

CITMA  
Ministry  
of Science  
Technology  
and Environment

## TALKING POINTS: CUBA – CASE STUDY

Item 6: Follow-up to the World Summit on Sustainable Development: water, sanitation and human settlements (integrated watershed management; management of coastal zones; cost of maintaining environmental conditions)

### **I. Background**

Environmental management in Cuba has been gradually institutionalized since the revolutionary victory in 1959. At beginning of the 1960s, the various organs of the central administration of the State which were responsible for natural resources were those which carried out the main activities. With the establishment of the National Commission for the Protection of the Environment (COMARNA) in 1976, which was attached to the Council of Ministers, a more rapid process of achieving those ends began. After the Rio Summit in 1992 and after the Cuban version of Agenda 21 had been developed, there was greater understanding of the need to make Cuba's environmental and integrated whole.

#### **I.1. Legal and institutional framework**

In 1994, the Ministry of Science, Technology and Environment (CITMA) was established, which is the environmental authority in Cuba and runs the national environment system; this made it possible to replace the previous structures and consolidate efforts with a greater degree of top-down structure and representativity at the national level, and also to achieve a greater degree of coherence in international environmental work. In 1997, the central Government approved the national environmental strategy and the National Assembly approved Law No. 81 "On the Environment", which replaced the earlier Law No. 33 of 1981. This gave a tremendous boost to the work of environmental circles in Cuba. In its articles 110 and 111, the new Law clearly defines the objectives of integrated watershed management by putting into words the establishment of a National Watershed Council (CNCH). Those articles read as follows:

*Article 110: Environmental management in watersheds shall be effect in conformity with the legislation in force and shall be based on integrated management which ensures that economic and social activities are carried out on the bases of adequate protection and the rational use of natural resources and the environment.*

*Article 111: It shall fall to the National Watershed Council, in coordination with the organs of the central administration of the State, to carry out such activities as enable the activities of all physical or legal persons which take place in a given watershed to be integrated and harmonized with the principles and objectives of the present Law.*

### **II. Establishment of the National Watershed Council (CNCH)**

Also in 1997, the Executive Committee of the Council of Ministers, in exercise of its powers, on 8 April adopted Accord 3139: To establish the National Watershed Council as the supreme coordinating body in matters of the regulation and management of watersheds in Cuba. That moment is considered to be the beginning of the national integrated management project for Cuba's watersheds.

The establishment of the National Watershed Council initiated a new style of working which made it possible to vary the concepts of integrated watershed management by defining watersheds as the "basic environmental management unit", in which all the natural components of the environment are integrated together with economic and social development on the basis of achieving sustainable development.

## **II.1 First stages**

### **II.1.1 Defining priorities**

The eight watersheds with the highest priority for the country were defined based on their economic, social and environmental complexity, the degree to which their natural resources were affected and their general characteristics. The eight watersheds are Cuyaguaje, Almendares-Vento, Ariguanabo, Zaza, Hanabanilla, Cauto, Guantánamo-Guaso and Toa, which cover about 15,000 km<sup>2</sup> in 11 provinces, are home to over 40 per cent of the population of Cuba and about 50 per cent of the country's fundamental economic activity.

#### **Watersheds of national interest**

**[Electronic copy of the graphic not provided]**

### **II.1.2 Provincial and specific councils**

To complete the organizational structure of the watershed bodies, 15 provincial councils were established, one for each province, including the special municipality of the Isla de la Juventud, as were six specific watershed councils (Cauto, Toa, Almendares-Vento, Ariguanabo, Zaza and Hanabanilla), whose principal function is to coordinate activities where watersheds straddle provincial boundaries. The provincial councils in turn selected watersheds of provincial interest, 49 in all, planning and periodically assessing the work carried out, in which prioritizing the investments to be made on the basis of the problems identified in the diagnoses is a task of the greatest importance.

### **II.1.3 Intersectoral cross-cutting**

The basic concept of the councils is that they should operate as an instrument of the level of government to which they correspond, to achieve collective coordination and integration of joint efforts to achieve integrated watershed management. The councils are bodies in which intersectoral cross-cutting predominates in their approach. They serve as examples of the degree to which the ministries of agriculture, sugar, education, forest rangers, economy and planning, armed forces and fisheries, together with the National Hydrological Institute and the Ministry of Science, Technology and Environment, have integrated their work. The Hydrological Institute and CITMA are Vice-Chair and Chair of the National Watershed Council; the Council does not take over the functional responsibilities of the various bodies and their dependant organs, rather, it enhances existing synergies and facilitates processes with a view to achieving the objective. It does make recommendations and agreements, within these conditions and premises.

### **II.1.4 Integral diagnoses and action plans**

The integrated diagnoses for each of the watersheds of national interest were developed using a specific methodology, together with their corresponding action plans, which are being applied with the coordination and participation of all the organs of the administration of the State at all levels, including the provincial and the local. The diagnoses reflected that the principal environmental problems in the watersheds are insufficient tree cover/deforestation, biological diversity, soil degradation and water pollution, amongst the most basic.

The diagnoses have enabled us to appreciate the scale of the principal problems which have been identified. Over 30,000 hectares have been reported as deforested; 498,291 hectares have been affected by serious erosion; 831,435 hectares are affected by inadequate drainage and 977,040 are affected by high salinity, amongst other problems. Some 26 per cent of (542) of the principal sources of pollution identified in the national inventory contribute about 90,000 tonnes per year of organic material expressed in terms of biochemical oxygen demand.

Each of these overall diagnoses had a corresponding plan of action, with a time span of three years, aimed at the solution or mitigation of the fundamental problems which have been identified

Consequently, and periodically, the National Watershed Council and the provincial and specific watershed councils analyse the evolution of the existing environmental problems, and the trends in them, taking into account the available financial, technological and human resources. The National Watershed Council carries out in situ monitoring in the eight watersheds of national interest and assesses whether the agreements are being complied with.

## II.2 New lines and prospects arising from the development of operations

### II.2.1 Programmes of work

Considering the data, information and assessments from the diagnoses and plans of action for the watersheds of national interest, in relation to the problems which have been identified, the National Watershed Council had a much more complete picture of the scale of the problems, their causes and the monetary amounts needed to mitigate them.

Thus, starting in 1999 and 2000 work began on elaborating and implementing programmes of work of major significance for consolidating national environmental management and, specifically, for the integrated management of Cuba's watersheds. The following programmes have been approved and are in the implementation phase.

#### Programmes currently being implemented by the National Watershed Council

No.	Name of programme
1	Investment programme for environmental protection in the watersheds
2	Water resources programme (water, sanitation and civil engineering)
3	Soil conservation and improvement programme
4	Reafforestation programme (including water regulating strips)
5	Programme to combat forest fires, fire management
6	Cooperative watch (protection of natural resources)
7	Programme to combat pollution (reduction of the pollutant load)
8	Biological diversity studies and sustainable use programmed
9	Environmental education and civic participation programme

The results achieved in implementing the above programmes, even if they have not yet resolved all the existing problems so far, have, though, been an important step forward in mitigating those problems and have at the same time created bases and opportunities for resolving them definitively.

Here are some examples for the eight watersheds of national interest:

- In the period 2001-2003, over 70 million pesos were invested in the eight watersheds for environmental protection.
- Between 1999 and 2003, 7.5 million pesos were invested in the civil engineering operations and networks in those areas, including 31 dams, 5 by-pass channels, 3 canals and 33 small dams.
- In 2003, the population with a water supply at home reached 75.4 per cent. The 51 per cent increase in drinking water coverage between 1999 and 2002 affected the rural population and environmental sanitation coverage reached 94.2 per cent.
- Between 1999 and 2003, permanent measures were applied to improve and conserve soils over 885,400 hectares, 1,706,600 hectares were covered with temporary measures, anti-erosion measures were applied over 52,300 hectares and 17,700,000 tonnes of organic fertilizer were applied.
- A total of 862,900 hectares benefited from the joint application of 75 per cent of the conservation and soil improvement measures.
- Between 2002 and 2003 1,916 hectares benefited from the application of compost. Minimal tilling was used over 24,111 hectares.
- In 2003 alone, 6,715 hectares were planted, together with 894,400 hectares in the water regulations strips. For 2005, the fringes of the water bodies in the eight watersheds of national interest are to be reafforested.
- A total of 807 forest farms have been established with the aims of protection and conservation.
- Between 1999 and 2003, there has been a sustained reduction in the biodegradable pollution load in the watersheds of national interest; this has varied year on year between 6 and 10 per cent or so, representing a reduction of thousands of tonnes per year of organic material expressed as biological oxygen demand.
- In 2003, wastewater from 12 sugar refining plants was used for irrigation and fertilization of 6,607 hectares under sugar cane.
- Eight environmental education programmes are at the development stage.
- Studies on biological diversity are being carried out and consolidated.

## **II.2.2 Inclusion of coastal zone management**

Taking into account the orographic and hydrological characteristics of the Cuban archipelago and the factors conditioning environmental management, since 2001 there has been a gradual process occurring of a new and successful experience, which has been consolidating itself, and was born out of the needs arising out of integrating environmental work at the local level.

This consists in using the provincial watershed councils, principally in the Sabana-Camagüey archipelago, which is in the north-central area of the island of Cuba, provinces of Matanzas, Villa Clara, Sancti Spiritus, Camagüey and Ciego de Avila, together with the specific councils (Cauto, Toa), to evaluate, in an integrated manner, the environmental management of the coastal zone, in its dynamic linkage with the terrestrial zone of the watersheds.

The analyses and assessments of the coastal zone environmental management within the watershed councils are conducted from a holistic management perspective. In this way, successful and practical conditions are created to specify, among other things, phenomena such as soil degradation in the upstream areas of the watershed, which negatively impact water quality in the coastal zones or, with those same problems of erosion, cause potential dangers and risks of flooding for the people living downstream.

## **II.2.3 Cost of maintaining environmental conditions**

Recognizing that although this concept is very much linked to the pre-eminently hydrological estimates involved in using it, and identifying dams and other hydrological works as a sanitation cost, the National Watershed Council, from its first stage, has promoted and, with the national authority for water on land and for Cuba's development in terms of water, has succeeded in ensuring that the existing dams and other civil engineering works in this regard use a certain volume of their water reserve with a view to maintaining downstream environmental condition.

This entails carrying out specific assessments for each civil engineering project in relation to the environment after the blockage, the uses therein and the values of the biological diversity, among other things.

In the eight watersheds of national interest there are 31 dams, 5 by-pass channels, 3 canals and 33 small dams. The reservoirs have a capacity of 3,201,900,000 cubic metres and represent about 40 per cent of the country's total; they are administered by the national authority for water on land.

The costs were determined for maintaining environmental conditions downstream from the dams on a case-by-case basis. Cuyaguajeje (Cuyaguajeje watershed) had 1.4 cubic metres per second, Zaza (Zaza watershed) had 2.4 and Cauto El Paso (Cauto watershed) had 1.44, to give a few examples.

## **III. Added value from establishing the watershed councils**

From 1997 to date, the National Watershed Council has been providing annual accounts of its operations to the Executive Committee of the Council of Ministers, so that the progress of its work has been assessed by the central Government. At the same time, the principal areas of action for the year are approved. The same process also occurs in the provincial and specific watershed councils, on a yearly basis. As a result of these activities, some key components of the contribution of this way of working to realizing the national environmental policy can be identified:

- Ecosystem focus of environmental management, over and above national, provincial and municipal political/administrative boundaries.
- An integral approach.
- Systematic, harmonized and coherent.
- Inter- and intra-institutional coordination.
- Territoriality.
- Decentralization.
- Participation.

Also, some new situations have come to the fore, situations which are demanding a dynamic and appropriate response. These include:

- The need to transform organizational systems and forms for acquiring data and information, give that the whole country operates on the basis of political/administrative divisions (provinces, municipalities, People's Councils).

- The gradual elimination of resistance to attitudinal change by increasing educational, capacity-building and training work, together with complementary measures, both operational and legal.
- The need to enhance the planning and integrated regulation of economic and social development, and environmental protection, based on sustainable development, at the level of watersheds, by adapting the corresponding mechanisms.
- Improved identification on the territorial scale (watershed) of the impact of scientific research and technological innovation.
- The inclusion and adaptation, faster and more extensively, of the particular features of the territory and local environmental problems into general, technical, university and postgraduate education plans and programmes.

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