

REPUBLIC OF TUNISIA
OFFICE OF PRIME MINISTER

AGENCE NATIONALE DE PROTECTION
DE L'ENVIRONNEMENT

AGENCE NATIONALE DE PROTECTION
DE L'ENVIRONNEMENT
IN FRAME OF THE
ENVIRONMENT

September 1990

LIST OF ABBREVIATIONS USED

ANEP	Agence Nationale d'Exploitation et de Mise en Valeur du Patrimoine
ANPE	Agence Nationale de Protection de l'Environnement
ASM	Association de Sauvegarde de la Medine (of Tunis)
BITS	Berdningen fur Internationellt Tekniskt Samarbete (Sweden)
CCE	Commission des Communautés Européennes
CGP	Commissariat Général à la Pêche
CPG	Compagnie des Phosphates de Gafsa
CRDI	Centre de Recherches pour le Développement International (Canada)
DBO5	Biological oxygen requirement at 5 days
DCES	Direction de la Conservation des Eaux et des Sols
DF	Direction des Forêts
DGSAM	Direction Générale des Services Aériens et Maritimes
DHMPE	Direction de l'Hygiène du Milieu et de la Protection de l'Environnement
DPAM	Direction des Ports Aériens et Maritimes
DRE	Direction des Ressources en Eau
DS	Direction des Sols
EEC	European Economic Community
EIB	European Investment Bank
FKD	Fonds Koweïtien de Développement
GNP	Gross National Product
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
IBRD	International Bank for Reconstruction and Development
ICF	Industries Chimiques du Fluor
INAA	Institut National d'Art et d'Archéologie
IRA	Institut des Régions Arides
JICA	Japan International Cooperation Agency
KFW	Kreditanstalt für Wiederaufbau (RFA)
MEDSPA	Mediterranean Strategy and Action Plan
METAP	Mediterranean Environmental Technical Assistance Program
MS	Ministère de la Santé
ONAS	Office National de l'Assainissement
ONTT	Office National du Tourisme Tunisien
SIAPE	Société Industrielle d'Acide Phosphorique et d'Engrais
UNDP	United Nations Development Programme
WHO	World Health Organisation

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INTRODUCTION

A National Plan of Action for the Environment in Tunisia was recently identified -- and the greater part of the costs calculated -- by a study mission financed by the World Bank.

The institutional and legal measures proposed, as well as the actions identified to reduce, prevent and monitor threats to the natural environment and to living conditions are part of an overall strategy which the Tunisian government is determined to apply as quickly as possible and to maintain on a long-term basis.

Already, urgent measures of conservation -- for example the stoppage of a fertilizer factory, despite the considerable financial loss entailed -- have been taken at the highest levels, and a National Agency for the Protection of the Environment has been set up under the direct aegis of the Prime Minister's office, to ensure coordination of all the studies and activities to be carried out by the ministerial departments and the other public and private organizations involved.

With the exception of certain projects the cost estimates for which will be made on the basis of studies not yet carried out, or which will be financed within economic development programmes, the National Plan of Action will, in the medium term (end of the Seventh Development Plan, 1990 and 1991, and Eighth Plan, 1992 to 1996), call up financing for a total which is estimated at nearly 423 million dollars; the needs not covered amount to approximately 315 million dollars, 185 of which are to be liberated in the years 1991 to 1993.

To ensure the availability of the additional financial resources required, the Tunisian government proposes to call upon the broadest possible assistance from all its usual financial partners, and from others who are interested in the protection of the environment.

The present memorandum provides an up-date on the situation regarding the environment and on the difficulties and concerns experienced by the agencies responsible for its protection; it includes a discussion of the strategy which the government intends to follow to curb and reduce the damage being caused; lastly, it provides an inventory and estimated costs of the projects which should be undertaken during the coming six years.

1 THE PROBLEMS OF THE ENVIRONMENT IN TUNISIA

Until the beginning of the 1970's, attacks upon the environment were as yet moderate, or were perceived as 'natural' and almost inevitable phenomena. The subject of greatest concern was the pollution of the Lac de Tunis, which had been the object of a number of projects of regeneration -- the first dating from before 1940 -- none of which had produced the desired results. Industrial pollution (liquid and atmospheric) affected only one part of the southern suburbs of Tunis, which were not yet highly populated and which were in practice devoted to this type of harmful activity.

There was, nevertheless, an awareness of the problems related to defective urban sanitation; as early as 1960 a programme of purification stations had been implemented. Their inadequate capacity, and in some instances faulty functioning, gave rise to the first operation of real scope, which concerned the Tunis area and its lake; an Office National d'Assainissement (National Sanitation Bureau) was created, and a long-term, national programme was devised which continues today, with planning done in successive segments.

The effects of urban growth, of the concentration of large projects in heavy industry (Gabes), and of the development of intensive agriculture became perceptible in the urban and natural environment only little by little, cumulatively. The multitude of actors, each responsible for managing one aspect of pollution containment or of environmental protection, undeniably contributed to delaying awareness of the acuity of the problems, and made it difficult to see clearly their ineluctable medium-term aggravation.

It was not until the situation in certain particularly vulnerable regions became truly alarming that an overall awareness came into play, touching all sectors of activity and the entire Tunisian territory.

The ravages caused by the chemical industry (fertilizers and derivatives) in the city of Sfax and in the Gulf of Gabes acted here as a detonator. The suspension of production at one unit marked the beginning of an exhaustive campaign to inventory forms of pollution of an industrial nature, even in areas in which their effects were still within acceptable limits.

A first summary report on the effects of the industrial zone of Ghannouch on the Gabes region, and particularly on the state of the oasis and of the marine environment, also revealed that the obvious harmful effects were accompanied by a rapid -- and even irreversible -- squandering of economic potential: agriculture, fisheries, tourism, etc.

The services of the Ministry of Agriculture addressed themselves particularly to the disappearance and the deterioration of such natural resources as water, soils and forests, through excessive or badly-controlled use, or because of the conjunction of external phenomena. Here again, long-term economic concerns were the decisive factor which led to rethinking the entire question of

One major source of concern is the trends affecting the water resources of northern Tunisia. The chief element in their mobilization, the Sidi Salem dam, already shows serious signs of silting-up, and more particularly of eutrophication. These phenomena, caused by lack of protection of the catchment area from erosion and by an increase in the quantities of organic matter (effluents, waste, fertilizer, etc.) in a river of low and irregular flow, threaten both the volume of usable water, and its quality.

Erosion is, in fact, within the framework of both soil conservation and the prevention of desert encroachment, the object of the oldest and most sustained programmes of activity, even if no thorough evaluation of the results of these activities has yet been carried out. Reforestation and forest preservation, for their part, absorb the majority of the credits allocated by the Ministry of Agriculture for the environment.

Another concern is that of protecting vulnerable natural or human sites of historic value, but of only indirect economic interest: monuments and archeological sites, ecosystems with delicate and rare fauna and flora, such as that of Lake Ichkeul, are already the object of studies or of specific actions.

Lastly, the protection of the marine environment and of its coastal fringe is not motivated solely by the concern for maintaining the existing fisheries potential; in addition, it is accorded priority inasmuch as, of all the pleasures offered to Tunisia's visitors, it is the only one which is not indefinitely renewable, and which can be destroyed by the very fact of being anarchically or excessively used.

In summary, Tunisia is currently facing the following environmental problems:

- a continuous deterioration of soil resources (erosion, desert encroachment);
- a biological rarefaction (fauna and flora) with appearance of symptoms of genetic exhaustion in many plant and animal species;
- a disequilibrium of the coasts (erosion of beaches) and of marine ecosystems, through:
 - anarchic use of coastal land,
 - abusive use of fisheries resources,
 - industrial pollution, both urban and maritime, resulting in an alarming deterioration of water plant communities;
- a considerable risk of qualitative deterioration of available water resources, through the amplification of industrial and agricultural pollution, and through overuse of the groundwater tables;
- a deterioration in the quality of life, due to:

- badly controlled industrial waste, dispersed in the urban environment,
- difficulties in handling household waste,
- the phenomenon of anarchic housing,
- difficulties in extending sanitation facilities to all cities and rural localities.

The prospects for development -- spontaneous or intentional -- in the next ten years can only aggravate the legitimate fears aroused by the state of the environment:

- population growth: + 3.5 million inhabitants, including 3 million in urban centres, leading to an annual supplement of 200 million cubic metres of water consumed and evacuated at concentrated points, and to approximately 20,000 hectares of land consumed by urban development over 10 years and lost to agriculture;
- tourism: + 100,000 beds, almost all of them at the seaside, or more than 3 million visitors per year and an additional 6 to 8 million cubic metres of water consumed and evacuated annually near the coasts;
- intensive agriculture: + 60,000 hectares under irrigation, or from 240 to 360 million cubic metres of water to be provided annually over and above current consumption.

2 ACTIONS UNDERTAKEN, SUCCESSES, AND CONSTRAINTS

To cope with environmental problems, the Tunisian government has set up a number of curative and preventive programmes, and has taken diverse legal, institutional and regulatory measures.

The accomplishments include, in particular, programmes of reforestation and of water and soil conservation, the combatting of desert encroachment, programmes of water planning and mobilization of water resources, efforts in urban sanitation, rehabilitation of areas of spontaneous habitation, and the conservation of ecologically balanced natural areas.

These different programmes have enabled the country to register considerable accomplishments in the domains of environment and natural resource conservation. At the same time, they have revealed the persistence of a number of structural or chronic constraints which have limited the effectiveness of the accomplishments and the scope of the attainments:

Preserving soil resources and checking desert encroachment

Attainments

- Perfect understanding of the mechanisms of erosion and desertification;
- Identification of effective methods of approaching farmers;
- Refinement of easy and effective techniques for intervention;
- Acquisition of appropriate national experience in the domain;
- Constitution of a considerable number of technicians who are experienced at all levels;
- Establishment of two seed banks.

Constraints

- Still-low level of sensitization of farmers and rural inhabitants to the importance of soil protection;
- Lack of water resources to carry out the necessary actions in a timely fashion;
- Persistence of land tenure problems (parcelling of farms);
- Difficulty of ensuring rural inhabitants of energy sources other than wood;
- Absence of financial resources for timely carrying out of all the actions of protection and prevention necessary to curb the processes of erosion and of desert encroachment.

Protecting nature and endangered biological species

Attainments

- Identification and protection of 10 natural areas which are ecologically balanced;

- Partial inventory of the country's fauna and flora;
- Creation of a base for the gene bank.

Constraints

- Problems of ecological management of natural areas;
- Lack of means to carry out experimental research in this domain;
- Lack of financial resources for the accomplishment of the planning measures necessary to protect these areas.

Protecting water resources

Attainments

- Inventory of most of the resources offered by waterways and water tables;
- Middle-term planning for mobilizing these resources and for allocating them to the different sectors of use;
- Summary understanding of the causes behind the deterioration of the quality of these waters, and partial monitoring of this quality;
- Development of legislation the rigorous application of which makes it possible to protect water resources from all forms of qualitative and quantitative deterioration.

Constraints

- Lack of institutional coordination in the management and protection of the country's water resources;
- Difficulty in applying regulations and laws pertaining to the protection of these resources;
- Lack of financial resources to set up networks of continuous verification and of qualitative and quantitative surveillance of water resources (on the surface and underground);
- Inadequacy of programmes of sensitization to the rational management of these resources.

Protecting marine environments

Attainments

- Adoption of regulations organising the use of halieutic resources;
- Network for monitoring the bacteriological quality of coastal waters;
- An inventory of the state of the coasts and coastal regions.

Constraints

- Lack of qualified personnel to carry out the protective activities planned;

- Lack of means for measuring and controlling the equilibrium of the coasts;
- Lack of an integrated plan for land use on the coastal fringe and for setting up economic and urban activities;
- Inadequate control over the use of halieutic resources;
- Lack of means for protection from hydrocarbons.

Combatting pollution and lack of sanitation in cities

Attainments

- Promulgation of legal and regulatory texts specifically appropriate to Tunisian conditions (laws, standards);
- Sewage disposal systems in cities, with achievement of a high rate of connexion to public networks in the large cities;
- Increased use of natural gas in producing electricity, thus reducing atmospheric pollution;
- Improvement of housing conditions (alleviation of crowding), improvement of sanitary facilities, electricity, potable water, sewerage);
- Rehabilitation of regions which are vulnerable to pollution (Tunis Lac Nord);
- Efforts for collection of garbage (equipment of local public communities).

Constraints

- Inadequacy of participation of citizens in general, and of industrialists in particular, in improving cleanliness in cities;
- Magnitude of the costs of cleansing already-installed industries;
- Non-observance of the regulations in force;
- Inadequacy of the means used for inspection;
- Scattered locations of small polluting plants, making profitable actions of cleansing difficult;
- Lack of financial means for cleansing in large industrial plants;
- Proliferation of spontaneous housing and difficulty in applying an integrated programme of land management;
- Absence of infrastructure for the elimination of garbage and of industrial waste.

The efforts made in the areas related to environment have not covered all aspects of environmental protection and of resource safeguarding and conservation. There are a number of gaps, some of which may result from the continuing constraints. The most important among these deficiencies are the following:

- Failure to put large-scale interventions into universal application (range improvement, combatting sand encroachment and protective reforestation);

- Absence of institutional and logistic means for the study and conservation of biological diversity;
- Absence of skilled personnel trained in the field of land fauna;
- Absence of equipment for protection from and prevention of accidental pollution, especially in ports;
- Absence of emergency plans to combat accidental pollution;
- Absence of means to measure the marine and coastal dynamics (marigraph, measurements of sediments, etc.);
- Lack of personnel experienced in port safety, pollution control measures, etc.;
- Absence of sewage systems in the rural environment;
- Lack of organisation in managing the rainwater drainage system;
- Inadequate organisation in managing garbage handling (dumping, disposal, encouragement);
- Inadequate understanding of toxic and dangerous waste, and lack of an appropriate management system;
- Lack of a system of inspection and measurement of atmospheric pollution and of the quality of ambient environments (standards, regulations);
- Lack of a suitable mechanism to finance curative and preventive actions against pollution;
- Inadequacy of measures to control the land tenure situation, particularly in urban centres and in regions which are vulnerable to environmental deterioration.

Numerous relevant organisations and ministries have attempted, within the scope of their competence and resources, to solve the various environmental problems, but until quite recently no overall policy had been established, and the different programmes and activity plans have been implemented without any serious coordination.

To correct this situation, and to try in some measure to overcome the main institutional constraints, the Tunisian government recently created the National Agency for the Protection of the Environment (Agence Nationale de Protection de l'Environnement -- ANPE), endowed with a mission of very broad scope in the domain of the strategy for protection and mastery of the environment.

It is the ANPE which is responsible for formulating environmental policy, for planning it, for coordinating the various departments concerned in its realisation, and for participating in efforts to obtain funding.

The agency is, moreover, responsible not only for representing Tunisia in specialised international organisations and events, but also for checking and monitoring the state of the environment within the country, and for sensitizing the population to the problem of the environment.

Because of the critical proportions of environmental deterioration in certain areas of the country, the agency's efforts have been oriented chiefly towards reinforcing the containment of pollution and towards accelerating the processes of elimination of the pollution engendered by industrial and human establishments.

Parallel to this curative action, the ANPE is trying to set up a preventive strategy requiring that all projects which are potentially harmful to the environment be subjected to impact studies; this should make it possible to avoid creating new sources of pollution, by setting up preliminary control at the stage of project conception.

The second priority is the increasing sensitization of the population to environmental problems. The population must be made more conscious of the necessity for individual effort, and must be brought to support measures which coincide with governmental goals. It is within this framework that several national campaigns have been carried out, directed chiefly at children and adolescents.

The initiatives taken and the assistance provided by local associations for the protection of nature and the environment have proven to be extremely helpful in this regard.

The Tunisian government has decided upon a strategy of environmental protection for the purpose of preventing and attenuating the perceived harmful effects, and plans to undertake a national plan of activity which should be accomplished before the end of the Seventh Development Plan. The ANPE will be responsible for monitoring and evaluating these projects, in accordance with the mission of national programme coordination with which it has been entrusted.

3 STRATEGY FOR ENVIRONMENTAL PROTECTION

The Tunisian government is entirely convinced that national development and environmental protection, far from being contradictory, are reconcilable within the framework of an overall reflexion which takes into consideration all the positive and negative aspects of projects envisaged.

The strategy it has adopted is based on the concept of durable development; this, unlike strictly financial project conceptions which look no farther than the short and medium terms, is conceived to guarantee the stability of natural resources, one of the very foundations of economic and social development.

The policy which the government intends to apply in this respect comprises three goals:

- long-term containment of pollution and environmental damage within limits which are deemed acceptable and are defined by standards, monitored and supervised;
- organisation of the use of the natural environment for economic purposes in such a way as to guarantee renewal of the resources consumed, and maintenance of acceptable quality;
- establishment of measures of protection and enhancement for those components of natural and human sites that are in danger of disappearing.

In addition, and preliminary to the above, the reconstitution of environments which are already highly damaged will be addressed through urgent, specific programmes; at the same time, under the supervision of the ANPE, the specialised departments and bureaux will set up a permanent system of follow-up and monitoring of the state of the environment on a national scale.

Considering the constraints and the deficiencies identified, the national strategy for environmental protection will take into consideration the following recommendations.

On the national scale

Natural resources

- preservation of water resources from all forms of qualitative and quantitative deterioration by setting up an observatory for continuous monitoring of their quality and establishing a policy of sensitization of water users;
- checking of desert encroachment by large-scale interventions aimed at improving rangeland, especially in private ranges, by implementing a programme of dune fixation and windbreaks, and by erosion prevention measures for catchment areas and cereal-growing lands;

- conservation of biological diversity by encouraging studies and research, reinforcing the gene bank, and setting up appropriate structures to identify ecologically balanced natural areas and manage parks and reserves;
- protection of the marine and coastal environment, by drawing up an emergency national plan and acquiring the necessary logistics.

Combatting pollution

- combatting industrial pollution by obtaining a commitment for curative actions in the zones affected (Gabes, Sfax, Gafsa, Sousse, Ben Arous, Bizerte, Tunis, Ariana, Mahdia, Kasserine, etc.) and by developing a financing mechanism which provides incentive for the establishments concerned to assume responsibility for part of the costs of cleansing;
- setting up an adequate system of prevention in the face of the amplification of existing pollution and the appearance of further pollution, by:
 - . providing conditions which will ensure effectiveness of the impact studies;
 - . setting up a bank of environmental data;
 - . equipping zones which are reserved for and suited to polluting industries;
- the elimination of solid waste and household garbage by reinforcing community action, by installing well-managed dumps, by making waste disposal profitable, and by setting up a policy of elimination of toxic and dangerous wastes;
- sewage disposal, by continuing to equip urban centres with sewerage infrastructure (sewage systems and filtering plants), giving priority to the Medjerda Basin, the coastal region, and the cities located on groundwater tables of good quality (Kasserine, Kairouan, etc.) and to the setting up of individual or semi-collective sewage disposal systems in rural areas.

Land development

- ensuring optimal land use by setting up a mechanism for supervision of land tenure in vulnerable regions;
- taking environmental constraints into consideration in planning and equipment studies, both general (ecological planning) and specific (studies of impact).

Activities of support

- sensitization to the environment by setting up appropriate programmes of training and information

4 THE PLACE OCCUPIED BY THE ENVIRONMENT IN PUBLIC BUDGETS

The measures the cost of which has already been calculated constitute a very considerable financial burden in comparison with what was, even in very recent years, supported by the budgets of the government or of specialised agencies.

An estimate of the current expenditures of the main ministerial services directly responsible for environmental protection that is:

- the Bureau of Environmental Hygiene and Environmental Protection (Ministry of Public Health)
- the Bureau of the Environment (Ministry of Agriculture)

not to mention the on-going interventions of those which have other functions, leads to a total budget of approximately 1.4 million dollars.

To this must be added the municipal budgets (cleaning, garbage collection, green spaces, etc.) which can be roughly estimated at nearly 8 million dollars per year, and the budget of the ONAS, which (taking all its services together) reached 18.6 million dollars in 1988. The ANPE, for its part, disposes of an annual budget of 0.22 million dollars.

The investment budgets consumed or registered (1990) have amounted to an annual average, over the years 1987 to 1990, on the order of 41 million dollars, or nearly 1.9% of the average allocation of the investment programme as a whole. The breakdown of the investment budgets with respect to environmental issues is as follows:

- sewage disposal	25.0 M \$ US
- water and soil conservation	5.4 M \$ US
- reforestation	9.0 M \$ US
- protection of tourist sites	1.1 M \$ US
- hygiene	0.3 M \$ US
- ANPE (equipment and studies) since 1989	0.2 M \$ US

In all, and as an annual average, the financial means devoted to the environment have amounted in recent times to slightly over 69 million dollars.

The anticipated progressive extension of ANPE activities, and the strengthening of the means of intervention of other ministerial services, should raise the annual operating expenses of the entire environmental management apparatus to over 2.2 million dollars (1990 prices), exclusive of the municipalities (8.8 million dollars) and the ONAS (24 million dollars).

As for projected investments, under the same headings as above and adding to them the urgent measures of restoration, these will generate a minimum average expenditure of 80 million dollars per year.

In all, the amounts devoted to the environment should, then, go from 69 million dollars per year (average value 1986-1990) to slightly more than 115 million dollars (1990 value).

This financial effort, which represented only some 7.5 % of the GNP in the last four years, should thus in the next five years reach approximately 1.1% -- a figure which is perfectly comparable to the efforts currently being made in industrial countries (from 0.8% to 1.9%, with in some cases predictions at term of over 3% of the GNP).

The increase in the budgetary amounts devoted to the environment should not, however, be effected by a transfer of resources to the detriment of development projects; it must result from the identification and mobilization of specific new sources of financing.

5 CONTENT AND PRESENTATION OF THE NATIONAL PLAN OF ACTION

The ANPE, after consultation with the ministries concerned, and on the basis of the document resulting from the IBRD mission, has identified a group of projects with major favourable impact on the state of the environment, and which can be accomplished, or at least obligated, during the coming seven years, thus covering the current Development Plan and the Eighth Plan now in preparation.

This programme, which is described in detail in the following chapters, is not exhaustive. Specifically, it contains a certain number of sectoral and geographic studies the purpose of which is to provide a more refined analysis of the condition of the environment and the effects of the activities studied, so that medium- and long-term activity plans can be deduced from them. These plans, and their financial repercussions, cannot be accepted definitively before completion of these studies, the conclusions of which will not be known before the end of 1990 at the earliest.

The programme does, on the other hand, include projects already obligated and fully or partially financed, which have been considered worthy of mention because of the fact that their accomplishment is an element in the coherence of the overall programme.

The estimates for the different projects have been made on the basis of probable costs under the economic conditions prevailing in 1898-1990; for some -- and this is mentioned in the tables -- they are provisions drawn up on the basis of ratios, and these are therefore liable to reevaluation on a case-by-case basis, as a function of projects which will be distinguished subsequently within the framework of these overall allocations.

It should, finally, be pointed out that the schedules of payments indicated correspond to periods of project obligation, rather than to periods of actual accomplishment and payment.

The details of the plan of action are given in two forms, through annotated tables.

In the first presentation, in chapter 6, the projects are situated with respect to large natural regions, which have been identified as follows:

- region of the Gulf of Gabes
- basin of the Oued Medjerda and Northeast region (Lake Ichkeul and the lake of Bizerte)
- Greater Tunis
- coastal region and tourist areas.

They are presented in two categories: individual projects, usually in the cities of the interior of the country, and projects of a national nature, which are not localized in any particular region.

- giving impetus to research programmes on alternative techniques (treatment of waste water, industrial waste and garbage, etc.), and developing processes that can be used by the local public service enterprises.

On the international scale

Tunisia will reinforce current international efforts to protect the ozone layer, attenuate the hothouse effect, prevent the effects of climatic change, conserve nature and biological diversity, and check desert encroachment.

In this regard, the following recommendations are made:

- that the convention and the protocol concerning protection of the ozone layer be put into application. Concerted efforts should be made to replace CFC products by substitute compounds. This requires that Tunisia have access to new technologies, and that compensation be provided for the financial consequences of the replacement of dangerous products;
- that efforts be made to organise the transfer of toxic and dangerous waste products, and to acquire the means to eliminate these waste products and to manage them in an ecologically sound fashion;
- that the measures designed to protect the Mediterranean from pollution and deterioration be observed;
- that activities to protect nature and conserve biological diversity be promoted;
- that the necessary measures be taken to prepare to face the effects of ocean expansion and the climatic changes engendered by the hothouse effect and the deterioration of the ozone layer;
- that Tunisia contribute to international and regional efforts to implement the United Nations programme to combat desert encroachment.

The tables of this section also present the types of actions to be undertaken in accomplishing the project: studies, works, assistance, means for operation, etc., as well as the implementor concerned and the period or periods planned for the financial obligation.

In a second presentation, in chapter 7, the projects are inventoried by sector, the different sectors being:

- urban sewage disposal
- water and soil conservation
- disposal of solid and dangerous wastes
- protection of vulnerable sites (nature and national heritage).

In addition, and separately, a programme of support measures is identified: technical assistance and reinforcement of agencies acting on the environment, general studies, and actions of sensitization of the public.

The tables of this chapter mention the current status of each project: identification, feasibility, technical studies, call for tenders, implementation in progress, etc., as well as any international sources of financing there may be, and the share of the project which they bear. The total costs and the uncovered financing requirements are shown by project.

6. DISTRIBUTION OF THE PLAN OF ACTION BY NATURAL REGION

NB. Interpretation of the tables in this chapter corresponds to the general indications given in chapter 5, as well as to the following legend which is common to all.

Legend for the nature of the activities to be financed	Amount in M \$ US	Type of activity	IMPLEMENTOR (period)		
			(90-91)	(92-93)	(94-96)
☆ Evaluation study	Total	opposite	Amounts remaining to be financed by period of accomplishment :		
○ Technical studies					
□ Implementation					
▣ Technical assistance					
⊗ General study					
☒ Means for operation					
			Immediate (1990 and 1991)		
			Short-term (1992 - 1993)		
			Medium term (1994 to 1996)		

6.1 Region of the Gulf of Gabes

The projects identified or currently being carried out in this region have been designed to address the most urgent matters first, particularly in eliminating the industrial pollution (SO₂, phosphogypsum, fluorine) emanating from factories of the SIAPE and the ICF.

The environmental problems in this region (city, marine environment, oasis, groundwater tables, etc.) extend well beyond what is shown here, awaiting the results of the general study on the Gulf of Gabes, which will probably be carried out on the ANPE budget between 1990 and 1991.

This explains why, taking into consideration the financing provided by the Commission of European Communities and the EIB, the net financing required appears very limited. Complementary programmes will be proposed subsequently, for amounts which cannot be estimated at the present time.

(1,1 million \$ US = 1 million DT)

Project par type and by locality	Amount in M \$ US	Type of activity	IMPLEMENTOR (period)		
			(90-91)	(92-93)	(94-96)
Sewage disposal					
Gabes filtering station	7,08	□		ONAS	
Waste disposal					
Sfax composting plant	5,23	☆□□		ONAS	
Chemical industries					
Emission of SO ₂ , two purification plants	16,50	□		SIAPE	
Disposal of phosphogypsum with water recycling	38,50	□		SIAPE	
Emission of SO ₂ , four purification plants	33,00	□		SIAPE	
Recovery of fluorine (study)	0,12	○		ICF	
SIAPE (phosphates) Sfax	2,80	□		SIAPE	
Other industries in Sfax (studies)	0,30	☆		ANPE	
Cleansing plants in Sfax (provisions)	10,00	□		Industrialists	
Redevelopment					
Redevelopment of the Taparura region in Sfax	3,00	□		SIAPE TAPARURA	
Marine environment					
Rehabilitation of hatcheries (Gabes)	0,50	□		Commune	
Support measures					
Reinforcement of the Gabes Central Laboratory	0,40	▣		L.C./ANPE	
Environmental study of the Gulf of Gabes	0,50	▣		ANPE	
REGION OF GABES	117,93	Requirements	9,78	16,21	39,83

- ☆ Evaluation study
- Technical studies
- Implementation

- ▣ Technical assistance
- ▣ General study
- ▣ Means for operation

6.2 Medjerda Basin and Northeastern region

The activities planned in this vast area are oriented essentially towards protecting the water resources of this region, which is the principal supplier of potable water and irrigation water to the entire northern part of the country and to a good part of the center.

Financing, or commitments for financing, have already been received for nearly half the amount required for the projects identified. To ensure full effectiveness of these projects of filtration, household waste disposal and prevention of erosion of cereal-growing lands, it is necessary that they be conceived and carried out in a coordinated fashion and over the same time periods. The aim of this complementarity is to avoid both excessive silting up of reservoirs (and concomitant decrease in the useful volume that can be made available), and loss in the quality of these reservoirs through eutrophication and chemical pollution (nitrates, phosphates and pesticides).

The succession of dams built either on the Medjerda itself or on its tributaries, as well as the "waterfall" type of serial release of these dams for irrigation of downstream lands, lead to a gradual increase in the polluting elements in the waters. Thus priority must be given to intercepting such elements as far upstream as possible, at each locality or region where they are being generated, so as to prevent the phenomenon of accumulation.

Another important problem which is specific to this region is the risk of decay of the lake and the park of Ichkeul, a site of world value, because of the restrictions which have been placed on its fresh-water supply during the winter by the construction of numerous dams on the rivers feeding into it.

This lake, the water of which may be fresh or saline according to the season, constitutes a very special and very vulnerable ecosystem, and it may also, if its flushing-out by fresh waters ceases to be sufficient, be threatened by real pollution from the lake of Bizerte, on the banks of which are found a large number of polluting industries, and two large built-up areas virtually devoid of any filtration system.

The two technical goals are to intercept the risks of permanent pollution and salination of the lake from downstream, and to arbitrate between the needs of irrigated agriculture in the region, and the fresh-water requirements of the lake.

As a complement to these technical measures, the setting up of a technical agency for the basin is envisaged, first within the ANPE, in a later stage in an autonomous structure. This agency would carry out the monitoring and management of water resources, in coordination with all the users and producers.

(1,1 million \$ US = 1 million DT)

Project par type and by locality	Amount in M \$ US	Type of activity	IMPLEMENTOR (period)		
			(90-91)	(92-93)	(94-96)
Sewage disposal					
Béja	15,33	<input checked="" type="checkbox"/>		ONAS	
Jendouba	5,94	<input type="checkbox"/>		ONAS	
Le Kef	6,60	<input type="checkbox"/>		ONAS	
Bou Salem	3,67	<input type="checkbox"/>		ONAS	
Ghardimaou	8,58	<input checked="" type="checkbox"/>		ONAS	
<i>Sub-total upstream from Sidi Salem</i>	40,12				
Medjez El Bab	7,33	<input type="checkbox"/>		ONAS	
Tébourba	6,56	<input type="checkbox"/>		ONAS	
Téboursouk	6,34	<input type="checkbox"/>		ONAS	
Jedeïda	5,45	<input type="checkbox"/>		ONAS	
Siliana	8,78	<input type="checkbox"/>		ONAS	
Gaafour	4,95	<input checked="" type="checkbox"/>		ONAS	
Testour	6,93	<input checked="" type="checkbox"/>		ONAS	
<i>Sub-total downstream from Sidi Salem</i>	46,34				
Greater Bizerte	13,20	<input checked="" type="checkbox"/>		ONAS	
Menzel Bourguiba	4,40	<input type="checkbox"/>		ONAS	
<i>Sub-total Northeast</i>	17,60				
Total sewage disposal	104,06	Requirements	3,20	22,30	19,17
Measures to combat erosion on cereal-growing land (190,000 ha)					
Le Kef	3,96	<input type="checkbox"/>		D/GES	
Béja	3,08	<input type="checkbox"/>		D/GES	
Jendouba	1,32	<input type="checkbox"/>		D/GES	
Measures to combat erosion on cereal-growing land (110,000 ha)					
Siliana	4,40	<input type="checkbox"/>		D/GES	
Bizerte (Medjerda)	0,99	<input type="checkbox"/>		D/GES	
Measures to combat erosion on cereal-growing land (20,000 ha)					
Bizerte (Northeast)	0,45	<input type="checkbox"/>		D/GES	
Total for combatting erosion	14,20	Requirements	2,86	7,28	4,06
Disposal of household waste					
3 priority cities	2,75	<input type="checkbox"/>		ONAS/EPIC	
Provision (8 other towns of the Medjerda)	10,00	<input checked="" type="checkbox"/>		ONAS/EPIC	
Provision (towns of the Northeast basin)	6,00	<input checked="" type="checkbox"/>		ONAS/EPIC	
Total for the household waste project	18,75	Requirements	0,16	6,24	9,60
Combatting industrial pollution					
STIR (petroleum refinery) Bizerte	0,27	<input type="checkbox"/>		STIR	
El Fouledh (steel mill) Menzel Bourguiba	0,25	<input type="checkbox"/>		EL FOULEDH	
Ichkeul Lake and Park					
Studies of the Ichkeul Park	0,45	<input checked="" type="checkbox"/>		ANPE	
Development measures for Ichkeul park (provision)	5,00	<input type="checkbox"/>			
Development measures for the water resources of the area (provision)	20,00	<input type="checkbox"/>			
Support measures					
Management structure for the Medjerda basin	0,12	<input checked="" type="checkbox"/>		ANPE	
Monitoring of the pollution of the Medjerda	0,35	<input checked="" type="checkbox"/>		DHMPE	
MEDJERDA AND NORTHEAST	163,45	Requirements	6,84	35,75	46,69

- ☆ Evaluation study
- Technical studies
- Implementation

- ▣ Technical assistance
- ▤ General study
- ▥ Means for operation

6.3 Greater Tunis region

The principal projects planned for Greater Tunis are the continued installation of filtration plants in under-served regions whose effluents will eventually exceed the capacity of the existing stations, the combatting of pollution by the industries of the near southern suburbs, and the extension of areas of dumping or treatment of household waste.

In addition, and so as to ensure better protection and enhancement of the Medina of Tunis, a programme presented by the ASM and the INAA is proposed within the framework of preservation of the historic and architectural heritage.

(1,1 million \$ US = 1 million DT)

Project par type and by locality	Amount in M \$ US	Type of activity	IMPLEMENTOR (period)		
			(90:91)	(92:93)	(94:96)
<u>Sewage disposal</u>					
Greater Tunis (West)	22,00	□□	ONAS		
Borj Cédria	4,40	□□	ONAS		
<u>Measures to combat industrial pollution (Lac Sud)</u>					
Diagnostic study	0,55	☆		ANPE	
Inventory and analyses	0,13	○		ANPE	
Financial assistance for equipment	6,00	□		ANPE	
Household waste (provision)	9,00	☆○□	ONAS/EPIC		
<u>Protection of archeological and historic sites</u>					
Bardo and Carthage museums	0,65	□		ANEP	
Tunis Medina (photographic surveying)	0,48	□		ASM	
Gates and walls of Tunis (repairs)	1,53	○□		ASM/INAA	
Printing of an atlas of the Medina	0,06	□		ASM	
GREATER TUNIS	44,80	Requirements	2,59	25,54	16,67

- ☆ Evaluation study
- Technical studies
- Implementation

- ▣ Technical assistance
- △ General study
- ⇌ Means for operation

6.4 Coastal region and tourist areas

The projects here aim primarily at reinforcing and setting up filtration plants in tourist areas which are already extensively developed or in areas which are expected to expand in the next decade: Mahdia, Tabarka, Kelibia; they also include the elimination of the many dumps in the Greater Sousse area, through the creation of a composting unit.

The equipping of five ports to combat hydrocarbon pollution, and protective works on threatened coastal areas (Jerba and Hammamet) also aim at ensuring the safeguarding of Tunisia's sea and beaches, which still today, along with the sun, constitute the chief element in the country's attraction for her tourist clientele.

In the same spirit, a plan to safeguard the Kerkennah Islands has been studied and should soon be implemented, to avoid excessive use of the land and coast of this archipelago for purposes of real estate development.

(1.1 million \$ US = 1 million DT)

Project par type and by locality	Amount in M \$ US	Type of activity	IMPLEMENTOR (period)		
			(90-91)	(92-93)	(94-96)
Sewage disposal					
Houmt-Souk	2,00	□		ONAS	
Mahdia	3,50	□		ONAS	
Tabarka : filtering station	2,22	□		ONAS	
Tabarka : networks	5,78	□		ONAS	
Sousse-North	0,70	□		ONAS	
Kélibia	0,70	□		ONAS	
Monastir	9,02	□		ONAS	
Composting plants					
Greater Sousse :					
Feasibility and technical studies	0,22	☆○		ONAS	
Travaux	4,18	□		ONAS	
Greater Nabeul	1,87	☆○□		ONAS	
Measures to combat industrial pollution					
Industrial zones of greater Sousse (provisions)	5,00	○□		Industrialists	
AL-MOIZ CHIMIE (furfural) Mahdia	4,00	○□		AL-MOIZ	
Measures to combat hydrocarbons					
Technical studies (5 ports)	0,33	○		DPAM	
Interception equipment (5 ports)	4,00	☞		DPAM	
Kerkennah Islands Park	3,00	○□		ANPE	
Protection of highly damaged coasts	2,20	□		DGSAM	
Protection of the coastal region (Jerba & Hammamet)	1,32	□		DGSAM	
COASTAL REGION & TOURIST AREAS	50,04	Requirements:	6,82	26,45	4,37

- ☆ Evaluation study
- Technical studies
- Implementation

- ▣ Technical assistance
- ▤ General study
- ☞ Means for operation

6.5 Additional individual projects

The following table identifies the implementors of these projects and provides the probable schedule of their accomplishment.

(1,1 million \$ US = 1 million DT)

Project par type and by locality	Amount in M \$ US	Type of activity	IMPLEMENTOR (period)		
			(90-91)	(92-93)	(94-96)
<u>Sewage disposal</u>					
Kasserine	4,40	□		ONAS	
M'saken	4,40	○□		ONAS	
Kébili	1,65	○□		ONAS	
Mednine	3,85	○□		ONAS	
Tozeur	2,20	○□		ONAS	
Tataouine	3,85	○□		ONAS	
<u>Sewage disposal in small localities</u>					
Pilot project	1,10	☆○□		ONAS	
<u>Industrial pollution</u>					
Replacement of ventilating units with washing plants	4,40	□		GPG	
Cessation of SO ₂ emissions (ICG-SLAPE IV)	6,00	□		SLAPE	
Dehydration of sludge (study)	0,25	○		CPG	
SOTUPALFA (paper) Kasserine	2,50	☆○□		SOTUPALFA	
Elimination of toxic waste (pilot dump)	5,00	○□		ANRE	
El Jem and Dougga sites (development measures)	0,50	□		ANEP	
INDIVIDUAL PROJECTS	40,10		1,31	16,86	6,93

- ☆ Evaluation study
- Technical studies
- Implementation

- ▣ Technical assistance
- △ General study
- ◻ Means for operation

6.6 National projects not related to specific sites

Most of these are support measures: institution-building, general studies, inventories, analyses, preliminary sectoral technical studies.

Two large amounts relate to provisions to finance pretreatment plants in two categories of industry: tanneries and the agricultural and food industry. These are not direct investments on the part of the authorities; rather, they are the establishment of a credit fund to help these very numerous firms, most of which are private and for this reason, these amounts figure here as complementary measures.

(1,1 million \$ US = 1 million DT)

Project par type and by locality	Amount in M \$ US	Type of activity	IMPLEMENTOR (period)		
			(90-91)	(92-93)	(94-96)
<u>Sewage disposal for small localities (study)</u>	0,20	☆		ONAS	
<u>Studies of water and soil conservation</u>					
Studies, measurement and monitoring of water quality	1,00	○		DRE	
Regional plans for optimizing land occupancy	0,50	△		DS	
Inventory of ranges	2,50	△		DS/DF	
Study and training (arid lands)	0,80	△		ANPE/IRA	
<u>Tanneries</u>					
Pretreatment installations	6,00	□		INDUSTRIALISTS	
Changes in processes (study)	0,14	○		ANPE	
<u>Agricultural and food industries</u>					
Studies of environmental impact	0,35	△		ANPE	
Cleansing installations (provisions)	15,00	□		INDUSTRIALISTS	
<u>Measures to combat hydrocarbons</u>					
General programme study	0,13	△		ANPE	
Study of used oil recovery	0,09	☆○		ANPE	
<u>Protection of vulnerable sites</u>					
Strengthening of the management of existing parks	0,60	▣		ANPE/DE	
Inventory of wet regions	0,20	△		ANPE	
Institution of new parks and reserves	0,20	▣		ANPE/DE	
Institution of historic monuments	0,13			INAA	
Other (museums, protection, planning measures)	1,65	☆○□		ANEP/INAA	
<u>Protection of the coastal region</u>					
General study of protection to the coasts	1,28	☆○		ANPE	
Study of wreck recovery	0,10	○		ANPE	
Quality control of sea products	0,20	▣		MS/CGP	
Technical assistance	15,27	▣		Concerned agencies	
General studies	7,22	△		[]	
Campaigns of sensitization	2,40	☆□▣		ANPE/ANEP/IRA	
UNLOCALIZED PROJECTS	55,96		7,15	29,52	15,26

☆ Evaluation study

○ Technical studies

□ Implementation

[*] ANPE with the exception of ONAS/CRGR (effluents), MS (laboratories), ANEP (cultural sites), INM (air pollution) and DGATU (Master Plans)

▣ Technical assistance

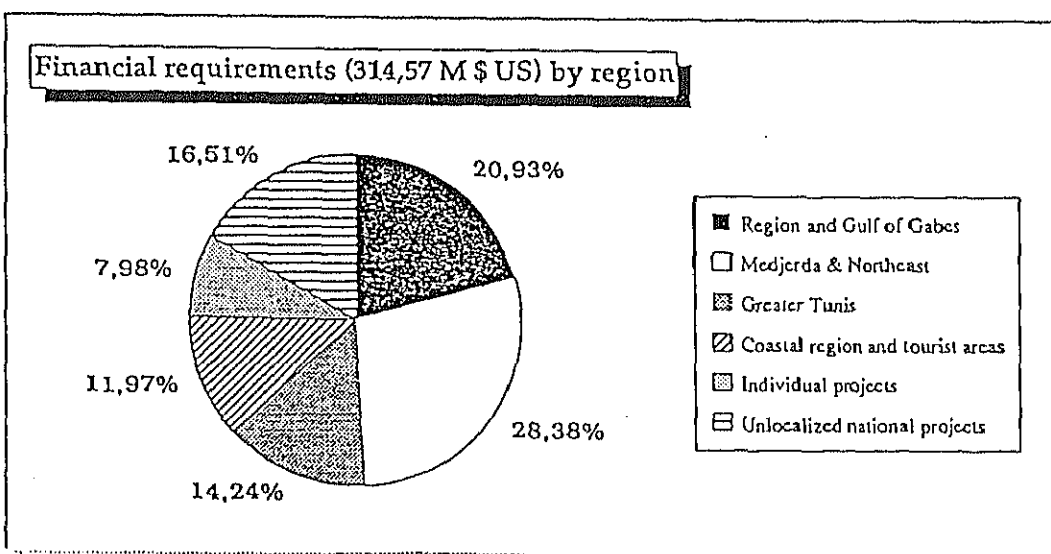
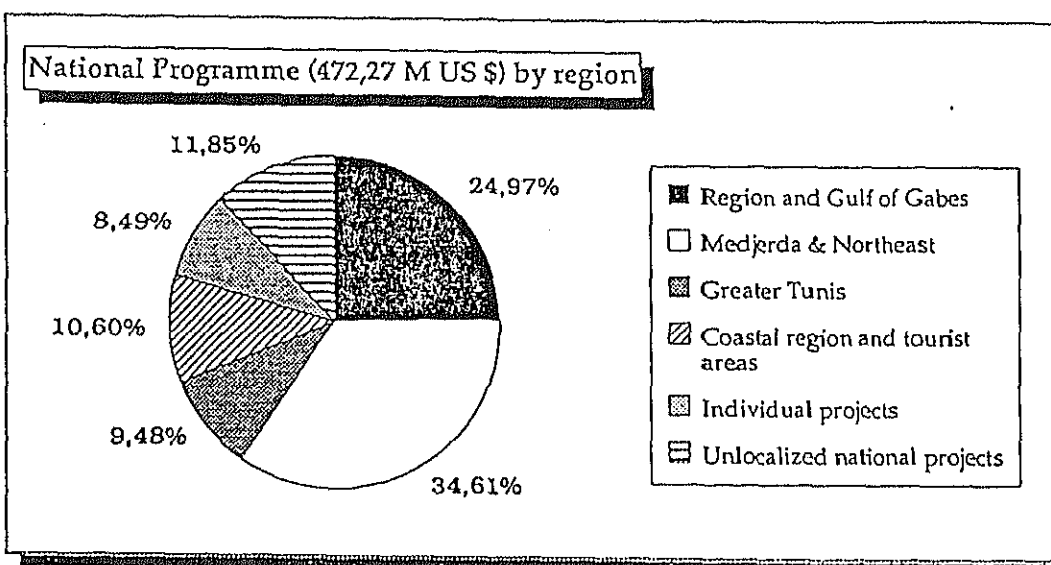
△ General study

▣ Means for operation

RECAPITULATION OF CHAPTER 6

The table and the two graphs below summarize the investments and financing by region

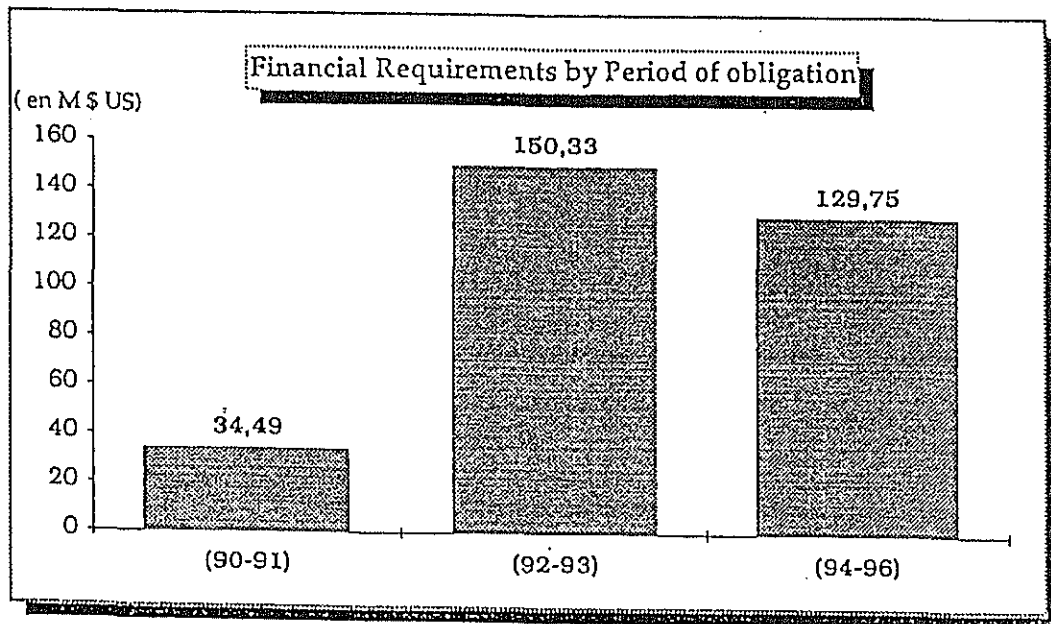
Recapitulation by region	Total amount		Amount to be financed	
	en M \$ US	en %	en M \$ US	en %
Region and Gulf of Gabes	117,93	25,0%	65,83	20,9%
Medjerda & Northeast	163,45	34,6%	89,28	28,4%
Greater Tunis	44,80	9,5%	44,80	14,2%
Coastal region and tourist areas	50,04	10,6%	37,64	12,0%
Individual projects	40,10	8,5%	25,10	8,0%
Unlocalized national projects	55,96	11,8%	51,93	16,5%
GRAND TOTAL	472,27		314,57	



The table and the graph below give the financing required according to period: 1990/91, 1992/93, 1994/96.

Financing requirements per region and per period of obligation

	Total amount		Period of obligation		
	en M \$ US	en %	(90-91)	(92-93)	94-96)
Region & Gulf of Gabes	65,83		9,78	16,21	39,83
Medjerda & Northeast	89,28		6,84	35,75	46,69
Greater Tunis	44,80		2,59	25,54	16,67
Coastal region and tourist areas	37,64		6,82	26,45	4,37
Individual projects	25,10		1,31	16,86	6,93
Unlocalized national projects	51,93		7,15	29,52	15,26
GRAND TOTAL	314,57		34,49	150,33	129,75



7. DISTRIBUTION OF THE PLAN OF ACTION BY SECTOR

NB. Interpretation of the tables in this chapter corresponds to the general indications given in chapter 5, as well as to the following legend which is common to all.

Legend for the status of activities inventoried	TOTAL	Project	Source of
☆ Identified, to be evaluated	In M \$ US	status.	financing
★ Evaluated (feasibility)	Financing obtained for entire project		
○ Technical studies in progress	Financing pending and probable		
● Detailed technical studies ready	Financing proposed		
□ Implementation to be assigned (tenders received)	Partial financing already guaranteed		
■ Implementation in progress	No financing obtained or requested		

7.1 Urban sewage disposal

The programmes of the ONAS shown in the table on the following page do not include the projects currently-implemented which have already been entirely financed:

- third urban sewage disposal project financed by the IBRD,
 - "17 cities" project financed by the EEC,
 - "Greater Tunis" project financed by the FKD,
 - special project concerning 72 neighbourhoods to be redeveloped,
- although considerable payments (some 43.7 million US dollars) will continue to be made for these during 1990 and the following years.

Also not included in this table are the "programme" projects on the ONAS budget, devoted essentially to extensions of systems, to small studies, and to reinforcement of its operating means (approximately 10.7 million US dollars).

It is expected that there will be money remaining from the international financing of these different projects; the amount of such a remainder is not yet accurately known, and has therefore not been taken into account in the available financial resources.

For the project of 11 cities of the Medjerda Basin, which is divided into three segments, the first segment, financed by the KFW, does figure in this programme because of the importance of this overall project for the safeguarding of this region's water resources. While the second segment will probably have to be financed by this same bank, the corresponding amounts are given here for indicative purposes.

The same is true for the "4 filtration stations" project, which is the object of financing promises from the BITS.

The most important project not yet financed -- with the exception of partial funding of the studies (EEC) -- concerns six filtration stations; the estimates should be revised as a function of the technical studies, and in the case of Greater Tunis (purification of the effluents of the western suburbs) in the light of the revised Sewerage Master Plan, which has in fact been financed, and which will make it possible to choose between two major options: a new plant to the west with inversion of systems, or reinforcement of existing plants (Cherguia and Choutrana).

Lastly, one final concern of the ONAS is to find a technically and economically acceptable solution for small towns. The programme includes studies of filtration systems, the choice of a process -- which must be refined by Tunisian technicians -- and a first pilot plant. This, however, is only the beginning of a much more vast programme the financial magnitude of which cannot yet be calculated.

(1,1 million \$ US = 1 million DT)

Projet identification Description of operations	TOTAL in M \$ US	Project status	Source of financing
Sewage disposal in 11 cities of the Medjerda Basin			
Béja	15,33	☐	KFW
Medjez El Bab	7,33	☐	KFW
Jendouba	5,94	☐	KFW
sub-total 1st segment	28,60		
Tébourba	6,56	★	KFW
Téboursouk	6,31	★	KFW
Jedeïda	5,45	★	KFW
Siliana	8,78	★	KFW
Bou Salem	3,67	★	KFW
Sub-total 2nd segment	30,80		
Ghardimaou	8,58	☆	
Gaafour	4,95	☆	
Testour	6,93	☆	
Sub-total 3rd segment	20,46		
Project total	79,86	Remaining to be financed	20,46
Construction of 4 filtering stations			
Houmt-Souk	2,00	■	BITS
Kasserine	4,40	☐	BITS
Mahdia	3,50	☐	BITS (depending upon result of call for tenders)
Gabès	7,08	☐	
Project total	16,98	Remaining to be financed	
Construction of filtering stations			
Le Kef	6,60	★	
Monastir	9,02	★	
Kébili	1,65	☆	
Mednine	3,85	☆	
Tozeur	2,20	☆	
Tataouine	3,85	☆	
Grand Bizerte	13,20	★	
M'saken	4,40	○	Studies (CEE)
Grand Tunis (Ouest)	22,00	★	
Borj Cédria	4,40	★	
Menzel Bourguiba	4,40	○	Studies (CEE)
Project total	75,57	Remaining to be financed	75,17
Sewage disposal in Tabarka			
Construction of the filtering station	2,22	☐	1,05 (BITS)
Construction of the sewage systems	5,78	☐	Local
Project total	8,00	Remaining to be financed	1,17
Extension of filtering stations			
Sousse-Nord	0,70	○	Studies (CEE)
Kélibia	0,70	○	Studies (CEE)
Project total	1,40	Remaining to be financed	1,33
Sewage disposal in small localities			
Studies	0,20	☆	KFW
Pilot project	1,10	☆	
Project total	1,30	Remaining to be financed	1,10
TOTAL SEWAGE DISPOSAL	183,11	Remaining to be financed	99,23

- ☆ Identified, to be evaluated
- ★ Evaluated (feasibility)
- Technical studies in progress

- Detailed technical studies ready
- ☐ Implementation to be assigned (tenders received)
- Implementation in progress

7.2 Water and soil conservation

The activities planned for this programme are those which concern the basins of the Medjerda and of the Ichkeul and Bizerte lakes, regions which are endangered and which contain the country's principal surface water reserves. The only projects mentioned here are those which, in correlation with the projects of urban sewage disposal and elimination of household and industrial waste, will act to protect surface water systems.

It is the absolute and urgent priority of setting up an integrated system in these two particularly vulnerable and vital regions, which has guided the choice of a partial programme to be accomplished as soon as possible.

The other actions of soil protection (combatting erosion in other regions, curbing desert encroachment) planned elsewhere by the services of the Ministry of Agriculture are not included in the programme. The funds necessary for these national programmes of water and soil conservation, which are to be carried out in the coming decade, amount to 327 million dollars:

- CES programmes (600,000 hectares)	\$214.0 M US
- combatting erosion on cereal-growing lands (400,000 ha)	\$ 18.0 M US
- hill lakes (50 million cu. m.)	\$ 25.5 M US
- checking desert encroachment	\$ 69.5 M US

(1,1 million \$ US = 1 million DT)

Projet identification Description of operations	TOTAL en M \$ US	Project status	Source of financing
Study, measurement and monitoring of water quality			
Inventory of the qualité of waterways	0,29	☆	
Setting up of a network of monitoring and alarm	0,35	☆	
Study of eutrophization of dam lakes	0,10	☆	
Study of water table vulnerability to pollution	0,04	☆	
Pilot study of the quality of an urban water table	0,07	☆	
Pilot study of the quality of a coastal water table	0,15	☆	
Monitoring of the pollution of the Medjerda	0,35	■	Local+CRDI+OMS (0,25)
Project total	1,35	Remaining to be financed	1,10
TOTAL WATER CONSERVATION			
	1,35	Remaining to be financed	1,10
Combatting erosion of cereal-growing lands (320 000 ha)			
Le Kef	3,96	★	
Béja	3,08	★	
Jendouba	1,32	★	
Siliana	4,40	★	
Bizerte (Medjerda)	0,99	★	
Bizerte (Northeast)	0,45	★	
Project total	14,20	Remaining to be financed	14,20
Specific studies and measures			
Regional plans for optimization of soil occupancy	0,50	☆	
Range inventory	2,50	☆	
Study and training (arid lands)	0,80	☆	
TOTAL SOIL CONSERVATION			
	18,00	Remaining to be financed	18,00
WATER AND SOIL CONSERVATION			
	19,35	Remaining to be financed	19,10

7.3 Elimination of solid and dangerous wastes

The policy recommended -- and already partially set up in the Tunis region -- is to entrust these operations to industrial and commercial public service enterprises (ECR), at the commune, town or governorate level.

Four regions are accorded priority: the Oued Medjerda basin, the Lake Ichkeul basin, the southern suburbs of Tunis, and Greater Sousse. In addition, one ANPE priority is the creation of a pilot dump for toxic waste which is unacceptable either in domestic effluents or in current systems of waste disposal.

(1,1 million \$ US = 1 million DT)

Project identification Description of operations	TOTAL in M \$ US	Project status	Source of financing
Dumps in 3 cities of the Medjerda Basin			
Technical studies	0,30	○	KFW
Works	2,45	○	KFW
Project total	2,75	Remaining to be financed	
Disposal of household waste (provision)			
Other cities of the Medjerda Basin	10,00	☆	
Priority regions (Northeast, Tunis-South)	15,00	☆	
Project total	25,00	Remaining to be financed	25,00
Composting plants			
Greater Sousse: Feasibility and technical studies	0,22	☆	
Works	4,18	☆	
Greater Nabeul	1,87	☆	
Greater Sfax	5,23	☆	
Project total	11,50	Remaining to be financed	11,50
Elimination of toxic waste			
Pilot dump	5,00	☆	
Project total	5,00	Remaining to be financed	5,00
SOLID WASTE	44,25	Remaining to be financed	41,50

- ☆ Identified, to be evaluated
- ★ Evaluated (feasibility)
- Technical studies in progress

- Detailed technical studies ready
- Implementation to be assigned (tenders received)
- Implementation in progress

7.4 Combatting industrial pollution

Following urban sewage disposal, the actions under this heading represent the greatest investment envisaged in the short and the medium terms. The seriousness of the problems of pollution in the Gabes region led to the taking of measures of conservation as early as two years ago, and to the implementation of works which have already in large part been financed by the EIB.

Four other regions are also threatened by increasing industrial pollution: the region of Gafsa, with the phosphate industry; the Sfax region, where one factory has been closed as an urgency measure; the industrial zones of the southern suburbs of Tunis; lastly the region of Bizerte lake (Bizerte and Menzel-Bourguiba), in relation with the protection of the two coastal lakes.

The paper mills of Kasserine and the furfural factory in Mahdia also fall within this priority programme, because of the magnitude and the danger of the pollution to which they give rise. The amounts indicated correspond to minimum solutions.

In any case, no preferential financing is requested for process transformations which would in themselves be of economic profit to the polluting firm. This is the case for the Compagnie des Phosphates de Gafsa, where the replacement of ventilation units by washing plants is an operation justified by considerations other than those which are purely ecological.

Two categories of particularly polluting industry should be addressed through overall action on the national scale:

- tanneries, for which the installation of means of pretreatment is planned to reduce chromium waste, before opting for a change in processing methods;
- the agricultural food industries in general -- dairies, cheese factories, canning plants, yeast manufacture, sugar refining -- which generate large quantities of DBO5 and of fermentable matter.¹

In the case of the latter, for the time being their impact on the environment will simply be measured, until such time as the technical processes making it possible to reduce or eliminate their pollution have been studied. At the same time, and this is valid for all highly polluting but not necessarily dangerous industries, one of the ANPE'S prime concerns is to conceive and set up a regulatory and financial apparatus capable of obliging or encouraging such industries to transform and improve their own installations.

¹ The problem of the sugar refineries (Beja, Bou-Salem) and of the Beja yeast manufacture is being solved within the framework of the sewage disposal and filtration projects concerning these cities.

In this part of the programme, provision is also made for urgent measures to be taken to intercept pollution of the marine environment in the five Tunisian ports which carry out operations on hydrocarbons.

(1,1 million \$ US = 1 million DT)

Project identification Description of operations	TOTAL in M \$ US	Project status	Source of financing
Chemical industries of Gabes			
Cessation of SO ₂ emissions, two purification plants	16,50	□	CCE-BEI (for 41,8 M \$)
Disposal of phosphogypsum with water recycling	38,50	□	
Cessation of SO ₂ emissions, four purification plants	33,00	●	
Recovery of fluorine (study)	0,12	⊙	CCE-BEI
Project total	88,12	Remaining to be financed	46,32
Compagnie des Phosphates de Gafsa			
Washing plants to replace ventilating units	4,40	☒	Self-financed
Cessation of SO ₂ emissions (ICG-SIAPE IV)	6,00	☒	Self-financed
Dehydration of sludge	0,25	☆	
Project total	10,65	Remaining to be financed	0,25
Evacuation zone of the Tunis Lac Sud (30 units)			
Diagnostic study	0,55	☆	
Inventory and analyses	0,13	☆	
Assistance for financing of equipment	6,00	☆	
Project total	6,68	Remaining to be financed	6,68
Tanneries			
Pretreatment installations	6,00	●	
Change of processes (study)	0,14	☆	Local
Project total	6,14	Remaining to be financed	6,00
Agricultural and food industries			
Studies of environmental impact	0,35	☆	
Cleansing equipment (provisions)	15,00	☆	
Project total	15,35	Remaining to be financed	15,35
Other industries and industrial zones			
STIR (Petroleum refinery) Bizerte	0,27	○	
El Fouladh (steel mill) Menzel Bourguiba	0,25	○	
SIAPE (Phosphates) Sfax	2,80	☒	Self-financed
Other industries in Sfax (studies)	0,30	☆	JICA
Cleansing plants in Sfax (provisions)	10,00	☆	
Industrial zones of greater Sousse (provisions)	5,00	☆	
SOTUPALFA (Paper) Kasserine	2,50	☆	
AL-MOIZ CHIMIE (Furfural) Mahdia	4,00	☆	
TOTAL INDUSTRIES	152,06	Remaining to be financed	96,62
Prevention of pollution by hydrocarbons			
General programme study	0,13	☆	METAP
Study of used oil recovery	0,09	○	
Technical studies (5 ports)	0,33	○	
Equipment of interception (5 ports)	4,00	○	
Project total	4,55	Remaining to be financed	4,42
TOTAL HYDROCARBONS	4,55	Remaining to be financed	4,42
INDUSTRIAL POLLUTION	156,61	Remaining to be financed	101,04

7.5 Protection of vulnerable sites which are of major value

The following table shows operations of protection or restoration of natural environments or historic sites which are particularly endangered: flora and fauna of wetland ecosystems, decaying coastal regions, cultural and architectural heritage.

Most of the amounts allotted concern protection of the park and the lake of Ichkeul, a site which has been declared of world interest, and one of the three main reserves of birds migrating between Europe and tropical Africa. The additional studies which were recognized as being necessary at the conclusion of a recent seminar have been financed, and commitments have been received from the RFA to cover up to 20 million DM worth of compensatory works and measures which will be required. The amounts shown here are a provision established from low estimates of previous studies.

The Kerkennah Islands, the other wetland regions, and the natural parks which exist or are to be created, complete these actions devoted to vulnerable natural sites.

With respect to the archeological and historic heritage, the costs of some actions and projects have already been calculated and these may begin very shortly provided financing is rapidly forthcoming. The agencies which are at present responsible for this domain have very few means of their own, and despite the recent creation of an Agence Nationale du Patrimoine (National Heritage Agency), these investments, which carry no profit, will have to be made from the national budgets and through foreign aid.

The development measures to be taken in the National Archeological Park of Carthage-Sidi Bou Said have not been mentioned in the programme, as they require additional studies.

(1,1 million \$ US = 1 million DT)

Project identification Description of operations	TOTAL in M \$ US	Project status	Source of financing.
Compensatory planning measures of Lake Ichkeul			
Studies of Ichkeul Park	0,45	☆	CEETNUD/METAP
Development of Ichkeul Park (provision)	5,00	☆	R.P.A. (à hauteur de 11 M\$)
Hydraulic planning measures for the region (provision)	20,00	☆	
Project total	25,45	Remaining to be financed	14,00
Institution and reinforcement of natural parks			
Kerkennah Islands	3,00	□	
Strengthening of the management of existing parks	0,60	○	
Inventory of wet zones	0,20	○	
Institution of new parks and reserves	0,20	○	
Project total	4,00	Remaining to be financed	4,00
TOTAL NATURAL PARKS	29,45	Remaining to be financed	18,00
Protection of the coast			
Rehabilitation of fish hatcheries (Gabes)	0,50	●	
Redevelopment of the Taparura region in Sfax	3,00	□	
Protection of highly damaged shores	2,20	□	
Works in Jerba and Hammamet	1,32	●	
Project total	7,02	Remaining to be financed	7,02
Miscellaneous studies and measures			
Recovery of wrecked ships	0,10	☆	
General study of coastal protection	1,28	☆	
Quality control of sea products	0,20	○	
Project total	1,58	Remaining to be financed	1,58
TOTAL MARINE ENVIRONMENT	8,60	Remaining to be financed	8,60
Archeological sites and museums			
Bardo and Carthage museums	0,65	□	
Sites of El Jem and Dougga (planning measures)	0,50	●	
Institute of historic monuments	0,13	☆	
Tunis Medina (photographic surveying and studies)	0,48	●	
Tunis gates and walls (planning measures)	1,53	☆	
Printing of an atlas of the Medina	0,06	●	
Other (museums, protection, planning measures)	1,65	☆	
Project total	5,00	Remaining to be financed	5,00
TOTAL CULTURAL HERITAGE	5,00	Remaining to be financed	5,00
PROTECTION OF SITES	43,05	Remaining to be financed	31,60

- ☆ Identified, to be evaluated
- * Evaluated (feasibility)
- Technical studies in progress

- Detailed technical studies ready
- Implementation to be assigned (tenders received)
- Implementation in progress

7.6 Measures of support

The implementation of the programmes described above, which amounts to nearly 450 million dinars (265 without the ONAS programmes, which are supported by a highly organised structure) cannot be envisaged under the desired conditions and within the desired times if the implementors responsible remain limited by the sole means of intervention currently available to them.

Consequently, a plan has been devised to reinforce and equip the organisations responsible for carrying out projects or for monitoring the state of the environment.

A large part of the projects which can be accomplished and planned in the short term are undeniably urgent, but their completion cannot alone suffice to guarantee the Tunisian environment; they will do so only if they are part of a larger technical vision and if they fall within an appropriate legal framework, so as to avoid a reversion to situations which are cause for concern.

A programme of studies at the national, and sometimes the local, level is thus presented here, in addition to the reinforcement of means.

Lastly, it is the government's ambition to act in such a way that the protection of the environment does not simply remain the affair of technical and administrative authorities, but becomes a component in the daily behaviour of the inhabitants of this country. Diffuse pollution, the slow deterioration of the natural heritage and of sites by individuals who are ill informed as to the consequences of their acts can, in the long run, be as dangerous as the waste products of a heavy industry.

Thus campaigns of information and sensitization for the public, for schoolchildren, and for economic actors, are also proposed as support measures, without in any way affecting the implementation of regulatory means.

A small part of the funds necessary to set up these actions has already been provided or promised; the budget of the state or of the local municipal services will play its role by providing as many technical and human resources as are available, but there are in the short term requirements which will necessitate the technical and financial support of organisations which are also ready to assist in the accomplishment of the investment projects described above.

(1,1 million \$US = 1 million DT)

Project identification Description of operations	TOTAL in M \$ US	Project status	Source of financing	
Technical assistance and strengthening of means				
ANPE	4,13	■	1,27 (GTZ) + 0,70 (CCE)	
Laboratoire Central de Gabès	0,40	□		
DGCPL (Ministry of Interior)	0,19	○		
Security services (OPNT)	0,54	●		
Departments of the Ministry of Agriculture	0,90	□		
Municipalities	3,00	●		
Communal and Regional Establishments (waste)	1,60	●		
DHMPE (Ministry of Health)	0,51	○		
Institut Pasteur (marine pollution)	0,72	■		Italy
DHMPE laboratories (water and food pollution)	2,00	○		Local OMS (0,335)
DHMPE laboratories (air pollution)	1,10	○		
ANEP (cultural heritage)	0,58	○		
Total Technical Assistance	15,67	Remaining to be financed	12,65	
General studies				
Legal plan of action	0,44	○	METAP/PNUD/MEDSPA	
Environmental data base	0,20	□		
Mechanism for financing cleansing	0,07	□		
Studies of rates and regulations	0,50	○		
Handling of dangerous waste	0,26	□		METAP
Water quality monitoring programme	0,04	□		METAP
Institutions for water resources management	0,12	○		
Reuse of effluents	0,50	○		
Soil resources (inventory, information, monitoring)	3,50	●		
Management structure for the Medjerda Basin	0,12	□		
Reorganisation of laboratories	0,20	○		
Environment of the Gulf of Gabes	0,50	○		
Evaluation of sites of cultural value	0,17	○		
Combatting noise	0,50	○		
Atmospheric pollution	0,20	○		
Revisions of master plans for development	0,52	○		
Total General Studies	7,84	Remaining to be financed	7,26	
Campaigns of sensitization and training				
National	1,75	○	0,70 (UNDP)	
On desert encroachment	0,30	●	2,20	
On the national heritage	0,35	○		
Total Sensitization Campaigns	2,40	Remaining to be financed		2,20
SUPPORT MEASURES	25,91	Remaining to be financed	22,11	

- ☆ Identified, to be evaluated
- ★ Evaluated (feasibility)
- Technical studies in progress

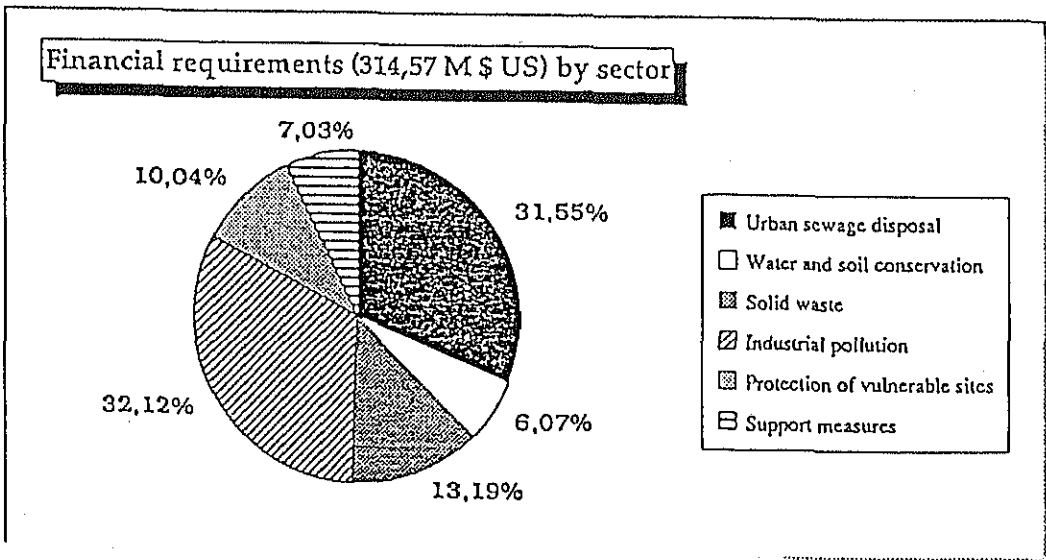
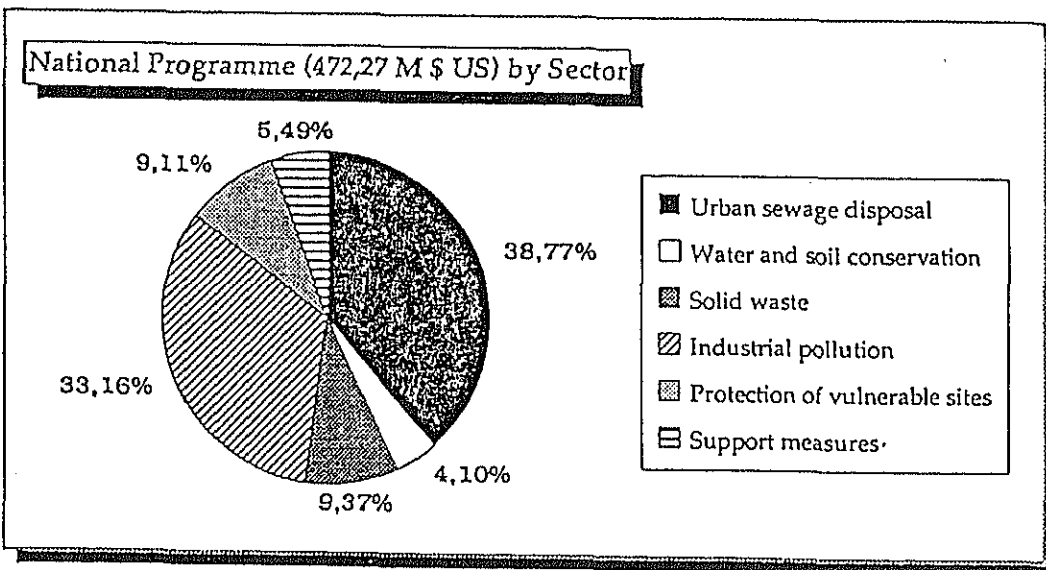
- Detailed technical studies ready
- Implementation to be assigned (tenders received)
- Implementation in progress

RECAPITULATION OF CHAPTER 7

The table and graphs below provide a summary and a breakdown of the plan of action and of the financing needs according to sector of action.

Summary par sector

	Total amount		Amount to be financed	
	en M \$ US	en %	en M \$ US	en %
Urban sewage disposal	183,11	38,8%	99,23	31,5%
Water and soil conservation	19,35	4,1%	19,10	6,1%
Solid waste	44,25	9,4%	41,50	13,2%
Industrial pollution	156,61	33,2%	101,04	32,1%
Protection of vulnerable sites	43,05	9,1%	31,60	10,0%
Support measures	25,91	5,5%	22,11	7,0%
GRAND TOTAL	472,27		314,57	



This document was prepared by the
AGENCE NATIONALE DE PROTECTION DE L'ENVIRONNEMENT
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ETAT DE LA LEGISLATION TUNISIENNE EXISTANTE
DANS LE DOMAINE DE L'ENVIRONNEMENT

チュニジアにおける現行環境関連法規一覧

Le législateur tunisien a édicté un certain nombre de textes-loi et décrets portant sur presque tous les domaines vitaux : Agriculture, industrie, santé, urbanisme, trafic routier...

AGRICULTURE

(1) Loi n°.83-87 du 11/11/1983 relative à la protection des terres agricoles, principale source de notre richesse nationale.

(2) Le code forestier : promulgué par la loi n°.66-68 du 4 juillet 1966 modifiée par la loi n°.73-25 du 7/5/1973, remplacé par un nouveau code promulgué en 1988. La forêt étant un patrimoine riche en ressources végétales, animales et hydrauliques.

(3) Loi n°.74-12 du 11/5/1974 protégeant les espèces de faune et de flore sauvages menacées d'extinction.

(4) Loi n°.76-6 du 7/1/76 créant l'Institut des Régions Arides Implanté à Medenine et contribuant à la lutte contre la désertification, à la protection de la nature et à l'utilisation rationnelle des ressources naturelles en milieu pastoral.

(5) Le code de l'urbanisme approuvé par la loi n°.79-43 du 15 août 1979 et la loi n°.76-34 du 4 Février 1976 relative aux autorisations de construire répondent à la politique de protection des terres agricoles.

(6) Loi n°.58-63 du 11 juin 1958 relative à la réforme agraire dans la basse vallée de a Mejerda. Cette loi inclut l'obligation pour les propriétaires de maintenir l'activité agricole constante sur au moins les deux tiers de propriété irriguée.

(7) Loi n°.63-18 du 27 Mai 1963 relative à la réforme agraire dans les périmètres publics irrigués est modifiée et complétée par la loi n°.71-9 du 16 février 1971.

L'ENVIRONNEMENT MARIN

(1) Loi n°.79-42 du 15 Août 1979 instituant le Commissariat Général à la Pêche chargé de veiller à l'exploitation rationnelle des eaux tunisiennes.

(2) Le code de la pêche constitué par :

Le décret du 26 juillet 1951 portant refonte de la législation de la police sur la pêche maritime modifié par la loi n°.63-49 du 30 décembre 1963 et modifié par la loi n°.87-12 du 23 mars 1987.

(3) Loi n°.73-49 du 2 août 1973 portant délimitation des eaux territoriales, arrêté sur l'exercice de la police de la pêche maritime (J.O.R.T 14 décembre 1951)

(4) Arrêté du directeur des travaux publics du 14 novembre 1951 relatif à la pêche dans la région de Salakta.

(5) Arrêté du directeur des travaux publics du 15 novembre 1951 relatif à la pêche aux poulpes dans la région de Ksibet El Mediouni.

(6) Arrêté du directeur des travaux publics du 19 mai 1952 relatif à l'installation de pêcheries fixes au voisinage des embouchures des lacs des Sidans.

(7) Arrêté du secrétaire d'Etat au commerce et à l'industrie du 12 septembre 1958 portant règlement de la pêche au feu.

(8) Arrêté du directeur des travaux publics du 14 juin 1955 relatif à l'exercice de la police de la pêche maritime.

(9) Loi n°.68-4 du 8 mars 1968 relative à la protection des phoques dans les eaux territoriales tunisiennes.

(10) Arrêté du ministre de l'agriculture du 16 avril 1977 portant réglementation de la pêche à la crevette, à l'aide de filets trainants de la première série dans le Golfe de Gabès.

(11) Arrêté du ministre de l'agriculture du 8 novembre 1983 modifiant l'arrêté du 14 avril 1977 portant réglementation de la pêche à la crevette à l'aide des filets traitants de la première série dans le Golfe de Gabès.

(12) Arrêté du ministre de l'agriculture du 14 juin 1984 modifiant l'arrêté du 16 avril 1977 portant réglementation de la pêche à la crevette à l'aide des filets trainants de la première série dans le Golfe de Gabès.

(13) Arrêté du directeur des travaux publics du 14 janvier 1955 relatif à l'exercice de la pêche des éponges en scaphandre.

(14) Arrêté du ministre de l'agriculture du 28 juin 1974 relatif à l'exercice de la pêche sous-marine de plaisance.

(15) Arrêté du ministre de l'agriculture du 26 février 1982 réglementant la pêche du corail.

(16) Décret du 3 juillet 1941 relatif à la pêche et la vente des coquillages et fruits de mer.

(17) Décret du 4 septembre 1952 modifiant le décret du 25 juillet 1941 relatif à la pêche et à la vente des coquillages et fruits de mer.

(18) Arrêté du ministre des finances et de l'agriculture du 19 novembre 1975 fixant la taxe et les frais de vacation à percevoir à l'occasion du contrôle de la salubrité des coquillages et fruits de mer.

(19) Arrêté du ministre de l'agriculture du 9 novembre 1973 relatif à l'institution d'une zone de protection biologique autour de l'île de Zembra.

(20) Arrêté du ministre de l'agriculture du 4 juillet 1980 relatif à l'institution d'une réserve marine intégrale autour de l'île de Galite.

(21) Arrêté du ministre de l'intérieur et de l'agriculture du 27 juillet 1974 relatif à la détention et au port d'arme par les agents garde-pêche.

(22) Arrêté du directeur des finances et du directeur des travaux publics du 29 avril 1953 fixant les modalités et la répartition du produit des amendes et du montant des transactions en matière de pêche maritime.

(23) Les conventions internationales : pour manifester sa volonté dans la lutte contre la pollution marine la Tunisie a adhéré jusqu'à ce jour à la plupart des conventions internationales relatives à l'environnement. A titre d'exemple la Tunisie a ratifié par la loi n°.77-29 du 25 Mai 1977 et publiée par le décret n°.79-935 du 16/11/1979, la convention pour la protection de la mer méditerranée contre la pollution et les deux protocoles y afférents signée à Barcelone le 25/5/1976.

LA SANTE

(1) Le décret du 8 janvier 1953 règle la police sanitaire maritime et aérienne.

(2) La loi n°.69-59 du 26/7/1969 relative aux maladies transmissibles à déclaration et désinfection.

(3) La loi n°.69-54 du 26/7/1969 portant réglementation des substances vénéneuses.

(4) La loi n°.61-39 du 7/7/1961 relative au contrôle du commerce des substances vénéneuses utilisées dans l'agriculture.

(5) Le décret du 3/2/1985 relatif à la protection des animaux contre les maladies.

(6) Quelques articles tels que les articles 315 du code penal, 82 et 104 du code des obligations et contrats peuvent être appliquées pour réparer les dommages causés par la pollution.

LE MILIEU NATUREL

La protection du milieu naturel concerne trois aspects :

I/ La Protection de la faune et de la flore

(1) Loi n°.58-83 du 25 août 1959 relative à l'élevage des caprins dans certains gouvernorats du nord.

(2) Loi n°.77-60 du 13 août 1977 modifiant la loi n°.76-115 du 31 décembre 1976 dont les articles 81-82, instituent un fonds spécial du trésor intitulé "Fonds de Sauvegarde de la faune cynégétique".

(3) Arrêté du ministère de l'agriculture du 27 juillet 1974 relatif à l'élevage et au commerce des animaux de mêmes espèces que les différents gibiers.

(4) Arrêté du ministère de l'agriculture du 23 septembre 1975 fixant les statuts de l'association nationale de la fauconnerie tunisienne.

(5) Protection de la flore et de la faune : Loi n°.83-87 du 11 novembre 1983.

II/ La Conservation et protection des sites naturels

(1) La section 5 du code forestier relative aux parcs nationaux (article 58-60).

(2) Le décret n°.77-340 du 1er avril 1977 portant création du parc national des îles zembra et zembretta.

(3) Les décrets n°.1606, 1607 et 1608 du 18 décembre 1980 portant respectivement création des parcs nationaux de Bou-Hedma, du Chambi et de l'Ichkeul.

(4) Arrêtés du ministère de l'agriculture de 6 juillet 1984 portant réglementation générale de chacun de ces parcs.

A côté du droit interne la Tunisie a ratifié 4 conventions internationales relatives à ce sujet.

III/ La Préservation du patrimoine culturel

(1) décret du 7 novembre 1882 : ce décret place "Les objets d'art et d'antiquité, les ruines de construction antique, les statues, fragments de colonnes, etc. Les inscriptions historiques, sculptées gravées ou écrites sur n'importe quelle matière sous surveillance du gouvernement beylical (Article 1).

(2) décret du 8 mars 1885 : ce décret porte création d'un "service des antiquités, beaux-arts et monuments historiques".

(3) décret du 7 mars 1886 : ce décret, par son titre un, assujettit la propriété des monuments, objets d'art et antiquités aux conditions d'une procédure de classement (article 10). Le titre deux définit le classement : "les monuments par nature ou destination dont la conservation au point de vue de l'histoire ou de l'art, présentent un intérêt sérieux, seront l'objet d'un classement ; (Article 2). Les effets du classement sont : pour le propriétaire, l'impossibilité de détruire ou de modifier ; pour les autorités publiques, l'établissement d'une responsabilité civile quant aux infractions (article 38).

(4) décret du 8 janvier 1920 : ce texte établit que toute antiquité immobilière ou mobilière antérieure à la conquête arabe "qu'on sait exister et qu'on découvrira par la suite dans le domaine de l'Etat, des municipalités ou des biens appartenant à des particuliers ou des collectivités sont la propriété de l'Etat Tunisien".

(5) décret du 3 mars 1920 : ce décret établit une délimitation "des souks de la ville arabe de Tunis en vue de leur préservation et de leur conservation". A l'intérieur de cette délimitation.

(6) décret du 11 mars 1920 : ce décret institue un comité consultatif des monuments historiques auprès de la direction des antiquités et arts.

7) décret du 13 septembre 1921 : ce décret étend les prescriptions du décret du 3 mars 1920 à trois nouvelles zones.

(8) décret du 12 août 1923 : ce décret soumet à l'autorisation préalable du président de la municipalité les changements d'affectation des immeubles habités bourgeoisement dans les trois zones délimitées par le décret du 3 mars 1920 et 13 septembre 1921.

(9) décret du 3 juin 1929 : ce décret interdit affichage ou publicité sur les immeubles classés dans les zones archéologiques définies non aedificandi, dans les quartiers ou agglomérations soumis à protection spéciale et dans les sites délimités au titre de la protection de monuments historiques.

(10) décret du 1er juin 1950 : ce décret délimite les souks de la Medina de Tunis où "la spécialisation traditionnelle par métier, industrie ou commerce doit être respectée".

(11) décret du 30 mars 1957 : porte création d'un Institut National d'archéologie et d'art.

(12) décret du 2 avril 1966 : ce décret, portant organisation de l'Institut National d'Archéologie et d'art, définit sa mission.

(13) loi 86-35 du 9 mai 1986 : relative à la protection des biens archéologiques des monuments, des sites naturels et urbains.

(14) loi 88-11 du 25 février 1988 porte création d'une Agence Nationale de Mise en Valeur et d'exploitation du patrimoine archéologique et historique.

IV/ Exploitation des ressources naturelles

Eaux :

(1) La loi n°.75-16 du 31 mars 1975, portant promulgation du code des eaux, régleme la conservation et l'utilisation des ressources en eaux.

A coté de ce code on peut citer 4 normes tunisiens homologuées concernant la qualité des eaux.

a/ N.T. 09-11-1983 : eaux de baignade - Paramètres physico-chimiques et micro biologiques.

b/ N.T 09-13-1983 : eaux superficielles destinées à la production d'eau alimentaire

c/ N.T 09-14-1983 : eau de boisson

d/ N.T 09-04-1983 : échantillonnages guide général pour l'établissement des programmes.

Mines et carrières :

(2) Décret du 1er janvier 1953 sur les mines pour être utilisé à des fins de protection de l'environnement.

(3) Article 93 du code minier prévoit que la recherche et l'exploitation des mines sont soumises à la surveillance de l'administration. Cette surveillance peut permettre indirectement la protection de l'environnement.

(4) Le décret du 28 Avril 1955 réglementant l'exploitation des carrières a également des dispositions se répercutant sur la protection de l'environnement.

(5) L'arrêté du Ministre des travaux publics du 29 novembre 1955 porte réglementation de l'exploitation des carrières.

(6) La loi du Ministère de l'énergie et des mines relatif aux carrières - Janvier 1987 renforce la protection de l'environnement.

L'URBANISME

A. La réglementation de la construction

(1) Le code l'urbanisme déjà cité

(2) Le règlement de l'urbanisme et de la construction de 1969

(3) La loi n°76-36 du 7 février 1976 remplace le décret du 22 Juillet 1943.

B. La lutte contre la pollution hydrique

La réglementation dans ce secteur s'avère très difficile. Certes, il existe plusieurs textes juridiques relatifs à la lutte contre la pollution hydrique mais souvent leur application pose des problèmes. Ces difficultés proviennent d'une part, d'un manque de coordination opérationnelle et de l'absence de décret d'application.

D'autre part, du fait du double objectif auquel la législation doit faire face à savoir :

- d'un côté préserver la qualité et la quantité du stock des ressources en eaux, d'un autre côté, prévenir et lutter contre la dégradation et la pollution de l'eau rejetée dans le milieu recepneur.

Les textes juridiques existants dans ce domaine sont :

- (1) Le code des eaux : Loi n°75-16 du 31 Mars 1975 (déjà cité).
- (2) La loi n°74-73 du 3 Août 1974 créant l'Office National d'Assainissement
- (3) Les règlements sanitaires municipaux
- (4) Le décret n°79-768 du 8 septembre 1979 réglementant les conditions de branchement et de déversement des effluents dans le réseau public d'assainissement
- (5) Le décret n°78-972 du 7 novembre 1978 modifiant et complétant le décret n°75-201 du 29 Mars 1975, portant institution des redevances d'assainissement
- (6) Le décret n°85-56 du 2 Janvier 1985 relatif à la réglementation des rejets dans le milieu récepteur.
- (7) Norme Tunisienne NT 186-82 (1989) du 20 Juillet 1989 relatif aux rejets d'effluents dans le milieu hydrique.

C. La lutte contre les nuisances

A côté de la réglementation des rejets dans le milieu recepneur la lutte contre les nuisances intéresse les déchets, les installations et les établissements classés, les substances chimiques, nocives et dangereuses, le bruit et les odeurs.

- Les établissements classés :

- (1) Le code du travail promulgué par la loi n°66-27 du 30 Avril 1966 traite au chapitre 6 des établissements dangereux, insalubres, ou incommodes.

- Les substances chimiques

(2) Le décret n°82 - 1355 du 16 octobre 1982 et l'arrêté du Ministère de l'Economie Nationale du 18 Juillet 1983 réglementent la récupération des huiles usagées.

(3) La loi n°61-39 du 7 Juillet 1961 réglemente le commerce et l'utilisation des produits pesticides à usage agricole.

(4) Un projet de décret relatif au polychlorure de biphenyle (PCB) est en cours de préparation au Ministère de l'Economie Nationale.

- Le Bruit

(1) La loi n°75-33 du 4 Mai 1975 portant promulgation de la loi organique des communes, pourrait être utilisée.

(2) Le décret n°84-1556 du 29 décembre 1985 relatif aux nuisances et bruit.

(3) L'arrêté du 29 Juillet 1955 modifie les arrêtés du 17 octobre 1951 et du 15 Avril 1954 relatif au bruit.

(4) L'arrêté des Ministères des Transports et Communications et de la Santé Publique du 27 Août 1984 est relatif au contrôle au point fixe du niveau sonore des véhicules automobiles.

- Les rayonnements ionisants

Les textes juridiques qui assurent la protection contre les dangers des rayonnements ionisants sont les suivants :

(1) La loi n°81-5 du 18 Juin 1981 est relative à la protection contre les dangers des sources des rayonnements ionisants.

(2) Le décret du 27 Octobre 1982 a créé le Centre National de Radio-Protection.

(3) Le décret n°86-433 du 28 Mars 1986 fixe les principes généraux de protection contre les rayonnements ionisants.

(4) L'arrêté du Ministère de la Santé Publique du 10 septembre 1986 est relatif aux demandes d'autorisation concernant les sources radio-actives des appareils d'irradiation.

Ainsi, d'après cet aperçu on peut constater qu'il existe un ensemble de textes juridiques qui touchent à presque tous les aspects du développement. Seulement pour une véritable efficacité de la

protection de l'environnement cette législation doit être aidée d'une prévention, d'un contrôle et d'une sanction.

C'est dans ce sens que la Loi n°88-91 du 2 Août 1988 portant création de l'Agence Nationale de Protection de l'Environnement a défini précisément dans son article 3 alinéa 6 et 10 l'une des principales missions de l'Agence :

- de lutter contre toutes les sources de pollution de nuisances et toutes les formes de dégradation de l'environnement ;
- de contrôler et de suivre les rejets polluants et les installations de traitement de tout rejet.

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