Chapter 15

Integrated Responses

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Main Messages

Integrated responses intentionally and actively address ecosystem services and human well-being simultaneously. They are gaining in importance in both developing and industrial countries, albeit with mixed results. Although many integrated responses make ambitious claims about their likely benefits, in practice the results of implementation have been varied in terms of ecological, social, and economic impacts.

Integrated responses are closely allied to the concept and implementation of sustainable development. The interrelationship between ecological, economic, and social systems and the motivation to bring them together in policy and other interventions links the two.

Trade-offs and synergies are central to the development of integrated responses. Integrated responses seek to explicitly manage trade-offs and to identify positive and negative synergies between different objectives and between ecosystem services and human well-being.

Integrated responses occur at international, national, and sub-national levels. Examples at the international level include some multilateral environmental agreements, and international agreements such as the Rio Conventions. Policy integration is a growing feature of many national governments. This is evidenced through national strategies for sustainable development and many other initiatives. Integrated responses are perhaps more usually associated with sub-national and local programs, including multisectoral approaches such as integrated coastal zone management and integrated river basin management.

Many integrated responses occur simultaneously at multiple levels. Integrated responses may be "nested" within different discrete levels, for example, the embedding of Local Agenda 21 within national strategies for sustainable development, developed under the overall framework of Agenda 21. Integrated responses may also be of a multiple scale, and not related to distinct government or administrative levels, but to geographical units such as a watershed or a transboundary marine ecosystem.

Scale issues are critical in integrated responses, and cross-scale responses are necessary. Integrated responses are often deemed successful at a small-scale, or in a particular locality. However, their effectiveness is limited when constraints are encountered at higher levels, such as in legal frameworks and in government institutions. There appear to be limits to scaling up, not only because of these higher-level constraints, but also because of so-called "leakage" problems. These occur when interventions at a local level address only direct, rather than indirect, or underlying drivers of change. Examples might be where integrated conservation and development projects cause increased migration into buffer zones, or where a carbon forestry project shifts deforestation to another location. In these cases, the problems of ecosystem degradation are merely shifted from one location to another. Cross-scale responses may be better able to deal with both the higher-level constraints and leakage problems, and simultaneously tackle the regional and national, as well as, local drivers of change. Examples of successful cross-scale responses include some co-management approaches to natural resource management in fisheries and forestry, and multistakeholder policy processes.

Integration is also about getting a wider range of actors involved in policy processes and about different forms of intervention and action. Successfully integrated responses usually include the active participation of key stakeholders. Increasingly, they are associated with the application of multistakeholder processes and with decentralization, and they may include actors and institutions from the government, civil society, and the private sector.

Implementing integrated responses is resource intensive, but the potential benefits can exceed the costs. Integrated responses are inherently complex, often entailing a combination of actions in a range of domains and at different scales. This can be very costly and requires specialized skills and knowledge. For example, the costs of bringing stakeholders to the negotiation table and of employing participatory methodologies in decision-making are often high. However, if decisions command the broad support of stakeholders, they are more likely to be successfully implemented.

Politics plays an important role in integrated responses at all scales. As integrated responses require bringing together a variety of institutions and individuals with vested interests, and negotiating trade-offs between sectors and actors, collaboration and compromise play a vital role. Successful integrated responses often incorporate conflict resolution mechanisms and deliberative inclusionary processes into their decision-making and management procedures.

Integrated responses do not necessarily bring about more equitable distribution of benefits to stakeholders. It cannot be assumed that integrated responses are more or less likely to deliver their stated objectives than non-integrated responses. In most cases integrated responses meet *some* of their objectives, but not all. Many integrated responses assume that there are synergies between objectives and fail to adequately consider and evaluate trade-offs. This results in unexpected or unanticipated problems and costs, both to ecosystems and society. Generally, the distribution of benefits is not equitable, and this stems from an inadequate consideration of the social, economic, and political dynamics of society. In a number of cases, the failure to appreciate the heterogeneity of communities, property rights, and access to resources, power, and knowledge of different sectors within society are of critical importance and need to be fully understood.

Integrated responses require multiple instruments for their implementation. Integrated responses have a complex nature, because of their multiple objectives and often multiscale characteristics. Therefore, a single instrument is rarely adequate to implement them. Market-based and economic instruments are used with increasing frequency in integrated responses, for example, in river basin management and sustainable forest management, but they usually need to be accompanied by other instruments. These are likely to include redistributive measures and property rights adjustments (for example, when setting up new markets) and institutional development and capacity building. Integrated responses, therefore, require a careful coordination of multiple instruments.

Integrated responses are long-term undertakings not short-term projects. A review of the literature indicates that integrated responses cannot be treated as finite, time-bound projects, nor can they easily be added on to existing policies and interventions. They often require a longer timescale before impacts can be realized or a broad constituency of support can be established. Integrated responses, therefore, should be seen as intrinsic components of long-term changes in environmental governance.

Integrated responses require fundamental shifts in governance institutions in terms of skills, knowledge capacity, and organization. The experience of many integrated responses shows that the conventional organization of governance institutions militates against successful design and implementation of integrated responses, because the institutions are separated along sectoral lines. This is especially true for government organizations, in both industrial and developing countries, and creates barriers in the transmission of knowledge and information and collaboration across the boundaries of organizations. Within organizations, power and prestige is maintained and conferred by defending knowledge rather than sharing it, resulting in "turf defending"

behavior, which needs to change in order to better support integrated responses.

Knowledge gaps are persistent and inhibit integrated responses. Knowledge gaps are prevalent in several different dimensions and constitute significant constraints to the more widespread successful implementation of integrated responses. Science itself is defined in disciplinary terms, and this undermines more holistic inclusionary approaches to understanding complex social and ecological systems. Furthermore, information needs to be shared and coordinated across disciplines and organizations.

Assessing integrated responses, assessing trade-offs and providing decision support requires multidisciplinary methods and techniques to capture the multiple impacts and assess multiple goals. Examples of good practice can be found in a number of multidisciplinary techniques such as Multicriteria Analysis. When used collaboratively within a multistakeholder process, these can help in the analysis of trade-offs, reconciliation of conflicts, and development of adaptive management strategies.

15.1 Introduction

Integrated responses are those that intentionally and actively address ecosystem services and human well-being simultaneously. Box 15.1 expands and explains this definition, although integration will be different in each specific context. In a broader sense, terms such as "mainstreaming" or "coordination of" are often used synonymously for integration.

This chapter synthesizes and further analyses the findings presented earlier in this volume by assessing the main features of integrated responses and their effectiveness, using examples from international, national, and sub-national scales.

Attempts to address the impacts of human activities on ecosystems have traditionally been based on sector-by-sector approaches, which ultimately have resulted in fragmented actions and institutions. Such approaches have not achieved optimum results as the linkages and interactions between natural and social systems have been largely ignored, compromised, or not sufficiently strengthened.

Consequently, the necessary adoption of responses that integrate ecological, economic, and social goals to achieve multiple and cross-cutting benefits for present and future generations is increasingly recognized. Integration has become an important concern in thinking about and putting into place sustainable solu-

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BOX 15.1
Definition: Integrated Responses

Integrated responses are those which intentionally and actively address ecosystem services and human-well-being simultaneously.

Integrated responses ideally involve all key stakeholders and span different institutional levels horizontally and vertically.

Integrated responses operate on different scales, mainly international, national, and sub-national. These scales are interrelated and determine and influence each other.

Integrated responses, even if primarily focusing on a particular ecosystem service, aim to address their specific impacts holistically, that is, in view of the related impacts on other ecosystem services, and their consequences for human well-being.

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tions that support human development (Folke et al. 2002; Gunderson and Holling 2002).

The concept of integration is attractive, particularly, as it implies synergies or win-win solutions for complex problems. Trade-offs or adverse consequences, as well as the costs of integration are, however, less regularly considered.

The concept of integration is strongly associated with systems thinking, which has gained much currency in debates on the environment in the past few decades (Berkes and Folke 1998; Berkes 1996; Costanza and Folke 1996). This holistic understanding also underscores "sustainability science," which can be considered as an integrative approach that blends concepts from various disciplines (Kates et al. 2001; Gunderson and Holling 2002; Adger et al. 2003). Integrative responses, therefore, serve as a significant step toward the universal goal of sustainable development.

15.2 Dimensions of Integrated Responses

Integration can be understood in several ways. First, conceptually, in the way the linkages between social and ecological systems are understood and different kinds of knowledge brought together. Second, institutionally, in the way that concerns for ecosystem services and human well-being are addressed in the formulation of legal frameworks, property rights, and in the organization of the government, civil society, and the private sector. Third, in the way in which policies, decisions, and management interventions are implemented at different scales.

15.2.1 Linkages between Social and Natural Systems

Concerns about integration have grown since sustainability became a prominent concept and paradigm guiding policy. It is widely accepted that sustainable development requires the integration of social, economic, and environmental goals. However, debates surrounding sustainability have also motivated more fundamental changes in worldviews, which call for an integrated perspective on social and ecological systems or society and nature. It is no longer sensible to view environment and society as two separate entities. Scientists have begun to argue that the distinction between them is artificial and arbitrary (Berkes and Folke 1998). Human societies affect ecosystems and environmental conditions and, likewise, environmental conditions and ecosystems both impose constraints on, and provide opportunities for, societal development. Societies co-evolve with nature through dynamic and reflexive processes occurring at a variety of scales, from local to global. An emerging body of theory defines such co-evolving systems as linked socioecological systems (Berkes and Folke 1998; Gunderson and Holling 2002; Olsson et al. 2003). Integration, therefore, begins with the recognition that environment and society are closely linked.

Ecosystems are complex, heterogeneous, and evolving. They often extend across administrative boundaries and are nested in larger landscapes. In contrast, the institutions that manage them tend to formulate "blueprint"-style responses that are designed to be applicable in a wider set of circumstances and that are not context specific or sensitive to local conditions. They are also resistant to change, inflexible, and are very defensive of their administrative territory. There is often a fundamental mismatch between institutions and the dynamic characteristics of ecosystems. Inadequate responses to environmental issues often result from this mismatch, which has been designated "problems of fit" between institutions and ecosystems (Young 2002; Folke et al. 1998).

Problems of fit have two sides. One is the misfit that often exists between environmental governance regimes and the ecosystems they are concerned with managing. The other concerns the misfit between the institutions themselves and the economic, social, and political contexts in which they operate (Brown and Rosendo 2000). Misfit in institutions refers to different and often conflicting goals, inability to cooperate, and failure to consider context-specific social, economic, and environmental factors. Integration can be understood as an attempt to address problems of fit.

There is an emerging consensus about the need for a fundamentally different scientific approach to meet sustainability challenges—an approach that is capable of bridging the divide between disciplines that analyze the dynamics of ecosystems and those that analyze economics and social interactions (Scheffer et al. 2002). A concern has begun to emerge within many disciplines themselves regarding the importance of synthesis and integration with other disciplines. These concerns are being reflected in new interdisciplinary and multidisciplinary research initiatives and institutions. Thus it would appear that designing strategies to achieve sustainable environment–society interactions requires integration, in this case, of scientific disciplines (Adger et al. 2003). Sustainability science, for example, has recently emerged as an integrative approach that blends concepts and understandings from across disciplines (Kates et al. 2001).

There is also a call for integration of different kinds of knowledge. Interventions to address the decline of ecosystems have drawn mostly on western scientific knowledge and worldviews. This has resulted in the exclusion of other equally valuable and valid types of knowledge. In the social dimension, integration can be about the combination of different disciplines and knowledge systems.

15.2.2 Integration of Different Actors, Stakeholders, and Institutions

A growing body of evidence suggests that addressing environmental problems or managing natural resources often requires collaboration between different actors (see, for example, the literature on co-management and decentralization). The idea is to involve all relevant stakeholders and make use of their comparative advantages. For example, many local communities, who are dependent on natural resources for livelihoods, are deeply knowledgeable of their environment and demonstrate the capacity to define common rules and sanctions, all of which contribute to making them potentially effective resource managers (Ostrom 1990; Gibson et al. 2000). However, on their own, these actors are unlikely to be able to deal with wider pressures and constraints, such as the ones brought about by globalization. Other actors have the outreach and capability to address such constraints, examples being governments, NGOs, businesses, and donors. Underpinning stakeholder involvement is the notion of participation, which has become a central ingredient to improve the effectiveness, legitimacy, and equity of environmental governance (World Bank 1996). Participation and stakeholder inclusion can be seen as a form of integration between different actors concerned with environmental management.

15.2.3 Horizontal and Vertical Integration

Integration can be referred to as either horizontal or vertical. Horizontal integration implies achieving greater coherence within and among sectors and institutions. It is about promoting linkages within the same level of social organization. A horizontally integrated response is one that links actors, stakeholders, and institutions at the same level or scale. Vertical integration implies linking discrete levels of governance, from local to international, and institutions across different levels.

Vertical integration is important in contexts where hierarchical forms of management dominate, which in the absence of collaboration and coordination tend to lead to fragmented responses unable to deal with complex problems. It is also crucial when promoting collaboration between actors at different scales. A vertically integrated response is one that addresses a given issue at multiple scales.

Responses can also integrate across different sectors and scales (Berkes 2002). A cross-scale response is one that works across different issues and multiple scales simultaneously. Integration, therefore, can also be understood as promoting cross-scale approaches.

15.2.4 Assessing Integrated Responses

Integrated responses represent a diverse set of interventions and approaches. This assessment defines integrated responses as those that intentionally and actively address ecosystem services and human well-being simultaneously; in other words, they have more than one objective—one or more related to ecosystems, and one or more targeted at aspects of human well-being or development. Integrated responses include direct interventions or actions ''on the ground,'' but also national and international policies and programs that in turn support these actions. Table 15.1 characterizes some of these integrated responses. Though it is a selective list, it illustrates the range of integrated responses in terms of their scale, objectives, the key actors involved, and the instruments used. It highlights the cross-scale nature of many integrated responses (for example, Agenda 21) and the participation by government and civil society actors in many of them.

As Chapter 3 explains, a variety of approaches and tools can be used to make an assessment of responses. In this section, integrated responses are assessed to identify lessons learned and the important constraints and enabling factors. Where possible, meta-analyses and reviews have been utilized to inform the assessment, then case studies are employed to exemplify or illustrate key points. The key questions which guided this assessment are as follows:

What drivers of change does the response seek to address? Which are the important actors—government, nongovernmental organizations and civil society, or the private sector? What scale is the response focused on?

Although many integrated responses include actors from different sections of society, they will be initiated by a specific set of actors. For example, although many of the national-level responses (NEAPs, Local Agenda 21) are initiated by government institutions, they will also seek to include actors from different walks of life and, often, at different scales (international-national-local) as in the case of Agenda 21.

What instruments are used to implement integrated responses?

Many different instruments are used to implement or bring about integration. The instruments used depend on the objectives of the responses and which drivers it addresses, the scale at which it occurs, and the actors involved. Integrated responses include economic, legal, and institutional instruments, voluntary approaches and partnerships, projects and mechanisms specific to particular sectors and contexts.

What impacts on ecosystems and human well-being can be identified?

Evidence on the impacts of integrated responses is reviewed, and where possible general trends are identified and lessons drawn. Trade-offs and synergies are considered and explained where they are found.

Table 15.1.   Assessment of Integrated Responses

Integrated Response	Drivers Addressed	Ecosystem Services Concerned	Aspects of Human Well-being	Scale	Key Actors	Instruments Used
Multilateral Environmental Agreements, including CBD, CCD, UNFCCC	habitat conversion, trade in wildlife and other species, overharvesting	biodiversity, cultural services, and others	equity, health, and others	global and international	governments, civil society, private sector, multilateral agencies	legal instruments, voluntary instruments (for example, codes of ethical conduct, guidelines, reporting), financial and market-based instruments
Agenda 21	numerous	potentially all	all	local, national, and global	international organizations, governments, civil society, and private sectors	voluntary instruments, primarily plans of action
National Environmental Action Plans	numerous, including land use change and climate change	biodiversity, water quality, food, wood and woodfuel, nutrient cycling, waste	all	national	national governments, donors	legal and voluntary instruments including capacity building
Integrated Conservation and Development Projects	overharvesting, land conversion and fragmentation	biodiversity	economic and income generation	sub-national	civil society, NGOs, private sector, donors, and governments	market-based, legal, and institutional instruments
Sustainable Forest Management	land use change, deforestation	wood and woodfuel, water, biodiversity	incomes, equity, livelihoods, vulnerability	sub-national	government and civil society groups, some private sector	voluntary and market-based instruments, including fair trade, partnerships, labeling, and certification
Integrated River Basin Management	pollution	provision, regulation, cultural	material, health, production, and livelihoods	sub-national, occasionally transnational	government, NGOs, civil society, private sector	legal, regulatory, institutional, and market-based instruments
Integrated Coastal Zone Management	land use change, pollution, overfishing	biodiversity, water quality, food, wood and woodfuel, nutrient cycling	incomes and livelihoods, health, vulnerability	sub-national, regional, transnational, or national	government, civil society, business sector	regulatory, legal, institutional (property rights) instruments

What are the enabling conditions and constraints to integrated responses, what lessons can be drawn from the assessment?

The specific and general issues affecting responses are outlined. However, difficulties exist because many integrated responses have multiple objectives, so it is often difficult to define success. Frequently, integrated responses are successful or effective in meeting some, but not all, of their objectives. They may have unplanned or unforeseen benefits or costs. This may be where explicit recognition of trade-offs between objectives is necessary. Drawing lessons across different types of integrated responses can also be difficult given their very diverse objectives, settings, and scales.

The responses are categorized according to the scale at which they are primarily focused: international, national, and sub-national. At the sub-national level, a number of quite different responses are assessed, but they each link ecosystems and human well-being (for example, integrated coastal zone management, and integrated conservation and development projects). Many integrated responses work across scales and link levels of governance in multi-level and cross-scale responses, so although the text is arranged in three sections, the divisions between the scales or levels are often blurred and many of the responses may fit together as nested initiatives. For example, Agenda 21 is an international integrated response, linked to national strategies for sustainable development and to Local Agenda 21 programs. Integrated conservation and development projects may be nested within a regional biodiversity conservation strategy, which in turn is nested within the settings of the Convention on Biological Diversity. Sustainable forest management approaches may be reflected in national forest strategies, the implementation of sub-national projects, as well as international agreements. The linkages between the scales and levels are therefore considered.

15.3 International Responses

In the 1970s, consensus began to emerge regarding the need for concerted action at the international level to protect the life-sustaining processes of Earth's biosphere. The 1972 United Nations Conference on the Human Environment held in Stockholm was groundbreaking in this respect, pulling together scientific evidence regarding the impacts of human activities on the global environment and establishing the United Nations Environment Programme. Throughout the 1980s, various reports attempted to bring global environmental issues to the attention of governments, the most influential being the 1987 *Our Common Future*

report produced by the World Commission on Environment and Development, known for having popularized the concept of sustainable development (WCED 1987). The 1992 United Nations Conference on Environment and Development, held in Rio de Janeiro, also known as the Rio or Earth Summit, resulted in internationally recognized governance structures for global environmental management. Agenda 21 and the Rio Principles were regarded as significant turning points in redirecting national and international policies toward the integration of environmental dimensions into economic and developmental objectives (UNEP 2001, p. 7). It is, however, also argued that the Rio process contributed much to the existing incoherent structure for international environmental governance.

The 2002 World Summit on Sustainable Development provided an opportunity for the international community to review the progress in the implementation of UNCED outcomes. The WSSD Plan of Implementation has been designed as a framework for action to implement the commitments of the Rio Summit and Agenda 21 (IISD 2002). Much of the criticism of WSSD focused on the fact that hardly any binding agreements were endorsed and that some issues were even negotiated backwards (IUCN 2002). The perceived accomplishments of WSSD when compared with the environment-focused Rio Summit included the stronger integration of social and economic needs, and the stronger involvement of non-state actors such as the private sector and NGOs, in concrete, implementation-oriented, public-private or ''Type II'' partnerships (IISD 2002; Witte et al. 2003).

The following section discusses key international response processes, namely Agenda 21 and its follow-up, international environmental governance, multilateral environmental agreements, and the debates surrounding trade and environment.

15.3.1 Agenda 21

Agenda 21, as a major outcome of 1992 Earth Summit, was designed as a comprehensive strategy to address environment and development challenges. Its main goals encompass poverty alleviation, equitable economic growth, conservation, sound management of natural resources, and stakeholder inclusion. As such, it serves as a conceptual framework for integrated responses aimed at sustainable development on different scales, across different drivers and actors.

As a concept, Agenda 21 does not provide any distinct methodology towards the development and implementation of responses across drivers, scales, or actors. However, through Agenda 21 an attempt was made to address and relate to each other the direct drivers (such as land cover change, air and water pollution, and over harvesting) and indirect drivers of change. The latter are primarily economic, sociopolitical, scientific and technological, and cultural in nature.

Chapter 8 of Agenda 21 outlines a programmatic approach for integrating environment and development at the policy, planning, and management levels. The overall objective is to improve or restructure decision-making processes so that the consideration of socioeconomic and environmental issues is fully integrated and a broader range of public participation is assured. Suggested activities include, inter alia:

- conducting a national review of economic, sectoral, and environmental policies, strategies, and plans to ensure the progressive integration of environmental and developmental issues;
- strengthening institutional structures to allow the full integration of environmental and developmental issues, at all levels of decision-making;

- developing or improving mechanisms to facilitate the involvement of concerned individuals, groups, and organizations in decision-making at all levels; and
- establishing domestically determined procedures to integrate environment and development issues in decision-making. Setting priorities is left to national governments in accordance with their prevailing conditions, needs, national plans, policies, and programs.

At the international level, Agenda 21 calls for, among other things, (1) availability of funding mechanisms, including public and private funding and international development assistance, to support the transition to sustainability; (2) the adoption of ecologically sound technologies, which in turn requires (3) research for technological innovation and technology transfer from industrial to developing countries; (4) improved scientific knowledge of social and ecological systems and their linkages, (5) education, training, and capacity building; and (6) international and national legal instruments and mechanisms. Most of these requirements are constrained by either lack of funding, limited transfer of technologies and scientific knowledge, or limited enforcement of binding legal instruments (UNESC 2002; UNU 2002a).

At the national level, Agenda 21 introduced the concept of national strategies for sustainable development (discussed below) as a means for integrating economic, social, and environmental objectives into overall planning and with the participation of non-state actors. Agenda 21 resulted in a variety of follow-up initiatives on the local level by local authorities and civil groups. Many Local Agenda 21 projects were particularly successful in implementing the often abstract concept of sustainable development into tangible results for local stakeholders. (See Box 15.2.) Key elements of these projects included (1) multisectoral engagement in the planning process, (2) consultation with stakeholders, (3) participatory assessment of local social, economic, and environmental conditions and needs, (4) participatory target setting, and (5) monitoring and reporting procedures, including local indicators (ICLEI 1996).

Over the past decade, public-private partnerships have been an emerging tool of integration between different sectors and across stakeholders on given subjects of sustainable development. Many of the Local Agenda 21 projects are pioneering public-private partnerships for that reason. While such partnerships cannot be accepted as a substitute for government and intergovernmental binding regulation, they are, however, considered by many as an effective complementary approach for implementing Agenda 21 and the WSSD Plan of Implementation (Witte et al. 2003; UN 2003). Almost 300 public-private partnerships were concluded during WSSD, involving different sets of governments, international agencies, local authorities, business, and civil society organizations (UN/DESA 2002). However, the lack of specific guidelines for the coherence, accountability, and evaluation of such partnerships caused much criticism, mainly from nongovernmental organizations (Witte et al. 2003). Since many of these partnerships have just been started, it is too early to assess their integrative function.

15.3.2 International Environmental Governance

The need for international approaches to tackling environmental issues derives from the many cases of transboundary initiatives or disputes over management of resources, such as regional waters or the transport of hazardous waste. International environmental governance as a term bundles all international efforts to set coherent and achievable policies and coordinated actions in response to

> **BOX 15.2**
> ## Local Agenda 21: The Case of the United Kingdom (ICLEI 1996)
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> The United Kingdom Local Agenda 21 National Campaign was established in 1993 by the country's five local authority associations—the Association of District Councils, the Association of County Councils, the Association of Metro Authorities, the Confederation of Scottish Local Authorities, and the Association of Local Authorities in Northern Ireland. The establishment of the Campaign followed the participation of these associations in the U.K. national delegation to UNCED. Since then, the Campaign has recruited more than 60% of the United Kingdom's local authorities to commit to a Local Agenda 21 planning process. The Campaign has also served as an organizational model for the creation of Local Agenda 21 campaigns across the world.
>
> The first step in the creation of the Campaign was the establishment of a steering committee, made up of senior local elected officials, to govern the Campaign's activities. The steering committee recruited the Local Government Management Board—a technical agency of the local authority associations—to serve as the Campaign secretariat. Recognizing the multisector and partnership-building approach to Local Agenda 21, the voluntary membership of the steering group was soon broadened to include senior representatives of environmental NGOs, the business sector, women's groups, the educational sector, academia, and trade unions.
>
> For their first task, the steering group defined the substantive elements of Local Agenda 21 in the U.K. context, recognizing the need to implement these elements differently according to local circumstances. The first two elements focus on the internal operations of local authorities: managing and improving municipal environmental performance and integrating sustainable development into municipal policies and activities. The other four elements focus on the local community: awareness-raising and education; public consultation and participation; partnership-building; and measuring, monitoring, and reporting on progress towards sustainability.
>
> The Campaign then developed manuals, tools, pilot projects, and seminars to assist local authorities to take action in each of these areas. A *Step-by-Step Guide to Local Agenda 21* and also a variety of guidance documents on specific aspects of Local Agenda 21 planning were published. In addition, a national database and a monitoring scheme for the implementation of Local Agenda 21 have been set up.
>
> The U.K. Local Agenda 21 quickly became part of everyday business for the majority of U.K. local authorities. The high rate of success in such a short period of time is ultimately based on the readiness of local authorities to actively commit themselves to a leadership role in sustainable development.

global environmental change across a wide range of drivers, actors, and scales.

There is much variation in the extent to which existing international responses can be considered integrated. IEG occurs through (1) promotion of international cooperation and coordination, (2) emphasis on sustainable development, (3) involvement of stakeholders and governance structures at multiple levels, (4) the cross-cutting nature of the issues addressed, and (5) linkages among the institutional arrangements involved.

Over the past thirty years, IEG has evolved from a focus on specific issues and regions, to an emphasis on cross-cutting themes and global strategies (UNEP 1999, 2001a). This evolution denotes a greater concern with developing integrated responses at the international level. The strategies and international agreements resulting from the Earth Summit in 1992 (Agenda 21 and the Rio conventions) are explicitly concerned with integration under the broad principle of sustainable development, including economic and social development as well as environmental protection.

IEG is primarily facilitated through the U.N. system. The United Nations Environment Programme holds the principal environmental mandate within the United Nations for environmental policy coordination (see UNEP Malmö Declaration). However, in practical terms UNEP as a U.N. program (rather than a full-fledged U.N. specialized agency or organization) does not have the financial resources to lead the international environmental governance process appropriately (UNEP 2001a; WBGU 2001). UNEP also shares the responsibilities for environmental issues with many other U.N. and Bretton Woods bodies. In fact, the U.N. system appears too fragmented in design, too sectoral in its approach, and too incoherent in its decision-making to address global environmental issues effectively (WRI 2003; WBGU 2001).

Widely accepted underlying concepts in IEG include key principles such as Rio Principle 7 ("Common but differentiated responsibilities") and Rio Principle 15 ("Precautionary approach") (UNCED 1992). Applying these principles, however, has been problematic. With respect to global responsibilities North-South disagreements are common over who is responsible for global changes, who is affected by its consequences, who should act in response, what should be done, and who should pay for it. National interests also continue to undermine efforts at creating and strengthening international environmental regimes for certain thematic areas following the precautionary approach, in particular if national social and economic interests are concerned (WBGU 2001; Figueres and Ivanova 2002).

Judged by the participation of civil society groups in large international meetings, such as WSSD and UNCED, the active involvement of such groups seems strong. Civil society continues to have little to no direct power in IEG, yet the organizations have a strong voice. Few governments include NGO representatives in their national delegations, for example, for meetings on multilateral environmental agreements. Clear and transparent rules for the selection of NGOs attending such international meetings are often lacking, as in the case of the United Nations Convention to Combat Desertification. Some convention secretariats maintain regular contacts with civil society organizations, so-called multilateral consultations or multistakeholder dialogues, and promote consultations with specific groups, such as indigenous peoples or the industry sector. Civil society involvement has made the process of negotiating, revising, and implementing MEAs more inclusive (Gemill and Bamidelle-Izu 2002). However, many technical and open-ended meetings still do not provide for the participation of civil society (Dodds 2001).

Within civil society itself, there are also clear differences in the abilities of different groups to influence outcomes in IEG. International NGOs, for example, tend to be strongly involved in negotiations—perhaps due to their access to information and ability to back their arguments with scientific evidence. The lobbying capacity of the business sector is also powerful, often indirectly through lobbying of national governments. Science and the scientific community play an important role, as both influence the way problems and their solutions are framed. Relevant regional approaches have been made to improve civil society participation

in environmental governance through enhancing access to information, public participation in decision-making, and access to justice. (See Box 15.3.)

The role of the judiciary in the promotion of sustainable development and adequate integration of environmental law is frequently underestimated. (See Box 15.4.) Consequently, the need for awareness raising, cross fertilization and capacity building within the judiciary, law enforcement, and prosecution is easily overlooked.

The main mechanisms of IEG include environmental treaties, so-called Multilateral Environmental Agreements (discussed in the next section) as well as ''soft law,'' which includes nonbinding guidelines, norms, and action plans, which are developed for voluntary compliance by national governments only. Examples include Agenda 21, the UNEP-administered Global Programme of Action to address land-based sources of marine pollution, or the guidelines of the World Commission on Dams. (See Box 15.5.)

Governments increasingly express their concern that the current environmental governance structure is no longer appropriate for tackling the international agenda on environment and development. Reforms will not only have to address compliance, enforcement, and liability, but to obey the common but differentiated responsibilities of developing countries and their right to development (UNEP 2001, p. 27; WBGU 2001). In this context, any approach to reform international environmental governance will need to be responsive on the following:

- *Credibility:* reformed institutional structures must command the universal commitment of all States, based on transparency,

fairness, and confidence in an independent substantive capacity to advise and adjudicate on environmental issues;
- *Authority:* reform must address the development of an institutional mandate that is not challenged. This should provide the basis for a more effective exercise of authority in coordinating environmental activities with the United Nations;
- *Financing:* adequate financial resources linked to broader development cooperation objectives must be provided;
- *Participation of all actors:* given the importance of the environmental consequences of the actions of major groups, ways must be found to incorporate their views in decision-making.

The discussion on the reform of environmental organizations and their structures generally reflects the need for a stronger environment agency (WBGU 2001). Suggestions include, inter alia, upgrading UNEP to a fully-fledged specialized agency or World Environment Organization, equipped with suitable rules and its own budget funded from assessed contributions from member States. Other options include advanced consolidation between UNDP and UNEP or restructuring the United Nations Economic and Social Council (UNEP 2001). In order to decide on the most effective manner of strengthening international environmental governance, the following questions need to be addressed:
- How can coordination and synergies on environment-related issues among various organizations be improved?
- How can the consistency of environmental standards and agreements be enhanced, particularly in the context of envi-

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BOX 15.5

World Commission on Dams (World Commission on Dams 2000)

In 1997, conflicting views of the appropriateness of dams worldwide had resulted in a significant stalemate in development planning. The World Commission on Dams was established by an initiative from the World Bank and IUCN. WCD brought together participants from governments, the private sector, international financial institutions, civil society organizations, and affected people. Public consultation and access to the Commission was a key component of the process. The WCD Forum, with 68 members representing a cross-section of interests, views, and institutions, was consulted throughout the Commission's work. Funding of the WCD, likewise, involved all interest groups. A total of 53 public, private, and civil society organizations pledged funds to the WCD process.

One of the key objectives of WCD was to review the development effectiveness of large dams and assess alternatives for water resources and energy development. The other key objective aimed at developing internationally acceptable criteria, guidelines, and standards, where appropriate, for the planning, design, appraisal, construction, operation, monitoring, and decommissioning of dams.

The WCD final report, *Dams and Development: A New Framework for Decision-Making,* was released in November 2000. The report presents a holistic assessment of when, how, and why dams succeed or fail in meeting specific development objectives. It reflects a comprehensive approach to integrating social, environmental, and economic dimensions of development. It further provides the rationale for a fundamental shift in assessment, planning, and implementation of water and energy resource management, including:

- a rights-and-risks approach as a practical and principled basis for identifying all legitimate stakeholders in negotiating development choices and agreements,
- seven strategic priorities and corresponding policy principles for water and energy resources development—gaining public acceptance; comprehensive options assessment; addressing existing dams; sustaining rivers and livelihoods; recognizing entitlements and sharing benefits; ensuring compliance; and sharing rivers for peace, development, and security, and
- criteria and guidelines for good practice related to the strategic priorities, ranging from life-cycle and environmental flow assessments to impoverishment risk analysis and integrity pacts.

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ronmental and trade agreement, and how will disputes be dealt with?

- What role would civil society, particularly environmental nongovernmental organizations, have in strengthened governance of the global environment?
- What role could be accorded to the private sector?
- What level of financing could be available, and with what level of predictability and stability, to ensure that mandates are realized?

15.3.3 Multilateral Environmental Agreements

Multilateral environmental agreements constitute a very substantial body of international law and the most concrete component of international environmental governance (WRI 2003). There are over 500 MEAs, of which about 300 have distinct regional focuses. The objectives and priorities of MEAs vary significantly, although the core environmental conventions and agreements are basically divided into five thematic clusters: biodiversity, atmosphere, land, chemicals and hazardous waste, and oceans and regional seas. Table 15.2 gives a selective list of major agreements and treaties under each of these thematic clusters.

As a general trend, MEAs have evolved from focusing on single issues such as wetlands, hazardous wastes, or migratory species, to cross-cutting themes such as loss of biodiversity, land degradation, and climate change. The later generation of MEAs, especially the Rio conventions, explicitly express their relevance to sustainable development across different scales (WRI 2003).

However, any international agreement is only effective if implemented by the signatories on a national scale. This requires translation into efficient strategies at national and sub-national level. It also requires encompassing governments and civil society including NGOs, academia, and the business sector (Domoto 2001). In most cases, countries need to adapt or amend national environmental legislation to meet the objectives of MEAs. Specific programs, institutions, and funds are often created to promote their implementation. Furthermore, multilateral and bilateral aid agencies are increasingly making their loans and assistance conditional upon countries adopting environmental mea-

sures, many of which are consistent with the goals of MEAs. From this perspective, MEAs are a potent driving force for national legal and policy changes in relation to the environment (UNESC 2002).

Environmental issues such as desertification, climate change, and loss of biodiversity and forests are multiply interlinked. However, these issues are dealt with separately by different conventions and policy fora, which are negotiated and implemented independently of one another, often by different departments or agencies within national governments. Progress for joint implementation on the level of MEAs (for example, on national reporting requirements) is considered limited (UNEP 2001). Attempts to link the different levels of governance and stakeholders, from local to global, have not been successful in most countries, especially as decentralization and devolution have created additional actors in environmental governance (Dodds 2001; UNEP 2001).

The international regulation of soil resource conservation is an example of thematic and administrative defragmentation that leads to a partial negligence of key environmental issues. Soil is degraded through a range of processes, including desertification and erosion of marginal land, but also by industrial contamination, soil sealing, urban sprawl, and impacts of mining or military activities. On the international level, attention rests with the issue of desertification in arid and semiarid areas as addressed directly in the UNCCD. While the features of soil degradation reach beyond drylands, no further international regulation toward a more sustainable use of soil resources exists. Indirectly, matters related to soil biodiversity or soil contamination are covered by the Convention on Biological Diversity, the Basel Convention, and Convention on Long-range Transboundary Air Pollution.

On the regional level, few legal frameworks exist for the direct protection of soil resources (one example is the Alpine Convention and its distinct Soil Protocol), while other aspects of soil degradation are partly and only indirectly dealt with in other regional frameworks on water, biodiversity, chemicals, or atmosphere (UNEP 2004). Equally, scientific advisory processes, which are essential for adequate assessments, lack a holistic approach on the

Table 15.2.   Major Multilateral Environmental Agreements

Agreement	Aim	Year Adopted	Year Ratified
Atmosphere-related			
Kyoto Protocol to the United Nations Framework Convention on Climate Change	achieve quantified emission limitation of greenhouse gases and reduction commitments (http://unfccc.int/resource/conukp.html)	1997	not yet
United Nations Framework Convention on Climate Change (UNFCCC)	stabilize greenhouse gas concentrations in the atmosphere at a level that prevents dangerous anthropogenic interference with the climate system (http://unfccc.int/index.html)	1992	1994
Montreal Protocol on Substances that Deplete the Ozone Layer	phase out ozone-depleting substances (http://www.unep.org/ozone/index.asp)	1987	1989
Vienna Convention for the Protection of the Ozone Layer	protect human health and the environment against adverse effects resulting or likely to result from human activities that modify or are likely to modify the ozone layer (http://www.unep.ch/ozone/Treaties_and_Ratification/index.asp)	1985	1988
Biodiversity-related			
Cartagena Protocol on Biosafety to the Convention on Biological Diversity	ensure the safe transfer, handling, and use of living modified organisms resulting from modern biotechnology that may have adverse effects on biological diversity and human health (http://www.biodiv.org/biosafety/default.aspx)	2001	2003
International Coral Reef Initiative	stop and reverse the global destruction of coral reefs and related ecosystems such as mangroves and seagrasses (http://www.icriforum.org/)	1995	
Agreement on the Conservation of African-Eurasian Migratory Waterbirds	coordinate measures to maintain migratory waterbird species in a favorable conservation status or to restore them to such a status in the agreement area (http://www.wcmc.org.uk/cms/aew_text.htm)	1995	
Lusaka Agreement on Cooperative Enforcement Operations Directed at Illegal Trade in Wild Fauna and Flora	reduce and ultimately eliminate illegal trade in wild fauna and flora in the agreement area and establish a permanent task force for this purpose (http://www.internationalwildlifelaw.org/lusaka.pdf)	1994	
Convention on Biological Diversity	conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources (http://www.biodiv.org/)	1992	1994
Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas	achieve and maintain a favorable conservation status for small cetaceans in the agreement area (http://www.ascobans.org/)	1992	
Convention on the Conservation of Migratory Species of Wild Animals	avoid any migratory species becoming endangered and improve their conservation status (http://www.unep-wcmc.org/cms/)	1979	1983
Convention on International Trade in Endangered Species of Wild Fauna and Flora	ensure that international trade in specimens of wild animals and plants does not threaten their survival (http://www.cites.org)	1973	1975
Convention Concerning the Protection of the World Cultural and Natural Heritage	protect the world's cultural and natural diversity of outstanding universal value (http://whc.unesco.org/)	1972	1975
Convention on Wetlands of International Importance, especially as Waterfowl Habitat	conservation and wise use of wetlands and their resources (http://www.ramsar.org/)	1971	1975
Chemicals and Hazardous Wastes Conventions			
Stockholm Convention on Persistent Organic Pollutants	protect human health and the environment from persistent organic pollutants (http://www.pops.int/)	2001	
Basel Protocol on Liability and Compensation for Damage Resulting from Transboundary Movements of Hazardous Wastes and their Disposal	provide for a comprehensive regime for liability as well as adequate and prompt compensation for damage resulting from the transboundary movement of hazardous wastes and other wastes (http://www.basel.int/pub/protocol.html)	1999	
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	protect human health and the environment from potential harm arising from the international trade of certain hazardous chemicals and pesticides (http://www.pic.int/)	1998	
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	protect human health and the environment against the adverse effects that may result from the generation and management of hazardous wastes (http://www.basel.int/)	1989	1992

Table 15.2.   Continued

Agreement	Aim	Year Adopted	Year Ratified
Land Conventions			
United Nations Convention to Combat Desertification	combat desertification and mitigate the effects of drought in countries experiencing serious drought or desertification, particularly in Africa (http://www.unccd.int/)	1994	1996
Regional Seas Conventions and Related Agreements			
Global Programme of Action for the Protection of the Marine Environment from Land-based Activities	prevent the degradation of the marine environment from land-based activities by facilitating the duty of States to preserve and protect the marine environment (http://www.gpa.unep.org/)	1995	1995
Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean	eliminate pollution of the Mediterranean Sea area and protect and enhance the marine environment in that area (http://www.unepmap.org/)	1976	
Kuwait Regional Convention for Cooperation on the Protection of the Marine Environment from Pollution	prevent, abate, and combat pollution of the marine environment from oil and other harmful or noxious materials in the region shared by Bahrain, Iran, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (http://www.unep.ch/seas/)	1978	

features of global soil degradation. In a way, soil has been the victim of its own unassuming character: it is difficult to see it as distinct from other milieus, and its slow, complex process of deterioration has not aroused media or public interest (El-Swaify 2000).

With the international MEAs being highly fragmented (from local to global and within governance structures), most governments face a multitude of different departments or national agencies dealing with various international, environmental, development, and trade agreements (Hisschemoller and Gupta 1999; UNEP 2001). For example, the CBD involves measures relevant to biodiversity protection, trade, and intellectual property rights. This requires different ministries, agencies, and departments to interact. Also, those agencies responsible for negotiating with particular MEAs may differ from the agency or agencies in charge of the MEA implementation (Van Toen 2001).

Most MEAs include no binding compliance and enforcement provisions, but put an emphasis on conflict solving in a nonconfrontational manner. The tendency has been to rely mostly on a ''carrot'' approach by offering national governments assistance to meet their obligations (Churchill and Warren 1996). The will to develop national or international indicators and parameters for management effectiveness and compliance has been largely lacking. The failure in complying with agreements is often, but not exclusively, related to lack of resources and institutional capacity, particularly in developing countries. Funds that would enable developing countries to prepare for, participate in, and implement international agreements remain scarce. Case studies of the Pacific Islands found that the burden of meeting the reporting and partnership process requirements (conferences, correspondence, and internal reporting and follow-up) for multiple MEAs was unacceptably heavy and, given extreme limitations of skilled resources, was often addressed at the cost of actually implementing the actions required by the MEAs (UNU 2002b).

Development and implementation of MEAs is clearly relevant for sustainable development (OECD 2001a, b). However, effective goals, parameters, and indicators regarding integration between social, economic, and environmental objectives are rare (Ovejero 1999). Achieving synergies across environment and de-

velopment require mainstreaming environmental agreements into national planning processes, such as sustainable development strategies and poverty reduction plans. The Rio conventions have potential for this kind of integration given the cross-cutting nature of the issues they seek to address, all of which have implications for poverty. Integrating national priorities with international priorities and obligations is, however, likely only when significant benefits are identified for major stakeholders. Integration must be demand-driven and pursued when there is adequate planning and implementing capacity, as well as resources. These are critical issues in developing countries, where governments often feel overburdened with various international commitments and lack the capacity and financial resources to pursue cross-sectoral, integrated strategies.

15.3.3.1 The Ecosystem Approach as a Broad Framework for Integrated Responses

The ecosystem approach has been developed as an overall strategy for integrated environmental management promoting conservation and sustainable use in an equitable way. In essence, the ecosystem approach modifies and broadens the multiple-resource use paradigm into a holistically conceived ecosystem management. It requires one to view landscapes in a comprehensive context of living systems and their complex interdependencies. The approach has importance beyond traditional commodity and amenity considerations. With this view, management practices that optimize the production or use of one or a few natural resources can compromise the balances, values, and functional properties of the whole.

Initial concepts on the ecosystem approach by the *International Joint Commission in the Great Lakes Basin* (see Allen and Hoekstra 1992; Allen et al. 1993; Hartig 1998; Boyle et al. 2001) were taken up and further developed by the CBD, which adopted it as its main vehicle for the holistic implementation of its objectives (see CBD Decision V/6 at the fifth Conference of the Parties). The ecosystem approach focuses on managing environmental resources and human needs across landscapes and is a response to the tendency of managing ecosystems for a single good or services, trying to balance trade-offs to both human well-being and ecosystem services. (See Figure 15.1.) Currently, the ecosystem

Ecosystem Functional Relationship
Understanding ecosystem dynamics, integrity, health, and function
Provision of ecosystem goods and services
Understanding ecological sustainability and environmental threshold

Management Practice
Use environmentally sound practices
Apply sustainable practice and stewardship
Harvesting based on sustainable use

Societal Choice
Involvment of society in planning
Public and private partnership
Transparency in decisions
Recognize stakeholder requirements

Operational Implementation
Application of adaptive management, audit, and review
Sharing of biological diversity benefits
Cooperation and consideration across sectors
Good governance, collegiate will, and development of capacity and capability

Management Systems
Management instruments effectively balancing and promoting conservation management and sustainable use goals
Management desicions and actions at the appropriate scale
Management roles and responsibility clearly accountable
Information-based decision-making

Sustainable Outcomes
Integrate and balance social, environmental, and economic needs in the short and long term
Properly value ecosystem goods and services
Promote the sustainable delivery of biodiversity and ecosystem goods and services

Figure 15.1. The Ecosystem Approach. The ecosystem approach contains the above elements, although it is not limited to them. The operational implementation of the ecosystem approach foresees the implementation of all principles together. Its application should be adapted to specific situations and frame conditions. (CBD Subsidiary Body on Scientific, Technical and Technological Advice 2003; Ecosystem Approach Annex 1)

approach under the CBD constitutes a set of guiding principles and strategies (see Box 15.6) rather than an applicable methodology. Criteria and indicators are, therefore, yet missing for a broader application of the ecosystem approach.

The ecosystem approach is reflected in several sectoral natural resource management concepts, such as sustainable forest management, which was mainly developed independently, but is recognized by the CBD as being largely compatible with the ecosystem approach (CBD COP 7, Decision VII/11 2004; Davey et al. 2003; Wilkie 2003). Other concepts include, for example, bioregional approaches, integrated coastal zone management, and integrated conservation and development projects.

The ecosystem approach has also been applied to health issues, recognizing the inextricable link between humans and their biophysical, social, and economic environments (Lebel 2003; IDRC 2003). Groundwater management can also be based on the eco-

system approach (Neufeld 2000). International institutions have adopted the concept in their strategies, for example, in UNESCO's Man and Biosphere Programme (UNESCO 2000), in FAO's Code of Conduct for Responsible Fisheries (FAO 2003), and UNEP's Strategy on Land Use Management and Soil Conservation (UNEP 2004). It has been pointed out that an institutional application of the ecosystem approach requires adequate organizational changes (Mullins et al. 1999).

The ecosystem approach has been criticized for being too vague and undetermined to be of practical value, while others have highlighted its flexibility (Emerton 2001; Hartje et al. 2003; Hartje 2003; Marconi et al. 2000; Smith and Maltby 2001; Smith et al. 2000a, 2000b; UNEP 2003). Negative consequences of focusing on the overall ecosystem function and processes have also been pointed out—especially the failure to consider specific areas, resources, or species that may need a more targeted approach for

BOX 15.6
Principles of the Ecosystem Approach

- Management objectives are a matter of societal choice.
- Management should be decentralized to the lowest appropriate level.
- Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems.
- After recognizing potential gains from management, there is a need to understand the ecosystem in an economic context. Any ecosystem management program should: (1) reduce those market distortions that adversely affect biological diversity; (2) align incentives to promote sustainable use.
- A key feature of the ecosystem approach includes conservation of ecosystem structure and functioning.
- Ecosystems must be managed within the limits to their functioning.
- The ecosystem approach should be undertaken at the appropriate scale.
- Recognizing the varying temporal scales and lag effects which characterize ecosystem processes, objectives for ecosystem management should be set for the long-term.
- Management must recognize that change is inevitable.
- The ecosystem approach should seek the appropriate balance between conservation and use of biological diversity.
- The ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations, and practices.
- The ecosystem approach should involve all relevant sectors of society and scientific disciplines.

Adapted from the CBD Decision V/6 adopted at the CBD COP 5 held in Nairobi, May 2000. For the full text on the decision, including the rationale underlining each of the principles, see http://www.biodiv.org/decisions/.

their conservation. Another shortcoming highlighted is the failure to include key actors such as the private sector. Despite the emphasis on complex, dynamic ecosystems as critical natural capital assets whose functioning must be conserved, there is also much uncertainty and lack of guidance regarding how to balance conservation and sustainable use in such ecosystems. It is felt that required knowledge (for example, on the state, dynamics, and criticality of ecological and institutional aspects), is yet undeveloped or does not yet exist in many circumstances.

Further, constraints in applying ecosystem approaches include: (1) different time scales in natural ecosystem dynamics and their human utilization; (2) the requirement for broad collaboration between stakeholders, when many places are characterized by a lack of trust and poor communication between stakeholders, significant power inequalities, and divergence of interests; (3) negotiating trade-offs between stakeholders in a fair, equitable, and cost-effective way; and (4) economic under-valuation of ecosystem services. Box 15.7 summarizes a U.S. experience with recurring barriers in implementing the ecosystem approach.

15.3.3.2 Funding Mechanisms for Multilateral Environment Agreements

Funding for international environmental governance comes from bilateral development agencies, multilateral agencies such as U.N. bodies, the World Bank, as well as from domestic national budgets, private foundations, civil society groups and private inves-

tors. The Global Environment Facility has been specifically designed to facilitate integrated responses for major environmental challenges. The GEF, which is governed by its own governing council, was set up in the run up to the Rio Summit and formally established in 1994. GEF projects are implemented mainly by three agencies, the World Bank, UNDP, and UNEP. It currently concentrates on six focal areas: biodiversity, ozone, energy, international waters, and since recently, land degradation and persistent organic pollutants. In the first ten years since its inception, GEF funded some 700 projects in 150 countries, involving a budget of $3 billion, plus an additional $8 billion in co-financing through other sources (UNEP 2001).

In terms of integration, the most interesting GEF features include the incremental cost approach, coordination with MEA secretariats, and cross-sectoral operational programs. The incremental cost approach of the GEF is designed to support cross-scale projects with proven *global* environmental benefits. Such projects often pilot new integrated approaches. Projects that exclusively serve national development objectives are excluded from the GEF.

As the key funding mechanism for major MEAs—including the CBD, UNFCCC, and since recently, CCD—the GEF is guided by MEA governing bodies with regard to what activities are eligible for GEF projects. For example, UNFCCC member governments establish guidance for GEF spending of the UNFCCC Special Climate Change Fund or the Least Developed Country Fund. While these procedures add to the challenge of inter-institutional coordination, they also ensure activity-focused integration.

The GEF has developed operational programs (OPs), which outline specific approaches in developing and implementing projects within different focal areas. The GEF OP12, for example, on integrated ecosystem management draws on the ecosystem approach (GEF 2000). OP12 aims to create opportunities to address issues that cut across the various GEF focal areas (biodiversity, climate change, international waters, and land degradation) within a common programmatic framework. It facilitates inter-sectoral and participatory approaches to the planning and implementation of natural resource management on an ecosystem scale.

15.3.4 Integration between International Trade and Environmental Governance

The dual trends of global economic integration ("globalization") and the escalation of global environmental problems have magnified the linkage between trade and environment. Trade and environment are fundamentally related and the linkage between the two spheres is considered both complex and critical (Shahin 2002). During GATT negotiations and subsequently in the WTO, the linkage between trade and environment has been receiving growing attention.

Trade-related environmental measures include environmental taxes, environmental subsidies and procurement policies, environmental technical standards, trade bans and quarantines, and environmental labeling (UNDP 2003a, p. 323). Many developing countries perceive these measures skeptically as thinly disguised trade barriers, designed to constrain their development options. While some of these environmental policies and rules result from intergovernmental negotiations and are contained in MEAs, others are imposed unilaterally, usually by industrial countries, raising questions regarding their legitimacy and fairness. In such cases, many developing countries see such environmental impositions as green imperialism or eco-imperialism, which will endanger, in

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BOX 15.7

Recurring Barriers in Implementing the Ecosystem Approach: U.S. Findings
(U.S. Interagency Ecosystem Management Task Force 1995)

A U.S. Interagency Ecosystem Management Task Force was mandated to increase understanding of the ecosystem approach and its applicability. Based on case studies, the task force identified barriers to implementing the ecosystem approach, as well as solutions that would improve the effectiveness of the approach. Among its findings:

Federal agency coordination. A coordinated and comprehensive framework is essential to implement the ecosystem approach.

Partnerships with non-federal stakeholders. The ecosystem approach requires active partnerships and collaboration with non-federal parties, particularly state, local, and tribal governments, neighboring landowners, nongovernmental organizations, and universities. Together, they must also project and articulate a desired ecosystem outcome with a shared vision for the future.

Communication between federal agencies and the public. Current outreach activities must be strengthened. Most federal employees who should be interacting with the public are not trained in the skills required to engage the broader public.

Resource allocation and management. Agency coordination in ecosystem efforts can be improved by recognizing the interdependency of agency budgets. The ability of each agency to take an ecosystem approach is affected by its ability to budget for long-term goals, organize around and fund interdisciplinary activities, and quickly modify programs in response to new information.

Knowledge base and the role of science. Existing information and knowledge bases are often inadequate for system-wide ecosystem analyses. The linkage between scientists and managers is essential in establishing or securing a shared vision of desired ecosystem conditions.

Information and data management. Managers must have coherent and complete information from all of the sources in order to make reasonable decisions on their actions that affect the ecosystem.

Flexibility for adaptive management. Adaptive management requires a willingness to undertake prudent experimentation—consistent with sound scientific and economic principles—and to accept occasional failures. This contrasts with the strongly risk-averse nature of most agencies and managers.

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the long term, their growth and development (UNDP 2003a, p. 325).

Agenda 21 expressly links the economy (in particular, ''an open, non-discriminatory and equitable multilateral trading system'') and the environment to human well-being (UNCED 1992, Chapter 1, p. 3; Shahin 2002). The current Doha round of international trade negotiations equally underlines the mutual support of an open and non-discriminatory multilateral trading system with actions to protect the environment and the promotion of sustainable development. (See Box 15.8.)

However, the dispute on how exactly trade and environment issues should be made compatible without undermining either system is largely unsolved. The potential for conflict stems, inter alia, from the fact that environmental regimes allow for extraterritorial measures, which under WTO rules constitute flagrant violations. Furthermore, the WTO concept of nondiscrimination in trade contradicts the basic premise of global environmental regimes, where countries can, and should, discriminate against specific products and processes based on their environmental impacts (UNEP and IISD 2000, Shahin 2002: pp. 48–49). One advantage of the WTO system over MEAs is the availability of clear mechanisms for dispute resolution as compared to often insufficient enforcement and compliance regimes in environmental agreements.

Environment-concerned groups often view WTO rules, trade liberalization and globalization in general, as root causes for accelerated unsustainable consumption and production patterns, which result in resource depletion and environmental degradation (Domoto 2001). These groups are calling for an integration of environmental approaches in WTO rules. Many developing countries on the other side remain deeply suspicious that accommodation of trade-restrictive measures on environmental grounds may further limit their market access in industrial countries. Industrial countries are often thought of as neglecting the needs of developing countries following common, but differentiated responsibilities, including the right to development and basic human needs such as food, health, and education (Sampson and Chambers 2002, pp. 2–7).

The interrelationship between MEAs and the multilateral trading system, which includes the GATT trade agreements as overseen by the WTO, is one of the key issues in the trade/

environment discussions (Brack 2002). Around 20 international MEAs incorporate trade measures with partly significant effects on international trade flows (UNEP and IISD 2000, p.16, Ricupero, 2001, p. 35). Three broad sets of reasons to incorporate trade measures into MEAs can be identified (Brack 2002):

- *to provide a means of monitoring and controlling trade in products where the uncontrolled trade would lead to or contribute to environmental damage.* For example, CITES requires export permits for trade in endangered species, and the Basel Convention requests prior notification and applies consent procedures for shipment of hazardous waste, which is subject to the Convention;
- *to provide a means of complying with the MEA's requirements.* The Montreal Protocol, for example, requires parties to control both consumption and production of ozone depleting substances as control measure to achieve its objectives; and
- *to provide a means of enforcing the MEA, by forbidding trade with non-parties or non-complying parties.* For example, the International Convention for the Conservation of Atlantic Tunas bans imports of certain species and products of non-parties or non-complying parties.

The effectiveness of trade measures in MEAs is difficult or ''virtually impossible'' to assess (Brack 2002). The necessity of MEA trade measures has not yet been challenged before the WTO (see Ricupero 2001, p. 35), although threats of such a challenge have been raised in a number of cases, for example, in the context of CITES. If judged by cases where environmentally based trade measures were imposed unilaterally, such measures were considered in the majority of cases not necessary or justifiable. However, such rulings may not necessarily be applicable in the case of multilateral agreements (Brack 2002, p. 336).

The compatibility of international trade rules and trade measures under MEAs is a long-standing, controversial issue. Major groups such as the European Union seek clarification on the interrelation between the two systems, while most developing countries reject the need for such discussions. It is argued that the perceived conflict between the multilateral trade system and MEAs may most likely be addressed only if an official WTO dispute, challenging trade measures under CITES, the Kyoto Proto-

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BOX 15.8

The Doha Trade Round and the Environment

A potential start on greening global trade rules may come from the World Trade Organization's current negotiating round (called the Doha Round) launched in the Fourth WTO Ministerial Meeting in Doha, Qatar, held November 9–14, 2001 (WRI 2003). The Doha Ministerial Declaration focuses in detail on the relation between nondiscriminatory multilateral trading systems, sustainable development, and the protection of the environment:

We strongly reaffirm our commitment to the objective of sustainable development, as stated in the Preamble to the Marrakesh Agreement. We are convinced that the aims of upholding and safeguarding an open and nondiscriminatory multilateral trading system, and acting for the protection of the environment and the promotion of sustainable development can and must be mutually supportive. We take note of the efforts by members to conduct national environmental assessments of trade policies on a voluntary basis. We recognize that under WTO rules no country should be prevented from taking measures for the protection of human, animal or plant life or health, or of the environment at the levels it considers appropriate, subject to the requirement that they are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade, and are otherwise in accordance with the provisions of the WTO Agreements. We welcome the WTO's continued cooperation with UNEP and other inter-governmental environmental organizations. We encourage efforts to promote cooperation between the WTO and rele-

vant international environmental and developmental organizations, especially in the lead-up to the World Summit on Sustainable Development. (Doha Ministerial Declaration 2001, Par.6).

The Doha Declaration also established a new, if limited, mandate for negotiations on the trade-environment nexus with WTO members agreeing, "with a view to enhancing the mutual supportiveness of trade and environment" (Doha Ministerial Declaration 2001, Par. 31), to negotiate: (1) the relationship between existing WTO rules and specific trade obligations set out in MEAs; (2) procedures for regular information exchange between MEA secretariats and the relevant WTO committees, and the criteria for the granting of observer status; and (3) the reduction or, as appropriate, elimination of tariff and non-tariff barriers to environmental goods and services (Doha Ministerial Declaration 2001, Par. 31).

The outcomes of Doha have not been universally welcome. Questions have been raised whether the new trade talks it launched are really a development round that adequately reflects the needs and aspirations of developing countries. Questions have been raised about the transparency of negotiations, the pressures brought to bear on developing countries, and the potential consequences of the new trade round on local and poor communities worldwide. The failure of the Cancun meeting in September 2003 on the issue of agricultural subsidies versus regulations on investment, competition policy, government procurement, and trade facilitation (Mutume 2003; Halle 2003) may also endanger further progress in addressing crucial trade and environment issues.

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col, or the Cartagena Protocol, is launched (Brack 2002, p. 350). However, the dilemma presented by the need to preserve market access opportunities for developing countries while facing the need to maintain the space to implement measures that address legitimate environmental objectives is internationally acknowledged (ICTSD 2003).

15.3.5 Enabling Conditions and Constraints at the International Level

Environmental policy integration at the international level is almost exclusively dependent on the commitment of governments to agree on binding compromises for given issues. The United Nations serves as a facilitator among sovereign states, but has limited capacity to progress beyond the expressed views of governments. The challenge of linking and effectively integrating economic, social, and environmental dimensions of development is well recognized, and appropriate international frameworks exist to enable direct national implementation. However, the international setting for addressing international environmental and development governance is fragmented, incoherent, and unbalanced. Efforts toward larger coordination or even integration are consequently limited and progress is slow.

Major challenges still ahead include a reform of the international environmental governance structure and coherence between international trade and environment mechanisms. Much of the international debate is naturally focused on feasible compromises along economic, cultural or political interests. The concept of sustainable development, while rapidly endorsed globally, still largely lacks viable criteria and indicators for its qualitative and quantitative assessable implementation, particularly on a national level. Also, more efforts are required to demonstrate benefits of

a widely integrated international policy framework for concrete national development objectives.

An effective integration of international environmental policy is mainly constrained by the apparent power imbalance between international environment and economic arrangements. Independent of how much international support can be gained for upgrading UNEP to a World Environment Organization, environmental sustainability ought to be more commonly integrated into economic decision-making. Here again, standardized procedures for measuring environmental performance in relation to financial and social performance are a necessary first step, as for example provided by the Global Reporting Initiative (WRI 2003). In this regard the international business sector should be more engaged in integrating environmental aspects.

Public access and participation of all affected stakeholders is essential for fully integrated responses. In this context, public participation is not restricted to access to information and direct participation, but also includes effective representation, judicial redress, and other mechanisms that enable meaningful, democratic environmental governance. On the international level, often enough, such a degree of access and participation is not available for impoverished stakeholder groups. Clearer and more effective rules for a more meaningful access of civil society groups, for example, to United Nations–led negotiations on global environmental governance are needed. However, as civil society groups gain in influence, they will increasingly demand principles of good governance, including transparency and accountability (WBGU 2001; WRI 2003).

15.4 National Responses

Governments are increasingly adopting integrated responses, including policy-making practices, action plans, and strategies.

Many nations have initiated efforts to achieve greater coherence and integration between different policy domains. A typical example is the integration of environmental concerns into other areas of policy. This is important in order to create enabling conditions for responses linking provisions of ecosystem services and human well-being. Sometimes this is referred to as mainstreaming. Policy integration constitutes both an integrated response in itself and a central element or mechanism for other integrated responses. Some national planning initiatives also demonstrate a potential for integration. They adopt a strategic approach, linking longer-term visions to medium-term targets and short-term coordinated actions. There is a vast experience with national strategic planning, but few initiatives can be considered (or enable) integrated responses. Table 15.3 lists the main strategic planning models that have been applied in recent decades. These demonstrate different degrees of integration, from no significant integration to high integration.

Some models, like national development plans, adopt a strategic planning approach that includes fiscal targets, major infrastructure development, and economic reforms, which may contribute to improvements in human well-being. They are, however, narrowly focused on economic concerns and do not constitute integrated responses. Other types of national strategic planning are also sector-driven but demonstrate some (but still limited) potential for integration. National conservation strategies are one example; they aim to provide a comprehensive, cross-sectoral analysis of conservation and resource management issues and propose a greater integration of environmental concerns into development processes. Poverty reduction strategy papers offer another approach that seeks to address a multidimensional problem within an integrated framework. However, environmental issues are not adequately covered within PRSPs, and the main focus is on the economic dimensions of poverty (Booth 2002; Sanchez and Cash 2003).

Other national strategic planning processes demonstrate greater potential for integration. These include approaches concerned with environment that also deal with social and economic issues. National environmental action plans, for example, have been expressly designed to provide a framework for integrating environmental considerations into a nation's overall economic and social policies and programs. They still focus on environment, but give more explicit attention to links and synergies with social and economic dimensions. National strategies for sustainable development are among the few national-level initiatives that demonstrate a high degree of integration or that can be considered truly integrated responses. An NSSD is a strategic approach that aims to integrate the economic, social, and environmental objectives of society, seeking trade-offs where this is not possible, while ensuring that such trade-offs are agreed among many sectors of society.

In both industrial and developing countries, the adoption of integrated (or potentially integrated) responses has been greatly influenced by international processes discussed in the previous section on international responses. UNCED represents a major landmark in this respect by generating an international consensus regarding the need for sustainable development, which requires strategic responses capable of achieving economic, ecological, and social objectives in a balanced and integrated manner. Agenda 21 has become instrumental for the translation of sustainable development from concept to practice, calling for the adoption of actions at multiple levels (global, national, and local). It also calls upon countries to prepare national plans to implement the inter-

Table 15.3. National Strategic Planning Models (Dalal-Clayton et al. 1994)

Approach	Main Objectives	Led by
National Development Plans	to focus on fiscal targets, major infrastructural development, industrial development, etc.	national governments (often the central Ministry of Finance and/or Development Planning)
National Conservation Strategies	to provide a comprehensive, cross-sectoral analysis of conservation and resource management issues in order to integrate environmental concerns into the development process	IUCN and implemented by different sectors
National Environmental Action Plans	to provide a framework for integrating environmental considerations into a nation's overall economic and social development programs	World Bank and undertaken by host-country organizations (usually a coordinating ministry) with technical assistance from the Bank
National Tropical Forestry Action Plans	to produce informed decisions and action programs with explicit national targets on policies and practices, afforestation and forest management, forest conservation and restoration, and integration with other sectors	FAO and implemented by the country concerned
Convention-related National Plans	to define a strategy for the implementation of international conventional at the national level	conventions on climate change, biodiversity, and desertification, in collaboration with national governments
Country Energy Plans	to formulate an energy policy and coordinate energy planning at the national level	World Bank under the Energy Sector Management Assistance Program (ESMAP)
Environmental Strategies, Country Environmental Profiles, and State of the Environment Reports	to present information on conditions and trends; identify and analyze causes, linkages, and constraints; and indicate emerging issues and problems	bilateral aid donors, governments, and NGOs
Green Plans	to promote environmental improvement and resource stewardship, with government-wide objectives and commitments	produced to date by Canada and the Netherlands
Poverty Reduction Strategies	detail plans for sustained reductions in poverty	World Bank and bilateral aid donors in collaboration with national governments

national agreements reached at Rio, including those on biodiversity, climate, and forests. National implementation plans for these agreements in many instances represent integrated responses at the national level.

However, there are substantive differences in the determinants leading countries in the North and in the South to adopt integrated responses. In the South, integrated plans and strategies have often been externally conceived, motivated and promoted by multilateral development banks, development cooperation agencies, U.N.UN organizations, international NGOs, and other external organizations. Some are linked to the release of aid funds, while others have been pursued as planning mechanisms to implement international agreements (Dalal-Clayton et al. 1994). The situation in developed countries has been different, since approaches are related to international processes such as Agenda 21, but have generally been domestically driven, following national government styles and cultures, and sometimes those of businesses and networks of civil society, rather than the dictates of external agencies (Dalal-Clayton et al. 1998). This is manifest not only in the preparation of NSSDs, but also of other approaches such as Green Plans.

Also, there are differences in the particular approach taken in terms of integration. The plans and strategies of industrial countries often focus narrowly on environmental concerns, even when dealing with multidimensional challenges such as sustainable development, while in developing countries greater efforts have been made to address social and economic issues, as well as environmental concerns, in a more integrated manner. Thus there is much scope for countries from the North and South to learn from each other (OECD 2002a).

This section focuses in more detail on policy integration, national environmental action plans, and national sustainable development strategies, which are approaches that fall within the range from medium to high potential for integration. Evidently, these responses not only display different degrees of integration, but also represent substantively different approaches to integration. Therefore, they are not directly comparable, but are used as key examples of national integrative responses from which lessons can be drawn.

15.4.1 Environmental Policy Integration

Policy integration is a central element of efforts to improve the decision-making structures of government in order to reach policies that are economically viable, socially equitable and ecologically sound. In the government sphere, attempts at integration have focused primarily on enabling a more systematic consideration of the environment when decisions are made on economic, trade, fiscal, and other policies, as well as the implications of policies in these sectors for the environment. At the national level, debates on environmental policy integration predominate.

Policy integration refers both to the degree of internal coherence of policy *goals* between different domains of policy-making and the *process* of designing integrated policies (Jacob and Volkery 2003). From a process perspective, a policy is considered integrated when all the potential social, economic, and environmental consequences of that policy are recognized, aggregated into an overall evaluation that defines acceptable trade-offs, and then incorporated into the strategies of all relevant ministries and agencies. An integrated policy from a goals perspective occurs when decision-makers in a given sector recognize the complementary elements, and the repercussions of their decisions on other sectors, and adjust them appropriately so as not to undermine the policies of other sectors. In this sense, policy integration is a pre-requisite

or first step toward integrated responses as defined in this chapter. Integration, therefore, can also be understood as *coordination* between policies and the ministries responsible for such policies.

Policy coordination may take different forms ranging from improved communication between departments and ministries to jointly identified policy priorities. Metcalfe (1994) has developed a scale to assess the extent to which national policies are coordinated. The scale was defined to assess EU states, but it is broadly applicable (OECD 1996). An adapted version of this policy coordination scale is shown in Box 15.9. Levels one to four are concerned with the importance of communication across government departments and ministries. Each body retains its autonomy, but joint efforts are made to avoid duplication and to achieve a level of coherence. Levels five to eight focus on deliberate attempts by ministries to work together, up to the point of developing mutually supportive policies and establishing common priorities.

Although coordination is important, integration is about more than improving communication among different bodies and minimizing contradictions between policies. Integrated policy is when there is a deliberate effort to realize mutual benefits between policies. This happens when policies generate benefits not only for the home sector, but also for other sectors. An economic policy that also enables the conservation of ecosystems, for example, would qualify as a strongly integrated policy.

In the specific case of EPI, integration has not only been promoted at the national level, but also within supra-national institutions that impact on national governments. The EU, for example, is highly committed to integrating environmental protection requirements into the definition and implementation of all EU policies and activities (Article 6 of the Treaty of the European Community). This commitment was substantiated in 1998 with the initiation of the Cardiff Process, the goal of which became to

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BOX 15.9
Levels of Policy Coordination (adapted from OECD 1996)

Level 1: Independence. Each department retains autonomy within its own policy area irrespective of spillover impacts on cognate departments/areas.

Level 2: Communication. Departments inform one another of activities in their areas via accepted channels of communication.

Level 3: Consultation. Departments consult one another in the process of formulating their own policies to avoid overlaps and inconsistencies.

Level 4: Avoiding divergences in policy. Departments actively seek to ensure that their policies converge.

Level 5: Seeking consensus. Departments move beyond simply hiding differences and avoiding overlaps/spillovers to work together constructively through joint committees and teams.

Level 6: External arbitration. Central bodies are called in by, or are imposed upon, departments to settle irresolvable inter-departmental disputes.

Level 7: Limiting autonomy. Parameters are pre-defined which demarcate what departments can and cannot do in their own policy areas.

Level 8: Establishing and achieving common priorities. The core executive sets down and secures, through coordinated action, the main lines of policy.

ensure that all relevant EU bodies develop their own strategies for integrating environment and sustainable development into their respective policy areas. Table 15.4 reflects the genesis of the environmental policy integration process in the EU.

15.4.1.1 Instruments for Policy Integration

Different mechanisms and instruments are necessary depending on the kind of integration being promoted, whether it is EPI within specific ministries or within the government as a whole (meaning integration between the different ministries and other bodies that form the government). Lafferty (2002) proposes a list of key mechanisms for each of these situations. Box 15.10 gives an idea of what putting EPI in practice entails, when the aim is to promote integration within a given government ministry or sector, while Box 15.11 does the same for situations where the goal is to ensure EPI within the government as a whole.

The EU has developed specific guidelines for implementing EPI into the daily work of Community institutions. These include the introduction of detailed environmental assessments of all key policy initiatives; explicit reflection of environmental re-

Table 15.4.   Environmental Policy Integration in the European Union (Cardiff European Council 1998)

Year	Event or Treaty	Description
1972	Stockholm Conference	Develops notion of "eco-development," emphasizing the interdependence between ecological and developmental goals.
1973	First Environmental Action Plan (EAP)	Establishes that effective environmental protection requires the consideration of environmental consequences in all "technical planning and decision-making processes" at national and community level.
1983	Third Environmental Action Plan	"[T]he Community should seek to integrate concern for the environment into the policy and development of certain economic activities as much as possible and thus promote the creation of an overall strategy making environmental policy part of economic and social development. This should result in a greater awareness of the environmental dimension, notably in the fields of agriculture (including forestry and fisheries), energy, industry, transport and tourism."
1986	Single European Act	New Environment Title (Article 130r) introduces the objective of integrating environment into other policies at all levels.
1987	Fourth Environmental Action Plan	Devotes a subsection to the "integration with other Community Policies" and announces that "the Commission will develop internal procedures and practices to ensure that this integration of environmental factors takes place routinely in relation to all other policy areas."
March 1992	Fifth Environmental Action Plan (CEC 1992)	Promotion of integration in five economic sectors: agriculture, energy, industry, transport, and tourism. EPI is to be achieved in a spirit of shared responsibility among all key actors and by making use of economic and communicative instrument and voluntary agreements.
1992–93	Treaty on European Union	Article 2 of the EEC treaty states: "The Community shall have as its task . . . to promote throughout the Community a harmonious and balanced development of economic activities, sustainable and non-inflationary growth respecting the environment." Article 130r(2) includes the requirement that: "Environmental protection requirements must be integrated into the definition and implementation of other Community policies."
1997–99	Amsterdam Treaty	Establishes sustainable development as one of the objectives of the EU and an overarching task of the Community. Article 6 requires that: "environmental considerations should be integrated into other policies in order to deliver sustainable development."
June 1988	Cardiff Summit	"The European Council welcomes the Commission's submission of a draft strategy [for integration of the environment into other EU policies] and commits itself to consider it rapidly in view of the implementation of the new Treaty provisions. It invites the Commission to report to future European Councils on the Community's progress" (Cardiff European Council 1988, paragraph 32). European Council invites all relevant sectoral councils to establish their own strategies for integrating the environment and sustainable development. Transport, energy, and agriculture are asked to start this progress and provided reports to the Vienna Summit.
December 1988	Vienna Summit	Transport, agriculture, and energy councils produce initial reports. Further integration plans are invited from development cooperation, internal market, and industry councils for Helsinki.
June 1999	Cologne Summit	European Council called upon the fisheries, general affairs, and ecofin (finance) councils to report on the EPI process and sustainable development in 2000. Commission submitted its report (of 26 May 1999) on mainstreaming of environmental policy (CEC 1999b).
December 1999	Helsinki Summit	European Council calls on nine Councils of Ministers (energy, transport, agriculture, development cooperation, internal market, industry, general affairs, finance, and fisheries) to complete work on environmental policy integration and to submit comprehensive strategies by June 2001. The Commission submits a report on "environment and integration indicators" (CEC 1999c), a report reviewing the integration process "from Cardiff to Helsinki and beyond" (CEC 1999d), and a "global assessment" of the results of the fifth EAP (CEC 1999a). The European Commission is invited to prepare a long-term policy on sustainable development by June 2001.

BOX 15.10

Mechanisms for Achieving Environmental Policy Integration within Ministries (adapted from Lafferty 2002, p. 17)

Sectoral report. Provides an initial mapping and specification of sectoral activity, which identifies major environmental/ecological impacts associated with key actors and processes, including the governmental unit itself.

Stakeholder forum. Establishes a system of dialogue and consultation with all relevant actors and citizens.

Sectoral strategy. Formulates a sectoral strategy for change, with basic principles, goals, targets, and timetables.

Sectoral action plan. Defines a sectoral action plan, matching prioritized goals and target-related policies with designated responsible actors.

Green budget. Incorporates the action plan into the sectoral budget and allocations.

Monitoring program. Develops a strategy-based system for monitoring impacts, implementation processes, and target results, including specified cycles for monitoring reports and revisions of the sectoral strategy and action plan.

BOX 15.11

Mechanisms for Achieving Environmental Policy Integration in Government (adapted from Lafferty 2002, p. 19)

Constitutional provisions. Sets in place the constitutional mandate for the special status given to environmental/sustainable development rights and goals.

Overarching strategy. Formulates a long-term sustainable development strategy for the domain (including timetables and targets), with a clear political mandate and the backing of the chief executive authority.

Politically responsible executive body. An option is to designate a specific governing body entrusted with the overall coordination, implementation, and supervision of the integration process, including a strategic national forum.

Information agents and programs. Aims to ensure clear communication between sectors to achieve overarching goals.

National action plan. Allocates responsibilities between sectors to achieve overall goals, including clear targets and a calendar for their achievement. Requires EPI to be implemented within sectors.

Programme for assessment, feedback, and revision. Undertakes periodic reporting of progress with respect to targets at both the central and sectoral levels.

Conflict resolution systems. These are aimed at resolving conflicts of interest between environmental and other societal objectives.

quirements in decisions and new proposals; review of existing policies and the preparation of integration strategies in key sectors; and review of current organizational arrangements to ensure policy integration (UNESC 1999). By legally requiring governments to adopt environmental considerations into their practices, EU directives can be an important driving force for EPI at the national level.

Any mechanism or combination of mechanisms for promoting EPI, however, will have limited impacts if the overall integration effort fails to adequately assess and identify the key environmental challenges for the sector, or if it fails to stipulate realistic targets, benchmarks, and measures for objective assessment of outcomes (Lafferty 2002). As with other integrated responses, an integrated policy must be viable, in both economic and political terms, and respond to real needs.

15.4.1.2 Outcomes of Policy Integration

Assessing policy integration involves looking at both process and outcome (Persson 2002). In Western Europe, for example, EPI strategies and mechanisms based on the imposition of environmental norms and criteria on policy sectors have often been unsuccessful. This is because sectors have refused to accept such norms and criteria. Sectoral strategies, which involve encouraging different sectors to develop their own programs and priorities for EPI, have a greater potential of overcoming this problem. However, this requires changing entrenched institutional norms and routines. It may be that EPI needs to be approached as an ongoing, long-term process designed to promote internal capacity and policy learning (Hertin and Berkhout 2001). Some developing countries seem to be even further away from actively tackling the challenge of policy integration. Others, however, have recognized the need to promote integration between environmental and other policies. A case study from Brazil outlined in Box 15.12 illustrates the tortuous route of policy integration. It illustrates the benefits of stakeholder involvement in the design of policies that

work for both environment and development, as well as the persisting barriers to greater horizontal and vertical integration between different actors.

To date, policy integration has often consisted of adding environmental considerations to economic policy or vice-versa. Simple ''add-ons'' do not constitute an integrated response because economic, social, and environmental considerations are not included from the start. This is not surprising since a three dimensional approach is much more difficult to implement, requiring a careful analysis and management of trade-offs, including considerations between short-term pressures and longer-term benefits (OECD 2001a). The main stumbling block is the traditional segmentation of government that impedes integrated policy-making. Government agencies and departments are highly specialized, have accumulated knowledge to govern their particular policy field, have networks with their target groups already in place, and are often unimaginative regarding their goals and instruments (Jacob and Volkery 2003).

15.4.2 National Environmental Action Plans

A national environmental action plan is a national level planning exercise designed to integrate environmental management into the overall development objectives of a country (Lampietti and Subramanian 1995). An NEAP involves identifying the major environmental issues facing a country, defining the underlying causes of environmental degradation, setting priorities, and defining the interventions needed to address such priorities, including policies and legal and institutional reforms. NEAPs are undertaken by governments, but typically with the assistance of development institutions. The World Bank, for example, often required countries to prepare a NEAP as a pre-condition for providing development funding. Thus a NEAP typically outlines the

BOX 15.12
Integration of Agrarian and Environmental Policies in the Brazilian Amazonia

Government policies have been identified as a main driving force for deforestation and unsustainable patterns of agricultural colonization in Brazilian Amazonia (Mahar 1989; Schneider 1995; Binswanger 1991; Mahar and Schneider 1994). Policies have often been directly contradictory and conflictive, implemented by different agencies acting in isolation, and generally poorly integrated. Agrarian policies have supported agricultural development, often favoring large farms and agro-industrial enterprises, while environmental policy has focused on forest conservation. The linkages and connectedness of various economic activities or forms of land use have rarely been taken into account in policy formulation and implementation (Cavalcanti 2000).

But greater integration has been initiated in recent years as a consequence of the emergence of new actors and their reaction to various public policies. This includes rural organizations, farmers' unions, and the landless movement, among others. These actors have been able to influence the land tenure and other policies. In the Marabá region, in Eastern Amazonia, the implementation of land reform projects rose from less than 2 per year in 1987 to 17 in 2000 (INCRA 2001) due to pressure from landless framers. These organizations are very critical of development models embedded in government policies and seek to implement alternative development projects, including initiatives linking development and conservation (financed mainly by international NGOs), which they believe should become references for future public policies.

Increases in deforestation in 2000 were attributed to farmers moving into forested areas and the persistence of government incentives. Interestingly, credit for small farmers was among such incentives. Without appropriate technical support many farmers used the credit to invest in cattle, which required clearing forestland to establish pastureland. The farmers' movements recognized that a more comprehensive strategy was needed to encourage framers to switch to more sustainable patters of land use. With the support of NGOs, they successfully advocated and guaranteed a special credit program called PROAMBIENTE (pro-environment), whereby farmers would receive special credit to implement agroforestry systems, avoiding the use of fire and receiving a grant for the maintenance of environmental services.

However, integration has only happened in one direction. While agrarian measures have assimilated environmental issues, the opposite has not happened. There are still conflicts between the actors involved in the environmental and agrarian arenas. Civil society has played a pro-active role in the policy process related to agrarian policies. Only the state and environmentalist organizations have participated actively in environmental policies, such as the Forestry Code or Law on environmental crimes, which regulates natural resources use and establish penalties for mismanagement of environment goods and services. Although the environmental policy is regarded as innovative, it has been more difficult to implement and is divorced from the sub-national context and the governmental, private sector, and civil society actors at whom it is targeted.

financial and technical assistance the country requires in order to implement proposed actions, in particular the external funding needed. These initiatives were strongly promoted during the 1980s and early 1990s and share similarities with national conservation strategies, also promoted during the same period.

From the perspective of integration, NEAPs have been promoted as an important step toward integrating environmental considerations into national economic and social development strategies (Lampietti and Subramanian 1995). The World Bank, for example, expected NEAPs to evolve into an integral part of the national development policy–making framework (World Bank 2000). Some NEAPs aim explicitly to analyze and address environmental issues within a framework that considers linkages between ecosystems and human well-being. However, the majority remain largely environment oriented. Probably the most important integrative characteristics of NEAPs include their emphasis on involving key stakeholders and analyzing the causes and consequences of environmental degradation from a multidimensional and multidisciplinary angle. They also often propose actions for better compliance with and enforcement of various international agreements countries have committed to, therefore contributing to strengthening the integration between international and national policy frameworks.

15.4.2.1 Instruments Used in NEAPs

The categories of policies and instruments more commonly used in NEAPs include regulatory instruments, market-based instruments, property rights, and ways to increase stakeholder engagement in the NEAP, as well as public awareness regarding environmental issues. There is no agreed set of criteria for selecting instruments. Possible criteria include, for example, cost effectiveness, equity, institutional capacity, financial capacity, and political and social feasibility (Lampietti and Subramanian 1995).

Regarding the institutional structure for implementation, NEAPs are generally implemented by a designated environmental agency that liaises with other sectors within and outside government. Putting NEAPs into practice requires effective coordination mechanisms and a variety of structures and systems to address environmental protection at the national and local level. These structures and systems are often complex, as they require integration to span sectors and levels and varying capacities and resources. Figure 15.2 illustrates the coordination structure developed to implement Sri Lanka's NEAP.

15.4.2.2 Impacts of NEAPs

NEAPs have been successful at raising public awareness of environmental issues, strengthening national environmental management institutions, and introducing environmental policies and innovative pilot projects (OED 1996). These impacts, however, have been mixed and uneven. Public awareness of environmental issues improved particularly in those countries where the preparation process was highly participatory. Lessons from NEAPs in Africa suggest that environmental strategies had a better chance of successful implementation when a range of stakeholders participated in their implementation. The earlier generation of NEAPs, however, did not benefit from a broad participatory approach (World Bank 2001).

The impacts of NEAPs on environmental management capacity have also been mixed. NEAPs tend to rely on legislative reform to improve environmental management, particularly command-and-control instruments, to achieve environmental objectives. Institutional reform has been hampered by two important factors. On the one hand, the traditional bureaucratic institutions are often not flexible enough to accommodate the cross-sector characteristics of environmental problems. On the other hand, when restructuring involves reforming environmental pro-
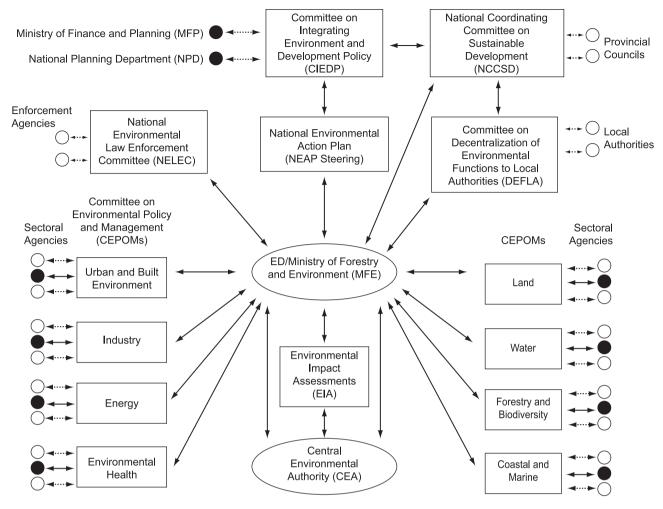
Figure 15.2. Coordination Structure Developed through the National Environmental Action Plan in Sri Lanka

tection, monitoring, and licensing, government officials may be tempted to seek new, or maintain old, rent-seeking opportunities (Lampietti and Subramanian 1995). Implementing a NEAP requires considerable environmental management and technical capacity, which many developing countries lack. Although most NEAPs include assistance to build human and institutional capacity, the NEAP processes tends to rely on international consultancy, thus failing to strengthen national capacity (OED 1996).

NEAPs have generally been supply-driven, without securing local ownership (OED 1997). Many appeared to be ''one-off efforts that ended with a document'' (OED 1996, p. 3). Few succeeded in stimulating the integration of environmental considerations into economic and social policies. More importantly, few NEAPs have resulted in an on-going, self-sustaining strategic environmental planning process at the national level (OED 1996). Many governments initiated them primarily to meet the requirements imposed by donors to provide aid loans (World Bank 2001). Ownership was often undermined by pressure to accelerate the preparation of NEAPs, while lack of systematic follow up further constrained their impact. Generally, NEAPs have not resulted in substantial long-term shifts in management style or in on-going activities.

15.4.3 National Strategies for Sustainable Development and Related Initiatives

National strategies for sustainable development aim to provide a national policy framework to tackle environment and develop-

ment issues. Agenda 21 emphasized the importance of national strategies and supportive policy instruments to help translate the concept of sustainable development into practice. In the 2002 WSSD, countries reaffirmed their commitment to put into place NSSDs or similar plans, as well as coordinating bodies called National Councils for Sustainable Development bringing together representatives from government, civil society, and the economic or business sector, to facilitate implementation and monitor progress (UNEP/RRCAP 2003). The OECD Development Assistance Committee (2001b, p. 8) defines an NSSD as:

A coordinated set of participatory and continuously improving processes of analysis, debate, capacity-strengthening, planning and investment, which seeks to integrate the short and long-term economic, social and environmental objectives of society—through mutually supportive approaches wherever possible—and manages trade-offs where this is not possible.

NSSDs are more comprehensive than NEAPs, which aimed to promote integration of environmental considerations into social and economic policies, but in most situations only accomplished to strengthen environmental management instruments and institutions. The main features of NSSDs are inclusion, flexibility, and integration. NSSDs aim to reflect the structures, needs, priorities, and resources of each country. It is agreed that an NSSD should comprise a set of mechanisms and processes that together offer a participatory system to develop visions, goals, and targets for sustainable development. It is also accepted that this is

not a one-off initiative, but a continuing participatory process, with monitoring, learning, reviewing, and continuous innovation (OECD 2002a). Therefore, an NSSD is not supposed to be a blueprint or a master plan, but a context-specific, flexible, and on-going process.

National councils for sustainable development or similar entities are multistakeholder mechanisms or focal points for the implementation of the Earth Summit agreements (Earth Council 2004). Now active in over 90 countries, an NCSD brings together representatives from the civil society, the private sector, and governments to ensure broad-based participation in planning and policy-making, and in integrating the social, cultural, economic, environmental, and other dimensions of sustainable development into national action plans. Many NCSDs have played roles in the preparation of NSSDs (for example, in providing expertise). NCSDs often monitor the implementation of NSSDs. These institutions typically play a wide range of roles, including offering advice to government, serving as a forum for debate, acting as a vehicle for promoting awareness and information dissemination, and providing a venue for cooperative action as well as commitment to implementation (UNESCAP et al. n.d; OECD 2002a).

15.4.3.1 Instruments and Mechanisms Used in NSSDs

The OECD Development Assistance Committee identified a number of mechanisms that can be used in the preparation of effective NSSDs. Some examples include mechanisms aimed at promoting stakeholder participation; strategic assessment mechanisms to inform planning; prioritization, planning and decision-making mechanisms; mechanisms to mobilize and allocate financial resources; and monitoring and accountability mechanisms (OECD 2001b). The manner in which these mechanisms are used needs to be consistent with a set of basic strategic principles, such as those compiled by OECD (2002a):

- strategies need to be people-centered, and stakeholders need to agree on a long-term vision with a clear time-frame for implementation;
- strategies need to integrate, wherever possible, economic, social, and environmental objectives, and trade-offs need to be negotiated where integration cannot be achieved;
- strategies need to be fully integrated into the budget mechanism to ensure that plans have the financial resources to achieve their objectives;
- priorities need to be based on a comprehensive analysis of the present situation and of forecasted trends and risks, examining links between local, national and global challenges.

These principles also constitute key enabling conditions for successful sustainable development strategies.

15.4.3.2 Impacts of NSSDs

Many strategic initiatives at the national level to promote sustainable development in developing countries are externally driven and envisioned. They are often set as requirements to secure aid loans or comply with international agreements. This contributes to lack of country ownership, which in turn impacts negatively on political commitment to implementation. In some circumstances, dependency on external funds leads to competition between agencies with different agendas rather than collaboration. It also results in integration being only partly a priority, and multisectoral ideas and plans not being mainstreamed effectively. Most sustainable development strategies are little more than wish-lists with no clear objectives, achievable targets, and performance indicators. Although participation is strongly emphasized, as a gen-

eral rule the participants represent only a narrow selection of all key stakeholders. These initiatives are often not supportive of existing processes, strategies, and capacities, but look to build new ones. In some cases, they are not even tailored adequately to local contexts. The necessary institutional changes to support integration have generally not been sufficient (OECD 2002a).

Although NSSDs and NCSDs have initiated national debates on sustainable development and encouraged a more intrinsic treatment of environmental concerns, in most countries economic imperatives still dominate overall development strategies. Social considerations are also underrepresented in policy-making. Therefore, stronger synergies between these three factors—with more visible impacts—need to be developed and put into practice. Political commitment is vital, and more awareness is needed of the more long-term structural change implications of integration. While institutional development can gain from one-off or project-oriented interventions, more concerted efforts are needed to establish integration as a regular feature into governance institutions.

15.4.4 Enabling Conditions and Constraints at the National Level

A number of lessons can be learned from the experience of national-level integrated responses. First, many of these responses are externally driven, either by donors as a form of "conditionality," or by the demands of compliance with international agreements. This means that they may neither necessarily or strongly reflect the priorities and interests of the country itself, nor of different sectors of its society. In turn, this may undermine the sense of ownership not only by governments, but also by civil society stakeholders. For example, OECD finds that NSSDs are generally not coordinated effectively and lack necessary national ownership (OECD 2002a). In the case of NEAPs, the links to donor assistance also mean they comply with project time scales which militates against a longer- term more strategic perspective.

Second, although many of these responses seek stakeholder participation in their formulation and implementation, a common constraint is in the mechanisms employed to widen participation, both *horizontally* across sectors within the government sector and into the private sector, and *vertically* at the sub-national and local scales. The form of participation, where any exists, is generally passive (consultative for example), not active.

Third, to be effective, the national integrated responses require political commitment at a high level. In many cases they are viewed as ineffective because they fail to be seen as important by key government departments, such as economic planning. They are not seen to contribute to the strategic development goals or economic performance of a nation.

Fourth, the compartmentalization of the government is a constraint to national integrated responses. Finally, the data and information needs, for successful national integrated responses, are demanding. Often, the capacity to collect and synthesize the type of information required does not exist, and furthermore, the process of monitoring is costly.

A review of NSSDs and related initiatives in the Asia-Pacific region illustrates these issues (UNESCAP et al. n.d.). The majority of the NSSD bodies are of an advisory nature, which does not grant them authority to enforce recommendations. Insufficient human resources and skills as well as financial resources also limit their ability to engage more effectively and productively in policy processes. Inadequate involvement of local-level actors such as local governments and NGOs has led, in some cases, to an underrepresentation of local concerns. Ironically, while environment

has been put at the center of sustainable development debates, when it comes to priority setting, it is economic concerns that have usually been prioritized. In most countries in the Asian and Pacific region, environmental objectives are still viewed as being distinct and largely independent from economic development objectives. Most sustainable development initiatives have not managed to establish links with economic planning agencies, where power to define national development strategies is usually concentrated.

These factors are confirmed by OECD (2002b), which suggests five enabling conditions to support policy integration at the national level. These include a policy framework supportive of sustainable development; specific mechanisms to steer integration; clear commitment and leadership; effective stakeholder involvement; and effective knowledge management. The absence of one or more of these enabling conditions can frequently become a constraint. In particular, policy integration often requires modifying the government architecture so it becomes less compartmentalized. This also necessitates instituting measures for power sharing, revising roles and responsibilities, and building supportive work force dynamics. Achieving these changes may involve creating or strengthening specific mechanisms to steer and mainstream integration.

Experience shows that policy integration often does not happen spontaneously. Some have argued that, if they are to be truly effective, imperatives for integration, apart from those outlined above, should be legally binding (Klein 2001). Policy integration, however, takes place in a variety of legal and institutional settings, not all of which will accept such impositions. It is, therefore, necessary to consider, in each case, whether making integration compulsory is an enabling condition or a constraint. In a jurisdiction, subsidiarity may well be seen as mechanism of integration. Subsidiarity recognizes that action will occur at different levels of jurisdiction, depending on the nature of the issues. International policies, for example, should be adopted only when they are more effective than policy action by individual countries, or by jurisdictions within countries. Environmental policies in different jurisdictions can reflect differences in environmental conditions or development priorities, leading to variations in environmental standards within countries or among groups of countries. Harmonization of environmental standards, procedural requirements, or laws, supplemented where feasible by negotiated minimum process standards, can play an important role by ensuring that these essential differences respect a common framework.

Of particular importance are mechanisms that promote communication, collaboration, and coordination among various ministries and levels of government. Measures to assist different sectors to design their own integrated policies also enable integration, and may be more effective. Continuous, high-level political commitment and leadership is vital. Without it, policy integration becomes more formal than substantive, and environmental concerns will continue to be routinely overridden by developmental and other interests. Clear commitment and leadership at a high level also serves to influence agenda and priority-setting further down in the government hierarchy. Efficient and effective flows of information between the scientific community and decision-makers are important to design policies that integrate social, economic, and environmental considerations. Improved knowledge and public understanding of science may help to reduce dissent between the different constituencies involved, and to design policies that command the support of a wider range of stakeholders. It is also important that other types of knowledge, such as the knowledge held by traditional societies, is integrated into the policy process. Since conclusive scientific evidence related to sustain-

able development either is not available or is incomplete, ensuring that data gaps are filled and that information is updated has to be an ongoing part of the process. Policy that supports research and development also becomes a forward thinking strategy to aid policy-making and assessing results in the future.

Enacting policy integration has strong potential for conflicts of interest due to the demanding and multidimensional goals. At the same time, efforts at environmental policy integration can provide a crucial platform and arena for attempts to transcend such conflicts (Lafferty 2002). It certainly cannot be assumed that finding win-win solutions can always be realized and that any conflicts between different goals can be resolved to the satisfaction of all relevant interests. Trade-offs between environmental and other societal objectives may be unavoidable, and means of prioritization are essential. While other objectives may at times be deemed more important than environmental concerns, there must be means to decide policy priorities democratically.

The national integrated responses themselves may be a good starting point for cross-departmental linkages in governments. They may initiate a consultation process and the development of skills and capacity for further integrated responses. For example, the preparation of NEAPs by multidisciplinary teams comprising specialists from a range of areas is considered an important enabling condition (World Bank 2000). When essential data are lacking, the environmental action plan process may involve developing information systems and building data analysis capacity at the national level—and this should be part of the continuous process to identify gaps, strengthen, assess and then put into place the next step. In this way, these responses may be developing the capacity and know-how, which will spill over into other government activities. For example, frameworks such as Comprehensive Development Strategies and poverty reduction strategies claim to be built on the experiences of the NEAPs.

15.5 Sub-national and Multiscale Integrated Responses

Many integrated responses are implemented at the sub-national level. This is often where the impacts and outcomes of integration at different scales can be observed in terms of changes to human well-being and ecosystems. Frequently the sub-national level is where integrated responses are operationalized. As noted, many integrated responses occur at multiple scales. Some, such as integrated coastal management and watershed management work explicitly across scales and ecosystems. Others, such as Agenda 21, are at multiple or nested scales. These approaches may result from the implementation of international and national level initiatives at sub-national and local scales. This section reviews four widely adopted integrated responses: sustainable forest management, integrated conservation and development projects, integrated coastal zone management, and integrated watershed and river basin approaches.

15.5.1 Sustainable Forest Management

Sustainable forest management constitutes a set of guiding, though not legally binding forest principles, which on the international level emerged from UNCED in 1992. These principles provide a broad framework for integrated responses. They aim to ensure that forest ecosystem goods and services meet present-day needs, while securing their continued availability for, and contribution to, long-term development and human well-being (FAO 2001, 2003). There is considerable disagreement in terms of the general categories used in assessing sustainability, particularly, with

regard to biodiversity, whereas agreement on silvicultural guidelines is relatively more common. SFM is considered an integrated response, as most definitions include a reference to different ecosystem services and human well-being (IIED 1996).

SFM, it is argued, allows managed forests to provide income, as well as forest resources and ecosystem services that society increasingly demands. It also intends to counteract damage to biodiversity, soil, and hydrological processes, and to mitigate global climate change through carbon sequestration (Putz et al. 2000). SFM has been particularly promoted in tropical forest regions as the standard approach to achieving biodiversity conservation outside of protected areas (Rice et al. 2001). Social forestry could be viewed as a form of SFM, in that it aims to involve local people in forestry activities. The term social forestry is used interchangeably with community forestry, farm forestry, and forestry for local development (Dankelmen and Davidson 1989; Gregersen et al. 1989).

15.5.1.1 Drivers and Scale Addressed by Sustainable Forest Management

SFM attempts to address both direct and indirect drivers of change in forest ecosystems. Direct drivers include harvesting of timber and non-wood forest products, in addition to land use changes, particularly conversion to agriculture (see Hartshorn 1998). Indirect drivers include mainly trade and market influences that lead, for instance, to timber mining usually, but by no means exclusively, in tropical regions. Other indirect drivers include the simultaneously increasing demand for ecosystem services provided by forests, including water resource protection, climate regulation, biodiversity conservation, or recreation.

SFM is essentially a sub-national scale instrument that is based on tools applied at the local level. The local level may include the project, concession, landscape, or watershed scales. SFM may be applied across scales, and it may also be a guiding principle informing and shaping national forest policies. (See Chapter 8 for examples.)

15.5.1.2 Actors Involved in Sustainable Forest Management

SFM involves a wide range of possible actors, including governments, local communities, NGOs, and private businesses. In many countries, governments are key actors, who not only control or own large areas of forest but also determine legal and economic instruments. Forest communities and forest dwellers, including small and large-scale farmers, landless families, artisans, traders, and small-scale entrepreneurs, often depend on a wide range of forests resources for their livelihoods. Other important stakeholders include forest product and service consumers in urban or peri-urban communities (MacQueen 2002). Environmental and development NGOs are usually involved in fostering SFM adoption at the local level. Finally, the private sector is involved in the commercialization of forest products and the transition to sustainable practices. SFM may be initiated by any of these actors and may involve different combinations of actors from each of these groups.

Studies on SFM implicitly agree that the integration of different stakeholders leads to processes and outcomes that are more efficient and effective (Mayers and Bass 1999; Colfer and Byron 2001; Wollenberg et al. 2001). However, until recently, few studies examined the social and economic costs of collaborative decision-making, conflict resolution, consensus building, participation, and other processes (Cooke and Kothari 2001).

15.5.1.3 Instruments and Mechanisms for SFM

SFM constitutes a large number of different instruments and mechanisms aiming at the scientific, technical, legal and administrative, economic, and social components of sustainable management of forests. (See also Chapter 8.)

Criteria and indicators for evaluating progress in implementing SFM have been developed for all key forest ecosystems in different regions. Nine such initiatives currently exist globally (Wijewardana 1998; FAO 2001). Criteria and their indicators, as well as other technical guidelines, generally address all aspects of harvesting, as well as the various pre and post-harvesting stages. They also address socioeconomic benefits and needs, as well as legal, policy, and institutional frameworks. They are designed to increase the growth of marketable timber or non-wood forest products, with efforts aimed at lowering the damage to the forest stand and critical ecosystem processes; to a somewhat lesser degree, they also include social development aspects (Putz et al. 2000; Rice et al. 2001). The degree of implementation of criteria and indicators at the national level varies considerably. In many cases, action is limited by lack of trained personnel or institutional capacity (FAO 2001).

Certification is a combined economic, legal, and behavioral instrument (See also Chapter 8). Although increasing in recent years, certified timber accounts for only a very small proportion of total tropical timber trade (Rice et al. 2001). It is likely that there is an unfulfilled demand for certified tropical timber in large consumer countries (for example, Barbier et al. 1994; Sobral et al. 2002). Key certification schemes have been noted for their expressive incorporation of community relations, labor rights, health and safety concerns, and social benefits of forest operations (for example, Forest Stewardship Council, Principle 4, Nardelli 2001). Diversifying markets for lesser-known species has been suggested as a mean to enhance the productivity per unit of forest (Buschbacher 1990). However, simply creating markets for a larger number of species may lead to more species being overexploited, and evidence from Latin America shows that multispecies exploitation cannot in itself guarantee the adoption of SFM practices (Rice et al. 2001).

Trade controls such as log export bans have been promoted as an incentive for improved forest management through larger investments in local processing (Bomsel et al. 1996). Export bans have been implemented in various tropical forest countries (Barbier et al. 1994; Rice et al. 2001). Although, these export restrictions have stimulated growth and employment in the processing timber industries, they have also led to excessive processing capacities and consequently increased logging (Rice et al. 2001, p. 20). However, temporary banning or controlled trade (for example, for endangered species) may prove an important tool (Barbier et al. 1994).

Forest concessions, as the dominant means of allocating harvesting rights in many countries, have usually failed in terms of protection and enhancement of other ecosystem services and human well-being. Security for land and resource tenure is thought to provide incentives for investment in long-term management (Buschbacher 1990). While secure tenure may be necessary to promote investments in long-term management, it is unlikely that this is sufficient for SFM (Boscolo and Vincent 2000; Rice et al. 2001). However, there is also evidence that frequent renewal of short-term concessions based on demonstrated forest management performance may provide stronger incentives for SFM (Gray 2002). Alternative approaches such as competitive allocation proved to be more effective in reducing corruption and in promoting productive and efficient management and revenue generation (Gray 2002; Landell-Mills and Ford 1999).

Improving logging and milling efficiency is seen as a way of increasing profits, while enhancing incentives for long-term management and reduced logging damage (Johnson and Cabarle

1993; Gerwing et al. 1996; Holmes et al. 2000). It is, however, also pointed out that greater efficiency may be associated with more rather than less forest destruction (Rice et al. 2001).

15.5.1.4 Impacts of Sustainable Forest Management

SFM has the potential to positively impact on a variety of ecosystem services, simultaneously. Uncertainties remain, however, in relation to the effects of exploitation on biodiversity and other key services (Bawa and Seidler 1998). Adequate understanding of ecologically sustainable and economically and socially viable forest management in complex tropical forest systems is often lacking (Boot and Gullison 1995), although much progress has been made in given cases, including, for example, the Deramakot Project in Sabah (GTZ 1994) and the Precious Woods Holding in the Amazon and Costa Rica (Freris and Laschefski 2001). While most countries have already set up SFM procedures, they usually focus on the management process rather than its impact in terms of sustainability (Gray 2002). Although governments and development agencies have devoted years of effort and hundreds of millions of dollars in promoting SFM, this form of management has failed in its attempt to curb deforestation (Rice et al. 2001). In contrast, the promotion of SFM has been perceived by many countries as a form of promoting forest exploitation instead of halting deforestation (Winterbottom 1990).

Human well-being and poverty reduction are referred to in different ways and at different scales in many SFM responses (Poschen 2000). (See also Chapter 8.) However, there are still significant uncertainties about the role of SFM on increasing the well-being of local forest dwellers and other key actors. Angelsen and Wunder (2003) argue that the role of sustainable forest management in poverty alleviation is largely overestimated. Mechanisms that explicitly refer to aspects of human well-being, such as certification, remain expensive and are rarely adopted by communities because of market risks and costs (Mallet 2000). Again, although SFM *in theory* enhances human well-being, in practice the evidence from its implementation is not conclusive.

15.5.1.5 Trade-offs between Ecosystem Services and Human Well-being in SFM

The literature on forest environmental services often assumes that services are complementary and, therefore, increased investment in one service will have positive spin-offs for others. In practice, however, relationships between ecosystem services are not well enough understood. Relationships are often dynamic and, therefore, switch between positive, negative, and neutral impacts at different levels of service supply vary, and are usually site specific. For instance, fast-growing plantations may have a detrimental impact on water supplies, while being valuable in terms of carbon sequestration. Biodiversity conservation may reduce income generation from timber and non-wood product exploitation. The most diverse forests are not necessarily optimal for landscape beauty or watershed protection (Landen-Mills and Porras 2001).

Trade-offs among ecosystem services cause problems, for instance, when markets for ecosystem services are developed. Although the commercialization of ecosystem services maximizes the returns to forest investment, merging and marketing forest services requires a clear understanding of their internal relationships. Also, allocative efficiency gains are restricted, since individual services do not have their own prices to send out signals about their relative value. Emerging trade-offs through bundling of services are likely to vary across forest types and actors. The lack of knowledge of technical relationships between services currently constrains the development of efficient markets for bundled forest services (Landen-Mills and Porras 2001).

Trade-off studies on forest services are scarce. Brown and Corbera (2003) report on research investigating the sustainable development dimensions of agroforestry carbon sequestration projects in Mexico. Although these projects have been widely promoted as a means of fostering local development and securing global benefits through carbon sequestration, a number of trade-offs were found to exist. (See Table 15.5.) The actual realization of "win-win" outcomes will depend on a careful crafting of project measures and on institutional acting as based on equity and efficiency at multiple scales ranging from local resource management and decision-making to national government frameworks.

15.5.2 Integrated Conservation and Development Projects

Integrated conservation and development projects, also termed community-based conservation projects, aim to intentionally and actively link biodiversity conservation and development of local communities (Wells et al. 1992; Hughes and Flintan 2001). ICDPs have become very popular over the last decade and absorb a major proportion of international funds available for biodiversity conservation (Wells et al. 1999; Alpert 1996).

15.5.2.1 Drivers and Scale Addressed by ICDPs

ICDPs emerged in response to the growing recognition that conventional protection approaches, which tend to ignore local needs and calls for equity, are largely inefficient or even counter-

Table 15.5. Trade-offs in Forest Carbon Sequestration Projects in Mexico (adapted from Brown and Corbera 2003)

Nature of the Trade-off	Manifestation in Mexico Forest Carbon Projects
Trade-offs between ecosystem services	maximizing carbon sequestration may jeopardize biodiversity and other ecosystem services
Trade-offs between ecosystem services and human well-being	enhancing forest carbon sequestration may make livelihoods more risky because of dependency on external finance and policy and actors
	enhancing carbon sequestration will have opportunity costs (for example, from harvesting timber and non-wood products)
Trade-offs between stakeholders	different stakeholders have different priorities in projects, include risk taking versus risk minimization; time preferences for income and investment streams
	critical differences in access to markets and decision-making are between rich and poor and between men and women
	richer farmers—who have more land and more secure property rights—are more likely than poorer farmers to capture benefits
	potentially a move from communal resource management to private property regimes, with results for equity inequities may be exacerbated by carbon projects
Trade-offs between different aspects of human well-being	maximizing income from carbon sequestration may not be compatible with diverse livelihood strategies

productive as pressure from growing rural populations is threatening the viability and integrity of protected areas (Newmark and Hough 2000; Worah 2000).

Direct drivers targeted by ICDPs include mainly unsustainable natural resource harvesting and land use changes. The scale of operation is sub-national or local and focuses primarily, though not exclusively, on areas adjacent to protected areas, so-called buffer zones (Wells et al. 1992). In some cases, ICDPs may cross national boundaries.

15.5.2.2 Actors Involved in ICDPs

ICDPs integrate local communities in buffer zones and protected areas, alongside NGOs and government organizations, and, in some instances, private enterprises. NGOs are the most common promoters and implementers of ICDPs. Buffer zones and protected areas are in many cases regulated by specific laws and administered by government agencies. Therefore, governments have at least a partial role in the implementation or regulation of ICDP activities. Private enterprises are commonly involved in commercial transactions concerned with natural resource products or services.

15.5.2.3 Instruments and Mechanisms Employed in ICDPs

ICDPs employ a set of diverse instruments ranging from the economic and institutional to the behavioral. Economic instruments are particularly important as ICDPs seek to integrate conservation and development through the provision of income-orientated incentives for local populations. Common activities fostered by ICDP projects to provide income include handicrafts, beekeeping, agroforestry, ecotourism, harvesting, and marketing of non-wood forest products, as well as sharing revenues of park entrance fees and employing local people as park rangers or wildlife guides (Wells 1995).

ICDP activities can also involve changing particular behavior, environmental education, or improving community infrastructure. The provision of schools, health services, and sanitation has been widely used as an incentive for people to cooperate with project conservation objectives. Furthermore, a number of initiatives promote alternative sources of food, fuel, and building materials in order to reduce pressure on natural resources. Finally, ICDPs are implemented or supported through institutional mechanisms. Projects often apply a combination of economic and non-economic incentives to secure the cooperation of local communities and to provide alternatives to unsustainable activities.

15.5.2.4 Impacts of ICDPs

Most ICDPs are established to alleviate pressure from local communities on protected areas and, therefore, to increase the provision of ecosystem services, among which biodiversity is the main concern. Despite the popularity of ICDPs, a number of assessments conducted over the years have concluded that most ICDPs have not achieved their objectives. Early assessments suggested that since projects were still not fully implemented, success was limited (Hannah 1992; Wells et al. 1992; Kiss 1990). Nevertheless, more recent assessments in several regions of the world continue to provide a largely negative view of the success of ICDPs (Wells et al. 1999; Newmark and Hough 2000). It appears that ICDPs have rapidly advanced from an untested idea to "best practice" in conservation, without their effectiveness ever being demonstrated and substantiated by practical results (Wells et al. 1999).

The efficiency of ICDPs to enhance ecosystem services is limited by a number of factors. While local people often pose a number of threats to biodiversity, large-scale government and business investments are generally much more serious in their impacts. There is, therefore, a fundamental mismatch between the causes of biodiversity loss and the focus of ICDPs (Kiss 1999). In Indonesia, for instance, the impact of local communities on ecosystem degradation ranks well behind road construction, mining, logging concessions, and sponsored immigration, when measured by their threats to protected areas (Wells et al. 1999). ICDPs focusing on local communities, therefore, fail to succeed in conserving biodiversity because they are often aimed at the wrong target.

Addressing the problem of biodiversity loss involves slowing, halting, and reversing land use change. This requires, consequently, a change in the behavior of a large number of people dispersed over large and ecologically significant areas over a long period of time. By contrast, ICDPs are characterized by being very limited in time and by the number of beneficiaries. Also, in terms of scale, ecosystems conservation must be realized most usually at a landscape scale, while development initiatives are often context specific and small scale (Ferraro 2001).

Another factor is the largely unproven assumption that development in areas adjacent to protected areas will necessarily lead to conservation within the protected areas. The balance of evidence suggests that efforts to establish alternative sources of income from ecosystem services can only work in combination with the adoption of strict and effective measures of resource protection (Kiss 1999). Otherwise, communities are tempted to add rather than substitute income sources and resource extraction. Often, establishing ICDPs is likely to result in "unconstructive dynamics and incentive structures" (Kiss, 1999, p. 3). (See Box 15.13.)

Many ICDPs fail because the economic incentives presented to communities are insufficient to foster behavioral changes (Gibson and Marks 1995). Sometimes the incentives offered also fail because they overlook the social and cultural importance of certain activities, such as hunting, that cannot be easily substituted.

Leakage can be a problem as ICDPs may export over-use of resources to other areas. In the Mamirauá Ecological Reserve project in Brazil, for example, negotiated fishing rules and regimes between local users and external communities led to the overexploitation of fishing resources in previously unaffected areas (Hughes and Botelho 2000). Also commercialization of non-wood forest products has been reported to induce overharvesting or overcultivation (Ferraro and Simpson 2001). On the other hand, ICDPs may also attract more pressures on resources. In countries where poverty is widespread, even modest benefits provided by ICDPs may induce higher pressures on natural resources through migration into the project area (Wells et al. 1999; Noss 1997; Barrett and Arcese 1995; Wells et al. 1992). Also, tourism may damage protected areas and buffer zones.

Overall, the bottom line is that conservation is not likely to result from *all* ICDPs (Salafsky et al. 2001). The linkages between conservation objectives and development activities, which are central to the rationale of ICDPs, are generally poorly understood or enforced. Many projects only provide nominal opportunities for community-wide participation and often do not succeed in linking development benefits directly to community conservation obligations. Simplistic ideas of making limited short-term investments in local development, then hoping this will somehow translate into sustainable resource use and less pressure on protected areas, need to be abandoned (Wells et al. 1999, p. 6).

ICDPs were developed among other things due to the concern over the impacts that protected areas implementation has on local communities. In particular, conflicts over rights to land and severe restrictions on harvesting resources called attention to the unfair distribution of the costs of biodiversity conservation (Newmark and Hough 2000).

BOX 15.13

Unconstructive Dynamics and Incentive Structures of ICDPs (adapted from Kiss 1999)

The project approach to integrating conservation and development often leads to unconstructive dynamics and incentive structures. The main problems that affect integrated conservation and development projects include:

A poor "donor/recipient" dynamic: this occurs when the main objective of the beneficiaries quickly becomes obtaining as many benefits as possible from the project and getting the project to address their most urgently felt needs (which rarely relate directly to biodiversity conservation). This raises false levels of expectation and builds dependency instead of self-sufficiency or empowerment. Instead of good relations and cooperation, it leads to worsened relations and hostility when benefits fail to meet expectations, or when they are phased out.

A "get on with it" mentality: once a project has been identified and expectations are raised (among donors and recipients) everyone involved becomes focused on getting project activities moving and getting the project going. This explains why so often we launch into implementing projects even though we realize we do not have: (1) an adequate understanding of either ecological or socioeconomic/political conditions, or (2) real consensus between project supporters and communities on the objectives and on respective roles/responsibilities. We all know that we should take the time to do this but buckle under the pressure of trying to get the project off the ground.

Misplaced "ownership": having designed and mobilized the funding for a project, the project supporters are often more intent on making it succeed than on the beneficiaries. This leads them to continue at all costs and make compromises that they should not make, just to keep it alive.

A focus on activities, rather than impacts: projects consist of specific activities, and project supporters become preoccupied with implementing them, and (inevitably?) come to measure progress and achievement in terms of implementation. The result is the general absence of effective ecological socioeconomic monitoring and evaluation in these projects. Even if an attempt is made to identify impact indicators, in practice, monitoring and evaluation usually focuses on the implementation of activities. In addition, the focus on activities usually amounts to excessive focus and time spent on community development activities, with project supporters forced into the role of "social control" (ensuring equitable use and proper accounting of development funds) for which they have no mandate and little capacity.

"Magnet effect": even very modest projects become (or become perceived as) islands of relative prosperity in the midst of poverty, attracting immigrants to the area. The result is a dissipation of project benefits, and increased demands and stress on the natural environment.

If ICDPs have in some cases been able to raise overall incomes, they have in other cases failed to evenly distribute benefits among different community groups. Failure usually derives from erroneous assumptions. Often, it is assumed that "communities" are homogenous, easily defined and recognizable and that social cohesion allows project activities to be aimed at the community as a whole. In reality, however, there may be a great deal of social differentiation within communities, which affects who benefits from project activities and who looses from restrictions on resource use. For instance, ICDPs are often biased against women in their activities and in benefit-sharing (Flintan 2000).

Another problematic aspect is that ICDPs may unintentionally promote dependency rather than reciprocity, in particular, when local communities are treated as recipients of aid rather than as partners in development (Newmark and Hough 2000).

15.5.3 Integrated Coastal Zone Management

Coastal ecosystems are critically important for human well-being. Almost half of the world's population lives in coastal areas and depends directly on coastal resources for livelihoods. The services provided by coastal ecosystems, such as protection against climate change–induced sea level rise, storm protection, and nutrient regulation are all vitally important. Many coastal zones are experiencing more rapid economic growth than inland areas. Population growth, expanding development activities, pollution, and overexploitation of natural resources are leading to the degradation of many coastal ecosystems.

Integrated coastal zone management has become a widely accepted response to sustain coastal zones (Clark 1996; Cicin-Sain and Knecht 1998; Kay and Alder 1999; Beatley et al. 2002; Harvey and Caton 2003). There are two main reasons why integrated management of coastal zones is necessary. The first concerns the impacts that coastal and ocean uses, as well as activities further inland, can have on coastal and ocean environments. The second is related to the effects that coastal and ocean users can have on

one another (Cicin-Sain and Knecht 1998). ICZM is a conscious management process that acknowledges these interrelationships.

15.5.3.1 Drivers and Scale

Coastal regions are highly dynamic environments and changes in the landscape brought about by natural processes are to be expected. However, pressures exerted by humans are changing these areas dramatically and to a point that they are not able to recuperate from disturbances. This leads to the degradation of coastal ecosystems. ICZM seeks to address multiple drivers of ecosystem change (both direct and indirect) originating from processes occurring at different spatial and organizational scales.

Economic development can significantly affect the ecology of the coastal zone, ecosystem processes, and natural resources availability. For example, the removal of mangroves for aquaculture interferes with the functions that these habitats perform as buffers for storms and fish nurseries (Cicin-Sain and Knecht 1998). The types of economic activities established in a given region will often depend on subsidized credit and other incentives, as well as global market trends. Such factors are important drivers of coastal change.

The growing population of the word's coastal zones presents a major challenge to their sustainability. Coastal zones in many countries are among the most attractive places to live, both economically and aesthetically (Beatley et al. 2002). Some are seasonal tourist destinations, the population of which increases manifold during a few months of the year. More people mean expanding infrastructure, greater need for potable water and food, and larger amounts of waste. All these developments put ever-increasing pressure on natural resources, and result in competition for resources and space by different users.

Inappropriate institutional frameworks often exacerbate the problems facing coastal zones. Conventional management processes have tended to segment concerns and deal with problems on an isolated basis. Regulatory and political structures can also encourage behaviors that endanger the fragile natural resources of the coastal area (Beatley et al. 2002). Inefficient planning regula-

tions, for example, enable the disorderly occupation of coastal areas, leading to the destruction of ecosystems and often placing people at risk from natural hazards. Another important problem that ICZM seeks to address is the inability of different agencies and levels of government involved in coastal zone management to work together.

ICZM deals with the drivers or factors that lead to the degradation of coastal resources in at least three major ways. It does so, first, by addressing conflicts between different uses and users of coastal resources. Second, by improving coastal planning and management processes in order to regulate increasing demands on resources. The third way drivers are addressed is by promoting institutional change, particularly the processes through which decisions are made about coastal zones and their resources. The latter implies fomenting more inclusive decision-making, building capacity, and promoting inter-sectoral and inter-agency coordination.

ICZM can be implemented at multiple scales. Managing complex areas such as coastal zones means focusing on geographically defined areas sharing common or interrelated resource management, pollution control, economic development, and other social, political, and environmental concerns. ICZM has often been implemented on a regional scale, sometimes using the watershed as the unit of management (Beatley et al. 2002). It is also commonly implemented on a local scale where it can respond to more locally specific interests, needs, and concerns. International ICZM plans are less common, but are urgently needed since problems often extend over national borders. Even though the focus of ICZM may be on a given scale, cross-scale interactions are considered in terms of the biophysical processes involved and the institutions responsible for management decisions and their implementation. ICZM, therefore, is best described as a cross-scale integrated response.

ICZM addresses several dimensions of integration. It involves balancing, at a number of scales, different, and very often, competing values, interests, and goals (Kenchington and Crawford 1993). ICZM promotes both horizontal and vertical integration. On the horizontal axis, integration occurs among different sectors concerned with coastal issues (for example, fisheries, tourism, environmental conservation, infrastructure development, oil exploitation) and integration between coastal sectors and land-based sectors that affect the coastal/marine environment (Cicin-Sain and Knecht 1998; OECD 1993). Integration among nations is often also a feature of ICZM, particularly when different nations share enclosed or semi-enclosed seas, or negotiated solutions must be found for fishing, transbounday pollution, and other issues.

Vertical integration implies, primarily, the integration between different levels of government (local, regional or provincial, and national). The different levels of government play different roles, address different needs, and have different perspectives. These differences may pose problems that ICZM seeks to address by promoting harmonized policy development, planning, and implementation between different national and sub-national levels (Cicin-Sain 1998; see also Sorensen 1997). The integration between different institutions and stakeholders is a central feature of coastal zone management, particularly stakeholder inclusion in decision-making (Treby and Clark 2004).

Integration between different disciplines (natural sciences, social sciences, engineering) is also a fundamental aspect of integrated coastal management. The bringing together of the natural and social sciences within an integrated framework, coupled with a learning-based management system, may enable gains to be made in the science of coastal zone management. As the knowledge base improves, so the management strategies used need to evolve (Olsen et al. 1998). Given the unsuitability of "blueprint" solutions for ICZM, a learning approach that draws on an improved knowledge base is particularly important. Essentially, ICZM is a form of adaptive management (Olsen and Christie 2000).

15.5.3.2 Instruments and Mechanisms for ICZM

A wide range of mechanisms and instruments are commonly used in coastal planning and management—ICZM draws on both well-established and more experimental ones. Kay and Alder (1999) identify a range of techniques that can be combined to assist in the integrated management of coastal zones. These techniques can be administrative, such as policies, legislation, and guidelines; social, including the use of traditional knowledge, co-management, and capacity building; and technical, such as environmental impact assessment, landscape visualization, and economic analysis (see also Clark 1996; Thia-Eng 1993).

The European Union has compiled a set of enabling mechanisms for ICZM, which range from legal and regulatory instruments to voluntary agreements and international conventions (EC 1999). Guidelines and good practices are particularly useful aides for those interested in adopting an integrated approach to coastal management (see Post and Lundin 1996; Pernetta and Elder 1993; GEF et al. 1996; UNEP 1995, 1996). Efforts have also been developed to produce guidelines for the incorporation of specific issues into coastal management such as wetlands (Ramsar 2002) and climate change (Cicin-Sain et al. 1997).

Brown et al. (2001) outline an innovative set of techniques to address dilemmas between conservation and development in managing coastal resources in developing countries. This approach has been labeled "trade-off analysis" and focuses on including the values and interests of all those concerned with coastal resources into decision-making processes (see also Brown et al. 2002). Using a framework of multicriteria analysis, the approach engages stakeholders in the research process in order to evaluate the trade-offs between users and uses of coastal resources, and to negotiate and design effective, efficient, legitimate, and equitable governance structures (Adger et al. 2003).

Trade-off analysis is particularly focused on the problems and dilemmas of those parts of the developing world where the natural resources of the coast form significant and necessary resources for livelihood resilience. Here the dilemmas and trade-offs for sustaining the coast are especially acute and immediate, given the high biodiversity and ecosystems values, and the livelihoods and dependence on coastal and marine resources. In addition to trade off-analysis, other methodologies have been proposed to facilitate the development of integrated coastal management. These are based on consensus, flexible institutional arrangements based on issues and not sectors, and more equal power in decision making (see Kay et al. 2003).

15.5.3.3 Impacts of ICZM

Assessing ICZM is challenging, not only because many (but by no means all) of these initiatives are relatively recent, but also because there is very little evaluative evidence on its effectiveness in improving the management of coastal zones and their resources (Cicin-Sain and Knecht 1998). Evaluations of ICZM have tended to focus on the quality of program implementation and the degree to which project objectives have been achieved. Some focus on management capacity to determine the adequacy of management structures and management processes as these relate to generally accepted standards and experience. For example, donor-funded ICZM initiatives usually emphasize performance evaluation,

which reveal little about how interventions have impacted on coastal resources and society (Lowry et al. 1999). Evaluation difficulties are compounded by the lack of baseline studies. Without a baseline, it is difficult to analyze the impacts of management efforts, as highlighted in a recent report of the U.S. Commission on Ocean Policy (2004).

A growing number of publications on ICZM have emerged during the last decade (Clark 1996; Cicin-Sain and Knecht 1998; Kay and Alder 1999). Most cover both the theory and practice of ICZM and provide valuable planning, implementation, and operational guidelines. They provide a guide on how to develop ICZM but rarely go into examining outcomes, partly because of the problems highlighted above. Their focus, therefore, is on processes not outcomes. Thus what this assessment can say about ICZM is mainly related to the process of ICZM development. Integrated coastal zone programs appear to have positive effects on two key areas, namely the improvement of coordination between the different sectors, actors, and levels of government involved in coastal management, and greater stakeholder involvement in decision-making (Klinger 2004).

ICZM initiatives have introduced the practice of preparing strategic plans for coastal zones looking at the bigger picture and the long-term linkage between maintaining the integrity of the natural system and the provision of economic and social development options. In the United Kingdom, for example, coastal defense is currently undertaken within the framework of shoreline management plans. This is a first step toward more holistic, broader encompassing coastal management, based on coastal process cells and sub-cells rather than the administrative boundaries of coastal operating authorities. Shoreline management plans also provide an enabling framework to link the work of the many stakeholders who need to be involved, while taking into account their individual roles and responsibilities (Atkins 2004).

ICZM initiatives have created conditions for stakeholder involvement in coastal management decisions and for partnerships that have helped to break sectoral barriers. However, studies have also highlighted that a number of interests are still excluded (Atkins 2004). In some cases, the ICZM process has failed to identify all relevant stakeholders and create conditions for their effective participation. In others, the stakeholders themselves have opted out because the benefits of involvement were not clear. This is partly because of uncertainty regarding the role of consultative processes in coastal zone decision-making by government authorities. Partnerships have been important but have not always demonstrated transparent and democratic methods for selecting participating organizations and individuals that truly reflect the range of stakeholders in the area.

One of the key lessons that are emerging from ICZM experiences is that more integration per se does not guarantee better outcomes. The challenge is not only formulating improved strategies, but also implementing such strategies (Olsen 1993). Many developing nations lack the capacity to implement complex programs aiming to address many different problems simultaneously. Focusing on a few issues initially and then gradually addressing additional ones as capacity increases is often more feasible and effective. This means adopting an incremental approach to ICZM (Olsen and Christie 2000). Ultimately, ICZM is a challenge of governance that requires "modifying entrenched patterns of behavior and societal norms" (Olsen 1993, p. 203). However, the required changes can be difficult to achieve, especially when they require shifts in the distribution of power and authority. For example, competition over management control between different agencies often undermines the political feasibility of approaches

requiring a high degree of intergovernmental cooperation and coordination. (See Box 15.14.)

15.5.4 Integrated River Basin Management

The need for the comprehensive management of water resources, using the river basin as the focus of analysis, has been stressed by international conferences such as the 1992 Dublin Conference on Water and the Environment and UNCED. Agenda 21 (Chapter 18) places much emphasis on the need for the integrated management of water resources, emphasizing the importance of water for both ecosystems and human development. IRBM shares many similarities with the concept of integrated water resources management, but although both concepts are interrelated, they are not necessarily identical. Integrated water resources management—which emphasizes the need for legal, institutional, and policy frameworks—is seen as the wider context within which IRBM as a concrete management approach takes place (GWP 2000; GWP 2004).

River basins are critical spatial and ecological units that sustain many important economic activities, as well as livelihoods. As freshwater and other resources provided by river basin ecosystems become scarcer, competition for their use increases. Resource degradation narrows options for future development, but these impacts are not evenly distributed. The poor, in particular, rely disproportionately on ecosystem goods and services provided by river basins, and feel the greatest effects when these are degraded (McNally and Tognetti 2002).

Conflicts among stakeholders regarding tradeoffs among different resource uses are common in river basins. Such conflicts may be exacerbated in international river basins where socio-economic inequities between the different countries are often considerable, as are differences in power. Of the world's 263 international river basins, 158 are believed to be potential flashpoints for future disputes since cooperation between the countries covering these basins is inconsistent or absent (UNEP 2002c).

River basin approaches are not necessarily new. For example, the Murray-Darling Commission, a well-known example of river basin management institutions, has a long development history. (See Box 15.15.) However, earlier approaches tended to focus on only a few aspects of water management, such as quantity and quality, whereas the scope of IRBM is broader. IRBM is explicitly concerned with promoting integration, for example, between land and water management, of upstream and downstream water related interests, of freshwater management and coastal zone management, and across all major water use sectors. IRBM should, therefore, be linked to ICZM efforts to form a process of broad-scale, integrated ecosystem management (Ramsar 2002; Ramsar Convention Secretariat 2004).

15.5.4.1 Main Drivers Addressed by IRBM

River basins often include many different ecosystems such as river systems, riparian forests, lakes, wetlands, and deltas. IRBM seeks to address, directly or indirectly, all major drivers causing the degradation of river basins. These drivers differ from region to region, but usually include changes in land and water uses that affect ecosystems and hydrological functions (for example deforestation), population growth, pollution, and overuse of natural resources. IRBM, therefore, seeks to address a complex set of drivers that undermine the ability of river basins to provide multiple ecosystem services as well as the capacity of people to benefit from such services.

IRBM also addresses the drivers that lead to the fragmented and uncoordinated management of water and associated resources

BOX 15.14

Barriers to Inclusive, Integrated Coastal Zone Management: Evidence from the Caribbean

Inclusive, integrated coastal zone management can be undermined by a number of constraints. In Buccoo Reef, Trinidad and Tobago, the main constraints to stakeholder participation in coastal management include the high financial cost of participation; the high time costs of participation; poor skill development of leaders; poor communication within and between groups; and existence of widespread personalized conflict in communities. The prevailing policy, legal, and regulatory setting as well as governance structures and institutions also militate against the implementation of integrated coastal management.

The national legislative setting in Trinidad and Tobago is not conducive to stakeholder inclusion in coastal zone planning and management. There are no legal provisions that make stakeholder participation in environmental decision-making and policy-development a requirement. The legislation also demonstrates other important gaps. For example, property rights to inter-tidal and other areas are not clear and the roles and responsibilities of the different agencies concerned with coastal resources are poorly defined. This gives rises to disputes, duplication of work, and institutional paralysis. Resource managers also feel that the enforcement of existing laws is inadequate. Combined, these factors make implementing ICZM more than a matter of drafting addition regulations. More profound changes are needed.

Structurally, the Trinidad and Tobago government lacks specialist staff with appropriate skills to implement integrated and inclusive approaches. Officials and field staff often do not know how to engage and work with different stakeholders. Lack of training, insufficient staff numbers, and inadequate financial resources can be major impediments when undertaking participatory planning and management. Consulting with stakeholders and enabling their participation in the definition and implementation of coastal management plans is often a time consuming and resource-intensive process that requires not only appropriate skills and resources but also will. Government officials often consider the inclusion of stakeholders as impractical, making coastal management more complex.

Formal natural resource management institutions in Trinidad and Tobago impose constraints on all arms of the government. The lack of space for networks to develop is identified by many within the system as the bottleneck to the development of more integrated and inclusive approaches. But in some cases, the constraints on the expansion of networks and innovation are self-imposed by the government agencies themselves. New government agencies, especially, may need to develop public credibility to achieve "success." Consequently, they may avoid untested methods or approaches. The problem of perceived power loss by the government may diminish as more government departments start to see the potential benefits by engaging communities in making decisions about, and managing, natural resources.

In other cases, there are few possibilities to expand institutional networks because of the peculiarities of institutional structures and operational arrangements. For example, many government agencies use a project cycle approach to allocate financial resources. Project timetables are fixed in the project proposal, and funding agencies generally require project managers to deliver outputs according to strict timetables, and funding is dependent on the successful completion of intermediate targets. The time allocated to inclusionary processes might be perceived as a stumbling block to the achievement of project deadlines. Effective inclusion can be time-consuming and unpredictable in terms of length of time required to complete the project. If a project leader is determined to meet inflexible project deadlines, it might not be possible to fully engage stakeholders. The project cycle, therefore, does not support social learning or adaptive approaches to coastal management.

Low levels of social capital, as well as limited access to spaces of engagement and lack of networks linking groups with shared interests constitute significant constraints to participation in decision-making. Constraints to participation can also arise from high costs of involvement, in terms of time or money. This has implications for who participates and who is excluded. The stakeholders involved are often asked to commit a substantial amount of their time, and sometimes their finances to supporting aspects of resource management. This can create the potential problem of non-representation, through a self-selection process, whereby those who have the time or resources to attend meetings and offer input may not reflect the opinions and attitudes of others in the community or group.

Poor interpersonal communication, aggressive behavior or strained intra-community relations can all act as constraints to participation. Poor communication within and between groups as well as, between these and the government is often an important constraint. Equally important is the issue of skill development, especially of leadership qualities and relationship management at the community level. In those groups that are poorly organized, the inability to develop a coherent message and deliver it to the appropriate agency is akin to exclusion. Often, communication and winning community trust and involvement rests on the commitment, sensitivity, and leadership of one person or a very small group of people. Some groups may not work well together because of historical factors such as mistrust of public authorities. If such cases exist, ways must be found to build trust.

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in river basins (Chew and Parish 2003). As a recent UNDP (2004, p. 2) publication discussing the role of water for poverty reduction argues, the water crisis that humankind is facing today has resulted mainly "not from the natural limitations of the water supply," but rather from "profound failures in water governance, that is, the ways in which individuals and societies have assigned value to, made decisions about, and managed the water resources available to them." One of the greatest challenges of IRBM, therefore, is to address institutional problems and bottlenecks. This involves changing practices and attitudes, resolving conflicts and power imbalances, and including a wider range of stakeholders in decision-making.

15.5.4.2 The Scale of IRBM

IRBM may take place at different scales: at the local to national scale it ranges from small catchments to major national basins; at the national and federal scales it focuses on intra-country trans-boundary issues; at the international scale it deals with transboundary river basins (examples include the Nile, Danube, and Rhine).

IRBM is inclusive of management of watersheds. Focusing on watersheds is a way to address problems that are difficult to solve at larger scales, such as relationships between land use and water flow for purposes of stabilizing stream flows, controlling erosion and sedimentation, and improving groundwater recharge (Barrow 1998). For clarification, a watershed (often called a catchment) is considered to be a topographically delineated area drained by a stream system; that is, the total land area above some (sometimes arbitrary) point on a stream system. A river basin is similarly defined, but is delineated on a larger scale and includes all the lands that drain through the tributaries into the basin.

Box 15.15

The Murray-Darling Basin Initiative

The Murray Darling Basin covers 1,019,469 square kilometers of southeastern Australia and contains the country's three longest rivers—the Darling, the Murray, and the Murrumgidgee. Key biophysical features are the presence of over 30,000 wetlands, 35 endangered birds, and 16 endangered mammals. It is also of economic significance to Australia as it generates 40% of the national income from agriculture and grazing and contains about half of the national cropland and three quarters of irrigated land, though it only drains 14% of the country's land area. It is administered by five different states that have different climatic conditions, water availability, water use requirements, and management approaches, as well as over 200 local governments. Over half of the basin is in the state of New South Wales, close to a quarter is in Queensland, and the rest in Victoria, the Australian Capital Territory, and South Australia (MDBC 2002).

A River Murray Commission was formed in 1915 to develop the Murray and Darling rivers for navigation and irrigation. Following a review and mounting environmental degradation, the Commission was reconstituted in 1988 with the Murray-Darling Basin Agreement between the four basin states and Australian Capital Territory establishing the Murray-Darling Basin Initiative and the Commission to run it. With the reinstitution of the Commission, a new program of work focused on sustainable natural resource management commenced.

The basin faced two major resource problems. First, over 70% of useable water was being diverted, mainly for irrigation. Consequently, native fisheries and water bird populations were collapsing and major wetlands had contracted by half. Pastoralists relying on beneficial flooding for livestock production on floodplains saw their productivity decline sharply. Second, the lack of dilution of pollutants and the side effects of the dams and levees were compounding the environmental impacts. Water quality was also in rapid decline with increased concentrations of nutrients, farm chemicals and salinity. Of greatest concern was an upward trend in salin-

ity due to poor irrigation practices and deforestation in the catchment headwaters.

While these problems have not been and may never be "solved," quality of decision-making improved in the Murray Darling Basin. Among the measures that contributed to the improvements:

- including both nature conservation and resources and agriculture ministers in the MDB Ministerial Council;
- appointing an independent, authoritative Chair of the Commission, which could informally mediate in disputes;
- establishing the heads of the relevant government agencies as the MDB Commission;
- employing technical staff to advise these bodies in the Office of the Murray Darling Basin Commission;
- contracting independent national scientific authorities to report on the most controversial issues and for auditing;
- establishing a Community Advisory Committee, with representatives of key stakeholders and the chairs of the eighteen (sub-) Catchment Management Committees, with the CAC chair representing the community on the Commission and Ministerial Council;
- creating opportunities for representatives of the key stakeholder groups to meet and work together. Thus, generating a better understanding of each other's concerns and facilitating decisions where agreements could be reached.

The result of such measures is that difficult decisions can be thoroughly assessed by experts working concurrently for all the governments, and this knowledge is widely shared. Consequently, a recalcitrant government is under a lot of pressure from the community, experts, and other governments to join in difficult collective decisions.

15.5.4.3 Forms of Integration and Instruments for IRBM

IRBM is about managing interactions and integration within and between natural and social systems. The natural system is of critical importance for resource availability and quality. The social (or human) system determines resource use and allocation, waste production, and pollution of resources, and must also set development priorities (GWP 2000). From the perspective of natural systems, integrated management at the river basin scale is appropriate because it recognizes the linkages within the ecological system, such as those that exist between the various habitats and ecosystems and between different biophysical processes. However, integrated management requires more than taking into account ecosystem dynamics to include sociopolitical dynamics and how these affect resource use and decisions (Bos and Bergkamp 2001).

A range of instruments and mechanisms exist for supporting the shift toward IRBM. Useful "toolboxes" have been compiled to assist decision-makers and practitioners to put together policy packages for sustainable water management and development. The Global Water Partnership (2004) has produced one of the most comprehensive toolboxes for integrated water resources management, which is relevant for IRBM. It organizes the tools into three main types. The first set of tools comprise those aimed at creating the enabling environment for integrated management, including laws, investments, and policies. They also provide the framework for the application of other tools. The second set of tools is concerned with building appropriate institutions and

strengthening their capacity. The third type includes specific management tools such as conflict resolution and consensus building mechanisms. The toolbox does not aim to be prescriptive and recognizes that the types of tools that can be used, and the way in which they can be combined, will vary from place to place.

IRBM is a particularly important approach within the Ramsar Convention on Wetlands. Ramsar has proposed a set of guidelines aimed at assisting interested parties in developing a "holistic" or integrated approach to the management of wetlands and river basins (Ramsar Convention Secretariat 2004; Chew and Parish 2003). The application of an ecosystem approach to IRBM is emphasized by the Ramsar Convention as well as other international institutions involved in promoting the sustainable use and management of water resources. Examples include the River Basin Initiative (2004), a joint work program between the Ramsar Convention on Wetlands and the Convention on Biological Diversity and IUCN's Water and Nature Initiative (2004). One of the most successful manifestations of the ecosystem approach, in fact, developed in the context of river basin management in the Great Lakes Basin (Allen et al. 2003; Kay et al. 1999; Kay and Schneider 1994; Allen et al. 1993; Hartig 1998).

15.5.4.4 Impacts of IRBM

It may take time for ongoing IRBM initiatives to reach a stage where tangible, on-the-ground benefits can be seen and comprehensively assessed at the basin-wide level. For example, integrated

management efforts in the Rhine Basin began in the 1950s but evolved from addressing a relatively narrow set of concerns to a basin-wide transboundary approach that integrates water management with land-use planning and coastal protection. The more ambitious targets of the Rhine program are long-term. (See Box 15.16.)

General lessons have been drawn from IRBM experiences that can serve as a useful checklist and planning tool for both ongoing and future initiatives (see, for example, WWF 2003). River basins and associated ecosystems are extremely productive and play a vital role in sustaining livelihoods. By improving land and water resources management in river basins, IRBM can have a positive effect on human well-being and ecosystem health. IRBM within an integrated approach to water resources management has been recognized as contributing to the objectives of poverty alleviation (UNDP 2004). So far, however, few efforts at implementing IRBM have actually succeeded in achieving social, economic, and environmental objectives simultaneously (McNally and Tognetti 2002).

15.5.5 Enabling Conditions and Constraints

Integrated responses need to be implemented effectively to guarantee better outcomes. A major constraint that sub-national and multiscale responses experience is lack of implementation capacity. Lack of expertise and resources is a particularly persisting problem in developing countries. For example, developing-country forestry departments often lack trained personnel to implement sustainable forest management and are under-funded. Limited capacity, however, should not be a deterrent to the initiation of integrated responses. An incremental approach to integration can be used, initially focusing on a relatively narrow set of issues that cut across different sectors and then gradually expanding the scope of the program as experience accumulates and capacity develops. Capacity is not only important in government but also in civil society. For example, in both ICDPs and SFM, communities need skills to manage enterprises that will bring them economic benefits.

Active public participation in decision-making appears to improve the outcomes of integrated responses. It is necessary to help different stakeholders to understand each other's perspectives, work together, and make common decisions (McNally and Tognetti 2002). In order to determine the best action for society, it is necessary to balance multiple objectives and views. Methodologies such as multicriteria analysis, whereby stakeholders are engaged to consider the merits of different management strategies and explicitly determine management priorities, can yield positive results (Brown et al. 2001). Feedback mechanisms to ensure that the outcomes of participatory processes are incorporated in decision-making are essential. However, despite its merits, participation on its own is not a panacea; it has to be used in conjunction with other mechanisms. Many successful integrated approaches combine bottom-up with top-down approaches.

Policies at the national and international level can support the implementation of integrated responses. Examples include legislation enabling public participation in decision-making and com-

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BOX 15.16
The Rhine Basin

The river Rhine flows for 1,320 kilometers from the Swiss Alps, through Germany and the Netherlands, to the North Sea, in a catchment area of 170,000 square kilometers with a population of over 50 million people. Other countries partly in the Rhine catchment area are Austria, Luxembourg, Italy, Liechtenstein, and Belgium. It has been heavily developed as a shipping channel and for industry and is also used to generate energy, for recreation, as a source of drinking water for 20 million people, and to dispose of municipal and industrial waste. It receives pollutants from agricultural and diffuse sources and has supported large fisheries, though most aquatic life had disappeared by the 1960s (ICPR 2001). Over the last two centuries, 90% of the functional floodplains have been lost to river regulation projects, leading to higher and more rapid flood peaks. Dam structures also prevented salmon and other migratory fish from reaching their spawning grounds. Concerns about pollution first became prominent in the aftermath of World War II.

Prior to 1950, inter-country agreements pertaining to the Rhine addressed freedom of transport and protection of fisheries. The International Commission for the Protection of the Rhine from pollution was established in 1950, but little action was taken. Measures to restore and protect the Rhine were only initiated in reaction to catastrophic events, which raised awareness of the need for basin-wide environmental impact assessments. A Rhine Action Plan to address pollutant concerns was developed in the aftermath of the 1986 Sandoz plant chemical fire in Basel, Switzerland, during which 30–40 tons of toxic substances washed into the Rhine. The action plan established ambitious goals and went beyond water quality issues to also include ecosystem goals, initiating a more integrated approach to river management. These included:

- a 50% reduction in the discharge of nitrogen, phosphorus, and dangerous substances between 1985 and 1995;

- higher safety standards in industrial facilities;
- guaranteed use of the Rhine for drinking water by 2000; and
- restoration of the ecosystem in such a way that migratory species could return and become indigenous by 2000—native migratory species that had disappeared include salmon, sea-trout, allice shad, sea-lamprey, and sturgeon; and
- reduced sediment contamination so as to restore the North Sea.

These goals were in part met. Reduction of phosphorus inputs by 66% exceeded the target. Nitrogen pollution only dropped by 26%, but much of it is stored in groundwater from which it is transported to the river very slowly. The 50% targets were reached or exceeded for point sources of most of the toxic substances. Substances that remain problematic are primarily those from diffuse sources and from contaminated sediments. There are also some signs of the return of salmon and sea trout. Current action plan targets are to reduce damages 10% by 2005, and 25% by 2020; reduce extreme flood levels by at least 30 centimeters by 2005; and 70 centimeters by 2020. New kinds of targets added to the 2020 plan are protection of groundwater quality, balancing abstraction with recharge, and restoration of habitat connectivity.

In summary, the Rhine program evolved from addressing point sources of pollution and reactive, event-driven policies, to a more proactive, basin-wide, and transboundary approach that integrates water management with land use and spatial planning to make "space for the river," and also with protection of the marine environment. It can also be considered adaptive, in that the Biannual Ministerial conferences provide an opportunity to continuously reassess and evaluate existing activities. Other developments are that the ICPR is cooperating more with NGOs as a way to promote the exchange of information and common understanding.

munal management and co-management of natural resources. A culture of transparency in decision-making is essential for the success of integrated responses. A process that is seen as fully open, based on reliable information, and accessible to all stakeholders stands a better chance of success. International policy developments have played an important role in the adoption of integrated responses at the national and sub-national level. Agenda 21, for example, has strongly advocated the adoption of ICZM and IRBM. The Forest Principles adopted at UNCED, although not legally binding, have promoted the SFM concept, while GEF has been an important provider of funds for conservation projects with development objectives.

Integrated responses must invest in building the necessary knowledge base to inform planning and implementing field operations. Key stakeholder groups must be identified; land tenure systems, drivers influencing resource management decisions, and existing institutional structures relevant to the response must be understood. One of the most important challenges in the management of natural resources is the science-policy interface. Improvements in natural resource management depend on improvements in understanding the processes involved, both ecological and social (Cicin-Sain and Knecht 1998). Increasing the success of integrated responses depends on effective monitoring and evaluation and dissemination of lessons learned for their incorporation in planning and management processes. Lack of evaluative data on integrated responses is a major constraint to successful integrated responses. Criteria and indicators to assess impacts are better developed in SFM (see CIFOR 1999; Prabhu et al. 1999). Efforts to develop frameworks and indicators to assess progress in ICZM initiatives are also being made (Olsen 2003; Olsen et al. 1997).

Working at multiple scales and using scale-dependent comparative advantages enables the success of integrated sub-national responses. The complex problems that integrated responses seek to address require action at multiple scales, including local, regional, national, and sometimes international levels. However, potential conflicts between interests and actions at different levels must be recognized. Each institution working at a particular level brings unique expertise and perspectives to the planning and management process. Local governments and communities, for example, can contribute the most detailed understanding of problems, constraints, and limitations that will affect the choice of solutions. The national government, in turn, can contribute capacity to coordinate policies and harmonize sectoral activities, funding assistance, and ties to relevant international responses.

Integrated responses cannot be fully accomplished within the scope of a typical three or five year project. They require long-term financial and technical investment. It also takes time to build sufficient trust and levels of understanding among stakeholders to enable effective planning and implementation of integrated responses. A long-term planning framework enables the success of integrated responses.

15.6 Effective Integrated Responses

15.6.1 The Limits to Integration

Many chapters in this volume recommend the implementation of integrated responses, and the assessment in this chapter has provided examples at different scales and from different contexts. However, every response cannot be integrated in all instances. In their discussion of integrated natural resource management, Sayer and Campbell (2004, p. 21) ask the pertinent question, *How integrated do we need to be?* They observe that if integrated approaches

are seen to be all embracing and need to integrate *everything,* then successful examples will be very difficult, if not impossible, to find. They argue that ''early attempts at integrated natural resource management sought to understand the total behavior of the system to develop the ability to predict the outcome of any management intervention. . . . In reality the skill or professionalism of integrated natural resource management lies in making judgments on what to integrate. It only makes sense to integrate those additional components, stakeholders or scales that are essential to solving the problem at hand.'' This assessment confirms this observation. Successful integrated responses are integrated according to the problem or issue at hand. For every context, the degree, extent, and type of integration will be specific. There are general lessons to be learned from the experiences of implementing integration, but there is no ''cookie-cutter'' model of how an integrated response should be.

So what are the key factors that determine when and where integrated responses are most appropriate and most likely to be successful? The assessment suggests that integrated responses are most appropriate:

- when the full costs are taken into account,
- where capacity exists in government and civil society institutions,
- where a feasible time scale to achieve objectives is possible,
- where there is compatibility and not obvious conflict between objectives,
- where the legal and institutional frameworks supporting the response are already in place, and
- when relevant and timely information is at hand and extensive new data and research are not necessary.

Furthermore, at all scales, it is apparent from the assessment that integrated responses cannot be super-imposed by external agencies, and will be more likely to be successful when key stakeholders—in government, the private sector, and civil society—possess a sense of ownership. In other words, integrated responses cannot be driven from outside—objectives must reflect stakeholder priorities.

15.6.2 Understanding Trade-offs in Integrated Responses

The assessment has shown that trade-offs may be particularly significant in integrated responses, perhaps more so than in non-integrated or single objective responses. Trade-offs between different objectives often constitute severe constraints to effective integrated responses, and trade-offs exist between different scales, and between different actors or sections of society.

In order to manage trade-offs, information and methods are necessary to assess and compare direct and indirect impacts on social, economic, and ecological aspects of different response options. This information has to be such that the decision-makers can understand it and it has to help rather than complicate their task. Single indicators of change are generally not sufficient in the case of integrated responses. Measures need to reflect multiple sectors and actors, and enable an evaluation of the impacts of responses on them. This raises the question of whether integrated responses need to be supported by integrated research. To an extent this is the case, particularly where there is a need to understand the linkages, and therefore to assess the potential trade-offs, conflicts, and synergies between different objectives, especially between different ecosystem services and aspects of human well-being.

This is increasingly recognized in the scientific and social science literature. There is an emerging consensus about the need

for a fundamentally different scientific approach to meet the challenges of sustainability, one which is capable of bridging the divide between disciplines that analyze the dynamics of ecosystems and those that analyze economics and social interactions (Scheffer et al. 2002). These concerns are reflected in new interdisciplinary and multidisciplinary research initiatives and institutions (Adger et al. 2003). Sayer and Campbell (2004) maintain that integrated approaches demand a new role for science; although the components may not be new themselves, the way they are put together and conceptualized is novel. Cutting edge research is still needed, but it has to be set in local contexts and be applied in ways that recognize the special circumstances of the poor—particularly as regards risk, dependency, and long-term depletion of productive potential and environmental externalities. Sayer and Campbell identify seven critical changes necessary to affect a paradigm shift in research. The seven conditions are more widely applicable to research necessary to support integrated responses:

- acknowledge and analyze the complexity of natural resource systems,
- use action research—become actors in the system,
- consider effects at higher and lower scales,
- use models to build shared understandings and as negotiating tools,
- be realistic about the potential for dissemination and uptake,
- use performance indicators for learning and adaptation, and
- break down the barriers between science and resource users.

Ultimately trade-offs need to be not only assessed, but also evaluated and managed. This will happen through a political process, requiring transparency and legitimacy but supported by a range of decision and evaluation tools.

15.6.3 Making Better Decisions for Integrated Responses

Developing and operationalizing integrated responses makes demands on decision-makers and planners. The multiple objectives mean that information across a range of subjects is necessary and analyzing the trade-offs and costs and benefits of different options may make the adoption of new analytical tools necessary in order to support decision-making. Sayer and Campbell (2004) argue that integrated natural resource management approaches should put greater emphasis on better decision-making, maintaining options and resilience, establishing appropriate institutional arrangements for resource management, and reconciling conflicting management objectives, rather than on producing technological packages. Many conceptual models of integrated approaches, therefore, focus on the decision-making processes.

There is an increasing emphasis on deliberative and inclusionary processes and greater participation by a range of stakeholders in all aspects of designing, planning, and implementing integrated responses. Opening up the decision-making process to a larger number of actors is both advantageous and disadvantageous for integrated responses. However, most of the case studies reviewed stress the importance of including all the relevant stakeholders in the early stages of the development of responses; using established techniques to identify the appropriate stakeholders; and adopting fair, transparent processes for their inclusion. Inclusion has to go beyond tokenism and this often requires empowerment of stakeholders to take control of certain aspects of the response process, an inherently political action.

However, these actors require information to base their decisions on. Integrated responses may require different tools that enable the different impacts of responses to be weighed. Table 15.6 summarizes some of the decision-support tools commonly used and their advantages and disadvantages for integrated responses.

As with most responses, developing and implementing integrated responses requires careful consideration of issues of power, access to resources and decision-making processes, and control of information. These considerations, as the assessment has shown, are applicable at all levels of government and across all scales, including international, national, and sub-national.

15.7 Conclusion

This chapter has reviewed integrated responses. Integrated responses are those responses, which intentionally and actively address ecosystem services and human well-being simultaneously. Many different types of responses may be integrated and they will employ a range of different instruments in their implementation. Often the coordination of different responses and instruments is central to the integration approach. The promotion of integrated responses and approaches to address problems of environmental degradation and development is strongly related to the paradigm of sustainable development. In the last two decades particularly, the recognition and analysis of linkages between environmental degradation and entrenched poverty and deprivation have resulted in increased calls for the integration of responses at all scales, from the global to the local. Hand in hand with this acknowledged need for integrated responses, there is increasing emphasis and growing interest in the science of complexity for increased understanding of ecological and social dynamics and of the need to include stakeholders as full participants and partners in responses.

However, it is still in the early days, and integrated responses are relatively novel in many, although not all, areas of policy. In some contexts they constitute "policy experiments." Assessment of these experiences is difficult and requires new methods, the use of multiple or adapted techniques, and interdisciplinary and multidisciplinary approaches. This in turn might demand new institutions and new ways of working together.

The lessons from these policy experiments are encouraging, but also cautionary. Integrated responses, whether on the international, national, or sub-national level, are often expensive (in terms of resources, personnel, and time) and in many countries and sectors there is a lack of capacity to effectively implement them. Disappointing results in the short-term, often related to inadequate appreciation and assessment of trade-offs, may mean that support for integrated responses is lost, or their promotion is seriously challenged. This has been the case, for example, in integrated conservation and development projects. Nonetheless, major advances on the sub-national level are discernable in watershed and river basin management, in sustainable forest management, and in integrated coastal management. Successful implementation of integrated responses on the sub-national level require, inter alia, a strong and effective national and international framework upon which such technical approaches can be based. The lessons learned from successful integrated responses do not provide easy to duplicate "blueprints" but they make clear that operationalizing sustainable development necessitates integration.

Table 15.6.   Decision Support Tools and Techniques (adapted from Pearce and Markandya 1989)

Conceptual Basis/ Method	Description	Advantages	Disadvantages
Cost-benefit analysis	evaluates options by quantifying net benefits (benefits minus costs)	considers the benefits and costs of management options	no direct consideration of the equity distribution of the costs and benefits
		translates all outcomes into commensurate monetary terms	ignores non-quantifiable costs and benefits
		reveals the most efficient option	assumes that all stakeholders have equal income and well-being
Cost effectiveness analysis	the least cost option that meets the goals of the decision-maker is preferred	no need to estimate the benefits of different management options	relative importance of outputs is not considered
		cost information is often readily available	no consideration given to the social costs resulting from side effects of different options
Multicriteria analysis	uses mathematical programming techniques to select options based on objectives functions with explicit weights of stakeholders applied	allows quantification of implicit costs	an unrealistic characterization of decision making
		permits the prioritization of options	theoretical difficulties associated with aggregating preferences for use as weights in the model
		model can reflect multiple goals or objectives for the resources	large information needs
Risk-benefit analysis	valuates benefits associated with a policy in comparison with its risks	framework is flexible	framework is too vague
		permits considerations of all risks (benefits and costs)	factors considered to be commensurate are not
		no automatic decision rule	
Decision analysis	a step-by-step analysis of the consequences of choices under uncertainty	model can reflect multiple goals or objectives for the resources	objectives are not always clear
		choices to be made are explicit	no clear mechanism for assigning weights
		explicit recognition of uncertainty	
Environmental impact assessment	provides a detailed economic, social, and environmental statement of the impacts of management options	requires explicit consideration of environmental effects	difficult to integrate descriptive and qualitative analyses with monetary costs and benefits
		benefits and costs do not have to be monetized	no clear criteria for using information in the decision-making process

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