakeholders (Humphreys 2004). Community forests are managed by local administrations on public land; the revenue from the sale of forest products from these forests is shared among the members of the community in cash, in-kind or in the form of infrastructural development. In developing countries community forests play an increasing role for SFM in developing countries (e.g. Wood and Yapi 2004, Lee 2007a and Lee 2007b).

The communities regard the forest as an integral source of their livelihoods and are prepared for long-term investments if the tenure rights are secure. Secure rights are a necessary condition but not a sufficient one. What is most important is the actual contribution of forests to peoples' livelihoods: 'The hypothesis that people benefit from the forest, and would conserve it if they controlled it, may not hold when alternative land uses provide higher benefits than forests.' (Tacconi 2007, p. 343). Similar to community forestry is leasehold forestry; the major difference is that in the latter, individuals are given user rights to plots of forest land. Leasehold forestry in Nepal provides 40-year leases for small plots of degraded forest land to the poorest of the local people. In Ethiopia, leasehold forestry refers

to the establishment of communal forest user rights on communal lands whereby the poorest members of the local community are provided with patches of degraded land for a certain period of time (usually 25 years) for the purpose of tree planting. This programme has proved to be an extremely effective measure for environmental regeneration, although it is based on local institutional arrangements and does not have any legal protection and policy ground (Tesema 2008). The most detrimental form of forest ownership is open access when public forests are not actually regulated and legal ownership rights are not exercised. Such forests are difficult to protect and easily depleted. They are exposed to the ‘tragedy of the commons’ (Hardin 1968) unless institutional arrangements such as allocation of user rights and establishment of common property regimes are put in place.

#### *Financial Incentives*

Financial incentives or disincentives for SFM come either from the national finance ministry (e.g. subsidies, grants, taxation, tax exemptions), bilateral Official Development Assistance (ODA), multilateral sources (World Bank Group), private-sector investments, NGOs, philanthropic foundations and other sources. Financial instruments play a crucial role in affecting actor behaviour; they can support or impede SFM depending on how they are designed. For example, high inheritance taxes in Flanders have impeded SFM and caused forest owners to lose interest in forest-management issues. But financial incentives act as a supporting factor in the United Kingdom, Lithuania and Switzerland (Humphreys 2004).

Payments for environmental services (PES) offer a relatively new source of financial support for SFM (FAO 2007). Costa Rica was a pioneer in developing a payment for environmental services mechanism. In 1996, it initiated a programme that enhances various forest environmental services (e.g. carbon sequestration, hydrological services, biodiversity conservation and provision of scenic beauty) through compensation payments to land and forest owners in exchange for multi-year contracts for reforestation, sustainable forest management and forest protection. Mexico has also recently initiated a national PES programme for forest-based environmental services. The growing role of the PES approaches today reflects underlying changes in environmental policy and the private sector worldwide. Hundreds of PES schemes are now being implemented, in both developing and developed countries, primarily for forest-based environmental services. A global review conducted by Landell-Mills and Porras (2002) examined 287 cases of market-based initiatives in the forest sector.

#### *Political Culture*

Political culture can be described as the sum of the fundamental values, instruments and knowledge that people of a country or parts of it share; they are acquired through political socialization and give form to political process. Political culture is an integral part of political reality and determines, among others, what and how issues are regulated. The patterns of political culture determine interest-oriented actions. Policy-makers have the choice to take certain accepted actions but not others. They can hardly break out of the established patterns of action without jeopardizing their success. Finally, political culture determines what is regarded as an issue (Berge 2004). For example, in Lithuania the old political leftovers from the previous centrally planned economy still linger. The Portuguese report suggests that such transitions can take decades. In Portugal the authoritarian political culture of half a century continues after the restoration of democracy in 1974. This has tended to impede inter-sectoral coordination and participatory decision-making. The French political culture is characterized by emphasis on representative rather than participatory democracy. Senior public officials and experts play a leading role in national policy processes, also in forest policy. There is a similar situation in Greece where the public authority is regarded ‘the sole entity in charge of making choices in the interest of the common good’ (Humphreys 2004, p. 27). The political cultures of France and Greece are obstacles for participatory networks. Also a strong clientelist or corporatist tradition in policy-making can impede genuine participation from other stakeholders (Olson 2004). Other political cultures, however, are more supportive of direct public participation, such as that of Switzerland.

## **7.4 New Forest Governance Processes at the International Level**

### **7.4.1 Introduction**

During the past decades, a series of international agreements on forests – legally binding and non-legally binding – has been achieved; it forms the ‘international regime on forests’. The following section discusses the main instruments used to adapt forests to the impacts of climate change in the light of the attributes of the policy design approach. The international regime on forests accrues additional significance due to climate change. The unresolved issue of deforestation not only exacerbates poverty in many developing countries but also increases GHG

emissions which adversely affect various sectors of other countries.

On the other hand, deforestation is driven by factors that are not always under the control of the country. These inter-sectoral issues caused by failures of nation states have arrived at the international political agenda and are dealt with by various international institutions. One of these topics is reduced or avoided deforestation. It simultaneously mitigates climate change through carbon storage and contributes to the adaptation to impacts of climate change. The analysis of the main international instruments should contribute to a better understanding of possible solutions for the adaptation of forests to impacts of climate change. The analysis is organized according to the following three components of the larger international regime on forests: United Nations Convention on Biological Diversity as the main part of the international biodiversity regime; selected elements of the international forest regime of relevance to adaptation (comprising the Non-Legally Binding Instrument on All Types of Forests, The International Tropical Timber Agreement, Forest Law Enforcement, Governance and Trade, ITTA, FLEGT, forest certification and the World Bank Strategy); and the climate change regime with the United Nations Framework Convention on Climate Change and its Kyoto Protocol, including reduced emissions from deforestation and forest degradation REDD.

#### **7.4.2 The International Biological Diversity Regime**

The Convention on Biological Diversity (CBD) was adopted by the UN Conference on Environment and Development (UNCED) in June 1992 in Rio de Janeiro ('Earth Summit') and entered into force in December 1993. The Convention has the following three main goals: conservation of biological diversity (or biodiversity); sustainable use of its components; and fair and equitable sharing of benefits arising from genetic resources. The main challenge to a successful design involves addressing the general market failure to value biological services and will necessarily involve the provision of financial incentives and compensation. Adaptation will put new strains on the ability to provide this financial assistance through the Global Environmental Facility, which is already subject to a number of other demands. The Ad Hoc Technical Expert Group on Biodiversity and Climate Change (AHTEG) was established in 2008 with a mandate to develop advice on biodiversity, relevant to the Bali Action Plan and the Nairobi Work Programme (see sub-chapter 7.4.3).

The primary framework for action under the Convention is the 'ecosystem approach'; it will help to

reach a balance of the three goals of the CBD. It is similar to the concept of SFM as both are based on the tenet of sustainability. Decision V/6, Annex 2, of CBD-COP 7 in 2004, Kuala Lumpur, states that 'SFM can be considered as a means of applying the ecosystem approach to forests'. It is an example of positive interaction between international regimes (see Box 7.2). As a result, both are overarching frameworks with due consideration to societal, ecological and governance issues. Whereas the ecosystem approach is content-driven based on 12 principles, SFM is outcome-driven and can be measured by criteria and indicators (C&I).

In regard to the adaptation of forests and people to the impacts of climate change, the implementation of the CBD is supported by C&I of SFM at the national level (by monitoring and reporting) and management-unit level (by forest certification schemes). In order to achieve greater harmonization of the SFM and ecosystem approach and to strengthen cross-sectoral integration, Decision V/6 proposes to apply C&I tools to other sectors. C&I, for sustainable agriculture in particular, could help abate forest degradation and deforestation. Similarly, forest C&I should include specific indicators of vulnerability to climate-change impacts and for the resilience of forests and forest-dependent communities.

#### **7.4.3 The International Forest Regime**

##### *The Non-Legally Binding Instrument on All Types of Forest*

In 2006, the UN Forum on Forests (UNFF) agreed on a new resolution, valid until 2015, to establish a Non-Legally Binding Instrument on All Types of Forests (NLBI). The NLBI, negotiated in April 2007 and adopted by the UN General Assembly in December 2007, superseded 270-odd 'proposals for action' that were the output of the IPF (Intergovernmental Panel on Forests) and IFF (Intergovernmental Forum on Forests) processes, and built upon the UNFF resolution. Under the overarching goal of SFM, the NLBI establishes objectives and policies to promote SFM at the international, regional and national levels. Together with its associated work programme, the NLBI prescribes and gives guidance for the implementation of four global objectives set out in the UNFF resolution. They are: (i) reverse the loss of forest cover; (ii) enhance forest-based economic, social and environmental benefits; (iii) increase significantly the area of protected forests worldwide and other areas of sustainably managed forests, as well as the proportion of forest products from sustainably managed forests; and (iv) reverse the decline of official development assistance for SFM.

*The International Tropical Timber Agreement (ITTA)*

When this successor agreement to the ITTA 1986 and ITTA 1994 enters into force, it will be the only binding agreement with the specific objective of promoting the sustainable management of forests, albeit covering only tropical timber-producing forests and only in the context of promoting ‘the expansion and diversification of international trade in tropical timber from sustainably managed and legally harvested forests’. Thus its trade-related limitations are clear. It funds specific projects as well as helps to build capacity through the multiple-level evaluation, monitoring and review that each project must undergo. The new Thematic Programmes Sub-account under the ITTA 2006 holds potential for increasing funding as well and using it more efficiently. Currently the International Tropical Timber Organization (ITTO) is developing a thematic programme area on how to include climate change, regarding both mitigation and adaptation, into its working packages.

*Forest Law Enforcement, Governance and Trade*

The European Union adopted in 2003 the Action Plan for Forest Law Enforcement, Governance and Trade (FLEGT) aimed at reducing the trade and use of illegally harvested timber and to promote the use of legally harvested timber in the European Union (EU). Its underlying rationale is to promote SFM and the rule of law in timber-exporting developing and emerging market countries. The EU proposes to accomplish these goals through Voluntary Partnership Agreements (VPAs) between the EU and timber-producing countries where illegal logging is a problem. The main policy instrument will be the establishment of a licensing scheme to ensure that only timber products that have been produced in accordance with the national legislation of the exporting country are imported into the EU. Once again, the main objective of FLEGT is to reduce deforestation by controlling illegal logging and preventing a ‘race to the bottom’ where one timber-exporting country can benefit from lax enforcement at the expense of its competitors. As presently constituted, its main contribution to adaptation lies in its efforts to promote SFM and improve governmental capacity. As a sectoral policy initiative, it cannot directly address the pressures from other sectors that will constrain forest adaptation options.

*World Bank Forest Strategy 2002*

After an extensive evaluation of its previous approach to forests, the Bank adopted a revised Forest Strategy in 2002, locating its interest in forests within the three broad policy ‘pillars’ of alleviating poverty, promoting sustainable economic development, and conserving the natural environment to protect local and global environmental services. Included in the third pillar are programmes that assist governments to develop measures to mitigate and adapt to the anticipated impacts of climate change and reduce the vulnerability of the poorest people to its effects (World Bank 2004). The 2002 Strategy includes some broad, quantified targets (though none specifically directed at adaptation to climate change), a commitment to monitoring progress, and an analysis of the challenges to successful implementation; this includes the observation that ‘the reality is that the flow of funds from donors and multilateral lenders into forests, for management and protection purposes, will continue to be dwarfed by investments in activities that may have damaging impacts on forests’ (World Bank 2004, p. 13). The strongest design element in the Strategy is the explicit awareness of the importance of inter-sectoral coordination to prevent sectoral adaptation gains being wiped out by developments in other sectors.

Evaluation and explicit efforts at policy learning are also noteworthy elements in the Bank’s approach. The Forest Strategy reviews have provided important feedback about the need for careful policy design, with significant learning about, for example, engaging governments, developing stakeholder capacity and the promise and pitfalls of decentralization initiatives. The Strategy already includes explicit reference to adaptation and adaptation mechanisms. Its fundamental orientation towards conserving forests that provide critical ecological services while promoting SFM in production forests will, if effectively implemented, support national and sub-national efforts to increase the resilience of forests and forest-dependent communities.

*Forest Certification*

The basic design of forest certification is the promotion of SFM through market incentives. The rationale is the belief that consumers prefer sustainably produced wood products to those which are not sustainably produced and that they are prepared to pay an extra price for them (‘green premium’). An independent third party (certifier) assesses the quality of forest management in relation to a set of predetermined standards. The certifier gives a written assurance that the management of a certain forest confirms to the standards (Rametsteiner and Simula

2003). The standards range from relatively loose performance standards (comply with applicable laws) to very detailed prescriptions to be applied at the management-unit level, some of which refer to carbon sequestration.

Forest certification is likely to provide effective market incentives to forest managers if round wood is internationally traded (and not used mainly for domestic consumption), and if these markets are environmentally sensitive. However, increasing amounts of timber are consumed as fuelwood or are destined for markets that are not especially environmentally sensitive. Moreover, certification schemes promote the development of a 'global forestry polity' that transcends the interests of territorial states (Tollefson et al. 2008) and for that very reason they take a sectoral perspective, when adaptation is, above all, an inter-sectoral issue. None the less, certification is a flexible instrument with the possibility that new indicators for forest adaptation measures could be included in the standards of the certification programs.

#### *Main Challenges Facing the International Forest Regime*

There are three main design challenges facing the international forest regime. The first is selection of the target groups for optimal results, and the key question here is whether the regime should be aimed primarily at national governments or individual forest projects. The NLBI has clearly chosen the former, the certification movement has chosen projects, while the others fall somewhere in between. With respect to adaptation, there are advantages and disadvantages to each approach. An emphasis at the national level makes it easier to use national C&I to establish goals, monitor progress and develop national capacity to create and enforce regulatory instruments when they are needed. Targeting projects fits with the current emphasis of many ODA agencies on decentralization. For the moment, tracking both targets while we learn which mix of policy instruments works best at each level is desirable. At both levels, it is imperative that policies and programmes address issues of inter-sectoral coordination so that local gains are not wiped out by negative developments in energy, agriculture or macro-economic policies. True policy integration, in which identifying and reducing vulnerabilities and increasing adaptive capacities become explicit goals of land and resource use policies, is best attempted at the national level.

The second design challenge is to provide an appropriate level of financing to achieve the objectives. While a great deal of emphasis is put on the means of implementation, only few financial mechanisms have yet been created beyond the existing ones provided

by CBD and the United Nations Framework Convention on Climate Change (UNFCCC or FCCC). Therefore, the UN Economic and Social Council decided in December 2007 (December E/2007/277) that UNFF should develop, with a view of adopting it at the eighth session, a financial system for all types of forests. Forest financing can come from domestic and external sources, both public and private. The current external bilateral (official development assistance) and multilateral sources (World Bank, GEF and regional development banks) amount to USD 1.9 billion per year; USD 0.5 billion per year are recorded for foreign private investment. Taking into account other sources of funding on which no consolidated quantitative information is available, the total amount of annual financing flows to forests is many times less than the estimated USD 8.2 billion needed for the sustainable management of the 602 million ha of tropical and subtropical forests (Simula 2008).

The third and most pressing challenge is the construction of a coherent international forest regime that promotes policy learning both within and between its component parts and positive interactions with the other relevant international policy regimes. The success of the UNFF in adopting the four global objectives would go far towards meeting adaptation needs by reducing vulnerabilities. However, the linkages between SFM and climate-change adaptation and positive interactions between the forest regime, the CBD and the UNFCCC, could be facilitated by adding a fifth global objective to the NLBI that specifically refers to climate-change mitigation and adaptation goals. Such an objective would provide guidance and legitimacy for the inclusion of mitigation and adaptation instruments in other components of the forest regime, for example by helping to create the necessary incentives and implementation arrangements at the level of the national forest programmes that are conducive to adaptation. Presently, as we have seen, action at the international level consists of a number of poorly coordinated programmes directed mainly at reducing deforestation rather than addressing the full range of climate-change adaptation issues and options.

#### **7.4.4 The International Climate Change Regime**

*United Nations Framework Convention on Climate Change and its Kyoto Protocol*

The UNFCCC was opened for signatures at the Earth Summit in June 1992 in Rio de Janeiro and entered into force in March 1994. By November 2008 altogether 191 countries and the European Union have

become Parties to the Convention. The supreme decision-making body of the UNFCCC is the Conference of Parties (COP). It is supported by two subsidiary bodies; the Subsidiary Body for Scientific and Technical Advice (SBSTA) and the Subsidiary Body for Implementation (SBI).

The goal of the UNFCCC is ‘stabilization of greenhouse-gas concentrations in the atmosphere at a level that would prevent dangerous atmospheric interference with the climate system.’ Furthermore, ‘such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and enable economic development to proceed in a sustainable manner’ (Art. 2). The internal target groups of the Convention are the Parties, i.e. states which have ratified the Convention. Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects (Principles, Art. 3.3). The Parties are divided into two main categories: Annex I countries (developed countries) and Non-Annex I countries (developing countries). Among Non-Annex I countries, the Least Developed Countries (LDCs) are often treated as a specific group. These distinctions reflect the recognition of the principle of ‘common but differentiated responsibilities and respective capabilities’, with the requirement of the developed country Parties taking the lead in combating climate change and the adverse effects thereof. (Art 3.1).

As its title expresses, the UNFCCC is a framework convention, i.e. it defines the aim, principles and instruments in general terms and opens up the possibility of adopting more precise legal instruments, such as the Kyoto Protocol under it (e.g. Art. 17). Nevertheless, the Convention does define a number of important instruments for its implementation. All Parties shall develop and publish national reports: greenhouse-gas inventories to be submitted by Annex I countries annually and national communications to be submitted by both Annex I and Non-Annex I countries periodically (cf. Chapter 5). They shall also formulate and implement national programmes to mitigate climate change and to facilitate adaptation to it.

The Kyoto Protocol entered into force in 2005, and by November 2008 it had been ratified by 182 countries and the European Union. Already in 2001 agreement on the underlying operational rules of the Protocol (‘Bonn Agreement’) was translated into legal texts, the ‘Marrakesh Accords’ (COP-7). The Protocol does not include any article on its specific objective but states in its preamble that it has been agreed ‘in pursuit of the ultimate objective of the Convention as stated in its Article 2’. The main instruments of the Protocol are legally binding quantified emission limitation and reduction commitments

by Annex I countries. The overall Annex I emissions should be at least 5% below their 1990 levels in the first commitment period, 2008 to 2012. Six greenhouse gases are taken into account: carbon dioxide, methane, nitrous oxide and three fluorinated gases.

Annex I Parties are expected to meet their commitments mainly through domestic efforts, but they are allowed to ‘supplement’ these efforts through the so-called ‘flexibility mechanisms’: joint implementation (JI, Art 6), clean development mechanism (CDM, Art 12) and emissions trading (ET, Art 17). Through the JI, emissions reduction units resulting from joint projects can be transferred from one Annex I Party to another. CDM provides a similar opportunity for transfers of credits to Annex I countries from projects implemented in developing countries. ET is about trading of credits between Annex I countries. The purpose of the flexibility mechanisms is to increase the cost-efficiency of mitigation activities but also to promote technology transfer and sustainable development in general. As an internal measure, the European Union has established in 2005 its own Emissions Trading System (ETS) among the Member States.

Informal discussions on the further development of the climate-change regime were gradually gaining ground towards the mid-2000s. In 2005 an ad hoc working group was established under the Kyoto Protocol to consider commitments of Annex I countries after 2012. This group has also assessed the existing Kyoto instruments and the need to develop them further. Through the Bali Action Plan adopted in 2007 by COP13 (decision 1/CP.13), this process was complemented with the Ad Hoc Working Group on Long-term Cooperative Action under the Convention that was established for the process ‘to enable the full, effective and sustained implementation of the Convention ... up and beyond 2012...’. The Bali Action Plan covers the actions by all other countries and addresses five main areas of work, of which the following three are most relevant for forests (see below): (i) enhanced international action on policy approaches and positive incentives on issues related to forests; (ii) enhanced action on adaptation; and (iii) enhanced action on the provision of financial resources and investment to support action on mitigation and adaptation and technology cooperation. Negotiations on these issues are continuing, and it is too early to predict their outcome and the extent to which and how the work of the above-mentioned two ad hoc groups will be packaged.

*Forests in the Climate Change Regime*

The Convention and its Protocol both treat forests recognizing them as an essential part of the carbon cycle.

**Mitigation**

'Mitigation' in the climate-change regime refers to the regulation of GHGs in the atmosphere. Forests contribute to mitigation by three avenues: (i) reducing emissions by avoiding deforestation and forest degradation; (ii) protecting the existing forests; and (iii) increasing the sink effect of forests by land use, land-use change and forestry activities (LULUCF). As mitigation regarding LULUCF is beyond the scope of this paper, protection of existing forests and, simultaneously, reducing emissions from deforestation and forest degradation is a key concern of climate change and forest policy and will be dealt with separately below.

In the Kyoto Protocol, protection and enhancement of forests, promotion of sustainable forest management practices and afforestation and reforestation are listed among possible policies and measures for achieving Annex I emission limitation and reduction commitments (Arts. 2.1). Annex I countries also have an obligation to account for the outcome of afforestation, reforestation and deforestation activities when reporting about the achievement of their commitments (Art 3.3). Furthermore, Annex I countries can on a voluntary basis include in the national accounting system additional human-induced activities that have taken place since 1990, including effects of forest management (Art 3.4). Finally, afforestation and reforestation (AR) are eligible activities within the CDM. However, the rules for these CDM projects (19/CP.9) are constraining and complicated; for the time being, CDM has endorsed only one forest project (Simula 2008).

**Adaptation**

Even if GHG emissions are reduced urgently and drastically, climate change will continue due to past emissions and the inertia of the climate system. Therefore, forests and people have to adapt to the adverse effects. Concern about adaptation is expressed already in the ultimate objective of the Convention (Art 2). In the operative articles, all Parties commit themselves to prepare adaptation programmes and to cooperate in preparing for adaptation to impacts of climate change (Art 4.1). The developed countries shall assist the developing countries that are particularly vulnerable in meeting costs of adaptation (Art. 4.4). All Parties shall give full consideration to what actions are necessary to meet the specific needs and concerns of developing countries arising from adverse effects of climate change (Art 4.8). National communications to be prepared by all Parties shall

provide descriptions of steps taken or envisaged by Parties, including those for adaptation (Art 12). The Marrakesh Accords introduced support to National Adaptation Programmes of Action (NAPAs) of least developed countries to build their capacities (cf. sub-chapter 7.3.1).

Another important development within the UN-FCCC is the Nairobi Work Programme, aimed at assisting countries to improve their understanding of impacts, vulnerability and adaptation. The programme modalities include information exchange, expert meetings, workshops and reports. A great deal of attention is paid to engaging a wide range of organizations, institutions, experts and communities (FCCC/SBSTA/2006/11). A concrete outcome of the programme is the compilation of methodologies and tools to assess vulnerability and adaptation strategies, including forests, particularly in developing countries (Robledo et al. 2008).

In the Bali Action Plan, enhanced adaptation action is one of the key areas of work. The following issues are considered: international cooperation to support implementation of adaptation activities; risk management and risk-reduction strategies; disaster-reduction strategies; economic diversification; and ways to strengthen the catalytic role of the convention in encouraging multilateral bodies and public and private sectors to build on synergies among activities and processes, as a means of supporting adaptation in a coherent and integrated manner. All these areas are relevant for multilateral bodies working in the field of forestry, and indeed the last point stresses the role of other actors and the need for cooperation.

**Reducing Emissions from Deforestation and Forest Degradation (REDD)**

About one fifth of global emissions of carbon dioxide are estimated to originate from tropical deforestation (Houghton 2005), and reducing deforestation would thus greatly contribute to mitigation efforts. However, in the Marrakesh Accords, avoided deforestation was explicitly not included in the CDM due to methodological and political hurdles which could not be overcome. In the negotiations leading to the Marrakesh Accords, there were widespread concerns of the risks related to the permanence, leakage and verifiability of credits earned through forest-related activities. Permanence is related to loss of carbon sequestered by forests through tree felling, forest fires, etc. Leakage means the displacement of deforestation from the region credited for avoiding deforestation to another region. Verifiability is related to the possibility of ensuring the credibility of the forest-related carbon credits. A thorny issue related to all CDM projects is their additionality, i.e. ensuring that resulting CDM credits reflect an improved situation beyond the business-as-usual development, including

beyond the implementation of existing legislation and policies. This is also a methodological challenge: e.g. if avoided deforestation became an eligible CDM activity, what method would be used to set the baseline for a country's deforestation reduction? These concerns were especially strong regarding activities under the CDM, since developing countries are not subject to the same monitoring system as the Annex I countries with legally binding commitments.

The Bali Action Plan includes consideration of policy approaches and positive incentives to reduce emissions from deforestation and forest degradation (REDD) in developing countries and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries. Attention is also paid to finding ways to strengthen the catalytic role of the Convention in encouraging multilateral bodies of public and private sectors, building on synergies among activities and processes (1/CP.13). In this context REDD may benefit from research into the causes of deforestation (Kanninen et al. 2007).

A key policy instrument of REDD is financial incentives for these countries which are prepared to reduce deforestation and forest degradation in the future. Two basic options have frequently been brought up for raising money: a market-based approach and a fund-based approach. The market-based approach can be a modified regulatory carbon market under the Kyoto Protocol and, in addition, a voluntary carbon market which already exists (Portela et al. 2008). In addition to credits for avoided deforestation, forestry projects can also include payments for environmental services (PES), such as provision of biodiversity, soil and watershed protection, and SFM at a project and at a broad landscape level (Meizlish and Brand 2008). An example of the fund-based approach to REDD is the Forest Carbon Partnership Facility (FCPF) established by the World Bank in 2006. It is designed to examine the preconditions for the successful formulation and implementation of REDD and to assist developing countries in their efforts to reduce emissions. Under the FCPF there are two funding sources: the Readiness Fund covers preparatory measures for target countries, such as assessing historical emissions from deforestation and forest degradation, setting baselines; and the Carbon Fund which will contribute to emission reductions based on sound approaches (Simula 2008).

#### *Funding Arrangements within the Climate Regime*

Within the climate-change regime, there are now several funding arrangements in support of adaptation and mitigation activities, including those related to forests. The Global Environmental Facility (GEF) has been entrusted with the operation of the finan-

cial mechanism of the UNFCCC. The GEF provides funding for the preparation of Non-Annex I countries' national communications and can cover incremental costs of projects with global climate benefits. It also supports capacity-building and demonstration projects related to adaptation. Under GEF, there has been a Strategic Priority on Adaptation (SPA) Trust Fund.

In the Marrakesh Accords two funds were created under the UNFCCC: the Special Climate Change Fund (SCCF) and the Least Developed Countries Fund (LDCF). A third fund was established under the Kyoto Protocol, the Adaptation Fund (AF) (Decisions 10/CP.7). While the operation of the two funds under the Convention has been assigned to the GEF, the Adaptation Fund is administered by a separate Adaptation Fund Board, for which the GEF provides secretariat services.

The Special Climate Change Fund (SCCF) was established to finance projects in Non-Annex I countries relating to adaptation, technology transfer, energy, transport, industry, agriculture, forestry and waste management, and economic diversification. The Least Developed Countries Fund (LDCF) has so far supported the preparation of National Adaptation Plans of Action (NAPAs) in 48 least developing countries. The Adaptation Fund (AF) can finance concrete adaptation projects and thus help developing countries cope with the effects of climate change. The AF is considered an interesting example of innovative funding: the main source of its funds is a 2% levy on projects from CDM. The Trust Fund Strategic Priority on Adaptation (SPA) is aimed at showing how adaptation planning and assessment can be translated into practical projects that provide real benefits.

In concurrence with the Bali Action Plan, the World Bank created the Climate Investment Funds (CIFs) in July 2008. They consist of the following two distinct trust funds: the Clean Technology Fund and the Strategic Climate Fund. The CIFs are a collaborative effort among the Multilateral Development Banks and countries to bridge the financing and learning gap between now and post-2012 global climate-change agreement. They should be in addition to existing Official Development Assistance (ODA) and operated in close coordination with the GEF and the Adaptation Fund under the Kyoto Protocol. The Clean Technology Fund will accelerate cost-effective mitigation of GHG emissions in developing countries by demonstration, deployment and transfer of low-carbon technologies. The Strategic Climate Fund will help more vulnerable countries adapt their development programmes to the impacts of climate change and will take action to prevent deforestation. It will explore political ways to integrate climate resilience into core development planning and budgeting, building on NAPAs. Furthermore, it will strategically align with the Adaptation Fund.

### *Main Challenges Facing the International Climate Change Regime*

From a policy design perspective, there are several major shortcomings of the UNFCCC and its KP regarding adaptation of forests to climate change and avoiding emissions from deforestation and forest degradation.

Regarding adaptation, the first shortcoming is the dominant role played by mitigation goals and the consequent risk that adaptation policies are caught up in CDM. There are strong arguments for separating forest sequestration programmes from emission reduction programmes. The result would be to turn the current emphasis around, focusing on policies that aim to discourage deforestation, to encourage the conversion of marginal agricultural land to forests, and for priority implementation of SFM in countries with high forest cover, all of which would improve adaptive capacity while contributing to mitigation (Plantinga and Richards 2008). Unfortunately, the second shortcoming is the lack of funding, and separating forest programmes from emission allowance programmes will probably make this worse by removing an important potential source of investment (Aldy and Stavins 2008). The current levels of pledges for financing climate-change mitigation and adaptation options through the GEF and GEF-administered funds amount to USD 90 million for the SCCF, USD 180 million for the LDCF and USD 50 million for the SPA. Currently, the AF is worth about EUR 50 million. Considering the number of CDM projects in the pipeline, this figure will rapidly increase to an estimated USD 80–300 million in the period 2008–2012. Yet, these funding resources are insufficient to cover even the costs of adaptation of forests and people to climate change in developing countries, even if they were not needed for anything else. However, as to future developments, the Bali Plan of Action includes consideration of enhanced action on the provision of financial resources and investment to support action on mitigation, adaptation and technology cooperation.

REDD's funding gap is not very different. The opportunity costs of REDD are estimated at USD 12.2 billion per year, considering that the annual deforestation in tropical countries amounts to 12.9 million ha (UNFCCC 2007, quoted by Simula 2008). This amount is not in balance with the current funding sources of regulatory and voluntary carbon markets, governmental initiatives and the Forest Carbon Partnership Facility. Funds to be raised from carbon markets are difficult to estimate. Presently, there are about 20 governmental initiatives to provide funding for tropical forest conservation. The most important ones are the Amazon Fund (launched in August 2008) with an initial target of USD 1 billion per year; the Congo Basin Forest Fund (launched in June 2008)

with grants from the British and Norwegian governments of together USD 216 million; Australia's International Forest Carbon Initiative of about USD 186 million. Norway has started to implement a programme with an upper limit of funding of USD 600 million per year. Finally, the target capitalization of the FCPF is at least USD 300 million. Although these figures show the readiness for action and willingness to pay, there is still a huge gap between the needs and actual funding for REDD (Simula 2008).

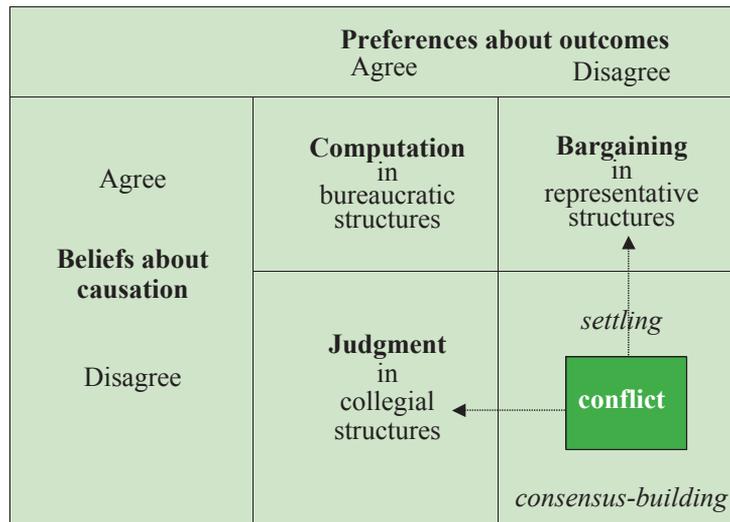
## 7.5 Conclusions

### 7.5.1 General Findings

This assessment of policy and governance options for the adaptation of forests to climate change began by noting the difficulty of carrying out such an assessment given the current state of knowledge about climate-change impacts on the ground. Lacking basic biophysical information about the adaptive capacity of forest ecosystems creates uncertainty about socio-economic vulnerabilities and management options. This, in turn, makes it difficult to generalize about governance capacity, our ability to create the appropriate framework of institutions, and policies that will promote adaptation to climate change. None the less, it is clear that climate change raises two general challenges at which policy and governance will be directed.

The first problem is to integrate adaptation to climate change into SFM. As a result of the various SFM dialogues that have taken place over the last decade, considerable progress has already been made on agreement about the goals, but the means remain contested. At the management-unit level, everything depends on the forest site (see confirmation of Wilhelm Pfeil's 'iron law of the site' in Chapter 6). The solution needs 'consensus-building' (Lee 1993) among all forest stakeholders. Once agreement on goals becomes more widespread, for example as the result of a NFP, the question of appropriate means can more easily be dealt with. Forest managers who are familiar with the relevant causal factors affecting forest health will play a larger role, guided by outcomes-based performance standards. As Lee states, this strategy benefits from major changes introduced from outside, so that new issues and new alignments of parties and interests can supplant existing lines of division. Adaptation of forests to climate change is such a driving force from outside, with significant potential to create a realignment of interests. According to this strategy we have proposed a number of policy tools to address adaptation.

The second problem is that climate change cre-



**Figure 7.2 Social decision-making under varying conditions of agreement (Lee 1993, p. 106).**

ates new pressures for increased deforestation and forest degradation, both as an attempt to compensate for lost agricultural productivity from drought or diseases and for growing biofuel crops to replace fossil fuels. The severity of the problem is compounded by the weakness of the international forest regime and its current lack of effectiveness in combating existing drivers of deforestation: ‘deforestation is a symptom of a multi-causal disease for which a proven cure does not yet exist’ (Streck et al. 2008, p. 247). Thus, efforts must be directed towards obtaining agreement on the causes of deforestation, which is more difficult when climate-change drivers are added to the existing mix of causes. As Lee (1993, p. 108) argues, ‘this strategy launches a process of bargaining and negotiation, usually by representatives of larger groups or interests.’ He calls this intervention method ‘settling’, ‘since the aim of the negotiation is not to achieve final resolution of conflict, but rather to hammer out joint actions within a relationship in which all parties are aware of and retain opposed interests’ (Lee 1993). In that case, collaboration of the participants has often to be forced from outside by government or international donor organizations. Agreements in such negotiations can be facilitated by the pressure from deadlines or from threats to cut funding. The ongoing negotiations on REDD are an example of settling in Lee’s sense.

The solution of both problems can be illustrated by Figure 7.2. It represents a typology of social decision processes depending on agreement or disagreement over goals (preferences about outcomes) and agreement or disagreement over means (beliefs about causation).

### 7.5.2 Specific Findings

#### *Consensus Building*

The appropriate policy instruments here are procedural and stress multi-stakeholder collaborative processes. The process of consensus-building will typically take place in these large-scale stakeholder consultations, for example in NFPs and NASs (National Adaptation Strategies), which must be strengthened. Thus, building capacity to conduct these exercises, especially in countries without a strong consultative tradition (which includes many developed countries), must be a priority. The C&I for SFM should be modified to include criteria for vulnerability and adaptive capacity. The NLBI should retain the promotion of NFPs in its strategic objectives, while adding a fifth objective that makes explicit reference to climate-change adaptation.

While consensus-building is taking place, the central message about the choice of policy instruments is to encourage experimentation and provide maximum flexibility for local innovation. For this reason, traditional policy mixes that combine regulation and subsidies are unattractive. The ability to produce efficient and reasonable outcomes in the face of what is expected to be changing (perhaps rapidly changing) conditions requires flexible policy instruments. In particular, given the need to encourage and reward successful innovation and technical progress in forest management, market-based instruments are preferred. SFM standards should be developed in the direction of performance or outcome standards rather than prescription. Voluntary agreements, labelling and other means of providing information can be used to address the complexities and uncertainties

of the ecological issues at stake. Promoting adaptive practices through certification is promising in this respect, although, as noted above, only when forest products are traded into markets that are sensitive to environmental concerns.

On forest governance to promote consensus building, it has been emphasized throughout the chapter that, although adaptive policy needs a forest focus, it cannot ignore the many drivers of change that originate in other sectors. Forest governance must continue to work towards better inter-sectoral coordination as a first step towards an integrated approach to land use and land management. Unrelated developments in agriculture, energy, transportation, conservation and even macroeconomic policies can have dramatic effects on the incentives to destroy or degrade forests. There are no easy answers here. Studies continue to show that policy integration is usually hampered by profound policy legacies, including the familiar administrative ‘silos’ that result in distinct land uses having their own planning, permitting and monitoring regimes with their own powerful client groups and political champions. Again, policy-makers need to seize opportunities to demonstrate the benefits of tackling adaptation through integrated land use at the project level rather than attempting large-scale transformative changes that almost always fail (Lim et al. 2004).

### *Settling*

The creation of joint actions in which participants set aside their differences about goals and priorities to search for effective policy means starts with broad agreement on at least two policy tools: portfolio financing and research. With respect to financing, there is a substantial shortfall in both the amounts and the precise targeting of funding necessary to reduce deforestation to the levels required. For this reason, a broad approach to financing is needed, one that does not rely on a single, one-size-fits-all mechanism. In spite of the risk of negative interactions between different international regimes, it is important to continue to look for synergies with climate-change programmes for meeting the projected funding shortfall for adaptation, while simultaneously seeking to restore ODA funding for SFM under the NLBI. As the evaluations of the World Bank Forest Strategy clearly showed, financial incentives are very effective policy levers, and it is better to learn pragmatically how to improve their precision as we go along rather than refraining from using them at all until they are refined to everyone’s satisfaction.

Another critical subcategory of programmes involves research. There will be less need for ‘settling’ and more opportunities for consensus-building once the scope, scale and direction of climate-change im-

pacts are more clearly understood and vulnerability assessments can be produced at regional and local scales. Assessments that can clearly distinguish the background adaptive capacities of ecosystems from vulnerabilities caused by social impacts and weak governance capacities should be a priority. Once these assessments can be carried out, the necessary scale of the interventions needed to address social impacts and strengthen governance capacities will become clearer and it will be possible to move on to prioritizing goals.

In the meantime, especially at the level of specific policy instruments, it is inevitable that these programmes will continue to experiment with a broad range of tools that are intended to compensate local economies for the global benefits that they are providing and to transfer best practices. These experiments must be encouraged and allowed to continue. When coupled with better monitoring and evaluation, a variety of programmes is highly desirable as a means of promoting policy learning and improving the rewards of joint action. However, the same variety demands greatly improved coordination between these regimes to ensure that adaptation is pursued hand in hand with climate-change mitigation, human security, biodiversity conservation and many other equally desirable global goals whose relative priority is a major source of disagreement.

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