

“Protection, Conservation and Valorisation of the Public Hydric Domain”

Summary of audit report presented during the Second EUROSAI Working Group meeting Paris April 2002

Programme

1. Introduction *

1.1. Objectives of the audit *

1.2. Methodology and Procedures *

1.2.1. Methodology *

1.2.2. Audit Techniques *

1.3. Conditioning Factors *

2. Overall Description of the Programme *

2.1. Objectives *

2.2. Management of the Programme *

3. Projects that received special attention within the audit *

3.1. Depollution of the Alviela Basin Project *

3.1.1. Objectives *

3.1.2. Description of the System *

3.1.3. Financial Execution *

3.2. Basic Sanitation System of the Estoril Coast *

3.2.1. Objectives *

3.2.2. Description of the Estoril Coast System *

3.2.3. Financial Execution *

4. Flood Control in the Lisbon Region Project *

4.1. Objectives *

4.2. Description *

4.3. Financial Execution *

5. Summary of the Overall Analysis of the Programme *

5.1. Perspective of the Programme design *

5.2. Management of the Programme *

5.3. Monitoring and control *

5.4. Results of the Projects *

5.5. Utility of Results *

1. Introduction

In 2000 the Portuguese Court of Auditors carried out an audit over a programme included in the Environment Sector of the Central Administration Investment and Development Expenditure Plan (PIDDAC) on the “Protection, Conservation and Valorisation of the Public Hydric Domain”, implemented by Institute of Water (INAG), which belongs to the Ministry of the Environment and Territorial Planning.

1. Objectives of the audit

The audit aimed to analyse the management of that “Programme” in order identify, measure and assess the actions taken to obtain the expected physical, temporal, environmental and financial results, with special emphasis on the years 1998 and 1999.

The “Programme” included the following Projects:

- Depollution of the Alviela Basin (1987-1999);
- Intervention in the Coastal Rim (1998-2002);
- Protection and Requalification of the Urban Environment and Surrounding Areas of the Hydrographic network (1991-2001);
- Re-conversion of the Sines System (1989-2001);
- Basic Sanitation System of the Estoril Coast (1987-2000);
- Valorisation of Riverside beaches (1997-2000).

The Programme's financial allocation was 25 million euros in 1998 and 23 million euros in 1999. The audit paid special attention to two of the six Projects – representing 25% of the total investment made: “Depollution of the Alviela Basin” and the “Basic Sanitation System of the Estoril Coast”. The Programme was analysed taking into account:

- the Government's Programmes and Strategic Options for the period 1995 to 2000, and their relationship with the Central Administration Investment and Development Expenditure Plan;
- the management, monitoring and control systems of the programme, in terms of design, organisation and efficiency.

The goals of the operational objectives established were to:

- identify the management and information systems;
- characterize the Programme;
- monitor budgetary, programming and implementation aspects;
- analyse administrative and financial operations circuit;
- analyse legality and financial regularity;
- check control procedures;
- verify the instrumental utility of results, in order that officials in charge may introduce adjustments or new guidelines for the programme.

A sample of construction job contracts was taken, based on materiality criteria and cases where overage costs were equal to or above 50%, in accordance with the current account supplied by the audited Service.

1. Methodology and Procedures

1. Methodology

During the planning phase, the context of the Programme's activities was studied, and the entities involved and the missions they institutionally performed were identified and characterized, in connection or interdependence with the authorities responsible for taking decisions and implementing the hydric resources policy. Data was collected on a selective basis and a logical and conceptual framework for the “Programme” was sought.

2. Audit Techniques

The audit procedures included the following techniques:

- Examination of documents, bibliographical research, structured interviews made with officials in charge of the respective entities and direct fieldwork observations (analysis of administrative, financial and technical records, in paper or electronic format);
- Analysis of information on the structure and logic of the “Programme” operations;
- Preparation of questionnaires, in the preliminary phase, concerning the “Programme” history and origins, objectives set, financial resources allocated and implementation conditions;
- Analysis was also conducted of the following variables and indicators:
- Analysis of the “Programme's” planning, budgetary, execution, monitoring and control systems;

- Identification of Strategic Decisions;
 - Analysis of the “Programme” components in temporal, qualitative and quantitative terms, in regards to budgeting, programming, implementation, monitoring and control;
 - Analysis of Management Plans and studies within the framework of the “Programme”;
 - Analysis of data on global financial execution during the periods 1998 and 1999;
 - Analysis of deviations between what was programmed and what was executed;
- Analysis of the decision and execution procedures of the works included in the selected sample, in terms of legality and regularity, and analysis of increases in the costs of additional unforeseen works in the same sample.

Concerning the specific aspects in the management area of hydric resources and the treatment of sewage waters in the selected Projects, the following aspects were analysed:

- Water quality before the intervention;
- Depollution plans and programmes before the intervention;
- Interventions, in the cases of Alviela and Estoril systems, over the effects on the surrounding environment;
- Evolution over time of water quality;
- Evolution of the quality of interventions designed to resolve problems of accumulated mud in the Alviela System.

1. Conditioning Factors

The temporal and thematic scope of the audit made it necessary to conduct a broad-ranging and extensive analysis, subject to several conditioning factors, including the following:

- Absence of Management Reports and indicators, in order to make a comparative and evolutionary analysis of individual initiatives in terms of the Programme and its various constituent Projects;
- Impossibility of identifying direct adherence between the objectives of the Strategic Options of the National Environmental Policy Plan, and implementation plans flowing from these guidelines, given the absence of Mid-Term Plans, with scheduled strategic objectives and specific goals that were financially supported within the “Programme”;
- Absence of a global information system or global implementation reports, in terms of the “Programme” and its various Projects, thus making it difficult to have an overall appreciation, to analyse indicators and assess results.

Overall Description of the Programme

1. Objectives

Considering the objectives of the six Projects included within the “Programme”, we were able to conclude that its main objective was to contribute towards the protection, conservation and valorisation of hydric resources, improving existing systems by specifically undertaking works in order to resolve or mitigate existing problems in terms of the coastal rim, regularisation of riverside areas, flood protection and improvement of the sanitary conditions of industrial and residential sewage waters, as well as the industrial and domestic water supply.

2. Management of the Programme

The “Programme” was managed by the Institute of Water (INAG) – a public authority under the aegis of the Minister responsible for the environment. The Institute’s attributions include the pursuit of national policies within the field of hydric resources and basic sanitation, and promotion of key objectives and strategies for an integrated management policy for national hydric resources, and conservation of these resources, in quantitative and qualitative terms, and physical and ecological aspects.

Projects that received special attention within the audit

As stated above, the main focus of the audit was on the “Depollution of the Alviela Basin” and the “Basic Sanitation System of the Estoril Coast” projects.

1. Depollution of the Alviela Basin Project

1. Objectives

The main objectives of this Project were the creation of a system to collect and treat urban and industrial sewage waters within this municipality (hereinafter referred to as the System), as a result of awareness of environmental problems related to the high levels of pollution caused by the tanning industry in Alcanena – around 85% of Portugal’s tanning production units and 65% of national production are located in this municipality –, as well as treatment, stabilisation and conditioning of muds and other waste residues produced.

1. The effluents produced by the industrial units are comparable to that normally found in a zone with 400,000 inhabitants, whereas the population zone currently served by the joint drainage system (domestic and industrial) has only around 10,000 inhabitants.

2. Description of the System

The system is located in the zone of Alcanena and is essentially composed of the Network of individual Pre-Treatment Units and Collectors, with water-flow measurement gauges installed at the exit points of the industrial units, three Primary Sewage Treatment Stations, a Chromium Recovery Unit, a Sanitary Dump and a Sewage Water Treatment Station (ETAR). In terms of the receiver device, this operates by discharging the final effluents into a stream that flows into the Alviela river, located within the Alviela River’s Hydrographic Basin, with a surface area of around 327 km² and originated in the Estremenho Chalk Massif, of karstic formation, being all the aquiferous extremely vulnerable to contamination.

The system’s origin, in the 1970s, resulted from the need to solve the serious environmental problems caused by the tanning industry in the region’s eco-system, as a result of accumulation of industrial waste, and in the general public health, as a result of discharging Alcanena Region’s industrial and domestic untreated sewage water into the Alviela river or into the streams flowing to the river.

As a result of lack of experience of treatment systems of sewage waters from the tanning industry, both at the national level and in industrially developed countries, the 1st phase of the system was largely unsuccessful in resolving the serious environmental problems in the Alcanena region. The System proved to be “insufficient to handle the organic material flowing into it”. It was verified that the muds produced were very liquid and deposited in large quantities (with a 20% dehydration level, i.e. 80% water), thus delivering great need for spaces in which this sewage waste may be deposited.

These muds, containing too much heavy metals and sulphides, were directly deposited, without any special care or control, in cavities dug into the soil, thus contaminating the surrounding land and creating a future problem of stabilisation of mud flows and de-contamination of the soil.

Another serious immediate consequence, deriving from this form of depositing mud in cavities, was its aerobic digestion (with air) that produced highly toxic gases (and consequently odours, whose intensity was felt both within the area itself and in surrounding areas), including methylmercaptans and toluenes, that are cancerigenic, cause irreversible damage to the human central nervous system and are lethal above certain concentration levels.

The medium term consequences, in addition to contamination of the land itself and the surrounding area, included the possibility of contamination of the “ground water”, due to the absence of waterproofing in the cavities where the muds were deposited.

The execution of construction works, although presented in different phases, did not reflect a prior and well-planned programme of staggered implementation, but was rather a series of one-off responses in order to solve problems of pollution caused by the tanning industry.

The works, in the 1st phase, were initiated in the 1970s and the system entered into operation in February 1988. In the 2nd phase, the repair and construction works were started before 1995, the year in which responsibility for the works was transferred to the Institute of Water.

1. Responsibility for the System’s operation and management is shared between the State – via the Institute of Water – that is the owner and responsible for designing, planning, building and financing the vast majority of the infrastructures – and the Association of Users of the Alcanena Sewage Waters Treatment System (AUSTR), constituted by Alcanena Municipal Council and the region’s Tanning Industries.

The system’s operations are self-financed, with the costs borne, in proportion to polluting responsibilities (polluter-payer principle), by the members of the Association (AUSTR).

2. Financial Execution

The long period of time gone since the project’s launch, study, design, construction and operation of the Sewage Water Treatment Station, the fact that various authorities were responsible for the project, plus the fact that forecast amounts for financial execution were inscribed in the State Budget, as if involving a process of effective execution, meant that it was not possible to establish rigorous quantification of either the costs that were effectively borne or effective financial execution.

The investment costs, in the period between 1979 and 2000, reached at least 48 million euros.

Basic Sanitation System of the Estoril Coast

1. Objectives

The main objectives of the “Basic Sanitation System of the Estoril Coast ”, focused upon alteration of the current situation in the zone of the Estoril Coast in terms of hydric pollution, through control of sewage waters and their dispersion in a suitable location and in safe conditions.

These objectives involved a clear need for the construction of a base system to which the urban sewage waters in the Estoril Coast region could be channelled. In this manner, such sewage waters would no longer be deposited into water courses and coastal sea water, thus making it possible to reduce the pollution of water courses and guarantee the quality of sea water in beach areas for bathing purposes, at levels that respect the EU guidelines – 100 Fecal Coliforms per 100 ml of water.

Description of the Estoril Coast System

The Basic Sanitation System of the Estoril Coast is constituted by a General Interceptor, a Collection Network that receives domestic sewage waters and flows into the general interceptor, Sewage Pumping Stations, a Prior Affluent Treatment System (small primary Sewage Treatment Stations integrated within the pumping stations), a Sewage Water Treatment Station, a Loading Well and a Submarine Drainage Channel.

After primary treatment of urban effluents, its diffusion and dispersion is made in the Atlantic ocean, through a long submarine drainage channel (marine treatment).

Right from the beginning,, the State was responsible for the System's design, construction and financing, through institutions that fall under its aegis, including the Estoril Coast's Basic Sanitation Office that was specifically set up for this purpose and had legal personality and financial, administrative and patrimonial autonomy.

1. In 1995 the Estoril Coast's Basic Sanitation Office was closed, a Multi-municipal System of Sanitation was created, and a concession contract for the System's management and operation was signed with a company (SANEST, S.A.), whose shareholders include the municipal councils of Amadora, Cascais, Oeiras and Sintra.

Construction of the 1st phase began in 1987, was concluded in 1993 and entered into operations in 1994. The construction of the 2nd phase was initiated in 1996 and entered into operation in 1998, and is now the responsibility of SANEST, S.A..

2. Financial Execution

It was not possible to precise the exact value of global financial execution, nor the consequent deviation verified against of the total forecasted cost, given that the necessary elements to determine these amounts are dispersed over time, space and responsibility, due to the long period of time that has passed since the launch of the works, and the creation and dissolution of various structures responsible for its management.

The total amount involved in the financial implementation of the 1st phase of the Estoril Coast System, according to the accumulated amounts inscribed in the State Budget until 1999 was around 73 million euros.

1. Flood Control in the Lisbon Region Project

In the audit carried out by the Portuguese Court of Auditors, other Projects of the "Programme" were also analysed, although in less detail. This section covers the "Flood Control in the Lisbon Region Project" whose objective is to prevent flooding and ensure river management.

2. Objectives

The Project aims to find long-lasting solutions to flood control issues in the Lisbon and Tagus River Valley Region. The main objectives include preparing studies and projects on flood prevention and control in the Lisbon region, identification and description of construction works and any other initiatives to be undertaken, estimating of the respective financial costs and technical and human resources required and implementation of the works and other related initiatives.

3. Description

Initially the main objective of the “Flood Control in the Lisbon Region Project” was to repair the damage caused by flooding in 1983.

In a second phase, alongside with those works, river regularisation projects were drawn up in order to control flooding, and to achieve a more comprehensive response to the problem of flooding, specially in the main urban centres.

The project’s initial area of intervention covered 12 municipalities: Cascais, Sintra, Oeiras, Amadora, Loures, Arruda dos Vinhos, Vila Franca de Xira, Alenquer, Torres Vedras, Mafra, Sobral de Monte Agraço and Azambuja. Subsequently the implementation zone was widened to the municipality of Lourinhã and the municipalities of the “Integrated Development Operation for the Setubal Peninsula”. Interventions also took place in other regions, in particular the Algarve, Alentejo, Santarém and Cartaxo. Implementation of the “Flood Control in the Lisbon Region Project” is co-ordinated by the Institute of Water. However, the Regional Directions of the Environment and Municipal Councils are also involved in rehabilitation of the hydrographic network, and protocols and collaboration agreements have also been signed with the Institute of Water in this context.

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1. As a result of this institutional articulation, the “Flood Control in the Lisbon Region Project” has been involved in initiatives outside its area of intervention, and has collaborated specifically with the Regional Directions of the Environment and the Natural Resources of the Algarve and Lisbon and Tagus River Valley.

2. Financial Execution

The investment cost, in the period between 1998 and 1999, was 13 million euros.

2. Summary of the Overall Analysis of the Programme

1. Perspective of the Programme design

In terms of the Perspective of the Programme’s design, there was found to be an absence of formally defined global objectives. A legal framework defining the objectives to be attained was not established, and the programme’s framework was delineated by the Projects specified in the State Budget and respective specific objectives.

In this manner it was possible to conclude that the “Programme” objectives are eminently financial in nature, formalised on an annual basis via the State Budget, and with no clear signs of temporal, physical or financial planning and programming, supported on a medium/long-term basis.

In relation to the strategic guidelines, objectives and actions to be carried out, it was verified that there was identity and coherence between the Strategic Options and the National Environmental Policy Plan. The latter document contained the main measures to be undertaken, the foreseeable and desirable implementation deadline, and the financial resources that could be mobilised.

Although the National Environmental Policy Plan announced that medium-term planning documents would be drawn up, detailing the measures, timetables and respective financing for the Projects that make up the “Programme”, this did not take place, with the exception of the Coastal Rim.

In relation to the Coastal Area, it was verified that in the published Coastal Programme action lines were defined, goals of intervention in this area were clarified and priority areas of activity were identified, through preparation of the Territorial Plan of the Coastal Rim, and Risk Charter for the Coastal Area. This was the only Project where a Medium-Term Plan and Annual Management Programmes were

found, based upon studies and analyses of the main external and internal factors, conditioning factors and catalysts of sustainable use of the coastal rim.

The development opportunities for the “Programme” include the following:

- Resolution of the problem of the sewage drainage system in the Alcanena Region that has been aggravated by local industry which discharges high levels of contaminated substances into water courses;
- Ensure the collection of Urban Sewage Waters in the Estoril Coast area, in order to resolve the problem of discharging sewage water into water courses or in collectors that discharge directly into coastal seawaters;
- Resolve or mitigate the problems related to the use and occupation of the coastal rim, safeguarding of persons and property in zones menaced by the sea, environmental pollution, delineation of the Public Maritime Domain and of risk zones and typification of coastal management;
- Find structural solutions for flood control, fundamentally in the Lisbon and Tagus River Valley Region, defending persons and property against flooding.

1. Management of the Programme

In relation to the management model's organisation, this is centralised in the Institute of Water, and also involves the Regional Directions of the Environment (acting as the Institute's representatives) and Local Municipal Authorities. This articulated intervention between Local and Central Administration is supported by collaboration agreements that define the process of technical and financial co-operation between the parties.

1. More specifically, in terms of the “Depollution of the Alviela Basin Project”, the management model is centralised in the Institute of Water in relation to construction works to be carried out, whereas the Association of Users of the Alcanena Sewage Waters Treatment System is responsible for operation and management of the infrastructures, equipment and materials that exist in the Sewage Station. Luságua, S.A., as the System's concessionaire company is responsible for operation, maintenance and conservation of the Sewage Station.

In the case of the Basic Sanitation System of the Estoril Coast the implementation and management model was initially centralised in the Office of Basic Sanitation and when the later was dissolved, passed to the Institute of Water, with SANEST, S.A., as the System's concessionaire company being responsible for conclusion of the design and construction of the works (infrastructures), equipment and material in the 2nd phase.

2. Monitoring and control

In terms of monitoring and control, self-assessment systems for the “Programme” were not detected, neither were information and inter-communication systems found to make it possible to collect and exchange the necessary information for the supervision, management and control of operations, in order to overcome management dysfunctions. Although, it were emphasised:

- The high quality of technical and operational monitoring verified in the Basic Sanitation System for the Estoril Coast, whereby information on the evolution and control of environmental impact on the eco-system was observed when the System entered into operation;

- In the Depollution of the Alviela Basin Project, there were found technical monitoring mechanisms that satisfied minimum requirements.

The monitoring and control of the implementation of programme-contracts were found to be ineffective.

1. Results of the Projects

In relation to the results of the Projects, the main conclusions were:

- The financial resources mobilised by the projects almost always exceeded the initially forecasted costs, as a consequence of additional works, in certain cases by very high amounts, indicating programming inefficiencies together with, in certain cases, faulty planning and lack of experience in certain works, given their scale and nature;
- The financing amounts allotted proved to be inadequate given the “Programme’s” vast objectives ;
- It was verified that there was no systematised and global information for the purposes of correction of the Project;
- There was no framework of competing indicators, of a different nature (quality, physical and financial control of the project), for the Programme’s management, control and assessment systems.

1. Utility of Results

The development of this Programme had an effect on the level of defence of the environment and quality of life, specifically in terms of quality of river and maritime waters, resolution of problems related to industrial and domestic sewage waters, air quality for local populations, defence of persons and property, mitigation of problems of erosion of the coastal rim, stimulation of the development of certain economic activities, in particular those associated to the enjoyment of the areas covered by the Projects and involving interventions.

The structuring and establishment of Projects, principally in the “Estoril Coast System” and the “Depollution of the Alviela Basin Project”, which were the main focus of the audit, made it possible to conclude that their respective sustainability was assured, either in terms of the level of conservation and maintenance of structures, and technological updating, thus guaranteeing in the future, unless there is an abnormal change of prevailing circumstances, that at least the levels of benefits already attained may be maintained, meriting special attention for the environmental problem of the Alviela Basin in terms of environmental preservation versus regional economic development.