

**MEDITERRANEAN ACTION PLAN
PLAN D'ACTION POUR LA MEDITERRANEE**



**WORLD HEALTH ORGANIZATION
ORGANISATION MONDIALE DE LA SANTE**



**UNITED NATIONS ENVIRONMENT PROGRAMME
PROGRAMME DES NATIONS UNIES POUR L'ENVIRONNEMENT**

Workshop for experts on compliance and enforcement
of legislation in the Mediterranean for control of
pollution resulting from land-based sources and activities

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Athens, 16-18 March 1999

**REPORT OF THE WORKSHOP FOR EXPERTS ON
COMPLIANCE AND ENFORCEMENT OF LEGISLATION IN
THE MEDITERRANEAN FOR CONTROL OF POLLUTION RESULTING
FROM LAND-BASED SOURCES AND ACTIVITIES**

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Introduction

1. In 1976 the countries of the Mediterranean signed and adopted the Barcelona Convention for the Protection of the Mediterranean Sea against Pollution and a number of related Protocols. Between 1993 and 1996, the legal texts were revised to broaden their coverage and to modernize them as a result of the new concepts expressed at the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992.
2. Of particular importance is the Protocol for the Prevention of Pollution from Land-based Sources and Activities (LBS Protocol), signed in 1980 and revised in 1996, in which a new Article 6 calls for the strengthening and/or establishment of systems of inspection related to land-based pollution. In addition, Phase III of MED POL, adopted in 1997, includes a pollution control component to assist countries to fulfil the provisions of the LBS Protocol. The Workshop of Experts on Compliance and Enforcement of Legislation in the Mediterranean for Control of Pollution resulting from Land-based Sources and Activities (the Workshop) was therefore convened in Athens from 16 to 18 March 1999 as part of the MED POL Programme, jointly with WHO/MAP, to assess the situation in the Mediterranean and to propose future measures for action.

Participation

3. The Meeting was attended by experts from the following Contracting Parties to the Barcelona Convention: Albania, Algeria, Bosnia and Herzegovina, Croatia, Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Libyan Arab Jamahiriya, Malta, Monaco, Slovenia, Syria, Tunisia and Turkey. The Meeting was also attended by five invited international experts as well as by representatives of the IOC of UNESCO, METAP, the Blue Plan Regional Activity Centre, the Cleaner Production Regional Activity Centre, CEFIC/EUROCHLOR and Greenpeace. The full list of participants is attached as Annex I.

Agenda item 1: Opening of the Workshop

4. The meeting was opened by His Excellency Mr T. Koliopanos, Deputy Minister for the Environment, Physical Planning and Public Works of Greece, who said that at the dawn of the twenty-first century the need for the effective protection of the environment was more than evident. For Greece, with its long coastline, the marine environment was of exceptional importance and in an effort to protect it from pollution from land-based activities his country had developed strategic plans for wastewater processing in all coastal cities and for the management of industrial liquid and solid wastes. In addition, codes of agricultural conduct were being implemented and the quality of coastal waters had been monitored for more than a decade. The establishment of any infrastructure in the coastal zone was subject to an environmental impact assessment and an inspection system was currently being introduced. He concluded by welcoming all participants to Greece and wishing them every success in their work.

Agenda item 2: Scope and purpose

5. Mr L. Chabason, Coordinator of MAP, thanked the Deputy Minister and the Greek Government for their warm hospitality. Outlining the context in which the Workshop was taking place, he said that, following the adoption of a legal system designed to protect the Mediterranean from pollution from land-based activities, the time had come to see to its enforcement. Generally speaking, experts in the field noted an "implementation gap" between the legislative and enforcement stages. Accordingly, the authorities concerned, which might be national, regional or local according to the country, were in the process of developing the necessary instruments. To that end, they should bear three objectives in mind: (i) the need to ensure political coherence by requiring a strict record of any actions taken; (ii) the need to inform the relevant international organizations; and (iii) the need to provide companies with a measure of legal security through transparency.

6. The Workshop was therefore called upon to take up the issue in relation to the permit and inspection systems, after which it would examine and propose specific cooperative activities that would promote the implementation of legislation at the regional level.

7. Mr. Civili, MEDPOL Coordinator, indicated that the meeting was the first step in the new approach to enforcement and control under MEDPOL Phase III. He also reminded the meeting that, under Article 6 of the amended LBS Protocol, adopted in Syracuse in 1996, the Parties were to provide for systems of inspection to assess compliance with authorizations and regulations and for the establishment of sanctions in the event of non-compliance. He believed that for the Contracting Parties, which had already expressed their determination to eliminate all pollution from land-based activities by the year 2025, compliance and enforcement would play a vital role in achieving that target and concluded by stressing that the Secretariat was ready to assist them in that direction.

Agenda item 3: Election of officers

8. The Workshop elected the following officers:

Chairperson: Mrs. Marie-Christine Van Klaveren (Monaco)

Vice-Chairperson: Mr. Abdul Fattah Boargob (Libyan Arab Jamahiriya)

Rapporteur: Mrs. Tatiana Kotobelli (Albania)

Agenda item 4: Adoption of the agenda

9. The Workshop adopted the provisional agenda contained in Annex II.

Agenda item 5: Organization of the meeting

10. The Workshop agreed to commence by the presentations of the key issues by the international experts, to be followed by country reports. On the basis of these and the ensuing discussions, general comments and recommendations would be formulated.

Agenda item 6: Presentations of key issues by invited international experts

11. Mr. Rob Glaser, Inspector, International Environmental Affairs, Ministry of Housing, Spatial Planning and the Environment of the Netherlands, explained that he was the national coordinator for IMPEL (European Network for the Implementation and Enforcement of Environmental Law), which was an informal group of environmental inspectors for the exchange of experience and information. He emphasized that the views he expressed were his personal views and not necessarily those of his Ministry.

12. He described the regulatory cycle of environmental legislation: policy planning and the setting of objectives were followed by legislation, the establishment of a permit system, compliance control, the promotion of compliance, enforcement, and finally assessment and feedback, which could lead to improvements in the system and possible revision of policies, objectives or legislation.

13. He emphasized that a permit or authorization was a business contract drawn up in such a way as to be enforceable. Vaguely-worded limitations would not be enforceable and the terms of the contract should be specific enough to ensure that any violation could be proved in a court of law. It was thus important to obtain the assistance of legal experts when drawing up the format for permits.

14. Monitoring compliance with regulations and administering permit systems were increasingly onerous for governments faced with budgetary restrictions. One solution was to negotiate voluntary agreements with industry, but this implied that the industry concerned was sufficiently organized to constitute a valid partner in negotiations. Furthermore, alternative measures had to be put in place in case the voluntary agreements did not prove effective. The more organized an industry, the lesser the burden on the government.

15. Turning to future developments, he stressed that the first step was to obtain a clear picture of the existing situation. It was then possible to envisage simplifying the permit system, laying greater emphasis on self-reporting and monitoring, and assisting SMEs to become better organized so that they could become effective negotiating partners for the government. The current trend was towards less detailed inspections, moving from a media-based approach to an integrated approach.

16. In response to questions raised by participants, he said that the audit Scheme (EMAS Directive) was complex and could perhaps be simplified. Regarding the advantages and disadvantages of voluntary agreements, he indicated that governments found them beneficial because they were relieved of some of the workload and industry considered they were useful because they left industry free to decide on the best way of reaching the emission reduction target. Awareness of voluntary agreements and their advantages could be promoted through industry information centres and non-governmental organizations. He agreed that voluntary agreements and a country's international undertakings existed in parallel and agreements did not in any way diminish a country's international obligations. Voluntary agreement should not be used by authorities in countries where the government infrastructure is not capable of handling the consequences of failure to meet the set targets. Industries could enter into voluntary agreements with a view to moving towards an objective that might ultimately become an international commitment. He realized that it was not easy to reach agreement with industry in developing countries, but a start could be made by ensuring compliance with certain standards and then, once confidence had been built up, industry could be helped to impose more stringent voluntary standards. In connection with the cost of imposing Best Available Techniques (BAT) on industries in developing countries, he stressed that regulatory limits had to be realistic. Where it was not possible to oblige existing industries to utilize BAT immediately, the authorities could negotiate with the industry in order to decide on a realistic time-frame, but it was essential that there should be continuous improvement and that industries be helped to meet international commitments that had been incorporated into domestic legislation. He noted the comment by one participant that the cost of compliance was built into the cost of products, so in the multilateral context environmental regulations had an impact on trade.

17. Dr Panos Panagopoulos, ECOS Consulting S.A., Athens, Greece, emphasized that non-compliance response (also known as enforcement) was essential for the effectiveness of the regulatory effort. The objectives of the enforcement programme were (a) to restore violators to compliance; (b) to create an atmosphere of compliance in the community; and, in some cases, (c) to correct actual or potential harm to the environment caused by the violation.

18. A broad range of response options available to the enforcement agencies could be explored, including the usual options such as plant closures or fines, as well as less common ones such as clean-up, publicity of violations, environmental audit requirements, etc.

19. He explained the processes by which the various response options could be applied, i.e. administrative or judicial (civil or criminal). A determination of the appropriate balance between administrative and judicial measures would depend on the legislative background and culture of each country. In each case, the allocation of administrative responsibility for enforcement should clearly lie with one (accountable) authority; this authority should be responsible for the consistent and integrated enforcement of all environmental legislation and permit conditions.

20. The formulation of a fair and consistent response policy was of major importance for the credibility of the enforcement authority. The response policy should provide for (a) warnings to violators on the need to comply within a specified time limit; and (b) means for appeal by violators to a higher (administrative or judicial) authority, if they felt that the enforcement measures applied were unsubstantiated and/or unfair.

21. In order to perform its function efficiently, it was imperative that the enforcement authority keep detailed records of the enforcement processes and follow-up all cases on the basis of these records. It was recommended that the enforcement agency periodically evaluate the success of the enforcement programmes and publicize its results, in order to amplify the impact of its operation.

22. Because of the importance of enforcement for compliance, inspection and enforcement efforts should be balanced and coordinated, for example:

- the facilities to be controlled should be targeted in such a manner that the inspection and enforcement workload could be met by the available resources; and
- the inspection and enforcement responsibilities should be allocated in such a manner that all violations determined by inspections could be fully acted upon.

23. Feedback to the preceding stages in the regulatory cycle was a prerequisite for building-up experience in the enforcement agency. The most valuable feedback, however, concerned the adequacy of existing environmental legislation and creating conditions for the effective protection of the environment; this type of feedback entailed an extensive programme for regular assessment of the state of the environment in the country, however, and that required a formidable effort.

24. In the ensuing discussion, Mr Panagopoulos agreed with a comment relating to the importance of compliance promotion, which came at an earlier stage in the regulatory cycle. In response to a question concerning the procedure to be followed when an industry itself informed the authorities of a violation, he suggested that in order to encourage self-monitoring the severity of the penalty could be reduced. Two experts raised the question of sanctions: one of them pointed out that international conventions tended to neglect the subject, with the result that sanctions were often inadequate. The only solution, in his view, was to include environmental law in the criminal code, thus making violations a crime. The other comment related to countries in which sanctions were covered by national legislation; in such cases, it was essential to ensure that the sanctions, as actually applied, were proportional to the damage inflicted on the environment. Another expert commented that at the international level enforcement tended to become a political issue, making it necessary for each country, in accordance with its circumstances, to do its utmost to implement legislation for the protection of the environment.

25. Mr François Durand, French Ministry of Land Use Planning and the Environment, said he would confine his remarks to a few major concepts that were derived from his administration's experience but were, in his view, valid for other countries. They could be summarized under four headings:

- a) "Protected interests", such as the environment, followed by public health.
- b) "Integrated control", which was the subject of an EU directive, consisted in preventing pollution resulting from industrial activities. The integrated approach favoured the issue of a single permit to a factory by a single authority.
- c) The "decision", which consisted, in the case of industrial activities, in the issue by one and the same authority of a permit for the purpose of protecting the

environment. It involved control over upstream flows and was based on an environmental impact assessment carried out by the party seeking the permit and evaluated by the competent authority. The decision was taken on the basis of certain major principles: prevention; precaution (in the case of uncertainty over the nature of the risk); "minority views" (contrary to the interests of both the industrialist and the competent authority, and emanating from "unforeseen partners" (such as the public, NGOs, etc.)). Minority views represented the country's or the region's environmental conscience and led to a debate in which the industrialist had to provide further explanations, thereby helping to improve the system. Two other basic concepts should also be taken into account: "transparency" upstream (public consultation at the permit issuing stage) and downstream (public access to monitoring results), associated with "traceability", i.e. the possibility of tracing the origin of the decision, with all the relevant elements of the file.

- d) Lastly, the "competent authority", which issued the permit and might check compliance with it, was a public legal entity. It should be independent of economic interests in order to avoid any suspicion that the environment or public health might be hostage to such interests.

26. In the ensuing debate, an expert asked whether it was preferable to have two different authorities for the permit and for compliance with it. Mr Durand said that such was not the case in his own country, but it depended on the national or local context and both approaches could be valid. In that connection, the Coordinator of MAP recalled his own experience in certain international bodies such as the Organization for Economic Cooperation and Development (OECD): some countries had single systems, others highly separate ones. In the latter instance (Sweden, for example), the ministry was responsible for the legislation but not for its implementation, which avoided any political interference. Other bodies that were independent of the political authorities were responsible for investigating cases and disputes, including consulting public opinion, associations and so on. On the other hand, no appeal was allowed once the decision had been taken.

27. Another expert expressed the dilemma as follows: the advantages of a single authority for the two stages consisted in fewer staff and a better knowledge of the facilities (already inspected at the investigation stage), while the drawbacks were the lack of mutual verification and increased vulnerability to political pressure as a result of placing more emphasis on the issuing of permits than on inspection.

28. Mr G. Boeri, Departmental Director of the Agenzia Nazionale per la Protezione dell'Ambiente (ANPA), Italy, explained that environmental control could be seen as the complex of actions tending to ensure compliance with laws, regulations, prescriptions and conditions, international agreements (inspections) and to guarantee a reliable and continuously up-dated picture of the quality of the environment and other information that made it possible to follow and forecast the evolution of environmental phenomena and trends (prevention and guidance).

29. The action of control could be source-oriented (i.e. the control of a single source with definite spatial localization), typical of control of compliance with laws, regulations or the permit conditions, through inspection, or environment-oriented (i.e. the control of the state of the quality of the environment in order to evaluate the combined effects of a sum of sources - cumulative effects - trends, effects of unknown or diffused sources and the monitoring of chosen parameters for a description of the state of the environment).

30. Environmental inspections were a key activity for the implementation and enforcement of environmental law and were essential to secure a high level of environmental protection. Inspection in its broadest sense was an activity that entailed (i) checking and promoting the compliance of industrial installations with requirements fixed in laws, regulations, ordinances,

directives, prohibitions and/or permits etc.; and (ii) monitoring the general impact of specific industrial installations on the environment that might lead to enforcement action or further inspection.

31. The aim of inspections included (i) examination of compliance with relevant legal and technical requirements so as to determine the implementation of relevant regulations, laws and ordinances; (ii) examination of conformity between the operation and the permit; and (iii) examination of the operators' self-monitoring systems to check their ability to comply with requirements.

32. The key elements for inspection activity related to industrial installations or other relevant economic and human activities were (i) planning - setting out a clear framework for inspection activities at the appropriate geographical or organizational level; (ii) collection of site-specific information - from visits, site surveys, etc.; (iii) analysis of results and follow-up at the site/company level; and (iv) regular evaluation and reporting of inspection activities.

33. Mr Boeri concluded his presentation by describing new monitoring techniques, the role of voluntary agreements, in particular, EMAS, and making some suggestions relevant to the Mediterranean Action Plan.

34. In the exchange of views that followed the presentation, an expert pointed out that the developing countries tended to give more emphasis to the inspection process than to evaluation and feedback. Mr Boeri considered that problems might arise if the two activities were conducted separately by different authorities. The solution might be to arrange for regular reviews of the regulations by the two authorities concerned. Mr Glaser commented that it was essential to establish an independent inspectorate that made regular annual reports. An expert took the view that while bodies might be autonomous, they could never be entirely independent. Another speaker drew attention to the importance of integrated pollution control under the responsibility of a single body.

35. A short discussion was held on the issue of environmental and source monitoring. One expert considered that environmental control, while still necessary, was being superseded by source control, one of whose advantages was that it could incorporate the precautionary principle. Mr Boeri pointed out that environmental control covered diffused or unknown emissions and the global effects, making it possible to ascertain the overall or cumulative level of pollution. The representative of UNESCO/IOC said that environmental monitoring was of the highest importance because it could reveal that the pollution levels authorized by the permit were producing unacceptable results. The representative of METAP drew attention to the important distinction between ambient and emission standards, the former being decisive, while the latter were only a means to an end. An expert agreed that environmental quality control was indispensable to the monitoring of effects. Finally, in response to a comment on the reluctance of some industries to accept on-line control systems, Mr Boeri said that in Italy they were sometimes included in the permits, making compliance compulsory. It was essential, however, to check that the actual measurements made were meaningful.

36. Mr. Emad Adly, President of the Arab Office for Youth and Environment, introducing a report on public participation and the role of NGOs in the framework of compliance with, and enforcement of, legislation for pollution control, said that public participation had again become a topical issue. Without the involvement of the people in the development process, it would be very difficult to ensure the sustainability of any action taken solely by governments. With the start of practical democracy in the southern countries of the Mediterranean, communities had begun to learn more about their responsibilities. In that context, NGOs became an important actor, with responsibility for mobilizing the community. Most NGOs were working in the area of awareness raising - the foundation of real democracy. Governments also had to show their willingness to work in partnership with civil society and the private sector. As a result, they were starting to adopt new strategies to face environmental problems, and in particular pollution.

37. Strong public participation depended on three essential elements:
- (a) awareness, which called for information dissemination, training and democracy.
 - (b) availability of alternatives, which could be a new technology, a new system, or a new law. To that end, it was crucial to find appropriate financial and technical mechanisms.
 - (c) law enforcement and incentives: public participation required incentives, a fact which was unfortunately forgotten in most systems.

38. The objectives of public participation were to inform the public, to create pressure groups, and to provide information. The conditions for public participation were accountability, transparency, effective monitoring, clarity of vision, balance of power and the availability of information. In the process, the direct partners were the private sector, central government, the local administration, NGOs, universities, media and unions, etc, and international agencies and donors. The impediments included disagreement about the subject of dialogue, the absence of a common language, the unavailability of information, the absence of an institutional framework for dialogue and a feeling of mistrust. The conditions for implementing the results of dialogue included a democratic environment, strong follow-up and the availability of resources to implement what was agreed upon.

39. As examples of public participation he cited two court cases won by an NGO in Egypt, and environmental hotline service. This service linked society with environmental problems and encouraged the community to share responsibility for protecting the environment. The service is developing a database on environmental problems for Greater Cairo, helping to raise environmental awareness in the community and to stimulate the role of NGOs.

40. Recommendations included the availability of information to the public and transparency. More effort was needed in awareness raising, training, public hearings and helping the public to go to court, if necessary. International NGOs and networks could facilitate the transfer of experience from country to country. In addition, UNEP-MAP had an important role to play by facilitating dialogue among the different partners and possibly through the MCSD. Lastly, emphasis should be placed on the importance of incentives in the process of law enforcement.

41. The Coordinator drew attention to the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (the Aarhus Convention), adopted within the framework of the United Nations Economic Commission for Europe. He noted, however, that the revised Barcelona Convention contained excellent provisions on public participation and, once it had entered into force, compliance with those would suffice.

Agenda item 7: Presentation of country reports

42. Experts from the following countries presented reports on compliance and enforcement of legislation in their countries (see Annex III to this report): Albania, Algeria, Bosnia and Herzegovina, Croatia, Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Libyan Arab Jamahiriya, Malta, Monaco, Slovenia, Syria, Tunisia and Turkey.

Agenda item 8: General comments and recommendations

General comments

43. The Participants expressed their satisfaction at the convening of the meeting, which had provided a valuable opportunity for the exchange of information and experience on compliance and enforcement. The fact that virtually all the Mediterranean countries had responded to the questionnaires and presented reports underlined their interest in the question and their

determination to make further progress. In particular, the presentation of the national reports indicated that in recent years tangible progress had been made as regards compliance with environmental regulations. It was also noted that MAP had played an effective role in encouraging the formulation and adoption of national environmental legislation.

44. The presentations showed that all countries had permit systems, even though they did not necessarily cover all polluting activities or were too complex, thus making them difficult to apply. In the majority of countries, too many authorities were involved in issuing permits and in inspection.

45. In most countries, compliance with legislation on economic activities and infrastructure and its enforcement were improving; in many cases their management was centralized. There was generally some form of compliance verification, although integrated inspection systems did not exist in all countries. Several countries had nevertheless strengthened their inspection structures. In others, however, inspections were only carried out irregularly owing to the limited number of inspectors. Several countries expressed a desire to receive assistance in order to strengthen and further develop their national inspection structures.

46. The presentations showed that Environmental Impact Assessment was in common use, although its application in some countries still appeared to present difficulties. The practices of Best Available Techniques (BAT) and Cleaner Technologies (CT), however, did not yet appear to have been taken into account in the majority of countries.

47. It was noted that there had been progress in involving environmental NGOs in the decision-making process in a number of countries, thus highlighting the important role of public participation in the compliance and enforcement processes.

48. The Participants underlined the need to strengthen the exchange of information among countries, to share achievements and to identify bottlenecks in the implementation of regulation and inspection systems.

49. In conformity with the LBS Protocol, stress was laid on the need to control not only economic activities but also non-economic activities, including infrastructures physically altering the coastal zones and activities causing diffused pollution.

50. The Participants shared the view that voluntary agreements with economic actors, industry in particular, although not a substitute for regulations, could play an important role in implementation and compliance and should be strengthened, with a view to adopting an integrated approach.

51. Considering the new legal context existing in the Mediterranean after the revision of the Convention and the Protocols, aimed at a broader and stricter control of pollution, the application of the relevant provisions (e.g. article 6 of the amended LBS Protocol on systems of inspection), demanded the ratification of the legal texts. As a result, all countries that had not yet ratified the Convention and its related Protocols, in particular the amended LBS Protocol, should be urged to work actively and expeditiously to that end and to adopt implementing legislation at the national level.

52. The following was recommended by the participants:

Recommendations to the Secretariat

- a) To establish an informal regional network aimed at:
 - (i) Facilitating and creating contacts with other environmental protection professionals in the region;

- (ii) facilitating discussion on and development of environmental protection;
 - (iii) establishing contacts with other regional networks and relevant international frameworks that have similar exchange programmes in other regions;
 - (iv) facilitating the exchange of information and possible comparison of requirements relating to: compliance with source and environment regulations; information on procedures for the issue of permits for installation (e.g. cross-media evaluation, self-monitoring, etc.); enforcement arrangements dealing with compliance assessment and inspection; technical standards and pollution control technology.
- b) To develop supporting measures, such as capacity-building programmes for inspectors and/or senior managers of control authorities, and to prepare manuals and guidelines covering regulatory processes with new environmental tools and facility inspections. Training courses and seminars for trainers could initially be organized at the regional level with a view to using the content for courses at the national level. Full use should also be made of national experience in this field.
- c) Future activities related to inspection systems might include:
- (i) Assistance (upon request) to countries in the formulation of country-tailored programmes to improve enforcement activities based on an integrated approach;
 - (ii) as a first step, activities could be developed through an exchange of information, and demonstration projects as appropriate, including the application of Cleaner Technologies and Best Available Techniques (BAT).

Recommendations to the Contracting Parties

- a) To urge Contracting Parties that have not yet done so, to work actively and expeditiously to ratify the Convention and its related Protocols, in particular the amended LBS Protocol, and to adopt implementing legislation at the national level.
- b) To give priority to the establishment or strengthening of permit systems and inspection systems that would be practicable and efficient.
- c) To ensure coordination and coherence between the environmental permit systems and any other applicable permits required (e.g. building, operating etc.) The environmental requirements should precede the issuance of other permits.
- d) To promote the introduction of Best Available Techniques (BAT), and Cleaner Technologies.
- e) To facilitate access by the general public to information on the permit process and compliance.
- f) To promote pollutant release and transfer inventories at the plant/facility level, public access to such inventories, and public right of recourse with respect to any alleged violations.
- g) To consider, where they do not already exist, the use of financial mechanisms that provide both disincentives for undesirable activities and non-compliance as well as incentives for cleaner production alternatives.

- h) To promote closer cooperation with the industrial sector, including dissemination of information regarding environmental protection initiatives taken by the industry, such as participation in international programmes (e.g. responsible care), and to encourage voluntary agreements.
- i) To introduce environmental law into the criminal code.
- j) To ensure that national authorities continue to implement regular source and environmental monitoring (physico-chemical and biological) in parallel with the self-monitoring carried out by industry that should be encouraged under the permit system.

Adoption of the Report and closure of the meeting

53. The Participants unanimously adopted the French and English texts of the draft report.

54. At the closure of the Workshop, the Secretariat underlined the important work carried out by the Workshop in relation to the effective implementation of compliance and enforcement of legislation for the control of pollution resulting from land-based sources and activities.

55. After the customary exchange of courtesy, the Chairperson declared the Workshop closed at 13:45 hours of 18 March 1999.

ANNEX I

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ANNEX II

AGENDA

1. Opening of the meeting
2. Scope and purpose
3. Election of Officers
4. Adoption of the Agenda
5. Organization of the meeting
6. Presentation of key issues by international experts
7. Presentation of country reports
8. General comments
9. Adoption of the report and Closure of the meeting

ANNEX III

COUNTRY REPORTS

The attached reports are reproduced in the form in which they were received from the countries concerned.

ALBANIA

REPUBLIC OF ALBANIA
NATIONAL ENVIRONMENTAL AGENCY

Dr. Tatiana KOTOBELLI
DIRECTOR OF AIR, WATER QUALITY AND WASTE MANAGEMENT DIRECTORATE

COUNTRY REPORT

ON
COMPLIANCE AND ENFORCEMENT OF REGULATIONS IN THE
MEDITERRANEAN FOR THE POLLUTION CONTROL RESULTING
FROM LAND BASED SOURCES AND ACTIVITIES.

I-BRIEF INTRODUCTION ON THE COUNTRY

Albania is a parliamentary Republic. The parliament has only one chamber of 140 members, elected mainly by majority system. The head of the state is the president of the Republic. In November 1998 the Constitution of Republic of Albania was approved by the people and parliament. The new constitution laid down the foundations of a democratic state in conformity with advanced relevant democratic standards. The Article 56 of the constitution guarantees the right of the citizens to be informed on the state of environment and its protection. The Article 59 obliges the responsibility of the state (under the disposed premises) to provide a sound and healthy ecological environment for the present and future generations and a rational use of soil, pasturage, forests, other natural resources, based on the principle of sustainable development.

Albania is a small country situated in the south Western part of Balkan Peninsula, on the coast of the Adriatic and Ionian Seas. Albania covers 28748 km² (34.8% are comprised of forests, 15% of pasture, 24.3 % of agricultural land and 4% of lakes). The sea surface area within the state borders is about 12900 km². The general longitude of the border line is 1094 km, out of which 529 km covers the border with the former Yugoslavia and 271 km with the border of Greece. The coastal line is 476 km long.

The population is 3 324 000 inhabitants (1997¹) of which 1798000 live in the rural area and the rest in urban area. The average density of population in 1997 was 115 inhabitants/km².

The population mobility is a random phenomena in Albania. The rates of population growth is lower than the rates of rural population migration to urban areas. The countryside is abandoned by the people more and more. The capital of Albania is Tirana with about 550000 inhabitants. The migration phenomena is influencing obviously the quality of environment and quality of life for such people category and autoctone populations.

The Albanian landscape is very rich and diverse and is comprised of beaches which lay near the Adriatic and Ionian Seas, and chains of hills and mountains, most of which are

¹ Source : Human Development Report Albania 1998

deforested. The natural lakes of Shkoder, Prespa, Ohrid, Butrinti, Lura, several artificial lakes, and the lagoons of Lezhe, Narta, Karavasta and water reservoirs along the coast create thousands of special and beautiful natural views which constitute a precious wealth for our natural environment. The climate is mainly Mediterranean. In the Southern part of the country, the climate tends to be subtropical, while in the north the mountain ranges have alpine climate.

The political, economic and social situation of Albania during the last years has changed. The orientation towards market economy, the extension of private activities, and the increase of foreign investments put forward a lot of challenges towards the existent industry. The majority of the existing industries are on eve of bankruptcy due to the very difficult financial situation. From the view point of environmental protection it is very important to consider as necessity that the environmental protection be treated as one of the most priority issues in consistence with the experience of developed countries and international standards, by applying the important principle of "*Sustainable development*"

II- BACKGROUND INFORMATION

The economic, social and civil society profile of Albanian development is changing rapidly. During the transition period the contribution of different sectors in GDP has noticed great changes. The decrease of industrial production contribution in GDP more than 3 times since 1990, has led to positive significant outputs as regards environmental protection. This is achieved due to the liquidation of multiple dangerous sources of environmental pollution. Table 1 provides some significant data²

<u>Sector</u>	<u>% GDP 1997</u>	<u>%GDP 1990</u>
Industry	12.4	37.2
Agriculture	56	40.2
Construction	11.2	6.6
Transport	2.7	3.3
Others	17.6	12.7

However the inherited environmental burden from the past, still represents a strong threat for the quality of the environment in general and specially in the coastal area. Amongst the industries or other sectors having a potential negative impact on environmental quality of coastal area are :

1. The continuous sources of pollution as : petroleum refining, metal industry, tanning industry, urban discharges, food processing, energy production and cement production.
2. The historical pollution dealing with big sources of potential hazards as the plant of nitrogen and urea production in Fier; Soda and PVC production in Vlora area and PortoRomano area contaminated with Chromium 6 valent and pesticides.

² Source : Human DevelopmEnt Report Albania 1998

The fertiliser factory (urea and ammonium nitrate) was shut down in the 90's and represents now some maintenance. Due to the type of the process carried on the plant for about 30 years, the abandoned chemical plant poses a serious threat to the environment and human health in the area. There are as well three old elevated steel tanks located within plant storing without any specific control hazardous waste materials 850 m³ of arsenic solution). Tank failure could represent a major hazard for the surrounding area and for the population living there. The presence of Arsenic constitutes an uncontrolled source of potential pollution for the local groundwater resources, Gjanica river and Seman river which flow directly to Adriatic sea.

The chemical plant of soda and PVC in Vlora was shut down as well in 1990. The contaminated area because of industrial wastewater and solid wastes disposal for a 30 years old period, (soil, surface water, ground water and sea water) with Hg and other pollutants level is under a partial study to be carried out by some national scientific institutions in co-operation with Italian counterparts.

The area of PortoRomano located in Durresi Bay, being contaminated with dichromate and linden pesticides represents a big threat. With the initiative of NEA and emergency fond of Italian Embassy in Tirana, during the summer 1998, the linden and bicromate wastes were evacuated to be stored in a high security place. However it remains to evaluate the environmental risks (specially for human health and coastal area) and to draft low cost rehabilitation plans for them. The NEA is working on finding technical and financial assistance to perform such studies.

The tanning industry is developing in country side and in coastal area. We have some factories in Durres, Vlora, Korca, Tirana districts etc. The NEA has provisionally licensed them in the condition that the discharges must respect the European standards. However there are some problems of compliance as well.

The metal refining industry is located in the central part of the country and the pollution has more local character. Although the pollution mobility is lower, the industrial solid waste of Copper and Chromium mines and the liquid discharges of mineral enrichment and treatment, represent a certain risk for human health in surrounding, environment and coastal area. The risk should be assessed by profound studies.

The liquid and solid discharges of petroleum industry (drilling and refining) constitutes a big source of environmental pollution. The content of phenols overpasses the permitted national and European standards more than 100 times. As regards the macropollutants content, their values for liquid discharges show a high pollution level. The pollution from petroleum sector is considered a very big source of the pollution specially for coastal line. Being aware of the this fact, the NEA has planned to undertake an environmental auditing process of the national refinery of petroleum in Ballsh. This project is expected to start this year in July, and will be financed by METAP under the Immediate measures of NEAP Updating.

BAT or CP technologies in Albania

There is a Law on Foreign investment in the Republic of Albania, which entered into force in 1992.. There are in force as well some specific laws as the basic law On environmental Protection, the Law for Hydrocarbons and the Mineral Law. Non of them provides binding obligations for using Best Available Technologies or Clean Technologies to be invested in Albania. But there are some relevant Articles taking into account the environmental protection as:

The Law for Hydrocarbons, entered into force in 1993, aims to promote the research and production of petroleum and natural gas and other asking for relevant technologies (operations) that will not threat human health or damage environment. Article 6 of this law obliges the contracting parties to carry out hydrocarbons operations according to the present law, law on environmental Protection and to prepare a development plan on :

- efficient use of HC reserves,
- to protect the environment and human life in the area where the hydrocarbons operations are to be performed.

The Mineral Law preview the obligations to prevent any environmental pollution and damage, to treat the mineral's sterile, protection of natural environment, remediation of damaged area and minimisation of any environmental impact on surface water, groundwater quality, soil quality etc.

The NEA for the new activities (specially invested by expatriate investors) agrees generally to accord the environmental permit only in the conditions of compliance with European standards.

State of environment in Albania

The NEA is collecting all the available data in order to draft the State of environment report for 1997 and 1998. Based on such data, it results that the most problematic area are the mouthfall of Seman river in the Adriatic Sea. The content of Phenols and COD in the Gjanica river and Seman river is high because of petroleum drilling and processing industry in the area. The surface and groundwater quality in the coastal area of Durres and Golem is appropriate. However the conclusions will be more clear after the Treatment of all the data for all the surface and ground waters sources in Albania. The disposal of urban waste close to river beds has led to the increasing of pollution for water sources.

Based on the SoE report for 1995-1996, results that generally the surface and ground waters are not polluted.

The NEA is now proceeding to prepare the SoE report for 1997-1998 that is expected to be approved by the Albanian government and published in September 1999.

environmental monitoring

The responsibility of environmental monitoring performing is legally differentiated for a certain number of scientific institutions and ministries. The NEA is the responsible for the co-ordination of such a work and collect of the available information.

The legal acts and provisions for environmental monitoring are as follows :

1. The basic law No. 6694 "On environmental Protection" (herein after called the basic law) dated on 21.01.1993 amended by law number 8364, dated on 2.7.1998, Article No. 26 says :

1. *The monitoring of state of Environment consists in the control of natural and human protection of the environment, observing and recording of its change and observing the sources or causes of such changes. The data collected by the control serves as a basis for information on the state of environment, reviewing or cancelling of environmental permits and for taking the relevant measures determined by this law.*
- 2.
3. The Decision of Council of Ministers No.541, dated on 25.9.1995 "On the tasks that the Ministries, institutions and juridical and physical persons have for environmental monitoring and control.

The monitoring scheme is :

- Public health institute should monitor the quality of air in urban areas, drinking water quality, urban wastewater quality and the coastal line quality (microbiological, etc.)
- The Hidrometeorological Institute is responsible to monitor air quality in the overall territory of Republic of Albania, meteorological indicators, rainfall measurements and their quality(acidity. solid content etc.), surface water quality and other parameters.
- The Soil Studies Institution is charged with monitoring of the quality of arable soil, their fertility, content of heavy metals etc., and the quality of irrigation water.
- The institute of Chemical Technology studies is charged with the monitoring of the quality of industrial wastewater, industrial solid waste and urban waste.
- The Museum of Natural Sciences, the Institute of Biological Studies is responsible for the monitoring of the biodiversity, habitat protection and genetic fond of Albania.

Under the MEDPOL Program, Phase I, II, The CEP(NEA) has organised the work with the Faculty of Natural Science and Institute of hidrometeorology to render possible the monitoring of biota in some stations (coastal and sea line) for pesticide control and heavy metals. We are co-operating with such institutions to establish a monitoring plan (compliance and trend scheme) under the Medpol Program Phase III.

This monitoring scheme is facing great difficulties because of financial and logistic lacking and weakness of the state structures. The NEA is now working on to establish a national monitoring program with the most appropriate environmental indicators. The aim is to draft a optimum monitoring program which could give to our Agency the necessary data to draft the SoE report based on OECD criteria. An other aim is the evaluation of the cost of this program implementation in order to find the due and stable financial sources.

Public participation in decision making

The public participation in decision making as a citizen's right is recognised by the law. Due to the low national environmental public awareness level, this right is not used in the proper way. The public has the right to be informed or to have access to information on general environmental issues as State of the environment, industrial wastewater, solid waste, air emissions quality and quantity, and EIA performing. There are some sporadic cases where the public has opposed the new constructions without and with permission, in public or green places, operation of some pollution sources locating closed to urban areas, waste disposal sites selected on doubtful criteria, etc.. The role of different media and specifically the electronic one, is playing a very important role in giving some information on environmental issues, in joining the efforts to protect the environment, in raising the national environmental awareness. Since the basic law did not provide for procedures and public rights to participate generally in environmental decision making, and to improve it in some different directions, this Law was amended 1998.

The Law on environmental Protection according to Art. 12 provides for public participation only in the case of EIA performing for Different activities: *"Interested juridical and physical persons have the right to participate in the process of defining the results of EIA. They are informed through the public information means on the national and local level or other means appropriate for the EIA procedures at least one month before its beginning"*.

Even in this case there is a lack of appropriate procedures and the practise is very poor.

The amended low provides for : *Institutions, physical and juridical persons, are obliged to preserve and protect the Environment and use it according to the principle of sustainable Development. It is guaranteed for each individuals the right of having access to the Environmental information from the specialised institutions and influencing the Environmental decision making. Public participation can be realised by individuals or Environmental NGO-s.*

There is no Article in the law for obligation of the Government to consider seriously the comments made by individuals/NGOs. However, in practise, there have been cases in which environmental officials or other have considered opinions and comments informally gave to them.

The NEA is doing some efforts to hear more than now the voice of environmental NGOs, organising consultative meetings, common activities, inviting NGOs representative in its meetings etc. In this regard, NEA is working hard to write down the guidelines for public participation in decision making, to organise a national environmental awareness conference with a strong support for NGOs, to draft the LEAP (local environmental action plans) guidelines etc..

III ENVIRONMENTAL LEGISLATION

The list of main laws and other legal acts dealing with environmental procession are :
Law No. 7664 dated on 21.01.1993 "On Environmental Protection", amended by the Law No. 8364, 1998.

Law No. 7623 dated on 13.10.1992 "On Forestry and Forest Service Police"

Law No. 7693 dated on 16.04.1993 "On Urban Planning", amended in 1998
 Law No. 7875 dated on 23.11.1994 "On protection of savage fauna and hunting"
 Law No. 7908 dated on 5.4.1995 "On fishing and aquaculture"
 Law No. 7722 dated on 15.06.1993 "On protection of natural fond of medicinal plants, and tanifers"
 Law No. 7917 dated on 13.4.95 "On Pastures and Meadows"
 Law No. 7929 dated on 11.05.1995 "On the protection of orchards"
 Laws No. 8093 dated on 21.3.196 "On water resources"
 Law No. 8094 dated on 21.03.1996 "On the public removal and Treatment of the urban solid waste"
 Law No. 8102 dated on 28.03.1996 "On regulatory framework of water supply, removal and Treatment of waste water.
 Decision of Council of Ministers No. 228 dated on 27.5.1992 : "On the protection of urban Environment from pollution and damage"
 Decision of Council of Ministers No. 451 dated on 16.9.1993 "On maintenance of caves"
 Decision of Council of Ministers No. 584 dated 6.12.93 "On Approval of pesticides rules to be used in agriculture"
 Decision of Council of Ministers No. 26 date 31.1.1994 "On hazardous waste and waste"
 Decision of Council of Ministers No. 541 date 25.9.1995 "On the tasks having the ministries, institutions and juridical and physical persons for monitoring and Environmental control"

During the 1998 the recent development in legislative framework is achieved :

- the approval by the government of the National Plan for Solid Waste management,
- the strategy of the Waters management was presented for approval by the government
- The basic law On environmental Pollution has been amended
- The Law On Urban Planning has been amended.

A part of such documents are outputs of Phare program A109396 implementation and are very important because they have a lot of recommendations for completing the legislative framework in the due directions and propose the best technical solutions.

The law on environmental Protection is a general Law with wide spectrum of environmental protection issues. The Article 4 of this law says : *The environmental protection from pollution and damages includes the protection of acquit ecosystems, soil ecosystems, nature and landscape and atmosphere. Detailed rules for water, air, soil, nature, landscape protection are to be decided with special legal Articles , laws, regulations, dispositions.*

In this regard, the NEA has planned for the 99 working program the preparation of some important laws and regulatory acts or guidelines in the field of air protection, water protection and the standards of industrial discharges in conformity with European directives. There are the Biodiversity Law and EIA Law under preparation as well. Thus, the environmental legal framework will be completed to such a way to enable the NEA to face better than now, the environmental challenges of the total development. –

At the moment, there are still in force the technical standards of liquid and air discharges of 1974, and the limits of some dangerous substances content in wastewater to be discharged in the surface water to be used for food processing industry and other to be used public needs. It is important to stress the old industries don't comply with this old standards due to the overuse of the technology and mismanagement way of the Enterprises.

For the Water Sector there are 2 principal laws into force:

For the regulatory framework of water supply, treatment and removal of wastewater.

The aim of this law is to set up the regulatory framework, the regulatory structures as Regulatory independent Utility for water supply and wastewater treatment. The law determines the functions, competencies, procedures and standards under which this regulatory independent entity acts.

The law On Water Resources regulates the institutional responsibility for water resources management. The chairman of the NEA is member of National Council of waters.

The arable soil quality and its management is regulated by the law No. 7501 dated on 19.7.91, "On the soil", amended with the law No. 7715, 2.6.1993 :On some changes and amendments in the law "On the soil" 1991. This law has two Articles taking into account the environmental protection.

Article 11 : Juridical and physical persons having or getting arable soil in ownership or utilisation, must exploit it only for agricultural purposes, to preserve and increase its fertility, to manage and to build protective works.

Article 17 : The industrial waste, the mine waste and the wastewater with a harmful contents for agriculture products, must be canalised and collected in special disposal site so that not to damage the soil, plants, water and human health, animals and fowls as well. These disposal site should be approved within the construction site permits of the project. Otherwise the construction and functioning of the project is not permitted. It's forbidden the discharge and landfilling of every dangerous waste of the country or imported into soil.

Animal Breeding is regulated by the law No. 7674 dated on 23.2.93: "On Veterinary Service and Inspectorate". The law aims :

1. Protection and Development of fauna as a national natural resource.
2. Environmental protection from infections, hazards, contamination and damage of ecosystems with consequences for the Albanian fauna.
3. Provision of a list of diseases to be under control and the responsible governmental body in local and central level.

For every kind of these diseases, the law determines the taking of immediate and chronic veterinary measures in case of emergency according to the Articles of this law. As regards the environmental protection there are 2 specific Articles:

- *Article 83 : In case of environmental pollution with ineffective agents from ill, cut, dead animals and their products, the veterinary of state of the proper local*

authority orders the owner or the administrator of the animals farm to take hygienic sanitary measures and control their implementation.

- *Article 84: The veterinary doctor of the state of the appropriate local authority level could forbid the utilisation of chemicals, fertilisers and others in case they contaminate the environment where the animals live, graze, are traded, with the exception determined by the law. The veterinary doctor of the appropriate local authority level should give the permit for utilisation chemical, fertilisers for agricultural purposes in a territory where the waters flow to the reservoirs etc., being used for animals, cattle in general.*

The enforcement of this law is very efficient and strong. The solid tradition, the awareness of the public and the careful care of the relevant local or national state institutions has led to the creation of a legal and professional education for the large public in general and for the countryside inhabitants dealing with animals.

However there is a problem. This law doesn't provide any Article about the EIA for the husbandry activities. Even in the basic law On the environmental Protection, the agricultural activities should be subject to the environmental licensing process. On the other hand, according to the basic law, the list of activities to be submitted to EIA is determined by an Order of the Chairman of NEA. In the list of activities only the hen-farm are to be submitted to such a procedure. As regards the individual economies of this kind or other, the Order of the Chairman of NEA doesn't foresee any provision for EIA performing. This must be corrected very soon. All the waste, animals excrement are uncontrolled and there is no laws or Article or guidelines for their disposal and management.

The 79% of business locations are in urban area. Urbanisation and overpopulation are the primary challenges that local governmental are facing today. Urban development is very complex and is controlled by some laws.

Law : "On Urban Planning"

Decision of Council of Ministers "On the protection of urban environment from urban and industrial pollution".

The control of law violations is very difficult because of two principal factors:

- 1- the urban mitigation is very high and quite uncontrolled. This has lead to environment damage at a large scale.
- 2- The strength of the state is very weak and the level of corruption is high. This has led to construction without contraction permits etc.

However, actually the construction police who is responsible for inspecting the construction without permits, is working strongly and is showing the power of the legal state by demolishing such constructions.

The law On Construction Police Entered into force in 1993, has established the police of construction as an executive armed body, specialised for the control of legal enforcement in the field of urban development and construction. This body controls :

1. Permits of technical persons for construction work
2. Waste removal and their disposal in the due site
3. interventions in the green areas

As regard the Council of Ministers Decision No. 228 dated on 27.5.1992, it provides the obligation of binding disposal of wastewater, solid waste etc., far away from urban centres and natural environmental and landscapes. The disposal site must be determined on the base of specific studies and be approved by the NEA.

Environmental Impact Assessment in Albania

The chapter II of the basic law For the environment protection is dedicated completely to EIA. The objects to be submitted to EIA procedures are:

1. National plan and program of territory planning and urban development and their changes
2. Projects that can have an impact or effects on environment and specially dangerous for human health.
3. Projects for rebuilding or reconstruction of existing activities having an impact or effects on environment and specially dangerous to human health.

Projects or plans according to the judgement of local authorities looking for EIA carrying out are NEA, REA, District Council, Municipal Council, commune council.

According to the Article 14 of the basic law, *The juridical and physical persons or the authors of the mentioned projects to be submitted to EIA are obliged to forward the documents as follows*

- *Description of the project*
- *Description of the environmental conditions dealing with the area where the project will be implemented*
- *Foreseeing of the Environmental impact of the project*
- *description of the measures to be taken for the prevention of negative environmental impact*
- *Juridical and physical persons or other subjects that can be affected by the pollution or any other environmental damage caused by the proposed project*

The NEA is responsible for EIA of a, b, c activities. reassessment should be carried out periodically by a order of chairman but not rarely than 5 years.

In case where EIA shows a negative impact on the environment, the NEA has the right to take such measures and actions: a- the closing down of the activity, b- full or partial cancelling of the activity c- its stopping. The law has no special Articles saying the EIA should be carried out for all activities being operated before this law was Entered into force. The chairman of the NEA according to the basic law, approves the list of activities to be submitted to EIA procedures.

IV PERMITTING SYSTEM IN ALBANIA

The chapter III of the basic law deals with the permits having impact on environment. According to the basic law, the competent authorities issuing environmental permits are NEA, Council of Ministers, Municipality and Commune Councils. The activities being subject to environmental permitting system are :

1. Construction and operation of different local and national activities
2. Local and national program of territory planning and urban development and their changes.
3. Road construction, railways, marine ports, industrial sector, hydro-technical objects, Soil systematisation , water management projects, research, extraction and exploitation of natural resources of soil and subsoil.
4. Exploitation of mineral resources, biological resources of waste for fishing taking into account individuals, periods, tools and permitted quotes of fishing.
5. Soil exploitation, wood planting, hunting, taking into account individuals, time, tools.
6. Exploitation of natural resources of flora and fauna of different areas and of marine bottom
7. Planting the new plantations for fruits growing.
8. Production, commerce and utilisation of toxic products
9. Determination of transportation ways and disposal site for the improvement and liquidation of toxic waste.
10. Import and export of fauna and flora that can damage the environment.
11. Import and export of toxic materials and their transit transportation in the territory of Republic of Albania.
12. Other activities

The permit is valid to that extent, that the conditions of the activity operation are the same, compared with the period where the permits is issued.

If the authority doesn't give the official reply in 6 months after the request of the juridical and physical person is presented, the permit is accorded automatically.

In case of new ecological elements appearing or new dispositions Entering into force, The competent authority has the right to revise or cancel the permits.

In case of starting an activity without environmental permit (in the case when the activity needs the environmental permits) the legal actions to be taken are: closure of the activity, temporary closure, stopping of production activity.

In case where the juridical or physical persons don't meet the criteria for getting environmental permits, the competent authority determine some deadline for compliance otherwise the activity should be object for some kind of sanctions as fines, penalties, closing down, etc..

The permitting system in Albania is complex and passes through certain successive steps as follows :

1. Creation of the legal Entity (juridical or physical person) for a specific activity with wide or narrow objectives by a local Tribunal Decision, and registration as juridical or physical person in the Register of a Local Court.
2. Permit for the right of the specialist to exercise the profession in a certain activity object.(permit of the expert or permit of specialist)
3. Permits of construction (in case of new construction or enlargement of the existing one)
4. environmental permit
5. Activity permit
6. Immatriculation in the register of Local Taxation Fiscal Office and obtaining of the respective certificate with number of registration and identification.

The permit of specialist or expert obliges the juridical and physical person to employ at least 1 expert, graduated in the field covering the activity to be licensed to a maximum extent. Such a permit should be accorded by the relevant Ministry in conformity with the nature of the activity to be licensed. The very small production activities, or activities operating in the field of the services, such licenses are given by the local Fiscal Office.

In case when the activity to be permitted, needs new construction or upgrading of the existing construction, another permit must be obtained : the permit of construction. The physical or juridical person could choice: or to get a permit of construction or to hire another juridical or physical person having the permit of construction. The obtaining of such a permit is very difficult. To get such e permit a juridical or physical person must meet the following requests :

- white waters canalisation with the central system of the city,
- sewage canalisation with the central system of the city
- legal contract with the electric energy supplying company
- public removal of the solid waste produced during the construction
- rehabilitation of all the surfaces damaged during the construction

In case of the new construction, it is necessary to have the permit of the construction site, which is issued by the Councils of Territory Planning at local and national level according to commune, municipality, district and national level land use planning. The above mentioned law : "For Urban Planning" regulates such a system operation. This law, being amended in the last months of this year, obliges the participation of REA-s members in the local and national Councils of Territory Planing rendering possible not only the information obtaining for the new activities having an impact in the environment, but the right of voting against in case of argumentative environmental negative strong impact.

The environmental permit process is described in the precedent paragraph. It is important to stress that based on the law : "On some changes and amendments in the Law For environmental Protection", of 1998, the environmental permit must be obtained before the permit of the activity. The influence of such an amendment is very big because the NEA could control better the different activities before their starting. The efficiency of the environmental inspection system in this case is higher.

The permit of an activity is given generally by the line Ministries as follows:

- Ministry of Agriculture and Food for the activities in the field of : agriculture production, chemical fertilisers commerce, pesticide commerce and other chemical for agricultural use, animal breeding and veterinary service, food processing.
- Ministry of Transport and Public Works : Different kind of construction, factories, roads, railway, public and private buildings, etc., different services and a lot of activities related generally to the transport.
- Ministry of Public Economy and Privatisation is responsible for giving the permit of activity in a large field as industrial production, chemical production, metallurgical production, incineration etc..

Thus, the permitting system of production activities is quite centralised in Albania. However, for some small production activities the permit are issued by local authorities. Whereas in the field of service activities, the majority of them are licensed generally by local government authorities.

- The water services activities (water supply, drinking water supply, sewage system etc.,) are licensed by the National Regulatory Entity of waters.
- The urban waste management (public removal or treatment) are licensed by Ministry of Public Work and Transport.
- The industrial waste treatment or their recycling etc., are licensed by the Ministry of Public Economy and Privatisation.

As regards the estimated number of industrial facilities needing permits for their operation, it's difficult to give a precise figure. The total number of small, medium and large Enterprises in Albania is accounted to be approximately 62000 (1997). The state own business constituted 9% of active enterprises. The majority of them operate in trade and service and only 10% represent the industrial production. Apart from the permitting body level and kind, the majority of them must have the permit of activity. As regard the environmental permitting, the NEA has no precise inventory of all the licensed subjects at local and national level. We consider a necessity the establishment of a data base for licensed activities in order to better know, help and control the different sources of pollution. In this regard we are working on drafting the regulatory acts to improve the permitting system. to upgrade the list of activities needing the environmental permit.

The permitting system in Albania to my estimation, should count about 200 employed on national level, dealing only with permits. This number could be considered small, but permitting system "employs" other employed by the state working in other structures of the ministries or local authorities. For example, there is no expert in the NEA dealing only with environmental permitting issues. The permitting tasks are part of other important duties of the agency as legislative framework, compliance control, etc.. The NEA has established a licensing commission, composed by the experts of its different directorates examining all the requests of juridical and physical persons for environmental permits.

There are two major problems in Albania related to permitting system :

- Operation of activities without permission (any kind of permits)
- Permitting of the activities that have not the performance required by the law.

The first phenomena has been very obvious during the transition period and continue to be a big threat even today. However, the state seems stronger in this direction and is taking measures to enforce the relevant laws properly.

The second phenomena is more than a fruit of the ignorance of the permitting system personnel, is a fruit of their corruption. Albania has big problems in this direction, but the state in its overall effort to face such situation is taking the proper measures.

The NEA is doing serious efforts to increase the effectiveness of the permitting system by taking care of the proper enforcement of the law. For this we train time to time the local inspectors dealing directly with the first step of permitting process in order to

accept the request and the documents forwarded by juridical or physical person, according to the law. In spite of this, the licensing commission of NEA has begun to individualise the permit according to the type of the activity, to specify the requests depending on the specific performance of a certain activity. There are some project for which NEA has requested the implementation of EIA procedures as : landfill project, dump-site project, tourist village in the coastal line, road constructions, etc.. There are some cases that we have requested EIA performing for new projects, but the state or the line ministries aren't yet aware of the respective necessity. Apart from this, the inherited industry from the past regime was not submitted to the permitting process and they continue to operate without any kind of environmental permission.

The NEA is working now to establish a plan on EIA performing for some important sources of pollution in the existing industrial plants (before 1999s or later). The law look for such procedure performing not rare than 5 years. We think to involve in this process not only the inherited industry that continue to be in the state ownership, but some new plants as well as: the tannery factories, cement factories, fertilisers plant, petroleum refinery, metal refining industry etc..

In this regard, the NEA is working on establishing new standards for industrial emissions and discharges as well. We think to deep our links with the line ministries in drafting of the common programs to reduce the pollution level and to prepare the industrial companies to face the stricter future regulations. The experience of voluntary agreement with the industry is yet unknown in our country. We are aware of its importance and intend to introduce it in Albania.

As regards the permits of the activity, given by the line ministries could be renewed each 1, 2, or 5 years. The permitting system takes into account new developments in the technology, physical enlargement, capacity production increasing, and new ecological elements appearing. In such cases the law provides the obligation of permits renewal taking into account all the changes.

Access to information

The right on access to environmental information is developed in different laws:

- Law No.. 6853: "On addressing and solving requests, complaints, remarks and proposals coming form the citizens"
- Law On the Management of water supply and canals (No. 8102, 1996, Art 32)
- Law : "On the Management of the energetic sector (No. 7970, 1995, Art 24)
- Law : On Food (No. 7941, 1995, Art. 15)
- The Law on Environmental Protection(Articles 32-36) provides rights on access on environmental information.

According to Article 32 of this law information on the state of the environment includes :

data on the state of the environmental elements and factors

data on the results of activities which cause or may cause pollution or damage to the environment and its elements and factors

data on the activities undertaken for protecting the environment

data on the state and exploitation of natural resources.

The access to environmental information rights are developed further in the guidelines of Ministry of Health and Environment, No. 7, January 1998, "On the Provisions on environmental information and the public right to information", which contains dispositions how the public must request the information and the way the official must provide the information or the exact place where to take it. Article 5 and 6 of the guidelines define the right of every citizen to have information on the environmental health and the process of how to get it, as well as what information individuals should have in cases of environmental accidents. The following data are required as basic information in such cases:

1. the date and the time of when it happened
2. the location
3. the type and description of pollutant
4. the quality and quantity of the pollutant
5. the impact on the local population and in general

V. COMPLIANCE AND ENFORCEMENT

The compliance and the enforcement is promoted by three manners:

- by penalisation of the law violation by imposing different kind sanctions and fines or penalties,
- by omitting the environmental permits or proposing the temporal or permanently closing down of the activity.

Before the permitting, the subjects to be licensed must handle small report on the possible environmental impact of a certain activity and a monitoring program of environmental pollution control as well. Prior to production the local inspectors verify on situ the reliability of the data provided by the juridical and physical persons. The permit is given with the condition of compliance with the law and standards of liquid, gaseous and solid discharges quality. In case of doubt, the licensing commission of NEA establish a group of combined local and central environmental inspectors to verify profoundly all the doubtful issues. After this procedure, when is the case, the commission issues the environmental permit with specific requests to be fully met.

In case when the complaints are lodged by local authorities, citizens, NGOs, etc., the inspectors themselves organise inspection directly on situ to clarify the situation. If the complaints are lodged at the higher or highest executive or legislative bodies and deal with major environmental problems, the NEA organise detailed inspection with experts, representative of the respective line ministries, local and central environmental inspectors etc., in order to take the due decision.

Generally the inspectors of REA and NEA draft working plans including direct inspection actions in different activities and above all the industrial ones. However the most frequent inspections can be ranked according to the activity type as follows : industrial activity, urban development, urban solid waste disposal, animal breeding. As regard the inspection of domestic wastewater disposal, incineration of the waste or infrastructure projects, is very rare and negligible.

The main authorities responsible for compliance and enforcement are :

1. Taxation and fiscal office (under the authority of Ministry of Finance) controlling the legacy of an activity and collecting the different taxes
2. Custom Police (under the authority of Ministry of Finance) controlling the compliance with the Law for Custom and Custom Code.
3. Sanitary Inspectorate, under the authority of Ministry of health, controlling the compliance with the law For Sanitary Inspectorate, and other laws for standards of drinking water, quality of surface water to be used for drinking water, food processing etc., urban solid waste omitting conditions and disposal, etc..
4. environmental Inspectorate, under the authority of the NEA, controlling the compliance with the basic law On the protection of the environment, industrial discharges quality standards, etc.
5. Police of Forests, under the authority of Ministry of food and agriculture, dealing with the control of laws acting in the field of forest protection and Development.
6. Police of construction, under the authority of Ministry of Public Work and Transport, dealing with compliance with relevant laws.
7. Veterinary Inspectorate, under the authority of Ministry of food and agriculture
8. Municipality Police is a weak executive body acting inside the municipal jurisdiction. This kind of police is expected to render stronger and will act in the field of infringement in municipality level.

It is very difficult to estimate the total number of employed working in this sector because of the big difference between all the Inspectorate systems. The custom, fiscal offices and sanitary Inspectorate count more than 1500 inspectors (in total) (to my estimation) or much more. The other sectors maybe count totally 500-1000 inspectors. In case when a violation of the law is verified, the actions to be taken depend on the kind of the violation and can be:

- Administrative response :
- fine or penalties
- control-act with specific tasks to be carried out in a certain deadline
- in case of violation repetition the administrative response can be:
- temporal closure
- proposal for temporal closing down
- proposal for permanent closing down
- permanent closing down

As regards criminal prosecution, even the law open the window for such actions, there are no clear procedures to act in this direction. the concept of the environment crime committing is quite vague in Albania.

The compliance with laws constitutes a big problem in Albania not only in the field of environmental laws but even in the public order one. However, the NEA aware of the fact that the state will become strong very soon, is working to have all the necessary records for pollution sources, to systems such a information, to establish data base on their pollutant potential. We are working on the approaching of the Inspectorate service level closer to the Environmental adviser and consultant than police. To realise this we are establishing a program to assess the relevant needs for training, equipment, laboratory or screening tools etc.

The environmental Inspectorate service is only 6 years old and inherited no traditional legal, administrative or other experiences. The improvement of this service, and with it, the improvement of compliance control is ranked as one of the most important priorities of the NEA in present and the future.

ALGERIE

**Conformité et application effective de la législation
en vigueur pour la lutte contre la pollution
marine en Méditerranée provenant des
sources et activités situées à terre.**

RAPPORT NATIONAL DE L'ALGERIE

Par : Mr. Y. ZENNIR

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1. Introduction

Avec un linéaire côtier de près de 1200 Km, le littoral algérien est bordé d'un plateau continental étroit se caractérisant par des fonds rocheux, couvrant près des 2/3 de la surface de la bordure maritime Algérienne,

Entre ces secteurs rocheux se développent des zones où le plateau continental est plus large et plus favorable à la pêche au chalut. Ces zones qui s'étalent sur près du 1/3 de la surface de la bordure maritime Algérienne se localisent principalement dans l'Algérie occidentale qui recèle plus de 60% du stocks national en ressources halieutiques et à un degré moindre dans l'Algérie orientale et l'Algérie centrale qui concentrent des richesses halieutiques non négligeables en espèces pélagiques et bancs corallifères particulièrement dans la zone extrême Est de la côte algérienne qui sont les mieux fournis en coraux rouges et roses.

Ces zones constituent également des aires très importantes pour la reproduction des poissons. La côte située à l'Ouest du pays, comprise entre la frontière marocaine et Mostaganem, représente l'aire de reproduction la plus importante du pays, avec des aires de ponte de moindre importance au Centre et à l'Est du pays.

La côte algérienne, recèle également des valeurs naturelles et culturelles incontestables qui témoignent du passage de différentes civilisations anciennes.

Certaines villes côtières, en dehors des vestiges historiques qu'elles renferment, sont elles même classées patrimoine culturel national et d'autres qui sont même classées comme patrimoine mondial telle que la ville de Tipaza par exemple.

La bande littorale algérienne est l'une des bandes les plus peuplées du bassin méditerranéen. Elle concentre plus de 20% de la population algérienne sur une superficie représentant moins de 0,4 % de la superficie totale du pays.

Les villes d'importance nationale comme Alger, Oran, Annaba, Skikda, Béjaïa et Mostaganem dont le volume de la population est supérieure à 100.000 habitants concentrent plus de 12% de la population totale nationale et 62% de la population du littoral.

2. Principales activités implantées sur la bande littorale

Les principales activités développées sur la bande littorale sont essentiellement liées à la pêche, au tourisme, à l'agriculture et à l'industrie. Cette dernière occupe cependant une place importante.

2.1.1 Activités liées à la pêche

Pour ce qui est de la pêche, cette activité se pratique essentiellement au niveau des 8 ports et 10 abris de pêches existants. Ce secteur connaît donc un développement insuffisant car essentiellement axé sur la pêche artisanale et traditionnelle qui a ses limites.

2.1.2 Activités liées au tourisme

Quant au tourisme, les différents types d'activités pratiquées sur l'espace littoral sont concentrés au niveau des stations balnéaires ou des ensembles de haut standing sont réalisés à proximité des grandes agglomérations, des stations thermales ayant une vocation nationale et un intérêt thérapeutique et au niveau de certaines villes côtières renfermant des vestiges historiques.

Sur le plan environnemental, il convient de souligner que ce secteur génère des nuisances d'origine domestique (rejets liquides et solides) principalement pendant la saison estivale où la population peut doubler voire tripler. Ce secteur est donc, dans la plupart des cas, lui même victime de pollution générée par d'autres secteurs notamment l'industrie.

2.1.3 Activités liées aux pratiques agricoles

Pour ce qui est de l'activité agricole, les différentes études à travers la bande littorale ont permis de déterminer que les potentialités de la bande côtière en terre agricole représentent environ 2% de la surface agricole utile totale nationale dans les communes côtières.

Les wilaya de l'Est qui ont le plus fort potentiel forestier de la bande littorale sont à vocation mixte agro-pastorale et forestière. Dans ces régions, on y pratique la culture extensive avec l'implantation des structures de soutien orientées vers l'industrie agro-alimentaire.

Par contre dans les wilaya du Centre, la culture intensive y est pratiquement généralisée avec le développement des cultures sous-serre. Cette pratique de la culture intensive à engendrer une pollution chimique d'origine agricole conséquence d'une utilisation abusive et irrationnelle des produits phytosanitaires.

2.1.4 Activités liées à l'industrie

L'essentiel de l'activité industrielle est également situé en bordure de la mer. Les quatre plus grandes zones industrialo-portuaires y sont d'ailleurs implantées. Il s'agit respectivement des zones industrielles:

- de Skikda et de Annaba à l'Est,
- d'Alger-Oued Smar et Rouiba- Reghaia au Centre,
- et d'Oran-Arzew à l'Ouest d'une part, et des complexes industriels de Ghazaouet, Mostaganem, Béjaia et Jijel d'autre part.

Ces grands complexes industriels et principales zones industrialo-portuaires qui constituent l'essentiel de l'industrie nationale concentrent les activités suivantes:

- *l'industrie de raffinage de pétrole*: concentrée essentiellement dans les zones industrielles d'Alger, de Skikda, Arzew (Oran) et de Béjaia. Ces Complexes bien que dotés d'installations de dépollution des effluents liquides déversent, pour la plupart, dans la mer des effluents fortement chargés dépassant souvent les concentrations admissibles particulièrement en huiles et hydrocarbures. Cet état de fait est attribué principalement :

* au sous-dimensionnement des installations d'épuration existantes après l'extension de ces complexes,

* et à l'insuffisance dans leur gestion en raison du peu d'intérêt accordé à ces installations considérées comme étant un outil non productif et donc à relégué au second plan

- *Industrie pétrochimique*: regroupant essentiellement des complexes de fabrication d'engrais (Asmidal-Annaba) et des plastiques (Skikda). Leurs effluents liquides chargés (chrome, mercure, d'huiles,...) et gazeux subissent des traitements partiels qui demeurent insuffisants.

- *Industrie sidérurgique et mécanique*: représentée particulièrement par le complexe sidérurgique d'El-Hadjar (Annaba) et par le complexe de montage des véhicules industriels à Rouiba (Alger). Ces complexes gros consommateurs d'eau rejettent respectivement de quantités importantes d'effluents industriels souvent fortement chargés d'éléments toxiques (cyanures, chrome,...) issues des différentes phases de fabrication. Bien que ces complexes sont dotés de stations de détoxification fonctionnelles, leur rendement épuratoire est cependant souvent en deçà des normes recommandées.

- *Industrie de fabrication de papier*: représentée par les complexes de Baba Ali à Alger et de Mostaganem qui consomment et rejettent d'importants volumes d'eau dont la charge polluante contient des matières en suspension, des produits chimiques et du mercure en raison de l'absence et ou de l'insuffisance des systèmes d'épuration affectant ainsi gravement la qualité des eaux respectives de Oued El-Harrach (Alger) et marines de la zone de Mostaganem.

- *Industrie de traitement de cuir*: particulièrement les tanneries de Jijel et de Rouiba qui se sont dotées récemment de systèmes de traitement rejettent des eaux dont la charge de pollution est considérée comme acceptable pour le milieu récepteur.

Ainsi que *l'industrie agro alimentaire* qui rejettent de fortes charges de pollution organique et dans des cas exceptionnels de forte pollution chimique déversées illicitement lors des opérations de nettoyage et d'entretien des équipements.

2.2 Utilisation des meilleures technologies disponibles et des technologies propres

Pour changer les modes de production, des mesures ont été prises pour introduire des technologies propres et les meilleures technologies disponibles peu consommatrices d'énergie et de ressources naturelles. Il s'agit notamment:

- l'obligation de réaliser des études d'impact sur l'environnement pour tous les nouveaux projets y compris l'obligation d'opter pour le procédé le moins polluant. Cette mesure à caractère obligatoire est appliquée de manière étendue à tous les nouveaux projets;

- la réalisation d'audits environnementaux de quelques complexes et unités industriels. Les résultats de ces audits ont permis la mise en oeuvre de deux projets d'investissement destinés à dépolluer trois grands complexes par l'introduction de technologies propres. Il s'agit de la reconversion des équipements des complexes sidérurgiques et de production d'engrais phosphatés à Annaba (financé sur un prêt de la BIRD) et du complexe de production des matières plastiques à Skikda (financé par la BEI). *La réalisation des audits environnementaux reste cependant l'exception est limitée à quelques points chauds,*

- la mise en oeuvre d'un programme d'investissements destiné à éliminer les substances appauvrissantes la couche d'ozone en application du protocole de Montréal;

- la promotion et le développement de l'utilisation des énergies propres tel que le gaz naturel, le butane et le GPL.

2.3 Etat de l'environnement

A la lumière de ce qui précède, il en ressort que par suite de la croissance démographique galopante, de l'industrialisation et de l'urbanisation non contrôlée, le littoral algérien est le réceptacle des différentes sources de pollutions.

L'industrie nationale déverse, pour la plupart d'entre elle, dans la mer ou dans les Oueds avoisinants qui finissent en mer ses principaux effluents insuffisamment traités souvent chargés d'éléments toxiques provoquant ainsi de fortes pollutions le long de la côte algérienne.

Les agglomérations urbaines évacuent leurs eaux usées domestiques soit directement en mer, soit dans le réseau hydrographique souvent sans aucune épuration préalable. La plupart des stations d'épurations réalisées sont soit non fonctionnelles soit d'un rendement épuratoire insuffisant.

A l'instar des eaux usées urbaines et industrielles, les déchets solides ne font pratiquement l'objet d'aucun traitement préalable ni précaution avant leur élimination comme l'atteste la prolifération des dépôts et décharges sauvages trop souvent constitués à l'intérieur ou aux abords des Oueds, falaises ou autres dépressions naturelles. Ceci explique la double forme de pollution du milieu marin par les déchets solides; directe par les dépôts sauvages opérés sur les falaises et les plages, et indirecte par ceux faits dans les Oueds que ces derniers charrient vers la mer à la moindre crue.

Ces activités urbaines et industrielles qui génèrent de grandes quantités de pollution chimique et organique contribuent de manière substantielle à la dégradation des eaux de surfaces, souterraines et marines.

Ces principales sources de pollutions et tant d'autres occasionnent des dégâts considérables aux ressources naturelles et biologiques marines et à toutes les formes d'utilisation de la mer.

Certains de nos Oueds sont ainsi devenus de véritables égouts à ciel ouvert et certaines nappes phréatiques sont dangereusement exposées à une pollution chimique.

Les eaux marines polluées par le rejet permanent d'eaux usées urbaines et industrielles provoquent d'importants dommages au milieu floristique et faunistique marin entraînant ainsi la destruction de nombreuses zones naturelles de ponte (cas de la zone de fraie de Mostaganem) et d'habitats naturels (zone de Annaba et Ghazaouet) contribuant ainsi à une forte diminution des ressources halieutiques du pays.

Quant aux autres formes d'utilisation de la mer, elles sont de plus en plus compromises par la pollution. Nos plages sont de moins en moins propres comme l'atteste d'ailleurs le nombre de plages non autorisées actuellement à la baignade.

En effet sur les quelques 360 plages qui existent, près du 1/3 est interdit à la baignade en raison du danger qu'elles représentent pour la santé des baigneurs. Il s'agit particulièrement des plages situées à proximité des grands centres urbains, touristiques et industriels côtiers.

A titre indicatif, l'analyse des échantillons d'eau de mer et des sédiments, prélevés à l'intérieur et à l'extérieur des principaux ports de ces agglomérations indique des concentrations élevées de polluants dépassant, en certains lieux, plusieurs fois les normes admissibles algériennes. Ce qui démontrent l'influence que les différentes activités, telles que le transport maritime, les industries et les rejets urbains, ont sur la pollution marine.

2.4 *Surveillance de l'environnement*

Pour permettre la surveillance régulière de l'environnement, l'observation et le contrôle des niveaux de pollution des ressources naturelles, les dispositions suivantes sont prises:

- l'obligation de contrôle régulier de la qualité des eaux de baignades, institué par décret exécutif n° 93/164 du 10/07/1993;

- la mise en oeuvre d'un projet portant réalisation et équipements de 4 laboratoires pour surveiller la pollution marine par les hydrocarbures au niveau des 4 ports pétroliers d'Alger, Oran, Annaba et Skikda (Projet FEM);

- le renforcement en équipement des laboratoires de l'Institut des sciences marines et de l'aménagement du littoral, de l'Université d'Alger, de l'Université d'Oran et de l'Université de Annaba (laboratoire de biologie marine et de zoo-benthos),

- l'obligation de l'élaboration d'un inventaire du degré de pollution des eaux superficielles avec établissement de la carte des eaux superficielles d'Algérie, instituée par décret exécutif n°93-163 du 10 juillet 1993,

- le renforcement en équipements des laboratoires et stations de surveillance de l'Agence nationale des ressources hydrauliques et des laboratoires d'hygiène de wilaya,

- l'obligation de soumettre tout projet visant l'incinération des déchets industriels ou domestiques à la procédure d'étude d'impact sur l'environnement et à autorisation du Ministre.

- l'obligation pour les producteurs de stocker leurs déchets dans des conditions sécuritaires satisfaisantes pour l'environnement et de tenir, à la disposition des services de l'environnement, une comptabilité rigoureuse précisant la nature et la quantité des déchets qu'ils ont en charge,

- le lancement d'un projet relatif au contrôle de la pollution industrielle, financé sur un prêt de la banque mondiale, pour l'acquisition de 4 réseaux de surveillance de la qualité de l'air dans les agglomérations d'Alger, Oran, Annaba et Skikda.

2.5 *Sensibilisation du public aux problèmes de l'environnement*

En dépit des multiples actions menées par les pouvoirs publics en matière d'éducation environnementale, le niveau de sensibilisation du public aux questions environnementales demeure faible au sein des larges couches de la population.

Cette faible adhésion du public à la promotion d'un environnement sain est imputé, entre autres, aux problèmes quotidiens d'ordres socio-économiques rencontrés par de larges couches des populations défavorisées qui relèguent ainsi le souci de protection de l'environnement au second plan.

2.6 *Influence des associations à caractère écologique (ONG)*

Depuis la promulgation de la loi 90-31 de décembre 1990 relative aux associations, un nombre appréciable d'associations activant dans le domaine de l'environnement a émergé sur la scène nationale.

Un dialogue permanent est ainsi progressivement établi entre les pouvoirs publics et les ONGs.

Ces mouvements associatifs à caractère environnemental sont devenu progressivement présents au niveau des différents pôles de décisions. Ils sont à titre indicatif représentés au sein du Haut Conseil de l'Environnement et du Développement Durable; La plus haute instance du pays qui arrête et dicte la stratégie nationale de développement économique et social.

L'on compte actuellement plus de 150 associations écologiques réparties à travers le pays qui activent aux cotés des autorités pour asseoir les fondements d'un développement durables.

Ces associations bénéficient de subventions prélevées sur le budget de l'Etat pour leur permettre de concrétiser leurs programmes d'actions axés principalement sur la sensibilisation du citoyen aux questions environnementales afin que soit donné à la protection de l'environnement une dimension collective.

3. Législation:

3.1 *Loi-cadre sur l'environnement*

Pour protéger ses ressources naturelles, prévenir et lutter contre les pollutions et nuisances, l'Algérie a mis en place un arsenal juridique plus ou moins étoffé qui s'articule autour de la loi cadre sur la protection de l'environnement (loi 83-03 du 5 février 1983) et de ses textes d'application.

Cette loi du 5 février 1983 pose, pour la première fois, les objectifs et les principes généraux du droit algérien de l'environnement, définissant ainsi les objectifs de protection et d'amélioration de l'environnement et les principes et règles générales de sa protection. Elle consacre les objectifs de:

- la protection, restructuration et valorisation des ressources naturelles;
- la prévention et la lutte contre toute forme de pollution et de nuisance,
- l'amélioration du cadre et de qualité de vie.

Pour concrétiser ces objectifs, elle énonce les règles et les principes de précaution, de prévention et de correction à la source, d'intégration, de participation et du principe du pollueur payeur.

Elle comprend une partie portant sur les dispositions générales et cinq parties traitant respectivement de la protection de la faune, de la protection des milieux récepteur, de la protection contre les nuisances, des études d'impact, et de la recherche et de la constatation des infractions.

Elle consacre enfin le principe de la prise en charge de l'impact de l'environnement sur le processus de développement affirmant ainsi la volonté des pouvoirs publics d'intégrer la protection de l'environnement dans la planification nationale et de parvenir à un équilibre entre le développement économique et social et la protection de l'environnement.

3.2 *Cadre législatif existant*

a) En matière de contrôle de la qualité des eaux marines:

Pour le contrôle de la qualité des eaux marines, il y a lieu de souligner le décret exécutif n°93-164 définissant la qualité requise des eaux de baignades au moyen de normes et d'objectifs de qualité. La fréquence minimale des contrôles et le nombre minimale d'analyse sont déterminés par arrêté ministériel.

En matière de protection du milieu marin, Outre les nombreuses conventions internationales ratifiées par l'Algérie, il ya lieu de citer les dispositions afférentes à la protection de la mer du chapitre III-titre III de la loi cadre relative à la protection de l'environnement, les textes importants en droit interne tel le décret législatif n°94-13 du 28 mai 1994 fixant les règles générales relative à la pêche, l'ordonnance n°76-80 du 23 octobre 1976 portant code maritime et les textes d'application qui le complètent ainsi que le décret exécutif n°88-228 du 5 novembre 1988 relatif aux conditions, procédures et modalités d'immersions des déchets susceptibles de polluer la mer qui interdit, en vertu de la loi 83-03 et nonobstant les dispositions des accords internationaux ratifiés par l'Algérie, le déversement, l'immersion et l'incinération en mer de matières de toute nature susceptible d'altérer le milieu marin (ressources biologiques) et ses usages(activités maritimes, utilisation de l'eau de mer, valeur d'agrément de la mer).

b) En matière de contrôle de la qualité des eaux intérieures: il y a lieu d'indiquer:

- le décret exécutif n°93-163 du 10 juillet 1993 instituant, en application des dispositions de la loi 83-03, la détermination du degré de pollution des eaux superficielles par un inventaire qui doit être établi selon des critères physiques, chimiques, biologiques et bactériologiques annexé au décret. Cet inventaire dont l'établissement est confié à l'Agence nationale des ressources hydrauliques (ANRH) devra donné lieu à l'élaboration de la carte des eaux superficielle d'Algérie.

En outre, l'application des mesures visant à assurer le respect des règles et normes sanitaires incombent aux collectivités locales. Le Wali est ainsi tenu de faire procéder régulièrement, dans le cadre du contrôle sanitaire, aux analyses de contrôle de la qualité de l'eau destinée à la consommation humaine et rendre public les résultats de ces contrôles.

En matière de protection des ressources en eau, la protection des ressources en eaux fait l'objet du chapitre 2 du titre III de la loi 83-03 relative à la protection de l'environnement et du titre VI de la loi 83-17 portant code des eaux qui prévoient la détermination du degré de pollution des eaux superficielles par un inventaire, instituent des périmètres de protection qualitative et quantitative et réglementent les déversement et les comportements susceptibles de polluer les ressources en eaux en prévoyant des sanctions en cas d'infractions à leurs dispositions.

c) *En matière de protection des habitats, il ya lieu d'indiquer:*

- les dispositions du chapitre II du titre II relatives à la protection de la faune, de la flore et aux réserves naturelles de la loi 83-03, qui prévoit le classement par décret, pris sur rapport du ministre chargé de l'environnement, des parties du territoire d'une ou plusieurs communes en parc national ou en réserves naturelles lorsqu'il ya nécessité de conserver la faune, la flore, le sol, l'habitat, le sous sol, l'atmosphère, les eaux ou tout milieu naturel présentant un intérêt particulier,

- la convention relative aux zones humides, d'importance internationale, particulièrement comme habitat de la sauvagine, signé à ramsar en 1971, à laquelle l'Algérie à adhéré par le décret 82-432 du 11 décembre 1982,

- le décret exécutif 83-458 du 23 juillet 1983 fixant le statut type des parcs nationaux,

- le décret 87-143 du 16 juin 1987 fixant les règles et modalités de classement des parcs nationaux et des réserves naturelles,

- le décret 87-144 du 16 janvier 1987 fixant les modalités de créations et de fonctionnement des reserves naturelles,

- le décret 94-279 du 17 septembre 1994 portant institution du plan national d'urgence de lutte contre les pollutions marines accidentelles dû au déversement des hydrocarbures en mer,

- le décret exécutif n°88-228 du 5 novembre 1988 définissant les conditions, procédures et modalité d'immersion des déchets susceptibles de polluer la mer effectuer par des navires ou aéronefs qui institue un contrôle sévère des opérations d'immersion en mer et y consacre l'obligation préalable d'étude d'impact sur l'environnement.

3.3 *Législation nationale relative:*

- au déversement des eaux usées industrielle:

- Dispositions de la loi 83-03 faisant obligation aux unités industrielles de procéder au traitement adéquat de leur effluents avant rejet dans le milieu récepteur,

- décret exécutif 93-160 du 10 juillet 1993 réglementant les rejets d'effluents liquides industriels. En vertu du décret, les rejets d'effluents liquides industriels sont soumis à autorisation du ministre chargé de l'environnement, autorisation qui ne peut être accordée que si les rejets ne dépassent pas les valeurs limites maximales fixées en annexe du décret. *Le contrôle effectif du respect de ces dispositions est cependant partiel voir même inexistant.*

- à l'élimination des déchets solides industriels:

- Dispositions de la loi 83-03 (chapitre II titre IV) faisant obligation aux détenteurs et producteurs de déchets susceptible de produire des effets nocifs pouvant porter atteinte à la santé de l'homme et à l'environnement, d'en assurer ou d'en faire assurer l'élimination dans des conditions propres à éviter lesdits effets,

- décret 98-339 du 3 novembre 1998 modifiant et complétant le décret 88-149 du 26 juillet 1988 relatif à la réglementation applicable aux installations classées et fixant leur nomenclature instituant l'activité d'élimination des déchets industriels dans la catégorie des installations soumis à étude d'impact préalable et à autorisation du ministre chargé de l'environnement et ce, conformément aux dispositions de la loi relative à la protection de l'environnement et des dispositions du décret 90-78 du 27 février 1990 relatif aux études d'impact,

- décret exécutif n°93-162 du 10 juillet 1993 fixant les conditions et les modalités de récupération et de traitement des huiles usagées,

- décret 87-182 du 18 août 1987 relatifs aux huiles à base de PCB qui contient des dispositions concernant les conditions d'élimination et de traitement des huiles de PCB et des équipements électriques qui en contiennent et des matériaux contaminés.

Le contrôle effectif du respect de ces dispositions est cependant partiel.

- à l'élevage intensif:

-décret 98-339 du 3 novembre 1998 modifiant et complétant le décret 88-149 du 26 juillet 1988 relatif à la réglementation applicable aux installations classées et fixant leur nomenclature instituant l'activité d'élevage intensif à la procédure d'étude d'impact sur l'environnement et autorisation du Wali, conformément aux dispositions de la loi relative à la protection de l'environnement et des dispositions du décret 90-78 du 27 février 1990 relatif aux études d'impact.

Le contrôle effectif de cette activité est partiel.

- au déversement des eaux usées domestiques:

- Dispositions de la loi 83-17 portant code des eaux faisant obligation aux agglomérations de plus de 100.000 habitants de disposer impérativement de systèmes d'épuration des eaux usées, de même que les localités situées sur les périmètres de protection en amont des ouvrages hydrauliques d'approvisionnement en eau. Les normes nationales relatives à la qualité des eaux rejetées par les stations d'épuration des eaux usées municipales sont en cours d'élaboration. *Le contrôle effectif du respect de ces dispositions est inexistant.*

- à l'incinération des déchets: Les installations d'incinération des déchets étant considérées comme étant une installation classée, l'activité est par conséquent soumise à la procédure d'étude d'impact sur l'environnement et à autorisation du ministre chargé de l'environnement conformément aux dispositions de la loi 83-03 relative à la protection de l'environnement, du décret 98-339 du 3 novembre 1998 modifiant et complétant le décret 88-149 du 26 juillet 1988 relatif à la réglementation applicable aux installations classées et fixant leur nomenclature et du décret 90-78 du 27 février 1990 relatif aux études d'impact sur l'environnement. *Actuellement, aucune installation d'incinération n'est implantée sur le territoire national.*

- à l'élimination des déchets urbains:

- Décret 84-378 du 15 décembre 1984 fixant les conditions de nettoiemnts, d'enlèvement et du traitement des déchets solides urbains qui fait entre autres obligation à la commune d'assurer ou d'en faire assurer le traitement des déchets solides urbains selon le procédé le mieux indiqué sur le plan de la préservation de l'hygiène et de la protection de l'environnement. En vertu des dispositions du décret, le choix de tout site pour le traitement des déchets solides est soumis à une étude d'impact sur l'environnement et à une autorisation du Wali.

- à l'agriculture: - Dispositions de la loi 87-17 du 1er août 1987 relative à la protection phytosanitaire réglementant l'utilisation des produits phytosanitaires dans la lutte contre les ennemis des végétaux,

- Dispositions de la loi 87-19 relative au mode d'exploitation des terres agricoles,

- décret exécutif 95-405 du 2 décembre 1995 relatif au contrôle des produits phytosanitaires à usage agricole et définissant les conditions de leur homologation. *Le contrôle effectif du respect de ces dispositions est presque inexistant.*

- aux projets d'infrastructures et de développement urbain:

- Dispositions de la loi 87-03 relatives à l'aménagement du territoire et 90-29 relatives à l'aménagement du territoire et à l'urbanisme et leur principaux instruments de mise en oeuvre pour l'aménagement et l'utilisation rationnelle des terres à savoir:

- le schéma national d'aménagement du territoire (SNAT),
 - les schémas régionaux d'aménagement du territoire (SRAT),
 - les plans d'aménagement de wilaya (PAW),
 - les plans directeurs d'aménagements et d'urbanisme (PDAU),
 - les plans d'occupation des sols.
- décret exécutif 90-78 du 27 février 1990 relatif aux études d'impact sur l'environnement.

3.4 Principales dispositions de la législation nationale:

- en matière d'étude d'impact sur l'environnement de nouveaux projets: Les études d'impact sur l'environnement sont régies par les dispositions du titre V de la loi 83-03 relative à la protection de l'environnement et le décret exécutif n°90-78 du 27 février 1990 relatif aux études d'impact sur l'environnement. En vertu de la loi et des dispositions des décrets sus-cités, tous les travaux, aménagements ou ouvrages qui, par l'importance de leurs dimensions ou leurs incidences, peuvent directement ou indirectement porter atteinte à l'environnement sont soumis à la procédure préalable d'étude d'impact. Le décret comporte cependant en son annexe une liste limitative des travaux, aménagement ou ouvrages qui y sont dispensés. Des dispositions en précisent sommairement le contenu de l'étude d'impact, les procédure de son dépôt auprès des services du Wali, de son consultation par le public et de son examen en vu de son approbation ou de son rejet par le ministre chargé de l'environnement.

- Dispositions du décret 98-339 du 3 novembre 1998 modifiant et complétant le décret 88-149 du 26 juillet 1988 relatif à la réglementation applicable aux installations classées et fixant leur nomenclature instituant la procédure d'étude d'impact à tout projet d'installation classée nécessitant l'autorisation préalable du Wali ou du ministre.

Pour les sources déjà existantes, Aucune disposition réglementaire n'y prévoit d'étude d'impact sur l'environnement.

- En matière de promotion des meilleures technologies disponibles et ou de technologies propres: seule une disposition du Fonds National pour l'Environnement (FNE) prévoit la possibilité d'apporter une aide financière aux projets d'investissements à caractère environnemental, intégrant des équipements de lutte contre la pollution ou adoptant des technologies moins polluantes.

- En matière de délivrance des permis pour les nouveaux projets:

- Dispositions du titre V de la loi 83-03 relative à la protection de l'environnement instituant l'étude d'impact comme outil de base pour la mise en oeuvre de la protection de l'environnement et attribuant la prérogative de délivrance de la décision d'approbation et/ ou de son rejet, au Ministre chargé de l'environnement, après avis des services des départements ministériels concernés,

- dispositions du décret exécutif n°90-78 du 27 février 1990 relatif aux études d'impact sur l'environnement fixant la procédure de dépôt de l'étude d'impact auprès des services du Wali territorialement compétent, et sa transmission aux services du Ministre chargé de l'environnement pour examen en vue de son approbation ou de son rejet.

- dispositions du décret ~~le~~ décret 98-339 du 3 novembre 1998 modifiant et complétant le décret 88-149 du 26 juillet 1988 relatif à la réglementation applicable aux installations classées et à leur nomenclature fixants les procédures et les autorités chargés de la délivrance des autorisations d'exploitations. En vertu des dispositions du décret toute installation figurant dans la nomenclature ^{des installations} classées est soumise, préalablement à sa mise en service et selon sa classification, à une autorisation délivrée soit par le ministre chargé de l'environnement, soit par le Wali, soit par le président de l'Assemblée populaire communale après enquête publique relative aux incidences éventuelles de l'installation sur la commodité du voisinage, la santé et la salubrité publique et l'environnement.

Ainsi, pour les projets soumis au président de l'Assemblée populaire communale, la délivrance du permis d'exploitation est soumise à la procédure enquête publique préalable.

Pour les projets soumis au Ministre et/ou au Wali, la délivrance du permis d'exploitation est soumise à la procédure respective de l'étude d'impact sur l'environnement et de l'enquête publique.

- En matière de renouvellement périodique des permis: Aucune disposition réglementaire ne prévoit de système de renouvellement périodique de permis. Les autorisations d'exploitations sont délivrées pour une période indéterminée.

Cependant en cas de transfert, d'extension, de transformation des installations ou de changement de procédé de fabrication, le propriétaire est tenu cependant, en vertu de la loi 83-03, de renouveler sa demande d'autorisation d'exploitation.

En outre le non respect, en cours d'exploitation, des prescriptions environnementales qui ont conditionnées la délivrance du permis peut entraîner la suspension du fonctionnement de l'installation jusqu'à l'exécution effective des travaux de mise en conformité exigés.

- En matière d'inspection portant contrôle de la conformité: Disposition du titre VI (recherche et constatation des infractions) de la loi 83-03 habilitant les inspecteurs chargés de l'environnement, les officiers de la police judiciaire et les officiers et agents de la protection civile, en leur qualité de police de protection de l'environnement, de rechercher et de constater les infractions en la matière. Toute entrave visant l'empêchement de l'accomplissement de cette mission est puni conformément aux dispositions du code pénal.

- disposition du chapitre V du décret relatif aux installations classées instituant une commission de surveillance et de contrôle, présidée par le représentant des services de l'environnement, exerçant sous l'autorité du Wali.

- En matière de promotion de la conformité et de l'application effective en cas de violation

- Dispositions du chapitre VI (délits et peines) de loi 83-03 prévoyant des peines et amendes pour toute infraction constatée au droit de l'environnement. A titre indicatif, le fonctionnement d'une installation en infraction et/ou en interdiction prononcée est passible, en vertu de la loi, d'une peine d'emprisonnement de 1 à 6 mois et d'une amende de 5.000 à 50.000 dinars ou de l'une de ces deux peines.

4. Délivrance des permis

4.1 Système de délivrance des permis

Les activités industrielles, d'élevages intensifs, les installations d'évacuation et de traitement des eaux usées domestiques, d'incinération des déchets, d'élimination des déchets solides sont considérées comme étant des installations classées au regard du décret 98-339 relatif aux installations classées. Ils sont par conséquent soumis:

- à la procédure d'étude d'impact sur l'environnement pour la réalisation effective du projet (délivrance d'une décision d'approbation),
- et à une enquête publique pour la délivrance de l'autorisation d'exploitation par le ministre, le Wali ou le président de l'assemblée populaire communale selon l'importance du projet.

La procédure de délivrance de permis comporte donc deux étapes principales:

I. Procédure d'étude d'impact

- 1 dépôt d'un avis d'intention d'entreprendre la réalisation du projet,
- 2 notification de la réalisation d'étude d'impact par les services de l'environnement,
- 3 réalisation de l'étude d'impact par le promoteur,
- 3 approbation de l'étude d'impact (après évaluation et consultation de l'étude par le public),
- 4 délivrance de la décision d'approbation de l'étude d'impact pour la réalisation effective du projet.

II. Procédure d'enquête publique

- 5 désignation d'un commissaire enquêteur,
- 6 information du public et ouverture d'un registre d'enquête,
- 7 transmission du dossier de l'enquête et des conclusions au Wali,
- 8 consultation des services des secteurs concernés par le projet,
- 9 contrôle de la conformité des travaux aux plans et conditions de la décision d'approbation délivrée,
- 10 Contrôle de la conformité des installations sur le plan environnemental,
- 11 délivrance de l'autorisation d'exploitation.

4.2 Principales autorités chargées de la délivrance des permis

Les principales autorités en charge de la délivrance des permis sont:

- le Ministre chargé de l'environnement,
- le Wali territorialement compétent,
- et le Président de l'assemblée populaire communale territorialement compétent.

4.3 Potentiel industriel existant soumis à la procédure de délivrance de permis:

En vertu de l'annexe du décret 98-329 portant nomenclature et classification des installations classées, on dénombre 369 activités soumises à déclaration et autorisation. On estime actuellement à plus de 1563 unités industrielles dont l'exploitation exige la délivrance préalable de permis. De ce total on dénombre -

- 128 entreprises publique d'importance nationale
- 234 entreprises publique d'importance régionale ou locale
- 1201 entreprises privé d'importance locale(plus de 10 salariés.)

4.4 Potentiel humain en charge d'instruire la procédure de délivrance des permis

On estime actuellement à près de 240 employés, au niveau national appartenant principalement aux services de l'environnement, de la direction générale de la protection civile et de la santé, en charges d'instruire les procédures de délivrance des autorisations d'exploitations.

Les services de l'environnements analysent la conformité, sur le plan environnemental, des procès de fabrications, des installations et des équipements du projet et ou de l'activité.

Les services de la direction générale de la protection civile analysent les dispositifs de prévention et d'intervention prévus pour protéger les travailleurs, la population avoisinante et les installations lors de la survenance d'un incident majeur.

Les services de la santé contrôlent la conformité des installations et ou de l'activité sur le plan de l'hygiène et de la salubrité publique.

4.5 *Efficacité des procédures de délivrance des permis*

A la lumière de ce qui précède, on estime que les procédures de délivrance de permis accordant des autorisations d'effectuer des activités spécifiques sont:

efficaces pour les projets d'importance nationale ou régionale; car leur réalisation ne peut être effective qu'après délivrance d'une décision d'approbation d'étude d'impact sur l'environnement et le permis d'exploitation n'est délivré par le Wali ou le Ministre qu'après enquête publique favorable et consultation des services des différents secteurs concernés par le projet,

mais restent peu efficaces pour les projets d'importance locale; car soumis à simple déclaration auprès du Président de l'assemblée populaire communale souvent démunis de services techniques en mesure d'apprécier correctement, selon la nature des projets ou activités, les répercussions négatives sur l'environnement ou la santé des populations susceptibles d'y être générées.

A cet effet, il convient à titre illustratif de souligner qu'au cours des 5 dernières années plus de 270 études d'impact ont été réalisés couvrant l'ensemble des secteurs d'activités.

Pour Les projets dont les études d'impact sur l'environnement ont fait l'objet d'une décision d'approbation, des autorisations d'exploitation ont été délivrés après enquête publique favorable.

Par contre, aucune étude d'impact sur l'environnement n'a été réalisée pour les projets déjà existants antérieurement à la date de promulgation de la loi 83-03 du 5 février 1983 relative à la protection de l'environnement.

En vertu ^{de} la loi ces installations, qui doivent être déclarées au ministre chargé de l'environnement, peuvent continuer à fonctionner sans autorisation à condition de s'y conformer aux prescriptions édictées par l'autorité chargée de l'environnement.

En vertu ^{de} la réglementation algérienne, les autorisations d'exploitation sont délivrées pour une période indéterminée, sauf en cas de non conformité des installations, constatée en cours d'exploitation, qui peut donner lieu à une décision de suspension du permis d'exploitation.

De même en cas de transfert, d'extension, de transformation des installations ou de changement de procédés de fabrication, le propriétaire est tenu cependant, en vertu de la loi 83-03 de renouveler sa demande d'autorisation d'exploitation qui ne sera délivrée par les services compétents de l'administration qu'après réexamen des conditions environnementales et en tenant compte des développements technologiques pour le choix des procédés.

Cependant conscient des difficultés économiques rencontrées par le secteur de l'industrie, des tentatives sont en cours pour instituer un cadre de concertation entre le secteur de l'industrie et les services de l'environnement afin que soit conjointement arrêté les principales actions prioritaires devant être mises en oeuvre par les unités industrielles pour se conformer à la réglementation nationale en matière de protection de l'environnement.

4.6 Accès du public à l'information environnementale:

Le secrétariat d'Etat à l'environnement dispose, après la récente restructuration de ses services, d'une structure centrale chargée exclusivement de la question de l'éducation, l'information et la sensibilisation du public. Un premier programme d'action a été ainsi concrétiser pour permettre au public d'accéder plus facilement aux informations traitant des questions environnementales notamment à travers:

- l'édition et la diffusion d'un bulletin périodique traitant des thèmes divers portant sur les déchets solides, les eaux usées, la pollution atmosphérique générée par la circulation automobile et les activités industrielles, la pollution marine,...
- l'édition d'un annuaire des textes législatifs et réglementaires,
- l'édition d'un manuel décrivant les procédures d'études d'impact sur l'environnement,
- la presse écrite qui consacre, avec l'aide des services de l'environnement, une page hebdomadaire à l'environnement,
- les émissions radiophoniques et tables rondes organisés auxquelles prends part souvent un représentant des associations écologiques,
- l'organisation de journées d'études traitant des thèmes de l'eau, des déchets, des produits chimiques avec édition et distribution de brochures et dépliants y afférents.

5. Conformité et application effective

5.1 Mesures d'encouragement à la conformité

Les mesures pour encourager la conformité sur le plan environnemental au niveau des installations ou des activités diffèrent selon les deux situations possibles pouvant se présenter :

- *Nouveau projet ou activité nouvelle*: Non délivrance du permis d'exploitation en cas de non approbation de l'étude d'impact sur l'environnement et/ ou d'enquête publique défavorable.

- *Activité déjà existante ou installation en exploitation*: Suspension de l'autorisation d'exploitation, amende et possible poursuites judiciaires en cas de non respect des prescriptions environnementales (selon la gravité de l'infraction).

Les principaux outils utilisés pour encourager la conformité au niveau des installations déjà existantes se limitent donc aux seules amendes et peines (suspension d'autorisation d'exploitations, poursuite judiciaires) prévues au titre des infractions à la réglementations.

Il faut souligner cependant que si les mesures d'ordres pénales demeurent encore efficaces, le montant des amendes est par contre très faible et ne peut de ce fait produire d'effet dissuasif. La non révision de leur montant depuis 1983 et les dévaluations successives du dinar aggravent leur caractère dérisoire et remet en cause le principe du pollueur payeur.

5.2 Vérification de la conformité au sein des installations industrielles avant le démarrage effectif de la production

Comme il est souligner précédemment, la délivrance de l'autorisation d'exploitation par le ministre ou le Wali est conditionnée par l'approbation préalable de l'étude d'impact sur l'environnement et les conclusions favorables d'une enquête publique (contrôle de la conformité des installations et équipements avant démarrage) menée par une commission dite de "contrôle et de surveillance" exerçant sous l'autorité du Wali et regroupant, entre autres, un inspecteur de l'environnement, un agent des services de la protection civile et un agent du ministère de la santé.

5.3 Inspections et contrôles lors de dépôts de plaintes

Lorsque des plaintes sont déposées, des inspections systématiques sont ordonnées par le ministre chargé de l'environnement pour constater les infractions objets de la plainte, et mettre en demeure l'exploitant à s'y conformer à la réglementation nationale dans un délai fixé, aux risques d'application des dispositions du chapitre VI afférentes aux délits et peines de la loi relative à l'environnement.

5.4 Fréquences des inspections et contrôles

Compte tenu du déploiement partiel du corps des inspecteurs de l'environnement à travers l'ensemble du territoire national, la fréquence des inspections et de contrôles varie selon les moyens humains et matériels dont disposent les services de l'inspection de l'environnement au niveau de chaque wilaya. Pour les inspections de wilaya qui sont actuellement suffisamment étoffées, un contrôle devra être effectué chaque année, sanctionné par un rapport transmis au Wali et au Ministre.

5.5 Principales autorités chargés de la conformité en matière d'environnement

Les principales autorités chargés de la conformité aux réglementations en matière d'environnement sont les inspecteurs de l'environnement et le corps des services de la protection civile.

Les inspections de l'environnement contrôlent la conformité des installations sur la plan environnemental. Elle ont pour missions principales:

- d'instruire les dossiers portant délivrance des autorisations d'exploitation (permis)
- de promouvoir les activités d'information, d'éducation et de sensibilisation en matière d'environnement,
- d'effectuer des visites d'inspections et de contrôles de toute situation ou installation susceptible de présenter un danger pour l'environnement et pour la santé publique,
- et d'enquêter en cas de pollution accidentelle afin de déterminer les causes, d'évaluer les dommages et situer les responsabilités.

L'organigramme prévoit la mise en place de 48 inspections de l'environnement, à travers le territoire national, organisées en 4 services pour prendre en charge les aspects de lutte contre les pollutions et nuisances générées par les différentes activités, de sensibilisation et d'éducation environnementale, de diversité biologique et de protection des ressources naturelles et de lutte contre la pollution accidentelle et les risques majeurs.

Actuellement 44 inspecteurs sont installés, partiellement dotés de moyens nécessaires pour y être opérationnels.

Les services de la direction générale de la protection civile contrôlent la conformité des plans de prévention et d'intervention des installations industrielles et activités.

Les missions de cette direction relevant du ministère de l'intérieur, des collectivités locales et de l'environnement portent sur la prévention et l'intervention face aux risques naturels et industriels. Elle comprend 4 directions :

- une direction de la prévention qui comprend une sous-direction des risques majeurs et une sous-direction des statistiques et de l'information,
- une direction de l'organisation et de la coordination des secours,
- une direction de la logistique et des infrastructures et une direction des personnel et de la formation,
- et une inspection générale des services.

L'organisation de ses services extérieurs attribue au niveau de chaque wilaya une direction comprenant:

- un service de la prévention,
- un service de la protection,
- et un service de l'administration et de la logistique.

5.6 Potentiel humain existant en charge du contrôle de la conformité en matière d'environnement

On estime actuellement à près de 200 employés au niveau national appartenant principalement au secteur de l'environnement et à la direction générale de la protection civile en charges du contrôle de la conformité en matière d'environnement.

Les agents et inspecteurs des services de l'environnements contrôlent la conformité, sur le plan environnemental, des installations et des équipements et ou des activités.

Les agents des services de la direction générale de la protection civile contrôlent l'efficacité des dispositifs de prévention et d'intervention mis en place.

5.7 Mesures consécutives à une infraction

Lors du constat d'une infraction à la réglementation, l'exploitant est mis en demeure de prendre les mesures nécessaires pour faire disparaître les dangers ou les inconvénients dûment constatés. Après expiration des délais impartis et non exécution des travaux exigés, une décision de fermeture est prononcée par le Wali territorialement compétent sur proposition des services de l'environnement. La décision de fermeture ne peut être levée qu'après exécution effective des travaux de mise en conformité exigés. Lorsque la gravité de l'infraction l'exige, des poursuites judiciaires sont engagées.

5.8 Moyens d'incitation à la conformité en matière d'environnement

Les seuls moyens existants d'incitation à la conformité se limitent aux amendes et peines (suspension d'autorisation d'exploitations, poursuites judiciaires) prévus au titre des infractions à la réglementation qui sont plutôt des outils de dissuasion.

5.9 Système d'évaluation de l'état de l'environnement

Pour l'évaluation de l'état de l'environnement, on se base actuellement sur l'analyse des indicateurs portant principalement sur:

- l'état de fonctionnement des stations d'épurations des eaux usées domestiques et leur rendement épuratoire effectif,
- l'état de fonctionnement des stations d'épurations des effluents liquides des établissements industriels et leur rendement épuratoire effectif,
- la qualité des eaux superficielles et souterraines,
- la qualité des eaux de baignades,
- le taux d'évolution des maladies liées à l'eau et à l'hygiène du milieu,
- l'état de salubrité et d'hygiène du milieu,
- le taux de prolifération des décharges des déchets urbains non conforme,
- l'état de fonctionnement des équipements antipollution des installations industrielles notamment, les systèmes de traitement de fumées et de lavage des gaz,
- et le taux d'évolution des maladies respiratoires.

BOSNIA AND HERZEGOVINA

BOSNIA AND HERZEGOVINA COUNTRY REPORT ON COMPLIANCE AND ENFORCEMENT OF REGULATIONS

Content

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2. Background Information on activities
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Brief historical review

The state of Bosnia first appeared in the Xth century where a specific religion was created, between the two Christian religions, known as the Bosnian-Bogumile Church. Later, Bosnia became a kingdom in the XIIth century and reached maxima size. During the occupation of the Balkan countries by the Ottoman Empire, Bosnia came under Turkish rule from 1463. A large part of Slavic population converted to the Islam religion and became as Bosniacs. After the defeat of the Ottoman Empire in the Balkans, the Austro-Hungarian Empire established its authority in Bosnia after the Berlin Treaty (1878). Thus, Bosnia entered the group of countries known as European countries. Up to the First World War, B&H had important changes in both economic and cultural sense. After the end of the war, B&H was united with Slovenians, Croats and Serbs to create the Kingdom of Yugoslavia.

The disintegration of Yugoslavia took place in 1941 during the Second World War and B&H came under the authority of the Independent State of Croatia. After the war, B&H belonged to the Socialist Federal Republic of Yugoslavia (SFRY). In the process of the second disintegration of Yugoslavia (1990), B&H determined to be an independent country within its historical borders. On May 1992, B&H was internationally recognized as an independent country. After more than three years of internationalized war, its integrity and sovereignty were confirmed by the Dayton Peace Accord. At present, there are two entities in B&H, the Federation of Bosnia and Herzegovina and the Republica Srpska.

Some statistic data from the year 1991.

GENERAL FEATURES	Area: 51 129 km ² Terrain: Dinaric mountains in the central and southern parts, plains in the north along the river Sava. Lowest point: Adriatic sea (0 m). Highest point: Magli} (2386 m) Climate: continental: hot summers and cold winters Land boundaries: Croatia 931 km, Montenegro 249 km, Serbia 357 km, coast line 25 km, total 1542 km. Population: 4354911 Population density: 85 per km ²
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	Ethnic groups: Bosniacs 44%, Serbs 31%, Croats 17%, others 8% Main cities: Sarajevo (capital), Mostar, Tuzla, Zenica, Banja Luka, Bihać
HEALTH STATISTICS	Age distribution: 0-14 years 23%, 15-60 years 65%, more then 60 years 11% Life expectancy: male 69,2 years, female 74,6 years Birth rate: 14.9 per 1000 population Death rate: 4.8 per 1000 population
TRANSPORT	Road: 21 677 km Rail road: 1040 km
ECONOMY	Natural resources: wood, coal, iron, bauxite, manganese, copper, chromium, lead, zinc, water power Manufactured products: textiles, clothing and footwear, chemical, electrical and machinery iron, steel, aluminum Energy: electricity, coal, coke
FINANCE	Gross domestic products: US \$ 10.2 billion Per capita GDP: US \$ 2300 Imports: US \$ 1.86 billion Exports: US \$ 2.05 billion
EDUCATION	Primary and secondary education: 532 468 (1990/91) students: 34 644 (1990/91) Doctors of sciences: 880 (1990) Universities: Sarajevo, Mostar, Tuzla, Banja Luka

General situation in B&H after the Dayton Accord

	Federation	Republika Srpska	total B&H
Surface (km ²)	26350	24650	51100
Administrative	10 cantons	7 "regions"	
Population (1996)	2466544	1550753	4017297
Density	94	63	79

1. Introduction

B&H is politically and administratively decentralized country. Lack of strong co-operation between entity, provincial (Cantonal or Regional) and local authorities responsible for environmental development and planing, causes, among other important matters, many difficulties in terms of integrated environmental management planing.

Apart from that, B&H is also faced with huge economic and social problems. In such a situation, it is very hard for policy – makers to give long-term priority for environment protection that this field really need.

Environmental Legislation is not yet established in B&H, but related proposals for governmental adoption are prepared and adjusted to West European environmental principles.

Bosnia and Herzegovina belong to Central and East European Countries block i.e. developing countries block and share the same problems.

B&H is nowadays in the process of big changes:

- Transition from one political system (socialistic) to another (capitalism),
- Transition of the public and state ownership to private,
- Introduction of market economy and

- Returning (or moving) of hundreds of thousands displaced persons and refugees.

Considering the fact that in B&H production activities need to be reestablished, it is necessary to use economic instruments to achieve the following:

- Adoption of legislative instruments,
- Appropriate resources management,
- Pollution control, and
- Environmental protection funds setting up.

Privatization programs still do not pay enough attention to the environmental protection issues. Considering the fact that B&H did not define causes and extension of environmental damages till 1992 (in the pre-war period), presently efforts are made to define following:

- Responsibility for providing finances for environment rehabilitation,
- Data about pollution emission,
- Responsibility for reduction of pollution emission.

Water Resources

In a hydrographic sense, Bosnia and Herzegovina belongs both, Black Sea and Adriatic Sea catchment areas. Out of total area of 51129 km², 12410 km² or 24.3% belongs to the Adriatic catchment area.

Besides the water courses, significant water resources are inland lakes, especially B&H has about 25 km long coast on the Adriatic Sea. Belonging catchment area is mainly karst region and that is why it can be treated as homogenous region. Even inland parts of the catchment areas of the rivers that gravitate toward Adriatic Sea basin must be treated in same manner as coastal zone itself. Dinaric karst region "locus tipicus", whom belong Adriatic catchment area, one can described as natural treasure of karst phenomena (sinkholes, caves, caverns etc.).

Circulation of surface and especially underground water go very fast and concentrate along the underground courses system. Plunged waters than arise on karst springs on the edges of "poljas", surface watercourses and submarine as "vruljas". Autopurification is almost negligible, because of the very short period of detention time in underground.

From mentioned above comes out that uncontrolled management of water and environment in his region that spreads on about 25% of the B&H territory, has great influence on Mediterranean area.

Neretva, as a transboundary river flowing through B&H in direction to Croatia, should be covered by Mediterranean Hydrological Cycle Observing System (MED-HYCOS), which aims to improve co-operation between the countries of the Mediterranean Sea basin, in the field of water resources assessments and management, including collection, transmission, processing and dissemination of relevant water data.

Protected areas

The Neretva Delta forms a valuable ecological entity with several internationally important and protected wetlands, ornithological and ichthyological reservations.

Neretvanske Blatije, (main channel and a few secondary ones) including the fields of the lower Neretva, comprise the area about 19.000 hectares, out of which about 7.000 on territory of the Bosnia and Herzegovina and 12.000 on Republic Croatia. A large part has been ameliorated and transformed into agricultural land, the rest wetland area constitutes a natural oasis with rich fauna and flora.

Protected natural position, rich water and land content, as well as the mild and wholesome climate have supported development of rich and original vegetation, as well as of versatile fauna of Neretvanske Blatije. The aquatic and marsh vegetation consists of about 450 species. In the area of Blatije about 300 bird species belonging to some 50 families have been recorded. This is an important ornithological area, in particular in the season of bird migrations, and also as the winter resorts for many species.

In addition to freshwater fish, some sea fish species are also present in the water in Blatije, the most important among them being the eel.

Locality of Hutovo Blato consisting of 7.411 hectares of wetland, is an extremely valuable resource in Neretvanske Blatije. Area includes hilly part of Lonja and Kojela, waters of lakes Deransko, Jelim, Orah and Drijen and region of Donje Balto including Karaotok, ornithological reserve [Krka, lake Svitavsko jezero and river Krupa.

2. Background Information on activities

Before the war in catchment area of rivers Neretva and its main tributary, Trebišnjica had lived about 280.000 inhabitants. Population was concentrated mostly in larger towns and settlements. In Neretva catchment area number of inhabitants were: Konjic (about 44.000 inh.), Jablanica (about 13.000 inh.), Mostar (about 126.000 inh.), Ljubuški (about 27.000 inh.), Grude (16.000 inh.), Stolac (about 19.000 inh.), ^apljina (about 28.000 inh.) and on the Adriatic coast, town Neum (about 4.000 inh.). Only about 20% out of all inhabitants were connected to the waste treatment plants. Only towns of Ljubuški and Neum have waste water treatment plants. Neum has waste pretreatment plant and waste water is pumping to Mljet bay, where is placed this pretreatment plant. In town of Grude was also built waste water treatment plant but it is not in function.

Industry in catchment area of Neretva is concentrated in few towns: Konjic - metallurgic industry, Jablanica - metallurgic industry and stone-masonry factory; Mostar - textile and meat industry, compressors factory, pressed plates factory, distillery, vine industry and juices factory on the left side of the river, and coal mine, milk factory, aircraft industry, alumina and aluminum factories on the right side. Only factory for pressed plates and milk factory are connected to the town sewer, and all other factories and mine dispose their waste water directly into the river Neretva, and also municipal sewer system.

Larger towns in catchment area of Trebišnjica river are: Gacko (about 11.000 inh.), Bileća (about 13.000 inh.) and Trebinje (about 31.000 inh.). Only Trebinje town has wastewater treatment plant.

Industrial facilities are: in Gacko - thermoelectric power plant as the biggest polluter, in Bileća - textile industry, whose waste water caused few serious incidental pollutions in

reservoir of power plant "Gran-arevo" and in Trebinje - metal tools factory, without waste water treatment plant.

Total pollution load from industry in equivalent number of inhabitants is estimated on about 150.000.

Total estimated pollution loads measured in 1989. on the lowest check point (downstream from ^apljina town) were:

- BOD 190 - 3.500 t/year (minimum - maximum load)
- COD 1.000 - 20.000 t/year
- total N 1.000 - 17.000 t/year
- total P 59 - 800 t/year
- TSS 900.000 t/year
- Fecal Coliform bacteria 17.500/ml.

In the Neretva river basin there are several hydropower plants with storage reservoirs Jablanica (320 mill. cu.m), Rama (450 mill. cu. m), Grabovica (11 mill. cu. m), Salakovac (40 mill. cu. m) and Mostar (7.5 mill. cu. m), which make it possible to intercept the high discharges in the Neretva and provide flood protection, along with power production.

In the construction of the hydropower plant ^apljina (using the water from Trebi{njska river between Popovo polje field and Neretva), a part of Hutovo Blato has been submerged.

In late period due the war activities, having in mind that first front line was very close to Hutovo Blato, degradation of the area was continued through deterioration of quality and quantity of animal and plant habitats. Devastation and destruction of some parts of Hutovo Blato were caused by fire and uncontrolled deforestation, enormous fishing etc. During the winter birds species as most numerous (about 50.000 birds of different species) were significantly decreased. Estimated present number is about 10.000. Biological bird diversity is reduced about 70% (prewar number was 240 species). Also following facts stress the seriousness of the situation:

- out of almost 2.500 prewar swampy species stayed 300;
- out of almost 160 partridges stayed only 12;
- out of almost 40 partridges gray stayed none;
- out of almost 160 rabbits, stayed 17;
- foxes and otters are almost gone.

There is no provision for using BAT or CT at this moment.

Considering the state of environment, situation is improved only because of the fact that due the war activities, industry facilities works at approximately 5-10% of the pre-war production.

Unfortunately there is no environmental monitoring at all. Lack of Environmental law causes that there is no legal means to establish monitoring.

Public awareness of environmental problems is also weak. In this part of B&H there is no even single NGO organization.

3. Legislation

Nowadays, there are no environmental management mechanisms in Bosnia and Herzegovina. Therefore adoption of appropriate legislative is ongoing process, in order to improve environment management. These regulations will define standards that will influence on pollution reduction, appropriate resources management and their sustain. To be implemented, these standards must be ecologically and financially acceptable, technologically feasible.

Presently, environment pollution is not considered as critical because of low production capacity.

Besides that, the war caused additional untypical and very specific environmental problems. Urban Planning Law in former Yugoslavia established general principles on environment protection and development, and it was overtaken in Federal Parliament in Bosnia and Herzegovina. This law set basic environmental protection regulations concerning water, land and air issues. Republic authorities were responsible for pollution measurements in the pre-war period.

Before the war Environmental Law did not exist in B&H. Environmental issues were formulated only within one Chapter within "Urban Planing Law" that was established in 1974, reversed and supplemented in 1981 and 1987. III Chapter of Urban Planing Law called "Protection and Improvement of Human Environment" consisted of numerous Articles related to the different environment aspects.

Existing legislation

3.1. Water resources

Existing laws, the present Water Law (May 1998) and legislative from the pre-war period, which are still in force, are not applicable and compliant with the EU regulations.

3.1.1. Water quantity and quality

Before the war, by the "Main Water Law" (Osnovni zakon o vodama, Sl.list SFRJ, 13/65), it was regulated that republics hydrometeorological service was responsible for systematic observing of water quantity and quality elements, in the way prescribed by "Regulation on observing and assessment of water quantity and quality changes and methodologies for physical and chemical detection" (Pravilnik o vrstama i nacinu osmatranja i ispitivanja kvalitativnih i kvantitativnih promjena voda i metoda za fizicko-hemijsko ispitivanje voda Sl.list SFRJ, 42/66).

By the "Law on hydrometeorological services that are on behalf of Republic" (Zakon o hidrometeoroloskim poslovima od interesa za Republiku, Sl.list SRBiH 10/76) hydrometeorological services were uniformly regulated, by the same methodology and standards defined for the whole territory of ex-YU. The basic hydrometeorological network was proposed by Hydrometeorological institute of B&H, and adopted by Government of Socialistic Republic Bosnia and Herzegovina (SRBiH). The same Law regulates publishing of observed and measured data by almanac and defines data of Hydrometeorological Institute

as the official. By Article 9 of the Law, Hydrometeorological Institute of SRBiH is financed by the budget of SRBiH.

“Regulation on network design and hydrological stations programme” (Pravilnik o utvrdjivanju mreza i programa rada hidroloških stanica), was predicated by United Hydrometeorological Institute of ex-Yu in Belgrade and, as it was a member of World Meteorological Organisation (WMO), the regulation was in accordance with criterion and guidelines given by WMO. At the end of 80-ties and beginning of 90-ties, the United Meteorological Institute started with activities in order to establish new station network. Therefore, the “Law on hydrometeorological services that are on behalf of the State” (Zakon o hidrometeorološkim poslovima od interesa za cijelu zemlju - SL.list SFRJ, 10/88) was adopted, as well as the “Regulation on network design and programme of hydrological stations that are on behalf of the State” (Pravilnik o utvrdjivanju mreza i programa rada hidroloških stanica od interesa za cijelu zemlju - SL.list SFRJ, 50/90), with list of stations for systematic observing of water quantity and quality elements ones a month (12 x per a year). The next logical step - harmonisation of law regulation on the level of Socialistic Republic Bosnia and Herzegovina (SRBiH) with the state law regulation of ex-Yu, firstly stopped because of political tensions, and then because of the war and disintegration. All of the mentioned law and bylaw regulations are still in force in the independent Bosnia and Herzegovina, by the Regulation from 1992 (Uredba, Sl.list RBiH 2/92).

Before the war, as result of such a organisation, water quantity and quality monitoring network existed at the territory of B&H. According to the Study of hydrometeorological network of B&H (1983), there were (in total) 371 stations for monitoring of surface waters quantity elements, including 144 stations of the basic network. The stations were equipped with water level-staffs, 62 of them were equipped with instruments for permanent water level recording. At 6 profiles, suspended solids load measurements were also being done, at the water temperature of 44 degrees. In average, the stations were in function for 30 years, and the stations with level recorders for 15 years. Discharge measurements were being done, in average, 1.6 per year for a station.

Systematic observing of B&H surface waters quality began in 1965. National statutory (basic) monitoring network of Hydrometeorological Institute of B&H was covering B&H rivers by 58 stations, situated mostly in the Black Sea (Danube River) basin - 53 stations, and 5 stations in Adriatic Sea basin. The areal density of sampling sites varies from 730 km² per one sampling site (Black Sea basin, average) to 2482 km² per one sampling site in Adriatic Sea basin, in average. It is caused by river network density. In the Mediterranean part of B&H, only Neretva river, 233 km long, was able to pass through the karst mountains appearing from outside of the karst territory.

Water quality data collection

Monitoring and evaluation of water quality was based on occasional grab water samples. Chemical parameters were monitored three times a year (spring, summer, autumn), and biological twice a year, in summer and autumn.

Standard physic-chemical parameters, such as temperature, appearance, pH-value, alkalinity, dissolved oxygen and degree of saturation, and afterwards all types of hardness, total and suspended solids, KMnO₄ consumption, BOD₅, ortho-phosphate and total iron were determined in all grab samples. Nitrogen compounds (ammonia, nitrite and nitrate nitrogen) were checked at 10 stations only.

Heavy metal analysis were being done from time to time by instrument procedure, which ensured general insight, but not reliable data on characteristic concentration for water courses.

Other specific, particularly organic pollutants, including wide range of law standardized organic micro-pollutants (pesticides and other biocides) were not included in regular control as well, for their determination the equipment not possessed by Republic Hydrometeorological Institute was required.

Biological and sanitary bacteriological parameters of water quality were regularly being determined at the stations.

Underground water, except Semberija region and stagnant water (water and reservoirs) were not included in the regular program of water quality control.

Before the war, monitoring condition was not satisfactory, regarding to both- quantitative and qualitative components. Documents issued just before the war, such as: "Programme of Modernization and Technical Equipping of Hydrometeorological Service in B&H for the period from 1991-2000" (1990), "Conception of Long-term Program of Water Protection" (1991), "Regulation on Network Establishment and Operation Program for Observation Stations" (1990) were an unsuccessful effort to improve water monitoring condition in B&H.

3.1.2. Water pollution (industrial and domestic wastewater)

In pre-war period measurement and control of effluents were done only on outflows of industrial effluents into the rivers, once in two to three years, depending of pollution load and variation in industries production processes. Most of the industry facilities are out of work nowadays. Pollution control of the existing ones that are in function does not exist.

3.2. Solid waste (industrial, urban)

The pre-war situation in Bosnia and Herzegovina considering the solid waste collection and disposal was mainly locally organized (approx. 170-250 kg/capita/year). Collecting equipment was inefficient, separate collection negligible. Solid waste was usually transported to the municipal, local landfills and disposed without any sanitary measures. Even the Capital had no sanitary dumping site. Large industries disposed their own waste, sometimes in their own landfill sites. It is recognized that industrial waste was the largest source of water pollution. Due the war, situation was changed on worse. Number of the existing landfills were out of reach for many municipalities, and waste was just scattered around, or there were organized improper temporary landfills. Collection equipment was to a large extent damaged or destroyed. In spite the fact that in general, amount of solid waste was decreased, especially in the large industries, but specific waste that is a direct result of the war (destroyed buildings,

vehicles, military dump sites, etc.) has increased and consequently to that, health hazards also increased.

Federal Law on collection, production and market of raw and waste material defines rights, obligations and responsibilities of legal and physical entities in the domain of collection, production and market of useful waste materials, and production and market of secondary materials.

Treatment of waste materials must be according to the regulation of environment protection.

In the sense of this law:

- secondary materials are products of waste recycling, by type, assortment and quality, done according defined standards and technical and technological classifications, that can be treated and used for production of final products or half-final products
- waste materials are waste substances in liquid, solid or gas form, as a result of production processes, market ore use in wide spending, including amortized equipment and similar. Special category is dangerous waste in a sense of Environment protection law.

Standard and technical and technological classifications of secondary materials will be done by Institute for Standards, Measurement and Patents.

It is forbidden by law destruction and incineration of waste that can be use for secondary materials if it is not defined otherwise by special regulations.

Legal and physical entities that works in this filed, must fulfilled conditions subscribed by Federal ministry for energy, mining and industry.

Treatment of waste materials

Legal and physical entities that produce during the operational process materials mentioned in Art 2 of this law, are obliged, according the contracts, to deliver them to the companies which produces secondary materials or to recycle them by themselves.

Type, amount and place of origin of waste material must be noted by legal and physical entities that produced them.

Legal and physical entities that ransom and recycle waste material are obliged to do that according the regulation prescribed by Cantonal government.

Waste materials with unknown origin are forbidden to be ransomed.

Legal entities in charge for waste collection in towns and settlement are obliged to separate materials mentioned in Art2 of this law and select them according to types and deliver to the companies that deals with recycling and production of secondary materials.

Legal entities from the Paragraph 1. of this Article are also obliged for installation of containers for separate collection of waste.

For regulations for collection, disposal and separation of waste in charge is Cantonal government.

It is forbidden import and export of waste that is out of balance regime.

Balance for Federation is done every year (annually) in the frame of federal association for industry

3.3. Agriculture and forestry

"Urban Planning Law" treats problem of soil and forest protection. Controlled usage and protection covers following areas:

forests and other vegetation,
agricultural land of high value or for specific aims,
areas impacted with erosions or floods,
karst, flatlands etc.,
areas that need special protection.

Protection measures are developed with regulations and plans made by appropriate Ministry department. Most of further information were provided by Federal Ministry of Physical Planning and Environment, Federal Ministry of Forestry and relevant experts in the field of agriculture and forestry.

Uncontrolled and illegal tree cutting is a huge problem in Bosnia and Herzegovina, especially in the Republic of Srpska. Because of that, price of wood fell down to even less than 10 DEM/m³ in some parts of Republic of Srpska. So the main problem is not just unregulated field of tree cutting charges with environmental relevance (present charges are economic, not environmental instrument), but incapability to stop illegal and completely uncontrolled process of woodcutting.

By related laws is not required, that existing sources or new project need environmental impact assessment studies.

Procedure for permitting of new project is as follows: Ministry of Urban planning and environment gives its permits first, and after that Ministry of Agriculture Water management and Forestry gives its permits.

By law is defined period for permit renewal depending from case to case.

In case of violations are two possibilities:

4. Permitting

Air

Buildings and plants construction is not allowed if the prescribed conditions for air protection are not provided. Permits' issuing for using of the buildings and plants is in charge of the environmental protection inspection.

Water resources

For permitting issue is in charge Federal Ministry of agriculture, water management and forestry. Permits are needed for: water use, recharge of water storage, effluent of wastewater and waste and hazardous materials into rivers, agricultural land, forests and atmosphere. Permits are also needed for all constructions that already have approvals from the same Ministry.

Biodiversity and nature

Nature protection is lightly covered with "Urban Planning Law". It defines the way to get a permission to build a factory, treatment plant, do a environmental hazardous transport, register a company etc.

At this moment responsibilities are not clearly defined between different state levels. Because of the fact that each canton has its own laws, Federal laws left possibilities for some responsibilities to be defined by Cantonal laws.

In pre-war period only about 20-25% of industrial facilities had wastewater treatment plants. Having that in mind, each factory that is planned to start with production will need permit in case that Federal Ministry of environment prepare and submit new environmental law to the Federal parliament.

As it can be seen from the annex, there are 3 inspectors in each related Federal Ministries in charge for control whether some project meet all conditions to get permit to start to work. For permit issuing are in charge Federal Ministries.

According to the existing law new or existing projects of any type do not need EIA studies included.

It is not often case but public theoretically has access to information.

There were some partially done researches on environmental state in the country, but comprehensive and complete study is steel needed to be done.

5. Compliance and Enforcement

Federal and Municipality authorities are responsible for supervision on implementation of the regulations through Federal and Municipal inspections with duties to control activities within urbanism, construction and environment protection fields. Urban Planning Law regulates also environmental economy delicts and penalties for them. They were mostly fees within urbanism, construction and environment protection fields.

At this moment Ministries in charge have 3 inspectors each. Situation in cantons and municipalities differs from one to another. At this moment there is no adequate qualified employees in cantons and municipalities.

Considering the period inspection and control carried out within industrial plants, domestic wastewater disposal, incineration and landfills there is no control at the moment.

Urban development and infrastructure projects have no regular control but from case to case. When violation is verified, procedure should be according the law as follows: official requirement for correction measures within strict time period including the temporary closure, after that goes re-inspection and if correction was not done, penalties for that facility

and responsible person and continuation of closure. There were no permanent closures, mainly because of the strong influence of politic structure pressure in that municipality.

One must have in mind that in pre-war period there was strong political pressure on inspection, courts, judges, etc

At this moment as industry works 5-10% of capacity, there are no cases that of closing the industries.

Regarding the state of the environment assessments for water quality, industrial emissions and protection of habitats, this is still not practice to do these kinds of assessments.

Here are some points regarding compliance and enforcement in different fields:

Air

Air pollution control and measurement is in charge of the municipalities.

The inducements of the air pollution defray in proportion with degree of pollution. Municipality proscribes the regulations about quantity of refund, way of refund and way of using those funds.

There is no air emission non-compliance fee in B&H

Noise

There are no noise pollution penalties in B&H

Water resources

Federal Ministry and Cantonal Ministries have their inspectors for control of law enforcement, i.e. they are in charge for control of states of international and other water courses and water in general, control compliance of executed works according the issued permits, control flood protection plans and their execution, results of sampling and measuring of water and waste quality and quantity, functioning of waste water treatment plants and others. Distribution of tasks among Federal and Cantonal inspectors is defined by Cantonal law.

According to the results of their work inspectors define measures and dead lines for executions.

There were no water extraction charges in B&H up to December 1998 (0.1 DM/m³).

There were no water effluent charges in B&H up to December 1998.

Before the war only 5 Municipalities in B&H had water treatment plant, but nowadays neither is in function.

Waste water

There are no waste water and sewage non-compliance fees in B&H.

Solid waste

For law supervision in charge is federal, cantonal legal entity and municipal legal entities. Penalties for destruction, non selection of waste material etc are 2.000 to 10.000 DEM

Soil, forest, agricultural land

There are no special environmental charges/taxes on fertilizers, pesticides or other chemical agents used in agriculture.

There are no charges/taxes on land use with clear environmental relevance in our Country. Federal law regulated that 20% of wood price should be directed to simple, and 3% of wood price to widened reproductive of forestry. Unfortunately, these regulations are not obeyed.

There are no mining charges/taxes introduced just for environmental reasons.

There are no charges/taxes on raw materials introduced with clear environmental motivations, other than mentioned.

There are no charges/taxes in the areas of soil protection, forestry and agricultural policy introduced with clear environmental motivations.

Nature protection non-compliance fee

There are no nature protection penalties in B&H, other than previously mentioned (water, forests, soil, waste ...)

Other instruments related to nature protection and biodiversity

There is no strictly environmental part of tourism taxes. There are very few nature parks, mostly not maintained, severely damaged during the war. Access fee is not charged for any of them.

Annex

As at this moment both Federal Ministries in reorganization process, i.e. it is expected that within this year will be founded new Federal Ministry for Environment and water resources, here is described present organization of the **Federal Ministries connected to environment issues.**

Federal Ministry of Urban Planing and Environment Organization

According to the article 22, paragraph 4. of Law on federal ministries and other bodies of federal administration (Official gazette of FBH no. 8/95), Minister of Federal Ministry of Urban Planing and Environment, with compliance of Government of FBH inaugurated Regulations for internal organization of the Ministry.

Ministry is organized for execution of administrative and other competent works on the Federation territory in the fields of:

- urban planing
- protection of cultural heritage
- protection in the field of ecology
- reconstruction of devastated facilities and facilities of cultural heritage
- planing, monitoring and realization of settlements constructions for the displaced persons settle.

Inspection

Inspection provides law execution other regulations and defined strategy in the filed of urban planing and environment protection, directly executes law and other regulation, expert, executive and immediate inspection works, provides experts support, prepare and participate in law and sub laws prepare and other business that this Ministry is in charged for.

Inspection department according the regulations consists of:

1. Chief inspector: 1
2. Inspector for urban planing and construction works: 1
3. Inspector for environment protection: 2.

Departments

Urban planing Department is divided in two sectors:

Urban planing and usage	Construction and reconstruction of construction heritage
Chief of sector	Chief of sector
Assistant on urban planing	Assistant on reconstruction and renewal of construction heritage
Assistant on urban usage	Assistant on settlement construction for displaced persons and refugees

Environment Department is divided in three sectors:

General ecology and ecology protection	Protection of ecosystems	Natural and cultural heritage
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Chief of sector	Chief of sector	Chief of sector
Assistant on ecological planing and sustainable development	Assistant on climate protection	Assistant on natural heritage protection and ecological tourism
Assistant on coordination and cooperation	Assistant on water protection	Assistant on cultural heritage protection
	Assistant on soil and urban ecosystems protection	
	Assistant on biological diversity and natural ecosystems protection	
	Assistant on waste and hazard materials	
	Assistant on pesticides and ecostimulcides	

At this moment there is 6 employees (3 chemists and 3 biologists) out of planed 14 .

Assistant on water protection is in charge for monitoring, execution and improvement of impact assessment on water ecosystems, i.e. activities and measures for water protection. Assistant prepares expert base for law and other regulation in the domain of water protection, prepares experts opinions and answers on different questions in connection with water protection. Assistant also controls water polluters cadastre within the regions during the time, undertakes exact measures, participate in compliance issuing for location and start of facilities that have emission of different materials which can pollute water and living flora and fauna.

Assistant on waste and hazard materials is in charge for monitoring of state of waste and hazard materials within environment, their transport, usage, collection, disposal and treatment in order to provide efficient protection for health of people, flora, fauna, funguses, hygiene and all other ecosystem components. Assistant participates in law and other regulations prepare that in connection with this subject.

Reconstruction and construction department has two sectors for:

Reconstruction	Constructions.
Chief of sector	Chief of sector
Assistant on coordination of reconstruction of settlements capacities	Assistant on coordination of construction works within the country
	Assistant on coordination of construction works abroad
	Assistant on technical regulations in domain of construction works

At this moment this department has 4 employees (3 architects and 1 civil engineer) out of planed 8.

General/common affair department has three sectors for:

Administration and normative works	Staff and supporting activities	Financial and accounting works
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At this moment this department employs 17 out of planed 27 workers.

*Draft proposal for Law on environment protection
From June, 1997.*

Federal Ministry for Physical planning and environment

System of management, protection and improvement of environment includes measures and conditions for:

- *conservation and protection of natural value of environment*
- *protection of people and environment form pollution*
- *protection from impact of hazardous and dangerous substances, ionized and non ionized emission, noise and vibration*
- *improvement of environment quality*
- *monitoring and rehabilitation measures.*

Main goals in management, protection and improvement of environment are:

- *preserve quality of living and nature in total*
- *preserve origin, biodiversity of ecosystems and ecological stability*
- *provide rational use and continuos approach toward natural resources and prevent degradation and destruction in environment*
- *prevent import of dangerous and waste substances that are planed for production and disposal*
- *provide development which provides fulfillment of present and future generations demands*

Federal ministry defines actions that must have document on environment impact assessment before there are undertaken

(author's opinion most probably for damping site construction must be done study on environment impact assessment)

Audit of impacts done in this study and acceptability of action is in Federal ministry domain. Federal ministry also can form commission of scientific, technical and other experts (federal administrative bodies, experts from the industry etc) for evaluation of impact.

*In charge for study design ordering is the subject that planes to take action
Study design must be done by Public utility.*

Permission for taking action gives Federal ministry

Urban planing plans

Environment protection measures included in Urban planing plans purport also (among others) measures for waste management.

Registration and control of activities that endanger environment

Activities that endanger environment or might endanger environment must be in accordance to special regime of control

Control is provided by:

- definition of list of activities and facilities that endanger environment or might endanger environment (oil refinery, chemical industry, pulp factories, transport and storage of dangerous, flammable and other substances,*
- by issuing special permission for those activities*
- registration of all facilities that endanger environment or might endanger environment*

How to define the list and way of issuing permission and registration will be appointed by federal ministry

Federal ministry of agriculture, water management and forestry

Federal Ministry of Agriculture, Water Management and Forestry consist of 4 sectors: Agriculture sector, Water Management Sector, Veterinary sector, Forestry sector and fifth, General/common affairs Sector covering above 4 sectors.

WATER MANAGEMENT SECTOR is responsible and deal with processing of water laws, by-laws, acts, strategic and policy planing and integrated water resource planing, issuing of water compliance and permits and water inspection through:

1. Water use and water resources development affairs,
2. Water conditions, compliance, permits, and water economy affairs,
3. Water protection affairs,
4. General affairs,

Water management inspectorate and Water management consult affairs.

Water management sector has 9 employs- 6 Hydro-engineers (including Assistant to the Minister for water sector), 2 Engineers of technology and Secretary.

Water sector use law and economy services from General/common affairs Sector, which has 1 Layer and 1 Economist employed.

CROATIA

COMPLIANCE AND ENFORCEMENT OF REGULATIONS IN CROATIA

1. Brief introduction on the country.

Croatia is medium-sized European country with two distinct natural and geographic regions. Geographically and culturally inland (continental) Croatia is part of central Europe while coastal Croatia lies on the Mediterranean. Thus Croatia is both a central European and a Mediterranean country.

The relatively small but geographically important SW corner of the central Danubian region that Croatia occupies largely consist of the Pannonian and Peri-Pannonian plains formed by the rivers Sava, Drava and Danube. Of the three the Sava valley region is the largest and the Drava valley the smallest. A narrow mountainous area known as the Croatian Threshold forms a natural link between the central Danubian region and the Adriatic coast.

The configuration of the state frontiers is such that the greater part of Croatia stretches across Pannonia and down the coast. The narrow mountainous Dinaric area that connects the two is the smallest. The Pannonian region accounts for 55% of the country, the coastal area for 31% and the mountains for 14%.

The coast of the Croatian Primorje is a very important part of Croatia. It accounts for only one third of the land area one third of population, but because it provides access to the sea Croatia is a very viable presence in world trade and shipping.

Croatia stretches from 46°33' N (Zabnik village, Medjimurje County) and 16° 22' E and from 41° 23' S (Galijula, Palagruza aripelago, Dubrovik Neretva County) and 16° 21' E. North-South this distance of 458 km as the crow flies. The most southerly point in continental Croatia is Cape Ostra (42° 12' N and 18° 32' E).

Area	sq.km.	%of total
land	56,610	65
Coastal sea*	31,067	35
Total	87,677	100

* The coastal sea consist of the internal waters and the territorial sea. the territorial sea stretches 12 nautical miles from the boundary of the internal waters.

The Adriatic sea is in fact a large bay of the central Mediterranean, separated from the rest of it by the Apennines. The Adriatic is about 870 km long and runs from NW to SE, with an average width of 160 km. The link between the Adriatic and the Mediterranean is the 70 km wide Strait of Otranto. The Adriatic is small and relatively shallow sea. With an area of 138,000 square km it accounts for slightly less than 5% of the Mediterranean and the three quarters of its sea bed is less than 200 km deep.

Croatia has a total of 1,185 islands, rocks and reefs, including 66 uninhabited and 652 inhabited islands, as well as 389 rocks and 78 reefs.

Most Croatian rivers flow towards Black Sea (62%), while the much closer Adriatic sea collects only 38% of river water.

2. Background Information on Activities

- Following activities (according to available studies) represent the ten most environmentally significant in the coastal area of Croatia:
 - *Energy production* – two thermopower plants – use seawater for cooling water
 - *Fertilizer production* – not present
 - *Pharmaceutical industry* – not present
 - *Petroleum refining* – producing bitumen, aromats, gasoline
 - *Paper & pulp industry* – paper industry facility present
 - *Cement production* – five cement industry facility
 - *Tanning industry* – not present
 - *Metal industry* – important is shipbuilding industry – seven facility
 - *Textile dyeing* – present, but not important
 - *Chemical industry* – present
 - *Food processing* – present – milk industry, brewery
 - *Industrial activities; other sectors* – turizam as very important “industrial” activity
- The provisions for using the Best Available Technologies (BAT) and Clean Technologies (CT) are not directly regulated by law or other related regulations. This is only matter of initiative of industry and their own interest and the extent is very limited.
- The state of environment in relation to the quality of seawater, quality of inland water, and protection of habitats (according to available studies) are as follow:
 - *seawater quality* – The national program of monitoring of seawater quality and other monitoring programs and research show that most significant part of the Adriatic sea is still clean, especial coastal and island areas far from main urban areas and discharging places of waste water. Eutrophication processes are followed on areas of big cities. (State Directorate for protector nature and environment – Report of state of the environment 1997)
 - *inland water* - On “Rijeka” area the monitoring of water quality of fresh water start in 1980. on 14 sampling stations on rivers, 6 sampling stations on lakes and artificial lakes and 17 sampling points on water supply areas. Results of monitoring show that the water quality is under the regulation especial for indicators BOD, COD and phosphates. On “Split” area the monitoring of water quality of fresh water consist 26 sampling stations on rivers, 7 sampling stations on lakes and artificial lakes and 27 sampling points on water supply area. Results of monitoring show that the water quality is on regulated level and have trend of improvement.(State Directorate for protector nature and environment – Report of state of the environment 1997)
 - *protection of habitats* – no access to information for writer of the report
- The provisions for environmental monitoring in effect for the following sectors are:

- *Seawater quality* – regulate in national program of monitoring of seawater quality
 - *Inland water quality* - – regulate in national program of monitoring of inland water quality
 - *Industrial wastewater's* – defined in Water Act and related regulations
 - *Industrial solid waste* – regulated by the Waste Low and other related regulations
 - *Urban development* – Physical planning regulations, and other Regulations related to the construction or environmental protection
 - *Domestic wastewater disposal* - defined in Water Act and related regulations
 - *Incineration of wastes* - regulated by the Waste Low and other related regulations
 - *Municipal solid waste* - regulated by the Waste Low and other related regulations
- The level of public awareness of environmental problems is moderate, or to be more precise related to big-planned investment facility the public awareness is very high. In contrary the public awareness related to everyday environmental problems (saving the water, waste discharging, waste disposal etc.) seems weak.
 - Environmental action groups (NGOs) often try to have influence in designing-making in Croatia, and today they have the bigger influence than before.

3. Legislation

- Croatian national legislation.

Protection of water from pollution is the most recent activity within the framework of comprehensive water management in Croatia. It was only in the 1970s than it started being pursued on a professional level. The first legislation regulating water protection from pollution was passed between 1980 and 1990. The subsequent Water Act passed in 1995 (published in Narodne Novine official gazette, No. 107/95), sets out the following principles guiding water protection:

- (i) Water is an irreplaceable precondition for the life and activity. It is the duty of all persons to protect carefully its quality, and use it sparingly and rationally under equal conditions by law;
- (ii) Water shall be managed in accordance with the principle of integrity of the water system and the principle of sustainable development which meets the needs of the present generation without threatening the right and possibilities of the future generation to meet their needs:
- (iii) The territorial water management units are the water basins and catchment areas as hydrographic and economic units. The borders of administrative – territorial units shall not present obstacles for integrated water management in such areas;
- (iv) In preparing and adopting of plans which are the basis of water management, the starting point is the obligation of integrated environmental protection and achieving of general and economic development of the Republic of Croatia;
- (v) For water use exceeding the limits of permissible general use, as well as for any deterioration of water quality, a compensation shall be paid in proportion to the benefit gained, or to the degree and extent of the impact on water quality;
- (vi) The regulations defining the tasks and duties for investments in improvement of the water system shall also define the sources of financing

The 1995. Water Act provides for the passing of new regulations in the field of water pollution control and water quality control in compliance with the EU regulations and the relevant conventions, i.e.:

- Ordinance on Water Classification, passed by the Government of the Republic of Croatia (Narodne Novine No. 77/98). The Ordinance regulates the important field in water pollution control referring to water quality control. On the basis of the Ordinance water is classified into different categories ranging from I. to V. based on its general environmental function, and the conditions of water use for the various purposes are defined. Here is necessary to give some additional explanation. The provisions of Water Act shall apply to: surface and ground terrestrial waters, including the mouth of rivers and canals discharging into sea, to the demarcation line as defined in Water Act; mineral and thermal waters, except mineral and geothermal waters suitable for extraction of mineral raw material or utilization of accumulated thermal energy for power purposes, which is regulated by the Act on Mining; drinking water sources in the territorial sea; sea water, as regards protection against

pollution from mainland and island based sources. So, indicators from Ordinance has been used also for evaluation of sea water quality directly on discharging places of all waste water discharging in sea water, mouth of the rivers and into the sea, in action for water pollution reduction of sea water from land based sources. This monitoring are regulated by Programs in the frame of Plans for sea water protection and other monitoring programs for control sea water quality of Adriatic sea. Integrated coastal management is under authority of Ministry of Navigation and Traffic and partially State Directorate for the Protection of Nature and Environment.

- Ordinance on Hazardous Substances in Water, passed by the Government of the Republic of Croatia (Narodne Novine No. 78/98). The Ordinance regulates the important issue of water pollution control regarding water quality by identifying the hazardous substances and their concentrations which are considered dangerous, and whose elimination from the water environment is priority.
- Regulations on the issuing of water management conditions, consents and permits, passed by the Director of the State Water Directorate (Narodne Novine No. 28/96).
- In addition to the above, the following relevant documents are in preparation:
- National Water Pollution Control Plan (National Strategic Action Plan for Water), to be passed by the Government of the Republic of Croatia,
- Regulation on discharging of hazardous and other substances into water, to be issued by the Director of the State Water Directorate,
- Along with the Water Act, an important law providing for the financing of water pollution control and water quality control is the Water Management Financing Act (Narodne Novine No. 107/95). This law forms the basis for the new regulations which are in preparation, i.e.:
- New Regulations for calculating water pollution charges, to be issued by the Director of the State Water Directorate.

Legislation and/or guidelines:

- not exist for seawater quality, or exist only partially as it is explained above,
- exist for inland water quality (Water Act, Ordinance on Water Classification, Ordinance on Hazardous Substances in Water),
- exist for protection of habitats (Law for Nature Protection – Narodne Novine No. 30/94).
- Legislation or guidelines for the regulation:
 - **Industrial wastewater disposal** - Legislation and guidelines that regulate this area exist to some extent. Most of the activities are regulate but there is evident the lack of critical aspects the basic Regulation on discharging of hazardous and other substances into water (and sea) – Standard Effluent.

- **Industrial solid waste disposal** – Legislation and guidelines that regulate this area exist to some extent. Basic law is Waste Act (Narodne Novine No. 34/95). The related regulations are as follow: Regulation about requirements in waste managing, Regulation about hazardous waste managing, and Regulation about waste classification, Regulations about packing waste.
- **Animal breeding** - Legislation and guidelines that regulate this area exist to some extent. Most of the activities are regulate but there is evident the lack of critical aspects the basic Regulation on discharging of hazardous and other substances into water (and sea).
- **Agriculture** - Legislation and guidelines that regulate this area no exist or exist only in area of issuing the permits for using the pesticides in context of Ordinance on Hazardous Substances in Water.
- **Urban development** - Legislation and guidelines that regulate this area exist fully. National Water Pollution Control Plan (National Strategic Action Plan for Water) "old" one and "new" one define the cities or urban area which have priority in constructing the wastewater treatment plants. Also the Law about physical planning and Construction Law and them related regulations regulate this area.
- **Domestic wastewater disposal** - Legislation and guidelines that regulate this area exist to some extent. Most of the activities are regulate but there is evident the lack of critical aspects the basic Regulation on discharging of hazardous and other substances into water (and sea) – Standard Effluent.
- **Incineration of wastes** - Legislation and guidelines that regulate this area exist to some extent. Basic law is Waste Act (Narodne Novine No. 34/95). The related regulations are as follow: Regulation about requirements in waste managing, Regulation about hazardous waste managing, and Regulation about waste classification, Regulations about packing waste.
- **Urban solid waste disposal** - Legislation and guidelines that regulate this area exist to some extent. Basic law is Waste Act (Narodne Novine No. 34/95). The related regulations are as follow: Regulation about requirements in waste managing, Regulation about hazardous waste managing, and Regulation about waste classification, Regulations about packing waste.
- **Infrastructure projects** - Legislation and guidelines that regulate this area exist fully. National Water Pollution Control Plan (National Strategic Action Plan for Water) "old" one and "new" one define the cities or urban area which have priority in constructing the wastewater treatment plants. Also the Law about physical planning and Construction Law and them related regulations regulate this area.
- The existing legislation provide:
 - **Environmental Impact Assessment (EIA) of new projects, EIA of existing sources** – The water management terms determine the conditions to be met by the documentation for construction of new and reconstruction of existing structures, and for regional and detailed geological research works, as well as other works which are not regarded construction, that may permanently, periodically or temporarily affect the water regime. water management terms are not required for construction or reconstruction of residential and other buildings in which water is used only for drinking and sanitation – provided such buildings are connected to the water supply system and the public sewerage system. Water management terms are issued by "Hrvatske vode". By exception from before mentioned the water management terms are issued

by "Hrvatske vode" with the confirmation by the State Water Directorate for: construction on interstate waters, construction of international and major pipelines for transport of hazardous substances, main roads and highways, railways, international airports, inland navigation waterways, rivers and sea ports, construction of hydropower or thermopower plants of 20 MW and more, nuclear power plants, junction and transformer plants and high-voltage lines of 110kV and more, construction of plants and development of terrain for storage, processing or disposal of hazardous waste. The body in charge shall refuse the application for water management terms for: construction or extension of the capacity of the sewage disposal facilities, if no decision regarding sewage disposal has been made, extension of the plant capacity, or change of technology in the industry discharging waste water that should be treated prior to discharge, in which such waste water was not treated in the past, unless the new investment provides for waste water treatment for the whole plant. If the person, having obtained the water management terms, intends to carry out, on facilities and plants that are subject to the terms, any modifications, changes of technology or any changes likely to affect the water regime, such person shall apply for modification of the water management terms or issuing of new terms.

The legal entity or physical person which has obtained the water management terms must, before the start of construction or other works, apply for the water management approval from the relevant body. The water management approval confirms that the documentation for construction or other works is prepared in accordance with the water management terms. The validity of water management terms, for which the approval has not been required, shall expire by expiration of the period of two years from the date of issuing.

The validity of water management terms for which the approval has been issued shall expire by expiration of the period of two years from the date of issuing of the approval if by that date the application for construction permit, or works for which the construction permit is not required have not been commenced.

- **Permitting of new projects** – The water management permit regulates the permission for water use and defines the purpose, location, method, conditions and extend of water use and discharging of treated and untreated water, hazardous and other substances that may pollute or contaminate water. The water management permit may also define special conditions which, in accordance with Water Act, ensure the general use of water and protection of public interests on water. The water management permits is required for water use and discharging of waste water in connection with industrial and other activities, and with other activities involving water intake and use and discharging of waste water, as well as for sand, gravel and rock excavation in areas of importance to the water regime. The water management permits is also required for production and traffic of chemicals and their derivatives which, after use, get into water.
- **Periodic permit renewal** – The water management permit is issued for a specified period, not longer than 15 years (most usually period is 2-4 years).
- **Review of environmental conditions in the permit** – Made during the Periodic permit renewal or on personal claim
- **Inspections for compliance control** – Inspection over the implementation of the provisions of this Act and the subsidiary regulations is carried out by the

State water Directorate (State Water Management Inspection) and the County offices in charge of water management (county management inspection). Water management inspection may also be performed by other governmental officials authorized by the Director. Water management inspection supervises the status of water pollution and contamination and implementation of water protection measures, and compliance with the conditions determined by the water management legal acts.

- **Compliance promotion and enforcement in cases of violations** – If the water management inspector finds any infringement of the provisions of water Act or of the regulations based on the Act, he shall state in writing all irregularities and defects and order the measure and time for their correction. Water management inspector have authority to: order temporary suspension of works or activities, forbid the use of facilities of plants, forbid or limit water use, forbid or limit discharge of hazardous substances into water, forbid disposal of waste and other substances in areas where this may cause degradation of water quality, order measures for treatment of polluted water, order repair of damages and establishing of the original conditions, order temporary confiscation of objects used in violation of the provisions of Water Act until final verdict, and other measures in accordance with the Act. Water management penalties are given as annex.

- The existing legislation not provide:
- **Promotion of Best Available Technologies (BAT) and/or Clean Technologies**

4. Permitting

- Permitting system in Croatia

The water management permit regulates the permission for the water use and defines the purpose, location, method, conditions and extent of water use and discharging of treated and untreated water, hazardous and other substances that may pollute or contaminate water. The water management permit may also define special conditions that, in accordance with this Act, ensure the general use of water and protection of public interests on water. The water management permit is required for water use and discharging of waste water of waste water in connection with industrial and other activities, and with other activities involving water intake and use and discharging of waste water. The water management permit is also required for production and traffic of chemicals and their derivatives which, after use, get into water. The water management permit is issued by the relevant County office, based on previously obtained opinion from Hrvatske vode. Exceptionally, the water management permit is issued by Hrvatske vode, with confirmation by the State Water Directorate:

1. for industrial and other activities involving the intake and use of water from an interstate watercourse or discharging of waste water into an interstate watercourse,
2. for activities in chemical, textile, leather, food-processing, metal, construction, petrochemical and other industries involving hazardous substances in the technological process,
3. for activities and services in sea and river transport (ports and harbors),
4. for hydropower plants with the capacity of 20 MW or more,
5. for transport and storage of oil, gas and other hazardous substances,
6. for water supply systems exceeding the capacity of 10 l/sec,
7. for running the public sewage systems,
8. for excavation of sand, gravel and rock on inland waters

The water management permits for putting into traffic chemicals and their derivatives, which after use get into water, is issued by State Water Directorate. The water management permit is issued for a specified period, no longer than 15 years, and for water use on the basis of the concession contract, for the period equal to the validity of concession.

The application for prolongation of the water management permit may be submitted not earlier than six, and not later than two month before the date of expiration of the present permit.

The rights resulting from the water management permit shall cease:

1. with expiration of the period for which the permit was issued,
2. if the holder of the permit waives the rights resulting from the permit,
3. with cessation of the activity for which the permit was issued,
4. due to interruption of water use, for which the permit was issued, for a period longer than one year, without good reason.

Cessation of rights under water management permit for reasons in para 1 is determined by the decision of the body that has issued the permit.

Permit Ordinances is a document issued along with the water management permit in order to adjust the behavior and activities of the permit holder with the conditions and responsibilities resulting therefrom.

The permit ordinance orders the holder of the water management permit to take an action, to carry out an investment or to abstain from some action in order to eliminate the risk of possible or already existing disturbance, or noncompliance with the conditions and responsibilities under the water management permit, and to establish the conditions in compliance with this act.

The format and the manner of issuing of the permit ordinance is subject to the provisions on resulting in administrative procedures, unless otherwise specified by this Act.

The permit ordinance is issued by the same body which has issued the water management permit.

Permit ordinances may be issued during the entire period of validity of the water management permit.

A copy of the permit ordinance is sent to the relevant water management inspector.

Objections against the permit ordinance may be submitted to the body issuing the water management permit.

Reacting to the objections, the body in charge may resolve:

1. to reject the objection as unwarranted,
2. cancel the permit ordinance if the objection is found justified, and that there was no reason for issuing of the ordinance,
3. modify the permit ordinance if the objection is found partly justified.

The objection shall not delay complying with the permit ordinance.

Non-compliance with the permit ordinance may be sanctioned by penalty with temporary withdrawal of the water management permit, or by penalty and withdrawal of the water management permit. The penalty for this may be pronounced in an amount from 400 to 40 000 Croatian Kunas. The resolution on the penalty and withdrawal or temporary withdrawal of the water management license is made by the State Water Directorate.

The water management permit shall be with drawn temporarily if the holder, within the period specified by the permit ordinance, does not take the action or carry out the investment, or does not abstain from some action, as required by the ordinance, provided this non-compliance does not impose the hazard of the effects to human lives and health or in economic problems. The water management permit may be withdrawn temporarily for the period of six month during which the holders rights based on the permit shall be suspended.

The water management permit shall be withdrawn:

1. if the holder fails, within a specified period, to carry out the activities or investment, or to abstain from some activities as required by the permit ordinance, for which reasons the water management permit has been temporarily withdraw,
2. if non-compliance with the permit ordinance is likely to result in serious hazard to human lives and health or in economic problems. The holder, whose water management permit has been withdrawn, may apply for the

new permit after six month from the date of entering into force of the withdrawal.

This is the permitting system for: industrial activities, animal breeding, urban development, domestic wastewater, incineration of wastes, solid waste disposal, infrastructure projects but only related to obligations from Water Act.

- The main authorities responsible for permitting on:
 - national level – State Water Directorate, Hrvatske vode
 - regional, local level – County offices, Hrvatske vode
- The estimated number of industrial facilities in Croatian coastal area which is considered that permits should be necessary for their operation are in Rijeka area around 520 and in Split area and around 200 in Split area.
- The number of employees of all related ministries/agencies in Croatia who deal with permitting are: State Water Directorate – 20 employees, Hrvatske vode – offices in Split – 7 employees and Rijeka – 6 employees, County offices – approximately – 3 employees in Rijeka area and 4 employees in Split area; in total 40 employees. This number is only relates with issuing the water management permits.
- The effectiveness of the permitting system in Croatia and information's on the following subjects:
 - EIA have been done for (specific) new projects – this is regulated in procedure for issuing the Civil Engineering Legal Permits, and also in other Acts as Water Act etc.
 - EIA have been done for (specific) existing projects – this is part of inspections procedures and issuing the permits
 - The permits have been issued for (specific) new projects – yes, defined by Lows
 - The permits have been issued for (specific) existing projects – yes, defined by Lows
 - Periodic permit renewal take place for industry – yes, according to the Lows and Regulations
 - New developments is taken into account in permitting renewal – according the lows and regulations
 - Voluntary agreements with industry - not exist
- The public access to information on general environmental issues, and, in particular, to: state of the environment; industrial wastewater; solid wastes and air emissions, permitting conditions is not on the high level.

5. Compliance and Enforcement

- **Compliance promotion in Croatia**

Based on the water Act, the government of the Republic of Croatia and its bodies pass the relevant regulations pertaining to water protection, grant concession for water and water resources in keeping with the Act and set the level of water use and discharge fees. The government earmarks budgetary funds for financing water protection plans ensuing from international obligations. The State Water Directorate is the highest administrative authority in charge of water management which drafts the necessary subordinate legislation regulating water management, passes ordinances ensuing from Act and carries out inspection and administrative supervision. It has authority to approve plans drafted by Hrvatske vode water agency, grants concessions for water and water resources in keeping with the Act and passes other water regulations in compliance the Act.

Hrvatske vode is a government agency that continuously and independently performs public services and other responsibilities pertaining to the implementation of water management policies, within the scope defined by plans and in keeping with the means based on the Act and other regulations ensuing from it.

Hrvatske vode is an executive agency responsible for the implementation of international commitments arising from the conclusion of international agreements.

Department for water management of State Water Directorate (State Water Management Inspection) supervise work of county water management inspections; define plans and guidelines for work of county inspectors and compliance and enforcement of regulations.

County Water Management Inspection control implementation of the Water Act, and other related Regulations enacted by County or City Councils and implementation of the water management actions.

- **Compliance checking in industrial plants**

Compliance checking in industrial plants is carried out in two ways: as procedures of issuing the water management acts (in particular water management permits) and water management inspection. Important part of procedure for issuing the water management acts is compliance checking. There are some requirements proscribed by Water act which have to be fulfilled for issuing the water management acts. Water management inspection supervises in particular: existing of water management permit and the status of water pollution and contamination and implementation of water protection measures, and compliance with the conditions determined by the water management legal acts.

- Each water management inspector have to organize the files for every controlled facility and loged all legal documents related to this facility
- Periodic inspection and control are carried out on the following activities which have permits:

- industrial plants, animal breeding, domestic waste water disposal – at least one time per year by water management inspection
- Urban development, incineration of wastes, urban solid waste disposal, infrastructure project – in responsibilities of environmental or constructing inspection
- The main authorities responsible for compliance and enforcement are:
 - State Water Directorate
 - Hrvatske vode – water management agency(organisational charts in addition)

The State Water Directorate is the highest administrative authority in charge of water management which drafts the necessary subordinate legislation regulating water management, passes ordinances ensuing from Act and carries out inspection and administrative supervision. It has authority to approve plans drafted by Hrvatske vode water agency, grants concessions for water and water resources in keeping with the Act and passes other water regulations in compliance the Act. (organizational chart in anex)

Hrvatske vode is a government agency that continuously and independently performs public services and other responsibilities pertaining to the implementation of water management policies, within the scope defined by plans and in keeping with the means based on the Act and other regulations ensuing from it.

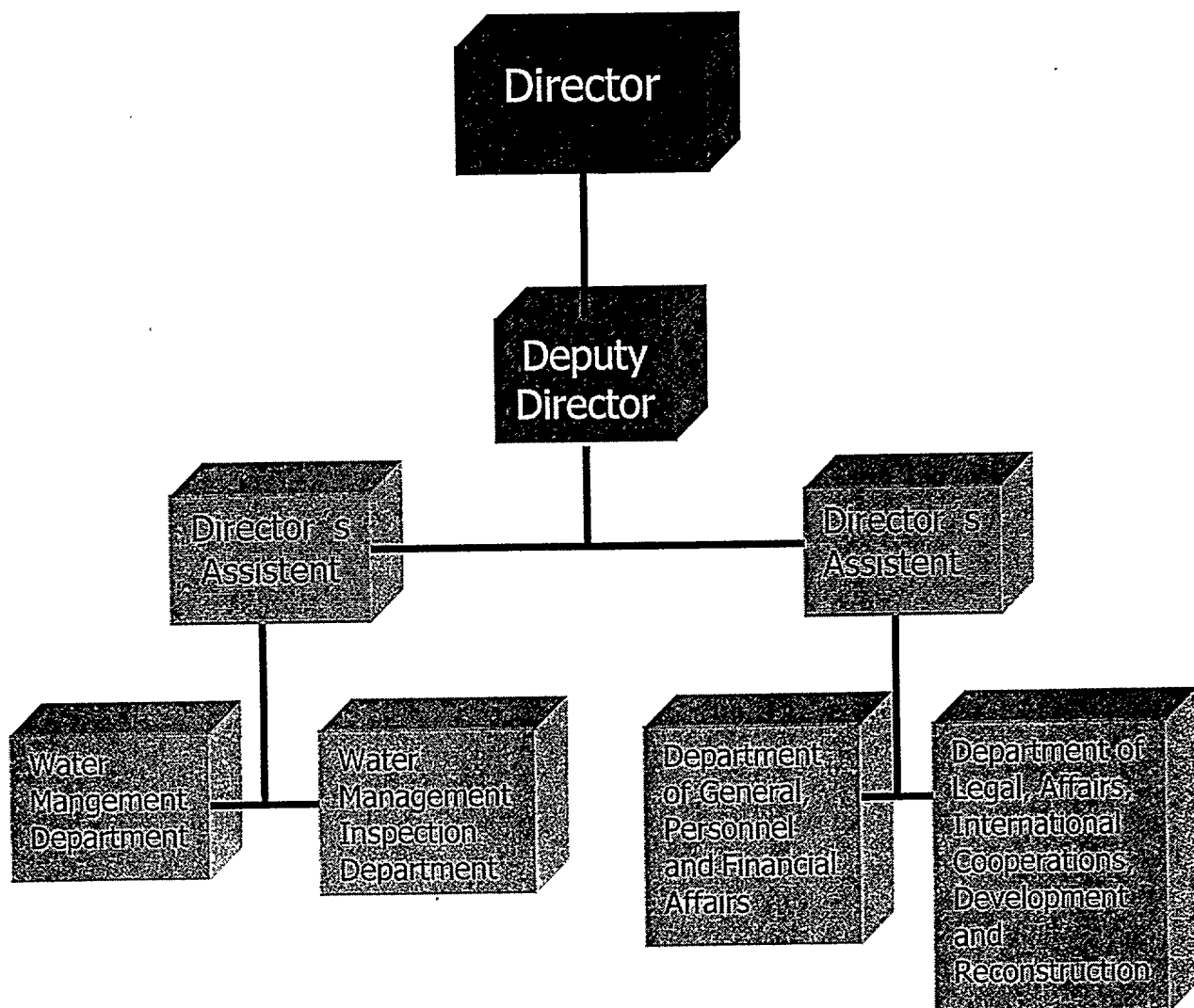
Hrvatske vode is an executive agency responsible for the implementation of international commitments arising from the conclusion of international agreements. (organizational chart in anex)

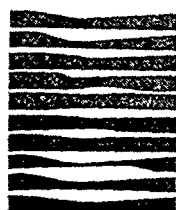
- Numbers of employees involved in compliance and enforcement within all related ministries and /or agencies are as follow:
 1. State Water Management Inspectors - 12 persons (4 person in coastal area) – responsibilities mentioned above
 2. County Water Management Inspectors – 31 person (8 person in coastal area) – responsibilities mentioned above
 3. State Water Directorate – Advisors – 4 persons
 4. Hrvatske vode – Advisors – 7 persons in coastal area – responsibilities mentioned above
- When the violation is verified usual action taken by controlling body is administrative response with additional permit requirements, corrective actions and even the report to Court and penalties
- The means of compliance promotion and enforcement, is related in process of issuing the legal requirement, permits and other legal acts. Any other legal compliance promotion and enforcement is not present.
- The system in force in Croatia for the assessment of the state of the environment regarding:
 - *water quality* – In national monitoring program are defined the monitoring stations, water quality indicators and frequency of sampling for monitoring

of fresh. The result of monitoring are delivered in Hrvatske vode and processed.

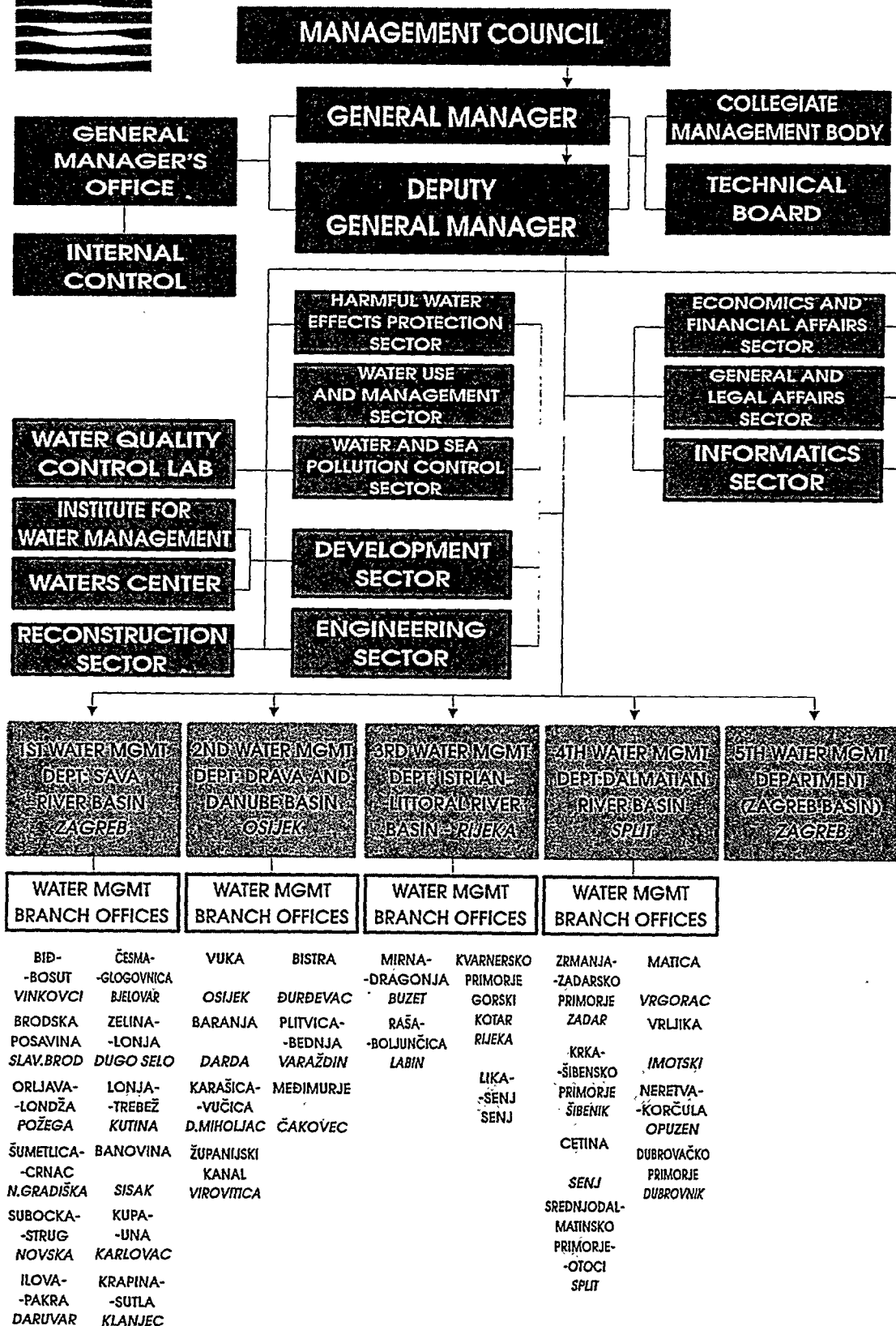
- *industrial emissions* – According to the Water Act and related Regulations and permits every facility have obligation to control the waste water. In Water Mangement Permits are defined the water quality indicators, MAC, frequency of sampling and sampling place. This data have to be delivered in Hrvatske vode where it is processed.
- *protection of habitats* - .

ORGANIZATIONAL SCHEME OF STATE WATER DIRECTORATE





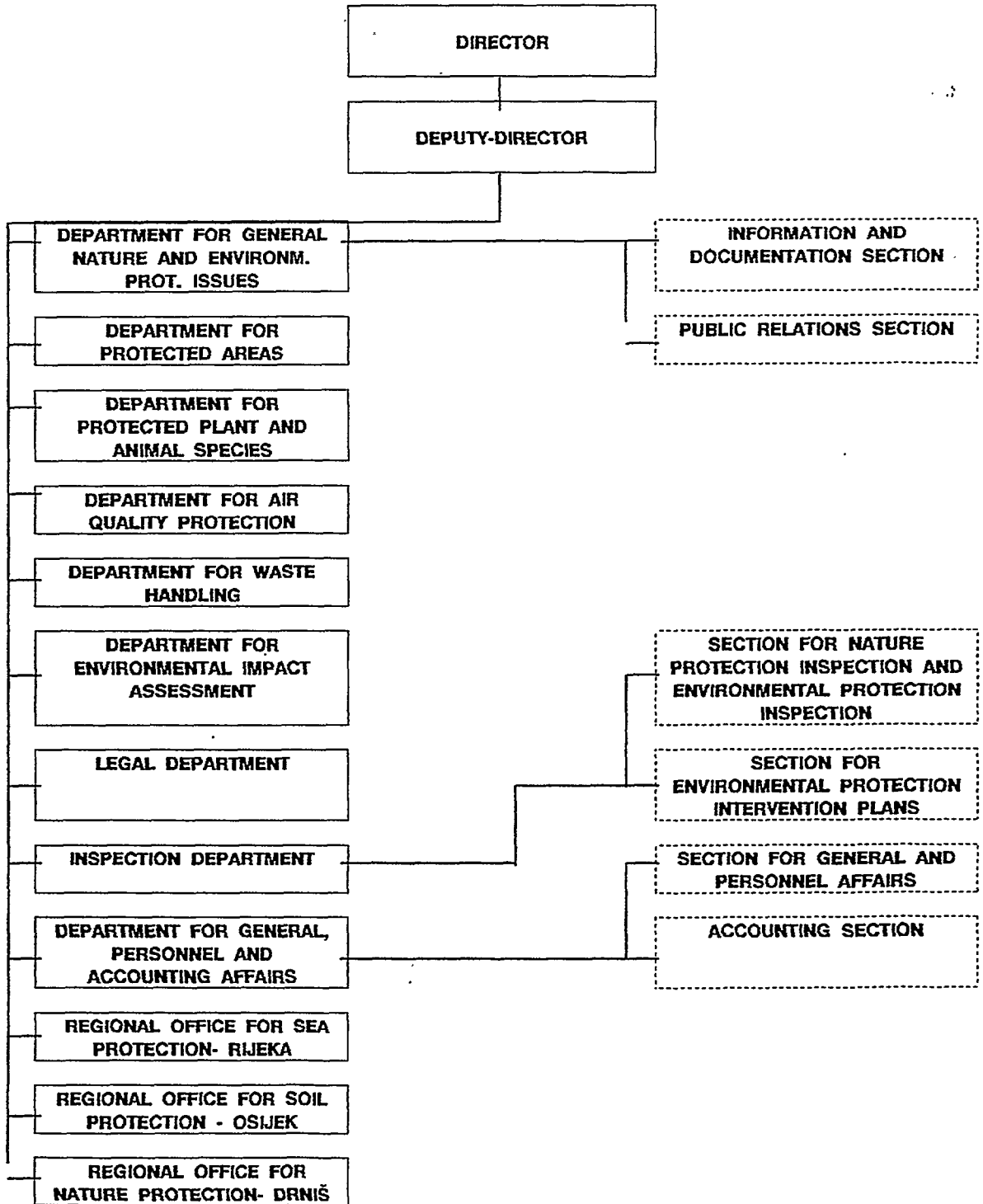
ORGANIZATIONAL SCHEME OF "HRVATSKE VODE"



STRUCTURE OF STATE ADMINISTRATION

THE CROATIAN STATE PARLIAMENT (HRVATSKI DRŽAVNI SABOR)		
THE GOVERNMENT OF THE REPUBLIC OF CROATIA (VLADA RH)		
STATE MINISTRIES	MINISTRIES	STATE ADMINISTRATION ORGANIZATIONS
1. Ministry of Finance	1. Ministry of Economics	1. State Geodetic Administration
2. Ministry of Foreign Affairs	2. Ministry of Agriculture and Forestry	2. State Directorate for Nature and Environmental Protection
3. Ministry of Internal Affairs	3. Ministry of Maritime Affairs, Transport and Communications	3. State Water Management Administration
4. Ministry of Defence	4. Ministry of Culture	4. State Hydrometeorological Institute
5. Ministry of Development and Reconstruction	5. Ministry of Planning, Construction and Housing	5. State Standardization and Measurement Institute
	6. Ministry of Tourism	6. State Statistics Bureau
	7. Ministry of Health	7. State Institute for Intellectual Property
	8. Ministry of Education and Sport	8. State Hydrographic Institute
	9. Ministry of Science and Technology	9. State Inspectorate
	10. Ministry of Justice	10. State Institute for the Protection of Families, Motherhood and Youth
	11. Ministry of Administration	
	12. Ministry of Labour and Social Welfare	
	13. Ministry for Croatian Homeland War Defenders	
	14. Ministry of Return and Immigration	
	15. Ministry of Privatization	

STRUCTURE OF THE STATE DIRECTORATE FOR THE PROTECTION OF NATURE AND ENVIRONMENT



REVIEW OF REGULATIONS IN THE COMPETENCY OF THE STATE DIRECTORATE FOR THE PROTECTION OF NATURE AND ENVIRONMENT

Off. Gazette No. Regulation

Environmental protection - general

82/94	Law on Environmental Protection
34/97, 37/97	By-Law on Environmental Impact Assessment
76/97	By-Law on Quality Standards for Liquid Oil Fuels
7/97	By-Law on Conditions for Issuing Permits for Performing Professional Environmental Activities
36/96	Rule Book on Environmental Emission Inventory
1/99	Rule Book on Awards and Prizes for Environmental Achievements
79/95	Rule Book on Environmental Inspector's Official Identity Card
64/96	Regulation on Environmental Label
79/95	Instructions on the Form, the Tenor and the Manner of Keeping Records of Inspections Performed by Environmental Inspectors

Nature

30/94, 72/94	Law on Nature Protection
31/80, 14/88, 13/97	Law on Kornati National Park
46/83	Law on Brijuni National Park and Memorial Ground
7/63, 34/65	Law on Proclamation of "Dundo" Forest on the Island of Rab a Nature Reserve
84/49, 34/65, 54/76, 15/97	Law on Proclamation of Paklenica Forest a National Park
5/85, 10/85	Law on Proclamation of Bijele and Samarske stijene a Strict Reserve
24/81	Law on Proclamation of Biokovo a Nature Park
4/69	Law on Proclamation of Hajducki and Rozanski kukovi a Strict Nature
5/85, 9/88, 13/97	Law on Proclamation of Krka National Park
11/90	Law on Proclamation of Lonjsko polje Nature Park
14/88	Law on Proclamation of Telascica Nature Park
24/81	Law on Proclamation of Velebit Mountain a Nature Park
29/49, 34/65, 13/97	Law on Proclamation of Plitvice Lakes a National Park
45/67	Law on Proclamation of Kopacki rit Floodplains and Administrative Nature Reserve
24/81	Law on Proclamation of Western Part of Medvednica Mountain a Nature Park
49/60, 54/76, 13/97	Law on Proclamation of Western Part of Island of Mljet a National Park
40/97	Decision on Elaboration of National Biodiversity and Landscape Strategy and Action Plan
63/94	Decision on Founding of Nature Protection Council
45/72	Decision on Proclamation of Area of Bijeli otoci-Kamensko on Licka Pljesivica Mountain a Nature Memorial and Natural Grounds Reserve
28/90	Decision on Proclamation of Crna Mlaka Area a Special Ornithological Reserve
63/94	Decision on the Management of Plitvice Lakes, Paklenica, Risnjak, Mljet and Kornati National Parks, and Telascica Nature Park
84/96	Rule Book on Compensation Fees for Damage Caused by Unlawful Actions on Protected Animal Species
47/95	Rule Book on Protection of Certain Reptile Species (Reptilia)
43/95	Rule Book on Protection of Certain Bird Species (Aves)
31/95	Rule Book on Protection of Certain Mammalian Species (Mammalia)
47/95	Rule Book on Protection of Certain Amphibian Species (Amphibia)
79/98	Rule Book on Protection of Fungi (Fungi)
52/79, 9/85	Protective Measures and Arrangement of Special Zoological Reserve

(Kopacki rit)

Air

48/95

Law on Air Quality Protection

101/96, 2/97

By-Law on Recommended and Limit Air Quality Values

140/97

By-Law on Limit Values of Pollutant Emissions from Stationary Sources into the Air

7/99

Regulation on Substances Depleting the Ozone Layer

Waters

33/96

By-Law on Beach Water Quality Standards

97/98

Rule Book on Requirements for Conducting Research on Seabed or Its Subsoil in Specially Protected Nature Parts of Internal Sea Waters and Territorial Seas of the Republic of Croatia

8/97

Contingency Plan for Accidental Marine Pollution in the Republic of Croatia

Waste

34/95

Law on Waste

32/98

By-Law on Requirements for Handling Hazardous Waste

53/96

Rule Book on Container Waste Management

123/97

Rule Book on Waste Management Requirements

27/96

Rule Book on Waste Types

51/96, 93/96

List of Professional Institutions with Authority of Publishing Reports on Testing Physical and Chemical Properties of Waste

CYPRUS

**MINISTRY OF AGRICULTURE NATURAL
RESOURCES AND ENVIRONMENT**

FISHERIES DEPARTMENT

**REPORT ON COMPLIANCE AND
ENFORCMENT OF REGULATIONS TO
CONTROL POLLUTION IN CYPRUS**

by
Loizos Loizides
Fisheries Officer A'

Nicosia
Jan. 1999.

EXECUTIVE SUMMARY

Industrial activities in the coastal area of Cyprus are restricted to energy production i.e. electrical power stations, cement production plants, oil refining and wine production. Tourist development and infrastructure, intensive habitation of the coastal area, along with other uses such as transport, agriculture, and aquaculture put however great pressure to the coastal environment.

Wastes derived from different sources, water quality and protection of habitats are continuously monitored by the competent national authorities.

Although there are signs of small-scale local pollution the greatest part of the waters of Cyprus is of high quality. So far the protection of habitats is based on the protection of the species found therein.

Public awareness of the environmental problems is high. Third organisations and NGOs are actively interested in environment issues and sometimes influence decision-making in Cyprus.

There is no specific legislation per-se concerning the protection of the environment, apart the Water Pollution and Atmospheric Pollution Control Laws. Several laws however, contain provisions for the protection of the environment.

The text of an Environmental Framework Law is now at the Attorney General office for finalisation of the legal drafting before its approval by the Parliament. Enforcement issues to all environment-related legislation have been further elaborated in the relevant provisions of this Law. They cover offences, penalties, assessment of penalties, costs, responsibility of third parties, proof of intention and violation, cost of enforcement, out of court settlements, on the spot fines, withdrawal and cancellation of licenses.

The Department of Town Planning and Housing which is responsible for town and country planning is the main authority for the permits of any development. The ministry of Labour is responsible for the permits of operation while the ministry of Agriculture

Natural resources and Environment for the permits of any liquid or solid discharges from industries.

The Town Planning and Housing Law as well as the Water Pollution Control and the Atmospheric Pollution Control Laws, and the Fisheries Law provide the responsible authority the power to apply the concept of EIAS by requiring such a study prior to the granting of a permit or allowing registration.

Compliance and enforcement of laws and Regulations are carried out at a satisfactory level at least to the sectors of the control of pollution of waters and protection of habitats.

Enforcement measures is still a weak link in the environmental management chain and more efforts are required in order to enforce licensing requirements and streamline enforcement processes in a more effective way. Issues of concern are land pollution, hazardous wastes management, and reduction in waste generation i.e application of Best Available Technology and Clean Technologies principles.

INTRODUCTION

Cyprus is situated in the north - eastern part of the Mediterranean Sea 33°, east of Greenwich and 35° north of the Equator, and has an area of 3.251 of square Kilometre, of which 1.733 are forested. It has a coastline of 778 km. The present population (1997) of Cyprus is 735,000. The capital of the island is Nicosia with a population of 191,000 and it is situated roughly in the centre of the island. Limassol, Larnaca, Paphos, Famagusta and Kyrenia are the coastal cities of Cyprus.

Cyprus has an intense Mediterranean climate with the typical seasonal rhythm strongly marked in respect to temperature, rainfall, and weather generally. Hot, dry summers from mid-May to mid-September and rainy rather changeable winters from mid-November to mid-March are separated by short Autumn and Spring seasons of rapid change in weather conditions. The average annual total rainfall is about 500 millimetres. Statistical analysis of rainfall in Cyprus reveals a decreasing trend of rainfall.

Its coastal area is indented and rocky in the north with long sandy beaches in numerous coves to the south. Rapid development over the last three decades have led to environmental pressures on the coastal zone.

The basis of Cyprus economy is tourism and the offer of services such as shipping telecommunications, banking, and activities of offshore companies with the agriculture sector contributed only at about 5% to G.D.P. In terms of per capita income currently estimated at U.S\$ 13,000(1997)

Environmental legislation originates from Departments or Ministries undergoes legislative drafting by the Attorney General's Office, is approved by the Council of Ministers and submitted to Parliament for consideration and approval, as submitted, or amended, or rejected. The Parliament can also originate legislation. The Council of Ministers are also vested, by legislation, with authority either to grant permits and licenses or issue orders or regulations, the later being deposited to Parliament, which has the right to approve, reject, or amend them. Implementation and enforcement are carried out in accordance with existing laws and regulations by the agencies, which have enforcement responsibilities over a wide range of environmentally related issues in the subject-matter areas of their respective responsibility. Enforcement of law is usually left to Government authorities responsible for the protection of the environment. Nevertheless, private prosecution by individuals or even environmental groups, is also a possibility and it can be exercised with the consent of the Attorney General.

2. BACKGROUND INFORMATION ON ACTIVITIES.

i. Coastal activities

The activities, which are significant in the coastal area of Cyprus, are the following:

a. Energy production.

The only activity which is related to energy production are the two electrical power stations namely Moni (180MWe cap.) and Dekhelia (300MWe cap.) electrical power plants. Both power plants use heavy fuel oil.

The waste waters (from boilers and heaters) from the two power stations are chemically treated in a common treatment plant at Dekhelia Power Station. The treated water is used for irrigation. Air emissions from these plants are: Nox: 8.800 t/y, SO₂: 30000, Dust: 1000 t/y. (year of reference 1996)

b. Cement production

There are two cement factories namely Vassilikos Cement Factory Ltd and Cyprus Cement factory.

There are no liquid discharges from these factories. Dust emissions from these plants are 2500t/y.

c. Petroleum refining.

Cyprus Petroleum Refinery LTD imports crude oil and distributes refined products to the nearby marketing companies tank farms directly through pipelines. Heavy oil is shipped from the refinery to Dekhelia and Moni power plants and to Vassiliko and Moni cement works. Marketing companies also import certain quantities of refined products.

The waste - waters from the refinery are treated and discharged through the main cooling water streams into the sea. Air emissions from this installation are: Nox 137 t/y, SO₂ 480 t/y, Dust 16t/y.

d. Wineries & Distilleries.

Four wineries and a brewery situated between the old and new Limassol harbours discharge their effluents directly in to the sea without any treatment. The pollution loads from these industries are mainly organic matter (2000 t/y asBOD₅), solids (350t/y) and nutrients (20t/y)

The bad "house-keeping" and the connection of domestic discharges with the process water result to the microbial contamination of the recipient coastal waters.

- **There are no legal provisions for the application of Best Available Technologies(BAT) and Clean Technologies(CT)**

In addition to the above industrial activities the following activities are significant:

- a) Tourist development and tourist infrastructure in the coastal zone.
- b) Agriculture development
- c) Aquaculture development in coastal waters.

ii. State of the environment

a. **Quality of sea water**

Although there are signs of small-scale local pollution the greatest part of the marine waters of Cyprus is of high quality.

The coastal zone and adjacent waters of the Island are exposed to great pressure as tourist and inhabitants use them not only for recreation but also for transport, light industry and aquaculture.

The microbiological quality of coastal waters is excellent. All the 158 microbiological coastal stations are practically in conformity with the WHO/UNEP criteria for bathing waters.

The quality of waters in respect of heavy metals pesticides and PCB's is evaluated through the monitoring of their concentration in biota. Comparison of these results with those found in other Mediterranean areas indicates that most of these data are lower

The last few years inputs of nutrients from point sources i.e. treated sewage effluents, coastal fish farms and non-point sources from urban areas and agriculture etc, result occasionally to problems of abnormal algae growth. These problems however are local and of a temporary nature.

b. **Quality of Inland waters.**

Inland waters are restricted to dams and other artificial reservoirs, which have been constructed for the storage of the water from "rivers", as "rivers" flow only during winter and spring time. Although a number of these dams is used for aquaculture their waters is of high quality The waters of these dams are continuously monitored for microbial or any other type of pollution as they are used for irrigation and as drinking water after proper treatment.

c. **Protection of habitats**

Cyprus is endowed with a rich fauna and flora. The present -day fauna of Cyprus includes 25 species of mammals, 26 species of amphibians and reptiles, 357 species of birds and a great variety of invertebrates while the coastal waters of the

island give shelter to 197 fish species and various species of crabs, sponges, and echinodermata.

So far protection is based on the protection of the species found therein, but the principle of preserving habitats for their own sake is taken into consideration for planned habitat conservation. For example in the case of Lara-Toxefra Nature Reserve which includes the most important nesting habitats for the marine turtles, *Chelonia mydas* and *Caretta caretta*. The protection is based on the protection of the species found therein. The area is protected under the provisions of the Fisheries Law and Regulations (Fisheries Law, Cap.135, and Reg.273/90). The Fisheries regulations provide also protection to the ecologically important seagrass beds of *Posidonia oceanica* since trawling is prohibited at water depths less than 55m.

iii. Environmental monitoring

- Seawater quality monitoring is carried out by the Fisheries Department for the physicochemical parameters and by the Medical Services for microbial pollution.
- Inland waters monitoring is carried out by the Water Development and the Fisheries Departments.
- Ground waters monitoring is carried out by the Geological Department.
- The Water Pollution Inspectors of the Ministry of Agriculture, Natural Resources and Environment carry out industrial wastewater's monitoring.
- Industrial Solid wastes monitoring is carried out by the Water Pollution Inspectors of the Ministry of Agriculture, Natural Resources and Environment and Inspectors for Environment Pollution of the Ministry of Labour.
- Urban Development monitoring is carried out by the Town Planning and Housing Officers.
- Domestic wastewater disposal is carried out by the Sanitary engineers of the Town Planning and Housing Department.

iv. Public awareness of Environmental problems

Some third organisations are actively interested in environmental issues, covering a very broad spectrum of activities and functions both at the national and local levels and effectively acting as pressure groups to influence decision making. A

number of NGOs are full members of the Council for the Protection of the Environment which is chaired by the Minister of Agriculture, Natural Resources and Environment and which is the higher advisory body on Environment and Development.

The House of Representatives exhibits an active interest on environmental issues and its Committee on the Environment frequently holds hearings in which NGOs, other representatives of the Public, and citizens may express their opinion on a variety of issues.

3. LEGISLATION.

The text of a comprehensive Environmental Framework Law is now under consideration. The proposed new law, is aimed to address the institutional and administrative framework for environmental planning and to be read as one with the rest of the media -and sour -ce – specific already enacted, approved or under finalisation environmental laws, which are to come under the umbrella of the Framework Law on the Protection of the Environment.

Beside serving as a framework law the new legislation's aim is also to serve as enabling legislation for other planned specific legislation measures relating to the management of the natural environment and to the conservation of the wild life and natural habitats

A. Legislation and/or guidelines for the control of:

a. Seawater quality

i. The Control of Water Pollution Law (No.69/91)

This Law includes provisions for the setting of quality standards for the waters of Cyprus, and the determination of activities that should only be carried out in accordance with a license. Also for industrial sources a permit is required for the discharge of effluent, which may granted under terms and conditions with regard to their position of effluent standards, quantity and manner and of technical, operational and monitoring specifications and conditions. Competence national authorities for this law are the ministries of Agriculture Natural Resources and Environment and Labour and its implementation and enforcement is enacted through their relevant departments.

ii. The Fisheries Regulations (No.273/90)

Under the Fisheries Regulations standards have been adopted for substances in effluent and the environmental quality for recipient waters referring to BOD5, COD, pH, TTS, Copper, Cadmium and Mercury. There are also prohibitions in the disposal of lubricating and other oils and in the use of organotin based antifouling paints in the marine. A provision also exists in these regulations for the discharge of any substances or objects to any surface waters that may have direct or indirect impact to aquatic life.

iii. Fisheries Law Cap.135- Amendment of 1990

According to article 6, par. 3a, "Any person who violates any relevant regulations related with pollution matters is guilty and can pay a fine up to U.S \$ 60,000

iv. The ratification Law No.51/79

This Law ratifies the Convention for the Protection of the Mediterranean Sea against Pollution, the Dumping and the Emergency Protocols

v. The ratification Law No. 266/87

This Law ratifies the LBS and SPA's Protocols

vi. The ratification Law No. 57/89

This law ratifies the Convention for the prevention of marine pollution from Ships MARPOL 73/78 with the amendments of 1984 and 1985.

b. Inland Waters quality.

The above Legislation **i, ii, iii**, is applied also for protection of inland waters.

c. Protection of Habitats.

Protection of habitats is regularly secured through the ratification of existing international treaties and/or specific national Legislation.

i. The Ratification Law No. 24/88

The ratification Law No. 24/88 ratifies the Convention on the Conservation of European wildlife and Natural Habitants Specific Regulations for the full implementation of the provision of the convention are under preparation.

ii. The Ratification Law No. 200/74 amended with the Regulation 92/90

The ratification Law No. 200 of 1974 as amended with the Regulation 92/1990 ratifies the Convention on the International Trade in Endangered Species of Wild Fauna and Flora.

With a Council of Ministers Decision they have been defined the Operational and Scientific Authorities for the implementation of the provision of the Convention. There are no specific Regulations for the full implementation of the Convention.

iii. The Ratification Law No. 266/87

The ratification Law No. 266/87 ratifies the Protocol Concerning Mediterranean Specially Protected Areas.

iv. Fisheries Regulations No. 273/90 based on article 6 of Fisheries Law Cap. 135.

Regulation No. 14 defines the Lara – Toxeutra as Specially Protected Area
Regulation No. 13 protects the turtles *Caretta Caretta* and *Chelononyia Mydas*
and prohibits the posses, on sale of dolphins.

Regulation No. 12 protects all the fresh water species.

Regulation No. 21 Protects the Seagrass *Posidonia Oceanica* from the
trawlers.

v. **The Forest Law No.14/67 and Regulations No.49/87**

vi. **The Game and Wild birds Law No. 39/74.**

B. Legislation/guidelines for the regulation of :

a. Industrial wastewater & solid waste disposal.

i. Water Pollution Control Law 69/91

Wastes disposal from industries is fully control with the relevant provisions of
the Water Pollution Control Law.

According to Article 10 of the Water Pollution Law a permit of disposal of
waste is prerequisite for the grand of building License to any Industrial
activity. The Minister of Agriculture Natural Resources and Environment
gives this permit.

According to Article 11 of the same Law it is an offence for any person which
discharges or disposes any liquid or solid waste from any industrial source, to
any waters of the Republic of Cyprus.

b. Incineration of Wastes.

There is no specific Legislation for controlling the incineration of wastes.

The control of emissions from incinerators is effected not fully but to a large
extent through the provisions of Atmospheric Pollution control Law No. 70/1991
and Regulation 94(I)/1992.

c. Urban Development

Urban Development is controlled by the Planning and Housing Law No. 90/72 as
amended by the Laws No. 56 7/90, 28/91 91(i) 92, 55/1/1993.

Basic Provisions of the above Legislation is the regulation and control of
Development.

The Minister of Finance draft the Development Plan for the whole country which describe the policy to be followed for the control of Development and the Minister of Interior draft the local Plans of Development for different areas.

In addition to the above legislation the control for urban development is effected also by the Foreshore Protection Law no. 202/61 and the amended Laws 17/64, 8/72, 52/75, 21/82, 126/89, 11/90, 251/90, 61(I)92, 103(I)/92, 7(I)/93, 4(I)/94, 34(I)/94 51(I)/94, 75(I)/94.

d. Urban solid waste disposal

Considerable legislation exist in Cyprus on the collection and disposal of urban waste

- Municipal Corporation Law.Cap.240
- Village (Administration and Improvement) Law.Cap.243
- Public Health. Villages Law Cap.259
- The Public Roads and Public Areas Pollution Prevention Law No. 19(I)/92 prohibits the illegal deposit or rubbish or other useless objects and substances in public roads and public areas.
- The Foreshore Protection Law (Cap.59) and the subsequent amendments the latest being No. 75(I)/94.

e. Animal Breeding

- Improvement of Animal Law 41/1991

f. Domestic wastewater disposal

- Water Pollution Control LawNo.69/91 and the associated Regulations and Degrees 52/93,297/95

3a. LEGISLATION FOR ENVIROMENTAL IMPACT ASSESSMENT.

(EIA)-new projects.

E.I.A is a prerequisite for any new project according to the Council of Ministers Decision No. 35.700 of June 1991.

The different categories of projects for which EIA is necessary according to par. 5.1.2 of the Council Decision is listed in ANNEX I.

The flowchart (procedure for the preparation of EIA studies is attached as ANNEX II.

4. PERMITTING

A. Required Permits for:

a. Industrial activities.

1. Planning permit. According to the Town and Country Planning Law No.90/72as subsequently amended, the latest is being the Law No. 72(I)/98.
2. Building permit. According to the Streets and Building Law CAP. 96/59 as amended.
3. Operation permit. According to Atmospheric Pollution Control Law 70/91 and The Water Pollution Control Law 69/71

b. Animal Breeding

As in a above and a number of conditions as described in the Animal Improvement Law and The Animal Health and Welfare Law No.46 (I)/94

c. Urban Development

1 and 2 as in a above

d. Incineration of Wastes

2 as in a above and,

Operations permit according to Atmospheric Pollution Control Law 70/91.

e. Solid Waste Disposal

3 as in a above and according to Municipal corporation Law Cap. 240 for cities and theVillage (Administration and Improvement) Law Cap. 243 and Public Health Villages Law Cap. 259.

f. Infrastructure projects

1and 2 as in a above and Appropriate permission depending of the infrastructure project i.e. for the construction of a road a Construction license is required according to the Roads Construction Law.

B. Permitting Authorities

- a) Minister of Finance-Approval of the National Development Plan for the whole Island
- b) Department of Town Planning and Housing- Planning and Building Permits for cities.
- c) Department of Town Planning and Housing and the District Officer through the Local Improvement Boards-Planning and Building permit in areas other than cities.
- d) Minister of Agriculture Natural Resources and Environment-Permit of Discharge
- e) Minister of Labour and Social Insurance-Permit for Operation (industrial Activities)
- f) Environment Committee(Chaired by the Permanent Secretary of MANRE)- Approval of EIAS

All Industrial Facilities in Cyprus required to have permits for their operations.

The main authority for permission is the Town Planning and Housing Department of Ministry of Interior.

The number of employees of the Town Planning and Housing Department is the following:

Scientific and Technical Staff:	140
Clerical Staff:	30

The permitting system is quite effective.

There is no any single building or installation without the relevant Permit or License.

EIA's for new Projects.

For all new projects which are listed in ANNEXII EIA's have been conducted. In these last few years EIA's have been prepared for six open sea Fish farms,. The New Electric Power Station at Vassiliko, for two new marinas ,for the Sewerage treatment plants of Limassol, and Larnaca coastal towns Etc.

EIA's for existing projects

No EIA's studies have been prepared for existing projects unless they have been asked for extension. Such cases are the expansion of Dekhelia Power Station, Larnaca Airport etc.

Permits have been issues for almost all new installations. For Industrial plants the Ministry of Labour has issued operational permits.

Permits

The Ministry of Agriculture, Natural Recourses and Environment also has issued permits almost for all industrial units, with liquid or solid discharges. These Permits are for two years and are renewed if conditions and terms in the permit are fulfilled.

There are no voluntary agreements with Industrial Sector.

The publics according to the existing Legislation can have assess to the Registers of any industrial activity kept by the Ministry of Agriculture, Natural Resources and Environment and the Ministry of Labour. Limitation with regards to access to such information is for the need to protect trade secrets or the public interest.

5. COMPLIANCE AND ENFORCEMENT

Implementation and enforcement are carried out in accordance with the existing laws and regulations by the agencies, which have the relevant responsibilities.

Enforcement of law is usually left to Government authorities responsible for the protection of the environment. Nevertheless, private prosecution by individuals or even environmental groups, is also a possibility and it can be exercised with the consent of the Attorney General.

A. Authorities responsible for compliance and enforcement

a. Ministry of Agriculture Natural Resources and Environment and Ministry of Labour

- Responsible for the enforcement of legislation regarding the control of industrial effluent and emissions, under the Water Pollution Control and the Atmospheric Pollution Control laws. This is carried out through a system of inspection of premises and installations. The duties and powers of the inspectors and other administrative arrangements such as criminal procedures, penalties etc. Are provided for in the aforesaid laws. A Court injunction may also be requested and granted for the discontinuation of operations, when a charge is made for violations of the law by and on behalf of the Government, or of the local authority

i. Violations

According to article 23 any person which violates or does not obliged with the provisions of the water Pollution Law and Atmospheric Pollution Control Law No. 70/92 or Relevant Legislation is liable to an offence. The offender is Liable to pay a fine not exceeding the U.S \$ 40.000,00.

According to Article 14 par. 3 in case where a discharge with temporary permit, creates danger to the Health of any person the Minister of Labour has the power at any time to request the cease of this discharge.

ii. Staff involved

- a. Ministry of Agriculture Natural Resources and Environment**
 - i. Chief Water Pollution Inspector (1M/M)
 - ii. Ten (10) Water Pollution Inspectors (10x2M/M)

b. Ministry of Labour and Social Insurance

- Department of Labour

Staff

Five (5) Environmental Pollution Inspectors 12M/M

Three (3) Clerical staff (3x6 M/M).

b. Town Planning and Housing and District Inspectors of the District Officer

Responsible to check and control compliance with the terms and conditions of issued permits.

For Domestic wastewater disposal by the Sanitary Engineers of the Town Planning and Housing Department.

Staff involved difficult to be estimated.

c. Fisheries Department (MANRE)-Responsible for the enforcement of the Fisheries Law (Cap.135) and its regulation (270/90)

Staff

11 Fisheries Inspectors (11x 9M/M)

4 Fisheries Officers (4x6M/M)

5 Fisheries Asst. (5x6M/M)

d. Game & Fauna Service. Responsible for the enforcement of the Game and Wild Birds Law No.39/74.

B. Means of compliance promotion and enforcement

- Emission standards for effluent discharge and quality objectives the recipient body (water, soil subsoil etc.).
- Inspectors have the right to take samples of any discharge.
- Samples are analysing by the State General Laboratories.
- When discharges exceeds set standards, the offender can be brought to the Court or pay a fine.
- The owner of the installation pays for the granted licence for reimpercement of the expenses of continuous monitoring and the measurements of the discharge.

C. Existing System for the assessment of the Water Quality

Marine waters –

Direct assessment:

- Collection of samples and in situ measures
- Monitoring, of physicochemical parameters i.e., pH, S, D, O, nutrients by the Fisheries Department.
- Analyses of Samples – Fisheries Department Specialised Laboratories and/or State General Laboratory Ministry of Health.
- Microbiological monitoring collection of Samples by the Medical Services and samples analyses by the State General Laboratory

Indirect Assessment:

- Determination of heavy metals – Pesticides PC, Bs in Biota and Sediments. Collection of Samples and analyses by the Fisheries Department, Ministry of Agriculture, Natural Resources and Environment.
- The evaluations of results is carried out by the Fisheries Department except for matters related with health aspects in collaboration with the State General Laboratory, Ministry of Health.

Other Surface waters, i.e., Dams etc.

For Dams with aquaculture – Fisheries Department

For Dams of which the water is used for irrigation Department of Agriculture and Medical Services.

For Dams of which the water is used for drinking water – Water Development, Ministry of Agriculture, Natural Resources and Environment.

Industrial Emissions

- **Liquid Discharges.**

Collection of Samples by the water Pollution Inspector of Ministry of Agriculture, Natural Resources and Environment.

Analysis of Samples by the State General Laboratory.

Air Emissions

Collection of samples and in situ measurements by the Environment Pollution Inspectors Ministry of Labour.

Analysis of samples -State General Laboratory Ministry of Health.

Protection of Habitants

- Marine habitants – Fisheries Department
- Other Habitants – Fund Game, Ministry of Interior and Forestry Department, of
Ministry of Agriculture, Natural Resources and Environment.

ANNEX I

LIST OF DIFFERENT CATEGORIES OF PROJECTS FOR WHICH EIA'S STUDY IS NECESSARY

- Tourist Installations and Housing blocks which covered an area greater than 4 hectares
- Fish farms
- Coastal Camping sites
- Playgrounds and entertainment places which covered an area greater than 2 hectares
- Coastal Development Projects
- Ports, marinas, Fishing shelters and breakwaters.
- Central Sewage Treatment Plants.
- Sites for Dumping of Liquid and/or solid wastes.
- Sides for dumping of noxious (toxic, dangerous) wastes.
- Animal - breeding wastes.
- Medical installations
- Constructions of Dams or diversion of rivers (streams)
- Construction of roads with more than two channels.
- Redistribution of Land Projects.
- Mining and quarries activities
- Industrial installations as defined in the Water Pollution Control and the areas which are situated in the zone with increased nuisance as they are defined in the Planning and Housing Law.
- Industrial areas
- Plants projects of energy production and Telecommunications
- Reforestrations
- Airports

EGYPT

Compliance and Enforcement in the Egyptian Industrial Sector

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Introduction

This paper will try to give an overview of compliance and enforcement issues relating to industrial activities in Egypt. The Egyptian environmental legislation, particularly Law 4 of 1994, will be the major reference used and illustrated in this paper. Because of the major responsibilities of the Egyptian Environmental Affairs Agency (EEAA) in compliance and enforcement, efforts and activities undertaken by the Agency will be explained. Since environmental problems relating to industrial activities mentioned here are of a general nature, their effects on the Mediterranean Sea can be easily understood and extrapolated.

I. Background

The Arab Republic of Egypt is a country of 62 million inhabitants concentrated in a narrow strip around the river Nile and on the coasts of the Mediterranean Sea. The Gross National Product was estimated at \$71.2 billion in 1997 with an average growth rate of 4.9% for the year 1996-97. The population density is 58 persons/km² and continues to rise steadily as a result of a high annual growth rate of 2% between 1990-1997.

Egypt has substantial coastal resources with over half of its boundaries along the Mediterranean and Red Seas. About 13% of Egypt's population live along or near the coasts. In addition, the country's top international revenue earners are coastal or marine-based, namely, tourism, transportation through the Suez Canal and oil production. Also the coastal zone of Metropolitan Alexandria encompasses more than 40% of Egyptian industry.

The main water resource for Egypt is the Nile, with a quota of 55.5 billion cubic meters per year. Industry, being one of the most important sectors in Egypt, also consumes large quantities of Egypt's quota of Nile water (about 20%). The number of industries with more than 10 employees in Egypt was estimated at about 22,000 in 1994 with the number of employees in the industrial sector estimated at 2 million. Greater Cairo and Metropolitan Alexandria, the most populated and dense areas of the country, account for over 80% of industrial activities in Egypt.

II. Industry in Egypt

Industrial development in Egypt is concentrated in the larger urban regions, particularly in Greater Cairo and Metropolitan Alexandria. Until a few years ago, this concentration of urban activities has resulted in major environmental problems, severe degradation of environmental quality in these cities and an overloading of public infrastructure. In addition, environmental degradation has been aggravated due to the vast increase of industrial emissions owing to the steady expansion of existing manufacturing plants and to the establishment of new industries. Moreover, improper or inexistent end of pipe treatment of emissions as well as unacceptable disposal of hazardous residues; lack of monitoring of industrial emissions owing to the lack of instruments and trained personnel have contributed to this problem. The lack of trained personnel for the operation of pollution abatement equipment and the weakly enforced regulations are also to blame. To counter these problems, in the recent years, the government has been trying to encourage industrial development in newly created cities by providing tax cuts and other incentives to investors. These new urban settlements are now increasing steadily and are mostly comprised of modern private sector enterprises. Moreover, the Egyptian government has recently started to promote pollution prevention through the promulgation of Law 4 of 1994, the first integrated environmental law in Egypt.

Industrial development in the Alexandria Metropolitan Area has grown significantly during the last three decades. This growth, although important for the economy, has lead to severe environmental degradation. This environmental degradation is manifested in deteriorated water resources, unsightly over-growth of weeds, decreased fish catches and adverse public health conditions. Because the coastal waters of the Mediterranean serve as a sink for land-based activities, the quality of the waters of the Mediterranean is severely affected. Industrial activities as well as with the discharge of untreated or poorly treated sewage water have lead to a great extent to this deterioration.

In 1996, the estimated flow of untreated industrial effluents discharged into the city sewer system, or directly in the sea, drainage canals was 1.7 million m³ per day. Pollutants included chromium wastes from tanneries, mercury from electronics and chloralkali industries, black liquor from pulp and paper mills, and hazardous chemicals from dyestuffs and textile finishing plants. Solid wastes of various industrial activities amount to about 1.63 million tons per year. Oil from petroleum and edible oil refining constitutes one of the most significant problems, with an estimated 4000 tons of oil discharged into the Mediterranean from refineries located in Alexandria. Chemical, engineering and metal industries, food processing, are also major polluters to the Mediterranean Sea.

Because of the dumping of this untreated wastewater into these drains, the quality of the lakes is very poor and the lakes are considered by EEAA as "Black spots" which need immediate remedying action. As a result of this poor quality of water, fish stock has decreased coupled with contamination of the fish with chemicals and parasites. It was recorded that the quantity of fish production has decreased about 37.6% during the period 1985-1994 with serious health hazards to the consumers of such fishery.

As an example of water pollution from pulp and paper industry in Alexandria, one company discharges 22 Mm³/year into the Abu Kir Bay with black liquor, another pulp and paper company in the same vicinity discharges 7 Mm³/year. (It should be noted that both companies are currently in the process of eliminating this problem with the assistance of EEAA.)

As for drinking water for the Alexandria Metropolitan area, it has also become polluted being downstream of the country's water system. For example, the Total Dissolved Solids (TDS) are about three times higher than WHO guideline value. This situation is expected to improve as a result of the stopping of dumping of untreated industrial wastewater in the Nile, which the Ministry of State for Environment and EEAA have achieved in the year 1998.

III. Legislation

Since the early twentieth century, laws directly or indirectly dealing with environment-related issues were promulgated in Egypt. Nevertheless, compliance and enforcement of these regulations was always inadequately performed. In 1982, a Presidential Decree was issued establishing the Egyptian Environmental Authority. The creation of this Authority demonstrated the government's recognition of the need for a cross-sectoral governmental authority to elevate environmental concerns to the status of national concerns. The Authority was to act as a liaison between different ministries and prepare national environmental plans, among other duties.

A. Law 4 of 1994

In 1994, and after years of discussion in the Egyptian Parliament, Law 4 of 1994 was promulgated. This law is the first comprehensive environmental law in Egypt regulating air, water, habitats and human activities affecting them. The Law also established the Egyptian Environmental Affairs Agency (EEAA) at a Cabinet level to replace the former Egyptian Environmental Authority.

The law has introduced in the Egyptian context several important aspects, namely the need for Environmental Impact Assessments for new projects and expansions, protection of natural habitats, fines and criminal penalties for violations and the need for establishments to keep an Environmental Register. It is also the first Egyptian law regulating air emissions and ambient conditions, which were regulated by other lower level legislation. It is also the first law addressing marine pollution in an integrated manner as well as contingency planning for environmental disasters.

B. Role of EEAA

The law states that the Agency shall be responsible for national environmental planning and policy making and for coordinating the implementation of such plans with different concerned authorities. The Agency is also the party entering into regional and international conventions as well as supervises an Environmental Protection Fund for financing pilot environmental projects and collecting fines and license fees.

Law 4 of 1994 also grants EEAA broader powers in terms of enforcement. For instance, EEAA reviews Environmental Impact Assessments; inspects industrial and

other facilities to review the Environmental Register; sets emissions standards and ensures that they are met; manages reference monitoring stations and emergency response centers.

In cases of violations, law 4 of 1994 stipulates a broad range of penalties which range from a mere financial fine to criminal prosecution. For instance, pollution to Egyptian shores, or waters adjacent to these shores, whether voluntarily or not, would lead to a fine between L.E. 200 and L.E.20,000 (\$80 to \$800). The same fine would also apply for failure to provide treatment units for licensed facilities close or on the shores. Exceeding maximum emissions of air pollutants, burning, dumping, or treating solid waste in non-designated areas carry a fine in the same amounts. In case of recurrence of violations especially concerning dumping wastes into the Nile and waterways could lead to imprisonment or a fine or both. The discharge of sanitary or solid waste, or oil into sea carries a fine between L.E.40,000 to L.E. 200,000.

Eventhough Law 4 of 1994 is targeting industrial and other activities, it is not yet industry or sector-based. No provisions for using Best Available Technologies exist in the current legislation. As for standards identified in the Executive Regulations, they are of a general nature and are not always applicable for specific industries. Pollutants emissions are calculated as concentrations with no differentiation between location or size of the facility. What EEAA intends to do in the future, is to revise these Executive Regulations and make provisions for Best Available Technologies per major industrial sector. Calculations of pollution loads would also be undertaken. This exercise would make the Executive Regulations easier to follow, more realistic and most useful to the quality of the environment in Egypt.

C. Environmental Impact Assessment

An important aspect of the Executive Regulations of Law 4 of 1994 is the new licensing requirement related to the assessment of environmental impact of new projects as well for expansions of establishments. According to the Law, projects are ranked into three distinct categories: white, gray and black establishments. This categorization is based on the expected environmental impacts of the proposed activity. Black projects, which due to their potential and substantial environmental impacts need a full Environmental Impact Assessment. Gray projects are projects that could lead to environmental problems. For the review of these projects, a stage screening process is needed through which a rapid environmental screening is performed which might be followed by a scoped EIA on certain identified impacts or processes. As for white projects, these are projects that have little environmental impacts but must conform with environmental standards and regulation. These white projects are exempted from EIA. It is the responsibility of EEAA to review such EIA's and to clear them to the local administration in charge of granting the building permit of the activity in question.

D. Environmental Monitoring

The monitoring of water quality is carried out by various institutes, with little coordination between them. A large number of fixed points have been chosen along the Nile, its branches and canals to monitor point sources of pollution whether from domestic or industrial sources (70 drains). There are twenty-four parameters for analysis and routine periodic inspections take place for all water treatment plants and underground water plants. One of the main responsibilities of EEAA is to facilitate

the collection and exchange of consistent information collected and its use in environmental policy analysis. To this end, EEAA has established a number of water monitoring stations spread out in the country, which provide reference information to decision-makers.

As for industrial solid and hazardous wastes, legislation exists for the collection, treatment and disposal of solid waste as well as for occupational health. It should be noted that Egypt does not yet have in place a well developed and comprehensive set of regulations for the generation, treatment, storage and disposal of hazardous wastes. EEAA is currently in the process of developing such guidelines in coordination with concerned agencies.

IV. Permitting

The industrial permitting system in Egypt is often non-homogeneous and suffers from administrative barriers and inconsistent enforcement from the different authorities. This is especially the case since licensing procedures involve different authorities both on the national as well as on the local levels. Eight central organizations as well as local administration are responsible for this exercise. The Egyptian regulations concerning permitting (Law 453/1954) are based on a two-tiered licensing system based on the scale of operation of the intended facility and the relative effect on health and comfort. Facilities with potential impact on health and well being are the facilities that follow this two-tiered licensing system. Permitting for industrial activities also occurs at different stages, prior to establishment and prior to operation.

It should be noted that a major distinction exists between different industrial facilities in relation to licensing, namely the difference between industrial facilities established before 1994 and those established after 1994. Operating facilities that are established prior to the promulgation of Law 4 of 1994 are not required to prepare an EIA.

Eight central agencies and representative of local administration at the Governorate level are involved in reviewing licensing documents, granting necessary approvals and issuing operating licenses for industrial facilities in Egypt. Of particular importance is EEAA with reviewing EIAs for new and expanding establishments after 1994, the Ministry of Industry for granting industry license prior to construction, with information such as intended industrial activity, responsible manager, capital costs and number of workers.

The first permit issued is that of the General Agency for Planning which approves the location of the new industrial establishment and its intended uses. After the promulgation of Law 4 of 1994, environmental requirements were introduced for the first time into the existing licensing system for the construction of new facilities and the expansion of existing facilities. The Egyptian Environmental Affairs Agency became an integral part in the licensing system for industrial and other establishments with the review of EIAs. After this review, EEAA provides its comments to the local administration in charge of granting the construction or building permit. The Ministry of Industry is responsible for issuing a permit for the industrial plant, and approving the intended uses of the plant. Upon completion of the construction works, the facility proceeds with its application for obtaining the operating license from local

administration. Local concerned administration in turn, reviews the needed documentation and forwards the application forms to the Ministry of Industry for review, approval or disapproval. Upon approval of the Ministry of Industry, the licensing agency or local department in the local administration requests an inspection fee. After inspection is completed, the application documents are sent to a review committee which provides recommendations on safety and health that are checked later during operation for compliance. In addition, the Ministry of Public Works and Water Resources issues a discharge permit to the same industrial plant allowing it to discharge its treated wastewater into the drains.

The above-described process illustrated the issuance of permanent licenses, temporary operating licenses, on the other hand, are granted in some cases. A facility operating with a temporary license awaiting relocation to an industrial estate; or a facility operating with a temporary license because the sewer network in the area is not yet extended to the facility or a temporary license conditioned upon environmental compliance. In most cases, once a permanent license is issued, it does not need to be renewed unless inspection occurs and the license is revoked.

As is clear from the above description of the permitting process for Egyptian industrial facilities, permitting is quite a complex and time-consuming procedure for establishments. Since the promulgation of Law 4 of 1994 and as a result of EEAA's efforts in raising awareness of environmental impacts of industrial activities, some problems have arisen in the implementation of the Law. Local administration, the main permitting authority for industrial activities, has seemingly extrapolated the Environmental Impact Assessments only required for new projects or for expansions, to the clearing of granting operating licenses for existing facilities. During the last year alone, EEAA has been solicited by local administration for providing technical opinions on applications for granting permits and renewal for over one hundred existing facilities.

Although the mandate of EEAA does not stipulate its involvement in the renewal of permits or issuing of permits for existing facilities, environmental considerations are becoming more and more a part of the permitting process with a decision requested by EEAA from local administration. This change is of course an important and positive step but needs to be institutionalized to avoid the state of confusion that is now evident in this process. To this end, EEAA is in the process of proposing a system to be implemented in coordination with local administration to ensure that environmental aspects are respected in the process while following the legal requirements.

V. Compliance and Enforcement

In Egypt there are many national, regional and local authorities, which are responsible for the enforcement of environmental legislation and inspection of industrial establishments. In addition to the responsibilities of EEAA which include the review of the Environmental Register, of hazardous materials handling, noise control and analytical sampling from the facility, other authorities have parallel responsibilities. For example, the Ministry of Health, the Ministry of Industry and local administration also check periodically for waste disposal, and emissions and noise.

EEAA's policy in the enforcement of Law 4 of 1994 was to assist industry, being the highest polluting activity in Egypt, in moving towards compliance with the law. The Agency while providing enabling tools for compliance, also resorted to the development of its own internal structure and capability for enforcement. Some of those efforts include capacity building for EIA reviews, training for municipality chiefs on judicial powers relevant to Law 4 enforcement, developing inspection capabilities in different authorities concerned with pollution abatement, and setting up legal fast tracks to expedite the management of environmental legal complaints. On the financial side of compliance and enforcement, and following EEAA's basic strategy of creating tools for compliance and enforcement, technical assistance to polluting industries as well as the provision of soft financing for environmental projects were provided through the Agency.

A. Compliance Action Plans

As a preparation for the entry into force of Law 4 of 1994 which stipulated a grace period of three years for the compliance of industrial establishments in February 1998, EEAA requested from industry the preparation and implementation of a Compliance Action Plan (CAP). This plan was to include basic information about the establishment, actions undertaken and progress achieved towards compliance, supported by satisfactory documentation. The plan was also to detail the planned activities for achieving compliance by February 2000, the identification of sources of financing, and the establishment of a CAP implementation task force, with clear authorities and responsibilities. To this date, some 450 establishments have turned in a Compliance Action Plan to EEAA.

Originally, the CAPs were to be used as supporting documents for industries' request for the extension of the grace period which ended in February 1998. Because of a Prime Ministerial decision not to grant any extensions, the CAPs became EEAA's tool for negotiation and monitoring of industrial activities. Eventhough most of the industrial sector became aware of the Prime Minister's decision not to grant extensions by March 1998, CAPs are still being received and reviewed by the Industrial Compliance Unit of EEAA. The association of investors of an industrial city (Sadat City) approached EEAA to express its intention to submit CAPs for all its members which amount to more than one hundred. The association was fully aware that no extension would be granted, but viewed the CAPs as an appropriate tool to ensure their compliance or willingness to comply.

From EEAA's perspective, and apart from the obvious use of these CAPs as enforcement and compliance monitoring tools, CAPs are also used as basis of information in the newly developed databases on Egyptian industry, since it is the most recent and detailed source of data available to EEAA. In addition, CAPs are used as references in certain inspection and auditing exercises performed by the Agency. The follow up of the commitments of the companies as stated in the CAPs is also an important activity performed by EEAA and a basis for enforcement actions if needed. It is the attitude of EEAA to provide assistance to the companies that have developed CAPs in the implementation of their planned activity. This assistance is mainly done through the provision of soft-financing for certain projects identified in the Plan if the follow up activity by EEAA provides information that the company in

question is serious in the implementation of the Plan but is facing financial difficulties.

B. Financing compliance

Financing of environmental industrial investment projects through EEAA was divided into several stages. First it was the view of EEAA that a substantial portion of industrial pollution could be dealt with by instituting good operational practices at no or low cost or through environmental improvements with short payback periods. To this end, the Agency established in 1994 the National Industrial Pollution Prevention Program (NIPPP); a program dedicated to the promotion of these interventions. The program has taken a sectoral approach to industry started in the largest industrial sectors, namely, food and textile. Nevertheless, the program stopped due to financial constraints. In 1998, the Minister of State for Environment declared that the goal for this year was to stop polluting industries discharging directly to the river Nile. This objective was successfully achieved. Today, twenty-four major polluters to the river Nile have stopped discharging untreated wastewater to the river. As a result of the growing environmental awareness and willingness to change, public sector industry, the most polluting sector, mobilized some L.E. 3 billion (\$ 900 million) of its own resources for pollution abatement activities

After the issuance of Law 4 of 1994, EEAA succeeded in attracting international financing for the promotion of environmental industrial projects. This financing, through the British Overseas Development Organization (ODA), the World Bank for Reconstruction and Development, the International Development Association, and the *Kreditanstalt für Wiederaufbau* (KfW), is being managed by EEAA. Apart from the project financed by the British Overseas Development Organization, which deals with low cost pollution prevention measures, the other projects target large-scale enterprises (major polluters) with relatively large investments. The main responsibility for the promotion of such soft financing options was and is still being done by EEAA in coordination with local banks participating in these projects. In addition to these financing packages available to large establishments, another facility was created within the Agency for assisting Small and Medium size enterprises in complying with environmental legislation. The Egyptian Environmental Investment Fund (EEIF) was therefore established with assistance from the Canadian International Development Association (CIDA). EEIF offers technical support as well as financial support (soft financing) for environmental investment projects. Although these different soft-financing packages make about \$100 million available to industry, self-financing would need to be the trend in the future following the example of the large public sector enterprises that have resorted to their own financial resources for pollution abatement.

C. Other institutional tools

In addition to the development of Compliance Action Plans (CAPs), other tools were developed (or are being developed) by EEAA in its efforts to establish a compliance culture in the country. For instance, institutional capacity building is being coordinated by EEAA for most players in the compliance and enforcement arena. As a result of the promulgation of Law 4 of 1994, nine Regional Branch Offices (RBOs) for EEAA were to be created in the country. The purpose of these new establishments was to disseminate EEAA environmental guidelines and policies and to decentralize environmental monitoring, compliance and enforcement. In addition to these RBO's,

other bodies in the local level are also responsible for environmental management in the country. These bodies are the Environmental Management Units (EMUs) which follow the Governors administratively and EEAA technically. Because RBOs are still being created and the existing EMU's are weak and untrained in environmental management, EEAA is being overloaded with responsibilities and expectations. RBOs and EMUs are expected to play a major role in the monitoring of industrial discharges and the compliance of industries, once they are adequately prepared. To this end EEAA is developing a coordination mechanism to ensure a common policy for environmental compliance and enforcement in Egypt.

During the last year, EEAA has been working on the development of a number of guidelines to be used by enforcement agencies as well as by industries themselves. Enforcement guidelines include general industrial inspection guidelines, Environmental Impact Assessment guidelines (to be used by both enforcement agencies and industry), and environmental sampling methods among others. EEAA is also currently preparing general self-monitoring guidelines to be followed by sector-specific self-monitoring manuals.

These manuals are being developed using an interactive approach by EEAA. For instance, the inspection manual was prepared by consultants under the supervision of the Industrial Compliance Unit of EEAA and will be field-tested by environmental inspectors before being finalized. Another example of the interactive approach is the general self-monitoring guidebook with its draft version being sent to industry and discussed in a workshop with industry, experts and regulators for finalization. EEAA is also currently developing a system for environmental laboratory authorization. This system which would ensure that all laboratories would follow the same procedures for sampling, calibration and reporting. The above mentioned activities are hence examples of EEAA efforts in the institutionalization and dissemination of environmental policy and enforcement.

At the other end of the spectrum, public participation in environmental decision making became an important part in EEAA's comprehensive policy of compliance and enforcement during the last periods. The role of Non-Governmental Organizations, NGO's in promoting compliance was also stressed in EEAA's policy directives. NGO's have also participated in the development of the environmental law. Since the promulgation of Law 4 of 1994, and partly as a result of EEAA's intensive awareness programs, the voice of NGO's has become louder and stronger in promoting better national environmental conditions. The establishment of a federation for environmental NGO's in 1998 formed of more than one hundred organizations is an illustrative example of their growing role. Several NGO's have recently become active in this field with, for instance, the establishment of a 'hotline for environmental complaints' managed by an environmental NGO in the Greater Cairo region. This hotline acts as a tool for mobilizing the community and lobbying for environmental problem solving especially related to impacts of industrial activities. In addition, as a result of public pressure, a number of public hearings have been held and are being organized to discuss certain industrial initiatives. The issue of public hearing is a rather new approach in the Egyptian context in general and in environmental aspects in particular. For example, a pulp and paper company held a public hearing in 1997 to discuss its long-term environmental protection plan and to get the support of the surrounding inhabitants on the contents of this plan. Although

this is only one case, several companies are to follow suit and convene such public hearings as a result of the growing importance of NGO's and community participation in environmental decision making. Another NGO in Alexandria has succeeded in lobbying for the reversal of several Governor's approvals for construction that would have affected the well being of Alexandria inhabitants. This was achieved with a great deal of media coverage in the national and local newspapers, radio and television. The same organization is now working to increase environmental awareness of workers in the industrial sector of Alexandria area and to assist industry in developing Compliance Action Plans. These cases are only examples of the growing role that environmental NGO's have started to play in environmental management in Egypt. Because of the increasing public awareness of environmental problems, this role is expected to grow even more and to be an integral part in environmental decision making in the country.

VI. Conclusion

From the above discussion of industrial enforcement and compliance actions in Egypt, it is clear that Egypt is facing a great challenge: natural resources are scarce and deteriorating and need immediate and drastic measures for protection from uncontrolled activities. Concerning pollution from land-based sources, industrial activities are major polluters. The number of industrial establishments is rising as well as that of industrial workers or services related to industry. Newcomers have a better chance of meeting compliance requirements since they probably use cleaner technology and are probably situated in the newly created industrial cities. There is still hope, however, that operating industrial facilities, especially large and medium scale facilities would be able to comply with the environmental legislation. Today, some progress in the implementation of environmental regulations can be witnessed in the Egyptian scene.

Awareness of environmental problems and concerns is rising among the Egyptian population at large and especially among decision-makers and Non-Governmental Organizations. In the industrial sector, industrial managers and decision-makers are becoming more familiar with environmental legislation and cleaner technology options available worldwide. Non-Governmental Organizations are putting more pressure on industrial facilities and the government to achieve a better standard of living. As a result, industrial environmental compliance is increasing but the momentum needs to be kept to achieve noticeable improvements in environmental conditions. What is still missing is the establishment of financial incentives for pollution abatement technology as well as more stringent penalties for polluters. Law 4 of 1994 stipulates the creation of a system of financial incentives. Once such a system is in place with tax alleviation for pollution abatement equipment and other types of subsidies, the Egyptian industry would be more able and willing to comply with environmental regulations. The Polluter Pays Principle should also be applied to provide for an equitable and realistic penalty system. Finally, although EEAA and other concerned agencies are becoming more and more active and successful, a great deal of effort is still needed on the institutional front to achieve a common environmental compliance culture and language among the different enforcement agencies in Egypt.

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Annex 1
COMPLIANCE ACTION PLAN (CAP)
(Framework)

1. BACKGROUND

The environmental law 4/94 has granted the existing industrial establishments a grace period of three years starting from the issuance of its executive regulations (February 95) to meet its requirements. The grace period can be extended for 2 years, given that the establishment proves seriousness in progressing towards compliance.

All establishments expecting not to comply with the requirements of the executive regulations by February 1998 are required to formally apply for extension 6 months before the end of the grace period (August 1997). This application should address the reasons for the extension and the actions already undertaken to comply with the requirements of the law.

The Egyptian Environmental Affairs Agency (EEAA) requires the establishments to provide satisfactory evidence of the progress achieved and the actions to be undertaken during the extension period to ensure compliance at its end, according to the attached framework.

2. OBJECTIVES

The immediate objective of the CAP is to bring the applicant facility in compliance with environmental laws and regulations. The ultimate objective is to strengthen environmental commitment and to incorporate environmental management systems and cleaner production technologies in the Egyptian industry.

3. SCOPE

The CAP should accomplish the following:

- Translate the planned technical interventions to conceptual engineering designs.
- Reflect financial requirements and limitations.
- Outline an environmental management system integrated in the facility's planning and management systems to respond to evolving environmental requirements.
- Form the basis of the facility's agreement with EEAA on a phased plan towards environmental compliance.

4. DEVELOPMENT OF THE CAP

4.1. Draft Cap

The CAP is the facility's document and throughout the phases of its development, the full involvement of its concerned personnel as well as its management full consent should be ensured.

The following issues should be addressed in the draft CAP report:

4.1.1. Environmental Status

- Provide Plant information as described in Appendix A.
- A list of environmental studies conducted for the facility in the last three years (copies of these studies should be attached).
- Report on actions undertaken and progress achieved towards compliance, supported by satisfactory documentation, since the issuance of the Law 4/94.
- Identify the state of compliance with relevant environmental laws and regulations expected by February 1998 concerning:
 - liquid Effluents, for each point of discharge, specifying discharge rates, source(s) by industrial process. A table comparing the average concentration of pollutants to the maximum allowable limits according to law 4/1994 should be attached.
 - Air Emissions, for each point of discharge (stacks and fugitive emissions), specifying source(s), emissions rates, stack heights and fuel used if applicable. A table comparing the average concentration of pollutants to the maximum allowable limits according to law 4/1994 should be attached.
 - Hazardous materials used in the facility and the current management system compared to the requirements of Law 4/94.
 - Solid and Hazardous waste, identifying sources by industrial process and the current management system compared to the requirements of Law 4/94.

- Work environment, specifying locations where pollutants concentration exceed the maximum allowable limits according to law 4/1994. A list for these pollutants with their concentrations should be attached.
- Existing Pollution Control Facilities
 - Sewer layout diagram.
 - Description of in-process and end-of-pipe treatment of liquid waste and air emissions and the efficiency of the existing treatment facilities.
 - Availability of space for installing pollution treatment units.
- 4.1.2. Planned activities for Environmental Compliance
 - 4.1.2.1. Polluting discharges
 - Specify proposed actions to mitigate non-compliance problems during the grace period including:
 - Process changes and / or control
 - Improved maintenance measures
 - Input substitution
 - Material recovery and recycling
 - End-of-pipe treatment
 - 4.1.2.2. Hazardous waste and materials
 - Describe measures to upgrade management of hazardous waste and material, according to law 4/1994, including a contingency plan.
 - 4.1.2.3. Work Environment
 - Specify actions to be undertaken to bring the work environment in compliance with law 4/1994.
 - 4.1.2.4. Monitoring of Industrial Emissions
 - Describe present system, and identify planned actions to establish a self-monitoring scheme according to the requirements of Law 4/94.
- 4.1.3. Environmental Policy and Management System
 - The facility should inform EEAA of the composition of the task force -with defined roles, responsibilities and authority as well as adequate resources- designated to ensure that the CAP is implemented as committed and to report on progress towards its implementation to top management.
 - During the extension period, this task force will also be responsible for developing the facility's environmental management system. This would include, but is not limited to :
 - Outline the company strategy on pollution abatement, cleaner production, energy conservation, waste minimization, water recycling and by-product recovery;
 - Designate the responsibility for achieving environmental objectives and targets to each relevant function and level of the organization;
 - Identify measures to strengthen awareness of management, supervisors and workers of environmental issues and regulatory requirements relevant to their areas of responsibility;
 - Develop a plan for on-the-job training on cleaner technologies, operation of waste treatment systems, and emissions monitoring; and
 - Identify measures to be undertaken when monitoring information indicates non-compliance or unacceptable degradation of the receiving environment
- 4.1.4. Action Plan
 - 4.1.4.1. Implementation Schedule
 - A summary implementation schedule should be included. This schedule should delineate the technical and managerial aspects of the compliance plan, the financial plan, targeted deadlines for major activities, as well as the anticipated reductions in pollution loading, and the resulting progress towards compliance.
- 4.2. Financial Plan
 - Delineate financial requirements in terms of investments and operational costs as well as potential benefits.
 - Identify sources of financing for the activities that will be implemented by the facility.

4.2.1. Progress reporting

- Periodical reporting -at 6 months intervals- to EEAA will be required to summarize the progress on the action plan as well as forth coming activities.

4.2.2. Feed back to the Draft CAP

The draft CAP, cleared by the establishment Board of Directors, will be submitted to EEAA for review and comments. The feed back solicited by EEAA, as needed, from the local administration as well as other concerned parties will be included.

4.3. The CAP Final Document

A revised CAP should be prepared by the facility to incorporate changes based on the comments, if any, of the concerned parties. The final document will be annexed by EEAA to its recommendation concerning extension of the grace period submitted to the Cabinet of Ministers.

Appendix A Facility Information Form

I. General Information

Company:.....

Facility Address:.....

CEO:.....

Size of labor force:.....

Major production activities:.....

SIC Code:.....

Contact Person:.....

Address

Phone Fax

II. Production Processes

Process Information

- Process flow diagrams.
- Material, water and energy balances.
- Map showing facility layout illustrating main uses, points of discharge and sources of emissions.

Production Information

- Products

Products	Production Capacity (t/y)	Average production (t/y)

- Raw materials and auxiliaries

Main Raw materials and Auxiliaries	Average consumption (t/y)	Maximal consumption (t/y)

FRANCE

LA PREVENTION DES POLLUTIONS ET DES RISQUES INDUSTRIELS

La prévention des pollutions et des risques industriels repose en France sur la législation des installations classées (loi du 19 juillet 1976 relative aux inspections des installations classées pour la protection de l'environnement). Cette législation s'intéresse - à l'exception des activités minières et nucléaires - à toutes les activités industrielles et aux élevages intensifs.

Le système juridique est simple : une nomenclature énumère les installations concernées. Les plus dangereuses pour l'environnement et la santé publique relèvent d'un régime d'autorisation, les autres d'un régime de déclaration.

La législation des installations classées met en oeuvre le contrôle intégré des pollutions et des risques : une autorisation unique est délivrée à l'entreprise pour le contrôle de tous ses rejets (air, eau) et du risque industriel. L'autorité administrative compétente est le préfet, représentant de l'Etat dans chacun des 100 départements qui divisent le territoire national. Le préfet est assisté par l'inspection des installations classées.

La procédure d'autorisation débute avec le dépôt d'un dossier par le pétitionnaire qui présente l'évaluation des effets du projet sur l'environnement (étude d'impact et étude de dangers). Elle se termine en général par un arrêté d'autorisation délivré par le préfet qui contient les prescriptions à respecter. Ces prescriptions, qui peuvent être plus contraignantes en fonction de la sensibilité de l'environnement, reprennent les dispositions d'arrêtés ministériels pris par le ministre chargé de l'environnement. Ces arrêtés ministériels ont vocation à transcrire le droit communautaire relatif aux rejets industriels.

En cas de non-respect des dispositions prévues, le préfet peut prendre diverses mesures administratives contraignantes : mise en demeure, consignation, exécution d'office, fermeture. Par ailleurs l'inspection des installations classées constate les infractions qu'elle transmet à la justice répressive qui dispose d'une panoplie de sanctions et de mesures contraignantes.

Des activités industrielles mais également des activités agricoles et divers services peuvent être à l'origine de pollutions, de nuisances ou de risques pour l'environnement. Elles sont ainsi responsables de plus de la moitié de la pollution organique de l'eau, de la plus grande partie des rejets toxiques dans l'eau et, d'une partie de la pollution de l'air (environ 83% des rejets de dioxyde de soufre, 17% des rejets d'oxydes d'azote, 40% des rejets de composés organiques volatils).

Depuis le début des années 1970, les pollutions émises par ces activités ont beaucoup diminué. Ainsi, les rejets industriels dans l'eau de matières oxydables et de substances toxiques ont diminué de moitié depuis 1976.

Les améliorations obtenues par la réduction des pollutions de voisinage et la sensibilité accrue de l'opinion à l'égard des problèmes d'environnement ont entraîné un élargissement considérable des préoccupations dans le domaine de l'eau (produits toxiques, eutrophisation...) ou de l'air (pluies acides, pollution photochimique, appauvrissement de la couche d'ozone, effet de serre).

Sur le plan économique, le coût des actions de prévention est important. Il peut cependant être mis au regard du coût de la réparation nécessitée par les suites d'un accident ou d'une pollution chronique.

En outre, le renforcement des contraintes relatives à la protection de l'environnement entraîne souvent une modernisation des installations par l'utilisation de techniques moins polluantes, ce qui généralement améliore aussi la compétitivité des entreprises.

Les actions entreprises se situent de plus en plus dans un cadre qui déborde le territoire national, englobant le reste du monde -on l'a vu, avec les conséquences des grands accidents à l'étranger- et plus spécialement l'Union européenne dont l'action entraîne la création d'une partie de la réglementation nationale dans le domaine spécifique de l'environnement.

Le principe de prévention sur lequel est fondé l'ensemble des actions est le suivant : une activité doit être exercée dans des conditions telles que l'homme et son environnement ne soient pas affectés.

Les actions des entreprises et des pouvoirs publics doivent respecter tout particulièrement le principe précaution : l'absence de certitudes, compte tenu des connaissances scientifiques et techniques du moment, ne doit pas retarder l'adoption de mesures effectives et proportionnées, visant à prévenir un risque de dommages graves et irréversibles à l'environnement à un coût économique acceptable.

La prévention des pollutions et risques industriels repose en France sur l'Etat. C'est l'Etat qui élabore la politique de l'environnement industriel et qui la met en oeuvre.

La direction de la prévention des pollutions et des risques au sein du ministère de l'aménagement du territoire et de l'environnement a la charge de cette mission.

A côté de l'action réglementaire qui relève de la responsabilité de l'Etat, la France a comme tous les pays industrialisés complété son dispositif juridique par l'incitation financière basée sur le principe pollueur-payeur et par l'organisation d'une approche volontaire des problèmes environnementaux et l'élaboration de procédure de concertation avec le public.

I. LES MOYENS DE L'ACTION PUBLIQUE

L'action publique en matière d'environnement comprend :

- l'instrument réglementaire
- l'incitation financière.

La plupart des politiques de prévention des pollutions combine ces deux instruments. Il est difficile de savoir ce que serait l'un sans l'autre. Il y a sans aucun doute complémentarité.

1.1. L'instrument réglementaire.

La loi du 19 juillet 1976 relative aux installations classées pour la protection de l'environnement est la base juridique de la politique de l'environnement industriel en France.

En-dehors des installations nucléaires et des mines (qui relèvent d'autres législations), elle vise toutes les activités industrielles, les élevages intensifs et les activités de traitement de déchets.

Cette loi a succédé à une loi de 1917, et cette dernière à un décret de 1810.

1.1.1. Une approche intégrée

La législation relative aux installations classées est fondée sur l'approche intégrée. Ce qui signifie que :

- **une seule autorisation** est délivrée pour un site industriel au titre de la protection de l'environnement (et non pas plusieurs autorisations, dont une autorisation pour les rejets liquides, une pour les rejets gazeux, une pour le risque, etc.). L'approche intégrée permet la prise en compte de tous les impacts sur l'environnement (air, eau, sol, bruit, vibrations) et du risque industriel. C'est là une distinction par rapport à la directive IPPC (contrôle et prévention intégrés des pollutions) qui met en place au niveau de l'Union européenne une législation semblable au système français mais qui écarte le risque industriel (celui-ci relève de la directive Seveso).
- **une seule autorité** est compétente pour l'application de cette législation. Il existe en effet la possibilité de voir plusieurs entités juridiques - Etat, région, département, commune - intervenir simultanément dans le cadre d'une même police. En France, seul l'Etat est compétent en matière de législation des installations classées. L'Etat intervient par l'intermédiaire du préfet assisté de services techniques.

1.1.2. Le système juridique

La législation des installations classées met en place un système simple. Les activités industrielles qui relèvent de cette législation sont énumérées dans une nomenclature qui les soumet soit à un régime d'autorisation, soit à un régime de déclaration.

- la déclaration (qui est une notification) concerne les activités les moins polluantes ou les moins dangereuses. Elle consiste à faire connaître au préfet son activité (le préfet remet alors un récépissé de déclaration) et à respecter des prescriptions standardisées .
- l'autorisation concerne les activités les plus polluantes ou les plus dangereuses. Le principe de l'autorisation n'est pas anodin en pays d'économie libérale puisqu'il soumet

la création d'activités économiques créatrices de richesses à un permis accordé au titre de la protection de l'environnement.

La procédure d'autorisation débute par la constitution d'un dossier de demande d'autorisation où figurent l'étude d'impact et l'étude de dangers. Ces deux documents sont fondamentaux. Le dossier est ensuite instruit par les services du préfet. Il est soumis à diverses consultations et notamment à une consultation du public (c'est l'enquête publique). La procédure se termine par la délivrance (ou le refus) de l'autorisation sous la forme d'un arrêté du préfet qui contient les prescriptions (par exemple pour les rejets : les valeurs-limites de concentrations et de flux des divers polluants) que doit respecter l'industriel. (voir en annexe le schéma de la procédure)

Par rapport aux prescriptions de la déclaration qui sont standardisées, les prescriptions de l'autorisation sont élaborées au cas par cas, sur mesure.

Cependant, des arrêtés ministériels peuvent être pris, ceux-ci fixent les dispositions minimales que doivent reprendre les arrêtés d'autorisation. Le plus connu des arrêtés ministériels fixant des prescriptions techniques est l'arrêté ministériel du 2 février 1998, dit arrêté intégré, qui concerne un grand nombre d'activités industrielles.

Le préfet dispose de nombreux moyens de sanctions administratives (mise en demeure, consignation de sommes, exécution d'office, suspension de l'autorisation, fermeture) en cas de non-respect des prescriptions.

Soulignons enfin que le droit des tiers est toujours préservé même si l'industriel respecte la réglementation.

1.2. L'incitation financière

Le principe pollueur-payeur est un principe de base en matière de politique de l'environnement.

Il consiste à faire payer le pollueur pour les dommages qu'il cause à l'environnement du fait de son activité et notamment de l'impact des rejets liquides, gazeux, solides (déchets).

Mais soulignons qu'aujourd'hui le coût le montant des taxes est nettement inférieur au montant des dommages. Certaines études établissent ainsi un facteur 10 entre le coût de la dépollution et le montant de la taxe et un facteur 100 dans le cas du coût du dommage à l'environnement.

Les taxes principales concernent les rejets liquides, les rejets gazeux et les déchets.

Par ailleurs des dispositions existent pour aider les entreprises à investir dans le domaine de l'environnement, ces aides sont soit des aides fiscales (amortissement exceptionnel sur 12 mois, exonération de la taxe professionnelle), soit des aides directes aux investissements notamment pour la réduction de la pollution de l'eau et de l'air (intervention des agences de l'eau et de l'agence de l'environnement et de la maîtrise de l'énergie)

II. LES RELAIS A L'ACTION PUBLIQUE

2.1. L'approche volontaire

2.1.1. Le règlement européen éco-audit

Le règlement "éco-audit" publié en 1993 a pour objectif d'inciter les industriels à mettre en place des systèmes de management environnemental au niveau des sites de production et à communiquer régulièrement avec le public. Le système proposé est ouvert à toute entreprise du secteur industriel. L'adhésion des entreprises, site par site, est volontaire.

Pour qu'un site soit enregistré dans le système communautaire de management environnemental, l'entreprise doit notamment :

- réaliser une analyse environnementale du site;
- adopter une politique environnementale;
- définir un programme environnemental.;
- faire valider sa déclaration environnementale par un vérificateur environnemental agréé;
- demander l'enregistrement du site auprès du ministère de l'environnement.

L'agrément des vérificateurs environnementaux est délivré par le ministère chargé de l'environnement sur la base d'une accréditation par le COFRAC (Comité Français d'Accréditation).

2.1.2. Les écolabels

Il est nécessaire de bien connaître l'impact réel d'un produit sur l'environnement, de sa fabrication à son élimination afin d'apprécier sa qualité écologique; ce qui permet de donner au consommateur une information objective et de prévenir les risques que peut occasionner ce produit. De ce constat est né l'écolabel.

Le produit portant la marque "NF Environnement" bénéficie d'un avantage commercial certain. En France, la marque "NF Environnement" couvre huit catégories de produits..

L'exemple français a servi de modèle pour l'établissement d'un label européen.

2.1.3. La gestion des déchets d'emballages

Le décret 92-377 du 1er avril 1992 conduit les producteurs, importateurs et distributeurs de produits à l'origine de déchets d'emballages ménagers à contribuer à l'élimination desdits déchets.

Cette contribution se fait à travers deux organismes agréés qui sont :

- Adelphe pour les emballages viti-vinicoles
- Eco-emballages pour les autres types d'emballages ménagers.

Fin 1997, plus de 24 millions de Français sont "concernés" par les actions lancées par Eco-emballages.

2.2. La concertation

La gestion de l'environnement et notamment de l'environnement industriel est un des terrains où doit se développer l'information et la concertation. Cette information a déjà été bien engagée autour des usines "SEVESO" . Le succès de ces opérations incite à l'appliquer progressivement à l'information sur les pollutions industrielles. Les outils mis en place pour assurer cette concertation sont les commissions locales d'information et de surveillance (CLIS) et les secrétariats permanents pour la prévention des pollutions industrielles (SPPPI)

2.2.1. LES CLIS

Les **commissions locales d'information et de surveillance (CLIS)** de plus en plus nombreuses permettent une participation des citoyens au processus de décision. Ces dernières années, plus de 300 commissions locales d'information ont été créées pour notamment le suivi des sites de traitement des déchets et cela conformément aux dispositions législatives et réglementaires

2.2.2. LES SPPPI

Là où la densité des industries le rend souhaitable des **secrétariats permanents pour la prévention des pollutions industrielles (SPPPI)** sont créés. Ces structures réunissent l'ensemble des parties intéressées (élus, administrations, industriels, experts, associations de protection de la nature) et permettent de définir les orientations de la politique locale de prévention des pollutions industrielles et des risques.

Des réunions régulières de diverses commissions (eau, air, risques industriels, information) permettent de faire le point sur la situation des installations concernées, d'établir des programmes visant à réduire les pollutions et d'en suivre le déroulement.

Les résultats considérables obtenus par les SPPPI de l'Etang de Berre et de Basse-Seine créés respectivement en 1972 et 1978 ont conduit à la mise en place des 8 autres SPPPI suivants : Dunkerque (1990), Toulouse (1990), Lyon (1990), Nantes (1992), Strasbourg (1992), Vallée de Seine (1993), Guyane (1997), Aquitaine (1998).

LA PROCEDURE D'AUTORISATION

Dossier déposé par le demandeur :
(7 exemplaires)

Demande d'autorisation indiquant notamment la nature et le volume des activités envisagées, les procédés de fabrication, les matières utilisés et les capacités techniques et financières de l'exploitant
Plans
Etude d'impact
Etude de dangers

PREFET

Servitudes éventuelles

Désignation du commissaire enquêteur par le président du tribunal administratif

Un exemplaire à l'inspection des installations classées

Avis des conseils municipaux

Ouverture de l'enquête publique:

- durée minimale 1 mois

- publicité : affichage en mairie et dans le voisinage de l'installation, information dans 2 journaux ; le public peut consulter le dossier, émettre un avis sur le registre d'enquête et rencontrer le commissaire enquêteur

Consultation des services

- police des eaux

- DDE

- DDAF

- DDASS

- SDIS

- DIREN

- etc.

Avis dans les 45 jours

Avis éventuel du CHSCT(*)

- Après enquête, le commissaire enquêteur communique les observations au demandeur.

- Le demandeur établit un mémoire en réponse (communicable au public).

- Le commissaire enquêteur adresse au préfet le dossier et ses conclusions motivées (communicable au public).

Rapport de l'inspecteur des installations classées, propositions de prescriptions

Conseil départemental d'hygiène ou commission départementale des carrières
(le demandeur peut se faire entendre)

Le projet d'arrêté est porté à la connaissance du demandeur

arrêté préfectoral

(*) CHSCT : comité d'hygiène, de sécurité et des conditions de travail de l'établissement

CHIFFRES CLES

Nombre d'inspecteurs : 1325 (679 en équivalent plein temps)

Nombres d'installations :

500.000 installations soumises à déclaration

63.000 installations soumises à autorisation

dont :

- 19.000 élevages
- 8.000 carrières
- 1.000 potentiellement dangereux (397 SEVESO)

Activité annuelle (chiffres 1997) :

Autorisations initiales : 3.589

Arrêtés complémentaires : 2.053

Arrêtés prescriptions spéciales : 390

Arrêtés de refus : 113

Arrêtés de changement d'exploit. : 555

Déclarations : 12.939

Sanctions administratives :

- mises en demeure 2.358

- travaux d'office 38

- consignations 200

- suspension 123

- fermetures 111

- apposition de scellés 7

Procès verbaux 1079

Visites et inspections 28.000

GREECE

COMPLIANCE AND ENFORCEMENT OF REGULATIONS

INTRODUCTION ON THE COUNTRY

Greece is surrounded by seas. It has a very extensive coastline (more than 16,000 km long) and the highest number of islands (approximately 3,000 among EU countries).

In the mainland there is a considerable number of rivers and streams with a permanent or periodic water flow, as well as a large number of lakes. Moreover, there is a substantial number of lakes and springs all over the land. Even though there are sufficient quantities of fresh water resources in Greece, these are unevenly distributed due to the natural land geomorphology, the geological context and the uneven and temporal rainfall distribution.

The most important water consuming activities in Greece are: Agriculture, Drinking Water supply, Industry and Energy production. The need to satisfy contemporaneously all these different water requiring activities, results into promoting Water Resources Management into a very important issue.

The coastal environment is of paramount importance to Greece. Coastal waters are used for fishing, recreation and tourism. Most of the population and the economic activities are concentrated within 20-25 km of the coastline and often are related to use of the coastal and marine environment.

The main pollution sources for marine waters are:

- Municipal sewage systems
- Industrial Activity
- Agriculture
- Registered landfilling, as well as uncontrolled solid waste disposal (encompassing in many cases the co-disposal of both municipal and industrial solid waste)

Pollution arises from sources in the form of municipal and industrial wastewater, wastewater from stock-breeding plants and slaughter houses as well as leachates from waste disposal sites and agriculture run-offs. Water pollution can also be classified qualitatively according to the main types of pollutants contained in the wastewater or leachates originating from the aforementioned activities. Thus, pollution load can be characterized as: organic, containing nutrients, microbial, heavy metal pollution and thermal pollution. It need not to be mentioned that the extend of pollution is inverse proportional to the degree of wastewater treatment and it fluctuates in frequency and importance according to the local conditions.

In Greece water quality can be broadly characterized as very good, especially in drinking water and in marine environment. Problems regarding surface and ground water quality degradation (especially due to agricultural activities) are located only to restricted areas where remediation and quality restoration projects are designed and are under implementation.

In order to abate pollution stemming from municipal wastewater, the Greek Government (Ministry for the Environment, Physical Planning and Public Works and Ministry of Interior, Public Administration and Decentralisation) has adopted a Programme which aims at restricting the further degradation of aquatic environment, the protection of water resources, the promotion of tourism development, the creation of job opportunities during the construction and operation of the treatment facilities as well as the upgrading of quality of life at coastal areas and islands.

The Ministry of the Environment has elaborated integrated programmes for the management of the pollution resulted from the above activities giving a special priority to the protection of the marine environment.

The Programme launched by the Greek Government concerning the expansion of the existing wastewater treatment facilities network goes beyond the requirements of the relevant EU Directive, since Greece is committed to preserving the high quality of its aquatic environment, providing at the same time the best possible environmental conditions.

Finally, a special attention is given to the organisation of a modern mechanism responsible

- a) for the issue of the environmental terms which should cover every installation or activity which is installed or is about to be installed in Greece
- b) for the control of the compliance of the environmental terms defined for the installation and operation of every activity in Greece.

A. BACKGROUND INFORMATION ON ACTIVITIES

A1. Industrial development in Greece is slower than in other European countries. Thus, the problem of water pollution deriving from industrial activity is less acute in Greece than in other European countries, e.g. Northern European countries. Moreover, the industrial sectors developed in Greece do not involve heavy industry, therefore the produced wastewaters from problems in certain areas. Nevertheless, due to the fact that industrial activity is widespread in Greece, there are considerable pollution problems in certain areas. Due to the fact that industrial zones are normally located in areas near to highly populated urban centres, water pollution problems usually occur simultaneously with pollution deriving from municipal wastewaters. Thus, the area of greater Athens apart from being the most populated area in Greece, is also the most industrialised area. Respectively, the areas of Thessaloniki, of Patra, of Volos and the area of Iraklio, Crete, which are the five biggest Greek urban centres are also the five biggest industrial zones.

Due to the fact that the largest cities in Greece and, consequently, the largest industrial centres, are built in coastal areas, most of the municipal and industrial wastewaters are discharged into the sea. Nevertheless, there are also inland areas where surface or groundwaters receive substantial amounts of wastewater, such as the industrial area of Ptolemaida, of Larissa, of Ioannina and of Inofyta-Schimatari.

The following table (table 1) presents the most prominent pollutants by industrial sector. The industrial sectors featuring in this table are the most widespread activities in Greece. Industrial pollution is the most prominent cause of fresh water quality deterioration.

The most important activities which are established in the coastal zone of Greece are:

- Fertilizer production
- Petroleum refining
- Cement production
- Agriculture
- Tourism
- Urban development
- Domestic wastewater treatment and disposal
- Infrastructure projects (construction of roads, railway, ports, airports, water supply and irrigation systems)
- Food processing

Table 1

INDUSTRIES PARAMETERS	Battery Manufacturing	Textile Dyeing and Finishing	Foodstu ff	Metal processing	Detergents	Chemical s	Olive-oil Refineries	Oil Refineries	Paper Mills	Tanneries
Nitrites - Nitrates				✓		✓	✓	✓		
Phosphates		✓	✓	✓	✓	✓	✓			
Sulphites- Sulphates	✓			✓	✓	✓	✓	✓	✓	✓
Cyanides				✓		✓				
Ammonium						✓	✓	✓		✓
COD		✓	✓	✓	✓	✓	✓	✓	✓	✓
BOD		✓	✓		✓		✓	✓	✓	✓
VSS								✓		✓
Oils & Fats		✓	✓	✓		✓	✓	✓		✓
Phenols		✓		✓		✓	✓	✓		
Agrochemicals						✓				
MBAS		✓	✓	✓	✓					

A2. Best Available Technologies (BAT) and Clean Technologies

There is an on-going process for the determination of BAT for all industrial branches concerned by the IPPC-Directive (integrated pollution prevention and control). This process is co-ordinated and financed by the Ministry of Environment, in order to prepare reference documents containing all technical, economical and environmental facts (i.e. description of the technique, expected emission values, application possibilities at new/existing plants etc.) of each BAT.

These documents will be considered by the national/local authorities responsible for issuing environmental permits, as well as by the industry for consultation for eventual new environmental investments.

The first reference documents will be published in the first semester of 1999 (cement/line industry)

A3 - A4. MONITORING NETWORKS

The quality of inland and coastal water of Greece has constantly been observed and has proven very good.

The control and protection of natural water resources as well as the materialisation of the action programmes regarding these goals were the basic aim during the years 1994-98. Within this framework, all the *Monitoring Programmes regarding Water Quality* (i.e. surface waters, groundwaters, bathing waters, marine environment) that were initiated during the past years were continued. Moreover, new action programmes were initiated in 1996 aiming at the *Intervention at the Pollution Sources* of water reservoirs and the planning of action programmes for the reduction of pollution deriving from these sources. Specific action programmes are presented hereby:

NATIONAL MONITORING NETWORK FOR WATER QUALITY

Regarding the monitoring of water quality, the project entitled "National Monitoring Network for Water Quality" has been incorporated into the Operational *Environmental Programme 1994-2000* (Action Programme 1.1) and is funded by the EU Structural Fund, with a budget of around 2,5 billion greek drachmae. This Programme is currently being implemented and will be completed by the end of year 1999. The development of the National Monitoring Network (NMN) for water quality encompasses the following actions:

- Completion of infrastructure for the National Monitoring Network for Surface Waters
- Creation of a Monitoring Network for Groundwater, at the national scale
- Creation of a Monitoring network for the detection/determination of Toxic Substances in surface waters, at the national scale
- Creation of a Monitoring
- Creation of a Monitoring Network for Coastal Waters, which encompasses:
 - Monitoring Network for Bathing Waters at 1700 coastal areas in Greece
 - Monitoring Programme for the quality of marine environment / water (enclosed gulfs, open seas) as agreed between the Ministry for the Environment, Physical Planning and Public Works and UNEP, in the framework of the Mediterranean Action Plan (MAP).
- Completion of the Monitoring Network for the quality of Transboundary rivers at the sites of the river entry in Greece.

The objective of this programme is to serve as a complementary mechanism to the Water Management system in Greece.

Hereby are presented in detail the aforementioned actions:

Monitoring Network for Surface Waters

Referring on the quality of inland surface waters a monitoring network has been developed.

The sampling locations in this network for inland waters, are about 150. Concretely, 130 sampling locations have been selected for systematic monitoring in 42 rivers and 20 sampling locations in lakes. The minimum sampling frequency is once a month.

The criteria for the selection of the sampling stations were:

1. The stations which have been monitored from the Ministry of Agriculture and other bodies which should be monitored systematically.
2. To take into account the point sources of pollution in order to study the impacts on the receiver quality.

For this reason, the registration of the industrial and urban water per water district in co-operation with the regional bodies has been carried out.

3. To include locations of special importance of use (like water supply locations, locations suitable for the fish living etc.)

The aim of this planning was to cover the national needs and the obligations regarding the implementation of the EU Directives. This network has been completed with some laboratory locations which already cover or are about to cover in the future the needs of the Directive concerning the quality of bathing waters.

The intention of the Ministry of Environment was to validate the existing laboratories' infrastructure, which could consist the laboratories of its network.

In this laboratories a great number of analysis is carried out. The sampling, the transportation, the analyses of samples are realized with the best scientific way, in order to ensure the precision and the credibility of the results.

The locations of the laboratories are:

1. Water District of Attikis: Athens – Laboratory of type A'
2. Water District of Central Macedonia: Thessaloniki - Laboratory of type A'
3. Water District of Ipiros: Ioannina - Laboratory of type B'
4. Water District of W. Greece, N. Peloponnisos and S. Peloponnisos: Patra - Laboratory of type B'
5. Water District of Thessalia : Larissa - Laboratory of type B'
6. Water District of Cental Greece: Livadia - Laboratory of type B'
7. Water District of E. Macedonia, Thraki : Alexandroupoli - Laboratory of type B'
8. Water District of N. Aegean: Mytilini - Laboratory of type B'
9. Water District of Crete : Iraklio, Laboratory of type B' (ITHAVIK)
10. Region of S. Aegean: Rhodes - mostly for the bathing waters quality

11. Water District of W. Macedonia: Kozani - Laboratory of type B'

Most of the analyses are carried out in the regional Laboratories (of type B') for the following parameters:

Table 1 – Parameters

1. pH
2. Temperature
3. Turbidity – Color
4. Conductivity
5. COD
6. BOD (Dilution Method) and DO
7. Suspended Solids
8. Volatile Suspended Solids
9. Nitrogen (Ammonia, Organic, Nitrates, Nitrites, Nitrogen Kjeldahl)
10. TOC
11. Phosphates
12. Phenols
13. Detergents
14. Cyanides
15. Metals

In the laboratories of type A' (Athens and Thessaloniki), analyses of Table 1 are carried out as well as specific analyses for parameters which present a special difficulty (pesticides, aromatic hydrocarbons) and which demand laboratory experience and a large number of instruments.

In the laboratories of type A' and some regional laboratories of type B' will be carried out analyses of microbiological parameters by a specialist personal: Faecal coliform, total coliform, E. Coli and Faecal streptococci. The operation of the above described network, has been started since 1988 (Larissa) and has been integrated progressively in 1995.

For the determination of pesticides and agrochemical residues in surface water (and groundwater samples) the Benakio Phytopathological Institute is additionally used.

It is obvious that the application and operation of this network will contribute in the decentralization and in the production of reliable data concerning the inland water quality of the country. The dangers of an alteration of the samples due to their transportation and the time between sampling and analysis will be eliminated. It is noted that the application of a common methodology of treatment and analysis is necessary and an intercalibration exercise is always needed for all the laboratories of this network.

As far as surface waters are concerned, during 1996 fresh water samples used for drinking purposes were collected from 66 locations in rivers and lakes and analysed. Moreover,

samples were collected and analysed from 14 additional locations in rivers and lakes selected with other criteria (e.g. used for agricultural purposes).

Residues of agrochemicals were detected, including lindane, dieldrin, parathion, parathion methyl and parathion ethyl as well as residues of aldicarb, 2,4 D and triazines. The measured concentrations were very low and in most cases near the detection limit of the analytical method used.

Monitoring Network for Groundwater

The programme that focuses on the control of groundwater pollution deriving from agricultural activities and the determination of sensitive areas or zones subject to *nitrogen pollution* is currently on-going. Apart from the determination of nitrogen concentrations, groundwaters are analysed for other parameters as well.

A network for the monitoring of groundwater reservoirs was created, aiming at the integrated surveillance of water quality as well as at the compliance with EU Legislation (Directive 91/676/EEC). This network covers the whole land area of Greece (excluding the Aegean islands).

Specifically, in 1996 measurements were conducted for the 239 control sites of this network. Nitrates, nitrites and ammonium ion concentrations were measured. Moreover, other important parameters, such as chlorides, sulphates, calcium, sodium etc, were also determined.

Preliminary results showed that nitrate concentrations present seasonal fluctuations. In specific samples, nitrate concentrations were found to exceed the 50 ppm threshold value set by the EU Directive 80/778/EEC.

The aforementioned programme resulted in the determination of 4 zones sensitive towards *nitrogen-pollution* from agricultural activities where special action programmes, aiming at the enhancement of groundwater quality, are to be conducted in co-operation with the Ministry of Agriculture.

These zones are:

- East and West Thessalia (hydrological compartment of Thessalia).
- Plain of Kopaida (hydrological compartment of East Sterea Ellada).
- Plain of Argolida (hydrological compartment of East Peloponnisos).
- The Pinios river basin in the Iliia prefecture (hydrological district of North Pefoponnisos).

Monitoring Network for the Detection and Determination of Toxic Substances in waters

This programme aims at the determination of complex toxic compounds in water, by means of:

1. An inventory of all toxic substance-producing activities.
 - The recording of the activities potentially producing toxic substances has already been carried out by the University of Aegean, in order to pinpoint areas for the collection and analyses of water samples. This research focusing on the List I (99 substances) toxic substances (EU Directive 76/464/EEC) was completed in February 1995. It showed that there are certain activities that produce List I toxic compounds which are discharged in water receivers.
- In June 1997 (Ministerial Decision 79978/4-6-97) the University of Aegean began a

research (assigned by the Ministry for Environment, Physical Planning and Public Works) in order to record all activities producing List II (115 substances), candidates for List I toxic compounds which are detectable in water reservoirs in Greece. This research is currently ongoing

- Contemporaneously with the research for the recording of all activities that could potentially produce List I toxic substances nation-wide, another research regarding the assessment of municipal and industrial wastewaters discharged in the area of Pagasitikos gulf and Vegoritida lake in the context of the presence of List I and II substances has been conducted by the University of Aegean and already completed in July 1997.

2. Measurements for the qualitative detection of such substances in surface waters, groundwaters and coastal areas waters.

- The University of Aegean has carried out chemical analyses for the determination of List I toxic substances in surface water, groundwater and coastal water samples collected from the areas selected under the aforementioned inventory (1). Within the framework of this study there were very few detectable List I toxic substances in the samples analysed.

- Assigned by the Ministry for Environment, Physical Planning and Public Works, the University of Aegean began the conduction of sampling and chemical analyses for the detection of List II compounds in water samples.

3. Organisation and operation of a monitoring network for toxic substances.

- The University of Aegean created a monitoring network for the monitoring of List I toxic compounds nation-wide. This network is on going since the second semester of 1996 with a regular in-flow of results.

- The same University is also currently planning the organisation and operation of a similar monitoring network for the monitoring of List II compounds.

4. Measures aiming at the mitigation of toxic substances concentrations as well as remediation of water resources, where required.

- Measures for the mitigation of water pollution from toxic substances as well as remedial measures are to be taken for the areas of Pagasitikos gulf and Vegoritida lake. The Ministry for Environment, Physical Planning and Public Works together with 3 Prefectures and their respective Development Offices, has confiscated the amount of 1.000.000.000 greek drachmae for the period of 1994-99 for the realisation of the aforementioned protection programmes for Vegoritida and Pagasitikos as well as for the Soulos stream.

Monitoring Network for Bathing Waters

For the monitoring of bathing water quality, a special monitoring programme is conducted during each "Bathing Season" (touristic high season) for the last 8 years, at the most important beaches of Greece.

A large number of public, private, municipal-local and institutional laboratories have been participating in this monitoring framework. The analytical results of this programme are presented in a special annual informative review edition of the Ministry of Environment. These

results indicate that the bathing water quality of Greek beaches is very high, thus Greece holds the first place in this sector among other European countries (Table 3.5).

Table 8: Bathing water quality - Monitoring results

Year	Compliance with imperative values of Directive 76/160/EEC	Compliance with guide values of Directive 76/160/EEC
1994	97.00%	95.00%
1995	98.59%	95.20%
1996	98.60%	95.80%
1997	98.40%	95.00%

Ministry for the Environment Physical Planning and Public Works, Athens

This monitoring framework played an important role for the successful participation of Greece in the "Blue Flags" Programme. Moreover, this programme supported the determination of the bathing water quality throughout the whole bathing period, the protection of swimmers in sensitive-problematic areas, the adoption of measures for pollution prevention and finally assisted the projection of Greece in the tourism sector.

"Blue Flags" Programme

This environmental programme began in 1985 under the initiatives of the FEEE (NGO, Foundation for Environmental Education in Europe) based in Copenhagen.

This programme entails the awarding of all European beaches that fulfil specific requirements-criteria with a premium sort "Blue Flag". The most important criteria for this awarding are the following:

- *Very high bathing water quality* established through the systematic monitoring programme as a result of compliance with all the set threshold values and criteria for all parameters featuring the EU Directive 76/160
- *Well organised infrastructure* that would guarantee the safety of swimmers on the beach. The required infrastructures include the existence of pharmacy, telephone, bathhouses, shower facilities, waste baskets, life guards etc.
- The environmental awareness of beach managers who have to organise programs for the environmental information of the public.

These criteria become stricter each year in such a way so as to cover not only the environmental condition of the beach but to apply to the greater coastal area (e.g. waste management). This programme is EU funded.

The fact that an extended monitoring system for bathing water quality is conducted in more than 1600 beaches, provides the opportunity to most of them for a candidature in the "Blue Flags" programme.

The programme's co-ordinator in Greece is The Greek Society for Nature Protection. All applications for candidature are reviewed by the Greek Review Committee. This committee, with representatives from the Ministry of the Environment, Physical Planning and Public Works, the Ministry of Internal Affairs, of Merchant Marine, of Health and of the Greek Tourism Organisation (FOT) and the Greek Society of Nature Protection, forwards to the FEEE all the applications that fulfil the required criteria.

The Greek distinctions for 1996 were 311 blue flags for beaches that brought Greece to the second position and for 1997 were also 311 blue flags.

The Greek Society of Nature Protection is financed by the Ministry of Environment, Physical Planning and Public Works for the conduction of this programme.

Monitoring of the Marine Environment (MED-POL)

This programme is ongoing since 1975; in 1996 new stations for the monitoring of pollution deriving from land sources in all the areas of research were introduced and elements from the bathing water monitoring programme were incorporated at the locations of these sources. Special care was taken to modify and adapt the monitoring parameters based on the specific characteristics of each area.

The areas of study were located in enclosed bays and seas and in some islands. The results showed that:

- In off-shore waters, pollution, with respect to the measured parameters, was not detected.
- In enclosed bays, at specific points, the measured concentrations were found to exceed the average values.
- Some parameters' concentrations have presented substantial decrease after the adoption of specific measures (construction and operation of central wastewater treatment plants, cease of operation of specific industrial units).

This programme provides estimations for the trends and increase rates of pollution and, therefore, facilitates the adoption of intermediate and long term measures for their prevention and reduction.

Transboundary Stations

This programme regards the determination of parameters used as pollution indicators at the existing Transboundary Stations for the Monitoring of Water Quality of Transboundary rivers. The points where samples are collected from for the determination of pollutants in river water are the Entry Points of these rivers in Greek grounds (crossing points of Greek boundaries). These rivers and the respective points of pollutant measurements are :

- *Evros River*, Dikaia site (entry from Bulgaria)
Junctior, with Ergini River site (entry from Turkey)
- *Nestos River*, River Bnidge site (entry from Bulgaria)
- *Strymonas River*, Roupel site (entry from Bulgaria)
- *Axios River*, Old Railway station of Axioupoli site (entry from Fyrom)

Each monitoring station is equipped with automatic instrumentation for the measurement of water level in the river bed, pH, Dissolved Oxygen, Conductivity, Turbidity and Temperature with the use of special sensors. Moreover, instrumentation for the on-line determination of other parameters, i.e. NO_3^- , PO_4^{3-} , NO_2^- , NH_4^+ , TOC, has been supplied and 20% of that has already been installed.

Water quality assessment is based on pre-established threshold values (EU Legislation). When the measured concentrations of parameters are found to exceed threshold levels the respective Prefecture and the Ministry of Environment, Physical Planning and Public Works are notified in order to take immediate action measures.

This programme facilitates the overcoming of emergency episodes with the adoption of immediate measures supporting at the same time the bilateral co-operation.

Municipal wastewater – Monitoring of municipal wastewater

Aiming at the reduction of the pollution arising from municipal wastewater, there are under construction 87 new sewerage network systems and 96 plants for municipal wastewater treatment, which will serve an equivalent population of 2 million and 7 million respectively. This action is incorporated into the *Operational Environment Programme*.

In all the established urban wastewater treatment plants has been carried out systematic monitoring in the out-put wastewater effluents and in the characteristic phases of this treatment.

WASTE MANAGEMENT IN GREECE

Waste management in Greece is today one of the most important questions concerning the Environment and Public Health. As wastes are not only potential pollution source but also a secondary raw material source, apart from its environmental impacts waste management is also related to technological and economic issues.

The today's **priorities of the Greek waste management policy** have been identified in the new legislative framework and in particular in the Joint Ministerial Decision (J.M.D.) 113944/1016/97, whereas two other J.M.D., issued recently, refer to measures and provisions on solid waste management (J.M.D. 69728/824/96) and on hazardous waste management (J.M.D. 19396/1546/97).

According to the legislation mentioned above, the basic principles of the national waste management policy are the following:

- the *prevention or reduction* of waste generation and its harmfulness
- the *recovery* of waste by means of recycling, reuse or reclamation or any other process with a view to extracting secondary raw materials and using wastes as a source of energy
- the *proximity* of the waste management facility to waste production source
- the *rehabilitation* of the waste disposal sites in a sustainable way
- the «*polluter pays-principle*»
- the use of the *Best Available Technologies*.

The realisation of those goals is being promoted by:

- The creation of modern installations for the final disposal of municipal wastes (landfilling), equipped with recycling plants
- The implementation of programmes on municipal waste segregation at source
- The construction of proper transfer station networks

- The pause in the operation of uncontrolled dumping sites, followed by reclamation projects
- The environmentally sound management of infectious hospital wastes and of hazardous wastes
- The supply of suitable mechanical equipment
- The implementation of coast cleaning projects
- The development of an integrated communication strategy, in the framework of the common effort for tackling the waste management problem.

For the implementation of the *National Waste Management Plan*, drawn up by the Ministry of Environment, Physical Planning and Public Works, in co-operation with other competent Ministries and also with local and social carriers, the total cost amounts to 110 billion GRD, derived from national and E.U. resources (Operational Programme «Environment», Cohesion Fund, Special Fund for the Implementation of Structural and Urban Plans, Regional Operational Programmes).

More detailed information on the subject is described in the following:

MUNICIPAL WASTE RECYCLING PROGRAMMES

The implementation of integrated recycling programmes is one of the main strategic aims of the Ministry for the Environment, Physical Planning and Public Works.

A paper recycling programme (segregation at source) has been implemented in the Athens region since February 1994, in which 52 Municipalities and Communities participate today, meaning a population of 2 million inhabitants.

In the Thessaloniki area a similar programme involves 18 Municipalities and 55 Communities, having a total population of 1 million inhabitants.

Moreover, in many other Municipalities and Communities all over the country, paper, glass and aluminium recycling programmes are being implemented. Those programmes will be strengthened and extended in combination with the construction of recycling centres in various places of the country.

Relevant current projects, included in the Operational Programme «Environment», concern: the construction of recycling centres in Zakynthos and Patras (with a budget of 308 and 502.037 million GRD, respectively), the compost production plant in Kalamata (1,300 million GRD), the Study on packaging and packaging waste at national level (50 million GRD), the extension of the «segregation at source» programme in Thessaloniki Prefecture (704.608 million GRD) and the integrated waste management on the island of Kos (500 million GRD).

Other relevant projects for Attica region concern the construction of a Recycling Plant in the landfill of Ano Liossia with a budget of 10.5 billion GRD and a capacity of 1,000 t/day, and also the extension of the «segregation at source» programme of the Association of Municipalities & Communities in Attica Prefecture (A.C.M.A.R.).

SANITARY LANDFILL

Sites

The construction of municipal waste sanitary landfill sites has become a very important issue in the last years, which is focused on the existence of all necessary infrastructure for the leachate and biogas collection.

Sanitary landfill sites of service of many cities have already been constructed or are under construction and usually they are being supplemented with mechanical segregation and compost production plants.

Resources for many relevant projects have been derived from the «Special Fund for the Implementation of Structural and Urban Plans» (4.8 billion GRD) and from the 2nd Community Support Framework (20.69 billion GRD).

HOUSEHOLD WASTE TRANSFER STATIONS

A number of household waste transfer stations operate successfully in Schistos (Attica), Thessaloniki, Kozani and in Municipalities around Athens.

There is also a plan for the construction and operation of a total of six waste transfer stations in Attica and one in the Greater Area of Thessaloniki.

WASTE MANAGEMENT IN COASTAL AREAS

The cleaning and redevelopment projects in Greek coastal areas, included in the Operational Programme «Environment», have a budget of approximately 2.6 billion GRD. More specifically these projects include studies, proper equipment supply, public information programmes and they are implemented in 15 Prefectures of the country. They also include cleaning works in several coastal areas, financed with resources of the «Special Fund for the Implementation of Structural and Urban Plans» (national funds).

REHABILITATION OF OLD MUNICIPAL WASTE DISPOSAL SITES

Rehabilitation projects have already been implemented (Zakynthos old dump) or are being implemented in several areas, such as Attica (Schistos, Ano Liossia), Thessaloniki (Tagarades, Derveni, Thermi), Crete (Skafidas), Rodopi (Komotini), Messinia (Messini), Euboea (Chalkida), Serres. The total relevant budget amounts to 12 billion GRD.

Moreover, the respective planing concerning Attica is focused on the rehabilitation of 20 municipal waste dumps, located in the Eastern part of Attica.

INFECTIOUS HOSPITAL WASTE

The relevant planning includes the construction and operation of two Infectious Waste Treatment Centres, one in Attica and another one in Thessaloniki.

For the construction of Attica's Centre, which will have a capacity of 30 t/day, the AC.M.A.R. is being financed with resources of the 2^d Community Support Framework. The budget amounts to 2.5 billion drachmas.

Thessaloniki's Centre will have a capacity of 10 t/day.

INDUSTRIAL-HAZARDOUS WASTE

According to the management plans, concerning industrial - hazardous waste, the final disposal by depositing into land should be the last choice.

As there are not any hazardous waste treatment and disposal facilities in Greece, the Ministry of Environment is planning the construction of such a facility.

Some categories of toxic wastes, e.g. PCBs, cyanides, pesticides/herbicides, phenols, are transported to other EU countries for incineration or proper treatment. Significant quantities of ash and slag are exported for recovery. The total quantity of hazardous waste, transported in the period 1991 - today, amounts to 3,580 tonnes.

Moreover some pilot projects have started, concerning the disposal of wastes from oil refineries and other hazardous wastes in cement manufacturing plants.

B. LEGISLATION

B1. NATIONAL AND INTERNATIONAL LEGAL FRAMEWORK CONCERNING FRESH WATER QUALITY

National Legislation

- The framework of the overall national legislation, is the Law 743/77 "Protection of the marine environment etc.". The above Law has been modified with Law 1147/81 according to the new international practice and development. The context and the provisions of this Law are effective and updated.

This Law provides certain preventive and pollution combating measures and it also describes the obligations for both ships and onshore installations.

According to its provisions the following sanctions are imposed to the violators of the Law.

1. Penal Sanctions

All those who cause intentionally marine pollution are punished with at least 3 months imprisonment. In case the pollution causes any damage to persons or things the penalty is at least 1 year imprisonment.

All those who cause marine pollution due to negligence are punished with imprisonment. In case the violator eliminates the pollution on his initiative, it can be excluded from any penalty.

2. Administrative fines

According to article 13 of the Law, as it is amended by the Presidential Degree 205/90 (Gov. Gaz 79A/90), the administrative fines imposed to the offenders of the above Law are the following:

- a. The maximum fine imposed by Port Authority decision is 2,000,000 drachmas
- b. The maximum fine imposed by Port Authority decision is for each day exceeding the period of time set up for restoration of damages caused is 1,000,000 drachmas
- c. In case of serious marine pollution incidents, the maximum fine imposed by the Minister of Mercantile Marine decision is 150,000,000 drachmas.

3. Disciplinary penalties

They are imposed to Greek seafarers serving on board of Greek merchant ships. The disciplinary penalties comprise, inter alia, the restriction of exercising seafarers profession, permanently or in the interim.

4. Beyond all the above mentioned penalties, the person who is responsible for the marine pollution, is obliged to take any proper measure for the prevention and elimination of the pollution.

They are also obliged to report the incident to the nearest Port Authority or to the Minister of Mercantile Marine.

Finally the Law defines that the person who is responsible for the prevention or the elimination of the damages caused by the pollution and the expenses incurred for the prevention or the elimination of the pollution is the person who provokes this situation. It is also noticed that for the restoration of the damages caused by the pollution, the internationally acknowledged principle of "PPP" – Polluter Pays Principle – is applied.

- Water management in Greece has made considerable progress during the last few years, especially after setting up the required legal framework for this purpose.

Law 1650/86 for the "Protection of the Environment" is setting up, among other, the legal and administrative arrangements for the preservation of natural ecosystems.

Moreover, Law 1739/87 for the "Water Resources Management in Greece", is setting up several legal and administrative arrangements, to face existing water resources management problems, on the national and regional level.

Inland surface waters (rivers and lakes) are put to specific uses determined, by law, by specific Prefectural Decisions, with respect to the water resources' location and the country's geographical and administrative division.

The Water Resources Management Act also provides for the determination of the minimum water quantity which should be left unused for the conservation and protection of aquatic ecosystems. Unfortunately this provision has not been implemented, except where certain Environmental Impact Assessments have resulted in relevant Environmental [Conditions].

In some cases, surface water recipients are put to certain uses, specified by Joint Interprefectural Decisions set by the Prefectures, within the boundaries of which, some or all the parts of the receivers are encompassed, e.g. the Vegoritis lake. In other cases, the uses of water receivers are determined by Ministerial Decisions when these are of high and above local scale importance. More specifically, such decisions exist with regard to the drinking water reservoirs for the area of greater Athens.

The water uses set by Law with decisions before 1986, comply with the concept of the Sanitary Provision E1 b/221 /21 .1 .65 regarding the management and disposal of municipal and industrial waste. After 1986, the issue of the Joint Ministerial Decision 46399/1352/86 (Governmental Gazette 438/A/3.8.86), constituted the harmonisation of Greek Legislation with the European Law, and specifically with the Directives 75/440/EU, 76/160/EU, 78/659/EU, 79/923/EU and 79/869/EU.

Standards for drinking water quality are set up by the Joint Ministerial Decision A5/288/86, which harmonised the E.U. Directive 80/778. A new Directive concerning the quality of water intended for human consumption has been recently adopted by the EU Council.

B2. OBJECTIVES SET OUT BY THE GREEK ENVIRONMENTAL ADMINISTRATION WITH REGARD TO WATER MANAGEMENT ISSUES

The main Water Quality objectives are set out by the Environment Protection Act 1650/1986 and the Joint Minister Decision 46399/1352/86 which harmonised Greek Legislation with the EU Directives 75/440/EU, 76/160/EU, 78/659/EU, 79/923/EU and 79/869/EU. This Decision defined water quality standards (thresholds) for basic uses, namely drinking, bathing and aquaculture. Thus, these quality standards define the «fit-for-purpose or use» quality of water resources. It is needless to mention that these standards are given as concentrations of physical water parameters, chemical elements (mainly heavy metals), organic and inorganic compounds, oxides, toxic substances as well as biological parameters. It should also be mentioned that these objectives, in terms of standards, could be lower than the standards proposed by the EU Directives but never higher. If Greece has very good reasons to believe that the EU standards are not feasible or too strict, it could ask for exemption from the directive, only when this is at a preliminary stage (proposal) and has not been ratified yet.

Compliance with the Joint Ministerial Decision 46399/1352/86, and therefore with the EU Directives, is verified by ongoing Monitoring programmes, conducted in rivers, lakes, groundwater, coastal areas and seas. The objective of the monitoring programmes, apart from detecting elements and substances above threshold values, is to detect the specific pollution sources responsible for pollutant production.

When the pollution sources are specified, then site-specific or water recipient-specific water quality objectives are set. These objectives aim at pollutant concentration reduction, and could include a time schedule. These objectives could consist of the establishing of stricter environmental conditions for industrial units, withdraw of licenses, remedial measures etc. .

Moreover, the only nation-wide objective related to water resources is completion of the construction of wastewater treatment facilities (for the treatment of municipal and industrial wastewater) in settlements with a population higher than 15,000 inhabitants, by the year 1999.

Finally, it has to be mentioned that all the national objectives concerning water resources management, in terms of quality and quantity, even though being on a site-specific base, they are all based upon the following key-points:

- *Sustainability principle* as it aims at the improvement or protection of the environmental conditions in Greece, while at the same time preserves the development efforts in the industrial, tourist and agricultural sectors.
- *Polluter pays principle* as it recognises the responsibility of the major polluters who are called to take rectification measures.
- *Precautionary Principle* as it attempts to prevent, rather than to rectify an environmental problem, with technical interventions at the source rather than at the end of the pipe line.

B3. AGRICULTURAL PRACTICES

Fresh water pollution problems deriving from agricultural activities, can be broadly classified in pollution from fertilisers and pollution from complex organic compounds used as agrochemicals, mainly pesticides and herbicides.

Soils containing such substances can affect surface waters via complex mechanisms such as the washing out of chemical compounds by rainfall and surface drainage. Moreover, groundwaters are also highly affected by the application of fertilisers and agrochemicals.

Agricultural activity is a very important sector of Greek economy, since it holds the highest percentage in the GDP structure, in comparison with the GDP structure of the other European countries.

Agricultural activity in Greece covers the national needs and some products, i.e. fruits, tobacco, olives, vegetables and resins are also exported. Based on the aforementioned facts, the agriculture originating pollution load towards water resources is very significant and should be taken into account when it comes to water management.

The cultivated area in Greece, due to the extended mountainous geomorphology, is rather limited and much smaller than the cultivated area of other European Union countries. Thus, the total cultivated area in 1981, was 3,545,550.4 ha, which stands for a 26.9% of the total land area of Greece, whereas the average cultivated surface area in the rest of EU rises up to 45% and up to 80% in France. Therefore, the water pollution problems in Greece deriving from agricultural activity are not as acute as they are in other EU countries.

Moreover, water pollution problems originating from agricultural practices usually occur in cultivated areas, which are highly irrigated. These areas are the basins in Macedonia and Thessalia districts, since these are the most highly irrigated areas in Greece, taking up the 50% of the irrigated land while being only the 36% of the country's surface area. Thus the potentiality of pollution problems occurring within the water resources of these basins is very high and mainly due to the fact that highly irrigated areas are more intensely cultivated with high crop outputs and thus pollutants reach more easily the fresh water resources.

A quantitative assessment of the inland water conditions throughout the country, is given from the analytical research conducted by the Benakeio Phytopathology Institute for the years 1991 and 1992 focusing on the determination of residual quantities of agrochemical substances in fresh waters. The analytical research showed that these substances even though present in elevated concentrations, do not exceed the threshold levels set by European and National legislation apart from limited cases.

Table 5: Consumption of fertilisers by category 1940-1990

Annual Cultivation Period	Fertiliser category by type of active components (tn * 1000)			
	N	P ₂ O ₅	K ₂ O	Total
1939-1940	7.5	15.0	3.5	26.0
1949-1950	17.3	15.4	2.8	35.6
1959-1960	68.4	49.2	6.9	124.5
1969-1970	190.0	114.0	17.6	321.7
1979-1980	338.0	171.0	40.4	549.5
1989-1990	396.1	173.3	64.8	634.2

Ministry for the Environment, Physical Planning and Public Works, Athens, 1993

Table 6: Use of agrochemicals for the years 80, 85, 89

Year	Insecticides Nematocides (tn)	Fungicides (tn)	Herbicides (tn)	Soil Fumigants (tn)	Total Agrochemicals (tn)
1980	2698	4363	1682	1506	10250
1985	2717	4797	3085	1676	12272
1989	3529	4630	3440	1376	12975

Ministry for the Environment, Physical Planning and Public Works, Athens 1993

As demonstrated in the above tables, it is obvious that the total amount of fertilisers and herbicides used, nation wide, during the last decade is increasing. Concluding, even though the widespread use of agrochemicals and fertilisers is increasing considerably during the last years, serious negative effects, in terms of pollution, have not been traced yet. Nevertheless due to this increasing trend, it is essential that measures for the water resources protection against this pollution source be adopted.

Under the EU legislation implemented in Greece (Directives 91/676/EEC, 91/27pEEC), the Ministry of Environment, Physical Planning and Public Works in co-operation with the Ministry of Agriculture, has begun taking up measures for the surface and groundwater resources protection against agriculturally originating pollution. Specifically, specific areas that present pollution problems from nitrate compounds of agricultural origin or municipal wastewaters have been pinpointed and characterised as sensitive areas. Moreover, husbandry related activities, the use of animal manure and the use of certain nitrogen fertilisers have been restrained.

HUSBANDRY (STOCK-BREEDING PLANTS AND SLAUGHTER HOUSES)

Pollutants deriving from husbandry related activities are basically nitrogen compounds in the form of nitrates-nitrites and ammonium compounds.

More specifically, large-scale stock breeding mainly includes the establishment of poultry farms, pig-rearing plants and cattle breeding farms. Potential contaminants arising from such establishments are, as stated before, nitrogen chemical species which are produced by the decomposition of organic compounds contained in the animal manure and urine. These pollutants are mainly ammonium ions and their oxidised forms, i.e. nitrates and nitrites. Wastewaters produced within animal breeding farms are either disposed of in natural surface water resources, i.e. rivers, or they can be leached out by rainfall. Their vertical percolation down the soil profile can also cause considerable pollution problems to groundwater.

Moreover, other related activities, such as the existence of slaughter houses, also constitutes an additional pollution source for natural water receivers. The quality of potential pollutants arising from slaughter houses is similar to those originating from stock-breeding plants. Specifically, the decomposition of proteins contained in the blood of animals leads to the production of ammonium compounds. Wastewaters, rich in ammonium ions as well as in other nitrogen compounds, either percolating vertically or disposed of in surface receivers, may reach the natural water resources causing significant pollution problems.

Finally, regarding nitrogen pollution of water (EU Directive 91/676), the Ministry of Agriculture has issued a "Good Practice Guide" aiming at farmers and stock-breeders, in order to inform involved parties about the appropriate practices concerning cultivation and waste management (treatment and utilisation) for reducing run-offs and, thus water pollution.

REGISTERED LANDFILLING AND UNCONTROLLED SOLID WASTE DISPOSAL (ENCOMPASSING IN MANY CASES THE CO-DISPOSAL OF BOTH MUNICIPAL AND INDUSTRIAL SOLID WASTE).

The impact of leachates from landfill sites on surface water and groundwater resources, has not been studied in an integrated qualitative and quantitative level. Apart from limited studies focusing on the potential impacts of leachates on water resources in specific areas, e.g. the area of Ano Liosia, there are not any data, on the national level, presenting nor assessing the potentiality, the impacts and the extension of this problem.

B4. ENVIRONMENTAL IMPACT ASSESSMENT IN GREECE

1. How the European Directive 85/337/E.C. has been implemented.

In Greece, the European Directive 85/337/E.C. for the assessment of the impacts of certain private and public projects or activities on the environment has been implemented by the Common Ministerial Decisions 69269/5387/90 (Common Ministerial Decision of the Ministry of Environment, Physical Planning and Public Works and the other co-competent Ministries) and

75308/5512/90 (Common Ministerial Decision of the Ministry of Environment, Physical Planning and Public Works and the Ministry of Justice).

In the former Common Ministerial Decision, project activities, public or private, are classified in Classes. Environmental permitting procedures and the content of EIAs for every Class of project or activity are also specified by this decision.

The latter Common Ministerial Decision defines the public participation procedure as a part of the EIA procedure of certain projects or activities. Moreover, it defines the appropriate EIA procedures in the case of transboundary impacts of projects or activities established in Greece to other E.U. Member-States and the opposite.

It has to be mentioned that the Frame Law for the Environment in Greece is the Law 1650 of the year 1986. This Law set the general legal framework of the environmental protection in Greece. It also defined EIA procedures for private and public projects or activities proportional to the procedures defined by the European Directive 85/337.

The two Common Ministerial Decisions 69269/5387/90 and 75308/5512/91 implemented the provisions of this Law (articles 3, 4, 5 and 21) as well as the provisions of the European Directives 84/360/E.C. and 85/337/E.C.

C. PERMITTING (Authorisation procedure for industrial and other activities producing wastewaters)

All units producing liquid effluents (industries, touristic enterprises etc) have to prepare a plan for the collection, treatment and disposal of effluents (study), which has to be approved by the Ministry of Health. This study is part of the general environmental permits (environmental impact assessment study), which is issued by the Ministry of Environment. In this permits the environmental conditions for the environmentally proper operation of the unit concerned are defined and precisely described.

The EIA procedures in Greece, as they have been defined by the two Common Ministerial Decisions previously mentioned, are the following:

a) Common Ministerial Decision 69269/5387/90

The projects and activities are classified in two Classes: Class A and Class B. The two Classes include:

- Projects and activities that cause serious hazards to the environment: according to the case, special specifications, terms and mitigation measures have to be imposed apart from the general ones.
- Projects and activities that ,without causing serious hazards to the environment, have to be subjected to general specifications, terms and mitigation measures.

The projects and activities of Class A are further classified in two groups (Group I and II) that include all the projects and activities of the Annexes I and II of the Directive 85/337/E.C. respectively. The Class B includes all the projects and activities not included in the Groups AI and All that need a permit for their establishment and operation.

The assessment of the environmental impacts of the projects and activities of the Classes mentioned above is accomplished by the environmental permitting procedure which is usually called "procedure for the approval of the environmental terms". The type of this procedure and the content of the environmental statement is differentiated according to the Class in which a

project or an activity belongs. The types of the procedures as well as some general guidelines for the content of each type of environmental statements are described in the Common Ministerial Decision 69269/5387/90. The existing procedures of EIAs, according to the Class of a project or activity, are shown in the two flowcharts attached to the text.

According to the same Common Ministerial Decision, competent authorities for the examination of the environmental impact assessments and the approval of the environmental terms for a project or activity are: a) for the projects and activities of Class A, the central environmental authorities, and b) for the projects and activities of Class B, the prefectural environmental authorities. When a project or activity belongs to the Class A, the competent environmental authorities have to consult the appropriate in every case authorities of the other ministries and the permit has to be approved by all the previous authorities. By additional ministerial decisions, a number of projects or activities of the Group All has been decentralised to the regional or the prefectural environmental authorities.

In the end, it has to be mentioned that a procedure for the pre-approval of the site is applied for the majority of the projects or activities of the Class A (Group I and II). During this procedure, which precedes the procedure for the approval of the environmental terms, a kind of mini environmental assessment has to be submitted to the central or the regional physical planning authorities of the Ministry of the Environment, Physical Planning and Public Works, in order to grant a pre-approval about the implementation of a new land-use in the area. This procedure includes a preliminary assessment of the environmental impacts of the project or activity. In the case that the decision of the pre-approval of the site is positive, the content of the decision defines also the content of the environmental impact statement that has to be submitted to the competent environmental authorities during the procedure of the approval of the environmental terms. This decision is binding for the procedure of the approval of the environmental terms only in the case that it is negative. In this case the project or the activity is turned down from the beginning.

b) Common Ministerial Decision 75308/5512/91

A part of the procedure of the approval of the environmental terms is also the procedure of the public participation, as it is defined by the Common Ministerial Decision 75308/5512/91. During this procedure, a copy of the environmental impact statement is sent by the competent central or regional environmental authority to the Prefectural Council of the relevant Prefecture, in order to be announced and set at the disposal of everyone concerned for a period of at least 15 days. Continuously, an open discussion about the EIA of the project or activity takes place in the Prefectural Council, during which everyone concerned (public: citizens or organisations) can express his opinion. The decision taken by the Prefectural Council is sent to the competent environmental authority, by which is taken into account at the decision of the approval of the environmental terms. However, the decision of the Prefectural Council is not binding.

The Common Ministerial Decision 75308/5512/91 defines also the procedure that has to be implemented in the case that a project or activity established in Greece has impacts in the environment of other E.U. Member-States and the opposite.

Apart from the two Common Ministerial Decisions mentioned previously, the legislative framework for the Environmental Impacts Assessments of certain public or private projects or activities has been completed by a number of thematic ministerial decisions or circulars which give guidelines about the EIAs of certain categories of projects or activities. For example, the Common Ministerial Decision 1661/94 defines all the categories of touristic installations to which the Common Ministerial Decision 69269/5387/90 is referred, as well as the appropriate content of the EIS for every category of touristic installation.

The institution of EIA, as it is implemented in Greece, is part of the total permitting procedure of a project or activity. The main problems confronted during its implementation are the following:

- Because of the requirement of mandatory EIAs for almost all the projects and activities of Classes A and B, the number of the Environmental Statements submitted every year to the competent authorities and especially to the central environmental authorities is great (proportionately greater than the number of EISs in the other E.U. Member-States). By a number of later Ministerial Decisions, the provisions of which have recently summed up in a new law, a significant number of projects and activities has been decentralised to the regional and prefectural environmental authorities which, however, are not sufficiently staffed yet.
- The quality of the statements for the pre-approval of the site procedure and the EISs is not usually satisfactory except from these ones for large national scale projects or activities. For this reason, a number of circulars including general guidelines for the content of the statements have been issued from time to time. It has to be mentioned that a study on the special detailed guidelines for the EIAs of every category of project or activity has been already assigned and is going to be funded by the Second Structural Fund. This study will also include guidelines for the public (citizens and organisations) concerned about the way to express their opinion during the public participation procedure, a detection of the red flag (from the environmental point of view) for every category of projects or activities and the recitation of the appropriate supporting documents.
- As many problems arise in the public participation procedure, the Common Ministerial Decision 75308/5512/91 is going to be modified. This modification will increase the time available for the information of the public concerned from 15 to 30 days. Moreover, the study mentioned above will include relevant guidelines to the public and the organisations concerned.
- The inspections on the spot of the projects or activities in order to find out their environmental impacts and check the implementation of the environmental terms set, are done only occasionally. The Ministry of Environment, Physical Planning and Public Works promotes to the Parliament a new Bill about the establishment of a monitoring system of the environmental terms of projects or activities.

2. Implementation of the European Directive 97/11/E.C.

The procedure for the modification of the Common Ministerial Decision 69269/5387/90, in order to implement the new Directive 97/11/E.C., has already begun and will be completed about the deadline for the implementation of the directive (end of March 1999).

It has to be pointed out that a kind of scoping and screening for the projects and activities of the Class A have been done during the procedure of the pre-approval of the site. Moreover, EIAs have been mandatory for almost all the projects and activities of the Annexes I and II of the Directive 97/11/E.U.

D. COMPLIANCE AND ENFORCEMENT

At the moment the Central Environmental Authority (Department of Industries in the Ministry of the Environment,) is responsible to check the compliance and enforcement of environmental legislation in general in industrial plants (AI and All Category)

The local Authorities is for the B' and some of the All Category.

One year before (November of 1997) the preliminary research which has been assigned to the National Observatory of Athens has been completed about the establishment of an INSPECTORATE. " The control of compliance and enforcement of Environment terms in plants and activities."

This "inspectorate" will perform regular inspections in all plants and activities in the Country. At the beginning these will be 3 centers of the Inspectorate (Athens, Thessaloniki, Patra)

Strategic Environmental Assessments in Greece

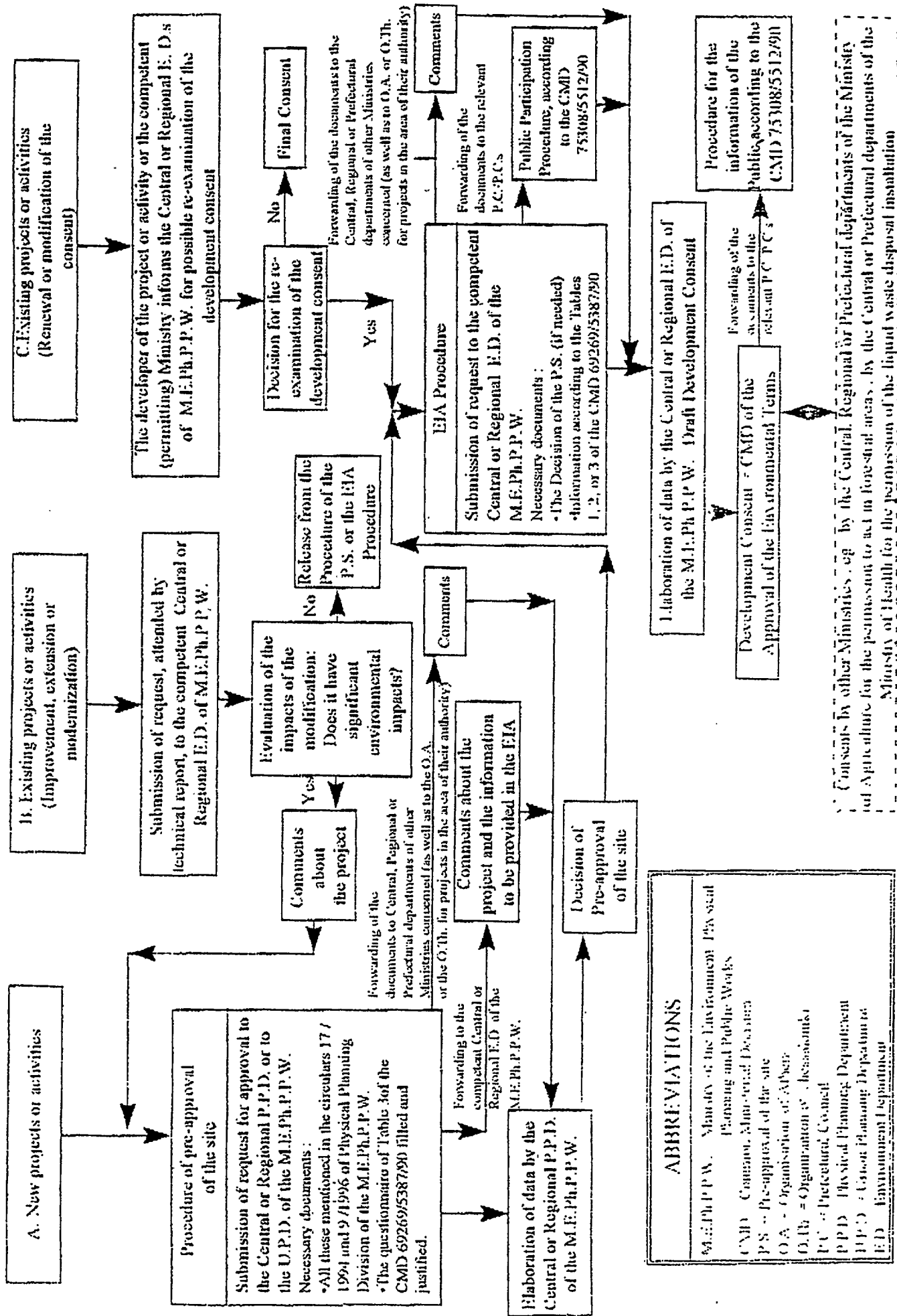
Although a great number of plans and programmes exist in several sectors (land use, agriculture, industry, energy, transport, tourism, water resources management, waste management, urban planning) implemented by formal or informal procedures, there is no official procedure for Strategic Environmental Assessments. Nevertheless, a kind of Strategic Environmental Assessments have been already carried out from time to time. For example, the specific land use studies carried out during the last 5 years in order to assess the probable environmental impacts of a certain physical planning in sensitive areas (coastal areas, mountain areas).

Moreover, the EIA for the Partial Diversion of Acheloos River to Thessallia Plain, which referred to the water resources management in two great areas of Greece, and the Study for the development of the land and maritime installations of Pireaus Harbour (passager and commercial), including the railway terminals and the road network, can be considered as SEAs.

The speculation existing in Greece about the implementation of Strategic Environmental Assessments relates to practical matters. Firstly, there is not clear distinction between the senses of project, plan, programme and policy and consequently, clear determination of the field of implementation. Moreover, a problem that may arise relates to the content of the respective SEAs (the level of analysis) and the requirement for more specific EIAs for the different projects included in a plan or programme. Finally, as to the legal framework for the implementation of the institution of SEAs in Greece, some problems may arise with the combined administrative competence of the different ministries or organisations.

In the end, it has to be mentioned that a kind of SEA had been carried out in the past by the Ministry of Environment, Physical Planning and Public Works on the effect of the withdrawal of cars with conventional motors and their replacement by cars of new technology (catalytic motors) on the reduction of air-pollution.

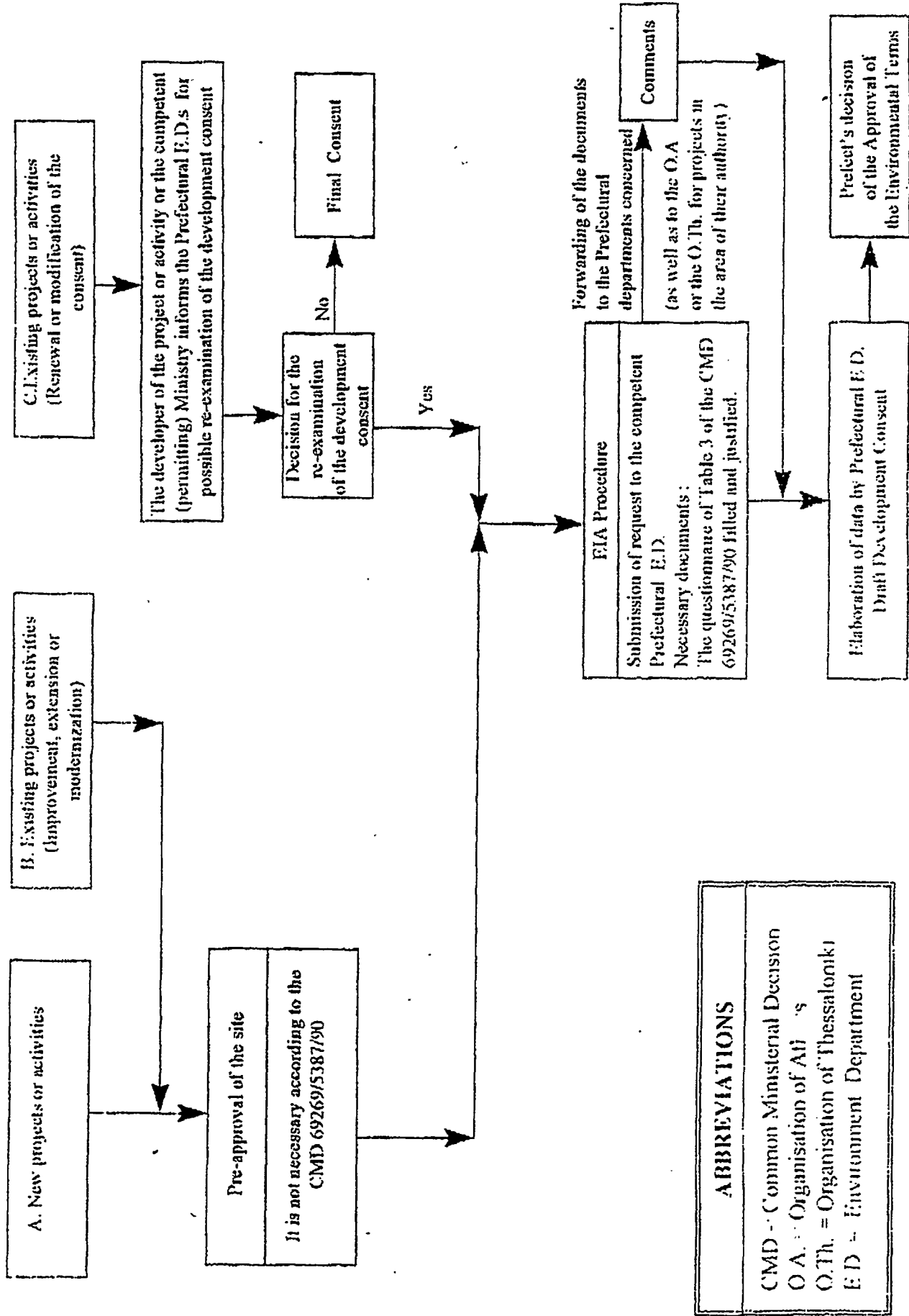
Class A (Groups I and II) of Projects or Activities



ABBREVIATIONS

M.E.Ph.P.P.W.	Ministry of the Environment, Physical Planning and Public Works
CMD	Command, Ministerial Decree
P.S.	Pre-approval of the site
O.A.	Organisation of Affect
O.Th.	Organisation of the Economy
P.C.	Prefectural Council
P.P.D.	Physical Planning Department
U.P.D.	Urban Planning Department
E.I.D.	Environmental Department

Class B of Projects or Activities



ABBREVIATIONS
CMD - Common Ministerial Decision
O.A. - Organisation of Affairs
O.Th. = Organisation of Thessaloniki
E.D. - Environment Department

ISRAEL

**The Israel Ministry of the Environment
Marine and Coastal Environment Division
Dr. Ilan Malester**

**Workshop:
"Compliance and enforcement of regulations in
the Mediterranean for control of pollution resulting
from land-based sources and activities"**

Athens, 1999, March 16-18

Brief introduction on the country

Israel's uniqueness lies in its amazing history and in the diversity of its land and people. Located at the junction of Asia, Africa and Europe, the country is characterized by a large variety of landscapes (fertile plains and arid zones, seashore and magnificent desert, snowy mountains and rifts) in a tiny territory (about 450 km long, 60 wide, 25,000 sq. km, as large as 5% of France).

Israel is at a crossroad of climatic and botanic regions. The main topographic formation is the Rift Valley, running north - south for over 400 km length (almost the length of the country), along the east side of the country (about 60 km from the Mediterranean Sea).

Physical conditions along the valley change rapidly from the alpine environment of the Hermon slopes on the northern border, going along the Jordan River to the sub-tropical environment of the shores of Lake Kinneret (Sea of Galilee) to the salty Dead Sea - the lowest point on earth, 400 meter below sea level - and the Aravah, a desert plain extending to Eilat at the northern tip of the Red Sea.

Israel's greatest resource is its people, counting about 6 million citizens, 80% of them Jewish. The variety of Israel's geographical regions goes together with the multiplicity of its population (Jewish people, native born Sabras and immigrants from all over the world, religious and secular, Arabs, Druzes, Bedouins, Muslims, Christians, Bahais, Chercessim etc).

More than 90% of the population lives in some 200 urban centers. The three large cities are Jerusalem (600,000 inh.), the greater Tel Aviv (2,6 million people) and the greater Haifa (500,000). Israel is one of the most densely populated country in the world (265 inhabitants per sq. km, incl. desert area).

Scarcity of water, very limited land reserves, lack of natural resources (apart from minerals from the Dead Sea) and traditional aspiration for intellectual studies have led Israel to base its economy on a highly-qualified work force and technological advances generated by a network of academic and research institutions (120,000 students). Israel occupies a respected position on the international scene in various areas of industrial and agriculture production.

Israel has vast tourist potential with its geographical diversity, religious and archeological sites, unlimited sunshine and modern resort facilities. One can also enjoy nature's marvels,

like birds migration observation (one of the world best site), special geological formations etc.

Presentation of the Environment in Israel

Since the establishment of the State of Israel in 1948, the country has experienced a rapid growth in population, urbanization, industrialization and intensive agricultural practices. Until recent years, security and economic concerns largely determined government policy regarding development projects. Environmental concerns were rarely considered. Today, however, environmental issues play an important role in the decision-making process. Within a year of the 1972 Stockholm Conference on the Human Environment, the Israeli Environmental Protection Service (EPS) was established under the auspices of the Ministry of the Interior. In December 1988, the Ministry of the Environment was officially established as the central body for environmental protection in Israel.

Since the 1992 Rio Conference on Environment and Development, the policy of sustainable development has been integrated into Israel's environmental management program. The goals of the Ministry of the Environment are to formulate and implement a comprehensive national environmental policy. The Ministry seeks to incorporate environmental considerations into decision making and planning processes; to implement programs for pollution control, monitoring and research; to develop and update legislation and standards; to ensure effective enforcement and supervision; to promote environmental education and awareness; and to advance regional and global environmental cooperation.

The Ministry of the environment

The administrative structure of the Ministry of the Environment is based on some 30 divisions, which fall under the responsibility and coordination of four assistant directors-general and one deputy director-general. Some divisions, such as the Legal Division, the Environmental Planning Division and the International Relations and Special Projects Division, fall under the direct responsibility of the Director-General. Reflecting a new awareness for the environment among policy makers and the public, the Ministry's budget has increased significantly from US\$8 million in 1992 to nearly US\$434 million in 1998.

The Ministry of the Environment operates on three levels - national, district and local.

National: At the national level, the Ministry is responsible for formulating an integrated and comprehensive national environmental policy; developing specific strategies, standards and priorities for environmental protection; coordinating cooperation with other agencies; and guiding the district and local levels in the implementation of national policy. The Ministry deals with

- Nature Conservation
- Air Quality
- Environmental Education
- Environment and Economics
- Solid Waste Management
- Marine and Coastal Environment
- Pollution Prevention (air, water and marine)
- Supervision of Sewage Treatment Facilities
- Hazardous Substances and Waste
- Industry and Energy
- Pest Surveillance and Control
- Agro-Ecology
- Radiation Safety
- Environmental Health

With the recent passage of a new National Parks, Nature Reserves, National Sites and Memorial Sites Law (1998), a Nature Protection and National Parks Authority was set up under the responsibility of the Ministry of the Environment. There are 155 declared nature reserves and 41 national parks in Israel.

District: The Ministry's six district offices are charged with implementing national environmental policy on a district level.

Local: Local authorities serve as the implementing arm of the central government in carrying out environmental policy on the local level. Municipalities are responsible for local environmental planning, operation and maintenance of environmental infrastructures such as sewage collection and disposal, garbage collection, pest control, street cleaning, preservation of local parks and historic sites, inspection and enforcement of industries and businesses, and monitoring of air, noise and drinking water.

Background information on activities.

The most environmentally significant activities in the coastal area of Israel are energy production (five electric plants along the Mediterranean shore), fertilizer production, petrochemical industry and plastics industry in the Haifa Bay, Petroleum refining and pesticides in Ashdod areas, as well as sewage treatment plant all over the country. One can also list some food processing industry, textile dyeing ...

All the industries are compelled to achieve Best Available Technologies (BAT) or better technologies. Most of the industries are well advanced in the program.

There is a significant environmental monitoring in seawater quality (by the Oceanographic Institute, in cooperation with UNEP), inland water quality (by Natural reserves Authority), industrial waste waters (by the Ministry of the Environment and by the industries themselves), domestic wastewater disposal and municipal solid waste (by the Ministry of the Environment).

The incineration of organic liquid wastes are permitted only in the national incinerator. There is no solid wastes incinerators.

Toward an Environment Ethic

A central theme of the Rio Declaration on Environment and Development is citizen involvement and responsibility for the environment. To facilitate and encourage public awareness and participation, nations should make environmental information widely available. The importance of environmental education and awareness has not been overlooked in Israel. In fact, Israel has long recognized that only a well-informed and concerned public can bring about a better tomorrow. From the very early days of the environmental movement, every effort has been made to instill an environmental ethic in all segments of the population.

Both the Environment Ministry and non-governmental organizations are using every means possible to increase public awareness and activism on behalf of the environment. Within the framework of the ministry, efforts have centered on including the public in enforcement of the Cleanliness Law and the Animal Welfare Law. About 150,000 registered volunteers already take part in anti-litter and animal welfare activities.

Cleanup Campaigns

In order to bring about concrete improvements in environmental quality, the Ministry of the Environment has targeted several areas for priority action, especially in fields where the general public can take an active part--and make a difference. The most prominent of these is cleanliness in the public sector.

In recent years, largely as a result of growing citizen awareness, the number of citizens who have turned to the Ministry of the Environment for help in solving environmental problems has skyrocketed. Citizens have bombarded both the district and national levels of the ministry with requests, suggestions and complaints concerning environmental deterioration--especially in the areas of waste, noise and air pollution. A special publications and ombudsman unit in the ministry deals with the public, both in terms of practical help in solving environmental problems and dissemination of information to both laymen and professionals.

The public awareness for environment can be split in two categories: a little minority is very concerned with environment problems, while the awareness of the vast majority could be described as weak to moderate.

For instance, amongst the public, there is no real opposition to the construction of a high way through the open spaces of the country or to the construction of a nuclear electric plant (thanks G-od not realistic nowadays) or to the constructions of hotels on the very seashore. Only little groups of "green" people do protest and are concerned.

Environmental action groups (NGO's) influence sometimes the decisions: reject of the construction of an outfall for a fertilizer plant in Haifa Bay, reject of a marina port in Haifa, changes in "monstrous" building project on the seashore in Haifa and more.

Legislation and Enforcement

Comprehensive environmental legislation is an integral part of environmental management. Israel's environmental legislation is wide ranging. It covers the entire expanse of environmental issues, uses all forms of legislative instruments--laws, regulations, administrative orders and bylaws--and is linked to a comprehensive international legislative system which includes numerous international conventions.

Israel's environmental legislation is characterized by its diversity and scope. It encompasses laws for the protection of natural resources (air, water and soil), laws for the abatement and prevention of environmental nuisances (prevention of air, noise, water and marine pollution); and laws relating to environmental contaminants and pollutants (hazardous substances, radiation and solid and liquid waste).

Alongside legislation dealing with specific environmental issues--whether conservation of environmental resources or prevention of nuisances and pollution--Israel's environmental legislation also includes some comprehensive laws. These include the Planning and Building Law and the Licensing of Businesses Law which provide not only a framework but also an important legal basis for controlling the use of resources and promoting sustainable development. Specific regulations under the Planning and Building Law require the preparation and presentation of environmental impact assessments, which are an integral part of the planning and building process. The Licensing of Businesses Law provides efficient administrative as well as criminal enforcement tools for the supervision of industry, by stipulating, *inter alia*, special conditions to business licenses.

Legal Powers of the Ministry of the Environment

The Ministry of the Environment currently has full or partial authority for numerous laws. All the laws provide for criminal sanctions which usually take the form of fines and, at times, also terms of imprisonment. Citizen rights to initiate civil and private criminal proceedings, with recourse to all civil remedies, including the payment of damages, are included in most of these laws. Several of the laws integrate regulatory and fiscal measures and include provisions for the appointment of special enforcement inspectors. A brief description of the laws, in the chronological order of their enactment, follows:

1. **Public Health Ordinance, 1940**

This law defines the powers of the Ministry of Health and the Ministry of the Environment to control public health and environmental nuisances of various kinds. The Ministry of the Environment is responsible for preventing malaria from mosquitoes and for eliminating nuisances from the confines of local authorities. Nuisances may include air pollution and odors emanating from dangerous dwellings or unsanitary conditions. A person who fails to remove the nuisance can be ordered to do so by the Minister of the Environment.

The law authorizes the Minister of Health to promulgate regulations on standards and testing methods for drinking water quality.

Violators of the law and of the orders issued under it are liable to criminal fines and six months' imprisonment. A 1997 amendment to the law, within the framework of the Environmental Quality Law (Punitive Measures), raised fine levels substantially for offenses relating to water quality and environmental nuisances.

2. **Wildlife Protection Law, 1955**

This law authorizes the Minister of the Environment to restrict the hunting of wild animals, to issue hunting permits and to appoint inspectors to enforce the law. The law defines protected wildlife as any animal that has not been designated as a "pest" or "game". The law is also Israel's implementation tool for the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and thus prohibits trading, possessing or transporting protected species without a permit.

3. **Water Law, 1959**

This law establishes the framework for the control and protection of Israel's water sources. A 1971 amendment to the law introduced new water pollution prevention provisions under the responsibility of the Ministry of the Environment. Other provisions of the Water Law fall under the responsibility of the Minister of Agriculture and the Water Commissioner.

In recent years, various regulations under the law have been promulgated relating, *inter alia*, to pesticide discharge into water sources, use of cesspools and septic tanks, and control of evaporation and effluent storage ponds.

4. **Abatement of Nuisances Law, 1961**

This was the first legislative instrument in Israel for the control of air, odor and noise pollution. Under the terms of this law, it is illegal to cause "any considerable or unreasonable pollution by noise or in the air, including odors, from any source whatsoever, if it disturbs or is likely to disturb a person in the vicinity or a passerby."

The Minister of the Environment has the authority to promulgate regulations defining national ambient and emission standards. Thus far, regulations have been issued to control air and noise pollution from stationary and mobile sources. Draft regulations setting emission standards for air pollutants have been completed.

The Minister of the Environment also has the power to address specific polluters with personal decrees instructing them on measures to be taken for the prevention of pollution. These decrees have been instrumental in controlling industrial air pollution throughout the country.

A 1997 amendment to the law, within the framework of the Environmental Quality Law (Punitive Measures), raised fine levels substantially and doubled the fine for offenses committed under aggravated circumstances. The amended law also authorized the Minister of the Environment to issue Nuisance Removal Orders, and, in case of non-compliance, to remove the nuisance independently and to charge the person responsible with double the expenses. The moneys collected are paid to the Cleanliness Fund.

5. **Local Authorities (Sewage) Law, 1962**

The law prescribes the rights and duties of local authorities in matters concerned with the design, construction and maintenance of sewage systems. It requires local authorities to properly maintain sewage systems to the satisfaction of the Ministry of the Environment. New sewage systems must be approved by District Planning and Building Commissions and by health and environmental authorities.

6. **Streams and Springs Authorities Law, 1965**

This law empowers the Minister of the Environment, after consultation with local authorities and the Ministers of the Interior and Agriculture, to establish an authority for a particular stream, spring or any other water source. Such authorities are empowered to undertake steps to protect the stream and its banks.

7. **Roads (Affixing of Signs) Law, 1966**

This law prohibits advertising along highways and interurban roads. The law has succeeded in keeping Israel's countryside free from the visual nuisance of billboards and commercial signs.

8. **Licensing of Businesses Law, 1968**

The law empowers the Minister of the Interior, in consultation with the Ministers of Health and the Environment, to designate and define businesses requiring licenses in order to ensure: proper environmental conditions including appropriate sanitary conditions, the prevention of nuisances and compliance with the Planning and Building Law; the safety of those on or near the premises of the business; and the prevention of pollution of water resources by pesticides, fertilizers or medicaments. Licenses under the law are issued by the head of the local authority in whose jurisdiction the business is located. They are subject to prior approval by a person authorized by the Minister of the Environment, Health, Police or Agriculture; depending on the type of business. Special environmental provisions imposed within the framework of the license may include preparation of preliminary surveys, establishment of infrastructures and treatment facilities for solid waste, sewage, recycling, hazardous substances and waste, and reporting, monitoring and control systems. In the case of air pollution nuisances, environmental limits are often based on emission standards.

Penalties for operating a business without a license and non-compliance with the regulations and conditions include fines or imprisonment terms of six months. The law also provides administrative and judicial powers for the closure of a non-complying business.

9. **Prevention of Sea Pollution by Oil Ordinance (New Version), 1980**

This law forbids discharge of oil or oily substances into the territorial and inland waters from any shore installation or vessel, and makes any such act a criminal offense. The Minister of the Environment is empowered to appoint inspectors to

discover or prevent violations. The law establishes maximal fines for oil spills and liability for cleanup expenses.

10. **Prevention of Sea Pollution (Dumping of Waste) Law, 1983**

This law prohibits the dumping of any waste from vessels and aircraft into the sea, except under permits which may be issued by an interministerial committee, headed by a representative of the Minister of the Environment. A court convicting an offender under this law may require, in addition to the fine levied, payment of cleanup expenses or of locating the waste dumped into the sea. The law provides for the appointment of inspectors to carry out inspections, investigations and searches to prevent or discover offenses.

11. **Maintenance of Cleanliness Law, 1984**

This law forbids littering or the disposal of waste, building debris and vehicle scrap into the public domain. It also requires municipalities to establish sites for the disposal or collection and treatment of construction and demolition debris, yard waste, tires and vehicle scrap.
12. **Prevention of Sea Pollution from Land-Based Sources Law, 1988**

This law forbids the discharge of waste, including wastewater, into the sea in all cases where practical and economic alternatives for treatment or reuse exist on land, under the condition that such processes are less harmful from an environmental point of view. An interministerial permits committee, chaired by a representative of the Minister of the Environment, determines what may or may not be discharged into the sea and under what conditions. The conditions and criteria for granting permits and the types of waste which may not be discharged at sea were established according to the provisions of the Land-Based Protocol of the Barcelona Convention.
13. **Abatement of Environmental Nuisances (Civil Action) Law, 1992**

This law enables private citizens to bring environmental law suits on behalf of themselves or non-profit organizations of which they are members, in cases of environmental pollution or nuisances.
In addition, the law allows, for the first time in Israel, the use of class actions in environmental law suits.
14. **Hazardous Substances Law, 1993**

This law authorizes the Minister of the Environment to license, regulate and supervise all aspects of the manufacture, use, handling, storage, marketing, import, export and transport of hazardous substances. Licenses are required for any premise selling hazardous materials, and permits are required by any business dealing in poisons. Three fine levels and imprisonment terms have been set according to the severity of the offense.
15. **Collection and Disposal of Waste for Recycling Law, 1993**

This law provides the principles and framework for recycling in Israel. It authorizes local authorities, and obliges them when so required by the Minister of the Environment, to allocate sites for recycling centers and to install recycling facilities and containers.
16. **Animal Welfare Law, 1994**

This law prohibits cruelty to animals, either by man or by animal at the instigation of man, including the organization of animal fights.
17. **National Parks, Nature Reserves, National Sites and Memorial Sites Law, 1998**

This law, first enacted in 1963 and revised in 1992 and 1998, provides the legal structure for the protection of natural habitats, natural assets, wildlife, and sites of historic, architectural and national importance.

Enforcement Strategies

Enforcing environmental legislation, and especially enforcing preventive measures within the laws, is a top priority of Israel's environmental management system. Israeli environmental legislation is characterized, *inter alia*, by the fact that it is enforced through administrative, civil and criminal measures. For instance, within the Abatement of Nuisances Law, all three legal spheres serve as tools of enforcement. Under this law, administrative action is taken through special directives (known as "personal decrees") which order an individual polluter to take specific steps to prevent and abate pollution. Civil law is employed through the application of the Torts Ordinance. Thus, a breach of the Abatement of Nuisances Law is considered a nuisance, under the Torts Ordinance, making available all civil remedies, including payment of damages. Finally, since the Abatement of Nuisances Law prohibits strong or unreasonable air and noise pollution or odors, the offender is subject to severe criminal punishment as well.

Criminal prosecution is an effective deterrent tool, especially for those in high positions, who may usually choose to comply with the provisions of the law in order to avoid the stigma of criminal proceedings. The main weakness of criminal prosecution is that while it can be a deterrent for future crimes, it deals with an accomplished act--pollution that has already occurred and has already caused damage. As such, criminal procedure is intended mainly to punish an offender; it is usually not effective in preventing crimes.

Administrative Enforcement and Injunctions

Administrative enforcement is an essential element in the Environment Ministry's enforcement program. Wherever possible, administrative enforcement is the preferred first response since it best serves the ministry's primary goals: prevention and deterrence. Based on this conception, major emphasis has been placed on the implementation of administrative preventive measures. Such measures, both at the national and the local level, constitute one of the most important bases of prevention. At the national level, these measures include permit systems and incorporation of environmental conditions in permits, decrees of various kinds, fiscal administrative arrangements, appointment of inspectors and trustees, and hearings before criminal proceedings. Such systems relate to planning and building, business licensing, marine pollution prevention, hazardous waste and resource management. At the local level, municipal administrative systems deal with business licensing, sewage and solid waste disposal.

While administrative measures exist in many of Israel's environmental laws, the most effective administrative enforcement measures are those incorporated into the Licensing of Businesses Law. Within the framework of this law, the Minister of the Environment is granted the authority to issue administrative injunctions for the temporary shut-down of the business for thirty days. Between 1994, when this authority was first granted to the Environment Ministry, and 1997, 24 administrative injunctions were issued. Most related to air and water pollution, with the rest distributed among noise nuisances, stench, non-compliance with poisons permit requirements, soil pollution, landscape blight and waste. Injunctions were issued against quarries, cement plants, fertilizer production plants, metal plating plants and other industrial plants, slaughterhouses and facilities for rendering abattoir waste, pig farms, solid waste disposal sites, and a car washing facility, oil refinery and discotheque.

Inspection

While administrative enforcement provides an efficient tool of preventive law enforcement, careful supervision is necessary to ensure strict compliance with legal stipulations. In general, environmental law enforcement is carried out by trained personnel who are specially empowered to discover, inspect and investigate violations.

The bulk of inspection and investigation activity is undertaken by the Environment Ministry's Environmental Protection Patrol and by various inspection bodies empowered by the ministry to enforce legal and administrative measures. The Environmental Patrol focuses on domains such as solid waste disposal sites, pollution of rivers and water sources, littering, hazardous waste disposal, and illegal billboards along interurban roads. In addition to the patrol, specific supervision units operate within the Ministry of the Environment. They include the Marine and Coastal Inspection Unit and the Poisons Monitoring Unit. Other ministries and organizations, such as the Nature and National Parks Protection Authority, the Drainage Authorities, and the Jewish National Fund, also carry out supervisory functions and aid in environmental enforcement, acting as part of a so-called "Green Police." These entities are staffed by professionals in their respective fields who are trained to carry out inspections and conduct investigations--and are legally authorized to do so.

A unique innovation of Israeli law enforcement is the recruitment of the general public as volunteer cleanliness trustees and animal welfare trustees. These volunteers participate in enforcing the Maintenance of Cleanliness Law and Animal Welfare Law by filing complaints against offenders. The complaints form the basis for a subsequent "finable offense" procedure (which provides for the payment of a fine in lieu of an appearance in court). At present, nearly 150,000 cleanliness trustees participate in this framework; about 10,000 tickets and court actions are initiated by their activities each year.

Criminal Enforcement and Judicial Ruling

The emphasis placed on enforcement in recent years has been reflected in a number of court cases in which relatively severe penalties were imposed on violators of environmental laws in an effort to change behavioral norms. The trend toward more severe punishments in both Magistrate and District Courts is accompanied by greater emphasis on prevention, abatement and treatment of environmental pollution and damage. This trend reflects both the growing awareness of the severity of environmental offenses and the recognition that penalties are important means of deterring potential offenders. Furthermore, more and more suits have been presented by the Environment Ministry and by others against mayors and municipalities charged with environmental offenses, especially water pollution and improper management of landfills. The responsibility of public officials, such as mayors and heads of local authorities, for fulfilling environmental laws and regulations were specifically raised in several cases.

Judicial Rulings on Environmental Impact Assessment

The courts have clearly stated that construction plans may not be promoted without due compliance with the provisions of EIA regulations. This was the case, for example, in a petition to the District Court by the IUED to prevent the deposition of plans to construct a marina at the mouth of the Yarkon River, since, *inter alia*, a complete EIA was not available to the Tel Aviv Planning and Building Commission at the time of deposition. In her ruling, the judge issued an injunction and prohibited the deposition, stating that "the plan in its present format without preliminary reviews will not be deposited. I am confident and certain that the authorities will operate according to the law and that the plan will only be deposited again in accordance with the provisions of the law, which is to say that the EIA will be completed and the other requirements of the National Board will be fulfilled."

Water

Water scarcity may be the most crucial environmental problem facing Israel today. The problem is exacerbated by the deteriorating quality of water resources due to demographic, industrial and agricultural pressures. Preservation of the quantity and quality of Israel's water resources may be the most important environmental challenge facing Israel.

Water Management in Israel

All water resources in Israel belong to the State. Management decisions on water quantity, production and supply rest with the Water Commissioner who reports to the Minister of National Infrastructure (save for the power to determine water tariffs for agriculture). The Ministry of Environment is responsible for the prevention of pollution of water resources and the Ministry of Health for the quality of drinking water and for standards on the use of recovered effluents for irrigation.

The Minister of the Interior is responsible for the administration of local authorities and, through control of their budgets, can influence the way they exercise their water and sewage functions. The Water Commissioner allocates water to local authorities and other large users. The Ministry of the Environment is responsible for preventing pollution of Israel's water sources. It compiles data on potential sources of pollution, supervises and controls human activity which may damage water resources, and initiates and implements plans for the preservation and restoration of rivers and inland water bodies.

Supervision and authority of wastewater treatment is divided among four government ministries: Interior, Environment, Health and Agriculture while local authorities are responsible for collection, treatment and disposal of wastewater. Wastewater is treated to varying degrees by different municipalities. In the past, opposing considerations guided the numerous bodies responsible for sewage, especially with regard to the location of treatment plants, the level of treatment and the utilization of the effluent for agriculture. The establishment of a National Sewage Administration has helped to set standard policy on the operation of municipal water and sewage projects, largely because of its control over loans to local authorities. The Sewage Administration has two central goals: advancement of sewage treatment to a level which will enable reuse or environmentally safe disposal and upgrading of water systems in local authorities.

Drinking Water Quality

The Ministry of Health is responsible for the quality of drinking water in Israel. In order to assure water quality, the ministry has promulgated regulations that specify water quality standards from the microbial, chemical, physical and radiological aspects. The regulations also specify requirements which obligate water suppliers, such as type and scope of sampling, disinfection, and operational requirements.

Quality assurance of drinking water quality is conducted in both water sources and supply systems and is based on multiple barriers including:

- Distancing pollution sources from the drinking water source;
- Preventing water pollution at source;
- Treating water in which violations of the standard have been discovered;
- Testing water quality at the water source and supply system;
- "Preventative" disinfection of drinking water.

The regulations also relate to the well structure, to its protection from external pollution and to well water treatment in cases where microbial concentrations exceed the standards. Quality of water pumped from the wells is regularly monitored for chemical and microbial contamination. An upcoming amendment to the regulations will require that water quality in

drinking wells be tested every three years for the presence of approximately 80 chemical, physical and radioactive agents.

River Restoration

With the exception of the upper part of the Jordan River and its tributaries, nearly all rivers in Israel share a common characteristic: pollution. The reason in most cases is directly attributed to the discharge of urban effluents--and at times industrial and agricultural effluents as well. The situation is exacerbated by the scarcity of water in Israel. Water has all too frequently been trapped at its source to supply urban and agricultural demand.

Monitoring of the microbial quality of some of Israel's rivers is undertaken on a monthly basis and more frequently in the summer and holiday seasons. Chemical monitoring of water quality is conducted twice yearly.

Wastewater Treatment

Israel's national program for sewage was first drawn up in 1970 and came into effect in 1973. Over \$160 million were invested in the original program, which comprised a large scheme for the densely populated Tel Aviv metropolitan area, two regional projects and forty-four smaller-scale municipal projects. Of the total volume of wastewater produced in Israel (400 MCM), about 90% is collected in central sewage systems and 70% (280 MCM) is treated, of which about 85% (240 MCM) is reclaimed for reuse. It is expected that by the year 2010, Israel will produce 500 MCM of wastewater per year, of which 450 MCM will be treated and 300 MCM will be reused.

Israel's wastewater treatment plants use intensive (mechanical/biological) and extensive treatment processes. Intensive treatment plants use the activated sludge method while extensive processes are based on anaerobic stabilization ponds which are integrated with shallow aerobic ponds and/or deep facultative polishing reservoirs.

Israel's special conditions dictate the use of both types of systems for the following reasons:

Of Israel's total wastewater, about a quarter (over 90 MCM) undergoes tertiary treatment in the Dan Region Wastewater Treatment Project (Tel Aviv-Jaffa area). It provides for biological treatment of wastewater including nutrient removal (to a level of 10-20 mg/liter BOD and 15-30 mg/liter suspended solids). The secondary effluent is then recharged into the groundwater aquifer by means of spreading sand basins for additional polishing and long-term storage. The water is eventually pumped and transported to Israel's arid Negev desert for unrestricted irrigation through the so-called "Third Negev Pipeline.

In the Haifa region, the Kishon Complex treats about 30MCM of wastewater yearly. This is the second largest reclamation system in Israel located in the Western Jezreel Valley. The reclamation plant receives effluents from the Haifa region treatment plant, which uses an integrated technology of activated sludge and trickling filter to produce medium-quality effluent (60-80 BOD/SS). The effluent is piped 30 kilometers eastward to irrigation reservoirs that serve the Jezreel Valley where water quality further improves after a long retention time in the reservoirs.

Throughout the country, numerous smaller municipal and local wastewater treatment systems exist. The quality of effluents produced by these treatment plants is not uniform, and all too often local authorities do not operate and maintain their facilities properly.

Regulations promulgated by the Ministry of Health in 1992 require secondary treatment to a minimum baseline level of 20 mg/liter BOD and 30 mg/liter suspended solids in every settlement with a population exceeding 10,000 people. Higher degrees of treatment are required by the Ministry of the Environment if effluents are to be discharged into rivers rather than for agricultural use. In such cases, nutrient removal and disinfection are

prescribed. Effluent irrigation above phreatic aquifers requires even higher standards which take account of nitrogen levels, heavy metals and toxic organic compounds.

Effluent Reservoirs

The large-scale reclamation of effluents which is practiced in Israel makes it necessary to store effluents in seasonal reservoirs (100,000 to 3 million cubic meters in volume).

- Retention time of the water in the reservoir: Since irrigation is undertaken in summer only, effluent quality can be very high in spring (5-30 mg/liter BOD) when the reservoir is full and retention time is long. In the later summer, however, water quality usually deteriorates and can reach BOD values as high as 200 mg/liter;

Sludge Disposal and Treatment

Wastewater treatment plants which use the activated sludge method generate large quantities of sludge, at a scope of hundreds of tons of dry matter per day. Sewage sludge has beneficial plant nutrients and soil conditioning properties, but it may also contain bacteria, viruses and protozoa that can cause disease and attract insects. Land application and surface disposal of sewage sludge create a potential for human exposure to these organisms through direct and indirect contact. To protect public health from these organisms and from the pollutants that some sludges contain, it is necessary to regulate the use and disposal of sewage sludge.

Surveys of sludge composition in several cities have revealed high concentrations of certain heavy metals in the sludge of the Dan metropolitan area (cadmium) and Haifa (mercury). Since these concentrations have largely been traced to the surface treatment of metals, strict supervision and inspection of electroplating and metal finishing plants has been initiated in order to ensure that the plants carry out the requisite pretreatment procedures before discharging their wastes.

Effluent Disposal and Reuse

At the request of the Water Commission, a national master plan for effluent reclamation has been prepared which describes present conditions and prescribes a program for future development. The plan constitutes a framework for the preparation of national and regional master plans for effluent reclamation including flow forecasts, principal treatment sites, main schemes, projected interregional transfers and estimates of investments in effluent reclamation in Israel. The aim is to achieve maximum treatment in order to prevent environmental nuisances and to enable effluent reuse in agriculture throughout the country.

The Ministry of Health maintains a permit system designed to ensure that irrigation with effluents is limited to crops such as cotton, fodder, etc. Effluents are never used for irrigation of vegetables or other crops which may be consumed directly without cooking.

Effluent Disposal to Rivers

Until 1991, all of the bodies involved in river rehabilitation were convinced that the prerequisites for river rehabilitation were elimination of all effluents and introduction of fresh water only. However, successive years of drought have shown that the realities of water scarcity in Israel threaten to leave Israel's rivers dry if other means are not taken to replace or supplement fresh water supply. Following a comprehensive review by the Ministry of the Environment, a policy which banned effluent discharge into rivers, no matter what the quality, was replaced by a policy which allows the discharge of high-quality effluents into riverbeds when fresh water allocations are unavailable. In all cases, effluent discharge to river sections designated for abstraction of water, bathing or fishing is prohibited.

In order to implement the program, effluent standards for each river are being set for such physical, chemical and microbial parameters as suspended solids, organic load, nitrogen concentrations, and indicators for pathogenic microorganisms.

The following table presents requirements set by the Ministry of the Environment for the effluents which will be discharged to the Yarkon River.

Table: Required Effluent Quality for Discharge to the Yarkon River

Suspended solids	10 mg/liter
BOD	10 mg/liter
Ammonia	3 mg/liter
Nitrogen (Kjeldahl)	8 mg/liter
Dissolved oxygen	3 mg/liter
Fecal coliforms	400/100 ml

Industrial Wastewater

Industrial wastewater constitutes about 17.5% (about 68 MCM/year) of Israel's total wastewater, but its potential risk to the environment is especially significant. By law, adequate pretreatment of industrial sewage prior to discharge into the municipal sewage system is required of every industrial plant. The Model Local Authorities By-Law on the discharge of industrial wastes into the sewage system prohibits the discharge of industrial wastes into the sewage system in a manner, quantity or quality that might cause damage to the sewage system, to the flow of sewage or to the treatment process. Thus, many factories have established in-house facilities for the pretreatment of industrial sewage before their discharge into the municipal sewage system.

Current criteria for wastewater treatment levels do not take account of the level of total salts and their composition. Yet, in view of the ever-growing quantities of effluents used for irrigation purposes, high salinity levels threaten to damage agricultural soils, reduce crop yields, and in certain cases, cause groundwater salinity.

Fresh water in Israel has a high average hardness, and water softening is performed routinely in factories for steam production, cooling towers, laundries, textile dye works and other industries. As a result of the release of sodium salts (mainly NaCl), sewage effluents have a higher salt content than the urban water supply. The model by-law on industrial wastewater discharge into the sewage system forbids the discharge of chlorides.

To stop discharge of brines to the environment, industry has to choose one of the following alternatives:

1. Discharge of brines to the sea following pretreatment to ensure that the brines are not polluted and will not cause marine pollution.
2. Transfer to an alternative technology for water softening (such as reverse osmosis).
3. Recycling of the brines.

Discharge to sea requires a permit in accordance with Israel's marine pollution regulations. The Ministry of the Environment is now investing special efforts in prohibiting land discharge of brines.

Prevention of Fuel Contamination

An especially grave problem in Israel is soil and groundwater contamination in the vicinity of gasoline stations. All too frequently, the problem is discovered accidentally during infrastructure work. The problem is especially severe and difficult to solve since about 700 public gasoline stations are scattered throughout the country with another 800 located in kibbutzim and moshavim.

Marine and Coastal Environment

Israel's Mediterranean and Red Sea coastlines are among the country's most valuable natural assets. Protecting them from pollution and from the conflicting demands of urbanization, industrialization, agriculture, recreation and tourism, is a national priority.

The Mediterranean Coastline

Israel's Mediterranean coastline extends along nearly 190 kilometers from north to south. With the exception of Haifa Bay, it is a smooth and generally sandy coastline. About 70% of Israel's population live within 15 kilometers of the Mediterranean coastline, and the country's major economic, commercial and tourist activity is concentrated here.

The Mediterranean coast includes 14 proposed marine nature reserves with a total length of about 35.5 km and another 20 declared and proposed coastal reserves extending about 44 km, mostly in parallel sections. Ten national parks dot the Mediterranean coastline. The coastal strip also contains Israel's most fertile agricultural land.

The Gulf of Eilat

The Gulf of Eilat, at the northern end of the Red Sea, is a clear example of the often conflicting demands of tourist, industrial and environmental interests along a limited coastline. Eilat is both an international tourist center and an industrialized port town with a major oil terminal.

The Gulf of Eilat is the world's northernmost tropical sea ecosystem. Its oxygen-rich water has a constant temperature of 21°-24°C, and it supports a dense population of hundreds of species of coral, 1270 species of fish, and 1120 species of molluscs. To protect this unique and sensitive area, two marine nature reserves and two coastal reserves have been declared.

Marine Pollution Control

Israel deals with all aspects of marine pollution: accidental and emergency oil and chemical spills from ships or terminals; polluting discharges from industrial or municipal land-based sources; dumping of waste at sea; airborne pollution into the marine environment; and litter in the sea or on beaches. Activities include prevention, abatement, law enforcement, and scientific research and monitoring aimed at reducing marine pollution and preventing significant damage to the marine environment. The Marine and Coastal Environment Division of the Ministry of the Environment is the national authority responsible for these activities.

The division has adopted a multi-faceted working plan consisting of the following:

- Detecting environmental problems along Israel's marine coastlines and territorial waters;
- Preventing and abating all types of marine pollution;
- Enforcing national laws on the protection of the marine environment;
- Updating relevant legislation in accordance with international conventions and modern environmental criteria;
- Developing and implementing policies for sound environmental management of the marine and coastal ecosystems.

On the Mediterranean coast, Gulf of Eilat, Lake Kinneret and Dead Sea, marine pollution prevention and enforcement are carried out by highly-skilled professional inspectors. Equipped with boats, vehicles and communication, monitoring and enforcement equipment, and aided by aerial surveillance, the inspectors carry out marine and coastal patrols which include routine inspections of hundreds of vessels and oil tankers calling at Israel's ports, of shore installations handling oil, and of industrial plants and wastewater treatment plants in local authorities.

In addition to serving a deterrent function, Israel's marine pollution inspectors investigate violations of the law by vessels or coastal facilities and file legal charges, where warranted. They are aided in their work by the ever-increasing vigilance of the general public in reporting pollution episodes. Dozens of reports on marine oil pollution reach the Environment Ministry each year, involving anywhere from a few liters to dozens of tons of oil. In 1997, 41 investigations of pollution events were initiated according to the following distribution:

- Marine pollution by oil and fuel - 12 cases.
- Non-maintenance of an oil record book aboard ship - one case
- Land-based discharges of effluents (municipal and industrial) - 19 cases
- Discharge of oil to sea from land-based sources - 4 cases.
- Pollution of sea and shores by litter and solid waste - 4 cases.
- Improper fueling by tankers - one case.

The use of older type chemical dispersants is strictly prohibited in the Gulf due to its special ecological sensitivity. Advanced dispersants are now being evaluated for use in deep water only, the major concern being to avoid contact of the oil with the coral and its associated fauna and flora. Primary reliance remains on containment and recovery techniques in order to deflect the oil to shore where it can be collected by skimmers, vacuum trucks and a number of manual and mechanical methods supplemented by the use of advanced sorbents.

Non-oil sources of pollution in Eilat are also being addressed with considerable success. The Eilat municipality has stopped discharging its sewage into the Red Sea and now diverts its effluents through a 40-kilometer long pipeline to the north of the bay where the reclaimed wastewater is used to irrigate date fields.

Yet another major pollution concern in the Gulf of Eilat is the rapid development of fish culture. Currently fish culture is carried out in cages where nutrients are released directly into the environment. Today, two commercial companies operate fish cages for some 1200 tons of fish in the Gulf of Eilat, and pressures are mounting to increase production capacity significantly.

Oil Pollution Control in the Mediterranean

Ports and oil facilities along the Mediterranean coastline of Israel present a major oil pollution threat. The Ashkelon and Haifa ports are oil refining, trans-shipment and commercial centers, while Ashdod port serves as the major center for cargo traffic in the country. Since the number of cargo and passenger ships arriving in Haifa and Ashdod ports is on the increase, as is the loading and unloading of oil near coastal installations, the risk of major spills is considerable.

All Israeli ports have reception facilities for oily bilge and ballast waters. In the event of a major spill, these facilities can be utilized to store "clean" recovered oil prior to its transfer to refineries for treatment.

The Ministry of the Environment has issued guidelines on the use of advanced (third and fourth generation) dispersants. Use of such dispersants requires the prior, written authorization of the director general of the Ministry of the Environment and must be carried out under the supervision and guidance of the ministry's marine pollution control inspectors.

Contingency Plans for Large-Scale Oil Spills

While Israel is equipped to effectively combat small and medium-scale oil spills in the Mediterranean, the country has long lacked the capability to effectively respond to large-scale oil spills. According to a contingency plan, formulated by the Shipping and Ports Administration of the Transport Ministry, an *ad hoc* emergency headquarters is to be set up in case of an oil spill emergency.

Dump of Waste

Dumping of waste into the sea from a vessel or aircraft is regulated through a strict permit system, instituted in 1984. The regulations list categories of substances prohibited or permitted to be dumped to the sea and establish procedures and considerations for issuing permits. A special interministerial committee deliberates on each permit application. A monitoring program must be implemented around the dumping site. Severe penalties are imposed for unauthorized dumping.

Land-Based Sources

Israel supervises and enforces all land-based sources of marine pollution within the framework of an interministerial permits committee. In line with regional commitments and national policy, Israel's marine protection policy calls for the elimination of all land-based sources of sea pollution. Ministerial policy is based on the following objectives:

- To minimize discharges to sea to the greatest degree possible by reviewing land alternatives such as connection to municipal sewage systems or irrigation reservoirs;
- To minimize pollutant emissions through installation and operation of best available technology;
- To require continuous improvement of wastewater treatment facilities and alternative land solutions, to stipulate conditions and requirements in permits, and to follow up on results;

- To permit discharge to sea of wastes which may damage land resources but not the marine environment, such as brines;
- To permit discharge of authorized wastes through regulated coastal outfalls only;
- To require wastewater quality monitoring and/or marine monitoring;
- To operate according to stringent and advanced international standards;
- To enhance cooperation with the district offices of the ministry and with associations of towns for the environment.

Israel's coastlines on the Mediterranean, Red Sea and Dead Sea include some 100 industrial plants, 100 facilities which contribute brines and groundwater, and 40 local authorities and other sources of sanitary wastes. In recent years, major progress has been made in preventing pollution from land-based sources, including domestic and industrial waste, agricultural runoff and river discharges. Increased supervision and enforcement of the Prevention of Marine Pollution (Land-Based Sources) Law and its regulations coupled with better information and guidelines to industrial plants and municipalities have actually helped reduce the number of legal claims while improving marine quality. Improvements were made in several areas: sewage discharges to the sea were stopped; wastewater treatment facilities were upgraded; effluent quality was improved; waste streams in industrial plants were separated to enhance treatment; a sewage monitoring and control program on the sea was instituted; marine outfalls were combined; and a new outfall was established to halt previous discharges to the shore.

Following are some achievements made by major polluters in recent years:

- *Israel Electric Corporation*: Preparation and partial implementation of a \$45 million program for wastewater treatment in five coastal power stations.
- *EIL (formerly Frutarom Acre)*: Implementation of a \$6 million plan for improving effluent quality and production and treatment processes which reduced mercury emissions from 50 kg to about 5 kg per year. Initiation of a plan to reduce organic pollutants.
- *Rafael*: Sewage discharge to the sea stopped in 1997, the plant's wastewater treatment facility was expanded, and effluents were used for irrigation.
- *Israel Defense Industries, Haifa*: Sewage discharge to the sea stopped in the winter of 1996-7, wastewater treatment facilities were installed along with a collection system for sanitary wastes.
- *Haifa Chemicals*: Initiation of a \$15 million plan to significantly decrease wastewater discharge to the Kishon River and to significantly improve seawater quality in Haifa Bay (nutrients and heavy metals).
- *Agan Chemicals*: Installation of an advanced system for the separation of solids and a facility for the separation and recovery of an organic solvent (which constitutes a third of the organic load). Completion of a pilot facility for biological treatment of wastes.
- *Ashdod Oil Refineries*: Improvements leading to better effluent quality and initiation of a \$300,000 pilot facility for biological treatment.
- *Wastewater treatment plants*: Completion of a wastewater treatment plant in Hadera; initiation of treatment plants for Ra'anana, Jerusalem and Carmiel; agreements for the construction of treatment plants in Acre and Nahariya; and initial expansion of the Haifa wastewater treatment plant.

An important breakthrough in the prevention of land-based pollution is expected to result from the Kishon River Project, an ambitious joint initiative of the Marine and Coastal Division, Water and Streams Division, Kishon River Authority and Haifa District. In an all-out effort to clean this severely polluted river, seven large industrial plants have been targeted for vigorous enforcement.

In yet another important development, a pilot project was recently launched to install sensors on pipelines which discharge effluents to the sea. The sensors will relay on-line information on everything spewed into the sea from land-based sources to a computerized control system in the offices of the Marine and Coastal Division in Haifa.

Alongside its national efforts, Israel is actively participating in the Strategic Action Programme for reducing and eliminating land-based pollution, adopted by the parties to the Barcelona Convention in 1995.

Litter

Solid waste, including nylon, plastic, bottles and driftwood, is a major blight on the country's shorelines. While current and wind regimes in the eastern Mediterranean are responsible for the deposition of significant quantities of waste from other states on Israel's shores, at least half the litter on the beaches is left behind by vacationers and bathers.

Marine Pollution Research

Prior to 1997, Israel's research institutes took an active part in the research component of MEDPOL, the Mediterranean Action Plan's monitoring and research program. While MEDPOL stopped its financial support of Israel's research and monitoring projects in 1997, research activities have not stopped. The Ministry of the Environment or the Marine Pollution Prevention Fund continue to support research activities designed to provide a better understanding of the processes and phenomena involved in the complex mechanisms of pollution. The following studies were initiated in 1997:

- *Transport of marine fauna via ballast waters of vessels.*
- *Monitoring marine pollution by nutrients from land-based sources.*
- *Potential impact of dispersants on coral.*
- *Biological monitoring of the marine environment.*
- *Development and assessment of monitoring and characterization methods for marine pollutants.*
- *Survey of T.B.T. uses and presence in Israel's coasts.*
- *Movement of particulate matter in the northern Gulf of Eilat: monitoring of transport paths of pollutants to the coral reefs:*

Marine Pollution Monitoring

Israel was one of the first Mediterranean states to sign a long-term national monitoring agreement within the framework of MEDPOL. Studies include systematic monitoring of heavy metals along the Israeli coastline, microbial pollution in bathing beaches, and monitoring of atmospheric pollution input into the Mediterranean at three points. The surveys indicate that the level of pollution along the Israeli coastline is relatively low compared to other industrialized countries, with the exception of Haifa Bay where higher concentrations of mercury and cadmium were detected. Nevertheless, all Israeli coastal waters meet international standards for chemical and bacterial pollution. The national monitoring program, which for many years was supported by UNEP funds, is now fully financed by the Marine Pollution Prevention Fund.

Monitoring of Heavy Metals

Monitoring of heavy metals along the Mediterranean coast of Israel is carried out by the National Institute of Oceanography (Israel Oceanographic & Limnological Research). The program includes continuous monitoring of heavy metals in sediments, suspended particulate matter (SPM) and biota along Israel's Mediterranean coastal zone. The overall aim of the monitoring and related research activities is to provide a basis for decision-making on a variety of management issues such as marine waste disposal, pollution control and seafood safety. The specific objectives are to assess the status of the coastal zone with regard to heavy metal contamination, to identify contamination sources and to detect early signs of potential health and ecological risks.

Bathing Water Standards

According to the Israeli standard for seawater quality, public bathing is prohibited in the following circumstances: epidemiological evidence of infectious disease connected with bathing in the beach; discharge of sewage in the vicinity of the bathing beach and water which does not meet the water quality standards: 200 fecal coliform bacteria per 100 milliliters of sea water; individual samples must not exceed 400 fecal coliform bacteria in more than 20% of all the samples.

Monitoring the Atmospheric Input of Trace Species

Assessment of the inputs of pollutants into the Mediterranean Sea including the atmospheric contribution has long been recognized as an important component of the overall Mediterranean environmental protection strategy. In order to obtain information on atmospheric material fluxes across the Israeli Mediterranean coastline, measurements of wet and dry atmospheric depositions were carried out at three coastal sites.

International and Regional Cooperation

Israel is an active participant in the Mediterranean Action Plan (MAP) which provides an important forum for regional environmental activities.

Permitting

Promoters and industries are obliged to get many permits (20 to 30) for many subjects.

Industrial activities: EIA, Planning and Building Law permit, Business License, LBS permit (if necessary), Discharge permit to the waste water treatment plant or to the river, annual permit for handling hazardous substances, solid waste discharge permit, use of water permit, radiation permit, Ministry of Health permit, fire-fighting permit, and more.

Incineration of wastes: EIA, Planning and Building Law permit, Business License, annual permit for handling hazardous substances, use of water permit, fire-fighting permit, and more.

Animal breeding: ??

Solid waste disposal: EIA, Planning and Building Law permit, Business License, annual permit for handling hazardous substances (if necessary), solid waste discharge permit, fire-fighting permit, and more.

Urban development: EIA, Planning and Building Law permit, Business License, fire-fighting permit, and more.

Infrastructure projects: EIA, Planning and Building Law permit, Business License, fire-fighting permit, and more.

Domestic wastewater: EIA (for treatment plant), Planning and Building Law permit, Business License, LBS permit (if necessary), Discharge permit to the waste water treatment plant or to the river, solid waste discharge permit, use of water permit, fire-fighting permit, and more.

The main authorities responsible for permitting, and the different levels existing (*for example: national, regional, local, etc.*) are listed below:

EIA: Min. of Interior, MOE, national, regional and/or local.

Planning and Building Law permit: Min. of Interior, MOE: regional and/or local.

Business License: MOE, Municipality, Min. of Health: regional and local.

LBS permit: MOE, national.

Discharge permit to the waste water treatment plant: MOE, Water commissioner, Municipality: regional and local.

Discharge permit to the river: Water commissioner, national.

Annual permit for handling hazardous substances: MOE, regional.

Solid waste discharge permit: Min. of Interior, MOE: national, regional and/or local.

Use of water permit: Water commissioner: national.

Radiation permit: MOE: national.

Fire-fighting permit: Min. of Interior.

and more.

The estimated number of industrial facilities in Israel for which we consider permits should be a necessity for their operation: about *Thousands*.

In our estimation, a *few hundreds* employees of all related ministries/agencies in our country, deal with permitting.

Have EIA's been done for (specific) new projects? Yes.

Have EIA's been done for (specific) existing projects? Yes.

Are permits issued for (specific) new projects? Yes.

Have permits been issued for (specific) existing projects? Yes.

Does periodic permit renewal take place for industry? Yes:

Are new developments taken into account in permit renewal?

Do voluntary agreements with industry exist? Yes, regarding air pollution.

The public has access to most of the information regarding general environmental issues, and, in particular, to the state of the environment; industrial wastewater; solid wastes and air emissions. There are restrictions for some details in order to prevent access to classified confidential information that could damage the companies (productions knowledge and commercial data). There are cases where the data is available through internet (air quality at Haifa).

Compliance and Enforcement

Toward environmental compliance

Since the establishment of the Ministry of the Environment, Israel's body of environmental laws and regulations has grown significantly and now covers nearly every aspect of the environment. Yet, the road to environmental rulemaking has not always been smooth. As a result of the complexity and multidisciplinary nature of environmental standards and regulations, they have frequently met with opposition when distributed for comment among government ministries and other affected parties.

Toward Negotiated Rulemaking

The process toward regulatory negotiation in Israel was initiated in August 1995 when a government decision called on the Minister of the Environment to establish a Committee to Review Aspects of Formulating Environmentally Related Standards and Regulations to ensure that all considerations are taken into account during the procedure. Two years later, in November 1997, an interministerial committee, chaired by the Chief Scientist of the Ministry of the Environment and including representatives of government ministries and organizations, non-governmental organizations and academic institutions, submitted the following recommendations:

- 1) The Ministry of the Environment will formulate environmental standards, including emission and ambient standards, by means of a process which will include a Steering Committee and subcommittees, in which representatives of government ministries and relevant bodies likely to be affected by the proposed regulation will participate.
- 2) The Steering Committee will coordinate the standard procedure and will operate subcommittees, each of which will formulate proposals for a specific standard. The timetable for preparing each standard will not exceed 24 months.
- 3) The subcommittees, which will be assisted by professional consultants, will be composed of representatives of all relevant stakeholders.
- 4) The procedure will be based on guiding principles which will ensure, *inter alia*, that all relevant considerations are taken into account during the standard setting process—including environmental, economic, technological and legal considerations, that the standards will be applicable, and that they will take account of anticipated benefit, cost, and best available technology under reasonable technological and economic conditions.
- 5) The guiding principles for the formulation of regulations and standards will also include the following:
 - Efficiency and cost effective implementation;
 - Causality (“polluter pays” principle);
 - Prevention at source;
 - Transparency and open deliberations during the entire procedure;
 - Precaution in cases where risks to the environment are anticipated although not certain;
 - Certainty with regard to the timetable in which the regulation will be in force to facilitate investment planning for compliance purposes;
 - Stages in implementation;
 - BATNEEC - employment of best available technology not entailing excessive cost;
 - Fulfillment of environmental policy.
- 6) The regulation procedures will include conflict resolution mechanisms aimed at reaching consensus.
- 7) The Ministry of the Environment will endeavor to promote integration between national environmental standards and municipal bylaws and standards.

In addition, several complementary steps were recommended by the interministerial committee: creation of a Division of Regulation, Information and Economics in the Ministry of the Environment to facilitate coordination of the new procedure and help create an environmental database, advancement of a fiscal policy aimed at changing relative prices and demands to achieve environmental targets, and optimization of enforcement efforts to assure compliance with regulations and shorten legal procedures against violators. All of the recommendations were adopted by the government in January 1998.

Covenant on Air Pollution Abatement

Along with the initiation of negotiated rulemaking in Israel, hopes are high that a new covenant signed between the Ministry of the Environment and the Manufacturers Association in January 1998 will prove effective in reducing pollutant emissions. The landmark decision

to sign such a covenant is the first example in Israel of voluntary compliance by industry of emission standards which have not yet been promulgated.

Economic Benefits of Environmental Investment

In an effort to prove that investment in environmental strategies can also be a money-making proposition, the Ministry of the Environment, in cooperation with the Israel Manufacturers Association, Ministry of Science, and United States-Israel Science and Technology Commission, organized a special conference in March 1998 entitled "The Economic Benefits of Environmental Investments at the Factory Level." With the aid of representatives from the Department of Economics at Haifa University, Ministry of Industry and Trade and the Treasury, and some 20 companies from Israel and abroad, the conference set out to show, as its title suggests, that environmental investments can indeed generate economic benefits.

Compliance is checked in industrial plants, prior to production by inspectors.

Lodged complains are followed by inspections that lead to criminal prosecution if necessary.

Periodic inspection and control are carried out on the following activities which have permits:

- Industrial plants: from once a day to once a year.
- Incineration of wastes:
- Animal breeding:
- Urban solid waste disposal: once a week to once a month.
- Urban development:
- Infrastructure projects:
- Domestic wastewater disposal: once a month to once a year.

The approximate number of employees involved in compliance and enforcement within all the related ministries and/or agencies should be 100 to 300 in all the country, following the responsibility described above.

When a violation is verified, what is the usual action taken by the controlling body? It depends of each division in each ministry, depending also of the law we are dealing with, and the gravity of the violation: all the examples are true: no systematic action; administrative response (e.g. fines, additional permit requirements, temporary closure); criminal prosecution (e.g. fines, jailing of responsible persons, permanent closure); re-inspection for corrective actions.

Describe the system in force in your country for the assessment of the state of the environment regarding:

Water quality: The sea is monitored by the National Oceanographic Institute; The inland Waters are monitored by the Nature Protection Authority (a part of MOE).

Industrial emissions: Air - there is a large air monitoring (mainly SO₂) through the urbanized country. The emissions of the main air polluters are also monitored.

Wastes water - The effluent that are discharged to treatment plants are monitored by local

Protection of habitats: No information

ITALY

REPORT ON THE STATE OF COMPLIANCE AND ENFORCEMENT OF REGULATIONS IN ITALY

(Some notes by Giovanni Guerrieri and Annunziata Desprini)

1. Brief introduction of the Italian situation

Actually, the Italian territory is administratively subdivided into 20 Regions, which are split in 103 Provinces (two of which have autonomous government), and in 8,103 Municipalities. This administrative fragmentation can be reflected in a similar organisation under the permits and controls systems, that means a distribution of competences among Region, Provinces and Municipalities, and within these among other administrative and technical bodies. This competences distribution obstacles the carrying out of co-ordinate and effective controls.

Also the collecting data for the preparation of the present report met some difficulties because the information are located by several bodies at central and local level and stored in different formats. For this reason the reported data aren't always referred to the same period.

The environmental aspects are regulated by too many Laws, Acts and Regulation produced from year to year, which sometimes are implemented with difficulty. Some of these are characterised by a sort of a guarantist approach that can make it difficult the actual enforcement and monitoring of the prescribed rules. For this reason, a new approach is rising towards framework laws on specific environmental sectors which combine in a consolidation act the existing and practicable regulations, integrate the absent aspects and abrogate all the previous legislation. Two framework laws, on Wastes and Protection of habitats have already issued in 1997 and 1991 respectively, a third framework law on Water protection and management is in progress and is supposed to be issued for the present year.

Some country characteristics can be summarized as follows:

Italy, with its 324,000 km² of State territory has a population density of 189 inhabitants/km². About 637 coastal Municipalities, 600,000 industries (129,000 with more than 10 employees), a spread infrastructure network, only a 29% of the total surface area is covered by woods, but also 2,800 sites with species or habitat of European interest are identified the Italian territory.

Beside these natural areas there are also:

- 14 polluted areas with a high risk of environmental crisis, for which the action plans are in progress;
- 16 polluted sites of national importance, for which the relevant actions for remediation have been finaced very recently;

- 14 main hot spots which have a serious negative impact on the marine environment, already selected in the Strategic Action Programme to address pollution from land-based-activities. Some of the mentioned hot spots are already listed in the above two categories of threatened areas.

2. Background, Information on activities

2.1 The ten most environmentally significant activities in the Italian coastal area are:

2.1.1 Fertilizer production

In the period from 1990 to 1993, it has been registered an increase up to 15% in the use of fertilizer, whilst in the 1994 there has been a decrease up to 11% compared to the previous year. This drop may be due to the fact that Italy has been one of the first European countries which have drawn up and adopted a "Good practice Code for the water protection to the nitrates", whose adoption was regulated by UE directive n.676/91 which aim is to reduce water pollution caused by nitrates from agricultural sources. This code identifies the possibility of a high grade of effectiveness in the fertilization activities, with the help of crops fertilization plains adoption.

The fertilizer use reduction has been, also, favoured by the diffusion of the biological cultivation techniques.

2.1.2 Petroleum refining

Italy is one of the principal petroleum importer countries to satisfy its energy needs (with a dependence of about 93% of total petroleum consumptions). In the last years, Italian petroleum refining industry has designed some project for its plant engineering adaptation, in order to promote some energy efficient plants. The principal actions can be summarized as follows:

- reducing emission deriving from the manufacture and distribution plants. In the last ten years, these emissions have been reduced of about 40%;
- promoting the manufacture of high environmental compatibility product.

Between 1991 and 1996, there have been investments for about 3,300 billions lira finalized to:

- the energetic efficiency improvement for the oil refinery, for the terminals, for the transport and sale;
- the working training and to the public information;
- the development of new and more efficient oil technologies.

Other relevant data for the Italian petroleum sector are:

- in 1994, the volume of the total tanker traffic for the petroleum transport, has been more than 300 million tons, into the 17 principal Italian ports, and the movement of petroleum products unloaded and shipped in the same ports, has reached the value of 188 million tons.

- thanks to qualitative production improvements, since 1993, the CO₂ emissions in the petroleum industry are now ranging at 17/18 million tons.

The petroleum industry has committed the construction of three gasification plants of the heavy residuals refinement products, in order to reduce the emissions and to improve energy conservation. These plants will allow the digestion of about 2,5 million tons for year of residuals.

Another important activity of the petroleum industries, is the transformation of some traditional electrical-power plant in advanced cogeneration plants (electricity and heat production).

2.1.3 Agriculture

The Italian agricultural system represents an income of about 286,000 billion lira, about 15% of the national GDP.

Beyond the environmental impacts caused by the use of fertilizers and plant protection products, agricultural activities involve the occurring of salinization phenomena. These phenomena are particularly important in the coastal areas, where the irrigation may demand an overpumping of underground waters, and also is often practised by means of spare or very bad waters quality.

According to the ISTAT census conducted in 1990, there are about 3 million agricultural, forestry and livestock farms in Italy, covering almost 23 million hectares, with 15 million hectares of cultivated land (66.3%). Compared with 1961, the number of farms has dropped up to 19% (1,258,000 farms) and the cultivated land decreased of 16%.

Since 1970 there has been a 16% decrease in the number of agricultural concerns (corresponding to the disappearance of about 570,000 farms) and about a 10% decrease in the total area of agricultural land, corresponding to about 2,4 million hectares. The area of agricultural land effectively used has undergone a 14% reduction (about 2,5 million hectares).

In the last ten-year period, the watering by surface waters needs has been doubled, while the watering by well waters is increased from 89,000 l/sec to about 115,000 l/sec. The direct effects of watering by underground waters is the lowering of the stratum level, which by itself can determine environmental changes (the coastal zone can be subject to the salinization of the stratum).

Livestock farming is responsible for the emissions of ammonia and methane, in the case of ruminants breeding. But, livestock farming emissions presents some regional variations because of differences in livestock keeping methods. Throughout the country there has been a decrease in the productive intensity of cattle, namely in the ratio between the number of cattles and the area of farmland used, which is a rough indication of the pressure that the livestock farming exerts on the environment. Actually, in 1982 there was a load of 0.55 beasts/Ha, and in 1990 this value dropped to 0.51. This trend towards a reduction in the number of cattle, is confirmed by the size of the livestock estates which is decreased from 9.51 million in 1961 to 8.69

million in 1982 and to 7.66 millions in 1990. Zootechny, because of its high concentration in some areas, is often an activity which produced great environmental impacts. In order to lower these environmental impacts, the legislator has introduced the maximum limit of waste that can be spread into one unit of surface per specific typology of land agricultural use.

Biological agriculture is quite diffuse on the Italian arable land. From 1985 to 1997, Italian biological farms grew up from 600 to 31,000 and the pertinent surfaces from 100,000 to 500,000 hectares.

2.1.4 *Tourism*

The Italian coastline (7,500 Km) has been subjected to an intensive urbanization. Between 1950 and 1991 the population in the coastal municipalities increased by about 4,600,000 inhabitants (interpolated data from 1991 census) rising from 27% of the total population to 30%. In addition to the pressure on the environment (particular important is the effect of the seasonal residence) there is a physical resident population pressure deriving from the increase in the number of buildings, particularly those used by tourist industry. The growing of international tourism is principally due to the integration, changing socio-economic conditions, better transport and tourist infrastructures. Among the phenomenon emerging over recent years, a mention should be made of the spread of man-made recreational amenities in the seaside resorts. The human pressures, the bathing limitation for seawater pollution (remarkable in the past years, but now reduced at the 6.4% of the total Italian coastline) and the coastal erosion have hindered the use of beaches for leisure activities. The tourist industry has reacted by supplying alternative services versus inland resorts.

2.1.5 *Urban development*

About 17,8 million inhabitants (which represent 30% of national population), are living in the 637 coastal municipalities, with a high density of 387 inhabitants/km² compared to the national average of 189 inhab/km². The trend of the internal migration towards the coastal areas is still positive. The residential estate, in the above mentioned Municipalities, is about 8 million of houses. Many of these are built non in compliance with the town planning and sometimes without building permit. The illegal activity in the residential building sector is an evil not well controlled yet. The ratio of 1 house per 2.2 inhabitant seems to be quite high and many of those houses are scantily utilized.

Besides the demographic increase of the coastal municipalities, there is also a location of productive and recreational activities almost spread along the coastal area. The lack of planning concerning productive and residential settlements, affected the state of distress of the coastal marine environment with some phenomena of degradation (as poor air or water quality, excessive noise, traffic congestion, dune destruction, loss of green areas, etc.).

Another source of environmental impact concerning the Italian coastal areas and connected with the littoral municipality and conurbation development, is the high number of existing ports (they are 96 of which 36 of national interest, 33 of regional interest, 27 of local interest). Beyond the marine pollution phenomena which are caused by harbour activities, there is a greater and greater demand for movement and storage space for the goods. In this context, a larger container platform capacity is now performing in some Italian ports.

2.1.6 Domestic wastewater disposal

The management of domestic wastewater depuration plants in Italy is - for the most part - entrusted to public bodies. Out of these, about 76% are Municipalities and about 12% are private person. At present there are 9,806 depuration plants, but only the 87% of these are really working (for a served population of more than 68 million inhabitants equivalent), about the 13% aren't operating, and 1,400 depuration plants are under modernization or construction.

In fact, the effectiveness of depuration depends principally on the type of treatment. The available data point out that, among existing depuration plants, 43%-utilize still the most simple technologies (that means the primary treatment). Secondary treatment concerns about 50% of plants, while tertiary treatment plants represent only 7% which serve about 39% of inhabitants. This latest data reflects the European tendency to built large dimensions plants with advanced technology.

2.1.7 Tanning industry

The Italian tanning industry, with its 2,400 companies and 25,000 employees, represents 65% of the European production. It has an income of about 11,000 billion lira for year (1996), that is 15% of the world sales. The amount of the national production of hides is of about 185 million m², and 54 million kgs of hide for shoes sole. According to the ISTAT Census conducted in 1996, the index of production concerning tanning industry from 1990 to 1995 has increased up to 3.6%.

The environmental impact of tanning industry is very high, especially as regards wastewaters and industrial wastes deriving from processing. This is underlined by the fact that one of the 14 polluted areas with a high risk of environmental crisis (existing in Italy), namely Sarno, is affected by the environmental damages deriving from tanning industry.

2.1.8 Chemical industries

The chlorine industry is a sector with hard safety, health and environmental impact. It supplies important products for the water sanitation, bleaching processes, medical devices, vaccines and medicines, herbicides, pesticides, special lubricants, solvents, plastics. Some of these products are classified as "persistent organic pollutants" (POPs), and they can appear long distance from where they are used, this because of their low rate of degradation in the environment. Some of these substances are, also toxic and liable to accumulate (PTBs). About 75% of the total Italian capacity of the

chlorine production is employing the mercury cell process, but a significant progress in reducing mercury emission in the environment has been achieved (more than 80%) in the last twenty years. Italian companies, associated in Federchimica and Eurochlor, according to a European agreement, commit themselves to make investments in order to reduce, within the year 2007, mercury emissions in air below 1 g. of Hg/ton of productive capacity of chlorine. This target will be reduced at 0.6 - 0.7 g/ton Cl₂ within the year 2010. Such programme of conversion from mercurial to membrane process aims at phasing-out the mercury process through a planning which has not to produce a parallel pollution deriving from the accumulation of the cut contaminated loops for decommissioning. On this subject, there are two crucial problems still on the table: the remediation of the polluted sites by POPs as a result of about 50 years of inadequate knowledge and legislation, and the conditioning for a final disposal of those substances, as PCBs, whose manufacturing and use are not allowed any more.

Another sector is the plant protection product production. Italy is one of the first consumer countries in the OCDE, with about 766 kg. of active substance per arable surface. Between 1985 and 1994, plant protection product total quantity distributed in Italy, has increased from 167,000 tons/year in the 1985 to 209,000 in the 1988, and then it has been lowered to 158,000 in the 1994. The reason of this trend can be explained by the adoption of the Good Practice Code in agriculture and in the development of the biological agriculture.

In Italy 600 plant protection products have been authorized, as antiparasitical, pesticides which are chemical compounds tied to the chlorine industry. Environmental hazards are connected whether to their toxicity for the out-target species, or to their diffusion in the environment (air, water, soil).

2.1.9 Paper and pulp industry

Paper and pulp industry have an income of about 10,450 billion lira (1997) and a production of about 7.5 million tons in 1997. From 1988 to 1997, the Italian paper industry has registered one of the most productive increase that is of about 27%. Besides this figure in the same period it has been noted a reduction of number of factories (from 228 to 209) and of number of employees (from 27,900 to 25,600). This phenomenon privileged the development of larger and more environment respectful plants.

Paper production uses some harmful substances which are utilized in the processing and introduce them in the environment, through wastewaters. These toxic substances, represented namely by the elemental chlorine, are used in the bleaching phase of the grey cellulose, because of its strong nature of oxidization.

In the last ten years period, new methods of production are emerging in order to decrease progressively as far as to eliminate chlorine from the processing. In particular, two are the principal methods:

- the Elemental Chlorine Free (ECF), which in the bleaching phase, makes use of chlorine dioxide (less pollutant) as substitute for elemental chlorine;

- the Total Chlorine Free (TCF) which consists of the substitution of the chlorine with the use of oxygenated water and oxygen.
- In this way cellulose-pulp is less white, but its final quality is however good.

2.1.10 Municipal solid waste

The total amount of waste produced in Italy in 1994 is estimated at about 63.6 million tons/year. Of these, 22.8 million tons/year are solid urban waste, 4.2 are disposable as urban waste, 19.3 are special wastes, 2.7 are toxic-hazardous wastes, 14.4 are inert wastes and about 0.2 are hospital wastes.

By comparing, the amount of solid urban waste produced in 1994 (22,8 million tons) with that produced in 1991 we can see an increase of 13.5%, while for the toxic-hazardous wastes it has been registered a decrease of about 20% in the same period. This trend is also confirmed for the following years.

Of the 27 million tons of solid urban wastes produced in 1994 (including those which are disposable as urban waste):

- 1,4 million tons are incinerated (incineration plants existing in 1995 were 52 of which 40 operating and 12 under restructuring);
- 23.8 million tons are destined for land field;
- 1.8 million tons are recycled.

The recycled quota in 1996 is increased of more than 60% with respect to 1994.

According to the data issued by the Italian Package Institute, concerning the separate collection and energy recovery 1996, pointed out that:

- plastic packages: of the 1,685 million tons produced, 0,113 million tons have been recycled by means of separate collection (of which 0,102 million tons have been utilized for energy recovery) and 1,572 million tons represent the waste residue;
- wood packages: of 1,777 million tons produced, 0,700 million tons have been recycled by means of separate collection (of which 0,07 have been utilized for energy recovery) and 1,077 million tons represent the waste residue;
- glass packages: of 2,049 million tons produced: 0,894 million tons have been recycled by means of separate collection and 1,155 million tons represent the waste residue;
- aluminium packages: of 51 million tons produced, 0,007 million tons have been recycled by means of separate collection and 0,044 million tons represent the waste residue;
- paper and cardboard packages: of 3,060 million tons produced, 1,190 million tons have been recycled by means of separate collection (of which 0,122 have been utilized for energy recovery) and 1,870 million tons represent the waste residue;
- iron: of 0,426 million tons produced, 0,045 million tons have been recycled by means of separate collection and 0,381 million tons represent the waste residue;
- others: of 0,068 million tons produced, 0,068 million tons represent the waste residue, and 0,004 have been utilized for energy recovery.

2.2 Best Available Technology and Clean Technology

In Italy, the provisions for using Best Available Technology and Cleaner Technology are limited. They are namely based on voluntary agreements with the competent ministries and industrial associations.

Recently, the D.Lg. n.22/1997 takes into consideration that competent authorities have to promote initiatives in order to foster the prevention and reduction of the wastes production, trough, inter alia, the Cleaner technologies development, in particular those which are natural resources saving-oriented. This decree also considers the promotion of the use of BAT in the disposal activities of wastes.

The promotion of BAT is also favoured by the application of Environmental Management and Audit Scheme (EU Regulation n.1836/93) by Italian industry; but nowadays its implementation is still lacking.

2.3 The state of environment in relation to the quality of seawater, inland water and habitats

2.3.1 Seawater

The quality of the coastal seawater is improving year by year. In 1997 about 457 km of coast have been found to be inadequate for bathing. This value, which represents the 6.4% of the total Italian coastline, has to be compared with that of 1990 which represented 8.68%. The inadequacy of the depuration systems of the wastewaters deriving from industries, agriculture and urban activities is the main cause of this situation.

2.3.2 Inland water

The total volume of the water resources for exploitation (including water surface) is valued about 100 billion mc, which decrease to 40 billion mc, if we consider that about 60% of the total volume is unusable for the physical, qualitative and economic limits.

Italy total water needs is about 33 billion mc/year, which are shared in a dishomogeneous manner on the country: 22,9 billion mc/year in the North; 2,5 in the Centre; 7,6 in the South. This water needs is satisfied for 66 % by river waters, 6% by lake and overrun waters, 28% by underground' waters. In particular, in the Centre and Southern Italy, the exploitation of surface and source waters prevails on the well waters exploitation, while in the Northern Italy the situation is on the contrary. The use of freshwater can be distributed as 14% for urban consumption, 20% for industrial purposes and 66% for agricultural needs. The most recently information on the quality of inlandwater pointed out that on 118 rivers only 31% are in good quality, about 29% are in moderate quality, about 28% are in poor quality, and about 12% are in very bad quality.

Concerning underground water, Italy is a country rich in this kind of natural resources, but this richness is often endangered by a mad use of the resource itself. This use is characterised by an excessive unplanned drawing, and by a widespread pollution of different origin (urban, agriculture, industrial). Italy is one of the countries, in the European Union, with most drawing - about 30% of the available resource.

2.3.3 Habitats

The quality of habitats results rather good. In particular the protection of natural habitats has been made with the protected area system: there are 17 National parks, 147 National Continental reserve, 218 Regional protected areas, others 70 Protected areas which are managed by public, others 12 protected areas managed by private and 17 Marine natural reserve. The management of these protected area is sometimes difficult, because of some lack in financing. Besides, there have been identified 2,800 sites of European importance through the application of the UE Dir. n. 43/92 (Habitat); it's also in course of definition the Italian Nature Paper which will enable the individualization and the description of habitat conditions.

2.4 The environmental monitoring

2.4.1 *Seawater quality*

The systematic monitoring activities for the seawater quality, has been introduced by the Law n.979/1982 for the protection of the seawater. In particular, the monitoring of bathing waters (DPR 470/82) takes place twice a month, during the spring-summer season.

2.4.2 *Inland water quality*

According to the Law 61/94, Regional Agencies for Environmental Protection (ARPAs) of the National Agency have been established the regional authorities for surface water monitoring and pollution control, besides of the Local Sanitary Units (ASLs).

2.4.3 *Industrial wastewaters*

The ARPAs are responsible for the monitoring and pollution control of all discharges into surface waterbodies.

2.4.4 *Industrial solid waste*

Recently, with the introduction of the MUD (Environmental Declaration Verified Model) by the Law n.70/94, every year, the company declares to the territorial competent Chambre of Commerce, the characteristics of the wastes, and the destination of waste (recycle, reuse, incineration, landfill). The company also has to report all information on produced waste on the loading and unloading register. At moment, MUD seems to be an effective tool for the creation of a Cadastre for the Industrial Special Wastes, Disposable as urban wastes and toxic wastes as Law n. 475/88 disposes. In 1996, first year of practical implementation of MUD, about 500,000 companies have made their declaration.

2.4.5 *Domestic wastewater disposal*

The Regions are entrusted with monitoring of discharge installations connected to public sewerage; whereas the municipalities are entrusted with water supply and wastewater treatment. ARPAs and ASLs are charged of the quality monitoring.

2.4.6 *Incineration of wastes*

Monitoring takes place by the licences and permits systems in place. ARPAs and ASLs are charged for emission quality monitoring.

2.4.7 *Municipal solid wastes*

Also this activity is subjected to the Law n.70/94 concerning the MUD. In particular, in 1996 about 7,000 municipalities have presented the MUD.

2.5 The public awareness on environmental problems

The awareness of Italian public of environmental problems is moderate, but it is improving very fastly. School, mass media and special educational programmes play a very important role in this improvement. Generally speaking, young people have a better awareness than older people; and this awareness is also influenced by the sector of activity in which people are involved.

2.6 Environmental action groups

The Environmental action groups are often consulted and their advice can influence decision making. The law establishing the Ministry of Environment states that associations with certain characteristics (statutory aims, presence in at least five regions, democratic and representative internal regulations) can be recognized by the Ministry as eligible for the National Council for the Environment membership. At present the most active environmental associations in Italy are, namely: Legambiente, WWF Italia, Greenpeace Italia, Ecomed, Marevivo, Amici della Terra.

2.7 Other relevant information

The Ministry of Environment is due to refer to the Parliament and to the State Audit Court each year about the activities, actions, investments and programs in progress on Environment. Moreover, in the period of three years, the Minister issues a report on the State of the Environment including current data about the different sectors that directly or indirectly influence the environment.

The Water Resources Surveillance Council established by Law n°36/94 and created in December 1994, reports, from 1997, every year to Parliament on the state of water resources. The information contained in that report are, at present, concerning namely the water supply contest, status of tariffation, mechanisms for the application of equitable tariffs, and, for a little part, the environmental water quality.

3. Legislation

3.1 Legal framework for the environment

A legal framework law on environment doesn't exist in Italy. Even if it doesn't exist (a framework law on environment), there have been issued two concerned framework laws on waste (D. Lg. n.22/97) and protection of habitats (L. n. 394/91) and there is in progress the framework law on water.

3.2 Legislation and/or guidelines existing for the control of seawater and inland water quality, and for protection of habitat

3.2.1 The seawater quality

The seawater quality is regulated by the DPR n. 470/82, Law n. 979/82 and subsequent amendments. Another relevant Law for the protection of the seawater is the Law n.220/92 and its amendment, that among other things gives the competence to the Central inspectorate for the seawater protection of the Environmental Impact Assessment procedures for projects and activities in the seawaters.

3.2.2 Inland water quality

Inland water quality is regulated by several laws, Acts, and subsequent amendments. The Law n. 319/76 which regulates modalities of wastewater discharges, monitoring of the characteristics of the freshwater bodies, and asks the territorial authorities the redaction of regional plans, for water quality improvement and sanitation. The Law n. 193/89 "Soil conservation Act", which created six national level River Basin Authorities and gives the competences to regional governments to set up intraregional and regional River Basin Authorities. The aim of the law is to plan all action on the river basin taking into account, inter alia, flood and landslide risk, water quality, surface water use, minimum vital, flow limits, etc.. The Law n. 36/94 which created the Optimal Territorial Areas to be defined by regional laws, introduces active promotion of rational use, reuse and recycling, and improved management structures for water supply. The Provinces are responsible for the registration and control of all discharges into surface waterbodies.

In order to secure that inland water resources aren't overexploited, licensing is subjected to legally binding conditions, the abstraction permit may cease its effects when the legally indicated environmental river flow is assessed below its required level. Italy included a specific reference to abstraction control for irrigation with the RD n.1775/33 as amended by DL n. 275/93.

3.2.3. The protection of habitats

The protection of habitats is regulated by the Law n. 394/1991 which introduced a framework for an adequate planning of the sector and for a distribution of responsibilities among State, regional and local administrations.

3.3 Legislation or guidelines existing for the regulation of the following sectors:

The sectors of industrial wastewater disposal, industrial solid waste disposal, urban development, domestic wastewater disposal, incineration of wastes, urban solid waste disposal and new infrastructure projects are fully controlled by the existing regulations; the animal breeding and agriculture sectors are controlled to some extent by the existing regulations.

3.4 The existing provisions in legislation for:

3.4.1 the Environmental Impact Assessment of new projects.

The EIA EEC directive came into force with the Law 349/86, the DPCM 377/88, the DPR 12/04/1996 and the DPR 11/02/1998. DPR of 1996 states that all Italian regions

should have issued regional laws about the EIA procedures. It classified if the competences for the new projects EIA procedure is of the State or of the Region, if is the new projects EIA procedure is compulsory or not; and in this last case the decision has to be taken on a case by case basis according to some fixed criteria. At present only nine Regions have operational EIA procedures (Provincia autonoma di Bolzano, Provincia autonoma di Trento, Valle d'Aosta, Friuli Venezia Giulia, Liguria, Toscana, Umbria, Abruzzo, Basilicata).

3.4.2 *the permitting of new projects.*

The D. Lg. n. 112/98 introduced two procedures for the realization of new projects, that are: simplified procedure with an self-certificated demand to the Region and demand to the Region without autocertification. In the case of enlargement, reconversion, restructuration, of existing plants, the decree requires a simple communication to the Municipality. The introduction of these procedures depends on the establishment, in each Municipality, of a Single Counter, which will be responsible of these simplified procedures (as established by the D.M. n. 57/97). The simplified procedure can not be applied in some specific cases identified by the D. Lg. 112/98 (such as the waste treatment activity).

3.4.3 *the periodic permit renewal.*

The periodic permit renewal depends on the provisions of the specific laws in the different sectors, in any case all these laws impose periodical controls. For example, Law n.30/1994 fixes a maximum (15 years) for licences granted for industrial large withdrawals.

3.4.4 *the inspections for compliance control.*

The compliance control is carried out, on all national territory, by the Inspectors teams, also supported by technical bodies members.

3.4.5 *the compliance promotion and enforcement in cases of violations.*

Generally, in cases of violations an adjustment period is allowed and a new inspection for checking the actual corrective actions is scheduled.

4. Permitting

4.1 The permitting system in Italy.

4.1.1 *Industrial activities*

The number of competent Authorities are in general too many and it is difficult to manage with this heavy bureaucracy. The present and the former Government fostered, with a new law and consequent Ministerial Acts, some simplified permitting systems and some more speedy procedures. In Italy permits for all industrial activities whether for building or for operating are required. These permits are always required by companies. In particular, the industrial activities with a high risk of accident are identified and subjected to safety procedures under DPR 175/88 which implements EEC Directive 82/501 and the subsequent Act of the Prime

Minister of 31 march 1989. Such kind of manufacturers are also required to notify, together with a safety report, to the Ministries of the Environment and Health and to the regional government concerned, in the cases of overcoming of the quantity of processed or stored substances respect to the established thresholds.

4.1.2 *Animal breeding*

The principal provisions about the permitting system for the animal breeding activities are those relevant for the Hygiene and Security on the Work Places.

4.1.3 *Urban development*

There are municipal and regional provisions concerning the Town Planning Scheme and the specific permits and authorizations for urban development activities.

4.1.4 *Domestic wastewater*

They are discharged to the public sewerage system through a prior demand to the Municipality. Moreover, the wastewater disposal licences system was established by the Law n. 319/76. The licences are granted on a permanent basis when the discharges comply with the quality standards envisaged by the law (tables A and C in Annexe), whereas only provisional licences are granted when the quality of the discharges doesn't comply with the regulations.

4.1.5 *Incineration of wastes*

A large number of rules introduce some procedures to the waste incineration activities, among which, EIA, building permit, construction and exercise authorization, air pollution emission authorization and monitoring, discharge authorization. D. Lg. n.22/97 establishes the demand to the territorial competent regional authority, for the installation of incineration of wastes. Moreover, the same decree establishes that from 1/01/1999 on the permits for incineration plants installation are granted only when the incineration activities are oriented to heat production.

4.1.6 *Solid waste disposal*

Solid waste disposal requires always the permits of the territorial competent authorities.

4.1.7 *Infrastructure project*

The infrastructure projects or restructuration of already realized project are subjected to the permit legislation which fixes the EIA procedures.

4.2 The main authorities responsible for permitting

They are: Ministers, Regions, Local Authorities (Provinces, Municipalities).

4.3 The effectiveness of the permitting system in Italy

- All new projects are subjected to the EIA procedures if they are included in the type individuated by laws.
- For existing project EIA procedure hasn't been done, except in the case of a restructuration.

- Permits are always issued for new and existing projects.
- Industry is subjected to a periodical renewal permit as established by specific legislation.
- Italian industries have drawn up some voluntary agreements among their specific sectors (for example the Responsible Care Programme which has been sought by many chemical industry in order to implement an environmental management of their activities) and between them and government in order to improve environmental condition in the industrial activities (such as the agreement between Ministry of Industry and Tanning Industries to promote the EMAS implementation in a large number of these industries).

4.4 Employees of all related ministries/agencies dealing with permitting

It is not possible to give any figures on this issue in consideration of the new organization of the new simplified permitting systems. This rationalization leads to reduce the number of the competent Authorities and to appoint one officer as "responsible of the specific proceedings" which is also a contact man with the other competent Authorities.

4.5 Access to information on general environmental issues

Law 241/90 establishes new rules for the administrative procedure and for the right to have access to administrative documents. But even if that law allows public access to available information, nowadays it isn't always properly applied especially in some small municipalities.

Moreover, the D. Lg. n.39/97 applying the EU Directive n.90/513, concerning the right to have access to environmental information by the public.

4.6 Other relevant information

In Italy still persists a structure based upon a mixing of both administrative and technical bodies responsible for the permits and controls. This condition often leads to relevant delays in the implementation of the overall environmental monitoring, controls and also compliance promotion activities.

5. Compliance and Enforcement

5.1 How compliance is promoted in Italy

Compliance is promoted in Italy principally by "command and control" regulation and legislation system. In the last years, some financial instruments for the environmental protection and improvement are introduced in Italy (such as Law n.488/92, Law 598/94, Law 341/95, environmental fiscal incentives in the 1997 Financial law).

5.2 How compliance is checked in industrial plants prior to production

Compliance is always checked in industrial plants prior to production both by the testing of the plants and the control of compliance by competent inspectors.

5.3 Provision when complaints are lodged

When complaints are lodged the inspections are systematic and are carried out by the competent control authorities (in particular the Aziende Sanitarie Locali - Local Sanitary Company).

5.4 Periodic control and inspection on activities which have permits

The periodic control and inspection on industrial plants which have permits are always carried out; these controls and inspections on animal breeding activities, on urban development activities, on domestic wastewater disposal, on incineration of wastes activities, on urban solid waste disposal, on infrastructure projects, are sometimes carried out.

5.5 The main authorities responsible for compliance and enforcement

There are a large number of bodies involved: **Ministries:** Environment, Health; **Local authorities;** **advisory committees:** Ministries of Health and Civil defence **technical bodies:** Institute for Prevention and Safety at Work (ISPSP), Institute of Health (ISS), National Fire Brigade, Ecological Executive Squad and Anti-Adulteration Unit belonging to the Army of Carabinieri, State Corps of Foresters, the Unit of Financiers.

5.6 When a violation is verified

When a violation is verified there is always an administrative response and re-inspection for corrective actions, and sometimes criminal prosecution.

5.7 Means of compliance promotion and enforcement

The main instruments are represented by the voluntary agreement and by financial and fiscal incentives. Other important means of compliance promotion and enforcement are:

- regulatory instruments conceived to make the public aware of qualitative status of sites liable to be pollutant;
- the availability of consultation means (or other means) about environmental indicators that can be easily understood by everybody;
- the diffusion and the improvement of environmental available information towards companies and public;
- the introduction of the environmental law in the criminal code;
- a better co-operation at international level between responsible authorities and inspectors existing at national level.

LIBAN



L'UNITE DE COORDINATION DU PLAN D'ACTION POUR LA MEDITERRANEE

ATELIER DESTINE A DES EXPERTS

“ CONFORMITE AUX REGLEMENTS EN VIGUEUR EN
MEDITERRANEE EN MATIERE DE POLLUTION PROVENANT
DE SOURCES ET ACTIVITES SITUEES A TERRE, ET LEUR
APPLICATION EFFECTIVE”

LE RAPPORT DU LIBAN

PREPARE PAR: DR.NAJI KODEIH
MINISTERE DE L'ENVIRONNEMENT
LIBAN



1. INTRODUCTION:

Pendant les dernières années, des efforts sérieux et importants ont été fournis à tous les niveaux administratifs. Néanmoins, il est évident, que nous avons encore beaucoup de choses à faire sur le plan institutionnel, dans le domaine de l'efficacité administrative, de l'établissement des structures de contrôle et d'inspection, de la réhabilitation des laboratoires et des appareils d'analyse, des législations et des dispositions juridiques, des mécanismes d'enforcement et des programmes de surveillance ponctuelle et continue.

Des études sont effectuées pour établir des stratégies de gestion dans les différents aspects de la politique environnementale. Un plan national de gestion des déchets industriels est déjà mis au point. On entre dans la phase préparatoire de sa réalisation. Une stratégie de gestion des zones cotières est déjà établie, et un plan d'établissement de neuf stations de traitement des eaux usées dans les villes cotières est déjà en cour de réalisation.

De sérieux efforts sont fournis pour la revision, la modernisation et l'accomplissement de la base législative et réglementaire dans le pays, qui va permettre l'amélioration et le perfectionnement des activités de contrôle, d'inspection et de renforcer le respect et l'application effective des législations en vigueur.

Des travaux sont mis en application afin d'améliorer et simplifier les procédures du système de délivrance des permis pour les différentes activités économiques dans le sens de décentralisation, en respectant la nécessité de soumettre les projets à des études obligatoires d'impact sur l'environnement.

2. INFORMATIONS FONDAMENTALES SUR LES ACTIVITES

- **A votre avis quelles sont les dix activités les plus importantes pour l'environnement des régions cotières de votre pays:**

Les activités industrielles, à importance environnementale majeure, situées dans la zone cotière, sont les suivantes:

- 1- **La production d'énergie:** les 4 grandes stations de production d'énergie électrique de Liban sont situées dans la zone cotière, et sont les suivantes:

- a- Centrale de Beddawi (diesel/gaz)
- b- Centrale de Zouk Mechael (fuel)
- c- Centrale de Jieh (fuel)
- d- Centrale de Zahrani (diesel/gaz)



- 2- **La production d'engrais:** Il existe une seule usine d'engrais phosphaté au Liban à Selaata (Batroun).
- 3- **La production de ciment:** Il existe 4 usines importantes de ciment à Chekka.
- 4- **Raffinage du petrol:** Il existe au Liban 2 raffineries de petrol; mais elles ne fonctionnent pas depuis 1982. Cependant, Il existe beaucoup de reservoirs de stockage des produits petroliers dans la zone cotière.
- 5- **Industrie du tannage:** Il existe un nombre de petites industries de tannage à Daoura (zone de Grand Beyrouth) et à Gazieh (Saida).
- 6- **Industrie de teinture du textile:** Il existe un nombre de petites unités à Daoura et Zouk Mesbeh (zone de Grand Beyrouth).
- 7- **Industrie chimique:** L'industrie chimique de base est limitée au Liban. Les branches les plus importantes sont les suivantes:
 - **L'industrie de Savons, parfums, detergents:** represente 18% de ce secteur.
 - **L'industrie de peinture, verniches et laques:** represente un bon nombre de petits " formulateurs " de peinture qui melangent des resines importés, pigments et emballages.
 - **Les produits de plastique:** est un important sub-secteur. Toutes les matières premières sont importées, sans production ou formulation de résines de plastique.
 - **La formulation et l'emballage des pesticides.**
- 8- **Industrie agro-alimentaire:** Cette activité concerne la production des conserves des legumes et des fruits, confection des fruits, production de vin, extraction d'huile, distillation d'alcool.
- 9- **Industrie de métaux de base:** Traitement electrochimique de l'aluminium: chromage, stannage, etc...
- 10- **Industrie du papier:** est limitée à la production des papier, tissus et de carton à partir de pâte à papier importée.

• **Quel est dans votre pays, le niveau d'utilisation des Meilleures Technologies Disponibles et des Thechnologies propres?**

Pendant les dernières quelques années, on constate une tendance à investire dans de nouvelle technologie, et on témoigne un mouvement actif de modernisation dans certaines branches de l'industrie, en particulier: la production de ciment, l'industrie agro-alimentaire etc... mais , on peut dire, que le niveau general d'utilisation des MTD et des TP est encore limité.



- **Quelle est votre opinion sur l'état de l'environnement de votre pays?**

L'étude effectuée l'année dernière, sur la détermination des "Points chauds" de pollution et des Zones sensibles, sur la Côte libanaise, a démontré que la qualité des eaux marines dans la région centrale (zone de Grand Beyrouth), la région de Batroun (Nord) et de Gazieh (Sud) sont relativement les plus polluées. Cette pollution est due aux effluents industriels et aux rejets des eaux usées sans traitement préalable. Tandis que les autres parties de la côte libanaise sont relativement moins polluées, en constatant que la côte de Tyr (Sour) et de Biblos (Jbeil) sont les plus propres. Par conséquent, on peut dire que l'état de l'environnement basé sur la qualité des eaux marines est **Faible** dans les zones des points chauds (Grand Beyrouth, Batroun, Gazieh), et **Bonne** dans les zones sensibles (Biblos et Tyr).

Nous n'avons pas des données certaines sur la qualité des eaux continentales, mais le fait que Israël rejette régulièrement des déchets industriels dangereux et toxiques dans la pleine Mer, à 50 Km de la côte, au sud de Chypre, représente pour les pays de l'Est de la Méditerranée (Liban, Syrie, Chypre, et peut être la Turquie) une inquiétude sérieuse, compte tenu que le sens des courants majeurs est du Sud vers le Nord.

Il est sûr que dans certaines zones (Antelias, Bourj Hammoud) les habitats sont menacés par les travaux de reconstruction effectués dans l'eau de mer et directement sur la côte. Dans d'autres zones, les habitats sont probablement touchés par la pollution due aux rejets des effluents industriels et des eaux usées non traitées. On peut dire que la protection des habitats est **Moyenne**.

- **Est ce que l'on réalise régulièrement des contrôles de l'environnement pour:**
 - La qualité des eaux marines: L'Institut des Sciences Marines à Batroun effectue des études sur la qualité des eaux marines, et réalise des programmes de surveillance continue et périodique.
 - La qualité des eaux continentales: à raison d'insuffisance des moyens, le Liban ne participe pas activement dans les activités de contrôle régulier de la qualité des eaux continentales, malgré l'existence d'un potentiel scientifique qualifié et important.



- Les eaux usées industrielles: Dans le cadre du Plan National de Gestion des déchets industriels, et dans le cadre du Programme National de surveillance continue (MEDPOL Phase III), on a établi un programme de controle regulier des eaux usées industrielles, qui va debuter prochainement, après l'achèvement des préparations nécessaires.d'organisation et d'opération.
- Les déchets industriels: le meme pour les déchets industriels.
- Le developpement urbain: la plupart des aires au Liban sont de caractère rural, elles sont zonées en variété d'usage comme le tourisme, sport, agriculture, commerce, et activités industrielles. En plus, quelques aires sont zonées en reserves naturelles comme les forets, les caves naturelles, rivières etc...
Le developpement urbain est controlé par le Departement d'Organisation Urbaine au sein du Ministère des Travaux Publiques.
- Le deversement des eaux usées domestiques: dans le cadre de planification et de préparation d'établissement d'un nombre de stations de traitement des eaux usées au long de la cote libanaise (9 stations) de capacités et de niveaux d'épuration différents, on controle périodiquement les deversements des eaux usées domestiques dans la mer.
- L'incinération des déchets: On a décidé à arreter le fonctionnement de deux incinerateurs de déchets municipaux. D'autre part, on a planifié l'établissement d'un incinérateur des déchets médicaux qui fonctionnera prochainement.
- Les déchets municipaux: On a établi une gestion des déchets municipaux basée sur la minimisation, séparation, recyclage et rusage, et enfin, le landfill sanitaire. Cette gestion est réalisée dans la zone de Grand Beyrouth et Mont-Liban, en préparant sa réalisation au niveau de tout le territoire libanais.

• **D'après vous quel est le niveau de sensibilisation du publique sur les problèmes de l'environnement?**

Grace aux activités du Ministère de l'Environnement, des organisations non gouvernementales, et des medias, on observe un **haut** niveau de sensibilisation du publique sur les problèmes de l'environnement.



- **Est ce que les groupes d'action environnementaux (ONG) influencent les décideurs de votre pays?**
Il existe au Liban un bon nombre de groupes d'action environnementaux (plus que 80), la majorité est regroupée en deux federations différentes en compétition. Cette atmosphère de compétition assure parfois, des résultats positifs, et dans d'autres cas empeche la bonne réalisation de certaines actions. En generale, l'influence des ONGs sur les décideurs est conditionnée et parfois est fructueuse.
- Je crois qu'une evolution des ONGs à base de la differentiation d'activité et de l' integration d'action, assurera des meilleurs resultats, et augmentera l'importance de leur influence sur les decideurs.

3- LEGISLATION

- **Est-ce que vous disposez d'une loi cadre pour l'environnement?**

Un projet-loi, préparé par le Ministère de l'Environnement et concernant le Code de l'Environnement se discute au Parlement. A la suite de son adoption, une série de Lois, de Directives et d'autres instruments législatifs lui seront ajoutés afin de contrôler plus efficacement et dans les moindres détails les différents aspects de la pollution.

- **Est-ce qu'il existe dans votre pays des lois ou des lignes directrices pour le controle de la qualité de l'environnement?**

Le Ministère de l'Environnement a adopté un Décret No 52/1 en septembre 1996 portant sur les normes et les limites admissibles de la pollution de l'air, des eaux et des sols. En effet, le Décret contient un nombre de " Normes de Qualité de l'Environnement" portant sur les décharges directes des eaux usées industrielles dans le milieu aquatique. Le Ministère est entrain de préparer une série de législations, applicables à tous les milieux aquatiques et traitant les limites de décharge directe dans l'eau. Il feront recours au Protocole de Protection de la Méditerranée contre la Pollution provenant des activités menées sur terre (LBS Protocole), ainsi qu'aux Normes de la Communauté Européenne et les valeurs guides de l'Organisation Mondiale de la Santé (OMS).

Les tableaux de 1 à 7 illustrent les normes de qualité des milieux aquatiques: les eaux fraîches, les eaux estuaires et les eaux de mer.



- Nous sommes entrain de préparer l'adoption des valeurs guides concernant la disposition des eaux usées industrielles et des eaux usées domestiques dans les différents milieux recepteurs, en faisant recours aux normes adoptés par le Comité pour combattre la pollution industrielle dans les pays arabes sous l'égide de la Ligue Arabe.
- Nous avons commencé à préparer un projet-loi pour la gestion des déchets (déchets solides urbains, déchets dangereux de sources variées etc..) , en faisant recours aux documents proposés par la Convention de Bâle sur le controle du mouvement transfrontier des déchets dangereux et leur disposition.
- Dans le domaine de l'agriculture, le Décret du Ministère d'Agriculture determine les pesticides interdits au Liban.
- Le departement d'Organisation Urbaine au sein du Ministère des Travaux Publics controle l'application des normes et des législations qui concernent le developpement urbain.
- Le Conceil de Developpement et de Reconstruction avec le Ministère de l'Environnement controlent l'application des législations et des mesures à respecter dans le domaine de la disposition des déchets domestiques et leur gestion complète, y compris le controle des "landfills".
- Nous avons deux incinérateurs de déchets domestiques qui ont été arreté et fermé en admettant la stratégie de minimisation , séparation, recyclage et reusage et le landfilling des résidus.
On se prépare à mettre en fonction un incinérateur spécifique pour les déchets médicaux dans le prochain future.
En général, nous pouvons dire que l'existence et l'application des législations est **incomplète**.
- Le projet-loi du Code de l'Environnement, qui n'est pas encore adopté, prévoit l'obligation d'Etude d'Impact Environnemental (EIA) pour tous les projets. Actuellement, seulement les projets majeurs financés par des institutions internationales (Banque Mondiale etc...) sont soumis à une étude d'impact. Les autres projets doivent respecter et appliquer une série de conditions ayant comme objectif la protection de l'environnement, déterminées, dictées et controlées par le Ministère de l'Environnement.
- Partiellement, et dans des cas limités, on applique une étude d'impact environnemental sur des sources existantes, afin de corriger leur situation pour but de proteger l'environnement, et pour attenuer leur effet néfaste sur l'environnement.
- Suivant les législations en vigueur, les permis de nouveaux projets sont soumis à trois types de conditions:
 - 1- Les conditions posées par le departement d'Organisation Urbaine,



- 2- Les conditions posées par le Ministère de la Santé.
- 3- Les conditions posées par le Ministère de l'Environnement.

-Le renouvellement des permis temporaires est soumis aux memes types de conditions mentionnés.

-Le controle et l'inspection afin de verifier l'application des conditions et le respect des recommandations est executé par:

- 1- Les inspecteurs du Gouvernat.
- 2- Les inspecteurs du Ministère de la Santé.
- 3- Les experts du Ministère de l'Environnement.

- Dans les cas d'inconformité et de violation des conditions et des recommandations, des mesures de punitions relatives peuvent etre suggerées au Gouverneur, qui seul a le pouvoir à prendre la décision et à agir. Les mesures de punition peuvent dans certains cas provoquer la fermeture de l'entreprise.

4-Delivrance des permits

- Est ce que dans votre pays existe un système de délivrance des permis:

Il existe au Liban un système de délivrance des permis pour toutes les activités économiques; mais ce système necessite d'etre modernisé, dans le sens de simplification et de décentralisation.

Toutes les activités économiques, et en particulier celles de l'industrie, sont classifiées en trois catégories. La première catégorie regroupe les entreprises relativement lourdes, la deuxième catégorie regroupe les entreprises de taille moyenne et enfin la troisième catégorie regroupe les petites entreprises. Cette classification est ancienne et elle est basée sur des critères purement économiques (nombre d'employés, investissement etc...). Des études sont en cours ayant comme objectif de reviser la classification actuelle dans le sens d'établir une nouvelle classification basée sur un complexe de critères économiques et environnementaux et en particulier l'estimation de l'impact sur l'environnement et la santé publique.

En ce qui concerne la délivrance de permis, on distingue deux niveaux de procédures, l'une est plus simple et concerne les activités qui appartiennent à la troisième catégorie. Pour ce type d'entreprises, les autorités municipaux et



locaux délivrent les permis; tandis que les activités de la première et la deuxième catégories vont suivre une procédure plus compliquée. Cette procédure est composée de trois étapes:

- 1- la première étape est déterminée par l'acceptation des autorités **municipaux et locaux**.
- 2- La deuxième étape est déterminée par la constatation du Ministère de la Santé, du Département d'Organisation Urbaine, et du Ministère de l'Environnement. La constatation de ces trois administrations est accompagnée de la liste des conditions qui doivent être respectées dans le cas où l'entreprise sera permise.
- 3- La troisième étape est déterminée par la délivrance du permis. C'est le Gouverneur **Régionale** qui délivre le permis en se basant sur les deux premières étapes; mais la Loi lui donne l'autorité de prendre la décision indépendamment des constatations mentionnées.

Cette procédure est valable pour les activités industrielles, et pour l'élevage. Pour le développement urbain, ce sont les autorités municipales et le département local d'organisation urbaine et le conseil suprême d'organisation urbaine qui prennent la décision et délivrent les permis. A ce niveau, les législations en vigueur ne nécessitent pas la constatation du Ministère de l'Environnement.

En ce qui concerne le versement des eaux usées domestiques et l'élimination des déchets, la pratique actuelle ne nécessite aucun permis, malgré l'existence de très anciennes législations qui permettent aux autorités municipales et locales de délivrer des permis.

Les projets d'infrastructure sont décidés par les institutions gouvernementales (les différents ministères ou bien le Conseil de Développement et de Reconstruction CDR); et par suite le permis est pris à ce niveau (national).

L'effectivité réelle de ce système de délivrance des permis est très faible. Une série d'inconvénients peut être citée: la complexité de la procédure, puisque la délivrance dépend de plusieurs institutions différentes, où un grand nombre d'employés est engagé, fait qui explique la longue durée nécessaire à la délivrance d'un permis.

Le projet-Loi qui concerne le Code de l'environnement prévoit l'obligation d'une étude d'impact de l'environnement pour les nouveaux projets et pour les projets existants ayant des problèmes de pollution.

Compte tenu des problèmes environnementaux au Liban, et le niveau relativement élevé de sensibilisation du public sur ces problèmes d'une



part, et l'esprit démocratique général dans le pays d'autre part, le publique et les organisations non-gouvernementales ont accès à l'information concernant les problèmes de l'environnement, y compris l'état de l'environnement, les eaux usées industrielle, les déchets solides, les émissions dans l'atmosphère et les conditions de permission.

4-Respect et maintien des engagements relatifs à l'environnement:

La mise en conformité des engagements relatifs à l'environnement est prise en considération au Liban.

Les administrations engagées dans le processus de délivrance des permis sont responsables de contrôler le respect des conditions mises en oeuvre. Ces administrations sont: les autorités municipales, les inspecteurs sanitaires, les agents de l'organisation urbaine, et les experts du Ministère de l'Environnement.

Les installations industrielles sont contrôlées et inspectées avant le commencement de la production afin de vérifier l'exécution et le respect des conditions et des recommandations demandées.

Les inspections à la suite de plaintes sont parfois effectuées. Des difficultés liées au nombre limité d'experts et d'ingénieurs au sein du Ministère de l'Environnement, limite le contrôle régulier et périodique, qui doit être effectué sur les différentes activités à la suite de plaintes. On espère, que la réforme législative et administrative attendue au niveau du Ministère de l'Environnement, dans le sens de multiplier les capacités humaines et instrumentales, et au niveau législatif, augmentera les possibilités réelles d'effectuer les activités de contrôle et d'inspection nécessaires.

Actuellement, un tel contrôle est réellement possible seulement de temps en temps et touche quelques types d'activités qui sont distinguées d'un impact important sur l'environnement.

On peut résumer, qu'il n'existe pas d'actions systématiques de contrôle et d'inspection. Les actions de contrôle sont, généralement une réponse administrative à des réclamations.

Malgré l'irrégularité du contrôle effectué, on prend, dans les cas de manque de respect des règlements, des décisions de fermeture temporelle ou permanente.

Un système régulier et suivi en faveur de l'étude de l'état de l'environnement consacré à la qualité de l'eau, à la protection de l'habitat et aux émanations industrielles n'existe pas encore au Liban. Des études limitées dans le temps et dans l'espace sont faites au niveau de différentes institutions, mais un système harmonisé et régulier pour les actions de contrôle et de surveillance continue, nous manque toujours.



TABLE 6.5.4
SUGGESTED CONCENTRATIONS IN WASTEWATER

COMPOUND	CONCENTRATION IN WASTEWATER NOT TO EXCEED THE FOLLOWING		
	FRESH WATER	ESTUARINE WATER	MARINE WATER
Mercury and mercury compounds	10 ug total Hg/l	5 ug dissolved Hg/l	3 ug dissolved Hg/l
Cadmium and cadmium compounds	50 ug total Cd/l	50 ug dissolved Cd/l	15 ug dissolved Cd/l
Organohalogen compounds	1000 ug/l in total (all waters) and individual compounds not to exceed the following:		
Aldrin, Dieldrin, Endrin, Isodrin ('drins)	0.3 ug total 'drins/l all waters		
Atrazine	20 ug atrazine/l all waters		
Trichloromethane (CF) (Chloroform)	120 ug CF/l all waters		
DDT	0.25 ug DDT/l all waters		
Endosulfan	0.03 ug endosulfan/l all waters		



TABLE 6.5.4 (Cont'd)
SUGGESTED CONCENTRATIONS IN WASTEWATER

COMPOUND	CONCENTRATION IN WASTEWATER NOT TO EXCEED THE FOLLOWING		
	FRESH WATER	ESTUARINE WATER	MARINE WATER
1,2 Dichloroethane (EDC)	100 ug EDC/l all waters		
Hexachlorobenzene (HCB)	0.3 ug HCB/l all waters		
Hexachlorobutadiene (HCBD)	1 ug HCBD/l all waters		
Hexachlorocyclohexane (HCH)	1ug HCH/l	0.2 ug HCH/l	0.2ug HCH/l
Pentachlorophenol.(PCP)	20 ug PCP/l all waters		
Simazine	20 ug simazine/l all waters		
Tetrachloroethene (PER) (Perchloroethylene)	100 ug PER/l all waters		
Tetrachloromethane (CTC) (Carbon tetrachloride)	120 ug CTC/l all waters		
Trichlorochlorobenzene (TCB)	4 ug TCB/l all waters		



TABLE 6.5.4 (Cont'd)
SUGGESTED CONCENTRATIONS IN WASTEWATER

COMPOUND	CONCENTRATION IN WASTEWATER NOT TO EXCEED THE FOLLOWING		
	FRESH WATER	ESTUARINE WATER	MARINE WATER
Trichloroethene (TCE) (Trichloroethylene)	100 ug TCE/l all waters		
Trifluralin	1 ug trifluralin/l all waters		
Organophosphorus compounds	10 ug/l in total (all waters) and individual compounds not to exceed the following:		
Azinphos-methyl	0.1 ug azinphos methyl/l all waters		
Dichlorvos (DCV)	0.01 ug DCV/l	0.4 ug DCV/l	0.4 ug DCV/l
Fenitrothion	0.1 ug fenitrothion/l all waters		
Malathion (MLT)	0.1 ug MLT/l	0.2 ug MLT/l	0.2 ug MLT/l
Organotin compounds	0.2 ug total/l	0.02 ug total/l	0.02 ug total/l



TABLE 6.5.5
OTHER CHEMICAL POLLUTANTS

SUBSTANCE	SUGGESTED DISCHARGE LIMITS	
	FRESHWATER	ESTUARINE WATER AND MARINE WATER
<u>Metals</u>		
Aluminium	3000 ug total Al/l	3000 ug total Al/l
Arsenic	500 ug dissolved As/l	250 ug dissolved As/l
Barium	1000 ug total Ba/l	1000 ug total Ba/l
Boron	20000 ug total B/l	70000 ug total B/l
Chromium	500 ug dissolved Cr/l	150 ug dissolved Cr/l
Cobalt	2000 ug total Co/l	2000 ug total Co/l
Copper	500 ug dissolved Cu/l	50 ug dissolved Cu/l
Iron	10000 ug dissolved Fe/l	10000 ug dissolved Fe/l
Lead	200 ug dissolved Pb/l	250 ug dissolved Pb/l
Manganese	1000 ug total Mn/l	1000 ug total Mn/l
Nickel	1000 ug dissolved Ni/l	300 ug dissolved Ni/l
Selenium	100 ug total Se/l	100 ug total Se/l
Silver	100 ug total Ag/l	100 ug total Ag/l
Tin (inorganic)	250 ug total Sn/l	100 ug total Sn/l
Vanadium	600 ug total Vn/l	1000 ug total Vn/l
Zinc	500 ug total Zn/l	400 ug dissolved Zn/l

Not more than 10 000 ug/l (10 mg/l) of any other metal and the total metals concentration not to exceed 10 000 ug/l (10 mg/l).



TABLE 6.5.5(Cont'd)
OTHER CHEMICAL POLLUTANTS

SUBSTANCE	SUGGESTED DISCHARGE LIMITS	
	FRESHWATER	ESTUARINE WATER AND MARINE WATER
<u>Inorganic anions</u>		
Cyanide	500 ug CN/l	500 ug CN/l]
Sulphide	100 ug S/l	100 ug S/l
<u>Organic substances</u>		
Petroleum hydrocarbons	500 ug total/l	500 ug/l
Phenols	10 ug total/l	10 ug/l total/l
Polycyclic aromatic hydrocarbons (PAH)	2 ug/l	2 ug/l
Total pesticides not otherwise prescribed	10 ug/l	10 ug/l



TABLE 6.5.6
LIMITS FOR PUBLIC SEWER DISCHARGE

COMPOUND	LIMIT FOR PUBLIC SEWER DISCHARGE NOT TO EXCEED	SUGGESTED EQS
Mercury and mercury compounds	0.1 mg Hg/l	1 ug Hg/l
Cadmium and cadmium compounds	0.5 mg Cd/l	5 ug Cd/l
Organohalogen compounds	10 mg/l in total and individual compounds not to exceed the following:	
Aldrin, Dieldrin, Endrin, Isodrin ('drins)	3ug total 'drins/l	30 ng drins/l (1)
Atrazine	200 ug atrazine/l	2 ug/l (2)
Trichloromethane (CF) (Chloroform)	1.2 mg CF/l	12 ug CF/l
DDT	2.5 ug DDT/l	25 ngDDT/l
Endosulfan	300 ng endosulfan/l	3 ng/l (2)
1,2 Dichloroethane (EDC)	1 mg EDC/l	10 ug EDC/l
Hexachlorobenzene (HCB)	3 ug HCB/l	30 ng HCB/l
Hexachlorobutadiene (HCBd)	10 ug HCBd/l	0.1 ug HCBd/l
Hexachlorocyclohexane (HCH)	10 ug HCH/l	0.1ug HCH/l
Pentachlorophenol (PCP)	200 ug PCP/l	2ug PCP/l
Simazine	200 ug simazine/l	2 ug/l



TABLE 6.5.6 (Cont'd)
LIMITS FOR PUBLIC SEWER DISCHARGE

COMPOUND	LIMIT FOR PUBLIC SEWER DISCHARGE NOT TO EXCEED	SUGGESTED EQS
Tetrachloroethene (PER) (Perchloroethylene)	1 mg PER/l	10 ug PER/l
Tetrachloromethane (CTC) (Carbon tetrachloride)	1.2 mg CTC/l	12 ug CTC/l
Trichlorobenzene (TCB)	40 ug TCB/l	0.4ug TCB/l
Trichloroethene (TCE) (Trichloroethylene)	1 mg TCE/l	10 ug TCE/l
Trifluralin	10 ug/l	100 ng/l (2)
Organophosphorus compounds [100 ug/l in total and individual compounds not to exceed the following:]		
Azinphos-methyl	1 ug/l	10 ng/l (2)
Dichlorvos	100 ng/l	1 ng/l (2)
Fenitrothion	1 ug/l	10 ng/l (2)
Malathion	1 ug/l	10 ng/l (2)
Organotin compounds	2 ug total/l	0.02 ug/l (2)

- (1) EC total "drin" standard has now been superseded by standards for each compound, but the former standard is likely to be more practical in Lebanon.
- (2) UK draft annual average EQS for freshwater.
- (3) Based on UK EQS for triorganotin compounds



TABLE 7.2.3
PRE-TREATMENT PROCESSES FOR COMPLIANCE WITH DISCHARGE
STANDARDS FOR RIVERS/SEA AND SEWERAGE SYSTEMS

POLLUTANT	PRINCIPAL INDUSTRIES AFFECTED (INDURY CODE)	TREATMENT PROCESS	INDICATIVE COST
pH	Mining/quarrying (14)*	pH correction by dosing with acid or alkali	Low
	Food/beverages (15)*		
	Textiles (17)*		
	Leather products (19)		
	Pulp and paper (21)		
	Chemical products (24)*		
	Mineral products (26)*		
	Basic metals (27)*		
	Fabricated metals (28)		
	Machinery/equipment (29)		
Electrical machinery (31)			
Any process using acids or alkalis			
Cyanide	Basic metals (27)*	Oxidation of cyanide (e.g. with chlorine)	Moderate
	Fabricated metals (28)		
Sulphide	Leather products (19)	Catalytic oxidation	High
		Precipitation/sedimentation	
Moderate			

(*) Denotes non-complying facility in this sector as identified in the survey work of Phase I study



TABLE 7.2.3 (Cont'd)

PRE-TREATMENT PROCESSES FOR COMPLIANCE WITH DISCHARGE
STANDARDS FOR RIVERS/SEA AND SEWERAGE SYSTEMS

POLLUTANT	PRINCIPAL INDUSTRIES AFFECTED (INDURY CODE)	TREATMENT PROCESS	INDICATIVE COST
Heavy metals	Leather products (19)	Precipitation (possibly including oxidation or reduction)/sedimentation	Moderate
	Chemical products (24)*		
	Mineral products (26)		
	Basic metals (27)*	Ion exchange	High
	Fabricated metals (28)		
	Machinery/equipment (29)		
	Electrical machinery (31)		
Any process involving metal finishing			
BOD/COD	Food and beverages (15)*	Biological treatment	High
	Textiles (17)*	Physico-chemical treatment	High
	Leather products (19)*		
	Pulp and paper (21)*		
	Chemicals (24)*		
	Rubber/plastic prod. (25)*		
	Mineral products (26)*		
Motor vehicles (34)*			
Suspended	All sectors	Sedimentation	Moderate

(*) Denotes non-complying facility in this sector as identified in the survey work of Phase I study



TABLE 7.2.3 (Cont'd)
PRE-TREATMENT PROCESSES FOR COMPLIANCE WITH DISCHARGE
STANDARDS FOR RIVERS/SEA AND SEWERAGE SYSTEMS

POLLUTANT	PRINCIPAL INDUSTRIES AFFECTED (INDURY CODE)	TREATMENT PROCESS	INDICATIVE COST
Solids [*]	Mining and quarrying (14)*	Physico-chemical treatment	Moderate
	Food and beverages (15)*		
	Textiles (17)*		
	Pulp and paper (21)*		
	Chemicals (24)*		
	Rubber/plastic prod. (25)*		
	Mineral products (26)*		
Motor vehicles (34)*			
Oil/grease	Food and beverages (15)	Gravity separation	Mod/High
	Textiles (17)	Flotation	High
	Leather products (19)	Physico-chemical	High
	Coke/ref. petroleum (23)	treatment	
	Chemical products (24)*		
	Basic metals (27)*		
	Fabricated metals (28)*		
	Motor vehicles (34)		
Transport equipment (35)			
	Any process using oil or grease		
Fluoride	Chemical products (24)	Precipitation/sedimentation	Moderate

(*) Denotes non-complying facility in this sector as identified in the survey work of Phase I study



TABLE 7.2.3 (Cont'd)
PRE-TREATMENT PROCESSES FOR COMPLIANCE WITH DISCHARGE
STANDARDS FOR RIVERS/SEA AND SEWERAGE SYSTEMS

POLLUTANT	PRINCIPAL INDUSTRIES AFFECTED (INDURY CODE)	TREATMENT PROCESS	INDICATIVE COST
Solvents	Basic metals (27)	Phase separation	Mod/high
	Fabricated metals (28)	Air stripping	Moderate
	Any process involving surface cleaning	Adsorption	High
Phenols	Coke/ref. Petroleum (23)	Biological treatment	High
	Chemical products (24)		
Pesticides	Chemical products (24)	Adsorption	High
	Any process involving use of pesticides	Chemical treatment	High
Ammonia (River only)	Food and beverages (15)	Biological treatment	High
	Textiles (17)	Air stripping	High
	Leather products (19)		
	Coke/ref. petroleum (23)		
	Chemicals (24)*		
	Any process using ammonia or ammonium salts		
Sulphate (Sewerage systems only)	Any process using sulphuric acid or sulphate salts	Precipitation/sedimentation	Moderate

(*) Denotes non-complying facility in this sector as identified in the survey work of Phase I study

LIBYA

GREAT SOCIALIST PEOPLE'S LIBYAN ARAB JAMAHIRIYA

COUNTRY REPORT

ON COMPLIANCE AND ENFORCEMENT OF REGULATIONS

Foreword

Today we are more aware than ever of the wide spread effects of human activities on our environment. As a result of community actions, in developed and developing countries, environmental changing is evident. Whether from the wasteful exploitation of natural resources, or from reshaping of landscape, land degradation, forest damage, hazardous wastes and loss of natural resources can clearly be seen as consequences of our actions.

The severe damage of the marine environment of the Mediterranean Sea over past decades, caused by the uncontrolled discharge of liquid waste into this sea, has call all Mediterranean countries to combat the situation by ratifying and implementing the Barcelona convention and its related protocols.

This national report on the state of the environment, particularly "compliance and enforcement " in the Libyan Arab jamahiriya is directly related to control and protection of the environment from all sources of pollution Including the pollution control from land-based sources.

DR. BOARGOB,
Head of environmental studies department
Technical centre fir environment protection

Brief introduction,

Libya, in full great socialist people's Libyan Arab jamahiriya, is a nation of northern Africa and a south Mediterranean coastal state. The Mediterranean sea, to the east bound it to the north by Egypt, to the south-east by the Sudan, to the south by Chad and Niger, to the west by Algeria, to the northwest by Tunisia. The area of Libya, one of the largest countries in Africa, is 1.759.540 sq. km.

About 95 % of the country is made up of barren, rock-strewn and sand areas, with two small areas of hills rising to about 915 m, in the northwest and northeast. In the south the land rises to the tepisti massif along the Chad boarder.

Extreme heat and aridity characterize climatic conditions of Libya.

Desert and semi-desert area have little precipitation. On the coast the annual rainfall rarely exceeds 350 mm.

Libya has a population of about 5 million inhabitants including foreign workers and their families, more than 75% of the people live in urban areas. The population, however, is unevenly distributed, more than two-thirds live in the more densely settled coastal areas. (Figure 1)

The Libyan coast along the south-Mediterranean region extends nearly 2000 km, the largest populated urban areas are located on the coast. (e.g. Tripoli, Benghazi, mesurata, syrte, zawia, and darna.)

Like many of the developing countries surrounding the Mediterranean the jamahiriya is since the September, 1969 revolution, experiencing a surge of rapid urban and industrial growth, taking place principally along the coastal zone. Attendant with these changes is the increased potential for pollution of Libyan coastal water.

A pollution control law has been officially approved and adopted by the end of June 1982, it is the legislative act, no. 7 of 1982, concerning the protection of the environment. Based on this law, a pollution control centre was established and it bears the responsibility for the protection of the environment in the jamahiriya. Among the objectives of the pollution control centre are the preparation of environmental protection projects, the proposal of effluent standards and the supervision of their implementation, the technology transfer, the co-operation with international organizations, the issue of permits, the review of environmental impact assessment statements, and the education in the field of environment, moreover the regulation promulgated pursuant to this act has been issued at the beginning of 1999 by the general peoples committee.

2- BACKGROUND INFORMATION ON ACTIVITIES

The most environmentally significant activities in coastal area of Libya: -

- | | |
|----------------------|-------------------------------|
| - energy production | - chemical industry |
| - petroleum refining | - food processing |
| - cement production | - metal industry |
| - tanning industry | - fertilizer production |
| - textile dyeing | - industrial activities other |
| | Sectors |

2-1 ENERGY PRODUCTION:

The energy sources in Libya are generated electricity, natural gas, liquid fuel and to a minimum extent, solar energy.

Almost all Libya's electricity is produced in thermal facilities, which are concentrated in the coastal area. In the late 80^S Libya electricity installations generated about 20 billion kilowatt-hours annually, based on an installed generating capacity of 2 million kilowatts.

(encyclopedia Britannica 98).

Natural gas is used in big cities for household and in some factories.

And power plants.

Based on the fact that the higher radiation of the sun in the Libyan desert gives ca 2200 kilowatts/hour/m²/year, and the sunshiny hours about 3500 /year,(para et al), an extensive efforts have been made by the centre of solar energy studies in collaboration with the secretariat of industry. The Aim of this collaboration is to advance beyond the research stage, to the application of alternative source of energy.

(Figure 2)

2-2 CEMENT PRODUCTION,

There are six cement factories located along the coastline., All cement plants in Libya use the dry process which generates insignificant liquid wastes.

The installed electrostatic precipitators in all the plants were designed to allow only 100 mg /m³ dust content. Bag filters are installed in all other pollution generating operations

It is reported that air pollution control devices work rather satisfactorily in nearly all plants, 0.8 % of the total production was produced with no pollution control.(UNAP/ Map).

2-3 PETROLEUM REFINING

Between 1980 and 1985, 3 main petroleum refineries were constructed, the design crude processing capacity is 5- 10 million ton/year each . Another 2 small and old Refineries also exist. They are typical topping refineries. From the available production data, crude oil is refined at a rate of approximately 14 million tons/year in modern Refineries, and 600.000 tons/year in old refineries

The main productions are: fuel oil, Naphtha, kerosene, Benzene, butadiene, butane, and mtbe. (Map,unep,fao)

2-4 TANNING INDUSTRY

As to the latest information of the secretariat of Industry, there is 7 leather tanneries in deferent parts of the country.. Four of them are built in the coastal Area, the total weight of the 1994 production of leather Tanneries was estimated to be 1.200 ton/year. All these Factories were provided during construction with a Wastewater pre-treatment plants. But from time to time the Environmental control authority discovers the need for Maintenance of plants and work is underway to assess the environmental effects at these plants to be comply with existing regulations.

2-5 TEXTILE DYEING

A - wool processing

Two large wool processing plants are located in the inland, one in al-marje (barce), 100 km east of Benghazi, the other one in beni-walid ca. 180 km south of Tripoli. Both plants are equipped with reasonable functioning wastewater pre-treatment plants. They manufacture mainly carpets, and blankets.

B cotton processing

There is one textile plant located west of Tripoli . The wastewater of this plant underlies pre-treatment processes prior to discharge in the sea.

2-6 CHEMICAL INDUSTRY

There are three main industrial- complexes of manufacturing industrial chemicals these are: **Raslanuf, National Company for Petroleum Chemicals in Brega and Abu-kamash.** They are produce following chemicals :

Hydrochloric acid, ammonia, chlorine, urea, methanol, polyethylene, polystyrene resins, PVC, polyester, polypropylene and nylon.

2-7 FOOD INDUSTRY

In the 1981-1985 five-year plan, emphasis is placed on the development of agro-industrial complexes for dairy Products, poultry, olive oil extraction, etc.

2-8 FERTILIZER PRODUCTION

There are two modest waste recycling plants, one in Tripoli, another one in Benghazi. They produce compost soil, between 40 and 60% of the raw materials.

2-9 METAL INDUSTRY

The huge steel complex at Misurata, a city 220 km to the East of Tripoli. This large complex has a production Capacity of 1.2 million tons /year. All its activity starts with basic raw materials all the way to the finished products. A substantial amount of solid waste is perimeter of the Complex and hence, could be considered as being taken care of. Plans are in progress of utilizing these wastes Products.

Other public sector of industry like aluminum, iron pipes, ovens, refrigerators and freezers are also exist. In addition to the public sector there is the private sector which is also very active in industry, particularly of a small scale.

2-10 INDUSTRY ACTIVITIES; OTHER SECTORS

Engineering and electrical sector such as: trucks, buses, tractors industry, metallic works, electric cables industry, electronic industry computer industry are existing in the country.

The provision for all the above mentioned sectors (2-1 to 2-10) to use best available technology (BAT) and clean technology (CT), is given by the environmental law and other respective laws and regulations existing.

The quality of seawater along the Libyan coastline is with regard to water pollution, 90% of the BOD and oil pollution originate from crude oil and petroleum products shipments.

In addition foul ballast waters are discharged off the Libyan waters, currents bring part of this pollution to the Libyan coast. In thus oil

pollution is evident, where most of the oil shipment activities take place.

As a step towards waste control measure of oil pollution, deballasting facilities in the crude oil export terminals of Tobruk as well as Ras-naluf were constructed.

Libya has no inland water. The measures for protecting the habitats are represented in carrying out related works by conducting ways and means specified by the laws in question, in particular law no.7 / 1982 and the law of marine wealth, as well as related decrease.

The legislative act no.7 of 1982 for the protection of the environment and the act no.13 of 1991 give the provisions for environmental monitoring of seawater, industrial wastewater, and domestic wastewater disposal.

- Public awareness of environmental problems in the Libyan Arab Jamahiriya could be considered as high. There are various types of information campaigns aimed at promoting increased awareness of the environment conducted by the (TCEP), Like workshops, interviews by radio or T.V., producing of Posters, Publishing in Journals and articles in newspapers.
- There is a small number of NGO's in Libya . Their influence decision –making is rarely. The majority of this NGO's are in the beginning of performing their programs and builds up their capabilities. The international energy foundation, an international NGO located in Tripoli, contributes to environmental awareness throw seminars, workshops and several publications.

3- LEGISLATION

- There is legal framework for the environment in Libya, like approved legislation, ratified environmental agreements, conventions, and creation of environmental control bodies.
- For the control of seawater quality as well as for protection of habitats, legislation exist.

- Legislation and guidelines for the regulation of industrial wastewater disposal, domestic wastewater disposal, urban development, and agriculture are existing, implementation of the legislation and control of the disposal action, is the responsibility of the respective sector and the environmental authority.

4- PERMITTING

All sectors in the jamahiriya shall in their field of competence, be responsible for issuing permission for specific activities. Licenses for the exercise of activity that might cause pollution, shall be issued only by the technical center for environment protection, containing specified regulations and obligatory requirements with which the licenses must comply.

The main authority responsible for permission is:

- general peoples committee on national level
- Secretariat of housing and utilities (regional level).
- Secretariat of health
- Secretariat of industry

Industrial facilities which need permission for their production, mainly pesticide, insecticides, and harmful substances.

The estimated numbers of employee deal with permitting is between 150 an 200. Their responsibility is to examine the compliance of the application with the obligatory requirement for the specified activities, and prepare the document license.

EIAs has not been done for new or existing projects.

Permits have been issued for specific new projects.

Information on general environmental issues are well accessible for the public, through annual reports on the state of environment, through workshops, seminars, training sessions and extra disseminated information on permitting conditions.

5- COMPLIANCE AND ENFORCEMENT

- In the Libyan Arab Jamahiriya the Compliance with the Provision of the environmental law, other relevant legislation, and regional conventions and protocols, showing a Successful step towards environmental protection.
- Provisions for inspection in case of complaints are listed in the Env. Law .
- Periodic inspection and control on some activities with permits, is carried out occasionally.

The officials from the technical center for environment protection, designated by the general people's committee, shall enjoy the powers assigned to all the security forces, coast guards, municipal police, forest rangers and other officials vested with criminal investigation authority under legislative acts in force. They shall follow the instructions issued by the center in matters pertaining to the application of the provision of the environmental act.

- When violation is verified, control bodies is usual taking action depending on the case occurred. It range between temporary closure, criminal prosecution and re-inspection for corrective actions.
- The system in force in Libya, for the assessment of water quality, industrial emission and protecting of habitat, is defined in the environmental law as well as in the standards methods given by the environmental authority.

Conclusion

- There is a strong and vital link between the activities of the deferent sectors and the environment.
- Environmental issues recognized as being extremely important and legislation with international standards are being passed regularly.

- Environmental awareness in the country is very high particularly during the last few years. The establishment of the technical center for environment protection is an example of this awareness. The center is empowered to investigate, monitor and control all types of activities that may effect the environment in any way.

- A lot of efforts has to be done:
 - to establish environmental data base in the country
 - carrying extensive monitoring and assessments to gather actual information on the state of the environment.

MALTA

**Mediterranean Action Plan
WHO/EURO Project Office
Athens**

Country Report

for

Malta

in preparation for the

**Workshop for Experts on Compliance and Enforcement of Legislation
in the Mediterranean for Control of Pollution resulting from
Land-based Sources and Activities**

Athens, Greece, 16 – 18 March 1999

**Ministry for Environment
Malta
1999**

This report was compiled by Ms Prassede Grech, Environment Officer (Coastal Zone Management) within the Environment Protection Department and by Ms Sylvana Camilleri, Head, Discharge Permit Unit within the Department of Works, in preparation for the Workshop for Experts on Compliance and Enforcement of Legislation in the Mediterranean for Control of Pollution resulting from Land-based Sources and Activities, to be held in Athens, 16 – 18 March, 1999.

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1.0 THE MALTESE ISLANDS

1.1 Geography

The Maltese Islands are situated approximately 96km south of Sicily, 290km east of the Tunisian coast and 354km north of Libya. They are aligned in a northwest to southeast direction and located on latitudes 35°48'28" to 36°05'00" N and longitudes 14°11'04" to 14°34'00" E.

The archipelago is made up of two main islands, Malta and Gozo, the islet of Comino and a number of other small islands and residual rocky stacks, which have been separated from the coastline by marine erosion (Figure 1).

Malta, the largest island, covers an area of about 245.7km². Gozo covers an area of 61.7km². By its very nature, the whole of the Maltese Islands can be considered as a coastal zone and hence its problems are more complex because of its size.

1.2 Demography

With a population of around 370000, the Maltese Islands have the highest population density in Europe, that of about 1000 persons/km². Built-up areas have increased from 5 to 16% in the past 30 years. Around 38% of the area are agricultural land and 46% is undeveloped, but even so, there are no wilderness areas on the islands.

1.3 Climate

The climate of the Maltese Islands is typically Mediterranean, with a dry season between April or May and September and a wet season extending from October round to about March. The average annual precipitation is 529.6 mm.

Rainfall is highly variable from year to year. Some years are excessively wet while others are extremely dry. The seasonal distribution of rainfall defines a wet period (October to March, with 70% of the annual precipitation) and a dry period (April to September). Temperatures vary from an average of 45°C in summer down to 10°C in winter during the daytime.

1.4 Geology and geomorphology

The islands are composed almost entirely of marine sedimentary rocks, mainly tertiary limestone and some clays and marls that form distinct layers which vary in their resistance to erosion. The main rock types in order of superimposition are:

- Lower Coralline Limestone
- Globigerina Limestone
- Blue Clay
- Green Sand
- Upper Coralline Limestone

Two distinct types of coastline are present, mainly a gently sloping rocky coast on the northeast side and a steep cliff on the southwestern coast (Figure 2).

The main coastal geomorphology in the Maltese Islands is divided as below:

Table 1.1 Distribution of the main geomorphological characteristics (Anderson & Schembri, 1989)

	Malta (%)	Gozo & Comino (%)
Building	30.5	7.5
Rdum	17.0	4.5
Bare cliff	22.0	62.0
Lowland coastline	30.5	16.0

1.5 The coastal environment

The particular geomorphology of the Maltese coastal has largely determined the pattern of coastal settlement and development around the islands. On mainland Malta, most settlement has concentrated on the lowland rocky northeastern coastline. In contrast, land use along the upland inaccessible western and southern coastlines, dominated by cliffs, is generally limited to infrastructure and industrial developments, such as quarrying. In Gozo, the inaccessibility of a large part of the coast is a constraint to development. The relatively few stretches of lowland coast, such as Marsalforn and Xlendi, have been overexploited and these are high-pressured by development in these areas, especially related to tourism facilities (Figure 3).

Table 1.2 Major coastline utilisation for activities (Anderson & Schembri, 1989)

Coastline	Malta	Gozo & Comino
Inaccessibility constrained by natural and man-made features	50.0% due to: 75.0% physical features 19.5% industrial activities 3.5% tourist amenities 2.0% military areas	74.0% due to: 99% physical features
Tourism dominated	84.0% of length of coastline 35.0% of proportion of coastal zone	74.0% of length of coastline 19.0% of proportion of coastal zone
Sandy beaches	2.0% of total coastline	2.5% of total coastline
Industrial activities	8.0% of coast of which: 25.0% salt production 2.0% RO plants 2.0% quarrying 71.0% other industry	4.5% of coast of which: 8.0% salt production 2.0% quarrying
Maritime activities	16.5%	4.5%
Agricultural activities	12.0% abandoned fields 11.0% cultivated fields	41.0% abandoned fields 16.0% cultivated fields
Vegetative cover	9.0%	8.5%

Over the last decades, Malta has undergone very rapid changes in demographic, social, economic and ecological terms. As a small island developing state, it has a limited and fragile ecological resource base and consequently there is less room for error in its utilization and management.

The marine environment is especially under threat from the very success that this country has enjoyed in a booming economy. Shipping activities have increased, and industries such as fish farming and urban development have also been thriving. Coastal activities such as port development and management, ship building and repair, energy and fresh water production, aquaculture, offshore oil bunkering, tourism and waste management are crucial for the future social well being and economic development of the Maltese islands.

Due to the high population density, small size, limited accessible coastal area, increasing levels of international marine-pollutant carrying ships transiting our waters and an ever-increasing need for supply and usage of current technologies, our coastal environment is presently threatened by a number of hazards, including marine contamination.

Malta's potential for future economic growth and social development will ultimately depend on the extent to which such coastal environmental problems will be successfully controlled. Problems of marine environment degradation are symptomatic of mismanagement and may be successfully tackled only via proper management practices resulting from the collaboration of all partners involved in sound environment resource management. The overall aim of any management strategy to control marine contamination hazards and risks is to prevent discharge whenever viable, or to otherwise reduce contaminant discharge to environmentally acceptable levels.

2.0 BACKGROUND INFORMATION ON ACTIVITIES

2.1 Infrastructural activities

Most infrastructural activities in the Maltese Islands are situated along the coast since this facilitates the import of raw materials and the export of the final product. Moreover, most industries have a marked need for cooling water or for receiving water for wastes created by the industrial processes involved. Water is required for desalination plants, power plants, cooling systems and to a large extent by the tourism sector.

Most maritime oriented activities are situated around the port-city conurbation of the three major harbours in Malta, namely Grand Harbour, Marsamxett Harbour and Marsaxlokk Bay. Such activities are mainly related to energy production, cargo handling and others. Other industrial processes such as chemical and pharmaceutical industries, printing industries, food processing industries, metal industries, are located in one of the six industrial zones in Malta and one in Gozo.

Some activities require a coastal location out of necessity for the very purpose of their operations such as transport, desalination plants and port activities, whereas other activities benefit from a coastal location for different reasons, including aesthetics. The factors leading to conflicts between coastal activities can be summarised as:

- competition for space (land and sea surface)
- degradation and eradication of land habitats and benthic habitats
- degradation of water quality from effluents

Coastal activities can be classified as follows:

Mainland Malta: 8.0% of total coastline comprising:	71.0% (maritime, manufacture, etc.)
	25.0% salt production
	2.0% desalination plants
	2.0% quarrying
Gozo and Comino: 4.5% of total coastline comprising:	8.8% salt production
	12.0% quarrying

A tentative list of activities (Figure 4) occurring along the Maltese coastline is given below:

Infrastructural activities:	power generating plants	2 Malta	
	major ports	3 Malta	1 Gozo
	sewage outfalls	2 Malta	1 Gozo
	major landfills	1 Malta	
	quarries	2 Malta	
	transportation (3 majors)	3 Malta	1 Gozo

Commercial activities:	inshore fisheries	
	aquaculture	7 Malta
	agriculture	
	hotels and tourist amenities	
	marinas	
	harbour cruises	

Recreational activities:	boathouses and beachrooms
	water sports
	walking
	upseiling/climbing and paragliding
	camping
	off-road vehicles

The main conclusions, from the environmental standpoint, are:

- the main negative effects resulting from infrastructural assets to the so-called littoralisation of the coast;
- the problems posed by these activities as principal land-based source of pollution the inappropriate siting of these installations.

In Malta no industries, discharge their trade effluents directly into the marine environment, with the sole exception of the reverse osmosis's and a couple of air conditioning units which effluents are not regarded being as industrial effluents.

The sewage system in Malta, is a one pipe system catering for all industrial, domestic wastewater and a high percentage of rain water. Through the implementation of L.N. 8/93, which stipulates the limits of the chemical and physical parameters and control on the effluent quality is achieved. These regulations request the individual industries to perform regularly analysis which can be acceded to by personnel of the Discharge Permit Unit as requested. Furthermore companies having IMAS/ISO 14000 are obligated to report all non conformities to the Director Drainage.

All around the island, there is a system of emergency outlets which come into function only in emergency situation which may lead to discharge of drainage into the marine Environment. It

must be emphasised that these conditions are rare and efforts have been made to ensure this through the installation of a telemetric system in pumping stations and retention reservoirs in critical areas.

Domestic wastewater disposal per se does not exist, disposal of waste water into the marine environment is currently being carried out at three sites namely: Ras il-Hobz (Gozo), Ic-Cumnija and Wied Ghammieri (Malta). At these sites a cocktail of Domestic/Industrial/Agricultural wastewater is disposed. Only 10% of the fully domestic wastewater is treated by Sant Antnin Sewage Treatment Plant. In the near future Biological Treatment Facilities will be installed at these three sites currently the Environment Impact Assessment for these facilities are being undertaken.

2.2 Overview of main coastal activities

(i) Energy production

Energy production in Malta is the function of two power generating plants under the jurisdiction of Enemalta Corporation. The older one is situated at Marsa, in Menqa Creek, providing about 48% of the total energy requirements in Malta. In 1992, a new power generating plant sited at Delimara Point in Marsaxlokk Bay entered the scene to provide 52% of the energy requirements.

For quite a long time, the power station at Marsa was operated using coal as fuel. However, the usage of coal has been phased out completely over the last decade and replaced by oil. The Delimara power station in Marsaxlokk Bay was constructed to utilise heavy fuel oil. In this way, coal dust is no longer allowed to accumulate in the sediments of Menqa Creek and Marsaxlokk Bay. Although plenty of coal dust is undoubtedly still present in Menqa Creek, it is to be hoped that in time this will gradually decrease. The annual fuel consumption of the two power generating plants is currently of the order of 700,000 metric tonnes of heavy oil and 50,000 metric tonnes gas oil.

The gas division belonging to Enemalta Corporation is responsible for the importation, storage and distribution of liquid petroleum gas (LPG) for the local market. The plant is situated in Birzebbuga along the coast of Marsaxlokk Bay. Annual importation of LPG is of the order of 20,000 metric tonnes of mixture, including some 250 metric tonnes of propane.

The Enemalta Corporation petroleum division is also located in Birzebbuga, along the coast of Marsaxlokk Bay is responsible for the procurement and freightage of all petroleum products including gasoil (180,000 metric tonnes), premium/unleaded gasoline (100,000 metric tonnes), jet A1 (120,000 metric tonnes), kerosene (20,000 metric tonnes), light fuel oil (18,000 metric tonnes) and fuel oil (500,000 metric tonnes), approximate annual consumption.

In Grand Harbour, oil and heavy fuel oil, are handled at Menqa Creek for the supply of Marsa power station. Various discharge points are present in both harbours. The main environmental damage to marine life in the vicinity is due to spillage of liquid fossil fuels, especially during the handling of a residue heavy fuel oil, which is high in metals and asphaltenes.

Addition of caustic soda (sodium hydroxide) and sodium triphosphate is used to keep high alkalinity to avoid corrosion and high phosphate levels in boilers and through blowdown, discharge into seawater of such substances creates a problem.

Sea water is used as a cooling medium in steam turbine condensers and lubricating oil and generator coolers of the Marsa power generating plant. For all this, sea water is treated by

chlorine to discourage the growth of organisms in the cooling water culverts, which is then discharged into the sea where it may affect marine life adversely. An average amount of 34kg of chlorine are added on a daily basis to each power station. Sea water is also used as a source of evaporated water, which is then treated to produce demineralised water. In this process, an acid-based descaling liquid, sulphuric acids and sodium hydroxide are utilised and then discharged into the sea after neutralisation.

The intake and output volumes of sea water is approximately the same for both power station, and average rates of 21,000 and 78,000m³ per hour of water is discharged from the Delimara and Marsa power station respectively. This of course depends on the season as the number of operating boilers varies under different conditions. The rate is higher for the Marsa power station, which is older, 10% less efficient, and 30% more polluting in terms of energy production, with its eight boilers working on steam, as opposed to the majority of gas turbines utilised by the Delimara power station.

Sea water is used as a coolant and for flue-gas scrubbing, the consequence of thermal effluents being released into the sea together with such substances as residual oxidant products of biocides, suspended particles and corrosion-inhibiting fluids. A rise of about 4^oC in the sea water temperature in the area will surely cause deleterious effects in the long term as already evidenced from studies carried out by the University of Malta over the last few years. Studies have focused on the area of *il-Hofriet* where water from the Delimara power station is discharged, since this previously pristine area is now being subjected to the consequences of thermal pollution. The cooling water is discharged at a remote point so that there will be no mixing of inlet and outlet water. At Marsa, on the other hand, the inlet is at Bridge Wharf, and the outlet at Church Wharf, and although separated, they are inside the same harbour and there is considerable mixing.

Oil interceptors are installed to prevent any leaking oil from being discharged into the sea. The phasing out of the use of coals for boilers to be supplanted by heavy fuel oil has eliminated the discharge of sea water with a high concentration of metals and ash collected when sea water is used to provide a wet seal at the bottom of the boilers.

(ii) Water production

The importance of seawater desalination in Malta is increasing over the years. The approximate annual demand for water in Malta and Gozo is of the order of 48,000,000 cubic meters. 47% of the annual water production comes through groundwater exploitation through pumping stations, boreholes and springs. Desalination plants currently account for about 53% of the total production of water. There are currently three seawater and one brackish desalination plant in Malta, situated at Ghar Lapsi, Cirkewwa, Pembroke and Marsa. The seawater desalination plant at Tigne' in Sliema has been shut down in 1995/1996 and is no longer in use since the one at Pembroke has been upgraded.

The existing reverse osmosis plants make use of Du Pont Permasep B-10 permeator membranes which are the most extensively field-proven membranes and the most effective sea water reverse osmosis device. It consists mainly of a cylindrical shell containing thousands of semi-permeable membranes in the form of hollow fibbers made of an aromatic polyamide. These membranes require periodic cleansing and treatment with flushing and back flushing of the systems. All water used in the cleansing processes is discharged into the sea.

All the desalination plants are situated right on the coast. Water is taken up from the area and discharged into the sea close to the desalination plant. It is quite possible that the presence of appreciable currents at these sites will transport and disperse effluents fairly rapidly and bring

about a good exchange of the water directly receiving the discharge, especially since three of the plants are located in areas where exposure to wave action is high. The one at Marsa is situated in Grand Harbour and in this case there is a greater chance of negative impacts through the discharge of water with a high concentration of salt and which may possibly contain washing chemicals and disinfectants are not dispersed so quickly.

Table 2.1 Reverse osmosis plant statistics (refer to figure 5)

Map No.	1	2	3	4	5
R.O. Plant	Ghar Lapsi	Marsa	Tigne' *	Pembroke	Cirkewwa
Bearings (UTM Grid)	447540 3965200	454740 3970540	456120 3973900	440160 3982820	453410 3976750
Desalination (m3)	6,184,000	1,197,000	29,000	13,349,000	3,744,000
Desalination (%)	25.2	4.9	0.1	54.5	15.3
Citric Acid (kg)	300	250	350	800	650
Ammonia (kg)	140	130	150	400	260
Formaldehyde (kg)	550	450	600	1450	1200
Washing Powder (kg)	75	70	80	183	144
Brine Flow (m3/day)	80,000	5,500	37,000	40,000	130,000

* No longer in use since 1996

(iii) Maritime activities

Maritime activities are mainly concentrated around the three major ports in Malta, Grand Harbour, Marsamxett Harbour and Marsaxlokk Bay and Mgarr Harbour in Gozo (Figures 6, 7, 8). Activities include ship building and repairing, cargo handling, oil bunkering, yacht marinas, passenger transport, tank cleaning and deballasting. Storage of most imported products including fuel hydrocarbons, cement, grain is mostly concentrated around these areas.

The vital importance of the maritime industry in Malta within the transport chain is demonstrated by the fact that the maritime sector is responsible for about 95% of Malta's trade with other countries.

The Grand Harbour is the principal port, in terms of transshipment and other maritime industries, covering an area of some 2.2km², with a population of about 14,500 inhabitants/km², distributed along its 15.4km coastline. This port is well equipped with berthing facilities for cargo handling and passengers. The Grand Harbour caters for nearly all imports and exports, as well as for all ship-travelling passengers. Such high traffic in the Grand Harbour inevitably contributes to the nutrient load. Oil slicks are frequently observed, especially in Rinella and Dockyard Creeks and also in the vicinity of the Power Station. The numerous creeks, together with the wavebreakers at the mouth of the port restrict currents and the circulation necessary to disperse the pollutants that accumulate from various sources.

The volume of cargo handled by Marsamxett and Grand Harbours amounts to some 2.6 million tonnes, mainly in the form of raw materials and consumable commodities. Almost 1 million tonnes of hydrocarbons are imported per year while exports in the form of bunkering amounts to some 450,000 tonnes/ year. Over 200,000 tonnes of coal were imported prior to phasing out for use by the power station and being replaced by oil. In addition, ports are the gateway for the annual movement of hundreds of thousands of passengers.

The number of vessels arriving in our ports has increased drastically while shipping activities around the islands have also increased with the establishment of the Freeport and the liberalisation of bunkering operations. The volume of hazardous cargoes carried by sea continues to increase and the Malta Maritime Authority is intensifying its control and monitoring of cargo handling in order to enhance safety and security in the port areas.

Port preparedness and response plans are required in order to provide a means of eliminating and confining potential environmental damage associated with accidents, such as spillage of oil, chemicals and other hazardous substances and water and seabed damage. This would involve an analysis of the ports with the intention of identifying and assessing risks in relation to global marine activities, cargo handling and port layout.

Oil pollution sources in Malta may originate from deliberate dumping or accidental release from passing ships, from operational discharges from ships, from ships undergoing repairs in the ship yard in Dockyard and French Creeks or from tank cleaning at the deballasting and slop reception station in Rinella Creek.

The Tank Cleaning Farm takes care of all oily wastes from ships entering the shipyard for repair. All other oily wastes from vessel inside the ship yard, such as bilge oils, as well as oily wastes and wastes generated in other shore processes, are handled by an oil-processing facility. Spent process waters are discharged into separate disposal. The spent waters and slop oil from tankers and other sources are segregated by multiple collecting lines and separate collection tanks. Partial removal of free or floating oil, a component of slop oil, is effected in settling tanks and oil separation from contaminated ballast water is effected by gravity separation. The separated water ballast is then run through a cascading process before being eventually run back into the sea.

A marina usually provides a base for a variety of boating activities, sited in an enclosed area of water sheltered from prevailing strong winds and heavy seas, yet with an access to the open sea. Some of the activities cause water pollution and these deleterious effects have to be mitigated before they cause irreversible damage to the water quality and marine habitats. Besides being aesthetically unattractive, a fetid, stinking marina may also contain pathogens, which act as health hazards for man. Eutrophic conditions caused by excess nutrients may be lethal to fish and other marine life.

Pollutants released, such as petroleum hydrocarbons and organotins, may be toxic to the marine organisms. There may also be the incidence of eutrophic conditions due to the elevated concentration of nutrients and microbiological contaminants released from the discharge of untreated sewage, waste water and agricultural runoff. Consequently, this is apt to cause a drastic fall in the level of dissolved oxygen, and water transparency and an increase in primary production. The best way of controlling water quality hazards in a marina is to restrain polluting activities. Pollution control is most effective when designed from concept.

Msida Creek has been converted into a modern fully equipped yachting centre during the early 1990s, to accommodate some 700 seacraft with modern berthing facilities such as slipways, floating pontoon piers and maintenance and repair facilities. The creek is sheltered by a 60m wave breaker, an extension of the Ta' Xbiex shoreline. The water depth ranges from 4 to 8m and the average width is approximately 110m. Being sheltered from inclement weather conditions, there is inadequate water circulation in the creek. The setting up if the marine amplified the effects of poor water circulation, modifying the movement of near shore water and bottom sediments with consequent change in the ecosystem characteristics of the area.

Dredging and construction activities carried out at the yacht marina were responsible for the release of large amounts of undissolved solids or silt, increasing the turbidity of the water in the creek. Dissolved substances included heavy metals and pesticide from disturbed sediments. Even though these adverse effects on water quality are short-term, the influence of these conditions on marine flora and fauna may be more drastic and recovery may be extremely slow. All this will represent a substantial impact on the marine environment in the creek.

Bunkers refer to residual fuel oils and marine gas oil used as fuels for ship machinery. The ship-to-ship (STS) transfer of oil presents certain risks, such as oil spills, unless it is conducted in suitable shelter from rough seas and swell and provided certain guidelines are adhered to as regards the area chosen, weather conditions, navigational warnings and the knowledge of certain technical information.

Offshore STS transfers within Maltese Territorial Limits (12 nautical miles) are mainly limited to bunker operations although STS lightening may be permitted. For offshore bunkering, the Malta Maritime Authority has designated five bunkering sites located off the coast in the area depicted in figure. These were selected after water depth, nature of bottom and frequency and density of sea traffic where considered. Hence this minimises the risk of pollution accidents which could be high considering that around 400 ships are bunkered offshore in a year. The total bunker throughout Malta is around 450,000 tonnes of which 65% is done offshore while 35% is carried out in Grand Harbour and Marsaxlokk, where the damage from any oil spill accidents would be considerable.

Another major industry situated along the coast of the Grand Harbour is the Malta Drydocks, whose main function is ship maintenance and repair and other related activities. It runs the Tank Cleaning Farm and is also concerned with oil exploration through the construction of pipelines, derrick barges and related facilities. Together with the Malta Shipbuilding Company, which is concerned with shipbuilding operations, the Malta Drydocks is one of the highly potential pollution sources in the Grand Harbour.

Situated on the western side of the Valletta peninsula, Marsamxett Harbour covers an area of 1.4km² which is located outside the Grand Harbour near Fort Ricasoli, and the towns concentrated along its 10.5km coastline, which include Sliema, Gzira and Msida, have a population density of around 29,500 inhabitants/km².

A large area of Msida is situated at sea level in what is the natural catchment area for rainwater falling on the surrounding towns and villages. The creek was dredged some years ago and together with Pieta' Creek and Manoel Island converted into a modern yachting centre. Eutrophication studies of the creeks have indicated the recurring incidence of spring 'red tides'. Lazzaretto Creek also harbours a yacht marina while a number of pleasure cruise vessels and together with a yacht repair yard are located in Sliema Creek. The latter is surrounded by numerous restaurants, hotels and other tourist amenities and residential establishments, all forming part of one of the most densely populated towns in Malta, Sliema.

(iv) Tourism industry

In the last years, over one million tourists have been visiting the islands annually, mainly during summer. Meeting their needs adds further to the pressure and makes extraordinary demands on the coastal zone resources.

The Maltese coast is a natural feature of the islands but is being utilised for tourist, industrial, commercial and residential purposes. This implies that the 190km of coastline not only play a

vital role in the social and economic development of the country, but is also expected to support all these demands (Figure 9). Tourism is directly linked to the management of marine resources. This industry in Malta is directly dependent on the good management of marine contamination hazards. Tourism alone is associated with an assortment of polluting activities including sewage discharge, waste generation, congestion and human pressure, building and construction of visually intrusive and ecologically damaging amenities, noise and so on.

This sector accounts for close to 40% of all economic activity in the Maltese Islands. For the last four decades, the context of an effective policy, which promoted local and foreign investment, at the same time, related to a basic objective of conserving the environment resources of the Islands. Sustainability did not enter the picture and it was only in 1989 that a Tourism Master Plan was drawn up to give a proper policy framework for future development in the tourism sector. The coast has been one of the main targets for development related to the tourism industry, and with the objective of moving up-market and upgrading the standard of living, more remote and sensitive areas are targeted for development.

Although offering significant economic benefits to Malta as a "tourist-importing" country, these also create significant social and environmental costs. They are a key element in coastal development because they force many aspects of urbanization, notably the construction of hotels, restaurants, shopping centres and marinas. Most activities take place on the beach or within 50m seawards, except for yachting/sailing or offshore angling. Nevertheless, the effect on the local species is considerable. One of the impacts is due to the litter left on beaches or thrown directly into the sea along the beach.

The great majority of the 1300 hotels, holiday complexes and catering establishments in Malta are situated around the Maltese coast, mainly in the most popular seaside resorts in the northern and eastern coasts of Malta. Most of the hotels are equipped with swimming pools, which are dosed periodically with chlorine. Most hotels and holiday complexes are equipped with air-conditioning systems and an ever-increasing number of hotels are setting up their own reverse osmosis system. All this causes the discharge of contaminated water into the sea along the coast in the vicinity, water containing chlorine, borates, and washings, among others.

(v) Agricultural industry

Diffuse pollution is more often related to agricultural techniques relying on the heavy use of fertilizers and pesticides runoff from urban and industrialised zones and the settling of urban pollutants.

The geographical character of the agricultural area and land use will determine and affect the coastal pollution influx rates originating from runoffs (Figure 10). Meteorological and topographical features are other important considerations. The major pollution problem is the oxygen deficiency caused by the discharge of organic loads. Pathogenic transmission is a problem in cases where domestic sewage finds illicit use in crop irrigation.

Enrichment through nutrient loading may stimulate symptomatic changes, among which are the rise in alga production, the deterioration of water quality and other negative changes which may interfere with the usage of protected waters.

Pesticide use in Malta is profuse and widespread. The amounts of pesticides used have more than doubled from 222,706kgs in 1982 to 470,554kgs in 1995. Though it is the general tendency to minimize the use of organochlorines and encourage the use of more environmentally friendly compounds such as organophosphates, carbamates and similar short active pesticide, control on field use is severely lacking.

Agricultural practices in Malta have changed considerably during the past decade. Increased population growth coupled with tourism induced market forces have been instrumental in procuring the moves away from the traditional type of farming to more "intense" and commercially-based methods. Crop production is ensured throughout the year, to the detriment of the soil and at the expense of the nutrients that are necessary for the healthy development and growth of plants and crops.

Through the adoption of such intensive farming practices, the demand and consumption of pesticides and fertilizers have increase considerably with the main objective of ensuring that nitrates and phosphates are liberated and that nutrients are imparted to the soil at the point of application. There are now several fertilizers in common use, namely ammonium sulphate, urea, ammonium nitrate, calcium ammonium nitrate, ammonia, nitrogen sol, other nitrogenous compounds, ammonium phosphate and NPK compounds.

Following heavy irrigation or seasonal rainfall, nitrate and phosphates are washed away to migrate seaward via runoff or similar routes. The influx of these nutrient chemicals into the marine environment will depend on the interplay of several factors primarily the nutrient concentration levels present in the soil, the rate of flow of the transport medium (runoff), the distance of the source from the coastline zone and the accessibility specified by the topographical features of the zone.

Though extreme conditions accompanied by a marked turbidity (due to high phytoplankton biomass) have not to date been recorded, limited increases of primary activity have been recorded locally in some "closed" coastal areas situated in the vicinity of a discharge or where rapid dispersion of nutrients is inefficient.

(VI) Aquaculture industry

Fisheries are adversely affected by over-fishing and by environmental pollutants, creating a serious threat to fishery resources, especially in the coastal sea. The growth of the mariculture industry is a response to the demand for fish and the decreasing prospects for the capture fisheries.

Mariculture is a victim of environmental degradation and pollution, wherever toxic wastes are discharged into coastal bays. It is also a cause of such degradation in its vicinity insofar as the cleaning out or flushing of mariculture sites releases excess food material and chemicals (e.g. fungicides). The species that are principally the object of mariculture in Malta are the gilthead sea bream (*Sparus aurata*) and the sea bass (*Dicentrarchus labrax*).

The Mediterranean has a low productivity when compared to world oceans, naturally occurring nitrates and phosphates being produced in small amounts. Plankton is in quite short supply and vertical mixing of surface with deep water is limited, meaning an inadequate supply of nutrients to the surface. Over the past few decades, fishing has been modernised and industrialized and consequently the marine environment is heavily overworked.

Great importance has in recent years been attributed to the possibilities offered by aquaculture. The aim of aquaculture is to maximize the yield of useful organisms from the aquatic environment by manipulation of growth, reproduction and recruitment, and natural mortality rates. Intensive fish farming, usually utilising cage culture is mainly restricted to the rearing of high value fish species, mainly carnivorous. All fish farms operating in the Maltese Islands use the intensive system of farming and fish rely entirely on the external supply of high protein (>20%) food, usually based on fishmeal.

In the Maltese Islands there are seven operating fish farms (Figure 11). The ones at Marsaxlokk Bay, Mellieha Bay, Mistra Bay, Marfa, Salina Bay, St. Paul's Bay, St Thomas Bay and il-Hofriet all utilise cage culture farming, some even in conjunction with land-based farming. The types of cages and their moorings are adapted to the particular site and can be both flexible and rigid, the latter the better type, as they are able to ride the waves. There are both types of cages in Malta. Good water exchange through the cages is essential for the replenishment of oxygen and the removal of waste metabolites, although it can cause food losses.

Wastewater from aquaculture units is rich in suspended matter, thus increasing the water turbidity that may reach an extent where photosynthesis is affected, leading to higher mortality rate of stock. The impact depends partly on the characteristics of the aquaculture unit, the type of operation, total biomass and fish size and feed used, and partly on the ability of water to handle such matter, which in turn depends on hydrographic conditions. Other factors include climate, water quality and depth, sediment type, benthos density and diversity and liability to eutrophication.

The main components of organic effluents are organic carbon, ammonia and phosphates which enrich the water, stimulating primary production, thus influencing phytoplankton composition and the occurrence of algal blooms which are often toxic. This waste also raises the levels of chemical compounds such as inorganic and organic nitrogen, and causes the spread of bacterial species, particularly anaerobic bacteria which produce toxic gases. Bacterial decomposition causes sediments to become anoxic, which in turn will lead to de-oxygenation of water with consequent species mortality.

Wastes from a fish farm mainly result from faeces and excreta of the fish in the cages and from the excess uneaten food passing through the cage. Dissolved wastes from excretion, dissolution of settling particles, and inputs from sediments, consist of organic material, inorganic nitrogen and phosphorus compounds and dissolved micronutrients.

Dissolved wastes entering the water column have a more widespread effect than particulate wastes beneath cages, especially the Dissolved Inorganic Nitrogen (DIN) compounds, nitrate (NO_3^-), nitrite (NO_2^-), ammonia (NH_3) and ammonium (NH_4^+) compounds. The DIN input effects from fish farms depend mainly on local hydrographic conditions, which determines the resulting concentration in the water column, rather than the actual input level, since an increase of DIN above background concentrations is necessary to influence phytoplankton ecology.

Waste loads from aquaculture operations are usually estimated using a mass-balance method, assuming net loads to the environment to be the difference between material input and output. The quantity of waste produced by a fish farm primarily depends on the amount of feed required to obtain a certain harvest weight.

Nitrogen is emitted into the marine environment either in the form of ammonia from the fish itself or the gills emit it. Together, in the Maltese Islands, these make up about 270 tonnes of nitrogen emitted per year into the marine environment. It is also known that about 10% of the food given to fish are lost. About 350 tonnes of protein are lost to the bottom of the sea, while around 100 tonnes of lipid and 150 tonnes of carbohydrate end up forming part of the sediment and thus creating anaerobic conditions.

Particulate wastes from uneaten food and faeces are either eaten by wild fish or dissolves into the water column, but most settles beneath the cages to be either consumed by benthic fauna or decomposed by bacteria. The most important fraction of the settling waste is the organic carbon fraction acting as a substrate for the bacteria in the sediment. High loading of organic carbon per

unit area will result in high bacterial activity so that the available oxygen is rapidly depleted to be replaced by oxygen diffusion from the sediment surface and by exchange of the pore waters within the sediment. These processes are affected by the particle size of the sediment, the coarser the particles the lesser the oxygen depletion. The by-products of the faster aerobic decomposition are carbon dioxide and water. When all the oxygen available is used up, anaerobic metabolism replaces oxygen by nitrate which is reduced to ammonia, sulphate which is reduced to sulphide and carbon dioxide which is reduced to methane which are toxic to fish.

Aquaculture units also release disinfectants, pesticides, fertilizers, antibiotics, hormones and others from the foodstuffs. Much of this ends up on the seabed below the cages to be swallowed by fish and later to be excreted and become concentrated in the sediment. Biocides and algacides used to control parasites are lethal to organisms although this process is not carried out in most of the fish farms in Malta. Several biocides and antifoulants based on copper are applied to the cages and other structures set up in the water in, order to prevent fouling. Leaching of heavy metals from these chemicals are now causing serious physiological damage to marine organisms as seen from studies on benthic animals carried out at the University of Malta and all over the world. Unfortunately, there is to date no fixed legislation on the usage of antifoulants in Malta, either on boats or on fish farming structure.

Wastes such as food, faeces, urine, also cause local damages on biodiversity, mainly through the loss of habitat diversity. Although aquaculture activities generate pollution, they are also at the mercy of environmental deterioration. Any type of water contamination causes mortality or make the animals unfit for consumption. Water quality thus has a direct influence on fish, leading to delayed growth and reduced resistance. Although parasites are apparently less proliferate in seawater, intensive monoculture offers almost ideal conditions for the appearances of new diseases and the persistence of existing illnesses. Water also has an indirect influence. The nutritional quality and healthiness of artificial foodstuffs is vital for, if the fish is not in top condition, it will have low resistance to impaired conditions in the environment, and to stress, and its growth may slow down.

(VII) Domestic and Industrial Wastewater

In Malta no industries discharge their trade effluents directly into the marine environment, with the exception of the reverse osmosis's and a couple of air conditioning units which effluents are not regarded being as industrial effluents.

The sewage system in Malta, is a one pipe system catering for all industrial, domestic wastewater and a high percentage of rain water. Through the implementation of L.N. 8/93, which stipulates the limits of the chemical and physical parameters, control on the effluent quality is achieved. These regulations require the individual industries to perform regular analysis which can be made available to personnel of the Discharge Permit Unit as requested. Furthermore, companies having IMAS/ISO 14000 are obliged to report all non conformities to the Director of the Drainage Department.

All over the island, there is a system of emergency outlets which operate in case of emergency leading to the discharge of sewage into the marine environment. Such situations occur only rarely and efforts have been made prevent this by installing a telemetric system in pumping stations and retention reservoirs in critical areas.

Wastewater disposal into the marine environment is currently being carried out at three sites namely at Ras il-Hobz (Gozo), ic-Cumnija and Wied Ghammieq (Malta). At these sites a cocktail of domestic/industrial/agricultural wastewater is discharged. Only 10% of the fully domestic wastewater is treated by Sant Antrnin Sewage Treatment Plant. In the near future Biological

Treatment Facilities will be constructed at these three sites. Environment Impact Assessment for these facilities are currently underway.

The Sewage Master Plan

The Sewerage Master plan for Malta and Gozo is the finalised document of reports which was compiled by consulting services, the Ministry for the Environment and COWI consult. This report was submitted to the Drainage Department in November 1992. The main aim of this consultancy was to identify and assess the current sewerage infrastructure of the Maltese Islands, to highlight problems areas and bottle necks of the network and to propose a series of upgrades and improvements to overcome the latter.

The improvements and upgrades can be subdivided into the following groups:

- New relief mains
- Retention basins and galleries to be used for retention
- Pumping stations and rising mains
- Sewage treatment plants
- Sewage outfalls

The implementation of the improvements and upgrade is intended to span over a number of years.

(i) Demands for treatment before disposal of wastewater

One of the objectives of the Sewerage Master Plan is to propose relevant improvements to the sewerage system and propose new works, which will eventually bring the collection, treatment and disposal of wastewater in Malta in line with the directives of the E.U. At present most of the waste water produced (~90%) is discharged untreated to the sea through a number of outfalls:

Sewage Outfalls: At present only a low percentage of the population of Malta is not served by a sewerage system. All sewage production is diverted to two main outfalls in Malta and one in Gozo.

The main outfalls are:

Area	Effluent Type	Lat	Long	Quantities
Wied Ghammieg	Industrial & Domestic & Agricultural	35°53'.07N	14°32'.04E	58,000 m ³ /day
		35°54'.14N	14°32'.67E	
		35°54'.06N	14°32'.85E	
		35°53'.06N	14°32'.06E	
Tac-Cumnija	Domestic & Agricultural	35°58'.22N	14°20'.15E	6,700 m ³ /day
		35°58'.22N	14°20'.25E	
		35°58'.05N	14°20'.26E	
		35°58'.05N	14°20'.16E	
Ras Il-Hobz	Domestic & Industrial & Agricultural	36°01'.04N	14°16'.70E	5,830 m ³ /day
		36°01'.13N	14°16'.85E	
		36°00'.98N	14°16'.96E	
		36°00'.91N	14°16'.79E	

The present practice of discharging raw sewage is in compliance with the laws in force in Malta. The Environment Protection Act 1991 contains a clause not yet in force which stipulates that discharges to the sea shall be in accordance with any international treaty instrument of a global or regional nature to which Malta is party to.

Malta has through participation in the Mediterranean Action Plan (MAP, Barcelona Convention) participated in the Genoa Declaration which commits Malta and other countries in the Mediterranean zone to establish sewage treatment and outfall for large discharges (exceeding by the year 2000 and for small discharges by 2005).

The Drainage Department is the regulatory body administering L.N. 8 of 1993. This legal notice establishes specific guidelines and parameters within which any effluent discharged into the public sewerage system by any trade premises must fall before the issue of what is termed as a Sewer Discharge Permit.

2.3 Brief overview on the state of the environment in the Maltese Islands

2.3.1 Seawater Quality

In the previous section, a description of the major activities on our coasts has already permitted a clear view of the nature and state of the marine environment and the consequent seawater and inland water quality characteristic of the Maltese Islands. Hence, only a few issues will be elaborated on in this section. Petroleum hydrocarbons and oil derivatives play a major role in seawater contamination with a negative impact on marine organisms ranging from acute toxicity to sublethal effects on their physiology and behavior. Such substances tend to accumulate in the superficial sediments of harbours and such areas where there is heavy use of petroleum hydrocarbons. In the Mediterranean, levels exceeding 10µg/g d.w. of sediment are usually considered as indicative of significant pollution. To this end, control is exerted both by the companies involved and through random checking by the Pollution Control Co-ordinating Unit in order to prevent the concentrations of hydrocarbons in effluent water entering the marine environment from exceeding this level. As an example, one oil storing company has a system which checks that the waste water from the reception tanks and from rainwater from the plant being discharged into the marine environment does not contain a hydrocarbon concentration of more than 5ppm.

Oil pollution in Malta mainly originates from deliberate dumping or accidental release from passing ships, from operational discharge, from ship repairs and from tank cleaning activities. The harbours are the areas most at risk from both chronic and accidental release of petroleum hydrocarbons. As such, port preparedness and response plans are required in order to provide a means of eliminating and confining potential environmental damage associated with incidents.

Studies undertaken between 1987 and 1993 indicate that levels of petroleum hydrocarbons in superficial sediments in Grand Harbour have increased from 5 to 12 times with maximum levels of 44.5µg/g d.w. in Chrysene equivalents recorded in the vicinity of Marsa power station and the greatest increase in the dry-docks area. A four-fold increase in oil pollution load in sediments between 1987 and 1993, from a mean concentration of 10.6µg/g to 40.0µg/g d.w. has also been detected in Pieta' and Msida Creeks following development of yacht marinas.

Several oil-tanking facilities are present in Malta, located in the harbours. The hydrocarbon substances are stored for local use or await transshipment to the other countries. As such, oil pollution results during handling of cargo and also through the discharge of wastewaters, which is contaminated with hydrocarbons after having been pumped up inside empty tanks to retain

pressure. The three main oil tanking storage facilities store an average of 2 billion metric tonnes of fuel oils annually in the three major harbours.

Data on the levels of heavy metals in local waters, sediments and biota is very limited. Field studies indicate that the levels of lead and zinc in biota and sediments within local harbours may be relatively high. A study undertaken in 1992 by Galdies, shows that the level of lead in sediments collected from Marsamxett was found to be comparable to or higher than that of other Mediterranean inshore sediment exposed to urban and industrial pollution (e.g. Marsamxett Harbour 118µg/g d.w.; Themaikos Gulf 71.2µg/g d.w.; Gulf of Venice 45µg/g d.w. – Galdies & Axiak, 1992). Car traffic appears to be the likeliest source of lead contamination. High levels of lead have been recorded in the tissues of such shellfish as *Lithophaga lithophaga* and *Venus verrucosa* collected from local harbours.

Tributyl tin (TBT), the active biocide used in antifouling paints on seacraft may cause biological damage to certain marine fauna, especially molluscs. TBT levels in sediments, seawater and biota were found to be relatively high in Marsamxett and Grand Harbours. One biological effect of TBT is the induction of imposex in some species of marine snails such as *Hexaplex trunculus*, especially specimen collected from Marsamxett, Mgarr and Grand Harbours. Assuming imposex to be an indication of the presence of TBT, it would seem that harbours and marinas exposed to heavy boating activities in both Malta and Gozo are already contaminated by this antifoulant to a considerable extent. As such no legislation on the use of TBT and other antifoulants exists in Malta.

2.3.2 Inland water quality

Freshwater habitats are represented on the Islands by kamenitzas (rainwater rock pools on karstland), permanent pools, watercourses (wet during the rainy season) and permanent springs. There are practically no perennial inland waters in Malta, since these largely depend on seasonal rainfalls. During the rainy season, several springs are present in the major valleys including *Wied il-Bahrija*, *Wied il-Luq*, the man made Chadwick Lakes in *Wied il-Qlejgha*, *Wied il-Lunzjata* in Gozo, and several others.

During the dry season from April to September most of these springs dry up, except for the permanent springs with perennially flowing fresh water, these being located in *Wied il-Bahrija* in Malta, and *Wied il-Lunzjata*, *il-Qattara* (I/o San Lawrenz) and *I-Ghadira ta' Sarraflu* (I/o Kercem) in Gozo. All fresh water habitats support rare species communities. The major sources of pollution of these inland waters comprise agricultural runoffs and runoffs from roads, especially following heavy rainfall.

Agricultural runoffs mainly contain pesticides and fertilizers, which chemicals may prove severely harmful to living organisms through the presence of toxic compounds in pesticides and through the nutrient enrichment of the waters, resulting in such deleterious effects as algal blooms and water quality deterioration. In this way, the stream becomes contaminated as it flows towards the sea, where eutrophic conditions will ensue, with consequent negative impacts on both the freshwater and marine environments. Soil erosion is also of concern, as it will add up to silting problems in the streams. Discharge of organic loads is also a major cause of oxygen deficiency while harmful pathogens are also a major cause of contamination in cases where domestic sewage finds illicit use in crop irrigation.

2.3.3 Protection of habitats

Ecologically sensitive areas generally support habitats with species that are rare or endemic or both and which are severely endangered for various reasons such as development. The Maltese Islands have a very high population density and consequently human impact on the natural environment is intense and usually negative. Therefore it is important to identify and protect localities which support particularly important habitats and species and designate them as conservation areas. This is especially important for sites that are on the verge of obliteration and hence ecologically sensitive.

Ecologically sensitive habitats include (Figure 13):

- a. permanent springs with perennially flowing fresh water – *Wied il-Bahrija*, Gnejna Valley, Bingemma Valley (Malta); *Wied il-Lunzjata* (Gozo)
- b. Saline marshland - *Ghadira* (Mellieha Bay), *Is-Simar* (St Paul's Bay), Salina Bay, Marsa (now completely degraded), *Il-Magħluq* (Marsascula), *Il-Ballut* (Marsaxlokk Bay).
- c. Fresh water pools - *Qattara*, *Ghadira ta' Sarraflu* – Gozo
- d. Cliffs - Along western to southern coast of Malta and Gozo. These harbour the most important elements of our native rupestral flora and fauna, including a large number of endemic species and species of biogeographical interest.

Saline marshlands situated on the coast constitute only 0.5% of the Maltese coastline. 5 sites in Malta and 2 sites in Gozo have been completely obliterated through land reclamation, whilst 8 sites in Malta, 3 sites in Gozo and one site in Comino have been severely degraded by human activities. The remaining saline marshlands of *Il-Ballut* (Marsaxlokk Bay), *I-Ghadira* (Mellieha Bay), *Is-Simar* (St. Paul's Bay) and *il-Magħluq* (Marsascula) are currently managed by the Environment Protection Department. Saline marshlands are legally protected through the Environment Protection Act 1991 and the Development Planning Act of 1992.

Another habitat for whose protection the Environment Protection Department is striving is sand dunes. Sand dunes are in the process of a rapid decline through the indiscriminate appropriation of beach and coastal area for the development of tourist amenities, haphazard exploitation for recreational facilities and general public ignorance. Most dune species are now restricted to *Ramla l-Hamra* in Gozo, which is, scheduled according to Section 47 of the Development Planning Act of 1992. Dune remnants are located at *Ramla tat-Torri* (White Tower Bay), *Ramla tal-Mixquqa* (*Għajn Tuffieha* Bay), *Ghadira* (Mellieha Bay) and *Armier* Bay. All these support small communities of rare dune biota which are in desperate need of protection.

The minor islands of Filfla (terrestrial) to the south of Malta, *il-Gebbla tal-General* (Fungus Rock in Dwejra, Gozo) and *Selmunett* (St. Paul's Island, St. Paul's Bay) are protected under the Environment Protection Act of 1991. These islands are designated nature reserves where all species of flora and fauna are protected. Comino has also been declared a nature reserve under the Declaration of Protected Species and Nature Reserves Amendment (1993) under the Environment Protection Act of 1991.

There are currently no marine conservation areas in the Maltese Islands although several coastal habitats have been scheduled and given legal protection. In 1993, the Environment Secretariat for the Ministry for the Environment had requested the assistance of RAC/SPA within the Mediterranean Action Plan in establishing marine protected areas in the Maltese Islands. The report prepared by an expert proposed 26 areas as Marine Protected Areas and 16 coastal areas as Nature Reserves. Formulation of regulations would aim at the control and abatement of the

immediate threats to the environment and regular monitoring, in conjunction with the setting up of policy and legislation for the proper management of the sites.

However, to date no area has been declared as a marine protected area or as a marine conservation area. However, preparations are now being made with PAP/Rac under CAMP projects to carry out an intensive study in the northwestern coast of Malta with the intention of setting all the necessary provisions for the establishment of a management plan of the area with the prospective of declaring the first marine conservation area in the Maltese Islands. This exercise would then lead to the study of other areas with the same intent.

2.4 Environmental monitoring

One of the main environmental programmes in the Maltese Islands is the MED POL programme for marine environmental monitoring. This programme has been running for several years to various degrees, depending on the currently available resources. In 1996, the MEDPOL monitoring programme for Malta was revised and is now being implemented in phases.

The MEDPOL programme was envisaged to cover the periodic analysis of sea water and sediment quality together with biomonitoring component utilising several organisms which have been established as bioindicators of pollution. Physical, chemical and microbiological parameters are measures. The Environment Protection Department is currently monitoring the microbiological content of seawater in about 30 sites in Malta and Gozo on a monthly basis. Some chemical parameters are also measures. Offshore seawater and sediment samples have also been collected seasonally and analysed for chemical parameters including heavy metals. It is envisaged that the MEDPOL programme will be extended in the near future to include biomonitoring and to study more areas on a more frequent basis, depending on the particular needs of the area in question. The methods of analysis applied are established by the Mediterranean Action Plan in order to conform to the provisions laid down by the said action plan under the Barcelona Convention.

Prior to 1996, the MEDPOL programme had been carried out to various extents, sometimes emphasising microbiology, at other times stressing on heavy metals, depending on the resources available. Concurrently, the Department of Public Health carries out an extensive programme on bathing water quality. This monitoring programme is carried out between May and October on weekly basis. Samples are collected from over 100 sites per week and analysed for microbiological parameters following WHO legislation for the safeguarding of human health. Bathing beaches are closed down if the microbiological quality is unsatisfactory and are not reopened unless clear indication of an ameliorating situation is observed.

As regards inland water quality, the Environment Protection Department has carried out a tentative programme for the last three years. This involves the collection of water samples from various annual and perennial springs in Malta and Gozo. These samples are then analysed for such physicochemical parameters. Samples are collected from five localities in Malta and two in Gozo on a monthly basis mainly during the rainy season. Results indicate rather high levels of conductivity and nitrate and nitrite nitrogen in most areas probably due to the leaching of fertilizers.

Provisions are currently underway to set up a more extensive programme covering a greater number of runoffs in various localities in the Maltese Islands. Samples will be analysed on a more frequent basis for physical, chemical and biological parameters, especially to include substances resulting from pesticide and fertilizers in the more agricultural areas.

2.5 Non-governmental organisations (NGO's)

There are several non-governmental organisations in Malta. Examples of NGO's concerned with the marine environment include Nature Trust (Malta), The Ecological Society, GAIA Foundation, GreenPeace Mediterranean, Marine Life Care Group, Environment Movement (*Moviment għall-Ambjent*) and Nature Friends (Malta). However, they rarely influence decision making in Malta, mainly due to lack of human resources and funds.

3.0 LEGISLATION

3.1 The Environment Protection Act, 1991

A legal framework law in the form of the Environment Protection Act was adopted in 1991 to address environmental and resource problems which may act as threats to the legitimate enjoyment of, amongst others, our sea, by all those species who live around, in or on it, or who otherwise depend on it.

The laws of Malta are in line with modern environment legislation elsewhere. The 'precautionary approach' is adopted in the case of toxicity or potentially toxic substances in such a way that protection and the reduction of risk, even in the absence of absolute scientific proof, is assured. The 'polluter pays' principle was adopted in an extended form so as to include liability for damages by pollution. The principle of 'public participation' is also legislatively established. It creates a right of redress not only to those parties considered to be directly affected, but also to any person who believes that the decision-maker's decision and subsequent action was incorrect.

Hence, Maltese Environment legislation stems from obligations set out the Environment Protection Act. These obligations specify the duty of the Government for and on behalf of present and future generations, in order to:

- take all those measures both preventive and remedial that may be necessary for the protection of the environment of Malta;
- collaborate with other governments and entities for the protection of the world environment;
- endeavour that food, drink, the land, the sea, and the air are free of contamination from any toxic substances.

The Environment Protection Act also makes provision for the protection of Marine Living Resources. Part 4 deals with discharges into the sea and lays down extensive administrative provisions in relation to protection of the sea from marine contamination hazards. It prohibits discharge into the sea of any matter deriving from land, air, or from any ship, airplanes or other craft "without the authorisation of the minister".

The Environment Protection Act of 1991 (Annex II) covers the following main issues:

1. Monitoring and information – Directives and codes of practice concerning the quality of the environment
2. Control of toxic substances including fuels and harmful even if not toxic substances
3. Noise and energy control
4. Discharges into the sea
5. Disposal and dumping on land
6. Protection to the flora and fauna
7. The historical heritage
8. Environment Impact Assessments

9. Authority of review
10. Civil damages and punishments in criminal law
11. Operation, repeal and interpretation

3.2 Maltese legislation

(i) Water quality

Sand (Preservation Act, 1949
Petroleum (Production) Act 1958
Marine Pollution (Prevention and Control) Act 1977
Malta Maritime Authority Act 1991
Bunkering (Fuels) Act 1994
Water Services Corporation Act 1991
Environment Protection Act 1991
Development Planning Act 1992

At the International level, Malta has constantly shown great interest in the emergence of a comprehensive co-operation taken between Mediterranean countries to combat marine pollution and is party to a number of international treaties concerned with the protection of the Mediterranean marine environment. Malta ratified the Barcelona Convention in December 1977 together with the Dumping and Co-operation in Emergencies Protocols, followed by ratification of Specially Protected Area Protocol in 1982, the all important Land-Based Protocol in 1983 and the Offshore Protocol in 1984. Malta also acceded to the 1972 London Dumping Convention and to MARPOL 73/78. In consonance with the emphasis laid down by Agenda 21, efforts of national environmental and scientific institutions have brought forth the seriousness of the environmental conditions of the coastal ecosystems of the Maltese Islands

New regulations make it compulsory that the construction, operations and equipment, procedures, personnel and practices of all ships, bunker barges, marine terminals and facilities and cargo activities must be in full compliance with all requirements laid down in IMO Conventions to which Malta has acceded, while taking into consideration prevailing local conditions and the requirements of the Authority. The Authority has also set up operational standards in accordance with international practice and to be relevant to safety requirements especially in the environmental aspects.

The Environment Protection Department co-ordinates oil pollution combating and collection activities, using its own limited capabilities. Massive oil pollution episodes deriving from vessels berthed in internal waters or from shore-based installations necessitates enforcement. Polluters are made to pay all relevant costs of the recovery exercise and are also required to liquidate damages to other parties, including environmental damages. Ships may be detained in harbour pending settlement of claims.

Malta has signed and ratified a number of international conventions on both the global and regional scale which address particular issues or areas relevant to the coast. The following is a list of those international conventions which affect Malta's approach towards its coastal environment:

- Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 (RAMSAR)
- Convention for the Protection of the World Cultural and Natural Heritage (1972)
- Convention on the Conservation of European Wildlife and Natural Habitats 1979 (BERN)
- United Nations Convention on the Law of the Sea 1982 (UNCLOS)

- Convention for the Protection of Architectural Heritage of Europe 1985
- Convention on Biological Diversity 1992 (RIO)
- Convention on Climate Change 1992 (RIO)

Specifically geared towards encouraging co-operation for the protection of the Mediterranean region, the level of commitment urged from the Contracting Parties to the Barcelona Convention is significantly higher; the success of implementation relies on the performance of each State in effecting the outlined provisions. The Barcelona Convention and its related Protocols are listed below.

- Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (1978)
- Protocol for the Prevention of Pollution from Land-based Sources (1984)
- Protocol for the Prevention of Pollution of The Mediterranean Sea by Dumping from Ships and Aircraft (1978)
- Protocol concerning Co-operation in Combating Pollution in the Mediterranean Sea by Oil and other Harmful Substances in Cases of Emergency (1983)
- Protocol concerning Mediterranean Specially Protected Areas (1986)
- Protocol concerning Pollution resulting from Exploration and Exploitation of the Continental Shelf, the Seabed and its Subsoil (1994)

(ii) Protection of habitats

At present there are no marine protected areas within Maltese territory. Fishing and/or diving are restricted in certain sea areas round the Maltese Islands, however this is for reasons of safety and to preserve important wrecks and marine archaeological remains rather than for the protection of marine habitats and species. The closest to a marine protected area, which the Maltese Islands have, is the sea area round the island of Filfla. There are currently two pieces of legislation under which marine protected areas of various sorts may be established in the Maltese Islands.

Environment Protection Act, 1991

Part 6 of this Act deals with the protection of flora and fauna. It is in terms of the provisions of this Act that the various nature reserves currently existing in the Maltese Islands have been established, however the Act does not define 'Nature Reserve' nor are there any blanket regulations applicable to all Nature Reserves.

Development Planning Act, 1992

In the version of the Structure Plan currently in force, there are thirteen policies drawn up towards the promotion of marine conservation. These identify fourteen candidate sites to be designated as Marine Conservation Areas, following adequate technical studies as well as full consultation with interested bodies from the administrative, private and public sectors.

(iii) EIA's and development

The Planning Authority was set up through the enactment of the Development Planning Act 1992, which establishes the strategic framework within which it will operate. Its primary function is to promote proper development and control such development in accordance with approved policies and plans, with close collaboration with Government Departments and other agencies.

The Planning Authority is concerned with the implementation of the Structure Plan, which was adopted in 1992. The Structure Plan is a document consisting of a number of policies aiming to guide the Planning Authority's work towards controlled development in Malta. The Plan contains specific policies referring to the coastal zone, which recognise the need to establish a comprehensive Coastal Zone Management Policy for the Maltese Islands. Other Structure Plan policies with direct relevance to development within the coastal zone include policies on Rural Conservation, Sandy Beaches, Marine Conservation Areas, Agriculture and Tourism. The Act requires that Government and state agencies seek permission from the Planning Authority for all developments by private developers and.

An important step towards the control of development on the coast has been the introduction of Environment Impact Assessment (EIA) for any development project on the coastline as specified in the Environment Protection Act of 1991. EIAs are a tool to evaluate the impacts that certain projects will have on the natural and socio-economic environment. The Planning Authority adopted policy and Design Guidelines on the procedures required for the EIA process in 1994. The document outlines a coordinated approach in the administration of the EIA process between the Planning Authority and the Environment Protection Department. Once a report on the assessment is submitted, it is subject for consultation by other administrative bodies and organisations which may have statutory control over a particular sector. Non-Governmental Organisations (NGO's) are also consulted and if the process requires the submission of an Environment Impact Statement, this is subject to public hearing. Presently, the EIA process is carried out jointly between the Environment Protection Department and the Planning Authority

(iv) Activity regulation

In Malta, various laws and regulations under the jurisdiction of several government institutions enforce regulations for the setting up of new activities. The Drainage Permit Unit under the Department of Works covers industrial and municipal wastewater disposal. The Department of Agriculture mainly covers animal breeding and agriculture while the disposal of solid waste is regulated by legal notice 128/97 of Maltese law. Infrastructural projects fall under the jurisdiction of the institution mainly concerned. However, all these projects require permit primarily by the Planning Authority. The Development Planning Act and the Environment protection Act both require an environment impact study in the case of most permits and in this way a close observation of the activity operations can be kept for compliance and control.

New projects are approved by the Planning Authority and seconded by the Environment Protection Department only in the context of the surrounding environmental situation and in full knowledge of the best provisions for the natural environment and human health. In spite of this, several inspections have to be carried out on a periodic basis in order to ensure compliance with the conditions set out by the relevant authorities. Nevertheless, violation of law is very often encountered, so that the authorities are then in a position to issue fines or the appropriate punishment for the infringement.

Summary of Legislation in respect to Discharge Permit Unit (Discharge Permit Unit) Function; (Monitoring, Implementation, control and advise related to Type and quantity of effluent discharge, Physical and chemical parameters including; BOD levels, pH, temperature, suspendible solids, settleable solids, etc.)

Process/Waste	Legislation/Regulations	Depts / Auth involved
Contaminated Rain Water (from Cowsheds, Pigsty, other animal husbandry)	<ul style="list-style-type: none"> • L.N. 8 of 1993 • Code of Police Laws (Chap. 10) • Dairy Farms Regulations • Pig Farm Regulations • Water Services Corp Act 1991 Emptying of Cesspits Reg; L.N. 270 of 1921, L.N. 339 of 1924, L.N. 34 of 1925 & L.N. 23 of 1929 • Env. Protection Act of 1991 • L.N. 128 of 1997 	Drainage Department – DPU Commissioner of Police Department of Public Health ¹ Dept of Agri & Fisheries ² Water Services Corporation ³ ; Env. Protection Dept. ⁴
Catering Establishments	<ul style="list-style-type: none"> • L.N. 8 of 1993 • Env. Protection Act of 1991 • Food Drugs and Drinking Water Act, 1972 • National Tourism Organisation, Act 1984 • National Tourism Organisation (Amendment) Act, 1986 • Hotels & catering Establishment Act, 1967 	Drainage Department – DPU Environment Protection Department Department of Public Health ⁵ Hotels Catering Establishment Board Hotels Catering Establishment Board Hotels Catering Establishment Board
Factories: Activities involving – Food & Beverage, Pharmaceutical, Electronics, Wood & Wood Products, Textiles, Chemical, Rubber, Plastics, Metal and Non-Metallic Industries, etc.	<ul style="list-style-type: none"> • L.N. 8 of 1993 • Environment Protection Act 91 • L.N. 128 of 1997 • Food Drugs and Drinking Water Act, 1972 Factories (Health, Safety and Welfare) Reg. 1986	Drainage Department – DPU Env. Protection Department Env. Protection Department Department of Public Health Dept of Social Security – Occupational Health & Safety & Dept of Health
Sampling and Monitoring	<ul style="list-style-type: none"> • L.N. 8 of 1993 • Environment Protection Act 91 	Drainage Department (DPU) Env Protection Department
Other Trading Premises: Sprayers, Mechanics, Petrol Stations, Panel Beaters, etc.	<ul style="list-style-type: none"> • L.N. 8 of 1993 • Environment Protection Act 91 • Marine Pollution (Prevention & Control) Act 	Drainage Department (DPU) Environment Protection Department
Swimming Pools	<ul style="list-style-type: none"> • Swimming Pools (Control), Act 1974 • Swimming Pools (Control) Regulations 1974 • L.N. 8 of 1993 Water Services Corporation Act 91	Water Services Corporation Drainage Department – Discharge Permit Unit

¹Farm design. Hygiene, manure storage, Quota, etc

²Farm Design, Quota, Farm siting

³Protection of the Water Table and Water resources

⁴Disposal of special waste and Land Based Pollution Sources Protocol.

⁵Siting of treatment facilities and overall jurisdiction on private mains.

4.0 PERMITTING

Permit systems exist for almost all activities in the Maltese Islands, covered by the relevant laws enforced by the institution/s concerned according to the nature of the activity. Different sectors of an operation in a particular activity may also be covered by different legislation, for example,

the Planning Authority is concerned with the construction permit of the activity (size, location, and aesthetics), the Drainage Permit Unit would be involved in the disposal of waste waters. The Environment Protection Department's concern would relate to the effects of the activity on the surrounding environment. The Department of Agriculture would be concerned with the raising of any animals or plants. These are just a few examples of the interplay, which may be present in the process concerning the issue of a permit.

4.1 Permit systems

Industrial activities, animal breeding, urban development, domestic wastewater and solid waste disposal and infrastructure projects are all controlled primarily by the Planning Authority as regards development (Development Planning Act and Structure Plan), the Environment Protection Department as regards the safeguarding of the surrounding natural environment and the prevention and control of pollution (Environment Protection Department and international legislation), the Commissioner of Police in relation to trading permits, the Department of Health in order to take provisions for the safeguarding of human health, and any other authority directly or indirectly concerned with the particular issue.

However, the main authorities responsible for the issue of permits are:

- Environment Protection Department (national and international)
- The Planning Authority (national)
- The Department of Health (national and international)
- The Commissioner of Police (national)
- The Discharge Permit Unit (national)

5.0 COMPLIANCE AND ENFORCEMENT

When a permit is awarded for the installation of a particular activity of any kind, a set of conditions is usually laid out by the various government institutions concerned. These conditions refer both to existing national legislation and any provisions laid down in international conventions and protocols to which Malta is signatory, and to any regulations which may be added in the particular case, at the discretion of the institution. The applicant is thus bound by law to abide by the conditions laid down, otherwise he will be severely penalized by heavy fines, permit withdrawal or in any other way as provided for in the regulations concerned.

Prior to the issue of a permit, the industrial installation or proposed activity is sometimes checked, although this may not always be the case. An investigation is often very helpful as it would provide the authority with a better idea of what the operation will involve and of the surrounding environment. It would avoid any misunderstandings and misinterpretations which may arise in the future between applicant and authority as a result of breaching of a law or non-compliance.

In the event that a complaint is lodged about a certain activity, the authorities concerned set about to carry out an inspection in order to justify or otherwise the complaint. If the complaint is

found to be justified, provisions are set at once to inform the owner of the activity and urge him to remedy the situation. In the worst case, the owner may be fined, or his activity temporarily closed down, or punished in some other way, if he persists in being a nuisance to the surrounding environment and all its inhabitants.

There are several activities in Malta, ranging from maritime activities and the other activities already described, manufacturing industries, catering industry, construction industry, farming industry and several other types of industry. All such industry require permits in order to operate and carry out their various activities. Several authorities have an enforcement inspectorate section within their jurisdiction. They serve to check and make sure that the provisions laid out in the permit conditions are complied with and applied. Such authorities include the Planning Authority Inspectors, the Health Inspectors and the Police Force.

Discharge Permit Unit

Agricultural, Industrial and other commercial activities generate additional liquid and solid waste which is currently being disposed by the majority with the domestic sewage. These on their own are a high priority issue and it must be pointed out that bad waste effluent management practices results in:

- Damages, stoppages and overflowing of the sewerage system.
- Pollution of potable water and other resources (aquifer).
- Pollution of Sea (beaches, etc.)
- Atmospheric pollution.
- General Environmental degradation (overflows, sewage contamination, etc.)
- Inconvenience to private houses.

The main aim of Liquid Discharge Effluent Control is to prevent certain contaminants from entering the sewerage system. These contaminants (lists of which are included in Schedules A, B & C of L.N. 8 of 1993) are turned into a Sludge, Slurry, Paste or solid form and this highly concentrated form of toxic waste falls within the jurisdiction of the Pollution Control Coordinating Unit of the Environment Protection Department. While the 'clean' resulting, controlled effluent is allowed discharge into the sewage.

The primary aim of L.N. 8 of 1993 is to safeguard the Sewage Treatment Plants and the Drainage systems. This is achieved by controlling the physical and chemical parameters as laid down in the Schedules A, B, & C of the regulation. The quality of sewage discharges into the Marine Environment from outflows discharges is controlled by Part 4 (Discharges into the Sea) of the Environment Protection Act, 1991 (Act No. V of 1991).

It must be emphasized that sampling and monitoring of treated liquid effluents from trading premises *is a must* and should be carried out regularly to ensure proper efficiency and functioning of the treatment plants (when installed) and quality of the resulting second class water (treated effluent) used for agriculture and Industrial purposes.

The Discharge Permit Unit was established in 1994 to regulate and set up a strategy as to implement L.N. 8 of 1993. Though an inbuilt structure, organization and strategy capable of dealing with these requirements in view of Malta's international commitments exists, the manpower *alias* human resources lacks.

The main aim of the Discharge Permit Unit is to protect the Sewage Treatment facilities and Sewerage system and this by offering the necessary scientific (Chemical, Biological and Biochemical) advice to prevent certain contaminants from reaching the sewerage system. These

contaminants are in turn turned into a sludge, slurry, paste or solid and this highly contaminated form of toxic hazardous waste falls under the jurisdiction of the Pollution Control Co-ordinating Unit within the Environment Protection Department. The resulting treated effluent (which is now within parameters set in L.N. 8 of 1993) is allowed discharge into the sewer.

Furthermore enforcement of the Regulations is of maximum urgency owing to the Sewage Master Plan; Changing of sewage pipes, installation of new and modern sewage systems, and the establishment of new sewage treatment plants whose treated effluent is intended for the irrigation of agricultural crops and other industrial use. For these reasons it is essential to ensure that sewage effluent entering the sewage systems is as free as possible from Industrial Chemical Pollutants (including Greases, oils, hydrocarbons etc.) which pose a risk to human health and general environment, affect irrigated crops and damage the newly laid sewage pipes and pumps.

It is more cost effective and more efficient to prevent contaminants from reaching the sewage system, rather than to construct Sewage treatment plants capable of performing such treatments. This can only be done by controlling the *Quality* of trade effluent being discharged at source.

Effluent Waste Management must be done in an integrated and environmentally sound manner. Good management involves the use of latest techniques, modern practices, adherence to EC directives and regulations, be commercially viable and where applicable apply standards such as DIN and ISO for reference and guidance.

ANNEX I

FIGURES 1 TO 13

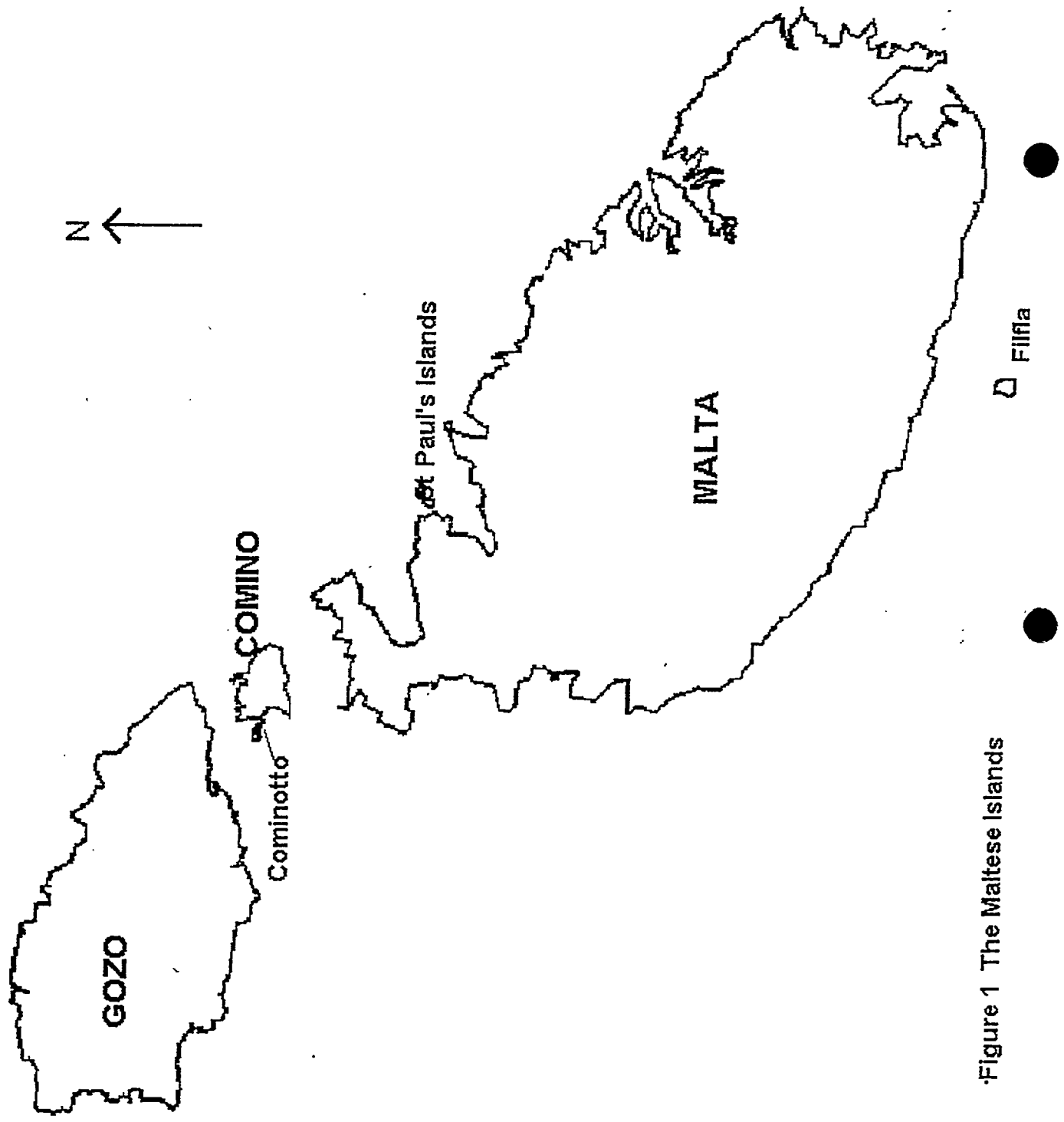


Figure 1 The Maltese Islands

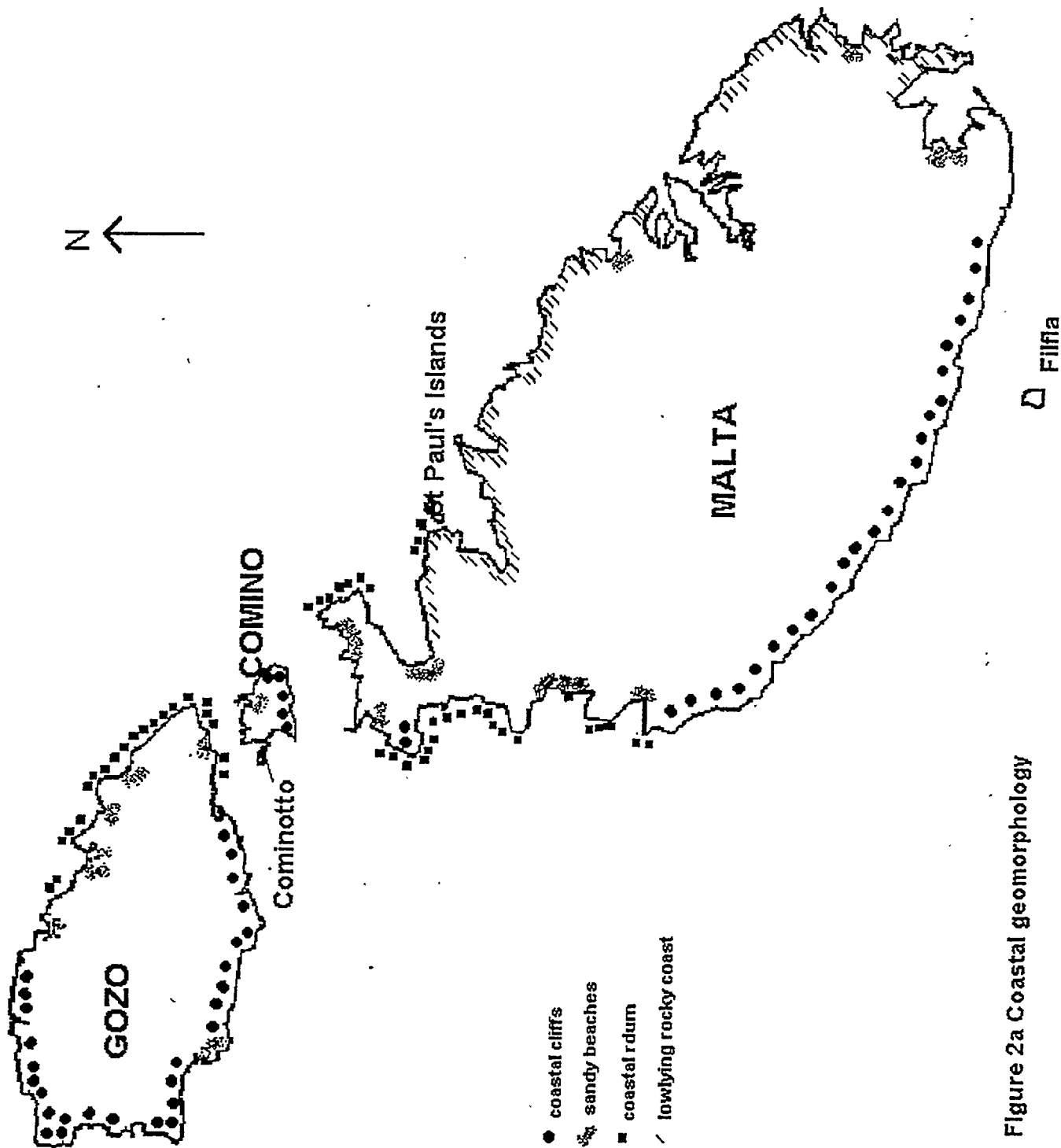
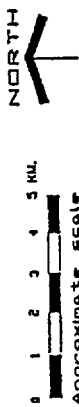


Figure 2a Coastal geomorphology

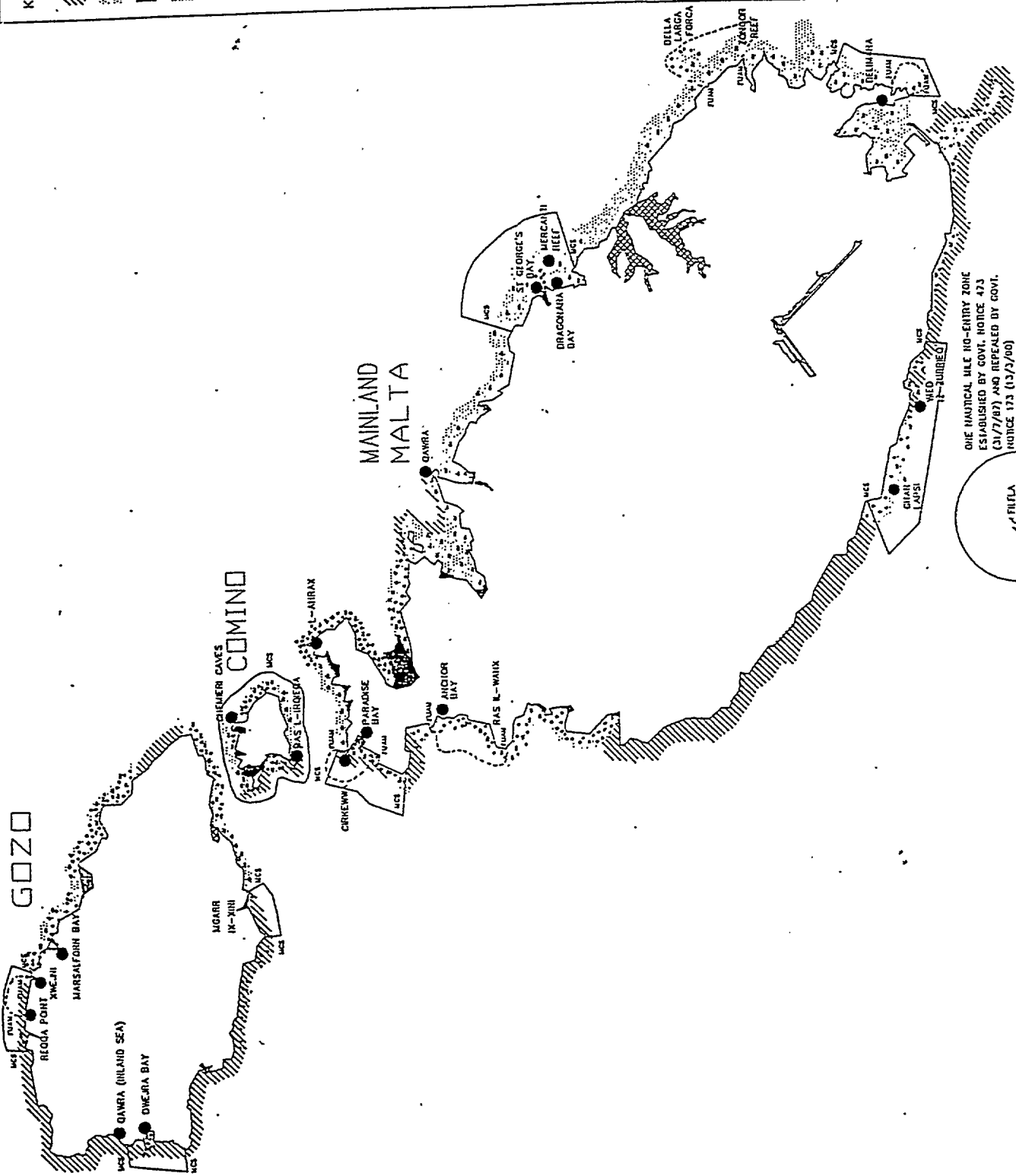
KEY AND SOURCES

- CLIFF HAVIAT AND DROP-OFFS
- GENTLY SLOPING COAST
- BARE SAND
- MUD AND FINE SAND
- SEA GRASS MEADOWS
- BOULDER GROUNDS

- POPULAR DIVING AREAS AS PROPOSED BY ASSOCIATION OF PROFESSIONAL DIVING SCHOOLS
- MARINE RESERVES/PARKS AS PROPOSED BY MARINE CONSERVATION SOCIETY
- MARINE RESERVES/PARKS AS PROPOSED BY SCIENTIFIC COMMISSION, FEDERATION OF UNDERWATER ACTIVITIES OF MALTA



MALTA STRUCTURE PLAN REPORT OF SURVEY COASTAL ENVIRONMENT UNDERWATER HABITAT SURVEY - GENERAL ZONING



ONE NAUTICAL MILE NO-ENTRY ZONE ESTABLISHED BY GOVT. NOTICE 473 (31/7/87) AND REPEALED BY GOVT. NOTICE 123 (12/2/00)

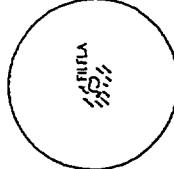


Figure 2b Underwater habitat - general zoning

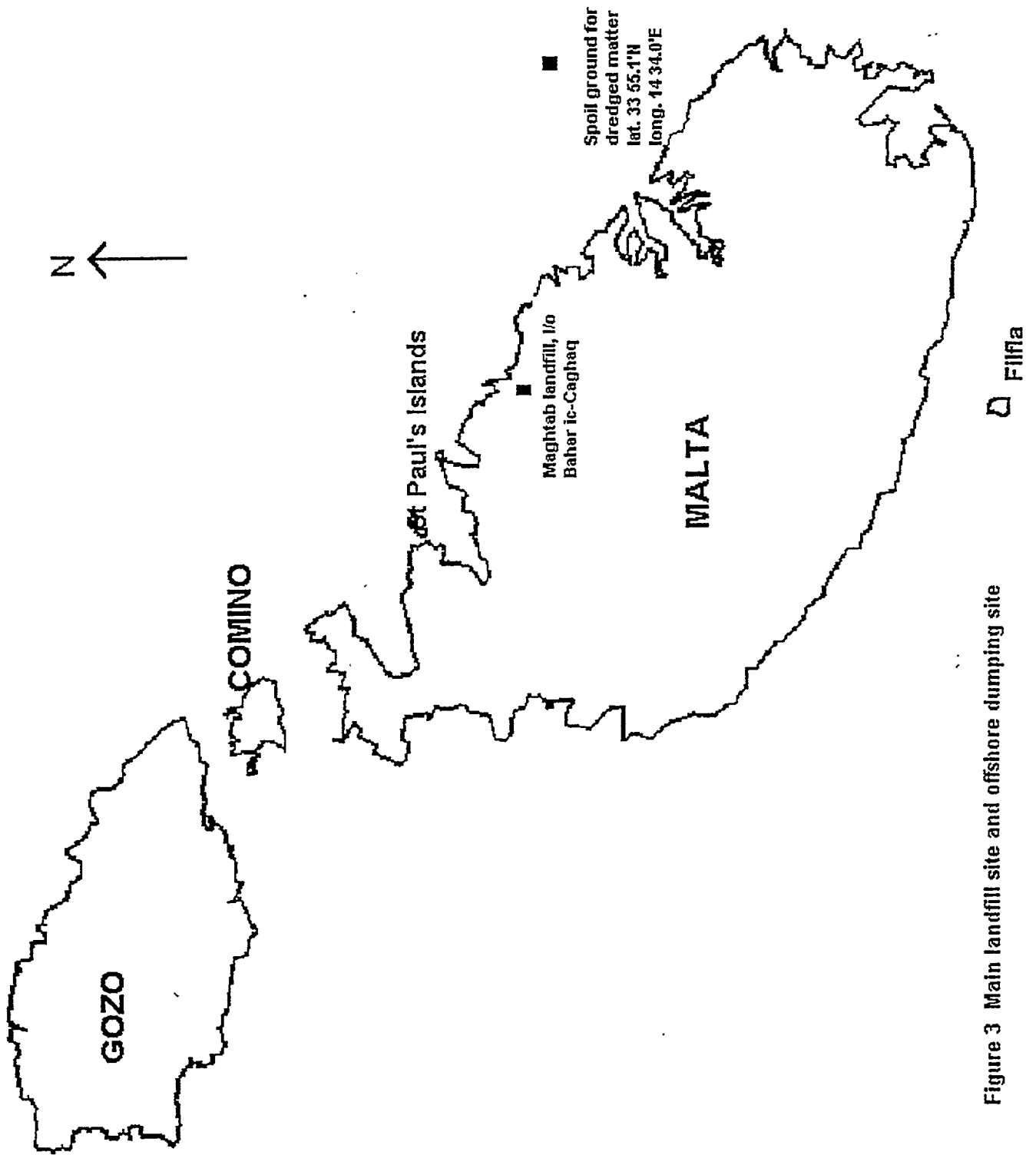


Figure 3 Main landfill site and offshore dumping site

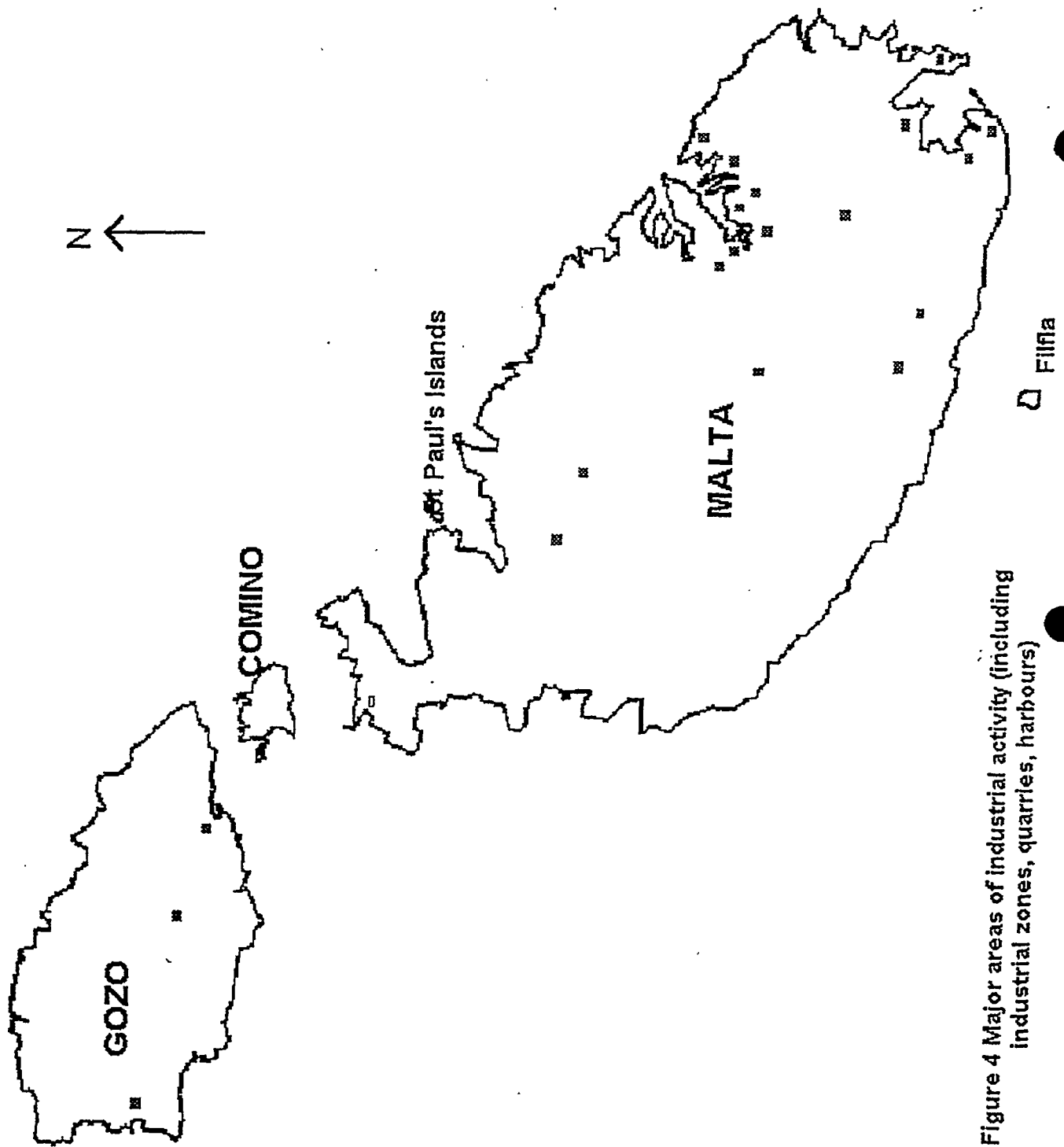


Figure 4 Major areas of industrial activity (including industrial zones, quarries, harbours)

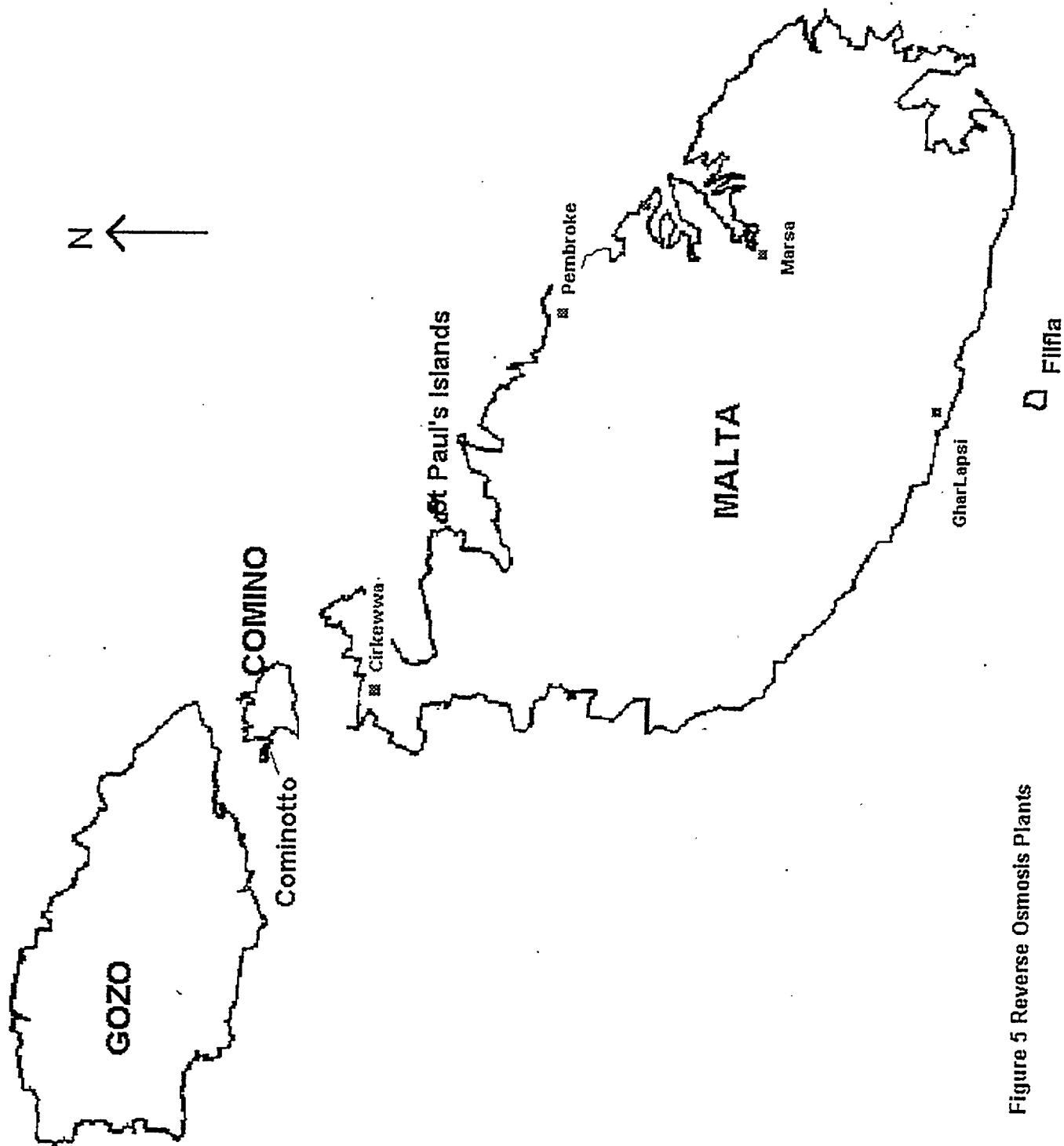


Figure 5 Reverse Osmosis Plants

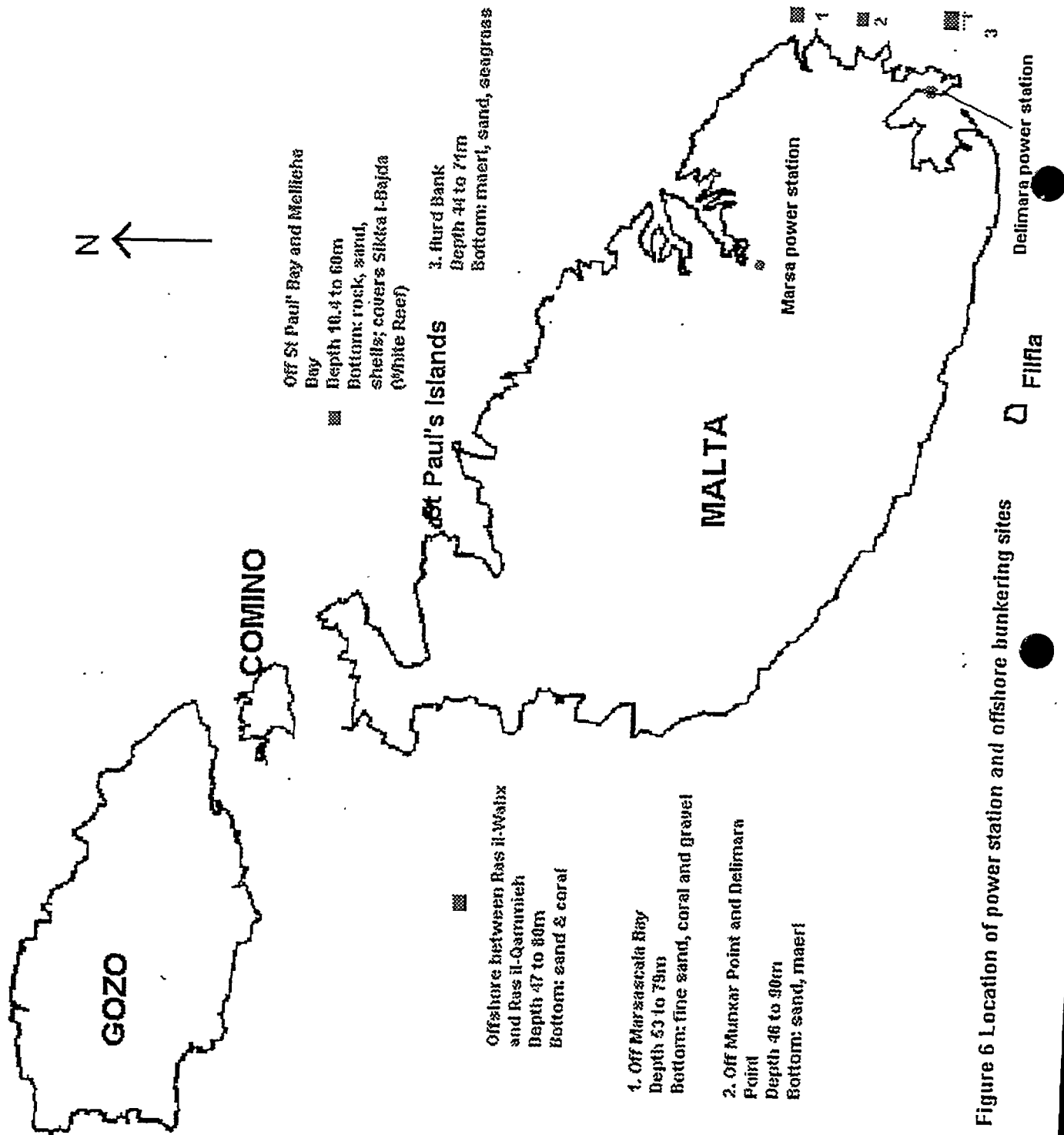


Figure 6 Location of power station and offshore bunkering sites

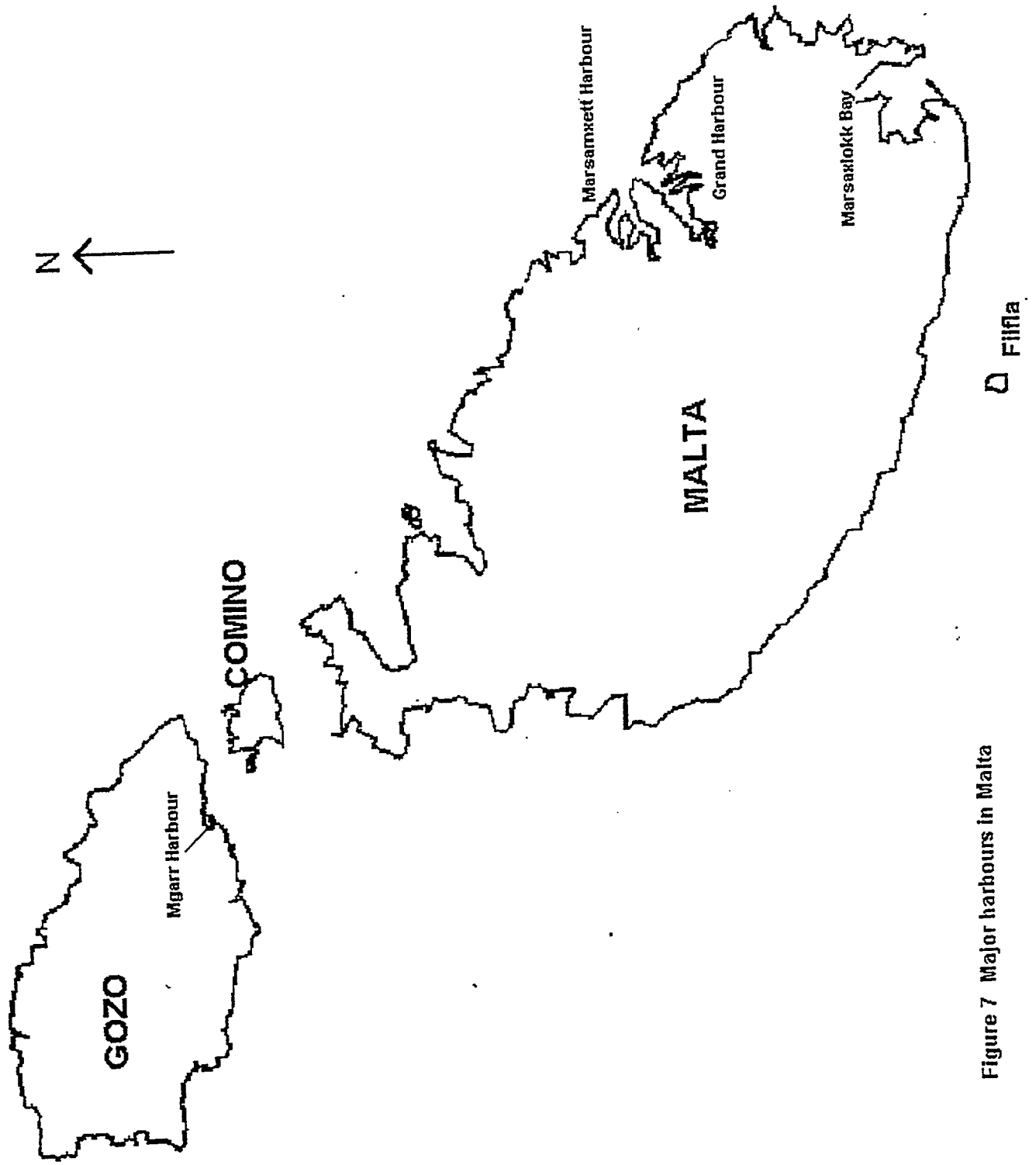


Figure 7 Major harbours in Malta

GOZO

COMINO

MAINLAND
MALTA

TO SICILY

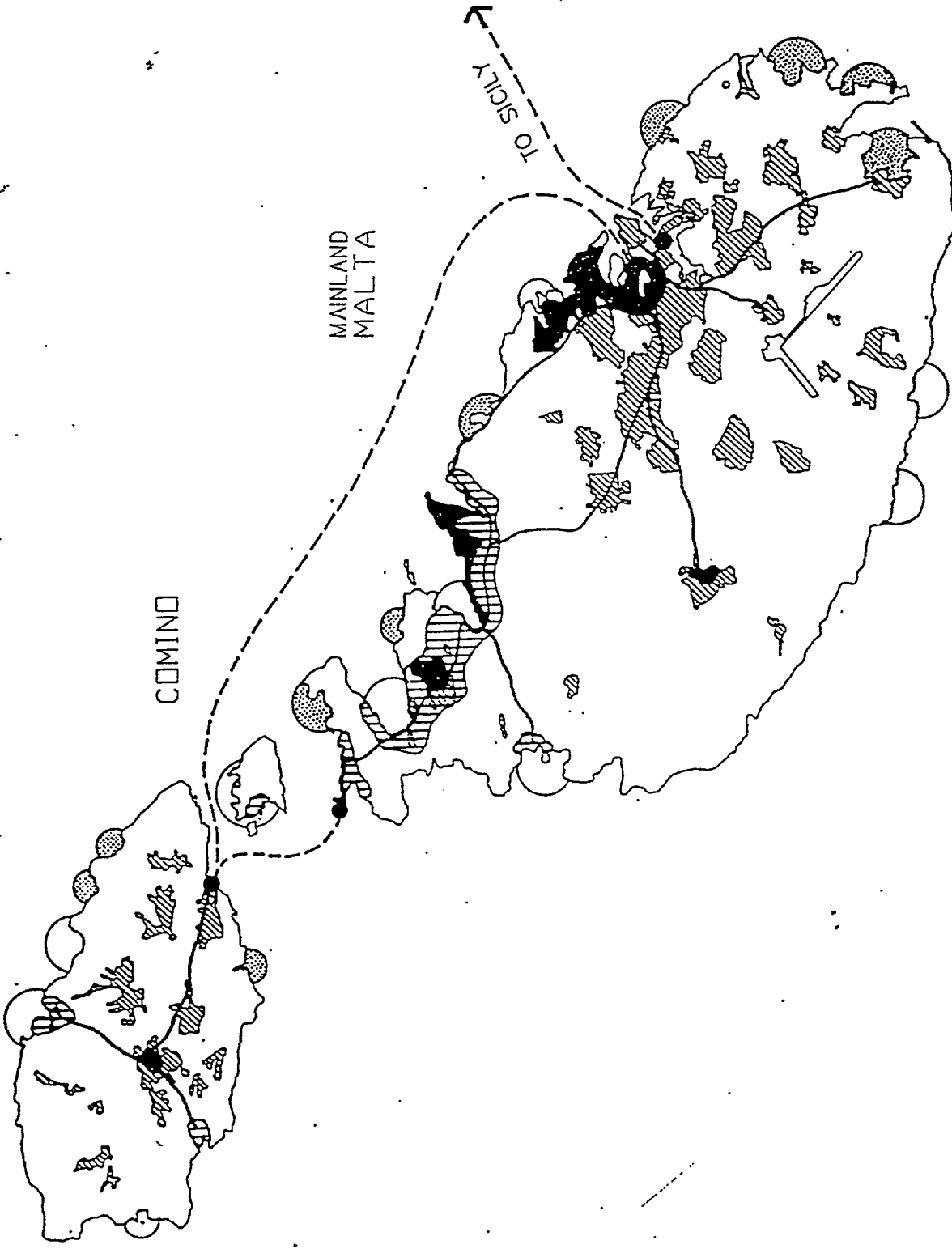
KEY AND SOURCES

- TOURIST DEVELOPMENT
- TOURIST-RESIDENTIAL DEVELOPMENT
- BUILT-UP AREA
- SWIMMING ACTIVITIES FOREIGN - LOCAL TOURISM
- PREVAILING LOCAL TOURISM
- MAIN ROADS OF TOURISTS IMPORTANCE
- FERRY SERVICE
- LANDING PLACE



MALTA STRUCTURE PLAN
REPORT OF SURVEY

Figure 9 Touristic areas



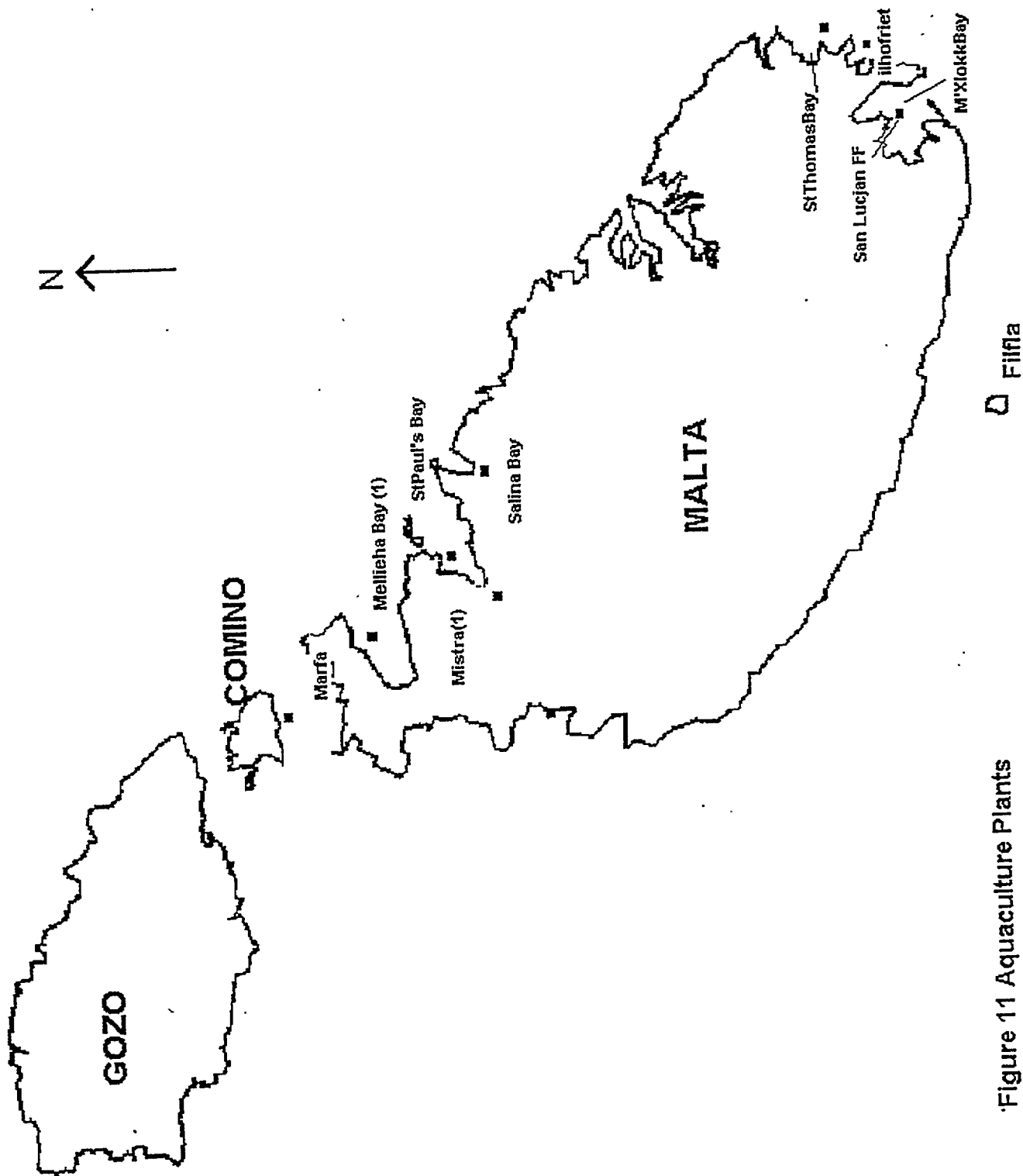







Figure 11 Aquaculture Plants

KEY AND SOURCES

- 
 AREA OF PARTICULAR ENVIRONMENTAL AND SCENIC CONCERN
- 
 AREA OF ENVIRONMENTAL AND SCENIC CONCERN
- 
 AREA OF ECOLOGICAL VALUE
- 
 BUILT-UP AREA

SOURCE: VISUAL AND ENVIRONMENTAL SURVEY
ECOLOGICAL SURVEY

0 1 2 3 4 5 KM.
APPROXIMATE SCALE

NORTH 

**MALTA STRUCTURE PLAN
REPORT OF SURVEY**

AREAS OF ENVIRONMENTAL IMPORTANCE (PRELIMINARY)

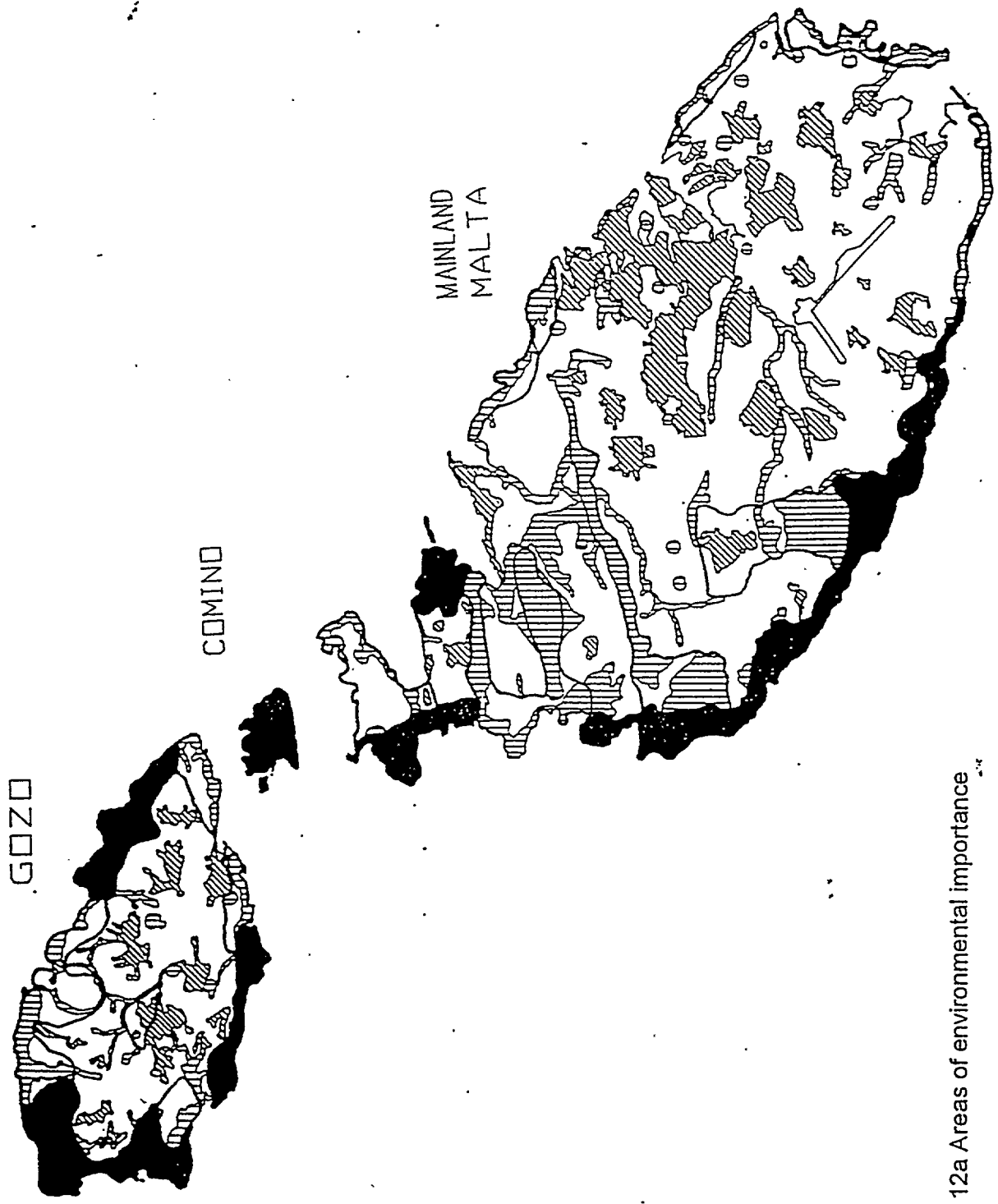


Figure 12a Areas of environmental importance

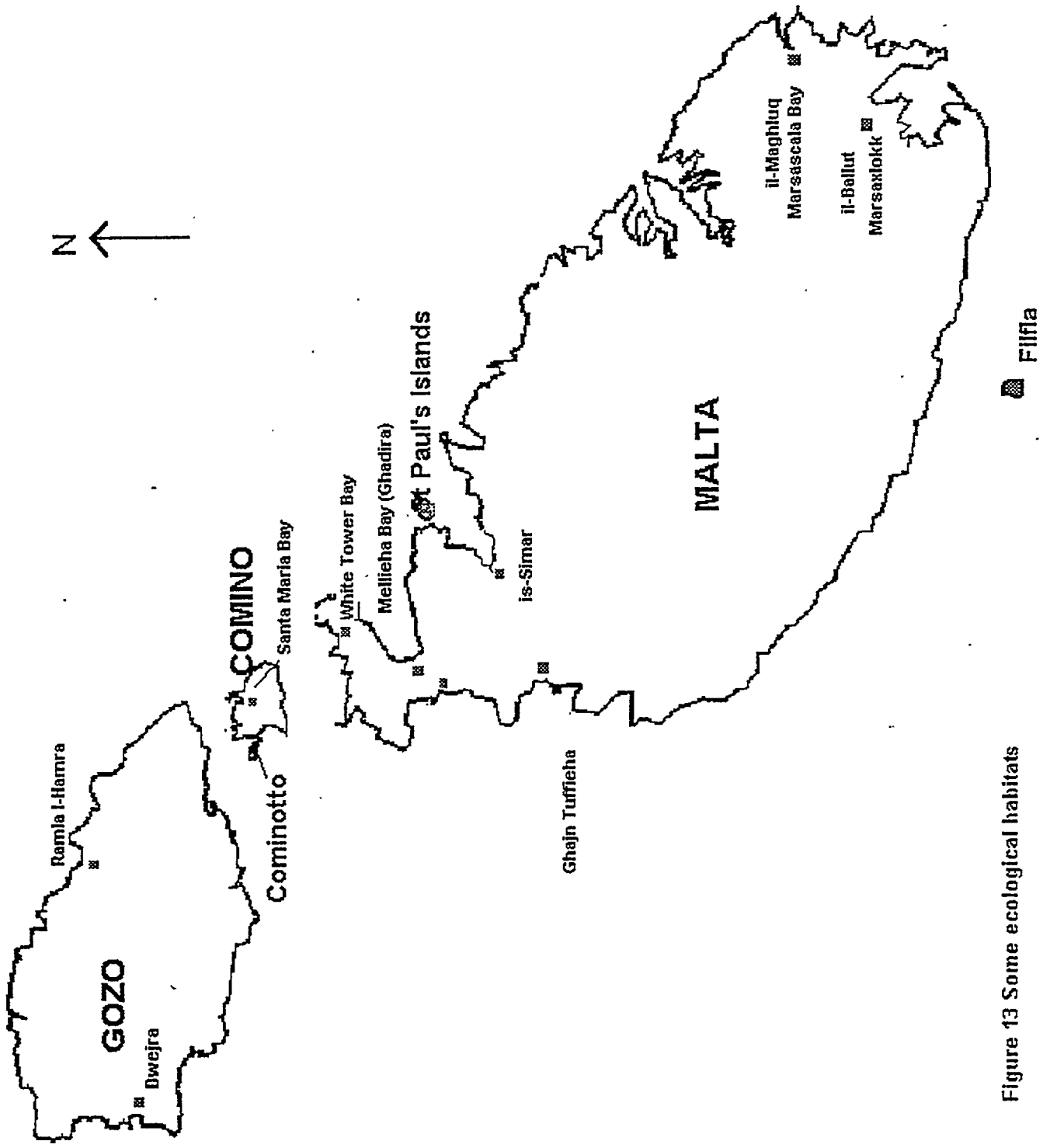


Figure 13 Some ecological habitats

MONACO

RAPPORT SUR LA CONFORMITE AUX REGLEMENTATIONS ET LEUR APPLICATION EFFECTIVE EN PRINCIPAUTÉ DE MONACO ¹

Affaire suivie par MC. VAN KLAVEREN

1. Informations sur le pays.

La Principauté de Monaco, Etat souverain reconnu par la communauté internationale, est située dans l'hémisphère Nord, sur la côte sud de l'Europe et sur le rivage Nord de la Méditerranée occidentale, à égale distance du détroit de Gibraltar et de celui des Dardanelles. Elle se trouve également au centre du bassin Ligure.

Sa superficie est de 1,9 km² pour 3,5 km de littoral ; ses eaux territoriales s'étendent sur environ 71 km². Son territoire maritime est donc 35 fois plus étendu que son domaine terrestre. Ce dernier se caractérise par une bande côtière très étroite de 3,5 km de longueur orientée NE-SW. Il est entouré par un cirque de hauts reliefs compris entre 550 et 1.100 mètres d'altitude à moins de 2,7 km du littoral. Il se situe au pied d'un bassin versant de 7 km², formé par quatre petits vallons drainés par des cours d'eau à régime torrentiel.

La population de la Principauté est de 30.000 habitants. Elle forme avec les communes avoisinantes une agglomération de près de 60.000 habitants.

Le relief sous-marin est comparable au relief terrestre. Le talus continental est très pentu puisque l'on atteint la profondeur de 1.100 m en moins de 6 km et 2.000 m à 24,5 km au large de Monaco.

Le climat de la Principauté est semblable à celui de la Méditerranée Occidentale mais le temps observé localement est très perturbé par l'influence orographique.

La mer de Monaco fait partie du bassin Liguro-Provençal, l'un des bassins de la Méditerranée occidentale. Ce bassin, se présente comme un demi-cercle ouvert au sud-ouest. Il est le siège d'importants mouvements d'eau notamment dans la colonne comprise entre 0 et 200 mètre, ainsi qu'une circulation cyclonique

Pour comprendre la politique de la Principauté de Monaco en matière d'intégration environnement/développement, il est nécessaire de suivre ces concepts dans le passé récent de la politique menée par ses Souverains.

Dès le début du XIXe siècle, un certain nombre d'Ordonnances Souveraines étaient promulguées par le Prince Honoré V de Monaco. Ces Ordonnances visaient à protéger les forêts de la Principauté. Cette dernière englobait alors les communes de Roquebrune et Menton et occupait vingt kilomètres carrés.

Avec le Prince Albert Ier, grand océanographe, vint la vision scientifique des problèmes et les premières actions visant à combattre les pollutions et à préserver les ressources naturelles.

L'immédiat après-guerre de 39-45 a été marqué par une véritable explosion du développement monégasque ; période qui coïncide avec l'avènement, en 1949, de SAS le Prince Rainier III, Souverain actuel, reprenant l'élan du Prince Albert.

Ce développement a touché essentiellement les secteurs économique et social.

¹ Les informations relatives aux programmes de surveillance de l'Environnement, à la conformité vis à vis des lignes directrices du MEDPOL et la liste des textes de lois sur l'Environnement actuellement en vigueur en Principauté font partie de notre rapport national sur le MEDPOL adressé à l'Unité de Coordination du PAM.

Au plan social, il faut citer notamment la création d'organismes de prévoyance sociale.

Au plan économique, trois axes essentiels de l'expansion sont à relever :

- le secteur immobilier, avec un nombre important de mises en chantier de programmes de logements, de bureaux ou de locaux industriels, en dépit de la rareté des terrains disponibles ;
- le secteur industriel, où le Gouvernement Princier - importante manifestation de son souci permanent de préservation de l'environnement - a toujours favorisé l'implantation et le développement d'industries légères et non polluantes, intégrant une forte composante de savoir faire (nombre de ces industries se rattachent réellement au domaine de la haute technologie) ;
- le secteur des services, dans lequel on peut relever que le domaine des prestations intellectuelles qui se caractérise par leur forte valeur ajoutée et leur qualité d'activité essentiellement "propres" est particulièrement florissant.

2. Informations de base sur les activités.

2.1. Les activités les plus importantes vis à vis de l'environnement du littoral sont les suivantes:

La Principauté de Monaco prend en charge l'ensemble de ces activités.

De par leur choix, les activités installées en Principauté sont peu polluantes et, sur une base volontaire, les industriels participent à l'image de marque environnementale de la Principauté.

En ce qui concerne le niveau de sensibilisation du public sur les problèmes de l'environnement, le mot « public a été pris au sens « population locale », étant entendu que les industriels sont très fortement sensibilisés à la protection de l'environnement.

Les industries importantes s'auto-contrôlent en permanence.

* **l'industrie pharmaceutique** représentée par un laboratoire équipé d'un centre de recherche, le tout occupant une superficie d'environ 20 000 m² et employant 400 personnes.

* **l'industrie chimique** incluant la cosmétologie dont la fabrique se limite aux produits de soins, émulsions, crèmes, lotions,... mais ne concerne pas les produits de maquillage qui constituent habituellement une source de pollution importante pour le milieu.

Cette industrie est représentée par une demi douzaine de laboratoires occupant des surfaces unitaires comprises entre 200 et 15 000 m². Leur activité correspond à la synthèse chimique moléculaire, c'est-à-dire la fabrication à façon et sur commande, des molécules spéciales servant de principe actif ou d'intermédiaire de synthèse dans d'autres procédés de fabrication.

* **autres activités industrielles:** parmi les plus importantes, on note environ une douzaine d'**industries de transformation des matières plastiques et du caoutchouc et une imprimerie.** Ces activités de moyenne et de grande importance occupent des surfaces allant de 2 000 à 10 000 m².

* **la production d'énergie** représentée par une centrale thermo- frigorifique avec pour activité le chauffage et la climatisation urbaine à partir d'énergie produite par l'incinération des déchets.

* **Le développement urbain et les projets d'infrastructure :** en liaison avec une extension sur le milieu marin qui nécessite des précautions à prendre vis à vis de l'impact.

* **Le tourisme** : lié à une augmentation de production d'énergie, de déchets, de consommation d'eau, de circulation automobile et des navires de plaisance.

* **Une centrale à béton** : équipée d'un lavage des poussières.

* **Déversement des eaux usées domestiques et industrielles**: la Principauté est équipée d'une station de pré-traitement depuis 1987 et d'une station de traitement physique et biologique créée en 1990. Le réseau étant de type unitaire, en cas de forte pluie, soit seul le pré-traitement fonctionne (débit compris entre 600 litres/s et 2000 litres/s), soit les effluents sont rejetés au niveau zéro de la station et par les émissaires d'orage (débit supérieur à 2000 litres /s).
Les stations de traitement des eaux usées et d'incinération des déchets sont des concessions de l'Etat . Leur auto-contrôle obéit à un cahier des charges.

2.2 Dispositions vis à vis de l'utilisation des meilleures technologies disponibles et des technologies propres

Les industries importantes utilisent de façon étendue ces deux concepts:

- réduction des nuisances à la source,
- réduction des solvants chlorés,
- remplacement des solvants organiques par des composés biologiques,
- réduction des déchets,
- tri et recyclage des déchets,...

Cette politique est conjointe à l'obtention des Normes ISO et de l'Assurance Qualité.

Pour les entreprises moyennes ou artisanales, l'utilisation de ces technologies est très modérée voire inexistante.

2.3. État de l'environnement en rapport avec la qualité de l'eau de mer et la protection des habitats.

La qualité bactériologique de l'eau de mer est très satisfaisante, toutes les sources de pollution tellurique étant prises en charge par le réseau d'épuration.

La Principauté n'abrite pas d'industries source de métaux lourds ou de polluants organiques persistants.

La source de pollution du milieu marin provient essentiellement des lessivages des rues et des surcharges du réseau notamment en période d'orage.

Les travaux d'évaluation de la qualité des écosystèmes marins par des indicateurs biologiques (limite de l'herbier,...) et par les biomarqueurs montrent que la zone est peu affectée par la pollution locale ou régionale.

En ce qui concerne les habitats, le peuplement d'algues invasives appartenant à l'espèce *Caulerpa taxifolia* est régulièrement suivi dans le cadre d'une collaboration avec IFREMER.

2.4. Dispositions concernant la surveillance de l'environnement :

Cinq programmes sont actuellement en cours :

- 1- l'analyse bactériologique des eaux marines,
- 2- la qualité microbiologique et chimique de l'eau de mer par l'intermédiaire de la matière vivante,
- 3- la biosurveillance du milieu marin et l'analyse physico-chimique des eaux littorales.

En ce qui concerne les effluents, dans un premier temps une station de prétraitement a été créée en 1987, puis une station de traitement physique et biologique des eaux usées domestiques et industrielles a été créée en 1990. La surveillance est réalisée par auto contrôle de la station elle-

même, avec supervision par un organisme agréé, l'APAVE, selon un cahier des charges basé sur la Directive européenne en la matière.

Les détails de ces programmes de surveillance du milieu marin mis en œuvre en Principauté sont décrits dans le rapport destiné au MEDPOL concernant les surveillances de la conformité, des tendances temporelles et la biosurveillance.

Les déchets solides domestiques et industriels sont incinérés avec lavage des fumées et récupération d'énergie, les déchets ultimes étant récupérés par des entreprises spécialisées. Les déchets toxiques industriels font l'objet d'une collecte par certaines de ces entreprises.

2.5. Niveau de sensibilisation du public aux questions de l'environnement.

Le public est sensible à l'image de marque environnementale de la Principauté et à ses répercussions dans les médias.

L'information systématique du public couvre la qualité des eaux de baignade et de l'atmosphère urbain;

Des actions de sensibilisation sur la biodiversité et la lutte contre la pollution sont ponctuellement organisées.

2.6. Influence des ONG sur les prises de décision.

En Principauté de Monaco on enregistre une Association Monégasque pour la Protection de la Nature venant de fêter ses 25 ans, qui développe préférentiellement ses actions dans le cadre des deux aires marines protégées instituées en Principauté et dans le cadre d'opérations de reboisement conduites sur les collines des communes limitrophes de la Principauté, en collaboration avec les services administratifs monégasques. On note également l'existence d'une nouvelle organisation : ECOPOLIS, dont les objectifs visent le fonctionnement de la vie urbaine et en particulier la gestion et le recyclage des déchets, les économies d'énergies. Divers clubs service ont dans leurs objectifs la protection de l'environnement.

Il est difficile de mesurer l'influence de ces organisations sur les prises de décision du pays. Il est, toutefois évident que la petitesse du pays rend les acteurs proches des pouvoirs publics et donc leur donne une capacité d'influence réelle.

3. Législation

3.1. Cadre juridique pour l'environnement :

la Principauté possède un cadre juridique relatif à la protection de l'eau et de l'air. Une liste exhaustive des textes relatifs à l'environnement est à ce rapport et fait partie intégrante du rapport destiné au MEDPOL.

Une partie de ces textes est en phase d'actualisation au travers notamment du Code de la Mer publié en 1998.

Une Loi Cadre pour l'Environnement est en cours de finalisation.

3.2. La législation et les lignes directrices pour le contrôle de la qualité des eaux marines et la protection des habitats :

Actuellement, des lignes directrices sont utilisées pour la qualité des eaux de baignades. Un texte relatif à la qualité des rejets dans le réseau devrait être publié sous peu.

La qualité bactériologique de l'eau de mer est très satisfaisante, toutes les sources de pollution tellurique étant prises en charge par le réseau d'épuration.

La protection des habitats fait l'objet d'un programme de surveillance, biologique basé sur l'utilisation des biomarqueurs, pour lequel des valeurs seuil ont été définis.

3.3. État de la réglementation des activités suivantes :

- * **traitement des eaux usées et des déchets solides domestiques et industriels** : un cahier des charges fixe les modalités de fonctionnement dont le suivi est assuré par la Direction des Concessions et des Télécommunications. Le contrôle de ces activités est permanent.
- * **développement urbain** : toute activité est soumise à autorisation et est régie par un Règlement d'Urbanisme, de Construction et de Voirie créé par l'Ordonnance Souveraine n° 3.647 du 9 septembre 1966 dont une révision est en cours. Le contrôle de l'activité est complet.
- * **Les projets d'infrastructure** : sont réalisés par l'Etat. Lors des études de ces projets, une attention particulière est portée à la protection de la qualité des milieux et de l'Environnement en général.

3.4. Description sommaire des dispositions de la législation portant sur :

* **l'étude d'impact sur l'Environnement (EIE) de nouveaux projets** : le règlement d'urbanisme et de construction actuel ne prévoit pas d'EIE mais prévoit des enquêtes *commodo, incommodo* relatives aux établissements insalubres ou bruyants.

D'une façon générale (cf. chapitre 4), un dossier est déposé auprès de la Direction de l'Environnement, de l'Urbanisme et de la Construction. Ce dossier est étudié par les différents services concernés au sein de la Commission Technique pour la Lutte contre la Pollution et pour la Sauvegarde de la Sécurité, de l'Hygiène, de la Salubrité et de la Tranquillité Publique, créée par l'Ordonnance Souveraine n° 10.505 du 27 mars 1992 chargée de donner un avis au Gouvernement.

* **la promotion des meilleures technologies propres** : bien que ce principe ne soit pas pris en compte dans la législation en vigueur, les industries sont, sous la pression du marché et de la concurrence soumises à l'acquisition de la certification des Normes ISO dans la série 9000 et, depuis 2 ans environ, à la Norme ISO 14001.

* **inspections en matière de contrôle de la conformité** : des contrôleurs de pollution et des contrôleurs de chantier ont pour mission de visiter les implantations, souvent en conjonction avec les visites de la Commission Technique.

* **promotion de la conformité et application effective en cas de violation** : la Réglementation prévoit la nécessité de mise en conformité et en cas de non respect la possibilité de décréter la fermeture de l'établissement.

* **Système de délivrance des permis, renouvellement périodique des permis, réexamen des conditions environnementales du permis** (cf. chapitre 4 ci-dessous).

4. Délivrance de permis.

– En Principauté, toutes les installations industrielles, commerciales et artisanales sont soumises à la délivrance d'une autorisation établie par la Direction de l'Expansion Economique et délivrée par le Ministre d'Etat.

Les Concessions de l'Etat font l'objet d'Ordonnances Souveraines.

– Les systèmes d'épuration, de distribution des utilités et d'assainissement sont construits par l'Etat et concédés à des opérateurs. Ils ne sont pas soumis aux mêmes procédures.

- Les projets relatifs au développement urbain et aux infrastructures sont soumis au gouvernement, puis au Comité consultatif pour la construction et selon les cas au Conseil communal et au Comité Supérieur d'Urbanisme.
Le permis final est délivré par un Arrêté Ministériel.
- Les permis de construire sont valable 1 an, en ce qui concerne la date de démarrage des travaux, et renouvelables une fois seulement pour la même période.
- Les permis donnent lieu à un affichage public et les projets d'envergure sont présentés en séance publique du Conseil Communal.
- Certains services sont en mesure de délivrer des autorisations sans que cela nécessite la publication d'un Arrêté Ministériel. C'est le cas par exemple pour la Direction de l'Environnement, de l'Urbanisme et de la Construction dans le cas de travaux mineurs (aménagement de façade, modification de devantures de magasins et boutiques).
De même, le Service De l'Aménagement Urbain autorise la réalisation de tranchées et l'arrachage ou le remplacement d'arbres dans les espaces verts de la Principauté.

5. Conformité et application effective

5.1. Encouragement à la conformité :

Vu la fiscalité particulière de la Principauté, il n'y a pas d'incitation fiscale à la conformité. Il faut cependant souligner la seule redevance environnementale perçue qui est liée à la consommation d'eau.

La Commission Technique donne des délais pour la mise en conformité et refuse le renouvellement d'autorisation si les conditions ne sont pas respectées.

5.2. Vérification de la conformité dans les entreprises industrielles :

Une seule autorisation globale est donnée pour le projet. Les contrôles réguliers sont exercés par la suite par la Commission Technique et les contrôleurs de pollution.

5.3. Inspections en cas de plainte :

Des visites et enquêtes systématiques sont prévues en cas de plainte.

5.4. Fréquence des inspections et contrôles :

- * usines : 1 fois par an
- * installations d'assainissement : 1 fois par an
- * chantiers : contrôles périodiques jusqu'à la visite finale de récolement des travaux par la Commission de récolement.

5.5. Principale autorité chargée de la conformité :

la Direction de l'Environnement de l'Urbanisme et de la Construction.

5.6. Mesures en cas de violation :

en cas de violation un constat d'infraction est adressé au Conseiller de Gouvernement pour les Travaux Publics et Affaires Sociales, puis au Ministre d'Etat pour poursuites judiciaires éventuelles.

5.7. Moyens d'incitation à la conformité (voir 5.1.)

5.8. Système en vigueur pour l'évaluation de l'état de l'environnement en rapport avec : la qualité des eaux, les émissions industrielles, la protection des habitats.

Cinq programmes de surveillance relatifs à l'évaluation de la qualité du milieu sont actuellement mis en œuvre en Principauté. Leur description est présentée dans le rapport national destiné au MEDPOL annexé à ce document.

En dehors de l'usine d'incinération des déchets, il n'y a pas de rejets atmosphériques notables de la part des industries.

Un réseau de surveillance automatisé de la qualité de l'air composé de cinq stations est mis en œuvre en Principauté. Il rend compte essentiellement de la pollution occasionnée par la circulation automobile urbaine.

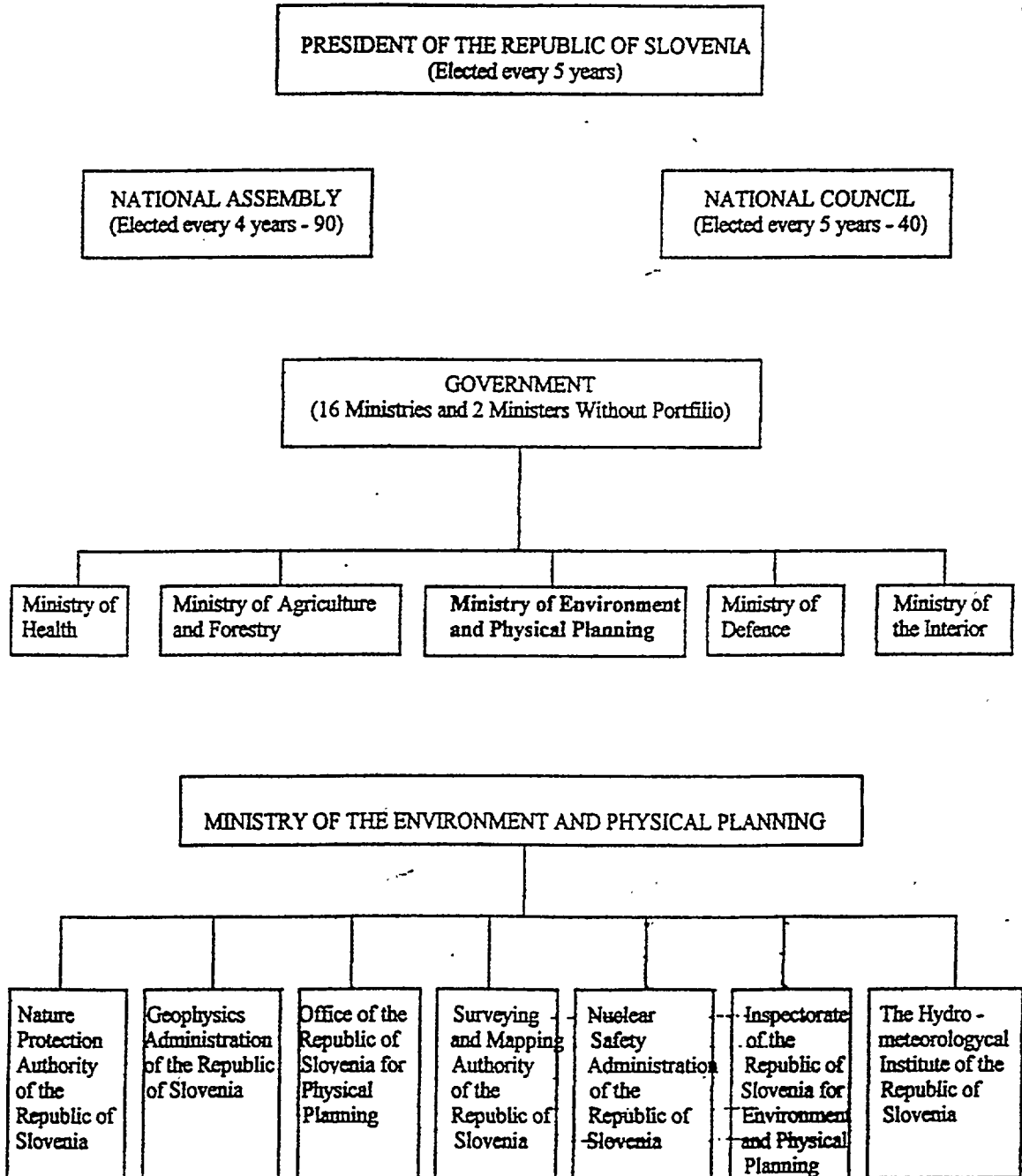


SLOVENIA

The Republic Slovenia environmental legislation and enforcement system

1.-The political and Administrative System of the State.

The government has 16 Ministries, one of them is the Ministry of Environment and Physical Planning (MEPP) one department of MEPP is the Inspectorate of the Republic of Slovenia for Environment and Physical Planning.



Up to 1995 the role of the Inspectorate was highly dispersed with the Municipalities responsible for compliance monitoring under the guidance of the following:

- Ministry of Environment and Physical Planning - Water
- Ministry of Health - Air and Waste
- Ministry of Agriculture.- Forestry
- Ministry of Culture - Nature Protection

This situation was altered in January 1995 under the Slovenian Government **Restructuring Act** with the establishment of an Integrated Environmental Inspectorate of the Republic Slovenia for Environment and Physical Planning (IRSEPP) has responsibility for enforcement with regard to:

- Air emissions from fixed sources
- Water discharges
- Waste material and landfills
- Maintenance of water buildings and water regime
- Noise emission from sources and infrastructural objects caused by traffic
- Emission of nonionized radiation in environment
- Border control of waste
- Control of public services for environmental protection
- Nature protection
- Cooperate with other institutions at environmental pollution caused by accidents

In the Inspectorate, division for environmental issues is employed 31 inspectors. All enforcement aspects of environmental protection are practically under control of the State Inspectorate. The Local authority has got possibility of establishing local environmental inspectorate since June 1997. In the near future it is expected that State inspectorate could transfer some competence to the Local inspectorates on the field of public services for environmental protection. Under the institutional arrangements, it is also proposed to establish local regulations regarding to air, water etc.

2.- Environmental protection regulation

In principal the **Administrative Law** is taken as the legal basis for all the procedures.

Essential environmental legislation:

The **Environmental Protection Act (EPA)** enacted 1993. Article 96, makes provision for all aspects of environmental protection inspection to be responsibility of the State Environmental Inspectorate, at both national and local level.

Old **Water Law (WL)** is still in force since 1981. There are no special laws for air pollution, water pollution waste&landfield and noise abatement, but following the subject of the Environmental Protection Act the special regulations were issued on the field of air emission, water emission and noise abatement, regulation for waste&landfields will be enacted during 1998 year.

New **Bulding Law (BL)** was enacted in 1997.

3.- Environmental Enforcement & Jurisdiction

3.1. Environmental Inspectorate

All enforcement aspects of environmental protection are under the control of the Environmental Inspectorate comprising nine Regional Inspectorates.

The Environmental Inspectorate currently exercises its enforcement prerogative by way of:

- Application to Offense Judge for fines for non compliance
- Ensuring that smaller facilities must do to revert to a compliance status
- Ensuring that major industries prepare Environmental Action (Rehabilitation) Programmes in accordance with the requirements of the EPA 1993 for non compliance

The role of the Inspectorate is to ensure that emissions to air, water etc. are in compliance with national emission standards for these environmental media. The current role therefore of the Inspectorate may be summarised as follows:

- Inspect all emissions sources
- Monitor emission to the environment
- Technical inspection of new buildings
- Emergency response
- Issue agreements with permits for infrastructure developments

3.2.- Enforcement system

Presently four permits issued by Ministry of Environment and Physical Planning (MEPP) are required for the new projects. These are: location permit, building permit, operation permit and water permit. Under the new Building Law there is a possibility for issuing a single building permit. Before the building permit is issued for all new bigger projects **Environmental Impact Assessment** have to be done.

Nature Protection Authority (NPA) (department of MEPP) specifies the environmental aspects of the operation permit (only for the project of the national importance otherwise the permits are issued by the local authorities.)

Permitting Procedures

The NPA is directly responsible for the issuing of permits to discharge to water, air etc., while the Inspectorate is responsible for ensuring that the conditions are relevant to the particular licensed activity. It is also duty of the Inspectorate to monitor the permits for compliance purposes.

Enforcement Procedures

For the Environmental Inspectorate, the typical routine involved in inspection of facilities for environmental compliance purposes is as follows:

- Site visit (planned or followed from report of third party)

- Should the facility continue to be non compliant or if any corrective action has not be undertaken the Inspectorate issues a written order stating what the facility must do to revert to a compliance status
- Depending on degree of non-compliance the Inspectorate can indict the facility and responsible person before the Offence Judge. Minimum fine for company is 200 000 SIT and for responsible person 50 000 SIT. If it is a major violation then the facility and responsible person is indicted in accordance with the provisions of the Criminal Law. For cases taken in a court penalties can be up to three years imprisonment and an unlimited fine.
- At this stage the facility may seek through legal channels prolongation of the time frame to attain compliance. The Inspectorate can prolonged for a certain period to put facility to a compliance status.
- For the biggest facilities, if the facilities to be non compliant or any corrective action has not been undertaken, the Inspectorate can request that the NPA issue legal orders under the Environmental Rehabilitation Program requiring the facility to undertake the necessary remedial action.
- Should the written order of the Inspectorate to be ignored, the Inspectorate can also issue a written order statting a fine of 100 000 SIT.

In the event of an activity non complying with requirements stipulated by the State Inspector the following actions shall be implemented:

- cessation of the activity or equipement thereof
- cession of use of substances, technological processes

4.-Conclusion

The extent of environmental enforcement and compliance is less efective in comparison with the EU enforcement system. For approximation purposes Slovenian eforcement system will need to be tailored in a manner similar to that currently in force in EU.



SURVEYING AND MAPPING AUTHORITY OF THE REPUBLIC OF SLOVENIA

Ljubljana, Šarotarjeva 12

prepares standards for:

- measurements of topography, hydrography, borders, communal facilities and equipment, transport links, measurement standards for the needs of cartographic and landscape information systems, and standards which enable links between geodesic data and records;
- prepares administrative and professional matters relating to the basic geodesic system, geodesic work relating to the state border and records on the state border, state maps, land and property registers, the register of land units with records of house numbers, records of place names, geodesic work for land aggregation and improvement;
- issuing and use of data of official geodesic records.

NUCLEAR SAFETY ADMINISTRATION OF THE REPUBLIC OF SLOVENIA

Ljubljana, Valkova 19

performs administrative and professional tasks relating to:

- nuclear and radiological safety of nuclear installations;
- traffic, transport and handling of nuclear and radioactive materials;
- supervision and records of nuclear materials;
- physical protection of nuclear materials and nuclear installations;
- responsibility for nuclear damage;
- training and education of users of nuclear installations;
- quality assurance in this field;
- ensuring radiological monitoring;
- early warning of nuclear and radiological accidents;
- international cooperation in the area of administrative work and other tasks specified by regulations;
- monitoring the implementation of laws, other regulations and general acts which govern nuclear safety.

INSPECTORATE OF THE REPUBLIC OF SLOVENIA FOR ENVIRONMENT AND PHYSICAL PLANNING

Ljubljana, Vilharjeva 33

- supervises the implementation of laws, other regulations and general acts which govern environmental protection and conservation, and ecological monitoring at the state border; water regime, and water management and use;
- land and settlement issues, alterations to the landscape and the construction of buildings;
- housing issues;
- geodesic activities.

THE HYDROMETEOROLOGICAL INSTITUTE OF THE REPUBLIC OF SLOVENIA

Ljubljana, Vokova 15

carries out professional tasks relating to:

- the basic network of meteorological, hydrological, agrometeorological and ecological stations;
- measuring, observing, control and processing of meteorological, hydrological and agrometeorological elements and phenomena of air and water pollution, and other special measurements;
- records on the environmental situation, and observation, telecommunications and computer systems;
- meteorological, hydrological and environmental analysis;
- short-term and medium-term weather forecasts, and the impact of meteorological parameters on farming culture;
- cooperation in protecting maritime vessels and road and air transport;
- detection of hydrometeorological weather damage to vessels, and radar meteorology;
- protection against hail.

MINISTRY OF THE ENVIRONMENT AND PHYSICAL PLANNING

Ljubljana, Zupariceva 6

deals with matters concerning:

- protection of the environment and nature;
- water and the water industry;
- geological, seismological, meteorological and other geophysical or natural phenomena;
- physical planning, alterations to the landscape, construction of buildings and property-law cases relating to real estate;
- nuclear safety;
- housing matters;
- geodesy and geo-oriented information systems, and inspection monitoring in these areas.

NATURE PROTECTION AUTHORITY OF THE REPUBLIC OF SLOVENIA

Ljubljana, Volkova 16

performs administrative tasks relating to:

- naloge*
- integrated protection of the environment, natural wealth, values and heritage, water, air, soil, plants and animals, and waste handling;
 - environmental impact assessments;
 - public environmental protection service, and the protection of natural wealth, and the professional for funding and for measures of environmental protection;
 - managing the information system, and professional tasks for the ecological development fund;
 - the water regime, water management, and other interventions in water;
 - the strategy of environmental protection and water-industry planning;
 - investment planning and construction, and maintenance and management of water and water-industry facilities and installations;
 - public service of water management and issuing concessions for water use, and for removing the consequences of natural and other disasters.

GEOPHYSICS ADMINISTRATION OF THE REPUBLIC OF SLOVENIA

Ljubljana, Bejsnikova 2

performs administrative and related professional tasks concerning:

- the network of stations, and monitoring and other recording of geological, seismological and other geophysical phenomena, definition of their regions, and their categorisation;
- defense, protection and early warning of earthquakes;
- earthquake safety of buildings and installations;
- user prognosis and warning, and international exchange of data.

OFFICE OF THE REPUBLIC OF SLOVENIA FOR PHYSICAL PLANNING

Ljubljana, Dvorska 17

performs professional and related administrative tasks concerning:

- physical planning, urban and regional planning and starting points for managing the landscape;
- preparation of the physical plan for Slovenia, regional components of the plan and detailed plans (construction plans) of infrastructure facilities of regional and national importance;
- land use and management;
- supervision of the preparation of physical plans of local communities, and land-use information systems.

SYRIA

**“Compliance and Enforcement of Regulation in the Mediterranean for Control of
Pollution Resulting from Land Base Sources and Activities”**

ATHENS, 16- 18 MARCH

Syria Country Report

1 Brief Introduction to the Country

Geographical and Social Background

The Syrian Arab Republic lies on the eastern coast of the Mediterranean Sea, bounded by Turkey to the north, Iraq to the east, Jordan to the south and by Lebanon to the West.

Syria is a largely arid country, with a population of nearly 15 million and an area of about 185,000 km² of which around one third is arable land and forest. The remainder is desert and rocky mountainous areas although, when there is sufficient rainfall, the Syrian desert supports enough grass to be used for pasture.

Geographically Syria may be divided into seven region

A Mediterranean climate generally prevails, characterized by a rainy winter and a dry and hot summer, separated by two short transitional seasons.

The overall structure of the economy has not changed significantly in the five-year period 1990-1995; agriculture continues to dominate. There has been some relative increase in the contribution of trade and transportation at the expense of the manufacturing sector, which was affected by the collapse of the Soviet Union. Agriculture represents the largest single employer, with nearly 29.5% of the work force; closely followed by Community and Social Services (25.3%).

Environmental policy is being developed in a context of changing macro and micro economic policies, of which liberalization is the main thrust. Private sector liberalization starting with steps to unify foreign exchange rates, removing subsidies on commodities (fertilizers, pesticides, petrol, cooking oil, tea), reducing price control, and removing barriers on imports, has encouraged more sustainable use of natural resources and provided an opportunity to switch to cleaner technology.

Pressures on the Environment

Syria is resource constrained in terms of availability of land for agriculture and settlements and fresh water. A particular difficulty is the conflict between the requirements of human settlements and those of the natural and cultural heritage, in those areas that are best endowed with natural resources. In this context, the pressures that have given rise to the priority environmental problems include:

- intensification of agricultural activities, especially increase in irrigated production;
- increased demand of water for agriculture, until irrigation accounts for 85-90% of consumption in most water basins;
- increase in demand for potable water, particularly in areas with permanent or seasonal shortages;
- rapid population growth and increasing urbanisation;
- increasing economic growth and associated increases in energy demand, industrial activity and production of polluting wastes;
- changing patterns of consumption and lifestyle associated with urbanization.

2 Main Economic Activities in the coastal region

The main economic activities in basin include agriculture, industry, services, and to a lesser extent, fishing and tourism.

Agriculture is the dominant economic activity in the basin but the service sector is growing rapidly.

The coastal region contains many heavy industries of national importance, including the Tartous cement company, the Tartous oil terminal, the Lattakia oil refinery, and the basin's thermal power station. In addition, several smaller, though significant industries are located in Lattakia, including a wood panels factory, electric motor manufacture, textiles, gypsum suppliers, marble suppliers, and cigarette manufacture, and cotton processing.

Fishing and fish farming accounts for a relatively small proportion of the economic activity of the basin. Sea fishing resulted in catches of 1,950 tons in 1990, and 1,406 tons in 1991 with the same fleet. Inland resources amounted to 30-50 tons per year.

Concerning provisions for BAT and CL for existing enterprises are limited to enforcement of end of the pipe treatment technology, while for the new one it is controlled by applying EIA. EIA will control not only the BA & CL technology but it will control location too.

The Government current policy and approach for main the industrial sector include the following measures :

Applying EIA for all new project

Setting up environmental committees in factories

Environmental requirements in industrial plant

conduct environmental review for existing plants

implementation of pollution control equipment

State of environment in the coastal region

Water Quality in the coastal region

About 70 % of the basin inhabitants discharge waste waters through the sewage network directly into rivers, streams or soil, with the remaining 30 % discharging waste water into the sea. The main coastal spring feeding Al-Seen lake is frequently polluted with high levels of fecal coliforms, chemical residuals (from agriculture), and oil discharges from the refinery. Main water resource issues concern groundwater pollution, and the use of contaminated waters for crop irrigation, they include:

lack of waste water treatment plants for domestic, agricultural and industrial sewage effluent;

uncontrolled dumping of solid wastes and subsequent leachate into groundwater;

sea water intrusion into groundwater due to extensive and illegal pumping;

poor maintenance of water supply facilities;

oil effluents from oil mill factories contaminating groundwater;

pollution of groundwater from agricultural run-off, particularly increased nutrient problems;

salinization of groundwater due to excessive extraction for agricultural irrigation;

raw sewage discharge directly into the sea near the cities of Lattakia, Tartous, Baniyas and Jableh giving sea water coliform readings of > 1000/100 ml;
intermittent dispersal of oil and sand layers in vicinity of oil refinery;
unsightly deposits of solid waste washing ashore;
health problems occurring from the use of sewage waters in irrigation activities;

It is proposed that secondary treatment plants for Tartous and Lattakia will commence construction by the end of 1997. For the Baniyas plant study plans are not yet prepared, whereas Jableh feasibility study and tender study are near completion. However, it is stated that these may have been underestimated or were referring to the treatment plant only (without below water out-fall).

The results of the 1995 water quality monitoring programme indicate the following water quality issues by source.

River Waters

Samples of water taken from the basin's main rivers exceeded WHO standards for the following quality parameters:

electrical conductivity;
chloride;
faecal coliforms; and,
total suspended solids.

Springs

In general spring waters were acceptable for all parameters except for high levels of faecal coliforms in some springs.

Groundwater Wells

The presence of pollution in artesian wells is documented although it is not evident whether the sample is representative of the entire basin. Most of wells adjacent to the sea have unacceptable water for drinking and irrigation due to high salinity, hardness and conductivity levels caused through sea water intrusion.

A high proportion of wells in villages contain water with very high levels of hardness, nitrates, ammonia and faecal coliforms, the latter suggesting pollution from sewage and animal husbandry. Many wells are unsuitable for drinking and irrigation.

The Marine Environment

The Syrian coastline is 183 km in length, with soft sands and a moderate climate, and with a backdrop of the mountain regions. The decline of the shelf perimeter is fairly shallow, dropping to about 500m at an average distance of 10km offshore.

The basin has three main ports, Lattakia and Tartous, and to a lesser extent, Baniyas, each is protected by long breakwaters. In addition there are a number of small fishing ports, also shielded by breakwaters. The basin's two oil refineries are located in the ports of Baniyas and Tartous, while Lattakia is host to a small terminal for handling kerosene and lubricating oils.

The coastline of region suffers from a number of polluting and unsightly conditions. These include:

industrial discharges directly into the sea, particularly the oil refinery in Baniyas;

substantial quantities of solid waste being washed ashore, together with arbitrary littering;
high levels of sewage discharged directly into the sea, resulting in chemical, visual and odor problems;
extensive extraction of marine sand for the construction industry.

In addition, the coastline experiences an influx of jelly fish during certain seasons, possibly constraining the potential of future tourist developments.

Ecological Resources

Some thirty sites have been identified as worthy of protection, these include sand beaches and dunes, cliffs, and river mouths and estuaries.

Approximately 75% of the total forest area in the basin is concentrated in Lattakia governorate, covering more than one third of its area. Forests are generally located in the highlands of the region, concentrated on the hill slopes at altitudes of approximately 6000 m above sea level and higher, and running parallel to the coastline. The dominant tree species is *pinus brutia*.

Wildlife is scarce in the coastal basin, having been influenced by the presence and development of human activities. However, species present include fox, boar, hyena, in addition to deer and wild goat.

Environmental monitoring

The draft environmental law include a specific article for monitoring , but since it is not signed yet ,therefor the monitoring process is limited to some extent specially by the ministry of environment ,taking into consideration the limited resource for the ministry though the ministry had already established a n environmental directorate in several region including the coastal region , while other authorities which already dominate and supervise environmental resource are carrying out to some extent the monitoring process .

Concerning sea water quality the marine research center is monitoring the sea water quality on the coastal shore on 11 selected points and this come under the Barcelona Convention as an activity with the MEDPOL programme .

In addition the irrigation department in the coastal area is responsible for monitoring surface and ground water both quality and quantity are monitored daily sampling is carried out at selected point , and monthly report is prepared and send to related authorities including the ministry of environment .

For Industrial waste water a new standard were prepared by Ministry of Environment for discharging Industrial waste water into the sewage network , the pollution control department at the Ministry of Irrigation takes samples for different enterprises at random frequency.

While for the incineration of wastes , Municipal solid waste and industrial solid waste the monitoring provisions are very limited except incineration of medical waste which is monitored and controlled by the municipalities .

Urban development is well monitored by the ministry of housing in cooperation with the local administrative ministry which is responsible for setting the master plans for cities, town and villages, they have special department for monitoring.

Industrial solid waste and municipal solid waste, the monitoring is restricted to the collection process, while for the disposal

Public awareness was very poor up to the last four to five years, lately with the increasing of environmental negative impacts specially on human health, it increased to some extent but it is still moderate for the most of the population.

There are no private NGO's in Syria, but from another point of view there are a number of vocational unions referred to as NGO's such as farmer union, woman union labor union, etc. These bodies have representatives in the parliament and sometimes they have influence on design making

3 Legislation

Environmental Legal Framework

The environmental legal system in Syria is represented by:

- **Presidential Decree No. 11:** which established the ministry of environment and defined its objectives and responsibilities as the following:
 1. Identify existing environmental Problems; and perform the needed studies and research in order to find the suitable solution for solving these problems; and abating any future environmental problems.
 2. Prepare the needed Plans, legislation and programs for conserving and developing environment within the general policy of the country.
 3. Raising environmental public awareness Through different types of media
 4. Adjusting the risks resulted from the usage of different materials that affects human health, environmental safety and its resources.
 5. Perform environmental monitoring on all activities within the Syrian land, interior and sea water and air. Besides the dangerous establishments that affects environmental safety and propose the right solution for removing the risk.
- **The higher council for environmental safety:** which is considered the higher environmental authority in the country, the council is headed by the prime minister and represented by twelve ministers and vice prime minister for services affairs.
- **Proposed Environmental law:** which consist of nine section that cover all environmental issues. The proposed law was adopted by the higher council for environmental safety and it was raise to the higher authority to be issued.

No specific general policies for general urban lands but various legislation governs the way in which urban land may be developed including:

- law No. 9,1973 sets out regulations for preparing master plans and obliges a property developer to reserve 30-50% of the total land area if an urban development for building roads and parks;
- law No. 60, 1979 canceled law No. 9 for urban expansion areas in the major cities and instructed the local authorities to acquire these areas, devise plans and then sell them to private developers to develop in accordance with the plan.

Current Legislation Relation to Environmental Protection

Issue	Existing Legislation	Proposed Legislation
Surface Water	Law N. 16 of 1982 on irrigation water use various articles & decrees on irrigation and drinking water quality	Elaboration of Draft Water Management Law (Mof) Articles 2a (water quality standards) and 3 (effluent control) of DEFR
Marine	Law N. 10 of 1972 on protection of marine Domestic water, and international water against oil pollution	Article 11 (marine transport and dumping of hazardous waste) of DEFR
Biodiversity	Law N. 7 of 1994 on sustainable forestry and several Biodiversity issues Law N. 30 of 1964 on protection of marine	Article 2f (protected ecosystems) of DEFR
Solid Waste		Articles 2e (classification for handling, storage, & disposal) and 3 (waste dumping) of DEFR
Hazardous Waste		Articles 2e (classification for handling, storage & disposal) and 12 (transport disposal) of DEFR
Land Management	Law N. 13 of 1983 on protection of rural lands	Articles 2d (land classification) and 4(pesticides use) of DEFR
EIA	Law N. 11 of 91 relating to investment projects Jan. 92 establish EIA Commission	Articles 2g, 13 to 18 of DEFR Draft regulation of EIA

it worth noting that although the legislation are existing but they are not well controlled or enforced.

The ministry of environment had already prepared draft decree for EIA and guidelines that emphasize the activity which need EIA , in addition to permitting condition requirement and expected no of industrial activity for the next five year .

under this context the EIA study for new project promote the implementation of BAT & CT .

For existing sources the ministry of environmental is implementing an environmental review procedures and upon the results the ministry advise the industrialist on the basis of pollution prevention concept , the ways to reduce the pollution from the source

4 Permitting :

The administrative permit: For all proposed constructions projects, an administrative permit is needed, to be issued by the govenorate. On application the govenorate will check whether the proposed project fits within its own policy, and land use plans. some govenorates ask the GCEA for advice. in practice applicants are sometimes sent to the GCEA to obtain their approval before the governorates grants the administrative permit.

Sectoral and other permits: the administrative permit is not the only permit or authorization that proponents need. In practice a number of permits or authorizations might be necessary for a proposed activity, and the administrative permit is in general the last one to be obtained. Generally the most important permit or authorization is given by the sector ministry under which the activity resorts such as industrial permits, agricultural permit, and touristical permit .

For example the issue covered by the industrial permits

permits	industrial waste and treatment procedure raw material products site EIA study
Implementation of industrial register	effective QT. Of raw material effective QT. Of product waste treatment erosion treatment record for analysis of waste Record of analysis toxic chemicals and waste

EIA: the component authority for EIA is the GCEA, with its specialized EIA Unit. The GCEA is in the process of establishing branches according to the water basins of Syria. Several ministries have organized their decentralized departments according to the 7 water basins of Syria..

The main authorities responsible for permitting are : Governorates, ministry of industry, ministry of agriculture, ministry of health , Ministry of mineral resources and ministry of irrigation , these authorities are represented at different levels, national , regional and local . Where they are represented by their departments at all these levels .

according to the classification prepared by the ministry of environment about 108 activity need to be permitted environmentally , on the hand all other activities have to get the sectorial and administrative permit

the estimated number of administration permitting employees is around 2000 .their major role is to verify that the proposed activity meet the requirements.

The existing permitting system is partially effective. Only few industrial activities have been fully EIAed. This includes the following:

3EIA's for new project (power station, dam, Chemical industrial plant) while no EIA's have been conducted for existing projects. For environmental permission almost more than 1500 permits were given to several activities. These permission have to be renewed yearly because they are valid only for one year.

Public have very limited access to the information of environmental issues since they are not published regularly. Though lately the media showed some interest, but not all environmental issues are covered.

5 Compliance and enforcement

The ministry of environment is the main responsible authority for this issue, and since the Environmental law is not signed yet the enforcement and compliance is not fully applied .

the ministry of environment is depending on other sectorial ministries to cover this issue. The other main authorities responsible for compliane and enforcement are listed below:

Ministry of Housing and Utilities (MOHU):

The MOHU has three key environmental responsibilities:

- Providing potable water to all major settlements;
- Collecting and disposing of sanitary wastes;
- Supervising urban land use planning and issuing building permits.

The potable Water Directorate of MOH coordinates with the Ministry of Irrigation to identify water resources suitable for domestic supply. It is then responsible for monitoring quality, prescribing a treatment regime, if necessary and ensuring that the water delivered to houses meets the national standards for potable water set by MSE.

The Sanitary Waste Directorate of MOH is responsible for constructing sewerage networks in accordance with the local masterplan and choosing a suitable waste discharge sites if there is no treatment plant. In addition, it should develop management plans and design treatment plants for cities, towns and small residential communities and build and mange these plants.

The Master Planning Directorate of MOH supervises the preparation of masterplans prepared by the govenorates to make sure that all new settlements are planned and constructed in an environmentally sound manner and that all environmental conditions

have been met (especially a Legislative Decree passed in 18-982, which specified that new settlements should have adequate green spaces, roads, water, electricity) and participates in regional committees which update the masterplans. In addition, the Land Use Directorate determines, in consultation with the Ministry of Agriculture which crops may be grown on any particular area of agricultural land.

The Ministry of Housing also issues building permits, but only for public buildings.

Ministry of Agriculture and Agrarian Reform

The Ministry of Agriculture and Agrarian Reform (MOAAR) has responsibility for irrigation and agriculture and the management of agricultural lands. The MOAAR has general responsibility for agricultural sector in Syria, as well as primary responsibility for management conservation of a number of Syria's natural resources. Including forests, range lands and grasslands. The MOAAR is organized into a number of departments that have environmental management mandates:

- The soils department performs research on soil fertility, desalination, and rehabilitation of soils;
- The Badia department is responsible for conservation of grasslands for grazing in Badia, including management of 28 protected areas for this purpose;
- The Forestry Department is charged with protection of natural forest lands, restoration of damaged forest areas, and afforestation programs;
- The Plant conservation department provides pesticides control, regulation, and testing;
- The Agricultural Affairs and Research Department undertake agricultural research and development programs.

The MOAAR manages project for the study and prevention of desertification and soil erosion. It cooperates with the Ministry of Housing to identify land, both agricultural and non agricultural, to be used for urban expansion.

Ministry of Irrigation (MOI)

The MOI is responsible for maintaining and protection all public water resources in Syria, including rivers, lakes, coastal waters, springs, and ground water. The MOI has a water pollution control department, which has broad authority under law 2145 of 1971 to regulate and control department in five river basins, which conduct water quality monitoring and control activities. The MOI has authority to issue regulations setting water quality standards and discharge limitations, to inspect facilities causing water pollution, to make samples and to analyze water quality, and to advise polluters on ways of reducing water pollution enforcement action to obtaining compliance with water pollution requirements, however, must be taken by local government or by the appropriate ministry. The MOI has promulgated standards for drinking water quality and ground-water protection and has prepared new guidelines for industrial wastewater discharges. In addition, the MOI has an extensive water monitoring network in place. It has its own laboratories for monitoring and analysis in each river basin and monitors water quality regularly nation wide.

The Ministry of Industry (MOIN)

The Ministry of industry is responsible for overseeing the operation of those industries which, because of their strategic importance to the national economy, are reserved for the public sector.

These comprise approximately 100 industries including some of the heaviest polluters such as cement, sugar, food, textiles, and chemicals. The directorate of scientific and technical affairs supervises issues of pollution control, safety, and health. Although short-staffed, the directorate works jointly with the environment committees within each of public sector industries and with the Local Environmental Committees in the Governorate to provide guidelines for environmental matters, such as pollution prevention and control. The MOIN has no effective enforcement authority.

Ministry of Oil and Mineral Resources (MOMR)

The MOMR is responsible for the important oil industry as well as the exploitation of other mineral resources. Within the MOMR, the General establishment for Geology and Mineral Resources includes a Directorate of Environmental Geology and land use, which provides support for geo-environmental studies and planning. The directorate performs geo-environmental surveys, producing maps for geo-engineering, soil, water resources mineral deposit, and pollution sources.

State Planning Commission (SPC)

The SPC is the Government agency responsible for overall development planning. To carry out this responsibility, the SPC prepares the five-year plan which sets out the Government's development priorities and identifies specific projects the government will undertake to meet these priorities. The seventh five-year plan (1990-1995) was the first to identify and address environmental issues specifically. In preparing this plan, the SPC conducted a survey of environmental problems in Syria and identified a number of environmental priorities. As a result, the plan contained an order requiring environmental reviews and approval of industrial projects that may have negative impact on the environment. Second, the plan committed the government to constructing waste water treatment plants for major urban centers.

When a violation is verified the responsible authority takes several actions beginning with fines and temporary closure followed by jailing.

The system for assessment of environmental state is in progress, the state of environment report will be published soon within a month and it will be the main base for assessment.

TUNISIE

Conformité aux réglementations
et leur application effective

I) INTRODUCTION

La Tunisie est consciente que le développement durable ne peut être mis en œuvre que dans le cadre d'une stratégie de développement humain intégrant, la lutte contre la pauvreté et la protection de l'environnement.

Les préoccupations de la protection des ressources naturelles et de l'environnement étaient plus ou moins explicites et à l'ordre du jour des différents plans de développement économique et social du pays depuis les années 70. Ces préoccupations se sont imposées au choix du développement depuis la fin des années 80 et le début des années 90 ce qui a orienté la Tunisie vers une société prospère, juste, solidaire et tolérante pour laquelle le développement sert à produire de la richesse donc de réaliser des taux de croissance les plus élevés possibles dans une logique de développement durable. Cette logique trouve ses fondements dans les efforts entrepris et à entreprendre, d'une part, dans les domaines de la protection des ressources naturelles et la sauvegarde de leurs capacités de production et d'autre part, dans la lutte contre les nuisances à l'environnement et dans l'amélioration de la qualité de la vie aussi bien en milieu urbain que rural.

Ainsi, dans cette logique du développement, la protection de l'environnement et la gestion rationnelle des ressources naturelles sont des impératifs de durabilité qui imposent à l'œuvre de développement économique et social, la satisfaction des aspirations des générations actuelles et de créer les conditions pour satisfaire celles des générations futures.

Dans ce domaine les réalisations appréciables et notables puisqu'elles ont touché aussi bien le domaine institutionnel, juridique et législatif que les aspects de la gestion de l'environnement en milieu urbain et rural, de protection des ressources naturelles et de conservation de la nature au sens large du terme.

Les défis que le développement durable doit relever à terme, est de maintenir et de consolider les acquis enregistrés dans le domaine de l'environnement.

Depuis le changement, la Tunisie consacre en moyenne 170 millions de dinars par an d'investissement direct pour la réalisation des programmes de l'environnement.

Les ressources allouées jusque-là aux domaines de l'environnement ont permis de nombreuses réalisations notamment dans le domaine de l'assainissement, dans la lutte contre la pollution industrielle et la gestion des déchets spéciaux, dans le traitement des déchets solides et ménagers, dans la protection contre la pollution par les hydrocarbures, dans la lutte contre la désertification et la protection des terres, dans la conservation de la nature de la biodiversité, dans la réforme du système institutionnel chargé de la gestion de l'environnement, dans la consolidation et le renforcement du dispositif législatif et juridique relatif à la réglementation de la gestion de l'environnement, et pour les mesures d'encouragement, de mobilisation et de participation pour la protection de l'environnement.

II) Informations de base sur les activités :

1) Le littoral tunisien :

Par la morphologie de ses côtes, sa bathymétrie variable, ses plages, sa physico-chimie

et son substrat variable, le littoral tunisien comporte une gamme d'environnements hétérogènes et diversement dynamiques.

La côte tunisienne est généralement subdivisée en quatre grandes zones :

- La côte Nord qu'on appelle aussi la « côte du corail » s'étend depuis la frontière algérienne jusqu'à Bizerte. Etroite et escarpée, elle s'ouvre sur une mer profonde. Le rivage est marqué par la turbulence des eaux marines et par la fréquence et la violence des vents et des vagues entraînant un affaiblissement et un éclatement des falaises. De nombreux récifs coralliens abritent une grande diversité de mollusques, de poissons, de faune et de flore. Cette côte accidentée est cependant agrémentée de quelques plages importantes. Cette zone est caractérisée par une faible pression humaine.
- Le Golfe de Tunis s'étend de Bizerte à El Haouaria. Il constitue un territoire faunistique qu'il convient de protéger contre la pollution, et où la pêche doit être contrôlée à cause de l'extrême fragilité de la faune et des pratiques de pêche inadéquates. Les invasions marines, dans les parties basses de la côte, ont formé de grands lacs et golfes entourés de promontoires rocheux. On y retrouve aussi de nombreuses plages et la pression de l'urbanisation et du développement touristique est très forte dans cette zone du littoral.
- Le Golfe de Hammamet s'étend de El Haouaria à Chebba. D'un point de vue morphologique, la région de Kélibia rappelle le Nord avec un plateau continental. Le tourisme et la villégiature exercent de fortes pressions dans certains secteurs de cette zone.
- Le Golfe de Gabés s'étend de Chebba à la frontière lybienne. Les eaux y sont chaudes et l'amplitude des marées est plutôt faible. Il présente un plateau continental très étendu et peu profond. Un herbier à posidonies longe les côtes et constitue un vivier pour une faune marine très variée. L'industrie chimique et la pêche commerciale constituent les principales pressions anthropiques sur cette partie du littoral tunisien.

La Tunisie possède un grand nombre de d'espaces insulaires. Ceux-ci souvent très inégalement occupés ou aménagés, présentent une grande variété de paysages naturels. Certaines de ces îles connaissent des aménagements

importants et sont de plus en plus sujettes à différentes formes de déséquilibre environnemental.

Les usages du littoral sont parfois complémentaires et parfois en conflit et englobent les usages suivants :

- L'habitat.
- L'approvisionnement en eau (domestique, industriel, agricole).
- Les rejets (domestiques, industriels, agricoles).
- L'agriculture et l'élevage.
- L'arboriculture.
- Les mines, les sablières et les carrières.
- Le transport et les communications.
- Le commerce.
- Le tourisme et les loisirs.
- L'industrie.
- La pêche artisanale et industrielle.
- Les ports de plaisance.
- Les grands ports et la navigation.
- La conservation (aires protégées, parcs, réserves, milieux humides).

Les principaux usages sont :

L'urbanisme :

La Tunisie a connu un développement urbain assez soutenu durant les dernières décennies. Le pays compte actuellement plus d'urbains que de ruraux, trois personnes sur cinq résident en ville. La population urbaine est passée de 1,4 million en 1956 à 2,7 en 1975 et à 5,4 millions en 1994 soit un taux d'urbanisation de 38%, 49% et 61% respectivement. On prévoit qu'elle atteindra les 9 millions d'habitants d'ici l'an 2010 et que le taux d'urbanisation se rapprochera de 75%. La concentration des villes s'est faite sur l'axe littoral qui regroupe l'essentiel de la population urbaine et des villes.

En Tunisie, l'inadéquation de l'offre formelle à la demande a conduit au développement d'un marché foncier informel qui a résorbé 40% de la demande en terrain à bâtir et 25% du parc additionnel en logements. Le développement anarchique sur des terrains non viabilisés et souvent sur des sites inappropriés à la construction, a provoqué une consommation excessive de terres agricoles, un sous-équipement en infrastructures et une détérioration du paysage.

L'objectif général que poursuit la Tunisie en matière d'établissements humains consiste à améliorer, du point de vue social, économique et écologique, la qualité de ces établissements et les conditions de vie et de travail de tous. Ces améliorations reposent sur l'instauration de liens d'association et de partenariat entre les secteurs publics, privé et communautaire.

La Tunisie a déployé des efforts considérables dans le domaine des logements satisfaisants pour tous, y compris le locatif, dans la planification et la gestion durable des ressources foncières, dans la rationalisation du système de financement et de maîtrise des coûts des établissements humains et dans le développement d'une infrastructure environnementale intégrée.

L'assainissement urbain, ainsi que celui des complexes touristiques, est pris en charge par un organisme public national, l'ONAS. Les efforts d'assainissement sont considérables. Toutes les grandes villes possèdent leur station(s) d'épuration ou sont sur le point de l'avoir. Cet assainissement doit être généralisé aux agglomérations supérieures à 10 000 habitants avant la fin du siècle.

Les rejets sont généralement effectués en mer, en position littorale. L'eau douce étant une ressource limitée, il existe un programme de réutilisation des eaux traitées, ainsi que les boues séchées.

La qualité des eaux de baignade en mer est surveillée par la DHMPE du Ministère de la santé (pour le Golfe de Tunis) et par le CITET (Centre International des Technologies de l'Environnement).

A travers son laboratoire du Milieu Marin et de la Protection du Littoral, le CITET, assure le suivi bactériologique en continu des eaux de baignade, au niveau des zones rejets, des STEP et des émissaires en mer. La fréquence très est rapprochée en saison estivale et ce pour éviter tout risque sur la santé des baigneurs et des usagers.

Si les rejets domestiques liquides sont pris en charge à l'échelon national par l'ONAS et généralement bien traités, les déchets solides posent par contre un sérieux problème aux municipalités sur l'ensemble du pays. En zone littorale, on observe ainsi de nombreux sites de dépôt, autorisés ou sauvages, à proximité de la mer, dans les sebkhas, des lits d'oueds ou des terrains incultes. En raison des difficultés essentiellement économiques que rencontrent les communes à évacuer et traiter leurs déchets solides, il existe un projet de création d'un organisme national spécialisé, qu'il convient de hâter et d'encourager.

Le tourisme :

Le tourisme est une activité fondamentale en Tunisie. Celle-ci ayant pris naissance au début des années 60. Le tourisme a enregistré une croissance rapide.

La contribution du secteur touristique à l'économie nationale est particulièrement importante. Les recettes touristiques qui se sont élevées ont assurés un taux de couverture du déficit de la balance commerciale de 66%. Enfin, en matière d'emplois, le secteur a généré 270 000 emplois dont 60 000 emplois directs et 210 000 emplois indirects.

L'essor spectaculaire du secteur touristique depuis les années 1960 a été à l'origine de quelques problèmes liés à la surexploitation de certaines zones. Le

secteur du tourisme se comporte davantage comme un utilisateur rationnel de l'eau, car d'une part, il mobilisera ses propres besoins en eau par dessalement, dont 80% sont recyclables et utilisables à d'autres fins de développement.

L'application, depuis plus d'une décennie, d'une politique volontariste de promotion d'un tourisme protecteur de l'environnement constitue une garantie de qualité du produit. Ce qui implique :

Des structures juridiques et réglementaires ont été créées, en particulier les plans d'aménagement des zones touristiques dont la mise en pratique a permis un développement touristique intégré.

Un système touristique diversifié et respectueux de l'environnement a été développé et promu afin de l'ouvrir davantage sur l'intérieur du pays.

L'industrie :

De part son importance dans l'économie nationale, l'industrie représente l'un des secteurs clé de l'économie tunisienne.

la Tunisie possède une importante base industrielle qui représente environ 30% de son PNB (Produit National Brut). Les principales activités sont les industries extractives et le traitement des minerais de phosphate, la production d'acier, le textile et l'agro-alimentaire. Cette industrie montre la coexistence d'un secteur lourds, aux mains de grands groupes étatiques d'implantation relativement ancienne et à peu près stabilisé et d'un secteur de petites et moyennes entreprises privées, très diversifié et dispersé, où tous les cas de figure sont possibles. Les implantations industrielles coïncident avec le développement urbain, de sorte que les deux grands secteurs sont particulièrement présents en plusieurs pôles le long de la côte Est, souvent directement sur le littoral ou à proximité (Bizerte, Tunis, Sud, Sfax, La Skhira et Gabés).

Le gouvernement, convaincu par les impératifs de développement et par les exigences de la protection de l'environnement, ont adopté une stratégie qui repose sur le concept du développement durable.

Ce choix l'a conduit à mettre en œuvre une politique qui vise à la reconstitution et à la restauration des milieux et zones déjà fortement touchés par la pollution industrielle grâce à des programmes d'urgence. Sur le long terme cette politique se donne pour objectif de contenir les pollutions dans les limites acceptables, définies par des normes.

Il existe maintenant une conscience des nuisances environnementales. Des auto contrôles sont généralement pratiqués particulièrement dans le cas des industries lourdes, d'appartenance étatique, contrairement aux PME – PMI où l'information ne semble guère disponible sans étude spéciale.

Pour les industries lourdes, les solutions sont généralement déjà identifiées, mais attendent des décisions politiques ou réglementaires, des financements ou des réponses techniques pour être mises en œuvre, comme par exemple :

- Une installation de déballastage ou un système de séparation des huiles compatible avec les débits enregistrés à la raffinerie de Bizerte.
- Une épuration plus poussée des rejets atmosphériques des usines d'engrais chimiques.
- L'arrêt des rejets en mer de phosphogypses et leur stockage à terre sur le site du complexe chimique de Gabés.

Pour les PME – PMI, les définitions de priorité sont nécessaires, par branche d'activité ou zone géographique, afin de recenser les établissements, les problèmes et de fixer les mesures à prendre. Les études préliminaires du lac de Bizerte, de la ville de Sfax, ainsi que le programme de réhabilitation du Lac Sud de Tunis, constituent une bonne illustration de l'approche géographique.

2) Technologies disponibles :

- Les dispositions portant sur l'utilisation des meilleures technologies disponibles et des technologies propres sont modérées cependant il y a des incitations et des encouragements de la part de l'état tunisien pour ce genre de pratique (importation, validation et mise en œuvre de nouvelles technologies de l'environnement).

*La création du Centre International des Technologies de l'Environnement (CITET) :

Le CITET, créé en 1996 est un centre qui a pour mission d'acquérir, d'adapter et de développer les nouvelles techniques, de promouvoir les éco-technologies et leur production, de renforcer les capacités nationales et de développer les connaissances scientifiques nécessaires à l'élaboration et à la mise au point de techniques environnementales appropriées aux besoins nationaux et régionaux spécifiques, dans la perspective d'un développement durable et ce, par la formation de techniciens et d'experts dans le domaine de technologies de l'environnement, par le transfert, l'adaptation et le développement de techniques environnementales pour mise à disposition des usagers et par l'encadrement des jeunes promoteurs et inventeurs dans le domaine de l'environnement.

- Les avantages et incitations économiques :

Les dispositions du nouveau Code d'Incitation aux Investissements ainsi que les textes d'application, fixent les règles d'éligibilité et de procédures pour bénéficier des mesures d'incitation ciblées en fonction des priorités en matière de lutte contre la pollution, d'élimination des rejets polluants et de gestion, valorisation et élimination des déchets.

En vertu du nouveau code, les investissements dans les projets concourant à la protection de l'environnement peuvent bénéficier, outre le régime des incitations communes à tous les investissements, d'un régime d'incitations spécifiques aux investissements réalisés par les entreprises pour l'élimination de leur propres rejets polluants et par les entreprises spécialisées dans la collecte, le recyclage et la valorisation des déchets. Ces incitations spécifiques impliquent :

- Des avantages fiscaux au titre des équipements.
- L'exonération des droits de douane et des taxes d'effet équivalent et la suspension de la TVA et du droit de consommation au titre des équipements importés qui n'ont pas de similaires fabriqués localement et nécessaires à la réalisation de ces investissements.
- La suspension de la TVA sur les équipements fabriqués localement.

Il est à noter que les entreprises qui se spécialisent dans l'assainissement ou le nettoyage des locaux, hôtels et administrations sont exclues du bénéfice de ces avantages.

Des avantages financiers sous forme d'une prime de dépollution dont le montant et les conditions d'obtention sont accordés dans le cadre de l'organisation et du fonctionnement du fonds de dépollution (FODEP).

- Le fonds de dépollution (FODEP) :

Le FODEP est un instrument financier qui a pour objectifs principaux :
D'aider les industriels à investir dans les installations visant à réduire ou à éliminer la pollution résultant des activités de leur entreprise et d'encourager les entrepreneurs à créer des unités de collecte et de recyclage des déchets.

Le FODEP permet d'accorder aux industriels présentant un schéma financier comportant au moins 30% de fonds propres, une aide couvrant jusqu'à 20% du coût des installations. Le reste, soit 50% de la somme nécessaire, peut être financé par un crédit bancaire obtenu par à partir de lignes de crédits réservées à la protection de l'environnement et gérées par des banques conventionnées.

Depuis trois ans, la Tunisie s'est engagée dans un programme de mise à niveau et ce compte tenu de son ouverture sur le marché Européen. Ce programme qui intéresse essentiellement les petites et moyennes entreprises, propose des aides quant à la mise en place à l'intérieur des entreprises d'un programme de gestion environnementale (E.M.S, ISO 14000).

3) Programmes de sensibilisation

Des programmes de sensibilisation et d'éducation environnementale ont été mis en place. En utilisant tous les canaux médiatiques et les supports de sensibilisation et en profitant des journées nationales, régionales et mondiales relatives aux domaines de l'environnement, ces programmes ont permis de

développer le sens de l'environnement auprès du public et notamment les jeunes. Par le biais du personnage de l'environnement ou mascotte de l'environnement « Labib » et la mobilisation de la radio et la télévision nationale, les messages de sensibilisation et d'éducation du public gagnent en efficacité ce qui fait que les préoccupations de l'environnement sont de plus en plus partagées par l'ensemble de la population du pays. Cette mobilisation populaire est nécessaire pour une gestion plus rationnelle de l'environnement.

Parallèlement à la sensibilisation de masse, un important programme d'éducation environnementale permet graduellement d'intégrer l'environnement, au sens large du terme, dans les programmes d'enseignement et d'éducation. Des sessions de formation au profit des enseignants, des fiches didactiques et des manuels d'enseignement ont été élaborés dans le cadre de ce programme.

Parmi les réalisations du programme de renforcement et de l'éducation environnementale, ont été accomplies :

- Un diagnostic de la situation de l'enseignement de l'éducation environnementale dans les domaines de l'enseignement formel et non formel.
- L'élaboration du programme cadre qui retrace la Stratégie Nationale en éducation environnementale.
- L'élaboration d'outils pédagogiques tel que des guides, des brochures, des livres pour l'enseignement primaire, des affiches, des cassettes video...
- L'organisation d'une conférence pour les enfants « MED 21 »

4) Les ONG

Les ONG jouent un rôle décisif dans le processus de démocratisation dans les pays en voie de développement. L'indépendance des ONG vis à vis de l'Etat constitue l'un de leur principaux atouts.

L'objectif en général est de favoriser toutes les actions visant le renforcement et le développement du rôle des ONG dans l'élaboration et la réalisation des politiques visant à promouvoir un développement durable.

En Tunisie, le tissu associatif serait constitué de plus de 6000 associations dont plus de la moitié de création récente. Les associations de développement et d'environnement qui nous concernent plus particulièrement, ont été créées dans les années 70, à l'initiative des ONG étrangères. Elles ont bénéficié de l'expérience acquise et de l'appui technique et financier de celles-ci.

Le contexte international a sensiblement renforcé la position de ces associations et popularisé leur approche en matière de développement durable ; ce qui a été à l'origine de nouvelles associations. Toutefois, malgré cette progression, le mouvement des ONG en Tunisie reste encore modeste. A titre de comparaison, il y a une ONG pour 900 citoyens en Tunisie contre une ONG pour 100 citoyens en France.

Les séminaires organisés et les études menées sous l'égide du PNUD ont pu recenser l'ensemble des difficultés auxquelles se heurtent les ONG en Tunisie. Les plus importantes sont :

- Les difficultés politico-institutionnelles liées à la persistance de pratiques administratives figées et restreignantes, en particulier au niveau local et régional.
- Les difficultés financières liées à la modicité des cotisations permettant les activités des ONG et la faible possibilité de mobilisation des ressources pouvant émaner d'organismes internationaux.
- Les difficultés organisationnelles liées au niveau de formation et de compétence des membres et des dirigeants et à la précarité des méthodes de gestion et de travail.
- Les difficultés psycho-sociologiques qui ont trait essentiellement au type de relations entre les ONG et les populations. Les habitudes prises au fil des ans par les populations d'être assistées, de tout attendre de l'Etat, entravent sérieusement l'action des ONG, en particulier auprès des cibles privilégiées constituées par les groupes défavorisés.

L'objectif général est de lever les obstacles organisationnels et psycho-sociologiques au développement des ONG pour leur permettre de jouer effectivement leur rôle de partenaires responsables dans la mise en œuvre d'un développement durable.

III) Législation

Afin de concevoir et mettre en œuvre sa politique dans le domaine de l'environnement, la Tunisie a renforcé depuis 1992 le cadre législatif et réglementaire de la protection de l'environnement dans plusieurs domaines tels que l'aménagement du territoire, la lutte contre la pollution et la gestion des ressources naturelles.

Par ailleurs, la Tunisie a participé activement aux efforts entrepris à l'échelle régionale ou mondiale pour préserver l'environnement. Elle a notamment ratifié plus de trente conventions internationales relatives à la protection de l'environnement dans les domaines les plus variés (interdiction des essais nucléaires, prévention de la pollution de la mer par les hydrocarbures, commerce des espèces menacées, protection de Méditerranée, lutte contre la désertification, protection des zones humides, etc...)

En mai 1993, la Tunisie a ratifié les deux conventions des Nations Unies signées lors de la conférence « La convention sur la diversité biologique » et celle sur « Les changements climatiques ».

Au niveau national, la Tunisie a promulgué depuis 1992 plusieurs textes législatifs dans le domaine de l'environnement et du développement :

- Le code de l'Aménagement du Territoire et de l'Urbanisme.
- La révision en 1995 de la loi relative au Domaine Public Maritime.
- La loi du 3 avril 1996, instituant un plan National d'Intervention Urgente pour la lutte contre les événements de pollution marine.
- La loi cadre (1996) sur les déchets et le contrôle de leur gestion et de leur élimination.
- La loi du 31 janvier 1994, relative à l'aménagement et à la maintenance des zones industrielles.
- La loi du 17 juillet 1995, relative à la conservation des eaux et du sol.

- Au niveau international, la Tunisie a signé et /ou ratifié les conventions et protocoles suivants :

- Ratification de la convention de Bamako sur l'interdiction d'importer en Afrique des déchets dangereux et sur le contrôle des mouvements transfrontières et la gestion des déchets dangereux.
- Ratification de l'amendement de la convention relative aux zones humides d'importance internationale particulièrement connues comme habitats de la sauvagine (loi du 3 novembre 1992).
- Adhésion de la République Tunisienne au protocole de Montréal amendé, relatif aux substances qui appauvrissent la couche d'ozone (loi du 3 mai 1993).
- Ratification de la convention des Nations Unies sur la diversité biologique.
- Ratification de la convention cadre des Nations Unies sur les changements climatiques (loi du 3 mai 1993).
- Ratification de la convention portant création de l'organisation pour la protection des végétaux au proche - orient (loi du 20 octobre 1993).
- Adhésion de la République Tunisienne au protocole de Montréal amendé, relatif aux substances qui appauvrissent la couche d'ozone (loi du 27 juin 1994).
- Adhésion de la République Tunisienne à la convention internationale de 1990 sur la préparation, la lutte et la coopération en matière de pollution par les hydrocarbures (loi du 19 juin 1995).
- Ratification de la convention des Nations Unies sur la lutte contre la désertification dans les pays gravement touchés par la sécheresse et/ou la désertification en particulier en Afrique (loi du 19 juin 1995).
- Ratification de la convention de Bâle sur le contrôle des mouvements transfrontières de déchets dangereux et de leur élimination (loi N°63 de 1995).
- Adhésion de la république tunisienne à la convention de Bene relative à la conservation de la vie sauvage et du milieu naturel de l'Europe (loi du 7 août 1995).

1) Les études d'impact sur l'Environnement

La loi n°88-91 du 02/08/88 portant sur la création de l'Agence Nationale de la Protection de l'Environnement prévoit l'obligation de présenter à l'Agence une Etude d'Impact sur l'Environnement (EIE) avant la réalisation de toute unité industrielle, agricole ou commerciale dont l'activité présente, de par sa nature ou en raison des moyens de production ou de transformation utilisés ou mis en œuvre des risques de pollution ou de dégradation de l'environnement.

L'approbation de l'EIE par l'ANPE est un préalable incontournable à la délivrance de toute autorisation administrative exigée pour la réalisation de ces unités. L'objectif principal de la mise en application des EIE, régies par le décret n°91-362 du 13/03/91, est la prévention des nuisances puisqu'elle intervient avant même la réalisation des unités susceptibles de nuire à l'environnement naturel et humain.

Il y a deux types de projets :

Ceux qui sont obligatoirement soumis à EIE et c'est la direction Etudes et Grands projets de l'ANPE qui évalue les études d'impact ; elle dispose d'un délai de 3 mois à compter de la date de réception de l'étude d'impact pour notifier sa décision d'approbation ou de refus.

Ceux qui sont occasionnellement soumis à EIE et c'est l'ANPE qui le juge nécessaire après examen d'une description sommaire du dit projet et de son impact prévisible. Elle dispose pour cela de 20 jours à compter de la réception du dossier de description sommaire.

Le détail des analyses requises par la loi en vigueur est arrêté dans un cahier des charges élaboré sur la base de termes de référence types fournis par l'ANPE.

Les frais de réalisation de l'EIE ou de la description sommaire sont à la charge du promoteur du projet. La description sommaire ou l'Etude d'Impact sur l'Environnement doit être déposée en trois exemplaires à l'ANPE et en un exemplaire auprès de chaque ministère habilité à intervenir dans l'autorisation de la réalisation du projet.

IV) Délivrance des permis :

Il existe environ 10 000 établissements classés et 1500 fortement polluants. 5 500 entreprises nécessitent un pré - traitement des rejets. Les anciennes entreprises sont soumises à des programmes de dépollution (FODEP). Les nouvelles entreprises, elles, sont soumises à des études d'impact. Environ 5 500 entreprises sont soumises à des notes d'impact.

Environ 900 à 700 employés de différents ministères s'occupent de la délivrance des permis.

Le public a accès à l'information sur les questions environnementales à travers des rapports faits par le Ministère de l'Environnement et de l'Aménagement du Territoire.

1) Conformité et application effective :

- En Tunisie, la conformité est encouragée par des distributions de prix que délivrent le Ministère de l'Environnement et de l'Aménagement du Territoire aux entreprises qui respectent les normes en vigueur.
- La conformité est vérifiée dans les entreprises par des contrôleurs de l'Agence Nationale de la Protection de l'Environnement.
- Quand des plaintes sont déposées, la plupart du temps des inspections sont faites.
- Les contrôles et inspections, sont effectués régulièrement pour les usines, le développement urbain, l'élimination des eaux usées domestiques ; parfois pour les élevages et pour l'élimination des déchets.
- Les principales autorités chargées de la conformité et de l'application effective sont : le Ministère de l'Intérieur, le Ministère de l'Agriculture, le Ministère de l'Environnement et de l'Aménagement du Territoire, la santé publique, le Ministère de l'Industrie et le Ministère du Commerce.
- Il y a environ 1000 à 1500 employés chargés de la conformité et de l'application effective au sein des ministères.

TURKEY

**Compliance and Enforcement of Regulations
in the Mediterranean for Control of Pollution
Resulting from Land-Based Sources and Activities**

**Country Report
TURKEY**

Prof. Derin Orhon
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March, 1999

1. INTRODUCTION

In Turkey, a remarkable progress has been made over the last fifteen years to create viable mechanisms for appropriate environmental management. In 1982, *a healthy and balanced environment* was recognized as a constitutional right. *The Environment Act* was passed in 1983 and *The Ministry of Environment* was structured in 1991. The last decade may be described as a period of increasing public awareness and demand for a clean environment and of substantial NGO activities. It was also affected by rapid economic growth, accelerating the pace of urbanization and the consumption of natural resources, and also increasing the magnitude of waste generation.

Despite significant improvements and achievements, environmental management is still challenged by the following issues, also valid and significant for the majority of developed and developing countries in the region:

- *over reliance on regulatory mechanisms*
- *little integration of environmental factors in planning*
- *limited public participation*
- *limited awareness of environmental facts*
- *inadequate environmental education.*

These factors lead like in elsewhere, to three major deficiencies in the management structure: (a) *non-scientific/misleading information about polluting sources/activities*; (b) *non-scientific expectations about environmental quality*; (c) *inadequate enforcement potential.*

A great deal of effort has been spent, on an international and national scale, to overcome these difficulties. Internationally, Turkey has become party as of 1997 to 38 conventions, signed 29 declarations and enacted 15 bilateral agreements on environmental protection and management. It also participated in various regional initiatives such as MAP, METAP, etc. On a national scale, a *National Environmental Action Plan (NEAP)* was formulated in 1998 mainly to

- *define and support actions for development of an effective environmental management system*
- *enhance scientific environmental information and awareness*
- *invest in improved environmental management, with priority on critical problem areas.*

Coastal zone management is a priority subject for Turkey; coastal areas with their 8300 km of shoreline and several islands constitute important ecosystems. Especially in the

Mediterranean region, each coastal zone has different features and require different management approaches.

Aquaculture has increased in recent years and it has negatively affected marine ecosystems. Both soluble and particulate pollutants constitute a serious threat to other beneficial uses, such as recreation, water-sports, etc, much more significant for the major part of the coastal zone.

With the new incentives, *tourism* is an ever increasing asset for the coastal zone. It brings an number environmental questions, still unsolved for the region, such as optimum land use, effective management and disposal of seasonal wastes, infracstructure activities (road construction, sea-filling along the coastline, etc).

Preservation of *natural habitats* is another important issue. The Mediterranean coast houses 9 of the 12 *specially protected areas* in the country. Interference and interaction of tourism with fragile sites, relics and natural habitats causes significant damage and degradation and calls for effective control.

2. BACKGROUND INFORMATION ON ACTIVITIES

2.1. Significant Environmental Activities

The activities listed in the Table below are estimated as the most environmentally significant ones for the Mediterranean coastal area in Turkey. The Table also gives the extent of activities ascertained in a national survey conducted by the Ministry of the Environment in 1996 (Anon, 1996).

Table 1. Significant activities in the Mediterranean coastal area in Turkey

Activities	Number of plants In the region
Textile	> 200
Food & Meat Processing	> 200
Tanneries	262
Pulp and Paper	9
Cement Production	7
Petroleum Refining & Petrochemicals	3
Fertilizer Production	5
Thermal Energy Production	4
Small Industry Sites	43
Organized Industrial Districts	6
Tourism	>10 ⁶ bed capacity

Textile is the most significant industrial asset in Turkey, and consequently the major activity among agro-industries in the region. Textile plants involve the whole spectrum of dyeing and finishing operations on knit and woven fabrics. They are mainly concentrated in the Adana and Izmir regions

Food processing is also a major industrial activity, reflecting the agricultural potential of the region. Edible oil and canned food production may be underlined together with meat processing; the latter is a widespread activity with 149 installations in the municipalities along the coastal zone.

As the table shows, the region also houses 3 of the largest refining/petrochemicals facilities, together with 4 thermal power plants, the most environmentally controversial and publicly debated activities in Turkey, due to their critical locations.

Small industries pose a special environmental problem, because of the difficulty in installing, operating and monitoring individual treatment facilities. Increasing numbers of these activities are now collected and grouped in *small industry sites*, for better environmental management. A successful version of this concept for large and highly polluting industrial activities is implemented as *organized industrial districts*. Tanneries representing a very significant industrial activity for the country and the region, are generally located in such districts.

Outstanding natural and historical assests of the country have promoted tourism as one of the fastest growing sectors, especially in the last two decades. As a result, priorities in land use in the coastal zone almost exclusively involve *areas for tourism* and rapid urban developments as *vacation homes*.

2.2. Best Available Technologies (BAT) & Clean Technologies (CT)

The concepts of *Best Available Technologies (BAT)* and *Clean Technologies (CT)* are only meaningful if they are properly introduced and implemented as viable instruments of a national or regional wastewater management program. Then, they may play a vital role in the formulation of

- appropriate effluent limitation standards
- feasible technical solutions
- achievable in-plant modifications and recovery/recycling schemes

The concept of *Best Available Technology (BAT)* has been introduced for at least six major industrial categories since mid eighties. This then, extensive research effort has been devoted to define BAT domestic sewage and most agro-industries, with major emphasis on textile and leather industries. However, there has been official reluctance to acknowledge and improve the accumulated scientific information and to translate it into legislation for appropriate enforcement.

The concept of *Clean Technology (CT)* is very new even for related research efforts. Request for in-plant modifications to allow for recovery/recycling comes only when and where cost of raw materials and especially water becomes prohibitive. Solutions offered need to be improved.

In this context, the existing provisions in Turkey, for either using or enforcing BAT and/or CT are *very limited*.

2.3. Environmental Quality of Water Resources

The quality of *seawater* is generally *good* and the major portion of the coastal zone in Turkey perhaps exhibits the **best** environmental quality in the Mediterranean, with the

exception of a few well-known pollution hot spots. Among the critical coastal areas requiring urgent protective measures, *The Iskenderun Bay* with special hydrological features and high pollutant discharges, *The Izmir Bay* suffering from excessive domestic and industrial wastewater discharges and *The Çandarlı Bay* polluted by petroleum refining, tanker traffic and organic pollutant loads from the Bakırçay and Büyük Menderes Rivers, deserve the highest priority.

The quality of **specially protected areas** is *excellent* and well suited for their specific habitat. These areas are well recognized for waterfowl preservation and reproduction, also housing some of the 12 most endangered species in the world.

2.4. Provisions for Environmental Monitoring

A general qualitative evaluation of the existing provisions for environmental monitoring is outlined in Table-2 below.

Table 2. Level of existing provisions for environmental monitoring

Sectors	Provisions for Environmental monitoring
Seawater quality	Extensive
Inland water quality	Extensive
Industrial waste waters	Moderate
Industrial solid waste	None
Urban development	Poor
Domestic wastewater disposal	Limited
Incineration of wastes	NA
Municipal solid waste	Poor

*NA – Not applicable

Seawater quality in mainly monitored as part of comprehensive scientific studies supported by Scientific and Research Council of Turkey and international agencies. Turkey is

- monitoring *marine water quality* in compliance with MEDPOL phase III;
- preparing an investment portfolio to minimize *land-based* sources of pollution;
- and helping *Agenda 21* plan for the Mediterranean.

A number of centers and institutions are well equipped for and heavily involved in theses surveys. Substantial data are systematically generated and evaluated especially for hot spots such as *Izmir Bay, Iskenderun Bay*, etc.

The most comprehensive effort on environmental monitoring is certainly devoted to the assessment of *inland water quality*, with specific emphasis on watercourses. For more than three decades, The State Water Works (DSI) systematically measures, evaluates and classifies inland water quality in terms of major parameters and in accordance with a unified set of criteria.

Control of *industrial wastewaters* follows an erratic pattern. Within the jurisdiction of Greater Metropolitan Areas, local pretreatment programs are generally very effective, especially in specific areas such as *Istanbul* or *Izmit Bay* housing major fraction of the national industrial activity. The compliance monitoring enforced is quite impressive as it covers 1420 different plants with a total wastewater flow rate of more than 40,000 m³/d (Sarikaya *et al.*, 1997). A similar program in *Izmir Bay*, within the Mediterranean coastline is not equally impressive. Outside large metropolitan areas, monitoring carried out by the Ministry of Environment and local authorities is relatively limited.

Sludge from industrial wastewater treatment and *Industrial solid waste* are practically ignored in waste management practice and related environmental monitoring.

Land use planning and the ensuing urban development often leads to illegal housing zones and to proliferation of slums areas, mainly because of the inherent deficiency of the existing system empowering elected authorities and giving way to political decisions.

Practice of *domestic wastewater disposal* and its monitoring are both under the control of local municipalities, creating a clear case of conflict of interest and authority. The situation will markedly improve with the move to replace deep marine discharges with biological treatment along the Mediterranean coastal zone.

There is no current practice of *waste incineration* in Turkey. Disposal of *municipal solid waste* is perhaps one of the most neglected environmental issues in the country. Along the coastal zone, substantial effort is devoted towards improving the existing open dumps to appropriate sanitary landfill areas.

2.5. Public Awareness of Environmental Problems

The level of public awareness of environmental problems is *moderate* and quite occasional. It manifests itself on issues making headlines in the news media, such as *the thermal power plant* at *Gökova* or *the gold mining* at *Bergama*. This is quite expected and understandable as chronic environmental issues are unlikely to compete with day to day priority issues such as economical and/or political problems. Recently, an increasing trend is observed however in public interest on environmental issues, parallel to improvements in education and economy.

2.6. The Role of Environmental Action Groups

Environmental action groups (NGOs) influence *rarely* decision-making in Turkey, mainly because such decisions on environmental issues are not usually open to public discussion and evaluation before enforcement and the NGOs are not educated and involved enough to affect and revert this mechanism.

2.7. Additional Considerations

The following topics need to be taken up as joint research issues/activities for a unified regional implementation:

- Categorization and BAT/CT assessment of significant industrial activities in the region
- Assessment of infrastructure requirements (methodology, equipment, man power, education) for unified regional compliance monitoring programs.

3. LEGISLATION

3.1. Legal Framework for the Environment in Turkey

The legal basis of environmental protection is set by the *1982 Constitution* which basically defines *living in a clean environment* as a *civil right*. The constitution states the mutual obligation of the citizens and the government to cooperate for the protection and upgrading of the environment. It also addresses the need to protect the shores, land and water resources, forests and natural, historical and cultural assets.

The Environmental Act (no.2872) of 1983 serves as the legal framework for the environment. It defines the basic structure of activities for the prevention and solution of environmental problems. These involve banning certain polluting operations, introducing the concept of *EIA* and *special environmental protection areas*, providing sanctions to prevent the discharge of hazardous chemical substances and wastes, and provisions for necessary incentives.

The regulatory mechanisms, as defined in the Environmental Act, serve as primary tools for environmental management. Different regulations promulgated in accordance with this act, specify procedures to be followed, plans to be prepared, standards to be met, and activities to be prohibited.

There are a number of other laws that relate to different elements of the environment. These include, *The water Act, Water Products Act, Municipalities Act, General Hygiene Act, Tourism Incentives Act, Protection of Cultural and Natural Assets Act, National Parks Act, Forest Villages Development Act, Bosphorus Act, Metropolitan Municipalities Act, Agricultural Reform Act, Game Act, Urban Development /Construction Act, Mining Act, Coastal Act, Reforestation and Erosion Control Act* and *Forest Act*. This type of a legislative package, although providing a comprehensive coverage, often leads to interference and sometimes to conflict of authority, which becomes detrimental for effective environmental protection actions.

This legislation package and specifically *The Environmental Act* and its regulations include measures for the control of

- seawater quality
- inland water quality
- protection of habitats

The existing legislation also includes different levels of provisions for the regulation of activities listed in Table-3 below:

Table 3. Level of legislative control for different activities

Activities	Level of Control
Industrial wastewater disposal	Full
Industrial solid waste disposal	Full
Animal breeding	None
Agriculture	None
Urban development	Limited
Domestic wastewater disposal	Full
Incineration of wastes	Full
Urban solid waste disposal	Full
Infrastructure projects	Full

As shown in this table, *animal breeding* and *agriculture* are not considered as significant components of environmental management. Plans for *urban development* often disregard environmental concerns and restrictions.

3.2. Specific Issues in Environmental Legislation

Environmental Impact Assessment (EIA)

Environmental Impact Assessment (EIA) is one of the vital instruments of environmental legislation in Turkey. It was promulgated within the regulation package of the *Environmental Act* basically translating a combination of US and EU procedures.

It basically involves EIA of significant *new projects*, such as major infrastructure projects, large housing developments, power plants, various industrial activities. It also involves provisions for activities in areas protected under national legislation and/or international conventions which Turkey is a party to, as well as sensitive zones such as agricultural land, wetlands, lakes, water abstraction areas and ecosystems rich in biodiversity. An *inclusive list* approach is adopted to identify activities subject to EIA evaluation.

EIA procedure for *existing sources* is only started when a major extension of activities is proposed.

New projects with a positive EIA evaluation is approved and authorized to proceed with a specific *EIA licence* or *permit* (EIA positive certificate) which is used afterwards for the application for regular land use, construction and operation permits.

The EIA permit is subject to periodical inspections for compliance control and to renewal, especially if it is issued conditional upon completion of a set of environmental protection measures, such as treatment, recycling, etc.

Review of environmental conditions in the permit is only allowed if a major extension of the activity is proposed. The EIA procedure as well as the general procedure in conjunction with the Environmental Act involve compliance promotion and enforcement in case of violations.

Best Available Technologies (BAT) and/or Clean Technologies (CT)

The environmental legislation does not contain direct provisions for the promotion of best available technologies and/or clean technologies. An important practical consequence is that the numerical definition of effluent and/or emission standards does not relate to or reflect these technologies.

3.3. Additional Considerations

The following topics need to be taken up as joint research issues/activities for a unified regional implementation:

- Regional directives are needed to reduce the diversity of existing environmental legislation
- A regional study should be undertaken to redefine effluent and emission standards on the basis of BAT and/or CT.
- A specific regional directive should be formulated for the protection coastal marine environment against eutrophication and for the enhancement of tourism and recreation as major beneficial uses.

4. PERMITTING

4.1. The Permitting system in Turkey

The permitting system in Turkey, as defined and implemented in related legislation involves different type of permits:

- *Environmental permits* including *the EIA permit* for major activities, and *the quality control licence* specifying environmental characteristics and restrictions for industrial sources,
- *Land use permits* for any type of development in accordance with applicable urban development plans,
- *Construction permits*, essentially controlling and ensuring the conformity of constructions to submitted and approved designs
- *Operation permits*, in the form of a *hygienic conditions licence*, specifying environmental conditions to be sustained during the operation of an industrial facility.

4.2. Authorities Responsible for Permitting

In Turkey, there are both *national* and *local* authorities responsible for permitting, depending upon the type of permits and the activities involved:

Industrial activities

- *EIA permit* – national (with the exception of Istanbul Metropolitan Area), issued by the Ministry of Environment,
- *Quality control licence* - local within the Greater Metropolitan Areas and national (The Ministry of Environment) elsewhere
- *Land use and construction permit* - issued by the local municipality
- *Operation permit* – issued by the Ministry of Health/Greater Municipalities for major activities and local agencies for smaller enterprises

Animal Breeding - no permit is required

Urban Developments – all permits issued by the local municipality

Domestic wastewater – theoretically permitted by the Ministry of Environment; but in practice, designed and constructed by *The Provincial Bank* which is a national agency and operated by the municipality or the settlement with nothing but voluntary self-control,

Infrastructure projects - Major projects subject to EIA evaluation, but in practice designed, built and operated by the responsible government agency with no appreciable environmental concern,

Incineration of wastes/solid waste disposal - permitted and licenced at the national level by the Ministry of the Environment , but generally left at the initiative of the local municipality.

4.3. Numerical Aspects of Permitting

It may be estimated that around 800 – 1000 industrial facilities would require *EIA permit* and some 6000 – 8000, *quality control licence* for their operation.

Similarly, the existing technical manpower in all related ministries/agencies may be estimated in the range of 400 – 500 employees.

- An estimated 309 *EIA studies* have been completed as of September 1997 in Turkey, and *permits issued* for *new and existing projects*.
- Periodic *permit renewal* takes place regularly in Greater Metropolitan Areas for industry,
- New development areas *rarely* taken into account in permit renewal,
- A substantial number of voluntary agreements take place with *large* industrial facilities, especially as related to *ISO qualifications*.

4.4. Public Access to Environmental Information

The environmental legislation does not have the necessary tools for a *mandatory availability* of environmental information to public. Consequently public finds occasional access to fragments of environmental information which, sometimes, lead to a misleading image of the issues involved.

5. COMPLIANCE AND ENFORCEMENT

5.1. Compliance Promotion in Turkey

In Turkey, there is now consensus on the fact that the success of compliance promotion relies on the way in which the following set of environmental parameters are defined and integrated in the national environmental management system:

- environmental characteristics of the activity
- environmental standards
- environmental measures (properly defined, structured, and operated).

If one of the above parameters involve elements or restrictions that are irrational in the sense they cannot be scientifically or economically justifiable, then the active (voluntary) involvement may be in serious jeopardy.

In this context, the compliance system in Turkey includes:

- a complete set of *environmental standards*, prescribed in relevant legislation,
- a *quality control licence*, providing official and correct description of environmental characteristics associated with each polluter/activity.
- Compliance monitoring – inspections and controls
- Action against violations – fines, temporary and permanent closures, criminal prosecutions

Enforcement is the bottleneck of the compliance; it should rely on

- an organisation scheme identifying appropriate steps and instruments, both from qualitative and quantitative standpoints
- adequate resources

Furthermore, public resources devoted to environmental enforcement are inadequate, resulting in insufficient funds and facilities (staff, equipment, budget, information, communication, technology transfer, education) for regulatory monitoring.

5.2. Procedural Aspects of Compliance and Enforcement

Compliance is checked in industrial plants, prior to production, before issuing a *hygienic control permit*, and/or a *quality control licence*. In this context, The Ministry of

Environment, The Ministry of Health and the local municipality are involved in these type of inspections.

Inspection is mandatory by law when complaints are lodged. Complaints may be taken up to the responsible local or central authority, or directly to courts for legal prosecution.

Periodic inspections are routinely carried out on *industrial plants* for controlling waste emissions. The control frequency very much depends on the relative magnitude of industrial operation and on available resources. Similar inspections are also conducted on tourism facilities.

The Ministry of Environment Local Environmental Committees, The Ministry of Health and local municipalities are responsible for compliance and enforcement. Permitting and compliance monitoring are carried out by the same group of technical staff.

When a violation is ascertained for the first time, pertinent legislation allows for two courses of action: (a) a *pollution prevention fine* may be issued, subject to re-inspection for corrective actions, and/or (b) a criminal prosecution may be started against the responsible person (s) in charge, in case of false or misleading record on environmental characteristics of the facility. Repeated violations may lead to temporary or permanent closures.

Qualification for *ISO certificates* presently works as the best means of compliance promotion. Several other incentives, such as recovery/recycling, clean technologies, joint treatment, improvements in emission quality beyond permissible levels, are also envisaged for the same purpose.

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