
Enabling Governance for Sustainable Development

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Introduction

Over the last quarter of a century there has been a growing and widespread concern in the global community that economic development and environmental management initiatives are not being effectively integrated. There is also widespread acknowledgement that the lack of mechanisms, arrangements, and incentives to pursue a more integrated approach for development is having substantial negative impacts on the natural resources base and consequently raises significant concerns regarding societal equity, both currently and for future generations. This is an international policy agenda that first came to prominence when these concerns were placed on the political agenda by the early work of Carson (1962), Schumacher (1974), and Meadows et al. (1972). These reports and books contributed to an altered perception regarding the trajectory of growth worldwide, from one of limitless capacity to something more bounded by resource availability, capacity of 'sink' functions of natural resources, and importantly societal equity regarding resource use.

Since then, significant change has occurred in the thinking regarding the role of governments in the management of natural resources on behalf of the society. A specific initiative that

brought the resource governance agenda to the forefront of global political focus was the World Commission on Environment and Development (WCED), which led to the report *Our Common Future* (WCED 1987), commonly referred to as the Brundtland Report. This report provided guidance on how to interpret sustainable development and canvassed the potential global implications of not attending to this agenda. Sustainable development was defined as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'. Widespread international debate ensued in the political, bureaucratic, and academic arenas, leading to the 1992 United Nations Conference on Environment and Development (UNCED), known as the Rio Earth Summit. This conference, attended by 183 world governments, articulated the implications of the sustainability agenda in more comprehensive terms and led to an internationally agreed protocol for development called Agenda 21 (UNCED 1993). The resulting mantra of 'act local think global' underpins the evolving new governance agenda for sustainable development, which is the focus of this chapter.

Australia's state and federal governments set out to address these developments in the early 1990s through an ambitious multisectoral initiative to develop a National Strategy for Ecologically Sustainable Development (Council of Australian Governments 1992). This strategy was intended to set major new directions in environmental management arrangements, including in agriculture and industry. Though not formally endorsed in its entirety, it has been influential in developing new policy directions, and the round table deliberative process it used has assisted the development of intersectoral working relationships and widespread recognition of the need to manage our enterprises and environment differently.

The interconnected nature of economic, social, and environmental issues is the perennial theme in the sustainable development discourse. The interpretation of environmental care has expanded to encompass economic vitality, social cohesion,

and environmental integrity: colloquially known as the 'triple bottom line'. It has taken over a decade of policy learning, through experimentation and reflection, to advance the recognition and to gain some clarity regarding the 'framing' role of governance in practically articulating a sustainable development strategy. In broad terms, we are seeing a major movement within Australia from a construction of government and non-government bodies in a regulatory-regulated, and 'top-down, bottom-up' relationship (Carr 2002), towards collaborative roles of mutual responsibility, with government shifting more towards an enabling role. Government retains its powers, but relies more on partnerships to design, share ownership of, and achieve sustainability goals. Public participation, formerly handled as a stage in planning and environmental impact assessment, is now becoming embedded in governance processes.

The emerging governance agenda is occupied with more effective development *and implementation* of policy strategy that addresses the nested requirements of the myriad of international conventions and national and state level legislation that relate to sustainable development. This need to integrate among scales and jurisdictions, and to devolve specific decision-making closer to its context, is encouraging and enabling a greater focus on regional, catchment, or other area-based management frameworks for the development and implementation of sustainability strategies. Regions provide context for stakeholder co-operation and enable different approaches to be tailored to different geo-political, ecological, socio-economic, and cultural circumstances.

A common model, loosely adapted from collaborative planning (Gray 1989; Healey 1997), brings government and non-government stakeholders together in regional bodies (boards) that first plan, then may or may not be enabled to implement regional approaches that attempt to integrate environmental with economic and social dimensions of development. In Australia this is reflected in adaptive policy processes such as 'Integrated Catchment Management', 'Regional Forest Agreements', 'Place Management',

'Indigenous Co-Management', and 'Regional Planning'. These seek collaborations through multi-stakeholder processes (Gray 1989; Healey 1997) to provide sustainable development outcomes. Multi-stakeholder processes encompass a need to separate the roles of government as purchaser of sustainable outcomes and as provider of these negotiated outcomes (OECD 2001).

The intention of this chapter is to develop a framework for considering the governance involved in addressing complex policy issues for sustainable development. The impetus for this emergent governance agenda arises from altered societal dynamics, which include science's altering relationship with society. It is hoped that this chapter will contribute to a more comprehensive interpretation of an emerging 'sustainability science' that takes a reasoned view of the place of community and community-based sustainable development in natural resource governance (Bourke and Meppem 2000).

Studies of effective management for sustainable development have led to the identification of three interrelated research agendas for resource governance (Bellamy and Dale 2000; Dale and Bellamy 1998; Dale et al. 2001). These emphasize a focus that:

- seeks strategy for sectors to develop their own planning and management capacity;
- facilitates better collective (multisector) understanding of the social, economic, and physical processes within a particular context; and
- develops strategy to support stronger institutional arrangements that facilitate negotiation between various sector interests.

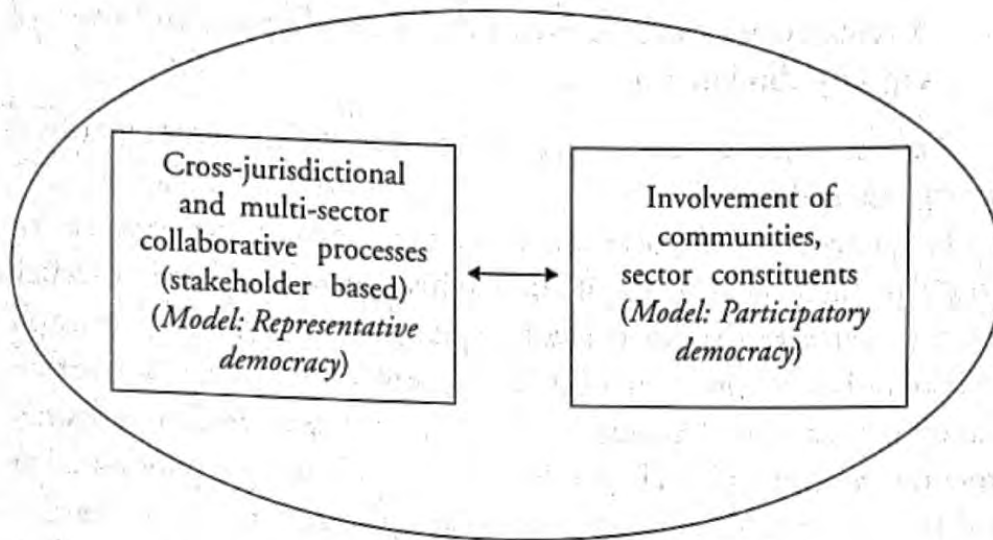
This research orientation promotes the development of strong collaborative alliances as the appropriate strategy to address complex sustainable development problems. Within a particular context, strategies will emerge through creatively facilitated participatory processes.

Governance

There is a clear shift emerging in policy for the twenty-first century that is seeking for more localized strategies to address increasingly complex and interrelated issues through community involvement and partnership development. The emergent alternative approaches to managing change are enabled through a devolution of specific decision-making powers for specific policy content to a more localized level. This enabling strategy by governments recognizes the necessity to empower context specific decision-making capacity for complex and interrelated problem issues. This trend is placing extreme challenges on conventional institutional structures and ways of communicating as new coalitions are emerging in response to these demands. This trend is characterized by an emphasis on developing partnerships, strategic alliances, and broader consultation with those who are likely to experience impacts from decisions.

The new lexicon in policy encompasses 'stakeholder participation', 'community capacity', 'agency capacity', 'negotiation', and 'partnership'. Responding to these demands requires new ways of communicating, creativity, and innovation in approaches that can foster the articulation and recognition of the mutual self-interest for sectors of collaborative endeavour. The intention being that through these avenues coalitions of interest groups are able to more clearly identify and articulate their priority concerns and engage in negotiation (or collaborative) processes with other sectors to gain agreement on collective strategy. This requires effective co-ordination or deliberative processes within interest groups and stakeholder categories: for instance, sector representatives require an imprimatur to negotiate and willingness on the part of their constituents to accept negotiated outcomes. This in turn requires consultation and broad agreement on priorities within each constituency (or community).

This international shift in policy formulation, articulation, and implementation represents a new approach that has three interdependent components, as shown in Figure 6.1.



Enabling Institutional Arrangements

Figure 6.1: New Policy Environment

Contemporary governance depends on a complex set of nested relationships between different groups with a stake in the sustainable development issue (including business and industry groups, community groups, government agencies, and politicians). Its effectiveness hinges on the quality of these relationships and the extent to which different actors are able to understand the perspectives of others and have the capacity to negotiate and to undertake collective action (Bellamy and Dale 2000; Bellamy et al. 2002; Meppem 2000). This requires, for example:

- Clear agreement on the roles and responsibilities of all actors involved;
- Clarification of powers, functions, and linkages required to ensure that the cross-jurisdictional governance system is compatible with community aspirations;
- Support of inclusive, open, and collaborative forums that facilitate processes of deliberation in which networking, exchange of information, social learning, and negotiation can take place;
- Fostering of organizational/agency cultures that support community participation and are attentive to the need for change management; and

- Attention to both individual and collective/community capacity building.

We term this set of supports 'enabling institutional arrangements'.

The new role of government in these policy processes is to facilitate these new styles of interaction, to foster the emergence of creative, agreed, and context dependent policy initiatives and collaborative actions. Internationally this new approach is often called governance. This creates a dual, and sometimes confusing, role for governments. Their role is shifting from sole policy-maker to that of enabler, but meanwhile government agencies are necessarily participants in the stakeholder-based collaborative processes.

The ability for sector interests to have their issues adequately represented in this new governance agenda is highly dependent on their capacity to engage in the negotiation processes. Addressing sector (interest group or particular community) inequities in capacity to engage and negotiate is a focus for governance aimed at sustainability, hence the emerging concern for 'capacity building'.

Complex policy issues now seem to have common challenges regardless of context. These include:

- Limits of jurisdictions; complex policy issues require cross-jurisdictional collaboration for effective strategy development and implementation.
- Not a common understanding of issues; processes to collectively frame problems among stakeholders are necessary for effective implementation of strategies.
- People who should be involved are not involved; inadequate representation of stakeholder groups in problem-framing, these groups will present in-built impediments to strategy implementation.
- Tendency for planning to be generic rather than based on a particular issue; conventional planning often proposes pre-determined solution strategies based on the presumption of

understanding a problem without empowering stakeholders to articulate the nuances of a particular context.

Technology and globalization are accelerating the pace of change which is requiring governments to develop improved listening strategies to accelerate its own innovation capacity rather than relying on a more fixed solution set. The purpose of reform-through-strategies that recognize governance is to make government more responsive to society's needs. Society's desire for engagement in public policy is changing as it is becoming more diverse, complex, and multifaceted. These responses are raising the importance of considering underlying values that shape strategies for the governance of public resources. This complexity encourages a learning approach (Meppem and Gill 1998). This arises from a more widespread recognition that we (society generally) do not really know the desired outcome other than 'better than now' which requires people to collectively address and determine what is better, and the incremental steps required to set this in train.

There is concurrent reconstruction of the notion of 'management'. In environmental management, there is increasing recognition that most stakeholders 'manage' the environment, either on-ground or through influencing processes such as policies and financial incentive programmes. Landholders manage environments by the nature of their using them, stewardship groups contribute by activities such as restoration work, and governments—conventionally regarded as 'managers'—influence the activities of those with on-ground opportunities to change landscapes through regulation, policies, and programmes.

Government has become just one actor, among many, seeking to represent and provide services for sustainable development. The state does not have and cannot be expected to have all the ideas, but it does have a specific role in facilitating their emergence. The role of government becomes that of an enabler, to support the capacity for society to learn rather than seeking to direct outcomes through programmes. This entails negotiation

among different interests, with government taking a strategic role including bringing parties together. Government therefore needs to be more strategic in positioning its engagement. More strategic reform requires developing a collective vision among stakeholders, which leads to the building of a constituency. Negotiated planning to achieve outcomes and communicating among stakeholders is an ongoing orientation for these strategic engagement processes. Effective dialogue processes are the currency for this altered organizational approach.

Given the nature of the tasks described for governance, outcomes are usually described more in terms of progress in a process, than through specifically quantifiable economic or physical outcomes that can be identified in advance of a collaborative approach. Improved process will, however, translate, via often complex pathways (or multiplier effects) to improved economic, socio-cultural, and environmental outcomes. The role of governance can be interpreted as promoting the working among different groups to assist in determining what the problems are and who might do what in a process of improvement. Rather than interpreting this activity as efficiency in the use of scarce resources—which is really about doing the same with less—it is more about enhancing the effectiveness of activities actually undertaken. The implementation of such strategies offers significant challenges, as this usually requires a shift in the working relations among those groups and organizations involved in activities (Meppem and Bourke 1999). It certainly requires appropriate evaluation assessment mechanisms; particularly evaluative mechanisms that can focus on the processes and their relationship to the consequences of those processes as co-dependents (Bellamy et al. 2001; Bellamy et al. 2003).

To assist in interpreting the implications of governance for sustainable development a simple diagrammatic framework will be employed. In Figure 6.2 the classic Ecosystem Model is portrayed.

Figure 6.2 emphasizes the importance of interpreting the dynamics and interrelations among various components of the

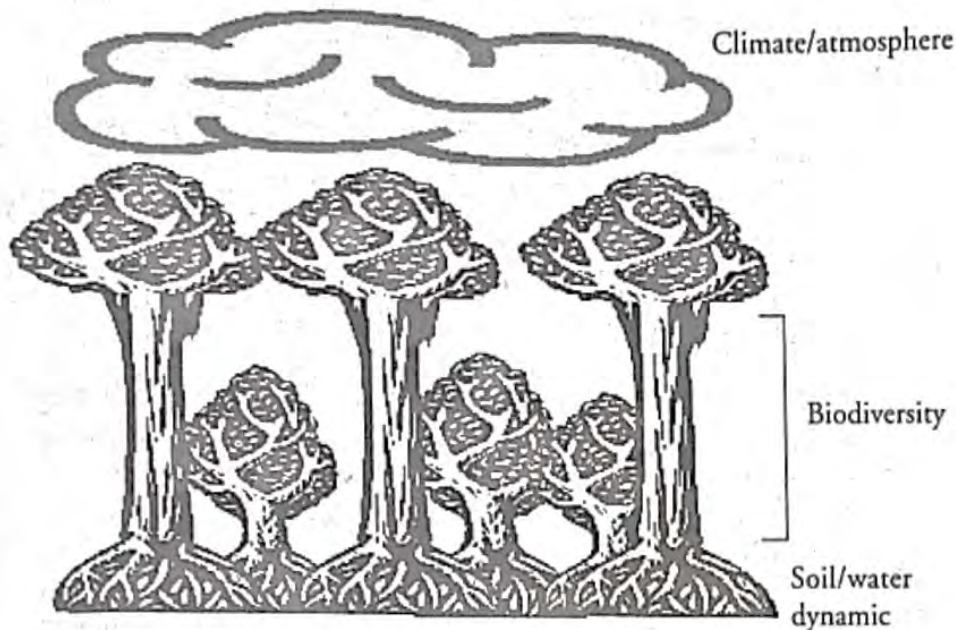


Figure 6.2: Ecosystem Model Representation

natural environment for understanding a healthy ecosystem. Put simply, the relations among climate/atmosphere, biodiversity, and the soil/water dynamic capture the complex functioning of the ecosystem.

We propose that this description of the natural environment may also be used as a metaphor to describe management or governance for sustainable development. In Figure 6.3 the ecosystem model is now labelled as the Governance Model.

In this model, the three essential components of a healthy governance system are:

- (i) Enabling institutional arrangements: The structures, legislative framework, and processes that create the 'climate or atmosphere' to encourage adaptation, empowerment, and partnership development;
- (ii) Diverse sector participation and co-dependence: In the same way that less visible organisms contribute to biodiversity, a healthy governance system requires diversity of sector participation and community engagement;
- (iii) Individual sectors must have processes for maintaining strong relations and feedback arrangements with their

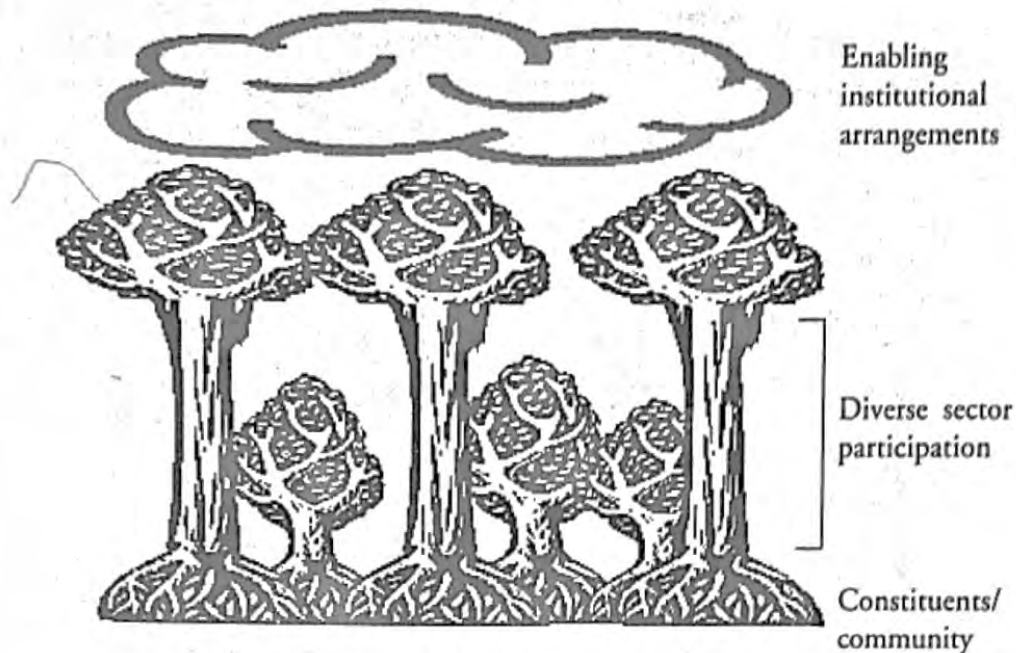


Figure 6.3: Governance Model

constituents or community. Just as plants depend on their roots, soil, and moisture, sectoral organizations that claim representation in sustainable development must gain their mandate or 'nutrients' from their constituents and communities in an ongoing way to enable the capacity to negotiate outcomes. This requires an adaptive learning policy strategy to enable feedback to occur so that sectors are able to adapt and evolve in response to 'environmental stimuli'.

With the use of this simple imagery, the components of healthy governance can be viewed as a system. Its use can now assist us in developing and interpreting more appropriate policy for sustainable development. For example, in Figure 6.4 the structural or 'jigsaw' approach to environmental management is portrayed.

Here those sectors that are prominent or most powerful, or whose 'tops stick out of the canopy', are most readily selected to be on a management committee or board for environmental decision-making, while less evident organizations, individuals, or

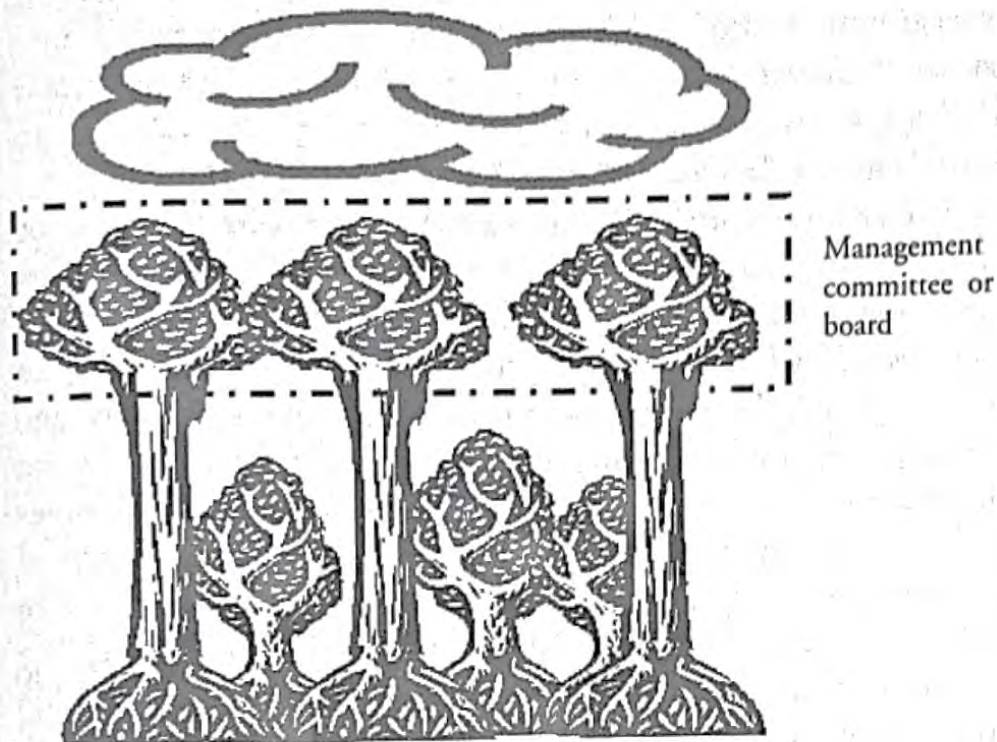


Figure 6.4: Structural Approach for Environmental Management

constituencies may be omitted. This often leads to significant problems. There may be resistance from those excluded, or the decisions may be impoverished by lack of diversity in the inputs. There may be further difficulties in moving from planning to implementation, because of the lack of attention to the role of 'enabling arrangements' to encourage negotiation among diverse sectors, and also a lack of attention to the dynamics of internal communication for sectoral policy development. Strategy development is necessary within each sector to build and maintain a mandate for wider negotiatory processes to be effective. In a healthy governance system, policy negotiations are concurrently occurring both across and within sectors, with these activities being fostered by enabling institutional arrangements.

Enabling institutional arrangements typically consist of legislative and policy frameworks that assist societal deliberations toward valued outcomes; healthy organizations with excellent constituent relationships in two-way communication flows (vertical

integration); healthy communication with mutual respect among sectors (horizontal relationships); equitable deliberative processes leading to widely accepted outcomes; and socially robust knowledge (Gibbons 1999).

The environmental policy domain has shifted from using good scientific information as a beacon on the horizon providing long-term direction for strategy. The concept of 'socially robust knowledge' makes room for assertions of 'sense of place', amenity, environmental integrity, biodiversity, indigenous spirituality and cultural responsibility, and intergenerational/intersectoral equity. It reflects an altered orientation for knowledge in complex contexts from what is 'known' to the relations between forms of system knowledge and what society collectively wants to 'do' to influence outcomes based on this 'interpretative' knowledge. The 'what' to do in complex contexts acts in a symbiotic relationship with 'how' this 'what' is determined. This has significant implications regarding representation in sustainable development decision-making since process and outcomes are interdependent.

Governance of Water Resources

Let us briefly illustrate these arguments through a complex case, that of governance of water resources. Allocation of water resources, for instance in a river, brings into play:

- Substantive arrangements, such as regional planning schemes, water allocation plans, and other legislative arrangements including property rights that form the legal and administrative structures for water management.
- Stakeholders/sector groups, that is the interests that affect, or are affected by, the distributions of water (including organizations and constituencies). Various kinds of knowledge inform sector planning and policy development, for example: technical knowledge in the form of catchment and ecological flow modelling and integrated ecological information systems; practical knowledge from the experiences of resource users;

and diverse community including indigenous knowledge from those who experience flow-on impacts from water management practices.

- Deliberative processes, such as stakeholder-based planning, or negotiations with a focus on communicative practices to develop and maintain sector constituency for effective negotiation in water management.

It is through the interactions of diverse stakeholders/sectors in the context of substantive arrangements and deliberative processes that socially robust knowledge emerges for decision-making to move to sustainable outcomes in the water sector. Our simplified representation using the 'Governance Model' is a means to conceptualize the dynamic interrelationships and co-dependence of an effective and adaptive water management governance system. Being better able to interpret the relations among the three core elements of a healthy governance system enhances the capacity to manage the system in a more effective and holistic way. A recent study in catchment management in Australia illustrates the complexity and co-dependent nature of these elements in practice (Bellamy et al. 2002).

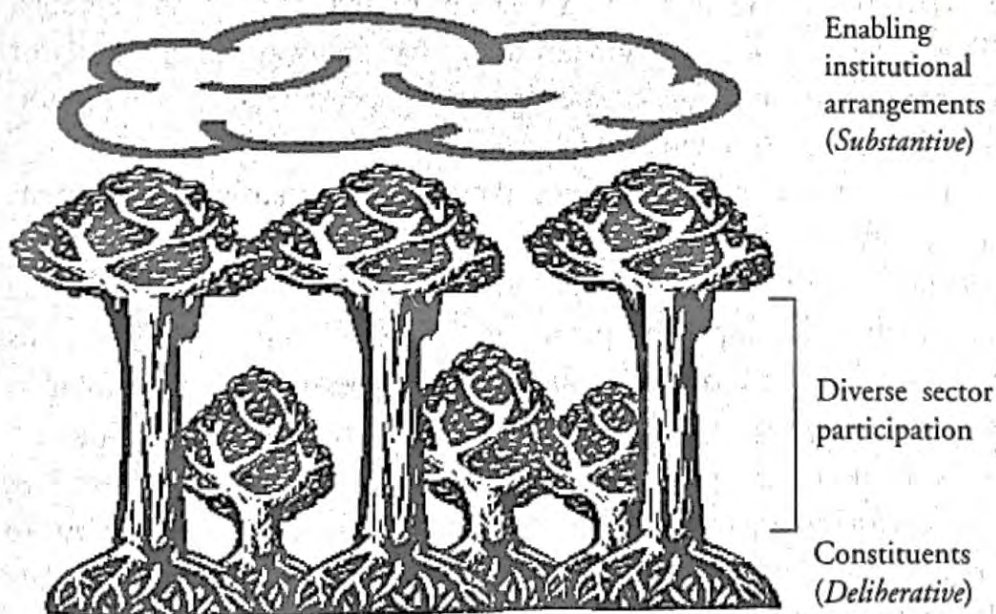


Figure 6.5: Effective and Adaptive Water Governance System

Concluding Remarks

The implementation of resource governance arrangements is inherently context-sensitive. A wide range of environmental, economic, social, policy/institutional, and technological factors will influence its implementation and impact. Natural resource management and economic development activity is embedded in societal associations through established social networks and interactions, social values, institutional frameworks, historical problems, past experiences, and established ways of doing things, and it will continue to be shaped by them in the future. Resource governance arrangements need to be able to adapt and to suit local contexts. Evolution in institutional arrangements is therefore vital to ongoing improvement in resource governance. Building the capacity of society to engage in participatory process is a fundamental role for government in planning for sustainable development. This will involve supporting and strengthening existing networks, shifting 'communicative lines of sight' which will influence the operation of institutional arrangements, and facilitate the use of scientific, indigenous, and community information into decision-making frameworks, rather than constantly seeking to create a new set of structural arrangements. This defines a role for government that is away from regulator or provider of technical expertise and toward enabler, facilitator, and partnership negotiator.

There is a need to produce tangible sustainable development outcomes through our efforts in water sector management. This position asserts three interrelated dimensions for reassessing the sustainable development paradigm. First, the ability for sectors to have their own agreed policy and planning process is essential in developing the capacity to negotiate for sustainable development. This is necessary for defining boundaries, modes of operation, and priority issues. Without this within-sector capacity to engage in negotiation, it is not possible for more broadly representative governance arrangements to effectively move from planning to implementation. Second, governance arrangements

should provision a framework that draws in complexity and allows for intersector collaborative assessment of how the various aspects of change relate to each other in a management context. The emphasis in this context is on the relationships among the components impacted on by change. The intention of the evolving framework agreements of governance is to provide greater certainty regarding the scope and intent of planning and implementation processes. Third, arrangements and processes to effectively mediate communication are crucial for capacity building to align commitment and engage collaborative endeavour for mobilizing sustainable development. All three of these interrelated dimensions are essential elements of a healthy governance system for natural resource management and sustainable development.

Glossary

Resource Governance can be interpreted as the interplay among institutions, legislation, information, communications, power, perceptions, and interests that are currently shaping our responses to environmental issues and consequent decision making.

Landscapes include people. Landscapes evolve through the interactions between human influences, the built environment, and 'natural' landforms, biota, and climate. Landscapes have public amenity values beyond their utilitarian value. Landscapes are inherently diverse. Landscapes are socially constructed.

Sector is a term used along with community to denote a specific category of special interest group, for example, government sector, indigenous sector, business sector, conservation sector.

Region: A regional approach can be understood as addressing issues that are multi-aspect or multi-disciplinary, encompass cross-jurisdictional implications, and have diverse sector impacts. This categorization recognizes the different scales in regional approaches and places a greater emphasis on the relations between actors and their organizations as the focus for regional approaches.

Organizational culture is the embodiment of all the recurring practices in the way people work, interact, co-operate, make decisions, and resolve problems. It is notoriously more difficult to change these working methods than to alter structures, which is generally more symbolic than innovation in practice.

Institutions: Desired changes in on-ground management are influenced by a complex mix of policies, land tenure, property rights, incentives, market forces, planning, administration, regulation, and so on. The shorthand term we use to refer to these elements of the operating context for natural resource management (NRM) is institutions. The institutional dimension of NRM thus refers to the way in which society organizes itself through relatively formal structures, policies, rules, and procedures.

Sustainability: It has been widely accepted for some time that the concept of sustainability cannot be reduced to a simple, absolute statement or definition—it is a journey rather than a destination. Outcomes will therefore be socially constructed, weighing up ecological integrity with social equity and economic efficiency, riven with tension, compromise, and non-linear trade-offs. The real challenge is not to define sustainability, but to develop the processes, the forums, the modes of inquiry and learning, to better inform and support debate, planning, decisions, and actions. The values people or societies ascribe to landscapes, whatever those values have a major influence on the way they interact with and manage them. Policy for sustainability needs to:

- Contribute to an enabling environment for diverse engagement in complex issues;
- Reward governance and encourage a strategic consensus on policy issues;
- Recognize nested clusters of stakeholders and interest groups who develop joint positions and to then enter into dialogue with the other main players;
- Seek to solve many contentious issues in the pre-negotiation phase; and

- Address place based outcomes rather than agency specific outcomes.

Stakeholders: These are parties who affect, or are affected by, any issue or decision, who have a 'stake' in the outcome. This is an analytical category, and can include abstracts such as 'future generations'. A stakeholder category, such as 'conservation groups' or 'local communities' may or may not correlate to identifiable organizations. This contrasts with 'actors', actual individuals, and organizations—the set of actors in an environmental issue may not give complete coverage of stakeholder categories (some may be left out of the process or be unable to organize themselves sufficiently), and there may well be several actors within a single stakeholder category.

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River Basin Management as a Way to Sustainable Development in Latin America

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Introduction

One of the issues currently raising concern in water resources management is what is known as 'governability', a concept that is related to the ability to make decisions in a participatory manner and to implement them. In order to make appropriate decisions, with a view to achieving integrated water resources management goals, it is necessary to reconcile the interests and dynamics of the local population with the conditions and particular dynamics of the environment in which they live, especially with regard to river basins and the hydrological cycle. This means that decisions taken should incorporate understanding of human behaviour with the characteristics of the environment in which they are implemented. This necessary linkage of the knowledge provided by the so-called 'soft sciences' (such as sociology, anthropology, law, economics, and politics) with the so-called 'hard sciences' (physics, chemistry, biology, ecology, and engineering) rarely occurs in practice.

The lack of co-ordination mechanisms for combining the contributions of both groups of disciplines and sciences is one of the reasons for ungovernability in integrated water resources management. Decisions are usually made in a simplistic and piecemeal fashion, using paradigms established beforehand, and

in most cases the decision-makers are unaware of the natural environment in which such decisions are implemented. Though proposals normally take social and physical factors into consideration, they fail to integrate these perspectives. In the social arena, for example, many initiatives advance the view that, in order to make better informed decisions, there is a need to construct a water culture, to build a level of awareness, and to formulate a policy on the importance of the resource, so that the public makes 'rational' decisions concerning water use. In light of these ideas, the assumption seems to be that there exists no culture, no policy, nor any degree of awareness of water resources management at the time the proposal is formulated, and that one needs only to establish a policy, a culture, and a level of awareness for progress to be made.

Culture is the way in which people express themselves in their social and spiritual relationships and with their environment. Culture is the way in which humans relate to the world and make decisions in order to improve their quality of life. This relationship requires a long learning and adaptation process linked to the territories people occupy or use at a distance. Culture, therefore, is linked to the accumulation of knowledge. At this point, however, it is important to shatter the first myth: traditionally, 'culture' associated with the accumulation of knowledge is viewed as an asset for human development. Acquired knowledge, including that represented by cultural characteristics, may, however, serve to impede adaptation to new situations. Societies and individuals are reluctant to change their attitudes; hence, with globalization intensifying changes and cultural shocks, we are witnessing increasingly contentious situations between the new inhabitants, long-standing inhabitants adopting new customs and the environment they live in.

As good intentions would have it, decisions must be 'rational', though no explanation is given as to what that actually means. A rational being may be defined as one who makes balanced decisions consistent both with knowledge of the environment in which decisions are to be applied and with his or her ability to

carry them out (Röling 2000). Therefore, rational thinking associated with a particular culture requires knowledge and time for adaptation. In the past 50 years, the cultural shocks engendered by migration and exchanges between inhabitants of territories, including within the same country, have become even more intense. These migrations—of people as well as knowledge and technologies—alter the rational basis of decisions, since the processes of transculturation and globalization outstrip the societies' ability to adapt to the new environment in which they intervene. In addition, their impact is being increasingly widely felt due to the use of technologies of greater power. Society's inability to avoid conflicts over water use and to deal with the effects occasioned by the unpredictable nature of the resource is one result of this situation.

If we accept that action should be taken to gear cultural attitudes to the new environment that they find themselves in, three questions arise: first, what 'kind of culture' is it hoped to develop when programmes are launched to that end?; second, how much is known about the environment to be modified?; and third, how should both aspects be linked? One of the problems observed is that the majority of the so-called processes of 'culturization' and 'awareness-raising' as regards water are associated with piecemeal approaches or ones established earlier in other places and under different conditions. Thus, for example, attempts are made to educate the public about economic matters, so that they make decisions on water resources management based exclusively on market prices and so that they respond to 'economic instruments'. This approach is certainly useful, though within certain contexts. It is not necessarily more 'educated' to think solely in terms of economic values while ignoring social and environmental aspects. Reducing human reasoning to economic reasoning is not a particularly suitable culturization process for relating to the world.

Niels Röling, a well-known Dutch sociologist, believes that the instrumental and economic solutions that have brought human beings into conflict with the environment and led them

to plunder will not by any means be the only solution to overcome this dilemma. In fact, says Röling (2000), it is these solutions which created the problems. Technology and economics may help build a sustainable society only if they are put to use within a framework of thinking and collective action that is superior to limited instrumental and economic reasoning. Such collective thinking does not appear to be a factor in most of the decisions taken today despite statements to the contrary in official speeches, laws, and constitutions. Every day, the public and private sectors, and society at large, express opinions in favour of the environment and social equity (for example, promoting 'sustainable development'), but the decisions they make belie their opinions. All governments issue statements expressing 'the need to attain sustainable development through participatory, democratic and multidisciplinary decisions incorporating gender and ethnic perspectives, among others,' but decisions are usually made based on the same old criteria.

In Röling's view, in order to break free of this impasse and act 'rationally' in regard to water resources management, the decision-maker must be able to link the soft sciences and the hard sciences. It is easy to see that Röling's assertion is correct, but simply aspiring to adopt a more socially and culturally focused approach, one that is interdisciplinary, participatory, and holistic, is not the same thing as actually achieving it; in a similar vein, it is not sufficient to consider the thinking of society without weighing it against the limits imposed by nature and our knowledge as to how it behaves. Here another paradigm arises. People often believe and assert that being well-informed about the environmental impact of decisions on land and natural resources development and use provides a sufficient basis on which to make correct decisions. However, human beings are slow to react to knowledge about the impact of their actions. For instance, many natural disasters are actual facts due to the population's failure to pay heed to the threat of danger by settling in flood-prone areas. The paradigm that information always leads to sound decision-making is also therefore subject to qualification. It is only valid

in a context characterized by a combination of conviction and the potential to implement recommendations and guidelines on prevention.

In summary, therefore, the design of functioning integrated water resources management systems and the attainment of governability in order to secure this management requires, first of all, breaking away from paradigms, myths, and beliefs that, though valid in theory or in isolated cases, lose their validity in real world situations that are much more complex. And second, there needs to be acceptance that, in order to make 'rational' decisions, interdisciplinary working methods must be used that foster appreciation and respect for the contribution made by all sciences and disciplines, both hard and soft. Such methods exist and are available for organizing interdisciplinary activities and making participatory, transparent decisions. It is regrettable to note that for now many of the failed attempts at achieving integrated water management goals are due to the use of approaches that are piecemeal, applied out of context, and even naive.

Integrated Water Resources and River Basin Management in Latin America

Sustainable Development and River Basins

The sustainability of development remains an academic concept unless it is linked to clear objectives that must be attained in given territories and to the management processes needed to achieve this. Management of the natural resources located within the area of a river basin is a valuable option for guiding and coordinating processes of management for development in the light of environmental variables. In order to turn environmental policies into concrete actions it is necessary to have suitable management bodies, which are normally very complex. The establishment of such bodies means generating a mixed public and private system which should not only be financially independent, socially oriented, and sensitive to environmental

aspects, but must also act in a democratic and participative manner. In the past, the idea of establishing bodies to guide the management of the natural resources of a river basin (especially water, of course) has aroused the interest of the countries of Latin America and the Caribbean, with varying results. This interest has now become an urgent necessity, in view of the greater competition for multiple water use and the need to control water pollution and manage the environment correctly.

Sustainable development does not refer to a tangible and quantifiable goal to be achieved in a given period of time, but rather to the possibility of maintaining a balance between factors that explains a certain level of development among human beings, a level that is always transitory, evolving, and, at least in theory, should always lead to an improvement in the quality of human life. Sustainable development is thus the result of a set of decisions and processes which have to be carried out by generations of human beings, under ever-changing conditions and usually insufficient information, subject to uncertainties, and with goals which are not shared by a population that is showing a growing trend to individualism.

One of the biggest concerns at present, at least to judge from policy statements, is to find viable development options based on equitable and lasting economic growth. The latter consideration has gained in importance in recent years because of the realization that many alleged advances, especially in terms of changing production patterns, have been outweighed by the damage they cause to the environment. The greater awareness and understanding that now exists of mankind's interaction with the environment, and the vulnerability of forms of development which do not take this into account, have been made more explicit by the addition to the word 'development' of the qualifying adjective 'sustainable'. Since sustainability should be implicit in the very concept of development, this adjective should be only a transitory addition that will be needed only until the vital importance that development should be of a lasting nature is definitively incorporated in the concept.

On the other hand, the sustainability of development remains only an academic idea or abstract aspiration unless the concept is linked both with clear objectives that must be attained within a given area that contains the natural elements and resources needed for the subsistence of the human race and with the management processes needed to achieve those objectives. Thus, political intentions must be transformed into concrete policies for implementation, and it is here that the greatest challenges arise.

In the Latin American and Caribbean region, there has been widespread reference to environmental problems, theories have been put forward on environmental issues, laws have been enacted, and even some ministries of the environment have been set up. What has not been done, however, is the laying of the necessary bases for the management of each of the natural resources—water, soil, forests, fauna, minerals, and energy—or of certain key natural areas such as coastal zones, river basins, and deserts.

This means that very broad goals have been set without deciding on the necessary steps for reaching them. Territorial organization for the management of each resource and later of the environment in general; organization and training of the population; research on ecosystems; the establishment of systems of management for given areas; the strengthening of public institutions (especially local governments) to provide support for environmental management; awareness and heightening of the economic value of natural resources; the keeping of natural heritage accounts; and the preparation of operating manuals and rules are essential aspects for making real progress in the management of natural resources and the environment in general.

The management of natural resources in the context of the dynamic evolution of a river basin, more generally known as river basin management, is one of the possible options for organizing the participation of users of natural resources within the process of environmental management. A river basin is uniquely fitted to serve as the basis for the co-ordination of the actions of all those involved in the use of a shared resource—water—and for the evaluation of the effects of environmental management measures

on that resource. Water quality largely reflects the environmental management capacity within the basin in question.

A first step towards river basin management is to limit action to the management of the water resources existing within the area of the basin. Water management is a complex process designed to control the cycle of a natural resource whose availability is erratic and irregular over time and space. Furthermore, water is vulnerable to the treatment it receives, since it can easily be polluted, thus affecting all its actual or potential subsequent uses. The aim of this process is to solve conflicts among multiple users who, whether they like it or not, depend on a shared resource. Consequently, even though they may have water use permits or rights, they nevertheless affect and depend on each other. The supply usually comes from a common system, to which surpluses and wastewater are returned. Surface, ground, and atmospheric water resources, together with the areas where water is diverted and returned, thus form a single unit.

The actions taken have enormous repercussions on human health, the environment, and production, so that they must be approached in an outstandingly technical manner. The high cost of the works involved, together with the long lead times of water projects, make it all the more necessary that management should be in the hands of experts whose tenure does not depend on political changes.

Finally, the water management process requires that many different agents should act in a co-ordinated manner in spite of their differences of approach and the fact that some of them are not aware of the effects of their decisions on the hydrological cycle. This is why it is so important to have stable co-ordination mechanisms and, at the very least, a permanent river basin centre or authority.

Between Ideas and Facts in Integrated Water Resources and River in Latin America

A recurrent theme at recent international forums has been the so-called 'global water crisis' which stems apparently more from

a mismanagement, or lack of it, of water resources and the spectre of an increasing water shortage. Discussions focus then on the lack of appropriate mechanisms for resolving conflicts among water users with respect to quantity, quality, and time.

Since average annual rainfall in Latin America and the Caribbean is estimated at about 1,500 millimetres, which is over 50 per cent above the world average, reference to a water shortage in that region in the absolute physical sense is not very appropriate, although one must recognize the fact that the natural distribution is highly uneven. There is no denying, however, that water management systems are often poorly organized if not non-existent. This results in a lack of information on water balances, an almost total lack of control of water quality and, scant preparation for natural disasters such as droughts and floods. In addition, the region still lags behind in drinking water supply and above all, in the development of adequate sewerage and drainage systems. Furthermore, deficiencies persist in the water management systems for agriculture, both in irrigation and drainage, one of the outcomes of a long tradition of State paternalism.

A major obstacle to the improvement of water resource management is the institutional legacy of systems, which traditionally were centralized, and in many cases assigned to a user sector such as agriculture or energy. Even today, there are draft bills which suggest that national water, or water resource councils should be run either by the agricultural sector or the energy sector. In addition, very often, such councils claim that they should be composed only of public officials, without water users or civil society, in particular the municipalities, having any say in the decision-making process.

Another important obstacle is the legacy of a 'subsidy' culture for water projects (main hydraulic structures) and rates. This is especially true for the irrigation projects. In fact, almost none of the costs of the hydraulic structures to improve irrigation schemes are being recovered. In many countries, there still exists resistance to the establishment of real prices for water use. In part this is

due to the fact that the money collected goes to the central budget. Stakeholders never know if the money collected is being wisely used for water management purposes. The lack of transparency in the financial management is a real obstacle.

For these reasons, much of the work in Latin America should be geared towards advising governments to formulate their water policies, in an attempt to achieve a balance between the advantages of markets and private participation, particularly in drinking water supply and sanitation, hydroelectricity, irrigation and drainage, and the need for government regulation to achieve social and environmental goals. Another part of the work consists in assessing the market's real capacity to act as a mechanism for ensuring the efficient use and transfer of water rights.

Proper policy-planning requires information on existing water resources, the existence of a land register and public register of water users, effective control of water quality, and a system of participatory management at the river basin level. To achieve such results, it is necessary to improve the institution in charge of water resources management, especially at the river basin and at the agricultural levels since other users such as energy and water supply are better organized.

Today, in Latin America and the Caribbean, the water issue is immersed in a series of plans related to integrated environmental management goals, an aim which assumes that the capacity to manage multiple water use will be achieved as a by-product. For the sake of this idea, in more than one case the existing capacity for water management has been reduced in the process of adapting it to 'integrated environmental management'.

There is currently a wide range of situations, many of them going backwards in the region with regard to proposals for legislation, standards, technical specifications, organizations, capacities, research, education, and effective application of processes for multiple water use management, even within a single country. Due to this, progress is slowly being made in the consolidation of some bodies for integrated water management, both at the national level and at the level of states, provinces, and river basins.

Brazil and Mexico are the only two countries with specific mandate in the water law to create river basin authorities.

Unfortunately, it has to be recognized that, in more than one case, at the national level, and at the level of river basins, government capabilities have been reduced. The current reduced governing capacity for multiple water use management is obviously not exclusively due to its being diluted by incorporation into the broader environmental issue. There are deeper causes that have existed for decades: some originate with the public and private officials responsible for water management and use; and others are external, and stem from the socio-economic situation of the countries or the river basins where the water resources are managed.

In contrast, and paradoxically, it is interesting that although almost all countries of the region agree that some organizations are needed for the management of water at river basin levels, progress has been very slow. It is certainly not a simple task, nor does the relevant legislation often exist to create such organizations with due legislative and financial support. It is thus important to create or enhance the region's capacity to support these initiatives.

The creation of a water management organization at the river basin level does not guarantee its continued existence as it requires continuous support for its consolidation in the form of technical assistance and financial resources for at least a decade. Many of the laws establishing these bodies do not provide for clearly defined roles, or the assignment of legal status, stable sources of income, personnel training, and in general the methods, criteria, standards, and operational procedures are not prepared beforehand in order to formulate plans and standards with due legality.

It is therefore suggested, as part of the necessary task of improving multiple water use management, that funding be provided for an appropriate number of researchers to systematize and standardize the experiences available. This would be possible

if one or more research or logistics centres¹ were established in Latin America for multiple water use management and integrated river basin management. These centres could be set up with the support of interested organizations and could be attached to a university or some existing regional or international organization, in order to serve as an information centre both for regional water resources networks and for educational centres to support manager training for river basin organizations and multiple water use management.

Although sizeable networks do exist now for issues relating to integrated water management, there are still very few regional studies available in this area and there is even less access to criteria, standards, procedures, and working methods at the river basin level. The above centre should help move on from the present situation of dispersed information, confused ideas, lack of follow-up on the progress made, and the generally unstable procedures for training, consolidation, and functioning of water management bodies at the river basin level, and organizations for multiple water use management in some countries of the region.

Water resources management has come to figure as a major item on the agenda at national and international meetings, after a long period during which the issue went relatively unnoticed among other environmental topics. Recent international meetings, however, have neither touched on new aspects nor, apparently, made any major strides in improving water management policies, particularly not in the Latin American and Caribbean countries. The concerns of national, regional, provincial, and local governments have proved to be a great deal more elementary than the lofty declarations of principles that usually arise from these events.

Case studies and experiences that already exist indicate the need for preparing a preliminary draft water legislation, evaluating

¹ One proposal is to establish one centre for the Andean region (in Cuenca, Ecuador), one for Central America, one for Mexico, one for a Caribbean island, and one for Mercosur based in Brazil.

the implementation of the existing legislation, assisting with the organization of water management systems at the river basin level, transferring hydraulic infrastructure systems to users, participating in river and lake restoration programmes, recovering natural water courses in urban areas, developing plans for international river basin management, and advising governments on the privatization of water-related utilities. Consultancy requests have increased exponentially in recent years. Central governments are no longer the only ones to request support. In the wake of decentralization and the privatization of water management and use, the demand for consultancy now comes from public and private organizations at national, state, provincial, departmental, and local levels, as well as universities, multilateral and bilateral aid agencies, non-governmental organizations, water-user commissions, public utilities, banks, and river basin organizations.

This growing demand reveals a need for principles, processes, and practices to enable the different actors to proceed correctly in multiple water-use management and public utility regulation. As a general rule, the countries of the region lack these basic instruments by which to co-ordinate the work on a large scale, covering many regions and situations simultaneously and making the most of the scarce resources available.

In spite of the lack of support, the need to improve the management of water resources is acquiring prominence on Latin American and Caribbean government agendas, not only nationally but also at the state and local levels. The various effects of greater private sector participation in water-related public utility companies and in the need for the management of the hydraulic structures as well as the irrigation systems, together with the decentralization of environmental management functions to the municipal level, including the management of river basins and streams, has generated increasing demand for information and technical assistance on this subject. This demand has been further boosted by the creation of numerous but weak river basin organizations, or plans to do so, by debates on water law reform, and by the disastrous effects of flooding and increased water

pollution. Even though from the hydrological viewpoint, water resources should be managed in accordance with the concept of the river basin, it is not so easy to accomplish such goals when confronted with the political jurisdiction and administrative organization prevailing in each country. There are invariably problems in implementing such an approach because most of the countries of the region have a long-standing tradition of centralized public administration. Attempts to apply the concept of water management at the river basin level in these countries have generally been only partially successful.

This revival of interest in the river basin as the most appropriate unit for water management is due mainly to the fact that it is precisely at this level that it appears more feasible to achieve a better integration between all parties, whether public or private, and whether their concern with water management is for purposes of production or conservation. Furthermore, water resource management at the river basin level is increasingly considered to be the most appropriate way of absorbing the environmental costs of use of water resources. Nevertheless, there is still a strong emphasis on the physical components of the systems or on activities and investments in the sector, while the organizational component for the establishment of river basin entities, which undoubtedly constitutes the most important aspect of this approach to water resource management, has scarcely been developed.

Different Approaches and Definitions for Water Resources Management at River Basin Level

Management of water at river basin level is not new in the region, but despite this there is still no consensus on definitions that spell out the objectives of that management. The lack of conceptual clarity on the subject impairs the exchange of ideas and experiences, particularly between professionals of different countries, causes overlapping of functions, and hinders the formulation of policies and laws on the subject.

Inconsistencies in the use and meaning of many of the terms relating to river basin management suggest the convenience of defining and classifying such concepts. Table 7.1 summarizes and classifies concepts related to river basin management in Latin America and the Caribbean. A matrix format is used to set out the stages of the management process as they relate to the objectives defined by the elements and resources covered by the management. This layout has been chosen to enhance understanding of the actions that may be co-ordinated in a river basin, and the purpose of such co-ordination. Moreover, it was considered useful to clarify other complexities arising from differences in terminology between English and Spanish. Hence the decision to include entries in both languages; it is hoped that understanding of the Spanish term will be enhanced by a comparison with the original concept.

Table 7.1 sets out two groups of factors, indicating the terminology used for each case:

I. The stages in a river basin management process (1, 2, and 3):

- Preliminary stage (1): studies, formulation of plans, and projects.
- Intermediate stage (2): the investment stage for river basin development with a view to the use and management of its natural resources for purposes of economic and social development. This stage corresponds to the notion of 'development' as in 'river basin development', 'water resources development' (the corresponding term in Spanish being 'desarrollo de cuencas' or 'desarrollo de recursos hídricos' or 'desarrollo de recursos hidráulicos').
- Permanent stage (3): the operation and maintenance stage of structures and management and conservation of natural resources and elements. This phase corresponds to the notion of 'management' (a term which has as many as four meanings in Spanish: 'gestión', 'administración', 'ordenamiento', and 'manejo'). In general, 'water resources

Table 7.1: Management at the River Basin Level: Stages and Objectives

Management Stages	River Basin Management Objectives		
	Integrated Use and Management	Use and Management of All Natural Resources	Water Resources Management (Integrated or Sectoral)
	(a)	(b)	(c)
(1) Preliminary stage		Studies, plans, and projects ('ordenamiento de cuencas')	
(2) Intermediate stage (investment)	River basin development ('desarrollo integrado de cuencas' or 'desarrollo regional')	Natural resources development ('desarrollo' or 'aprovechamiento de recursos naturales')	Water resources development ('desarrollo' or 'aprovechamiento de recursos hídricos')
(3) Permanent stage (operation, maintenance, and management, and conservation)	Environmental management ('gestión ambiental')	Natural resources management ('gestión' or 'manejo de recursos naturales')	Water resources management ('gestión' or 'administración del agua')
			'Watershed management' ('manejo' or 'ordenación de cuencas')

Source: Dourojeanni, A., 1994, *Políticas públicas para el desarrollo sustentable: la gestión integrada de cuencas*, Economic Commission for Latin America and the Caribbean (ECLAC) and Centro Interamericano de Desarrollo e Investigación Ambiental y Territorial (CIDIAT) and ECLAC, 1994, *Políticas públicas para el desarrollo sustentable: la gestión integrada de cuencas*, LC/R.1399, 21 June 1994, Santiago, Chile.

management', is translated as 'administración de recursos hídricos', and 'watershed management' as 'manejo de cuencas'). It should be noted that Spanish does not normally make a distinction between the concepts 'watershed' and 'river basin', both of these being translated as 'cuencas hidrográficas', although some effort has been made to differentiate between the two by using terms such as 'cuenca fluvial' and 'hoya hidrográfica' to refer to 'river basin', and 'cuenca de alta montaña' or 'cuenca de captación' to render the idea of 'watershed'.

II. Natural resources and elements that are considered in the process of river basin management (letters a, b, and c):

- Group (a): all the elements, resources, and infrastructure for development of a river basin.
- Group (b): all the natural elements and resources to be found in a river basin.
- Group (c): only water resources.

This form of terminological analysis is unique and it is hoped that it may be helpful in classifying concepts of the objectives of river basin management. Table 7.1 shows clearly that the most complete type of management at the river basin level is indicated in column (a), under the heading 'river basin development' at the intermediate stage and 'environmental management' in the permanent phase. This approach amounts to applying regional development and environmental management techniques at the river basin level. It is an approach that gained currency in Latin America following the success of the Tennessee Valley Authority in the United States, an approach that attracted followers in Mexico, Colombia, Brazil, and Peru. Agencies responsible for this type of management are usually referred to as water corporations or commissions. Most originated and developed out of major investment projects.

The intermediate river basin management level is shown under column (b) and includes activities aimed at the co-ordination of the development ('natural resources development') and manage-

ment of all the natural resources to be found in a river basin ('natural resources management'). This level of systematic management of all natural resources in a river basin (management of the use of a river basin according to its capacity and purpose) has not been applied comprehensively in the region.

There are no systems or entities that facilitate co-ordination of the activities of use and management of the natural resources in a river basin. However, there are many watershed management programmes and projects ('manejo de cuencas'). Watershed management has become a sub-item or part of this integrated approach to natural elements and natural resources management.

The traditional approach to watershed management aimed at regulating the runoff of water (a concept that originated and was first applied in the United States) is part of the approach to natural resources management. Watershed management is therefore a mixed activity, linked to management and conservation of all natural elements and resources as well as water management itself.

The third level of management, which is shown in column (c), is geared towards co-ordination of investments in water resources development and subsequent management thereof. It is the best known level of river basin management in the countries of the region and it is at this level that most of the studies and investments in hydroelectricity, irrigation and drainage, drinking water, and flood control are conducted.

In Latin America and the Caribbean, it is normal for the intermediate phase ('development') geared towards planning and execution of investment projects, in particular hydroelectric projects, to be governed by strong systems of management. This is largely due to the fact that it is a phase that normally benefits from substantial financial backing, political support, and interest on the part of the banking sector.

Conversely, the permanent phase ('management'), involving the day-to-day management or administration (for example, of water, use of flood-prone areas, pollution control, or use of hillsides and operation and maintenance of waterworks except in

the hydroelectric sector and some drinking water services) was generally very poor. This is the phase that needs to be improved in all fronts.

Development of Integrated River Basin Management

The development of river basin management in the countries of the region has been neither uniform nor stable. Management systems have been changing erratically, giving rise to many cases where in the past, management, at least of water resources, has tended to be more integrated than at present.

In its initial stages, co-ordination of activities at the river basin level was limited. Work was done at this level in order to solve problems as they arose and satisfy specific or sectorial demands for water, supplying water for population centres or irrigation, controlling floods, and building hydroelectric power stations.

The next step was to operate and maintain the structures thus constructed. This management was limited to the existing structures without any particular interest in multiple use of water resources or in managing the river basin area, that is to say the natural resources of the river basin. Thus, a series of water management systems were implemented in the region, many of which were developed solely for sectorial water use.

In the late 1940s, corporations were set up for the integrated development of river basins, that is, for regional development at the river basin level. Starting from the construction of water projects these corporations were set out to embrace extensive areas under their jurisdiction and to invest in a number of sectors.

In the 1970s emerged the concept of 'watershed management' mainly with the aim of reducing silting up in dams and to control landslides or floods. There are very few instances in which all the natural resources of the river basin are managed. Integrated agricultural, forestry, and livestock projects have helped to improve this aspect but do not compensate for the lack of a well-co-ordinated system for the management of the natural resources of river basins.

The environmental dimension began to be taken into account in Latin America only at the end of the 1970s, that is, some five to seven years after the United Nations Conference on the Human Environment was held in Stockholm in 1972. First came environmental impact studies, and later environmental quality analyses. To a large extent, environmental management at the river basin level did not go beyond the phase of studies and proposals for forming organizations.

A look at Table 7.1 is necessary to understand this development and to identify the different steps in management that cover the entire river basin depending on the phase of execution and the resources to be managed. Table 7.1 shows a total of seven steps (intermediate and permanent phases) for river basin management: three geared to river basin development and four to the control, administration, or management of the environment, natural resources, or water resources.

The chronological order followed in Latin America in co-ordinating actions at the river basin level is as follows:

- First, the question of water control and use in river basins is approached through the construction of water projects ('water resources development').
- Second, the question of the management of water in river basins is tackled ('water resources management').
- Third, there is then a direct transition to 'river basin development'.
- Fourth, the question of 'watershed management' is taken up, especially with a view to controlling the erosion that affects existing dams and preventing landslides and mudslides.
- Fifth, there is then a direct transition to a consideration of the issue of 'environmental management'.

What stands out in this evolution is that there has been an abrupt decision to co-ordinate, at least on paper, environmental management at the river basin and regional levels, without yet having fully co-ordinated the measures for the development and management of all natural resources of a river basin. It will be

remembered, however, that if natural resources are not managed in a co-ordinated manner, not even water, then it will be impossible to undertake environmental management. The first step should then be to manage the water resources in an integrated manner and then the other natural resources associated with them.

A review of the history of river basin organizations shows that many never become more than, at best, 'action-coordination systems', and they somehow managed to get some studies on river basin carried out. Historically, some river basin organizations were even created for the specific purpose of sponsoring a study or plan, often carried out by groups of consultants hired temporarily for the purpose. In other words, many short-lived 'river basin organizations' were only intended to direct the execution of inventories, studies, assessments, or diagnoses, or draw up river basin development plans that were somewhat more complete than usual. Many of the studies on individual river basins that are currently available have been conducted by institutes of natural resources or by government ministries; these tend to produce the same results as the integrated river basin studies conducted by temporary river basin agencies.

In other cases, river basin organizations are, in practice, the management structures of investment projects corresponding to major water works in the river basin. The names given to these organizations also tend to be varied, the most common being corporations, commissions, or agencies, or simply 'programmes' or 'special projects' that have been responsible for executing water development investment projects in one or more river basins. Likewise, there have also been many national-level projects devoted to a single type of activity, which have been responsible for simultaneous studies in many river basins. These are what are known as 'national programmes' such as those targeting flood control, watercourse stabilization, soil conservation, drainage and land reclamation, river basin management, or rural electrification, to mention a few examples. Some of these projects have been co-ordinated at river basin level, but most of the national programmes have been run independently.

With the increasing drive for municipal participation in environmental management and the acknowledgement of the vital importance of broad public participation in river basin management programmes, a new focus has developed on the issue of managing river basins and bodies of water that are shared by urban areas and several municipalities. Local officials have become the most recent 'clients' in need of working methodologies on river basin management and recovery of watercourses, with the participation of the inhabitants of their administrative areas.

A variety of historical circumstances have brought about substantial progress in establishing and operating river basin organizations, such as the 25 river basin councils recently created in Mexico. There are also some river basin organizations that have been in operation for several decades. In general, in the course of their existence, they have undergone several changes of name, responsibility, or degree of autonomy. None of them, however, are guaranteed to survive unless they adapt to the changing situations in politics, the economy, and demands of the population. Although the efficient operation of a river basin organization does not ensure its continuity, it does give it a certain degree of security in the face of the institutional changes that may occur in any given country.

Prior to proposing the establishment of a new river basin organization in a country it is, therefore, useful to analyse the historical development of similar organizations. It is a worthwhile exercise to look for explanations of why some of these bodies continue to exist years after their creation, while others have disappeared.

Processes Involved in River Basin Management

Setting up any kind of river basin organization, with a view to river basin management under any of its modalities, entails a series of ongoing processes that can be implemented in parallel. The processes that are particularly worthy of further analysis are: (i) communication and awareness-raising; (ii) formation of alliances

and agreements; (iii) legalization of operations; (iv) scenario development, evaluation, and diagnosis; (v) operational consolidation of each water user; (vi) administrative organization; (vii) economic valuation and preparation of strategies; (viii) operation of the shared hydraulic system; (ix) conservation of water bodies, natural habitats, and biodiversity; and (x) pollution control, stream corridor restoration, and recovery of rural and urban drainage capacity. These processes can be divided into three groups: a central co-ordination process, a group of socio-economic processes, and a group of physical and technical processes.

Communication and awareness-raising. Awareness-raising campaigns through whatever media are available are to be recommended before proposing the establishment of any river basin organization. It is a good idea to explain to the actors involved in managing the water resources of a river basin why an agency to co-ordinate their efforts is useful and necessary. This stage also serves to gather information, identify conflicts, and compile literature. It is worthwhile to establish which bodies or organizations are operating in the basin, which of them distribute the water, how they measure distribution, if they keep water quality records, if they have emergency programmes, and, in general, how they operate the existing water systems and with what resources.

Formation of alliances and agreements. The actors involved should set up a preliminary alliance to take action that will gradually progress toward the establishment of an overall system of river basin management. The scope of the alliance can be widened as time goes on but, initially, it is usually easier if the actors set a specific objective for their action (clean-up of a lake or river, reforesting a river bank, administering the water of a river, or canal used by several users, managing the banks and course of a river or any other subject that is of interest to more than one actor). The actors may include public or private groups, non-governmental organizations, municipalities, universities, and professional organizations. Alliances must be formally established

and set concrete goals for their work. Ultimately, this activity is expected to give rise to roundtables for co-ordination and dialogue. The list of actors who are invited to take part must be flexible, since it will vary from one situation to another.

Legalization of operations. The legal framework for a river basin organization can be consolidated gradually. If there is no specific legislation under which to create a river basin management system, the parties could start with a simple agreement to carry out a project. The final objective of the process, however, is to give the river basin management system legal personality and clearly identifiable competencies to manage the water in the basin (collection of charges, monitoring, etc.), either directly or by co-ordinating the actions of responsible organizations. There are several ways of affording legal status to actions relating to river basin management, including ministerial resolutions establishing special programmes and projects and responsibilities which are assigned by law to municipalities, ministries, or institutes, which then give their actions legal status through the modalities of ordinances, regulations, and other directives.

Scenario development, evaluation, and diagnosis. Once a minimum degree of commitment and agreement has been obtained among the actors in the alliance about what they want to achieve in the river basin through their co-ordinated action, the existing situation must be evaluated in order to arrive at a diagnosis. This will require the participation of an interdisciplinary team and can be defined as a management procedure for sustainable development. The actors must be encouraged to participate in a public debate about the issues to be addressed. It is also important to promote the use of geographical information systems and, in general, of all available techniques for describing what is happening in the basin, who the affected and responsible parties are, and what are the costs and benefits involved in the programme of action.

Operational consolidation of each water user. The aim of this process is to help each actor involved in managing the water and the river basin to ensure that they are complying fully with their

responsibilities. For example, support should be given to organizations of agricultural users, drinking water and sanitation services, mining, fisheries and recreational users, and, in general, all those actors who in some way alter the flow of water in the basin, to ensure that their practices conform to the highest standards possible. This consolidation process includes providing support to local governments to help them comply with their environmental responsibilities and to ministries—such as health ministries—to help them discharge their role of environmental quality control, and to other entities including non-governmental organizations.

Administrative organization. All the stages must be carried out within an adequate administrative framework, including the collection of charges, registering of actors, accounting, financial controls, monitoring and ensuring compliance, procurement of equipment, and hiring of staff and consultants. The administrative system will become more complex as the process advances. If the organization is to survive, it must make itself indispensable, and that will only happen if it generates confidence in its financial management and the quality of its work. The professionals who make up the administrative system must be suitably qualified.

Economic valuation and preparation of strategies. Plans are written strategies, and are presented in the form of programmes of work or projects which have due technical and financial backing. Once it has started, the process of planning is never concluded. Planning should be seen as equivalent to building a system of information and rules, standards, and criteria that facilitate decision-making among multiple actors. The factors which are used to calculate costs and benefits, design strategies, and draw up a plan come from the stages of identifying the actors, their criteria, problems, and objectives, building shared scenarios, evaluating the existing situation, making diagnoses, and identifying obstacles and restrictions. The plan should serve to communicate intentions and co-ordinate where necessary.

Operation of the shared hydraulic system. Qualified technicians are needed to operate and maintain the hydraulic system built

in the river basin and to support water conservation and management, and the many users in the river basin must also participate in the process. The basin's rivers and hydraulic systems must also be equipped with a series of water monitoring stations and satellite information systems, or these must be reinforced if they already exist. In general, the organization needs to be sufficiently equipped to be able to keep track of situations and plan ahead. Modern communications systems are essential to enable the overall system to function correctly.

Conservation of water bodies, natural habitats, and biodiversity. It is not enough to merely operate the hydraulic systems built. An enormous amount of work is required to recover damaged areas along riverbanks and riversides and rehabilitate biological habitats. It is essential to mitigate the effects of conflicts related to water and river basin management by ensuring that plans for the use and occupation of the territory respect—as far as possible—the natural catchment and water-flow conditions in the basin. This is necessary to maintain all the river basin's original functions, in particular to conserve biodiversity and the landscape. This process requires town planners to take account of natural watercourses, with normal and seasonal flows, in their decision-making.

Pollution control, stream corridor restoration, and recovery of rural and urban drainage capacity. In most river basins, especially in urban areas, this process entails reversing situations that have already profoundly altered watercourses and flows. This is a long task and likely to be the most challenging of all. It is not possible to conserve basins or watercourses if they have already deteriorated totally. While industrialized countries are in the process of rehabilitating stream corridors, most developing countries are in the process of destroying them.

This analysis is clearly not intended to be complete. Neither does it address how to combine all these processes in a flow diagram of work, incorporating the activities, staff, and time for each action. The implementation of the stages described above will be greatly aided if theoretical and practical data is compiled

to support the establishment of the river basin organization. This can be complemented with additional information such as an evaluation of the knowledge of water users, the actors who will be involved in managing the water in the river basin, their criteria on multiple water-use management, the problems and conflicts involved in shared management, and the objectives they are pursuing. It is also necessary to carry out a comparative analysis of the past and present experience of attempts to create such organizations within the country, and if possible in more than one country, whether these have been successful or not.

A particularly important point for making the processes of creating and consolidating a river basin organization as smooth as possible is to begin while the hydraulic works are still being built, whether they are State or privately operated. Commonly, the 'master plan' for integrated river basin management is not thought of until the works are finished. Still worse is that this often means that no resources are available for setting up the operative system—which amounts to much more than making a plan—including funding for complementary communication works and monitoring systems. At least 5–10 per cent of the cost of the major hydraulic works should be allocated to establishing the management system—including the necessary infrastructure. No less than ten years should be allowed for consolidation, especially in river basins featuring a combination of formal and informal actors and low-income groups.

The Long Process of Creating the Legal Framework for River Basin Organizations

In order to analyse the institutional structures for river basin management, it is essential to attempt to distinguish between the many variations they adopt. There are three basic types of structures in river basin management organizations:

- *Management structure.* Management structures vary depending on the extent to which the different actors participate in the management process. The name given to the river basin

organization does not necessarily reflect their degree of participation in the decision-making process but it does, at least, indicate the original intention. The most common formulas are 'river basin commissions', 'river basin committees', 'river basin councils', and 'river basin agencies', which display a wide range of types of participation by the actors involved in the decision-making process. In other cases, the management structure consists of a board of directors, which may be composed of government officials only or may include users, non-governmental organizations, universities, etc. The board of directors must have the power to decide, resolve, and enforce agreements (it should not be merely an advisory or co-ordinating body).

- *Operational structure.* An operational structure is the body which puts the decisions of the management group into practice. It executes actions and processes, either directly or through consultants and contractors. The operational structure of a river basin organization must have highly qualified personnel. They are the 'agency' in the strict sense, although they may be known by other titles, such as executive office, technical group, technical office, corporation, or even institute, for example. The operational structure is the one responsible for providing the studies and information that the management group needs to take decisions.
- *Financial structure.* The body responsible for raising financial resources is one of the most difficult to design. In the countries of the region it is common to find that financial resources for river basin management are only available at the phase of executing hydraulic works, which is obviously not the solution for a river basin organization that is intended to be permanent. Few 'models' of financial structure are transferable from one country to another. The polluter pays principle, aids and incentives are a good option but are clearly insufficient and even inapplicable to many of the region's river basins which are characterized by informal settlements and producers. Any financing proposal must

take into account the situation of the country, region, and river basin.

The creation of formal institutional conditions for river basin organizations is at varying stages of progress in the region. Without a doubt, the best scenario involves national legislation serving as a regulatory framework for the process of creating river basin organizations while also providing for the possibility of adopting alternative approaches at the state, provincial, and regional levels, in line with the country's political and administrative structure.

In federal countries, and countries with regions which have greater or lesser degrees of autonomy, the legal framework for establishing river basin organizations is usually established at the respective administrative level (state, province, or region). In some cases, the framework is jointly created by mayors who share a river basin or by simple agreements between the main users of water in these areas.

The legal provisions establishing these organizations should usually be part of a wider framework of water legislation, as occurs in Mexico and Brazil. However, there are also situations in which the national level legal provisions come under legislation on decentralization, environmental laws which include provisions on territorial organization, investment promotion legislation, laws on national investment programmes or projects, or other variations arising from proposals by different ministries or regional governments.

Transboundary river basin development agreements can also provide a basis for formalizing the framework of river basin management. These agreements tend to be lasting, indeed much more so than agreements concluded at the national level. Some of the river basin organizations which have survived longest—albeit with some changes of name and responsibilities—are precisely those which come under international treaties involving bilateral or multilateral commitments.

Another major catalyst—and technical factor—in stabilizing and conferring legal status on river basin organizations are

bilateral technical assistance agreements. These agreements have the virtue of providing a legal framework for the creation and operation of river basin organizations through agreements with banks or with partner countries. This arrangement puts the respective organization in a better position to withstand at least one direct attack, which can come in the form of a change in management, a change in attitude by some official, or the sudden structural and operational transformation of the public agency responsible for controlling it.

The process of providing a legal framework for any type of river basin organization is slow and many fall along the wayside. The fact that a law is passed to establish such an organization represents no guarantee whatsoever that it will be implemented. The approval of legislation is only a preparatory step, which must be made in parallel with many other actions, particularly in relation to organizing and implementing the formulas needed to create and operate these organizations. For river basin organizations to become consolidated, they must also be given the capacity to raise their own funding.

Difficulties in Establishing and Operating River Basin Organizations in Latin America

The establishment of river basin organizations very often faces opposition from some of the main users, sometimes from interinstitutional rivals and sometimes because they have to confront or compete openly with regional authorities. Many organizations which have been in operation for years continue to face the same set of conflicts and opposition. Many river basin organizations have succumbed to this problem, as the statistics of some countries show. The organizations which last the longest are those which can rely on their own fund-raising system.

Probably some of the greatest obstacles to the establishment and successful operation of river basin authorities are lack of awareness on the part of public and users of the economic advantages of having such organizations; lack of clarity about

their role, which generates potential competition with other authorities and with the public and private sectors; an unrepresentative management level (council, committee, or board); problems with the means and legal basis of raising funds; and the fact that water management at river basin level is often dominated by a sector which has no interest in forming part of a system of shared management.

To establish a river basin organization it is, therefore, necessary to run several processes in parallel. It is strategically advisable to start by acknowledging any type of water administration that already exists in the river basin—whether this is a single sector user, such as irrigation, hydroelectricity, or drinking water supply and sanitation, or various sectors—and involve them in the process right from the beginning. Many past failures or delays in creating river basin organizations are attributable to the neglect of something as fundamental as this.

It is obviously essential to have agreements in place among the public institutions which are involved in water management. Conflicts between State agencies are very injurious to the process and often occur between ministries and agencies, even from the same sector, to the extent that one party may even boycott the initiative. Conflicts sometimes arise between local authorities or provinces and the central government for political reasons, especially if the mayor or governor belongs to the ruling party's opposition.

In general, most of the financial agents of major hydraulic works are guilty of a glaring lack of provision for financing the establishment of river basin organizations to operate and maintain the hydraulic works once they are built. This is usually considered to be allocable to current expenditure of the fiscal budget and not to project expenditure.

Conflicts over the creation of river basin organizations also arise because of the effects of existing legislation, or the lack of it. Sometimes an existing law that provides for the creation of a river basin organization is not flexible enough to allow it to achieve its purpose: it may establish conditions for the participation of

actors, composition of boards, or charges which are impracticable. In other cases, there is no legislation on which to base the creation of a river basin organization, afford a legal framework, or provide financial support.

From the hydrological viewpoint, river basins are ideal territorial entities for water resources planning and management. However, in situations where political-administrative jurisdictions do not coincide with the physical boundaries of river basins, many of the decisions that affect the hydrological cycle, water use, and the inhabitants of the basin fail to take into consideration this integrated system as a whole. Furthermore, water resources management is normally fragmented along the lines of user groups, sectors entrusted with overseeing the resource, types of use, the source of catchment, and other similarly arbitrary criteria. An integrated system and a shared resource are administered in a piecemeal fashion, and as a result more situations of conflict over water resources management occur when they should be avoided, minimized, or resolved. *The challenge we face, therefore, is to create competencies for governability over areas delimited by natural factors, such as river basins, which do not correspond to traditional forms of government over political-administrative boundaries, such as states, provinces, regions, and municipalities.*

How Can the Failure of Water Resources and River Basin Management Processes be Prevented?

Attempts to establish water resources and river basin management systems usually fail because proposals for the creation of the pertinent organizations, whether in the form of authorities, agencies, or any other body, are presented in a relatively superficial manner. Generally the aim is to give systems a holistic focus. Hence they should: (i) be economically efficient, self-sustaining, and competitive; (ii) have a social orientation, promote social equity, and be environmentally responsible; and (iii) involve both public and private sectors, promote civic participation, and

take a conciliatory rather than an authoritarian approach. In essence, the objective is to create a superior body responsible for fostering sustainable development.

Experience shows that the creation of any organization that performs at least some of the basic functions, such as preventing, reducing, or solving disputes among water users, should be a gradual process. The initial step should be to gather information on public policies in regard to water resources and the economy; the features of water resources and river basin management; the characteristics of water management systems and the actors involved; and the most appropriate methods of operation for public or private organizations responsible for managing water and natural resources in a river basin.

Viewed from this perspective, it may be very useful to analyse policy declarations in terms of a methodological sequence which seeks to direct management procedures towards sustainable development. It is suggested that in order to execute actions, it is necessary to:

- (i) identify the actors involved in the management process;
- (ii) analyse the actors' criteria (policies, principles, etc.);
- (iii) identify any problems related to these criteria;
- (iv) identify what the actors' objectives are;
- (v) define the spheres within which it is hoped to attain these objectives;
- (vi) identify constraints on the attainment of these objectives;
- (vii) propose solutions for overcoming these constraints;
- (viii) decide on the strategies to be applied in order to achieve solutions;
- (ix) design programmes and projects for carrying out the selected strategies and evaluate them; and
- (x) execute both one-off and ongoing programmes and projects.

In accordance with this sequence, policy formulation takes place mainly at the stage when criteria for action and the actors' objectives need to be specified. These criteria are for the most part declarations of intent. By contrast, policies for executing

actions can only be formulated once the solutions and strategies have been designed. Thus, water policy formulation needs to be undertaken step by step, in a systematic way, so as not to overlook aspects critical to successful implementation.

Water policy formulation in the countries of the region has seldom been carried out in a rigorous way. Generally speaking, policy formulation is ad hoc, and does not follow any established procedure. Water policies in the region have at various times emphasized the preparation of plans, the formulation of laws, the creation of new entities, and so on. However, it is a matter of concern that the vast majority of these proposals are not properly harmonized. The measures taken in this context are piecemeal, their objectives limited to, for example, avoiding inconsistency with an economic system, reinforcing other laws, mitigating specific conflicts that arise from time to time among users, satisfying the demand of certain groups of voters or facilitating a particular decentralization project. In such circumstances, the water policies formulated are normally incomplete. For example, decentralization in some countries has led to profound contradictions between development policies and water policies, with the result that river basin organizations attached to the central government sometimes find themselves subordinate to two or even three authorities, because the river basin under their control has been divided by regional boundaries.

Water policies should fit neatly with national development policies, but it should also be pointed out that both water resources and processes to develop them have certain features which, if neglected, give rise to huge contradictions. The unique features of water as an economic resource demand, if not a dominant role for the State, at least joint management by the State and users of supply at the river basin or interconnected system level. This is the only way to resolve any conflicts that may arise, to make resources available to deal with shared problems and to control externalities, natural monopolies, and other aspects that require regulation.

As the consequences of water management policies in force are often unknown, it is difficult to come up with a way to improve them. In other words, if there is a lack of information about how water development policies are currently working (causes and effects), it is hard to decide what to do to make them more effective. Many countries do not maintain an up-to-date register of laws dealing with water resources and watershed management. Countries also sometimes lack a register of users of river basin or water systems, as well as an inventory of studies on each system or of investments made in water infrastructure works in each basin. It is not known to what extent policy declarations and official rulings on functions are implemented in practice. A large number of government agencies do not have sufficient resources to perform the tasks they are set. Until now, most water policies that stem from changes in economic policy remain little more than declarations or policies of intent. In many cases, without any deeper analysis, policies of intent have become laws of intent, and this has generated serious gaps, especially in terms of instruments to implement the laws. In several cases, the spirit of the policy bears little relationship to the provisions of the law or to the results it achieves.

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Index

- Abbott, R 85
Academic exercises 75
Acid Rain 124-5
Ackerman, R 55
Africa 146, 152
 South 147
 Sub-Saharan 67, 143, 146
 Traditions 14
Agarwal, A. 55
Agriculture 73, 76, 119, 145, 151, 200
 Production 145
Ahmad, Q.K. 105, 108
Air pollution 120-1, 124, 126, 137-8
 Transboundary 126, 138
Air quality 120
Al-Baz, I. 111
Algae 140
Algeria 149
Alperovitz, G. 55
America 25, 146
 Latin 67, 144, 150, 176
Amis, M. 34
Angola 142
Antarctic 134, 136, 153
Anthropocentrism 89
Antibiotics 105
Arctic 129, 135-6
Argentina 150
Arthur, W.S. 173
Asia 76
 Central 67
 East 146
 South 66-7, 146
 Values 14
Assimilative capacity 1, 24, 112
Athens 115
Atom bomb 53
Australia 25, 157, 169
Awareness 13, 177-8, 181-2, 197-8, 205
Azar, C. 107-8
Bailey, R. 55, 118-19
Banuri, T. 36, 55
Barbier, A.M. 110
Barbier, E.B. 110
Bazzar, F. 132
Beckerman, W 36
Beland, P. 128
Belarus 147
Bellamy, J. 156-75
Biodiversity 81, 165, 168, 198, 201
Biomass 131
Biswas, A.K. 7, 9, 12-13, 16, 65-81, 108
Bongaarts, J. 119, 151
Bonn 82

- Botswana 147
 Bottom-up 158
 Bourke, S. 4, 9, 16, 159, 164, 174
 Boyce, N. 122
 Brazil 144, 150, 186-7, 192, 204
 Brown, L.R. 46, 95, 108, 110
 Brundtland Commission 20, 33, 55,
 71, 87-8
 Report 36, 55, 157
 Buber, M. 116
 Bulgaria 147
 Bullard, N. 109
 Burkina Faso 14, 149
 Burundi 147, 149
 Business management 84

 Cadmium 128
 Calder, N. 50
 Cambodia 142
 Cameroon 147
 Canada 24-5, 45, 129
 Capacity building 12, 82, 162, 170,
 171, 186
 Capital
 Return 32
 Social 36
 Carbon
 Cycle 133
 Emissions 24
 Oxides 137-8, 140
 Carcinogen 122, 139
 Caribbean 181-2, 184-5, 187-8,
 190, 193
 Carr, A. 158, 174
 Carson, R. 156, 174
 Catchment management 169
 Chasek, P.S. 110
 China 14, 147
 Chlorine 112
 Chlorofluorocarbons (CFCs) 136-7
 Civil society 34, 54, 84, 87, 89-90,
 103, 105, 184
 Clausen, A.W. 6, 16, 20
 Climate 23, 48, 50-1
 Change 23, 27, 38, 43, 48-9,
 76-7, 81, 103, 130-3, 137,
 141, 145, 151-2
 Fluctuations 76, 77
 Modelling 50
 Cobb, J.B. 34
 Coghlan, A. 130
 Colborn, T. 128
 Cold War 142
 Indicators 142
 Colombia 142, 192
 Communication 52, 160, 164, 167-
 8, 170-1, 197-8, 200-2
 Community 13
 Involvement 160
 Participation 161
 Conceptual attraction 79
 Conflict 9-10, 75, 93, 141-2, 178,
 183, 198, 201-2, 205-7, 209
 Resolution 99
 Congo, Democratic Republic of 142,
 147
 Congo, Republic of 142
 Conservation Foundation 5, 19
 Conservation Movement 70
 Constanza, R. 106
 Consultative Group on International
 Agricultural Research 53
 Corcoran, T. 33
 Cost
 Allocation 40, 202
 Effectiveness 13, 67, 79, 102
 Recovery 184
 Cost-benefit analysis 83, 85-6, 95
 Culture 10, 14, 34, 88, 158, 168,
 177-9
 Cytokines 122

- Dale, A. 159, 161, 174
 Daly, H. 33-4
 Data collection 11-12, 76
 Dawson, S. 173
 Day, M. 122
 Debt crisis 150-1
 Decentralization 188, 204, 209
 Democracy 87-90, 95, 103, 105-6, 108
 Denmark 128
 Desalination 145, 149
 Desert 119
 Development
 Adverse impacts 79
 Community 13
 Decades 66
 Evaluations 69
 Indicators 13, 70, 146-7
 Official assistance 65
 Regional 13, 192, 194
 Dichloro diphenyl trichloro ethane (DDT) 128, 129
 Dieldrin 128
 Disaster
 Ecological 35
 Natural 179, 184
 Dolphin 129
 Dourojeanni, A. 9, 11, 16, 176-211
 DNA 123
 Dragan, A. 4, 9, 16
 Drainage 72, 184-5, 193, 196, 198, 201
 Drought 184

 Ecodevelopment 70, 77
 Ecology 88, 92, 106, 140, 158, 168, 172, 176
 Economics 91, 99, 106-7
 Disaster 34-5
 Modernization 100-3, 108

 Economic
 Conditions 10, 14
 Efficiency 172
 Growth 1, 10-12, 35-6, 68, 83, 86, 100-2, 106-7, 144, 181
 History 84
 Interactions 9
 Issues 3, 9, 11-12, 15, 21, 24, 31, 35, 42-4, 47, 49, 68, 73-5, 78, 82, 102, 105-6, 113, 130, 141, 144-5, 150, 156-7, 159, 164, 170, 178-9, 182, 190, 198, 200, 205, 208, 210
 Planned 103
 Welfare 34
 Economic Commission for Latin America and the Caribbean 16
 Ecosystems 1, 34, 65, 82, 88-9, 95, 112, 125-6, 164-5, 182
 Resilience 107
 Services 107
 Ecuador 187
 Edelstein, L. 116
 Edwards, M. 90, 109
 Edwards, R. 123, 128
 Efficiency 4, 32, 84, 93-4, 102
 Economic 172
 Market system 96
 Eggleton, A. 134
 Egypt 119, 149
 Einstein, A. 50
 Empowerment 165
 Environment 1-4, 6, 9, 11-13, 18, 21-2, 27, 30, 32, 34-6, 40, 43, 50, 53-4, 65-6, 81, 83, 86-8, 90, 95, 100-1, 104-5, 107-8, 112-3, 116, 119, 120, 124, 127, 130, 134, 136-7, 144-5,

- 149, 157-8, 163-8, 170-3, 176-8, 180-3, 185-6, 195, 200, 204, 207
 Conservation 68, 78, 189, 190-1, 193, 198, 201
 Cost 40
 Crisis 37, 38
 Damage 6
 Deterioration 2, 7, 13, 38, 47, 88, 95
 Disasters 23
 Disruption 13
 Entrepreneurs 93
 Impacts 13, 15, 23, 34, 78, 158, 179, 195
 Analysis 79
 Interactions 9
 Management 24-6, 37, 42, 78, 90, 98, 101, 156-7, 163, 166-7, 181-3, 188, 192, 195-7
 Performance 98
 Policy 36-7, 53
 Protection 10-11, 78
 Quality 6, 21, 24, 33
 Equity 11, 21, 53, 54
 Intergenerational 168
 Intersectoral 168
 Societal 10-11, 156, 179
 Ethics 88-9, 106, 112-13
 Ethiopia 149
 Ethnicity 179
 Etzioni, A. 92, 109
 Europe 25, 107, 121, 123, 125-6
 Eastern 67
 European
 Commission 125
 Union 93, 103
 Eutrophication 125-6
 Evaluation 164, 182, 187, 198-200, 202, 208
 Development 69
 Sustainable development 15
 Externalities 40, 75, 83, 209
 Ewert, A.W. 174
 Ewing, S. 173
 Faber, M. 92, 109
 Falkenmark, M. 82, 109
 Famine 44
 Farman, J. 136
 Farmers 74
 Perceptions 74
 Fertilization 131
 Fertilizers 73
 Fisheries 5-6, 19, 71, 94-5, 112, 118, 126, 140, 152-4, 200
 Sustainable yield 71
 Floods 179, 184, 188, 194
 Control 193-4, 196
 Folke, C. 106-7, 109
 Food 151
 Availability 145
 Chain 129
 Production 11, 53, 146
 Supplies 44, 152
 Ford, D. 97, 109
 Ford Foundation 54
 Forestry 5-6, 19, 27, 125, 141, 182, 194
 Deforestation 141
 Reforestation 141, 198
 Fossil fuel 43, 137
 Foster, J.B. 45
 Founex Report 19
 French, H. 26
 Friman, E. 106, 109
 Fulford, R. 33
 Funds 15

- Galileo 50
 Gaventa, J. 109
 Gee, D. 109
 Gender 179
 Genetically modified (GM) crops 151-2
 George, S. 102, 109
 Gibbons, M. 168, 174
 Gill, R. 4, 10, 163
 Gillespie, A. 112-55
 Global thinking 3
 Global warming 44, 47-9, 131, 133
 Globalization 52, 163, 177-8
 Goklany, I. 118
 Goldstein, G. 150
 Goodland, R. 9, 16
 Gorddard, R. 173
 Gothenburg Protocol 126
 Gould, R. 139
 Government failure 83, 87, 158
 Governance 14, 36, 43, 82, 156, 159, 160-72, 176, 180
 Gray, B. 158-9, 174
 Green ideology 84
 Green revolution 136, 145
 Greenhouse gases 23-4, 38-41, 47, 49
 Greenland 129, 133
 Gribbin, J. 132, 134-6
 Groundwater 73, 95, 105, 183
 Grunberg, I. 110
- Haiti 149
 Hajer, M.A. 100, 102, 109
 Hamer, M. 121-3
 Hammond, A. 3, 12, 16
 Harremoes, P. 109
 Hartwick, J. 31
 Heal, G. 41
- Healey, P. 158-9, 174
 Health 15, 95, 183
 Hecht, J. 136
 Helsinki Protocol 121
 Hilderbrand, G. 116
 Holdren, J. 121
 Holmberg, J. 108
 Honigsbaum, M. 152
 Hormones 105
 Human
 Activities 6
 Basic needs 6, 70
 Rights 115-16
 Hunger 66
 Hydroelectricity 185, 193-4, 206
 Hydrocarbons 123
 Hydrofluorocarbons (HFCs) 136
 Hydrological cycle 183, 207
- Ice Age 51
 Ideologies 81, 84
 Impact
 Analysis 79
 Assessment 108
 Social 13, 15, 78
 Technological 12
 Environmental 13, 15, 23, 34, 78
 Income distribution 68, 71
 India 14, 143, 147
 Industrial Revolution 38-9, 44
 Industry 13, 145
 Infant mortality 147
 Inflation 26
 Information 12, 32-3, 168, 170, 171, 179, 181, 184, 187-8, 198-201, 208, 210
 Access to 88
 Exchange 161
 Infrastructure 13, 32, 88, 192

- Insecticides 152
 Institutionalization 90, 98-9
 Institutions 5, 10, 14, 32, 37-8,
 43-4, 66, 68-70, 81, 84-6,
 90-2, 98, 100-2, 107, 108,
 159, 160, 162, 165, 167, 170-
 2, 182, 184-5, 196, 202, 204,
 206, 209
 Change 23, 28, 97-9, 197
 Failure 83, 87
 Integrated river basin management
 4, 176-211
 Integrated water resources
 management 4, 176, 180, 185,
 187
 International trade 97, 106, 144
 International Conference on
 Freshwater 82, 109
 International Water Supply and
 Sanitation Decade 69
 International Whaling Commission
 130
 Irrigation 72-3, 185, 188, 193-4,
 206
 Israel 143
- Jakobsson, K. 4, 9, 16
 Jakunbowski, P. 92, 109
 Japan 14, 25, 129
 Culture 14
 Jeffreys, K. 118
 Johannesburg Conference 20, 27,
 41, 49, 82, 87, 105, 107
 Johansen, L. 86, 110
 Jones, N. 125
 Jordan, A. 3, 16
 Jouravlev, A. 211
 Jowett, B. 117
 Joyce, C. 132, 139
- Karlsson, S. 108
 Kaul, I. 97, 110
 Kellogg Foundation 54
 Kenya 147
 Keys, J. 109
 Kissinger, H. 65
 Korten, D. 87, 102, 110
 Krauthammer, C. 50
 Kuhn, T.S. 110
 Kuwait 149
 Kyoto
 Conference 41, 49
 Protocol 24, 50, 138, 141
- Land
 Reclamation 196
 Tenure 172
 Use 13
 Landslides 194, 195
 Latvia 147
 Legget, J. 103, 110, 133
 Legislation 5, 10, 14, 153, 165,
 167-8, 171, 179, 185-9, 199,
 202, 204-7, 209-10
 Leitch, A. 174
 Lesotho 147
 Liberalism 84, 87, 108
 Liberia 142
 Libya 149
 Life
 Expectancy 122
 Quality 1-2, 9, 15, 65-6, 68,
 79, 177, 181
 Standard 31
 Lifestyle 31, 87, 92, 107
 Literacy rates 148
 Lithuania 147
 Little Ice Age 49
 Livestock 194
 Lobbying 100

- Lomborg, B. 113-14, 116-28, 130-1, 134, 136, 138-9, 141-3, 145-6, 149-52, 154
 London 120-1, 124
 Los Angeles 124
 Lovejoy, T. 125
 Lubchenco, J. 174
- MacGarvin, M. 109
 MacKenzie, D. 136
 MacNeill, J. 38, 41
 Malardalen University 107
 Malaria 144, 152
 Malawi 147, 149
 Malhotra, K. 109
 Malnourishment 67
 Malthus, T. 44-6
 Malthusian thesis 34, 44, 47, 52, 118
 Management capacities 5, 14
 Manuel, F. 116
 Market system 40
 Efficiency 96
 Failure 83, 86
 Free 151-2
 Marx, L. 116
 McDonald, G.T. 173
 McDougall, S. 174
 McKibbin, W. 49
 Meadows, D. 156
 Meltzer, A. 116
 Meppem, T. 4, 9-10, 16, 156-75
 Mencken, H.L. 26
 Mercury 94
 Methane 140
 Mexico 14, 186-7, 192, 197, 204
 Microeconomics 91
 Middle East 146
 Migration 178
 Miller, M. 18-64
 Mishan, E. 34, 86, 110
 Modak, P. 13
 Moldova, Republic of 147
 Monitoring 15, 76, 125, 146, 199-202
 Morse, B. 66
 Multiplier effect 164
 Mulvaney, K. 132
 Myanmar 142
 Myrdal, G. 85-6, 110
- Naim, M. 52
 Nairobi 6
 Conference 27, 41
 Declaration 7
 Namibia 147
 Nazis 53
 Neoclassical economics 83-7, 91, 93, 95, 97-99, 101-2, 106-7
 Neo-liberalism 86
 Nerfin, M. 107
 New Zealand 123
 Nitrogen oxides 121, 125, 138, 140
 Nitrates 73
 Non-governmental organizations 13, 19, 20, 25-6, 46, 54, 70, 78, 90, 158, 188, 198, 200, 203
 Norgaard, R.B. 107, 110
 Nowak, R. 132
 Nuclear energy 46
 Nutrients 140, 166
- Oakes 38
 Ocean
 Conservation 153-4
 Pollution 126
 Oil
 Crisis 45
 Pollution 127
 Spill 126

- Oman 149
- Organization for Economic Co-operation and Development 67-8, 70, 80, 97, 110, 148, 159, 174
- Osborne, F. 5, 6, 19
- Ozone 81, 88, 112, 125-6, 136, 137
Depletion 134, 135
- Pain, S. 133
- Pakistan 143
- Paradigm 83
Coexistence 106
Failure 84, 87
Shift 106
- Paraguay 150
- Parsons, E. 128
- Participation 82, 88, 176, 179-81, 201
Community 161
Private 185
Processes 159
Public 10, 158, 197
Societal 170
Stakeholder 15, 160, 169
Users 182
- Participatory management 185
- Particulates 122, 140
- Partnership 160
- Passet, R. 102, 110
- Patel, T. 123
- Pearce, D.W. 95, 110
- Pearce, F. 121, 124, 132, 139, 142
- Perceptions 81, 156, 171
Farmers 74
People 75
- Peru 142, 150, 192
- Perrings, C. 106
- Pesticides 105
- Petersen, T. 109
- Pezzey, J. 29
- Pitt, W. 44, 52
- Plankton 140
- Pluralism 89, 90-1
- Policy 5, 12, 18, 31, 36-7, 53, 81-2, 105-6, 163
Environment 36-7, 53
Indicators 108
Public 18, 163, 208
Research 106
Water 3, 12, 81-2, 105, 185, 209, 210
- Political
Agenda 78, 108
Correctness 41
Will 69
- Politics 32, 44, 71, 102
- Pollution 22, 78, 81, 94, 102, 104-5
Bioaccumulation 128
Control 193, 198, 201
Ocean 126
Oil 127
Rights 96
- Polluter pays principle 83, 203
- Polychlorinated biphenyls (PCB) 128-9
- Population 1-3, 10-11, 13, 15, 21, 26, 37, 44, 46, 53-4, 119, 147, 149, 176, 179, 181-2, 194, 197
Asia 66-7, 76
United States 148
- Porter, A.H. 110
- Porter, G. 105, 110
- Positional Analysis 95
- Poverty 15, 21, 26-7, 67, 81, 119, 143, 147, 149
Alleviation 2, 36, 65, 67-8
Eradication 66, 146

- Precautionary principle 88, 130, 133-4, 154
 Precipitation 76
 Private
 Participation 185
 Sector 10, 54, 74, 75, 146, 179, 188, 206, 207
 Privatization 188
 Property rights 168
 Public
 Good 18, 41, 97
 Debate 99
 Participation 10, 158, 197, 207
 Policy 18, 163, 208
 Sector 10, 152

 Rate of return 32
 Rangachari, R. 108
 Reagan, R. 42
 Redclift, M. 35
 Regulations 42, 75-6, 93, 163, 172, 185, 188, 204, 209
 Reijnders, P. 128
 Renaissance 115
 Rennie, J. 119
 Repetto, R. 30
 Research 12, 85, 105, 107-8, 159, 182, 185
 Policy 106
 Resource allocation 85, 95-6
 Rights
 Property 168
 Human 115-16
 Pollution 22, 78, 81, 94, 102, 104-5
 Water use 96, 183, 185
 Rind, D. 132
 Ringskog, K. 96, 111
 Rio de Janeiro
 Conference 2, 41, 49, 82, 89
 Earth Summit 157
 Risk 76, 130, 154
 River, international 188, 204
 Rockefeller Foundation 54
 Röling, N. 178-9, 211
 Romania 147
 Rome
 Club of 45
 Conference 65
 Roosevelt, T. 70
 Ross, H. 156-75
 Roumasset, J. 31
 Roy, A. 103, 110
 Ruckelhaus, W. 38-40, 41
 Rural electrification 19
 Russia 129, 147
 Rwanda 149

 Sachs, I. 35, 36
 Sainju, M.M. 108
 Salinity 72, 74
 Sanders, W. 174
 Sanitation 69, 185, 200, 206
 Saudi Arabia 147
 Sceptics 115
 Schiller, J. 109
 Schneider, S. 134
 Schumacher, E.F. 156, 175
 Sedimentation 194
 Sen, A. 81, 106, 110
 Serageldin, I. 12, 54
 Sewage 184
 Treatment 105
 Shady, A. 111
 Shaw, G.B. 80
 Shaw, R. 122
 Shiva, V. 102, 110
 Siddayad, C. 50
 Sierra Leone 142
 Simmonds, M. 128
 Simpson, L. 96, 111

- Singapore 149
 Soderbaum, P. 9, 81-111
 Social
 Benefits 13
 Capital 36
 Change 84, 97, 105
 Conditions 10, 14
 Costs 75
 Development 130
 Dynamics 159
 Equality 10-11, 179, 207
 Impact 13, 15, 78
 Inequality 2
 Interactions 9
 Issues 3, 9, 11-12, 34-5, 71, 74, 88, 92, 95, 100, 102, 113, 157, 159, 161, 168-70, 177, 179-80, 185, 190
 Norms 14
 Responsibilities 90, 102
 Values 170
 Socialism 84, 87
 Socio-cultural issues 164
 Socio-economic issues 158, 186
 Socio-political issues 71
 Sociology 84
 Socrates 114-15, 117, 131
 Soil
 Conservation 196
 Erosion 73, 195
 Solow, R. 28-30
 Somalia 149
 Soviet Union 143
 Spencer, R. 118
 Speth, J.G. 36
 Stakeholders 11, 92-3, 163-4, 172, 185
 Participation 15, 160, 169
 Stern, M.A. 110
 Stiglitz, J. 22
 Stirling, A. 109
 Stockholm
 Action Plan 78
 Conference 6, 41, 78, 82, 107, 195
 Water Symposium 82
 Stoics 115
 Stolarski, R. 135
 Stott, P. 48-9
 Streets, D. 133
 Strong, M. 23, 38, 41
 Subsidies 75, 83, 184
 Sudan 142
 Sulphur dioxide 121, 137
 Sustainable development 5, 157
 Flawed concept 18
 Definition 7, 18, 68, 71-2, 87, 157
 Evaluation 15
 Evolution of the concept 5
 Ideological debate 9
 Implementation 4, 7, 10, 68, 71-2, 77, 79
 Indicators 10
 Measurement 10, 15
 Monitoring 15, 76
 Transition 11, 76
 Swaziland 147
 Sweden 88, 101, 107
 Syme, G.J. 173
 Taylor, J. 118
 Technical assistance 186, 188, 205
 Technology 12, 31-2, 154, 163, 170, 178-9
 Advances 32
 Change 31, 130
 Development 93, 151
 Efficiency 136
 Exchange 144

- Impacts 12
- Innovations 12, 53, 100
- New 12
- Temperature 76
- Tennessee Valley Authority 192
- Thatcher, M. 42
- Third World Centre for Water Management 81
- Thorsell, W. 44
- Tietenberg, T. 40
- Tokyo 129
- Tolba, M. 2, 6-7, 19
- Top-down 15, 158
- Tortajada, C. 1-17, 19, 81-2, 102, 111
- Trade 149, 151
 - International 97, 106, 144
- Training 12, 182
- Transculture 178
- Transnational companies 87, 103
- Transparency 185
- Troisi, T. 128
- Tuan, Yi-Fu. 175
- Turco, R. 136

- Ukraine 147
- Uncertainty 49, 76, 88, 115, 131-3, 154, 181
- Unemployment 26
- United Kingdom 81, 124, 128, 139
- United Nations 19, 27, 41, 65-70, 72, 78, 146
 - Conference on Environment and Development 2, 20, 82, 157, 175
 - Action Plan 3
 - Agenda 21 3, 15, 21, 35, 89, 91, 157, 175
 - Conference on Human Settlements 68
 - Conference on the Human Environment 6, 78, 195
 - Conference on New and Renewable Resources of Energy 27
 - Environment Programme 1, 5-7, 19, 36, 66, 71, 82, 124, 127, 132, 147-8
 - Food and Agricultural Organization 153
 - General Assembly 3, 7, 69, 152
 - Intergovernmental Panel on Climate Change 50-1, 130-3, 140-1
 - Millennium Goals 146-7
 - Water Conference 68
 - World Food Conference 65
 - World Health Organization 152
- United States 14, 65, 70, 103, 107, 122, 124, 139, 143, 145, 148, 192, 193
 - Environmental Protection Agency 38
- Unpredictable 135
- Uruguay 150

- Van Doren, C. 116
- Vaz, S.G. 109
- Venezuela 150
- Verma, S. 135
- Voisey, H. 3, 16

- Walden, B.B. 109
- Walker, D.H. 173
- Warnings 11, 76
- Waste assimilation 1
- Wastewater 75, 183
- Water
 - Allocation 168
 - Conservation 201

- Culture 177
- Logging 72
- Management 4
- Policy 3, 12, 81-2, 105, 185, 209-10
- Pricing 184
- Quality 15, 81, 95, 104, 181, 183-5, 189, 198
- Use 32, 75, 177, 181, 194-5, 207
 - Drinking 73, 184-5, 193, 200, 206
 - Services 194
 - Recreation 127, 200
 - Rights 96, 183, 185
- Users 184, 208
- Shortage 145, 149, 151, 184
- Supply 69
- Watershed management 192-5, 210
- Webber, J. 175
- Welfare 34
- Wente, M. 47-8
- Western civilization 14
- Wilcox, P. 49
- Wolfe, P. 105, 111
- Wolfensohn, J. 24
- World Bank 5-6, 20, 24, 29, 54, 66, 70, 80, 124
- World Business Council for Sustainable Development 74, 102
- World Commission on Dams 95, 111
- World Commission on Environment and Development 5, 7, 18, 20, 87, 111, 157, 175
- World Trade Organization 97, 106, 120, 122-4, 144
- World Wildlife Fund 46-7
- Worldwatch Institute 95, 118
- Wynne, B. 109
- Yield 72
 - Safe 5
 - Sustainable 71
- Zambia 147
- Zimbabwe 147

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