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## **COMPLIANCE AND ENFORCEMENT PROGRAMS ON RESIDUAL WATERS, CASE STUDY: COSTA RICA'S GRANDE DE TARCOLES RIVER**

ENG. GONZALEZ SALAZAR, MARCO ANTONIO

Vice-Minister of the Environment and Energy, Ministerio Recursos Naturales, Energia Y Minas, Calle 25 Avenidas 8 y 10, Entre 11 y 13 Calle Poniente, San Jose, Costa Rica

### **SUMMARY**

Costa Ricans are entering an era of great change. The present government is determined to transform this country into a pilot project for sustainable development.

What we are looking for is a social transformation that involves interactive mechanisms of education for citizen awareness, and real participation of society in decision-making; it strengthens basic necessities and improves the quality of life of present and future generations, but without destroying ecological bases or altering the vital life supports on which environmental quality and overall development depend.

We have to reexamine policies, identify programs, link up with governments and with the civil society in order to bring us all into a collective effort. Costa Rica's principal competitive advantage lies in the quality of its people, and in their capacity for innovation and creativity.

The following is a sample of an updated vision of the actions of the Costa Rican Government and the participation of the civil society in the control and management of agro-industrial wastes and wastewaters in the country, through an analysis of the legal and administrative situation of the entities involved in the protection of water resources, and the compliance and enforcement programs relating to this matter.

Because of its condition, the Grande de Tárcoles Watershed was selected as a pilot-watershed to develop interinstitutional actions and to promote the participation of the civil society in order to rescue this important water resource.

## **1 INTRODUCTION**

### **1.1 Costa Rica: geographical, social and environmental situation [See Annex 1]**

Costa Rica lies in Central America, 10,429 miles (16,784 kilometers) from Chiang Mai, Thailand. It is bordered to the north by Nicaragua, to the northeast by the Caribbean Sea, to the southeast by Panama, and to the west and southwest by the Pacific Ocean. It lies completely within the tropics.

The average temperature is 72 degrees Fahrenheit in the highlands and temperature vary from the high 70s to the low 90s in the lowlands. We have dry season from December to April, and wet season from May to November.

Costa Rica, a Spanish speaking country, has 3.5 million inhabitants, with a literacy rate of 93% and a life expectancy of 75 years for men and 79 for women. Our major exports are coffee, bananas, tourism, sugar and beef.

Geographically, Costa Rica is an extremely varied country despite its tiny size (51,100 square kilometers). A series of volcanic mountain chains runs from the Nicaraguan border in the northwest to the Panamanian border in the south east, thus splitting the country in two.

Many different microclimates and ecological habitats are found corresponding with altitudinal changes up the mountains.

We have a strong commitment towards preservation of nature. Our wilderness areas provide shelter for almost:

- 1200 varieties of plants.
- 237 species of mammals.
- 848 kinds of birds.
- 361 amphibians and reptiles.

The current use of land is as follows: some 70% of the country is a mosaic of agricultural, forestry and livestock use; 25% is wildlife conserved for nondestructive use of their biodiversity and ecosystem services, and the remaining 5% is for urban life and the community network. [See Annex 2]

## 1.2 Costa Rican water resources: technical diagnosis

The situation concerning treatment of wastewater and river contamination is of great charm. Less than 10% of wastes go into sanitary conduits and most of the cities of the Central Valley decreased the number of the treatment plants that existed in the past.

Agro-industrial wastes, which represent nearly four million metric tons per year, constitute another important focus of contamination for waterways. The Grande de Tárcoles watershed, which has a high energy potential and is also one of the most beautiful, has been reduced to the level of a gutter for the wastes produced by almost half of the Central Valley.

Costa Rica has 34 major rivers, which have not been already deeply studied in relation to their quality, except the Grande de Tárcoles River, that is 2.149 kilometers long and drains a large area of the Central Region of the country.

The most potential sources of pollution in the urban zone (Greater Metropolitan Area) are:

- Solid and liquid wastes from coffee industry as first pollutants of the rivers of the country, providing some 191.500 kilograms of biochemical oxygen demand daily.
- Food, paper, cardboard, textile, tannery, jewelry industry wastes and others, providing approximately 40.485 kilograms of biochemical oxygen demand daily.
- Domestic fecal wastes, providing about 40.485 kilograms of biochemical oxygen demand daily.

These estimations were made during the dry season. No estimations were made for heavy metals, chemicals, and small industry.

90% of the total amount of industries of the country do not have stations for wastewater treatment.

Among the main sources of pollution in the rural zone we find: agro-chemicals, pesticides, herbicides, insecticides and coffee industry waste.

Coffee industry constitutes the main pollutant of the country. It represents 70% of the global river pollution of the national territory. Such industry is seasonal (from November to February), that is, during the dry months, when there is not much volume of water and there is minimal oxidation capacity.

Sixty-one percent of the coffee industry is located in the Central Region of the country, that is also drained by the Grande de Tárcoles River. Most of the population is concentrated in the Central Region of the country (Greater Metropolitan Area), where also the main social and economic activities take place. This situation has caused great damage to the aforementioned river.

The main responsibilities for the pollution of the Grande de Tárcoles River are:

- Coffee industry (68%).
- Other industrial activities (18%).
- Domestic waters (14%). [See Annex 3]

In addition, it has been estimated that the Grande de Tárcoles River collects 33 tons of wastes daily, including hospital, industry and domestic wastes.

It has been determined that industry together with solid wastes, have polluted 40% of the rivers of the country, agro-chemicals, 40% and fecal wastes, 20%.

Even without a constant monitoring program of the aquatic ecosystem parameters, different studies have determined non-quantitative levels of pollution.

- Low polluted rivers — 35%.
- Medium polluted rivers — 25%.
- High polluted rivers — 20%.

The most damaged and contaminated rivers of the country are:

- Grande de Tárcoles River — 67%.
- Reventazón River — 10.8%.
- Grande de Térraba River — 7.7%.

## **2 LEGAL AND ADMINISTRATIVE BACKGROUND: CENTRALIZED MODEL**

The year 1948 became the starting point of new political, economical and social transformations in our country. The well-being of Costa Ricans increased during the four decades which followed and was extended to more and more extensive sectors of society.

The State assured and propitiated advances in education, social and individual rights, health, road services and hydroelectric development. The abolishment of the army and the perfected electoral system has given Costa Rica a completely new social and democratic character over a time period of scarcely five decades. In the next years, the socio-economic improvements in all sectors was not detained. It continued to make our country more recognized, at the close of the 80s, as one of the most advanced countries in terms of human development.

Nevertheless, the general conditions that have altered the world in the recent years, as well as the combination of internal, political and economic factors, have produced troubling signs indicating that the quality of life for Costa Ricans has begun to deteriorate in a way that runs contrary to the development model presented in 1948.

Not only the well-being of the poorest sectors of our society begun to decrease, but even the more sheltered sectors of our society are encountering difficulties in enjoying their advantages.

The development models which have been imposed upon us, and that some internal sectors have chosen to accept without forethought, are reproducing deteriorating circumstances in Costa Rica which are visible in other regions of the world.

In the 1950's and the 1960's, under a centralized model, we experienced an extraordinary economic and social development, however this development mined our natural resources and damaged the environment. In the 1980's and 1990's, we suffered the costs of economic disequilibrium which was followed by a period of economic development without a social dimension.

The application of the laws relating to the contamination of waters (since 1942), propitiated a model of centralized management that restricted the participation of the civil society, and also lacked environmental compliance and enforcement programs. As a consequence, the legal framework was not being implemented in an efficient way; we reached high pollution levels in rivers; there was not knowledge of how to use the water resources, and the pollution problems of surface- and underground waters were worsening.

For these reasons the present administration proposes to change course in order to turn tides of economic growth which proceed together with the highest possible level of environmental sustainability.

Our current interest in environmental compliance and enforcement programs shows the determination to ensure that environmental requirements take us to real improvements. We understand under the concept of environmental enforcement the range of actions governments and others may take to encourage and compel compliance with environmental requirements. This is our new guideline in order to achieve environmental objectives.

## 2.1 Traditional legislation relating to water pollution

During the last fifty years there have been many efforts to implement the legislation of water pollution efficiently, such as the Water Act, N°276 (August 27, 1942), General Potable Water Act, N° 1634 (September 18, 1953), Aqueducts and Sewerages Law, N° 2726 (April 14, 1961), General Health Law, N°1634 (October 30, 1973), Organic Law of the Ministry of Health, N° 5412 (November 8, 1973), Industrial Sanitation Regulation, N° 11492 (April 22, 1980), the Forestal Law, N° 7174 (June 28, 1990), and the Municipal Code.

We consider it is important to highlight certain aspects of some of the laws mentioned above that are relevant to our present study.

The Water Act mentions in its Chapter X, article 162-1 punishments from one to twelve months of imprisonment for those who contaminate surface and underground waters.

The General Health Law and its amendments establish controls over the effects and negative impacts on watersheds, as a result of the industrial, agricultural and human activities relating to wastewaters and other wastes.

This Law in its articles 275, 276 and 277 prohibits the pollution of surface, underground and sea waters; the contamination and damage of watersheds; and also, established the licenses required for draining or altering areas.

The General Health Law, the Organic Law of the Ministry of Health and the Industrial Sanitation Regulation establish the entities that are responsible for compliance and enforcement of environmental programs and authorizes the Ministry of Health to supervise the quality of water.

Among other faculties, the Municipalities must promote environmental education and reforestation programs and also must protect the watersheds in order to supply potable water to the communities, among others.

Although there were many attempts to regulate water resources, there were no monitoring and control systems to supervise the maximal permissible concentrations in solid and liquid wastes in receptor waters and rivers, and that caused great damage to the environment. The lack of environmental compliance and enforcement programs was also an obstacle to implement the legislation efficiently.

## 2.2 Costa Rica's traditional water resources administration

The traditional institutional structure for the management and use of water shows a Rector Ministry, a Management Entity and Private and Public User Entities. [See Annex 4]

The Rector Ministry is the Ministry of Environment and Energy. The entity in charge of the management of the water resources is the National Electricity Service, that regulates and authorizes the potable water services rate.

The users are public entities that need the resource to provide a service, and also physical and juridical persons that use the resource for their own interests.

The Ministry of Health is responsible for monitoring the water quality in general, the priority here is for provision of safe water for the public to utilize, and through its Department for Environmental Sanitation, ensures potable water supply, the observance of the public health regulations and the prevention of damage to the environment.

The Costa Rican Aqueduct and Sewage Institute is an autonomous institution created in 1966 to manage, to fix policies, to implement rules, and to promote the planning, financing and development of projects relating to drinking water, sewerage, etc.

In the past years, the Municipal Governments, 82 councils in the whole country, were supposed to control all aspects relating to the rivers and health. As an example, the Municipal Corporation of the Central Canton of San José established in August, 1991, a twenty four-month term for those industries that discharged non-treated wastes in rivers, streams, or sanitary sewers for the installation of treatment plants in production centers otherwise risking cancellation of their operational licenses.

This traditional structure lacked mechanisms to the coordinate activities and for this reason efforts were often duplicated and no one was responsible of following up on the legal actions.

## 2.3 Legal and administrative problems of Costa Rica's water resources

Some legal problems have arisen and weakened the administrative sector relating to our water resources. The Water Act is in force since 1942, which lets us assume that it needs to be brought up-to-date. Basically, this Legislation was billed to regulate the use of waters by private persons. There is no entity that grants water to public institutions. This Legislation lacks new concepts for planning, use and recovery of water resources. There are no monitoring and control systems to determine whether procedures are being respected or not. We can say it is obsolete and incomplete.

There is a great need of agile and effective mechanisms for the solution of water use conflicts. Other laws have been passed which have limited the functions of the National Electricity Service and have granted its competencies to other institutions, which results in duplicity of action.

In the past years the necessity of more production intensified the irrigation culture, which amplified the necessity of water for this activity. The population, together with industry increased and that implied more water supply and more pollution, respectively.

The volume of pollutants increased and there were no treatment systems. The rivers became urban trash deposits and the levels of deforestation were too high. There are no statistical reports of denouncements and punishments relating to water pollution.

There was a lack of governmental interest and of an integrating vision of water management. The National Electricity Service lacked political, economical and technical support to develop its functions and to regulate the big and powerful user institutions.

The Ministry of Health, which performs water quality management functions, did not have the mechanisms to assure compliance with, and enforcement of environmental legislation for the prevention of water pollution.

To conclude, we have to emphasize that three main reasons obstructed the efficient water resources management in the last years:

- Our water resources were not a priority for the last Governments.
- There was a lack of coordination between the institutions relating to water pollution.
- The water legislation was obsolete.

There comes the time to recuperate what we have lost, without stepping back to the past, with a new vision of things, that involves decentralizing the decision-making process through the participation of the civil society.

We have to minimize overlaps and conflicts of functions to make efficient use of existing capacities and local knowledge and to emphasize sustainability.

### **3 SUSTAINABLE DEVELOPMENT MODEL**

Sustainable Development is the yardstick guiding the actions of the Figueres Administration, 1994-98. This is a national objective aimed at improving the quality of life of Costa Rican citizens through the management of production, economy and commercial activity in such a way as to ensure that they are in harmony with natural resources and the environment. [See Annex 5]

The concept of Sustainable Development means "to find a better well-being in the present while sustaining the initial equilibrium that has made our development possible in the long term, combining a strong social investment with macroeconomic equilibrium and an alliance with nature," after our President's words.

The complex social-environmental situation and the existence of an obsolete legal framework propitiated the generation of a new policy related to wastewaters and pollution of the watersheds that includes the new guidelines with the effective collaboration of the civil society, that is:

- The search for a consensus between all parts involved.
- The establishment of voluntary plans.
- An acknowledgment and incentive plan.
- An authorization system.
- The alliance and coordination among governmental entities relating to environmental control.
- An active participation of the civil society in the prevention and solution to pollution of waters.
- Permanent dialogue with the companies or enterprises.

- A Public Service Office with an efficient, quick and non-bureaucratic procedure for attention to the public.

### 3.1 Institutional and legal framework

According to the sustainable development model, new legislation was billed, which makes a great difference between the old patterns and the current ones, and activates the efforts in search of a better use of our water resources through an efficient institutional coordination and the creation of new entities: the Wildlife Preservation Law, N° 7317 (December 7, 1994), the Competence Promotion and Consumer Defense Law, N° 7472, the Environmental Organic Law, N° 7554 (November 13, 1995), and the new Forestal Law, Expedient N° 11.003, recently approved by the National Assembly.

The Wildlife Preservation Law establishes regulations to protect the wildlife of the country. Its article N°132 prohibits the discharge of wastes or any polluting substance in streams, rivers, etc. This article also confirms that every industry must have treatment systems in order to avoid the destruction of the wildlife. With the implementation of this article, since December 1994, this specific law gains importance by regulating and controlling wastewaters.

On the other hand, the Competence Promotion and Consumer Defense Law establishes the National Quality System, that allows the participation of the civil society through a network of "Authorized Laboratories," and is based upon international regulations to test that industrial activities do not contaminate the environment.

Article N° 8 of this Law establishes the faculty of the Ministry of Economy, Industry and Commerce, and the National Technical Environmental Secretary to authorize those entities that accomplish all technical and regulatory requirements in order to control the results of the laboratory studies and pollutant analysis.

The Ente Nacional de Acreditación is the national entity in charge of the authorization of laboratories, and is also a dependency of the National Commission of Quality. At the same time, the National Office of Standard and Measurement Units, which belongs to the Ministry of Economy, Industry and Commerce, functions as a Technical Secretary for these authorizations.

There are many criteria established by the series EN-4500, that are taken into account when authorizing a laboratory, among others, the technical and professional level of the personnel, the characteristics of the installations, the existing equipment, observation of the good laboratory practices, the quality management policy, the protocols of analysis and standardized operation procedures, the preservation and maintenance of infrastructure, the maintenance of reference patterns and storage of reagents and materials, the validation of methods, and the use of statistical techniques for the validation and control of the methods and procedure analysis.

The Executive Decree N° 24158 - Ministerio Recursos Naturales, Energia Y Minas-S, of April 21, 1995, fixes the residual water disposal norms to the bodies of surface- and groundwaters.

The Executive Decree N° 24662 - Ministry of Economy, Industry, and Commerce, of October 2, 1995, through the ISO-25 Guide and the EN-45000 Series, establishes the criteria for the authorization of national laboratories, being also approved by the National Technical Environmental Secretary. These criteria are:

- EN-45001: establishes general criteria about the functioning of the authorized laboratories.
- EN-45002: establishes the general criteria for the evaluation of the authorized laboratories.

- EN-45003: establishes the general criteria according to the functioning of the authorizing organisms.

The approval of the Law N° 7554, Environmental Organic Law, of November 13, 1995, in its Chapter XV, Articles 59-70, establishes a series of regulations relating to pollution through wastewaters over the national territory, and the obligation to treat wastewaters before disposing them into any watershed.

We have to emphasize again the importance of these new regulations in the establishment of compliance and enforcement programs on wastewaters with the direct participation of the civil society.

### 3.2 Current compliance and enforcement programs on wastewater's and results

Effective domestic environmental compliance and enforcement programs are an important factor in global efforts to reduce international trade barriers and enhance economic development in a way that does not create unfair competition, or pressure to diminish environmental quality of valuable natural resources. [See Annex 6]

Effective enforcement also can provide an element of fairness to the regulatory process, instill credibility to government institutions, and prevent short term economic competition among regions and between facilities from undermining longer-term economic, social and environmental goals for a sustainable future.

As a result of this new vision, the Ministry of Environment and Energy together with the Ministry of Health have joined efforts to implement all aspects relating to enforcement and compliance of environmental actions, as an instance of political will and interinstitutional coordination.

The Government of Costa Rica in its search for sustainability through compliance and enforcement programs on wastewaters has implemented the Authorization System, the Voluntary Plans, Acknowledgments and Incentives, and the Environmental Organic Law.

#### 3.2.1 Authorization system

The authorization system gives the civil society the opportunity to have a direct control of the water resources through the use of the laboratories, where people can identify and pursue violators by testing the quality of water.

Based upon the Executive Decree N° 24158 - Ministerio Recursos Naturales, Energia Y Minas-S and Executive Decree N° 24662 - Ministry of Economy, Industry, and Commerce, the authorization of laboratories was established to offer the services of analysis of wastewaters. These laboratories must be supported by a National Authorization Entity, constituted by experienced professionals, and approved by the Ministry of Environment and Energy and the National Technical Environmental Secretary. In this way, the uniformity of the analysis methodologies will assure the confidence of the results.

The Civil Society will become the main actor in all this process and will support it in a permanent way by:

- Temporarily authorized laboratories to be put to the test.
- If the laboratory does not accomplish the requisites, it can be unauthorized immediately.
- As of January 1996 there are three new authorized laboratories to start functioning. There is already a list of companies which will soon begin the process.

Through the execution of “interlaboratorial studies,” that consist in interchanging control samples and comparing analytical results, the reliability of the laboratories and the quality of the results can be assured.

By means of the process of “certifications” through the authorized laboratories and other modalities, not only for goods, but also for services, the Government delegates in the private sector the vigilance for environmental quality, and makes use of the capacity installed and of the existing human resources, permitting the professionalization of the new system in stages of investigation.

### 3.2.2 Voluntary plans

Based upon the legal framework, a tripartite agreement was signed between the Ministry of Environment and Energy, the Municipality of San José and the Chamber of Industry as an alternative to generate “Voluntary Plan Projects,” public and transparent, with the compromise of the companies to avoid the use of pollutants, and with the faculty of the civil society to denunciate any irregularity.

This project was thought to solve the pollution problems generated by wastewaters. So far we have:

- One hundred of voluntary plans introduced by industrial or Agro-industrial enterprises.
- The signing of three Agreements of Interinstitutional Cooperation with the productive sectors of the country: coffee, sugar cane and pig farming. These sectors gather some of the most important productive enterprises of the country. [See Annex 7]
  - As a result of these actions, during 1995, 96% of the coffee mills reduced their waste use through the implementation of recirculation mechanisms in every stage of the process, such as the filtering process.
  - Sedimentation tanks, dry extraction of pulp, and non-hydraulic pulp transportation were also installed in 92 of the 129 coffee mills existing in the country.
- An adequate on-site visit plan for each company involved in order to convince the people to protect the environment.
- An “Action Plan” is being elaborated to evaluate on the short and medium terms the firms involved in these voluntary plans for wastewater treatment.

### 3.2.3 Acknowledgments and incentives

As part of the actions of the Chamber of Industry, the Municipality of San José and the Ministry of Environment and Energy, the “Ecological Flag Project” was created in September 1994, through the ratification of the Coordinating Commission of three communities, including the one drained by the Grande de Tárcoles River, Playa Guacalillo.

The “Ecological Flag Project” consists in a distinction that is awarded to those industries, communities and institutions that help protecting the environment and cleaning up the rivers. During 1995 there were 13 ecological flags awarded to industries, and 10 schools were acknowledged because of their support to the protection of watersheds.

This project is divided into three parts — cleaning of rivers, reforestation, and maintenance. The first step incorporates the different communities through their organizations in order to clean up the banks of rivers. The second phase is reforestation based upon a plan elaborated by technicians of the Ministry of Environment and Energy. The third step consists in the application of measures established by the citizens to keep rivers clean and trees protected.

To obtain an “Ecological Flag” the industry, the community or the institution must accomplish the three steps mentioned above. The flag is granted by the respective Coordinating Commission and the Ministry of Environment and Energy.

### 3.2.4 Environmental Organic Law, N° 7554

With the publication of the Law N° 7554, the name of the Ministry of Natural Resources, Energy and Mines (Ministerio Recursos Naturales, Energia Y Minas) changes to that of Ministry of Environment and Energy, increasing its action area on environmental matters. That represents a new challenge in relation to waste management and a change of perspectives with the help of environmental education and the participation of the community in a sustainable development. That is the reason why many agreements have been signed, for instance, with the Spanish Cooperation Agency, the Institute of Municipal Development and Consulting, and the Ministry of Health for the construction of solid waste management systems with 40 municipalities of the country and the construction of sanitary conduits.

## **4 INTEGRAL MANAGEMENT OF THE NATURAL RESOURCES OF THE GRANDE DE TÁRCOLES RIVER PROJECT: A CIVIL SOCIETY INITIATIVE**

### 4.1 Background

In August 1992, the first “Seminary of the Grande de Tárcoles River” took place as an incentive of the municipalities and as an example of the interest of the Costa Rican society to implement actions to benefit the environmental quality of the resources of this watershed. Local Governments, private and public institutions, and nongovernmental organizations took part in the event. [See Annex 8]

As a result of this Seminary, the “The Grande de Tárcoles River Commission” was created, with the participation of Ministries, Local Governments, Autonomous Institutions, NGO’s and Private Enterprises. This Commission will support the Ministry of Environment and Energy by controlling and recuperating the environmental quality of this important watershed.

The Inter-American Development Bank approved a project for the Integral Management of the Natural Resources of the Grande de Tárcoles River presented by this Commission in May, 1993.

### 4.2 General objectives

The general objectives of the “Integral Management of the Natural Resources of the Grande de Tárcoles River Project” are:

- To reach an integral development through the sustainable use of resources and land use planning program based upon a successive approximation system that propitiates an increase in the agricultural, cattle and Forestal productivity.
- To improve the quality of life and the environmental conditions including the rural and urban communities in these initiatives.

### 4.3 Duration of the project

The project will last twelve years divided into three consecutive periods of four years each. During the first phase a strategy of land use planning of the watershed must be elaborated, the potable water supply to rural areas must be guaranteed, and there must be an adequate use of soil and training of local organizations, among others. The project starts in April 1996.

### 4.4 Beneficiaries

In general, the Costa Rican community will benefit through a better environmental quality, public health, recuperation of the water resource with the help of the sub-programs of the project, that include land use planning, natural resources, monitoring and control of pollution, and monitoring and control of potable water.

"The Grande de Tárcoles River Commission," the Ministry of Environment and Energy, and the Chamber of Industry granted "Ecological Flags" in February 1995 to all the new enterprises that joined this pilot project, as an incentive to promote the participation of more sectors of the society to contribute to the preservation of our natural resources. Also were awarded with an "Ecological Flag" those companies that since 1993 have been distinguished with the "Environmental Conservation Prize" granted by the Ministry of Environment and Energy, the Municipality of San José, and the Chamber of Industry because of their new productive process that reduce or eliminate the discharge of pollutants in the environment. These are only few examples of what we have done in order to be in harmony with nature.

## 5 CONCLUSIONS

Based upon the results obtained, the sustainable development model, that propitiates a high level of participation of the civil society, has allowed the introduction of viable actions and practices to give short term solutions to the problem of wastewaters of the country. Such a model could be emulated by other countries that suffer similar limitations.

Costa Ricans are taking up their share of the responsibility for long term preservation of our watersheds. This is the case of the Grande de Tárcoles River, which we have analyzed above and that shows that through the real participation of the civil society many valuable experiences can be reached in our journey to sustainability. The Authorization System, the Voluntary Plans, the Acknowledgments and Incentives, and the Environmental Organic Law are only a sample of the new mechanisms our present Government is implementing, whose results have been also very positive in a short term.

As we have seen there are various roles the citizens may play in environmental enforcement and achievement of compliance, that is, their role as an economic and social force for compliance, their role in identifying violations, and their role in pursuing enforcement actions or forcing governments to pursue violators.

In analyzing the causes of environmental destruction, it is evident that we, human beings, need to make fundamental change in how we view the world. We need to see ourselves as part of the natural world, and we need to radically change our relationship to it. We need to be aware of the fact that we are not owners, but in a certain manner, custodians of nature and all the living things that populate the planet. We need to recognize that we have acquired an enormous responsibility for ourselves and for the future generations, as well as for the other beings that inhabit the planet. This is a genesis of a new Costa Rican citizen for this new stage of development in alliance with nature.

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  - El Instituto del Café de Costa Rica.
  - Ministerio de Recursos Naturales, Energía y Minas.
  - Ministerio de Salud.
  - Liga Agrícola e Industrial de la Caña.
  - Cámara de Porcicultores.
  - Comité Coordinador Regional de Instituciones de Agua Potable y Saneamiento de Centroamérica, Panamá y República Dominicana.

# COSTA RICA

Population  
3.5 million

Area (sq km)  
51,100

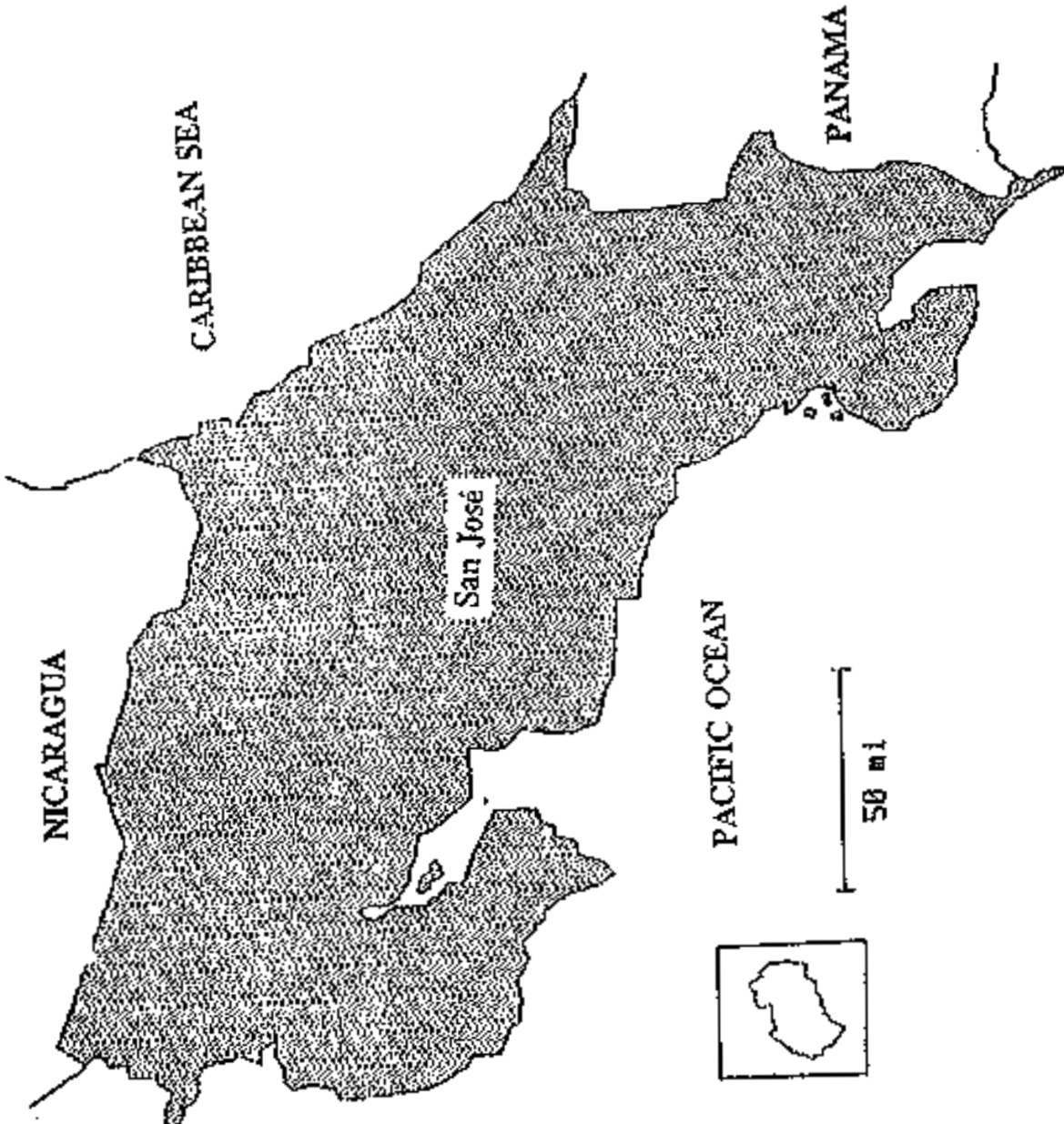
Language  
Spanish

Literacy Rate  
95%

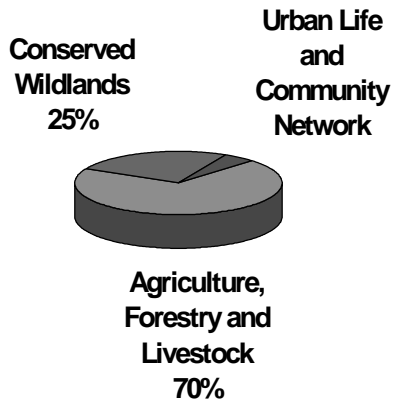
Life Expectancy  
men 75 yrs  
women 79 yrs

Average Temperature  
70°-90° F

Government  
Executive Branch  
Legislative Branch  
Judicial Branch  
Electoral Tribune

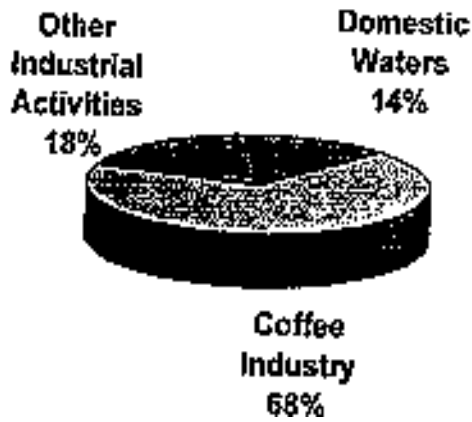


# COSTA RICA: CURRENT LAND USE



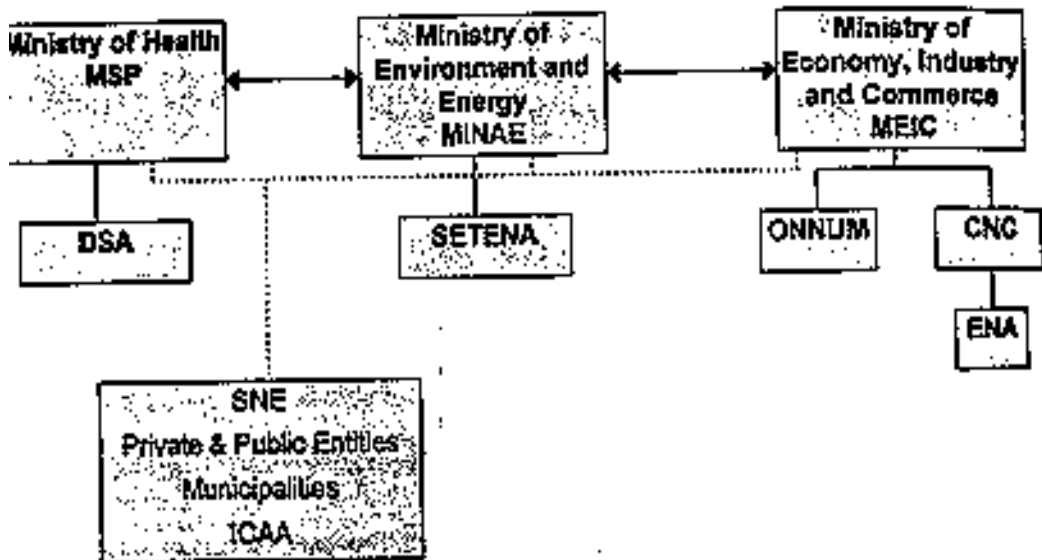
## ANNEX 3

# MAIN RESPONSIBLE FOR THE POLLUTION OF THE GRANDE DE TARCOLES WATERSHED



## ANNEX 4

## ADMINISTRATIVE FRAMEWORK



**DSA:** Department for Environment Sanitation  
**SETENA:** National Technical Environmental Secretary  
**SNE:** National Electricity Service  
**ONNUM:** National Office of Standard and Measurement Units  
**CNC:** National Commission of Quality  
**ENA:** National Equity for Authorization  
**ICAA:** Costa Rica Aqueduct and Sewerage Institute

ANNEX 5

***COSTA RICA - A PILOT PROJECT FOR SUSTAINABLE  
DEVELOPMENT***

What do we understand under the concept of sustainable development?

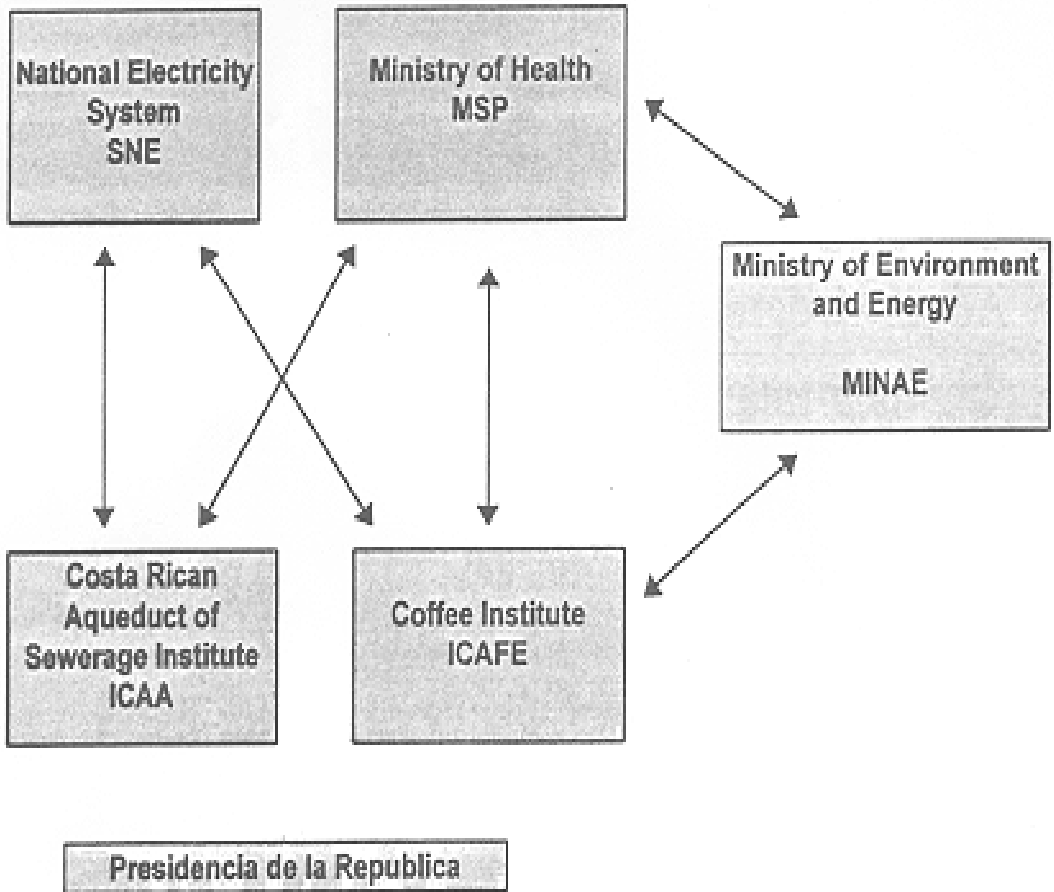
*“To find a better well-being in the present while sustaining the initial equilibrium that has made our development possible in the long-term, combining a strong social investment with macroeconomic equilibrium and an alliance with nature,” as our President, Eng. José María Figueres said, at the First International Forum “From Forest to Society” held at San José, Costa Rica, on May 9, 1994.*

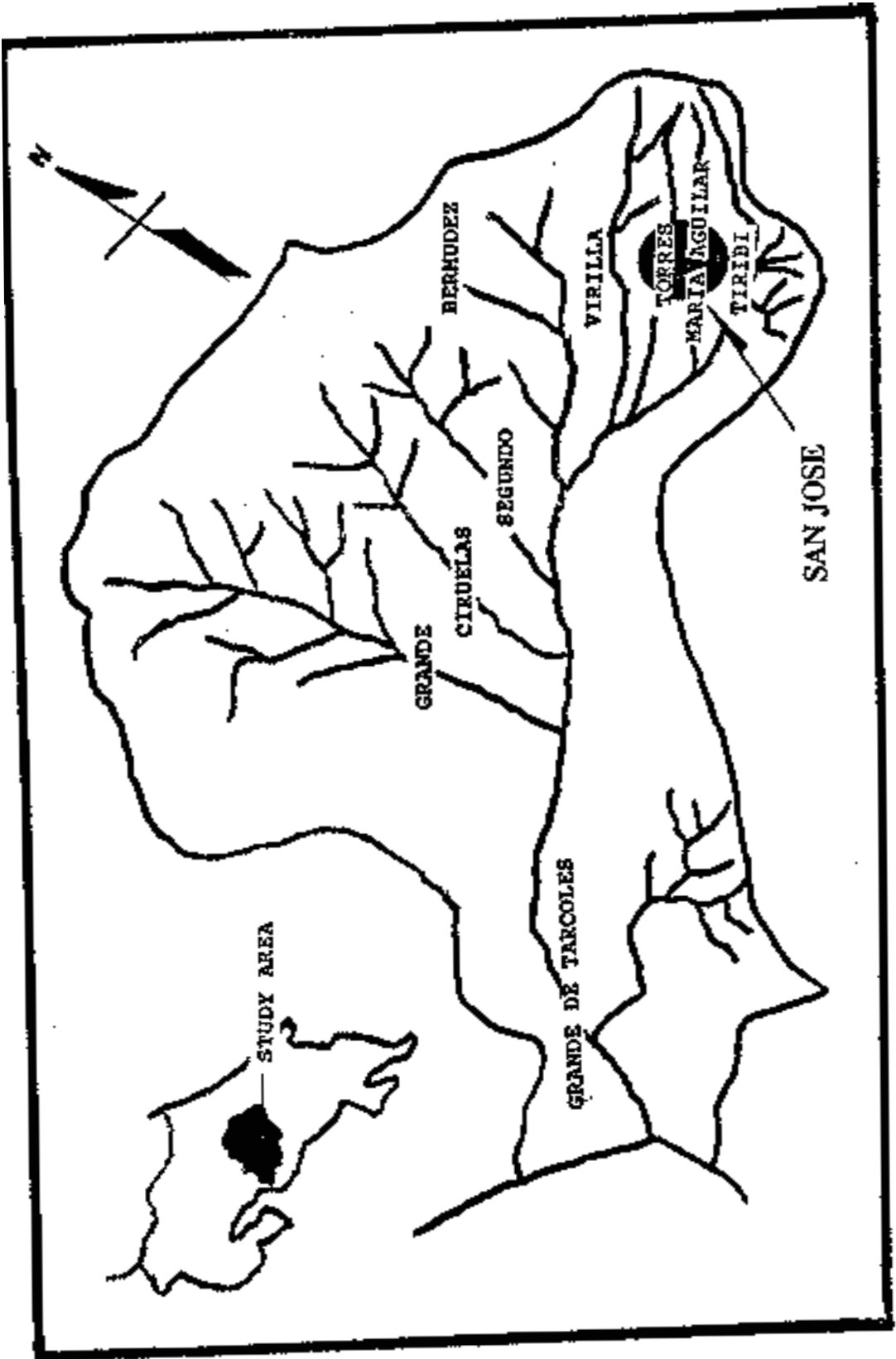
## CURRENT ENVIRONMENTAL COMPLIANCE AND ENFORCEMENT PROGRAMS

- Authorization System
- Voluntary Plans
- Acknowledges and Incentives
- Environmental Organic Law, No.7554

ANNEX 7

COFFEE RESIDUAL WATER TREATMENT  
IN COSTA RICA





**GRANDE DE TARCOLES WATERSHED**