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recursos naturales e infraestructura

ater management at the river basin level: challenges in Latin America

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Natural Resources and Infrastructure Division

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Abstract

Water management is akin to conflict management among human beings and between human beings and their environment. Water and river basin management systems are created to avoid, prevent or resolve such conflicts. Humankind needs to learn to live with these conflicts and deal with them adequately. All the more so since the relative scarcity of water will become ever more pressing as time goes on, as a result of economic growth, social demands and climate change. Competition between users will become ever more intense and ruthless, so that legislation and institutions to manage the system satisfactorily will become an absolute necessity. To implement processes of integrated water and river basin management it is necessary to form alliances or agreements with many actors who normally act independently by sector, and in areas defined according to administrative and political criteria which do not coincide with the limits of the river basins. It is often difficult to co-ordinate these actors in Latin American and Caribbean countries due to the existence of a vast informal sector of the population which neither complies with the legal norms nor responds to the economic instruments that are used in the countries more advanced in their organizations for water resources management and use.

River basin management and the creation and operation of organizations for water resources management at the river basin level is one of the central areas of work, both in terms of policy-oriented research and technical advisory activities, of the Natural Resources and Infrastructure Division. These technical advisory activities and policyoriented research have resulted in many studies on various aspects of river basin management and the creation and operation of river basin organizations (see Annex 1), but most of them are available only in Spanish. The objective of this publication is to make a summary of this research available in English.

I. River basin management as a way to sustainable development

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 co-ordinating 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.

A. Sustainable development and river basins

"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 explain 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" (Dourojeanni, 1996). 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 realisation 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. 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 to lay 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 organising 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 coordinated 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.

B. Characteristics of water and river basins

A river basin is an area which is defined by nature itself, essentially by the limits of the run-off areas of surface water converging towards a single watercourse. The river basin, its natural resources and its inhabitants have physical, biological, economic, social and cultural qualities which endow them with their own special characteristics.

Physically, a river basin represents a natural area of collection and concentration of surface and ground water and therefore has an essentially volumetric and hydrological connotation. At the same time, both the river basin and, above all, the water collected in it represent a source of life for mankind, though it can also be a source of danger when extreme natural phenomena take place or it is affected by pollution.

In mountainous areas, watersheds are natural arteries for communications and trade integration, either along the rivers that run through them or along the ridges that separate them. In other words, there are close-knit mechanisms of interaction among their inhabitants which endow them with special economic and social conditions. In river basins with a big flow of water and wide, relatively flat valleys, the line of the river also becomes an area of interrelation of the inhabitants, especially through the use of the river for navigation, transport and communications.

The territory of the river basins facilitates relations among those who live in them, even though they may be grouped together in different communes or other politico-administrative subdivisions, because of their common dependence on a shared water system and road network, and because they face common dangers. When there are no systems for reconciling the interests of the various actors who depend on a river basin, there are bound to be conflicts among them. All this is particularly true in inhabited mountain watersheds, but it is also true in broad river basins where there are water use projects that benefit the inhabitants as a whole and thus create a sense of interdependence among them.

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