MEDITERRANEAN ENVIRONMENTAL
TECHNICAL ASSISTANCE PROGRAM

MEDITERRANEAN
ACTION PLAN

Sub-regional Workshop

Environmental Performance Indicators

Split, 26-28 November 1998

Record of the Workshop

PRIORITY
ACTIONS
PROGRAMME

REPUBLIC OF CROATIA
STATE DIRECTORATE FOR THE PROTECTION
OF NATURE AND ENVIRONMENT

UNOPS

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Part 1 : Summary

The present record summarises the discussions held during a Workshop on Environmental Performance Indicators (EPI) held at Split [1] in Croatia from the 26th to the 28th November 1988 on the initiative of Mediterranean Action Plan Regional Activity Centre (MAP/RAC): Blue Plan, with financial contributions from the METAP and LIFE programmes, in co-operation with the Croatian State Directorate for the Protection of Nature and Environment and the MAP/RAC : Priority Actions Program (PAP/RAC).

The workshop brought together 25 experts representing four Mediterranean countries (Albania, Croatia, Slovenia, Turkey)) and had the benefit of technical back-up from two French experts, an expert observer from the Cairo seminar, an expert from the World Bank and three Blue Plan experts. It was part of the follow-up to the Regional Meeting on EPIs held in Beirut in December 1997 and was concluding the last sub-regional consultation after two other workshops of the same type in two other Mediterranean sub-regions.

After a reminder of the context, of some definitions, methods and an awakening to the usefulness and limitations of applying Environmental Performance Indicators through a few examples, the workshop allowed above all the common problems for the four countries, as well as a minimum set of EPIs for monitoring them to be defined, for four priority subjects in the Mediterranean[2].

The subjects touched upon in the presence of the experts appointed by the 4 countries were: air pollution (local and global), solid waste and water, as a resource in terms of quantity and quality.

The definition of common problems and the selection of a restricted number of indicators by subject allowed a list of twenty or so priority indicators for these 4 subjects to be agreed upon.

The workshop, in addition to the preparatory questionnaires for it (sent out to the countries and analysed by Blue Plan), also allowed the availability of data for calculating these indicators to be assessed.

The experts nevertheless stressed the need to carry this work further at the level of each country; this is in order to set the tools required for their application to work and for their calculation on a permanent basis. Recommendations were formulated to this end which begin with raising the awareness of decision-makers.

The workshop demonstrated the usefulness of a uniform approach in the Mediterranean on EPIs (harmonisation of lists and definitions) which must take place over time.

The Workshop Timetable and the list of participants are supplied as an appendix.

[1] In the premises of the Priority Action Program /regional Activity Centre
[2] of the METAP program.

Part 2 : A Record of the Workshop

1 1 Session n°1 : Opening and Introduction

1.1 1.1 Introduction

After a welcome address to all participants, Mister Alersahdar Bjelica , as a representative of PAP/RAC Director, introduced the Workshop by strongly focusing on the importance of environmental issues for all the countries in the region and the need to fight pollution by all means. Mr. Randic, Director of the Office for sea protection of the Croatian State Directorate for the Protection of nature and the Environment, insisted on the fruitful cooperation with both METAP and the MAP which is stronger years after years ; he also stressed the importance of this subject as indicators are strategic tools for the improved monitoring of environmental issues.

After thanking the representative from Croatia, PAP/RAC and all participants, Aline Comeau, the Scientific Director of Blue Plan, drew a quick overview of the history of the METAP programme and its achievements since 1990. The METAP programme is now in its third phase, and aims through the environmental performance indicators project at developing the capacity to use and devise indicators, alongside a continual sharing of knowledge and expertise.

1.2 1.2 Historical Background and Context

The general context of the project and a presentation of the different parties -Mediterranean Action Plan (MAP)/Blue Plan, and METAP- are set out in the appendix to this record.

As an introduction to the Workshop, Aline Comeau provided a brief historical background to the work on Environmental Performance Indicators to explain where we stand today, and what progress has taken place since 1996. The item set out in the Appendix: "Historical Background" summarises the different phases of this project.

IN 1996 : AGREEMENT ON COMMON CONCEPTUAL FRAMEWORK

This joint activity by METAP and MAP/Blue Plan was initiated through a regional workshop in Damascus in January 1996. This workshop focused mainly on the definition and agreement of a common conceptual framework for indicators ; participants there recognised the usefulness of the Pressure -State - Response framework of OECD. This first workshop was useful for identifying parties' needs and in drawing up a schedule of activity for the coming years.

IN 1997 : IDENTIFYING RELEVANT INDICATORS TO ASSESS PRIORITY ISSUES

As a consequence, a second regional workshop was organised in December 1997 in Beirut to continue the activity of identifying and selecting relevant environmental performance indicators for the monitoring/assessment of the main issues and national policies, and also at local level within project frameworks. This workshop was very productive and came out with a first list of relevant indicators for the follow-up of 4 issues: management of water resources, water demand management, industrial pollution, and solid waste. This workshop was also an opportunity to test the World Bank approach to identifying environmental performance indicators within the framework of technical projects. It was then concluded that the use of EPI at project level should focus on assessing impacts and outcomes of the project.

IN 1998 : SELECTING RELEVANT AND PRIME INDICATORS FOR ASSESSING ENVIRONMENTAL PERFORMANCE FOR A GIVEN ISSUE

The Beirut Workshop recommended deeper study, at sub-regional and national level, using experts in each topic, of the set of indicators in order to agree upon a common set, with a procedure for definition and calculation. This is the goal of the three sub-regional workshops which have been organised from September to date:

- in Rabat, from the 26th to the 28th September 1998 a gathering including Morocco, Tunisia, Algeria, and Lebanon,
- in Cairo, from the 8th to the 10th of November a meeting with Egypt, Syria, Cyprus, and the Palestinian Authority, with a Lebanese observer from the Rabat workshop.
- In Split, from the 26th to the 28th November for Croatia, Slovenia, Albania, and Turkey, with an Egyptian observer from the Cairo workshop.

1.3 Objectives and Workshop Organisation

As a continuation of the work at Beirut, the Workshop aimed at a deeper understanding of the relationship between : issues → indicators and at a better assessment of the conditions necessary for the calculation of such indicators.

It aimed also at a technical debate among experts of a topic. This is the reason why the industrial pollution issue (tackled in Beirut) was split into the various types of industrial pollution (air pollution, solid and liquid wastes).

Consequently, four topics were considered amongst the three METAP III priorities: (1) air pollution ; (2) solid waste (urban and industrial) ; (3) water resources and demand (*quantitative* aspects of water management) ; (4) Water pollution and waste water management (*qualitative* aspects of water management).

The workshop goals were several :

EPI AT NATIONAL LEVEL:

This concerned favouring exchanges on common issues, between managers for the 4 topics coming from various Mediterranean countries, validating the relevance of a set of indicators for the monitoring/assessment of these issues, selecting a small number of them and lastly appraising the conditions for their calculation.

> *Working in small groups was suggested, including specialists in each subject coming from the 4 countries represented.*
>
> *Group discussions followed an approach described later on and were enriched by a questionnaire sent out previously to participants by Blue Plan.*

EPI AT PROJECT LEVEL :

This concerned awakening participants to the uses of EPI in the various stages of project cycles. Focus was put upon measuring environmental impacts and outcomes of projects.

> *This activity formed the subject of a plenary session (cf. session 5).*

CONCEPT AND DEFINITION OF EPI

Furthermore, group work was preceded by a brief reminder about EPIs (in order to make all participants agree on a common vocabulary and conceptual framework, and to re-position the

exercise within the context of current initiatives), and by the account of two concrete experiments on the use of EPIs in the field of air (ATMO index in France) and landfill management (in France).

1.4 Presentation of Participants

The workshop brought together 25 participants : experts from Albania, Croatia, Slovenia and Turkey, an Egyptian expert on water resources who had participated in the Cairo Workshop, and two experts invited from France. Three persons from Blue Plan were facilitating the discussions with the help of Mr Kamel Amer from Egypt and Mr. Hamilton from the World Bank. A detailed list of participants is provided in the Appendix.

Sitting at a round table, participants were asked to present their expectations from the workshop. Most participants insisted on their interest in the work on Environmental Performance Indicators, and their willingness to exchange expertises and to put the use of indicators in everyday management of environmental problems into practice. Reporting on the State of Environment was often mentioned as one type of exercise which uses indicators. Stress should be put on issues neglected up to now such as : waste management and air pollution.

Participants felt that the preparatory questionnaire was useful to think over the issues but it was difficult to fill since data availability is unbalanced depending upon the topic and some definitions should be more precise.

It was also strongly recommended to refer to ongoing work on sustainable development indicators carried out by the Mediterranean Sustainable Development Commission. A recent workshop was held on this issue in june 1998 in Tunis (A copy of the reports was handed over to the participants).

The Slovenian participants expressed their concern on the geographical scope of the workshop : was it meant for implementing national strategies or for comparing countries performance at Mediterranean level ? It was answered that the main long term objective was the *national* environmental policies strentghening but that for practical reasons it was easier to work, exchange and compare experience at sub-regional level, on common issues.

2 Session n°2 : A Reminder about Environmental Performance Indicators (EPI)

2.1 A Reminder about EPI

Aline Comeau (PB) briefly summed up the basic concepts on Environmental Performance Indicators and the OECD reference framework adopted during previous workshops (Damascus 96, and Beirut 97). A focus paper was handed out in the session. The main definitions and functions which the indicators must comply with, in order to be useful for the monitoring/assessment of issues can be restated here.

Definitions and Main Functions of Environmental Indicators

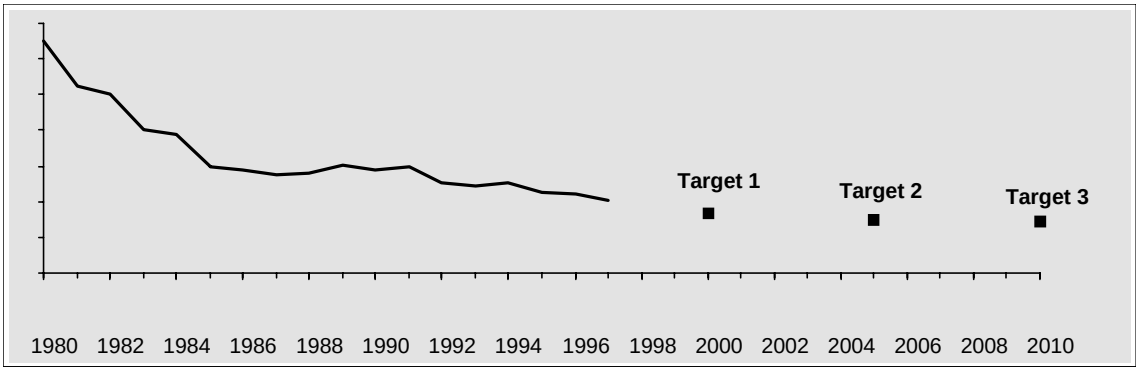
Indicator: A parameter, or a value derived from parameters, which points to, provides information about, describes the state of a phenomenon/environment/area, with a significance extending beyond that directly associated with a parameter value.

Major functions of indicators:

- to assess conditions and trends over time,
- to compare places and situations,
- **to assess conditions and trends in relation to goals and targets**,
- to provide early warning information,
- to anticipate future conditions and trends.

Sources : OCDE ; Gallopin in ICSU-SCOPE, 1997

In the last years, the emphasis in the use of indicators has shifted from *descriptive* indicators useful to show trends in degradation or improvement of a situation to ***performance indicators***, that show not only trends but **distance to a set goal or target.**



Source : OCDE

This target associated with a time schedule may be as specified in policy, or a reference value such as a WHO guideline for safe levels of pollution concentrations in water or air.

The selection criteria for developing and choosing one type of indicator or another, refer to three aspects : policy relevance, analytical soundness and measurability. The major factor for identifying a good indicator is checking that it allows relating the issue to actions taken.

Necessary Properties for Indicators	
Policy Relevance	• Indicators should be easy to interpret, • They should show trends over time, • They should be responsive to changes in the environment and related human activities, • They should refer to a threshold or a reference value against which conditions can be compared (for performance indicators).
Analytical Soundness	• Indicators should be theoretically well founded in technical and scientific terms.
Measurability	• Indicators should be calculated from data that is readily available or made available at a reasonable cost; • Data should be documented and of known quality; • Data and indicators should be updated at regular intervals in accordance with reliable procedures.
Analytical Soundness	• Indicators should be theoretically well founded in technical and scientific terms.
Measurability	• Indicators should be calculated from data that is readily available or made available at a reasonable cost; • Data should be documented and of known quality; • Data and indicators should be updated at regular intervals in accordance with reliable procedures.

Various approaches are used to present in sequence a set of indicators that can assist the analysis and understanding of environmental problems. Choosing a conceptual framework and keeping track of it is more important than the conceptual framework itself.

The conceptual framework that was agreed upon in the previous workshop on the performance assessment program (PPM) is the Pressure State response framework (PSR) of the OECD. It is widely used internationally to classify environmental indicators. In fact, it is simple and effective : it shows the sources of environmental stress (pressure P); the state of the natural resources (state S) and the responses by society to reduce the pressure (responses R) ; this framework is flexible and can be applied to a number of environmental issues.

It was used to classify problems and indicators during the workshop.

Apart from the present workshop that focused on environmental performance indicators (and so related to objectives in environmental policy), it is important to recall the existence of many on-going initiatives in the Mediterranean, especially those concerning sustainable development indicators. These indicators have a wider scope and cover socio-economic aspects in addition to the environmental field. The main current initiatives in the Mediterranean on this subject are described in the Appendix under " Context ".

2.2 Presentation and Examples of EPI Use

For the sake of pragmatism, it was deemed useful to introduce the themed sessions with a description, in plenary session, of two concrete examples of the use of EPIs in France.

2.3 Air Pollution, the ATMO and Ozone Indexes to inform the population

A NETWORK FOR AIR QUALITY

Mr. Géraud, from the Qualitair 06 network (France), first of all described the monitoring system set up gradually in the region of the Alpes Maritimes (history, institutional and technical organisation).

The Qualitair 06 network works 24 hrs a day, thanks to a network of 12 fixed stations[3]. Major pollutants continuously measured by the network are : CO, SO_2, particulates, O_3 and NOx. Ozone is mainly measured in the Mediterranean basin in summer.

Investment costs in this type of network are high : about 500,000 FF for a central position, 50,000 FF/station for the on-line acquisition unit and 80,000 FF in average for each analyser. This does not include the cost of fitting out the premises.

The running costs of a network of this kind (12 stations, and 4 staff) must not be under-estimated: they come to 3 million Francs per annum. These are borne by various sources of funding including a State aid (from special taxation on industrial emissions).

Network efficiency depends on the appropriate *siting of the measuring stations* and *regular calibration of measuring instruments*. The siting choice of a fixed station must, in addition, be based on a deep knowledge of the following criteria: weather conditions, the relief, the movement of air masses, the probable various sources of emission (industry, transport). Analyses of population densities, traffic flows and population types are also necessary.

THE OZONE INDEX AND ATMO INDEX

Two EPIs were presented , used in major French cities: the ATMO index and the O_3 concentration index.

O_3 concentration gives rise to communications made to the public when it exceeds certain thresholds. At 180µg/m3 and only when this value is reached at two fixed stations at least, the population which is most vulnerable to respiratory problems (children, the aged, pregnant women) is invited to stop carrying out sporting activity. At 360µg/m3, traffic is restricted and the whole population is concerned.

O_3 is a good tracer because it reveals the presence of NOx, poorly burned hydrocarbons, VOCM and VOCNM.

In order to meet the demand for information from politicians and the public at large, a simple summary indicator for air quality has been devised by a working group for France. This is the ATMO index, which takes several pollutants into account (O_3, SO_2, NOx, particulates) and weighted according to their level . This indicator can only be any of 10 values between 1 and 10.

[3] Most of them are " base " stations

It is calculated on an hour basis**.** Beyond certain values set for the pollutants included in the index, there can be an obligation , for public local authorities, to inform the population or regulate traffic (See appendix for more details).

This indicator is calculated daily from the maximum value for the average maximum amount of each pollutant and selecting the most restraining pollutant. It is published in the press and is accessible by telephone, Minitel or Internet.

This is a good example of a summary indicator which brings together several parameters, and which facilitates an understanding by the public at large and the comparison of regulatory thresholds.

2.4 Waste Management : Using EPIs to Manage Waste in Landfill

Mr. Duval from a Firm of Consulting Engineers, ICE Ingénierie Conseil Environnement in France, presented management tools for landfill. In sanitary landfill, indicators for local goals can be devised.

The focus of monitoring should be the major pollution sources from a landfill such as lixiviates, bio-gas and harmful side-effects: landscape changes, noise, odours, light waste as plastic bags being blown away, and animals such as birds, insects or rats. Reducing these environmental problems involves implementing certain controls for landfill: a laboratory to analyse waste entering the site, a treatment unit where waste is stabilised with chemical compounds, a cell system to allow waste dumps to be retraced, water-proof membrane installations, a bio-gas and lixiviates collection system etc.....

The efficiency of these controls can be measured using EPIs: the amounts of bio-gas recovered, compacting efficiencies, surface exchanges between waste and the soil and water cycle. Bruno Duval presented three water cycle EPIs :

- effective rainfall: this is the difference between total rainfall and evapo-transpiration. Effective rainfall depends on climate. In France, it is often equal to lixiviate volumes. In any case, effective rainfall is the most significant component of lixiviates.
- amount of waste water. It varies from 0 to 100 l/t.
- ratio of the volume of lixiviates to the volume of effective rainfall. It varies between 0.10 to 0.50. This indicator gives data on landfill management. In sanitary landfill, this ratio will be low, whereas in uncontrolled tipping, it will be very high. The amount of lixiviates can be calculated as follows: it equals the (effective rainfall + waste water amount - amount of variation in water quantity). If the measured amount of lixiviates is different from the calculated lixiviates, it implies there is a risk of lixiviate “release”.

  Other EPIs are used for other types of waste management practices (incineration plants, composting and recycling) but their application is most obvious for sanitary landfill.

  Several questions were raised after the presentation :

- Can we compare the efficiency of incinerator and landfills regarding the treatment of gases, especially for greenhouse gases ? It is difficult to answer directly to this question as these are two very different ways of management but it should be said that incinerator are producing in addition to the greenhouse gases, toxic gases and acid rains ones.

If we do a comparison of impacts of both management strategies, it can summarised as follow :

Landfill	Incineration
lixiviates greenhouse gases	ultimate waste (saline pollution resulting from the treatment of gases) toxic and greenhouses gases

- France declared that in 2002, it will be forbidden to landfill solid wastes. Why and what are the consequence ?
  - It is a hot issue today in France and a very expensive choice. It is linked to the strengthening of EC regulations on gas emissions for incinerators and landfills.
  - In France, industrial wastes are treated in 13 treatment plants (of which 12 are managed by only one company). 58 % of Municipal Waste end up in landfills (only 600 are sanitary landfills out of a total of 6000 landfills).
- What do you do with Hospital Waste ? Is incineration the best choice ?
  - Today, there is a tendency to split hospital wastes in two categories : non-hazardous (90% of the total volume) and hazardous (10% of the total volume) waste. Non-hazardous are sterilised before being disposed of as municipal wastes.

These examples above show the practical usefulness of Performance Indicators, but also the need to carefully define target values or performance criteria in order to measure whether or not there has been progress.

3 Session 2 : Organisation and Working Methodology for the Thematic Groups

After this general restatement of the definition and practical uses of EPIs, the session carried on with a discussion on the organisation of work in thematic groups.
Four work-groups of a dozen people were set up over two half-days[4] (group 1: air pollution; group 2: waste management ; group 3: water demand and resources; group 4: water pollution).
The aim of the work-groups was to select an initial set of Environmental Performance Indicators which best matched the issues of the subject in the Mediterranean and to analyse the terms for their calculation.
The work-groups also had the aim of identifying steps to be taken and requirements for achieving the practical set-up of this series of thematic indicators for raising the awareness of decision-makers or for informing the public.

The pre-workshop questionnaire, drawn up by **Blue Plan**, had the goal of structuring group discussions around the various following stages, for each of the 4 subjects:

1) Exchanges on problems and current strategies (1h)
   - Presentation by one country of its main problems and current national strategy :

Country	**Issue**
Albania	waste
Slovenia	water pollution
Croatia	air
Turkey	water resources and demands

   - Debate on the " common " problems as they arise from various responses on the questionnaires.
2) Discussion on the **relevance** of the proposed set of indicators (30 mins)
   - Does the list cover and describe the problems encountered?
   - Does the list describe strategies/ responses?
   - Suggestions for adding or deleting indicators
3) **Selection** of 5 prime indicators (30 mins)
4) Discussion on the **5 selected indicators** : (1hr)
   - Are the definitions put forward in the questionnaires clear ?
   - Is the data available , over the short, medium or long term ?
5) **Necessary action** for the calculation of these 5 indicators (30 mns)
6) **Conclusions and recommendations** (30 mns) : actions needed to achieve the calculation of these indicators.

In addition to this general methodology, it was proposed by the Mrs Melanija Lesnjak to look at issues for a topic at different levels (international, regional, national, local) and look at the following items " issue-causes-solutions " to select relevant indicators. The results can therefore be clearly presented in this form. An example was presented on the air pollution issue.

[4] See the composition of groups at the start of part 3.

2 4 Sessions 3, 4 and 6 : Thematic Groups

In order to reflect the quality and intensity of debate, detailed records are provided in Part 3 below ; these records include also the main points discussed in the plenary session after each group presentation (session 6).

In groups 3 and 4 the participants insisted on the need for grouping both issues under the general topic of " water management " and the usefulness of considering some prerequisites before choosing EPI, such as :

1. **effective institutions equipped** with relevant management tools including policies, action plans and a proper legal framework as well as monitoring system.
2. **the assurance of the availability of financial resources** which enables the implementation of the above mentioned policies and plans.

The following table summarises the final set of indicators selected as they arose from each group sessions:

SET OF PRIME SELECTED INDICATORS PER THEME :

INDICATOR	PSR Type	N° of the Quest. (*) sheet	Number of values provided in the questionnaire
Air (group1)			
SOx emissions	P	3	41
NOx emissions	P	4	23
Frequency of excess over standards	E	9	33
Expenditures devoted to air pollution abatement	R	14	0
Proportion of Clean Fuels in Total Fuel Consumption		-	0
Solid Waste (group2)			
Municipal Solid Waste Generation	P	1	56
Destination of Collected Municipal Waste	R	4	8
Hazardous Waste Generation	P	8	8
Contaminated area		9	1
Cost Recovery	R	-	0

(*) N° of the sheet : refers to the previous questionnaire (see list in Appendix); for new indicators, a new indicator sheet should be drawn up.

SET OF PRIME SELECTED INDICATORS PER THEME

INDICATOR	PSR Type	N° of the Quest.(*)sheet	Number of values provided in the questionnaire (**)
Water resources and demand (group3)			
Aquifer Over Exploitation Index	P	4	0
On-farm Irrigation Efficiency	P	10	4
Exploitation Index	P	11	4
Drinking Water Demand Efficiency	P	15	7
Cost Recovery Rate	P	-	0
Pollution and Water Quality (group4)			
Water Quality Indicator	E	1	13
Agro-Chemicals Use Indicators	P	2'	7
Drinking Water Supply Compliance Indicators	P	5	1
Waste Water Collection and Treatment Indicator	R	6'	6
Industrial Waste Water Treatment	R	8'	1

(*)N° of the sheet : refers to the previous questionnaire; for new indicators, a new indicator sheet should be drawn up.
(**) present the sum of the number of values provided in the questionnaire from the four countries, but they are not the values themselves.

3 5 Session n°5 : Environmental Performance Indicators in Projects

1.1 5.1 Use of EPIs in Following-up Environmental Projects

Kirk Hamilton (World Bank) presented the methodological framework used by the World Bank for integrating Environmental Performance Indicators in the monitoring/assessment of projects.

Reference was made to the document distributed during the Workshop entitled " Performance Indicators for Projects on : Frameworks and Examples from METAP ", which details the most recent views on this matter, and presents seven sample projects.

Project level indicators can have many use, including : planning, forecasting and early warning during implementation, assessing results, benchmarks, and quality control, ...The most commonly used project indicators concern input, output and risks. These are not our subject here, since the focus is mostly on purely environmental project features. Projects can be varied, dealing with for example : institutional strengthening, water supply and sanitation, management of natural resources, pollution abatement, and waste management.

This wide variety of projects means that no single list of project-level indicators will be universally applicable. There are, however, broad principles that can be applied in indicator development from the early stages of project planning. These principles, combined with a simple framework, comprise the basic tool-kit for project level indicators. These are : relevance, linkage, selectivity, spatial and temporal coverage, practicality and client ownership.

Projects are generally divided into components or sub-projects. The performance of each component can be measured thanks to a specifically tailored set of EPIs. Two major types of indicators are: impact indicators (which relate to stated project goals), and outcome / output indicators (which measure the achievement of specific component objectives).

Examples of ongoing METAP projects were presented to illustrate the use of EPIs in project planning, implementation, assessment and monitoring,...). They showed that EPIs are important components of quality control.

Answering a question concerning the appropriate relative costs of developing indicators within a project, Kirk Hamilton explained that this cost should be included in a project but obviously without being disproportionate, when compared to the total project cost.

There is much concern at the World Bank to improve project monitoring and evaluation systems and EPIs are being used more and more by project managers. EPIs should be drawn up at the design stage, involving the project team (WB and Correspondents).

It was emphasised that most of the indicators selected during the Workshop were also mentioned in the example put forward in the Lebanon by Mr Hamilton (except for the %age for private sector which should be considered specific to this project).

Mr Hamilton also answered a question on whether there already was an existing training course on EPIs, on announcing that the World Bank was soon to publish a commentary on this topic. He will later provide information on existing training courses.

It was concluded that devising indicators is a useful and continuous process which can be applied regardless of scale both nationally and project level.

4 6 Session n°7 : Conclusions and Recommendations

1.1 6.1 Debate on Workshop Achievements and Findings

The last session following the discussion on Group Works reports was devoted to a debate on the main findings and recommendations of the Workshop. It was chaired by Ms Mastrovic.

Mr Kamel Amer (Egypt) introduced the debate with a comparison between the workshop results in Cairo and at Split. In Split, the proportion of female participants was higher than in Cairo.

Despite the fact that at Cairo people were brought together from very different countries (Syria, Egypt, Jordan, Palestine and Cyprus) from the ones represented at Split, it appears that the final selection of issues (and consequently of indicators) was nearly the same : 80 % of the EPIs selected at Split for air pollution had been already selected in Cairo, 70 % of waste management indicators, 40 % of those for water resources and 100 % of those for water pollution !

The main difference is due to the difference in the scarcity of water resources between the Middle East and Balkan sub-regions. In the Balkan Region, water is abundant but pollution is a major issue. In the South, quality problems are made more difficult by water scarcity.

The definitions of the indicators selected were discussed much more in Cairo than in Split.

One main proposal at the Cairo workshop was calculating the selected EPIs and presenting them on the Internet.

The presentation was complemented by a comparison of the 3 sub-regional Workshops made by Aline Comeau. It was pointed out that, despite the differing situations for the 13 participant countries, it has been possible to agree on a limited number of issues and indicators.

NUMBER OF SELECTED EPIS

Number of selected indicators:	In only one Workshop	In only two workshops	In the three workshops	Total selected indicators
Air pollution	3	3	3	9
Solid Waste	3	2	3	8
Water	5	3	2	10
Water pollution	3	1	5	9
Total	14	9	13	36

In the Split Workshop, environmental concerns (eco-system protection, quality aspects) were more apparent.

Concerns about cost recovery have been stressed in all 3 sub-regional Workshops ; it was considered essential to set up significant financial mechanisms to allow for infrastructure sustainability (by reallocating taxes from users to cover operating, investment and maintenance costs).

After this statement, Ms Mastrovic opened discussions to the floor for questions and comments.

Mr. Miran stressed the specificity of air and solid waste issues as compared to water issues: air and waste management are more recent concerns and do not have strategies which are as advanced as in the water sector. Therefore, there is a specific need for technical exchanges on these topics.

Ms. Lesnjak accepted the main conclusion of the three workshops, i.e. that there is some similarity in issues between the Mediterranean countries. But she (and Ms. Demirhan Darvish) emphasised that there is no point in trying to merge all indicators together and that countries may tackle the same issues in very different ways according to their living standards and history ; they can also have other priorities.

Mr. Amer answered by assuring the participants that indicators would not be merged, and that each country will use the indicators in its own way.

Ms. Comeau recalled that the main workshop goals were to strengthen environmental policies, practices and exchanges at sub-regional level on EPIs on common topics. Merging selected indicators has never been planned as a primary objective, but working on a common set appeared to be more practical.

Mr. Potocnik expressed the wish that EPIs play the same role in the future as classic economic indicators, such as GDP. Having a common basis for making environmental comparisons between countries could be very stimulating. The problem which up to now remains unsolved is the full and precise definition of this common set.

Mr. Amer explained that the primary reason for this work session was to bring together people from different countries, and secondly to assist the process of data collection.

Mr. Hamilton assumed that a common set of indicators would encourage countries to adopt comparable data.

Ms. Comeau recalled that the harmonisation of data collection (and therefore comparison) in Europe is made difficult by each country's starting to collect environmental data on its own way from the very beginning. One outcome of this kind of workshop could be to prevent this situation arising in countries which are starting their environmental information systems.

Mr. Celik argued that a few indicators which were not selected remain quite important. The choice of indicators is closely related to the level of living standards.

Ms. Comeau recalled that the selection of indicators was an on-going process and that other indicators can be used in each specific country.

Mrs Globevnik mentioned that during elaboration of the Slovenian national strategy for environment, same difficulties than one encountered in the workshop for selecting and calculating EPI have been faced. That's why this workshop is fruitful for Slovenians especially in the Slovenian perspective of using EPI as communication tools.

Ms. Demirhan Darvish assumed that Turkey will initially use EPIs to improve national environmental capabilities.

Ms. Floqi stressed the difference between EPIs and environmental norms or standards and assured those present that EPIs would help Albania to improve its situation.

Mr. Hamilton stated that significant progress has been made since Damascus meeting: EPIs improved the quantification of environmental issues. The next step should be to implement selected EPIs at national level and at a later stage, to organise a regional workshop for comparing the results of national experiences. METAP and the World Bank may support national efforts, but only on a few pilot countries. Blue Plan again could take charge of co-ordinating this type of project.

Ms. Velkhavrh Pirc expressed the need for more co-ordination between various international bodies engaged in works on indicators. Slovenia, for instance has to meet international commitments with, each one which has its own indicators (Alpine Convention, EEA, CSD, ..). This makes things difficult for the few staff involved to meet all these various requirements.

Ms. Comeau agreed about the need for co-ordination, although each objective should be measured by a specific set of indicators. Sustainable Development evaluation, for instance, can not be based on the same indicators as Environmental Performance Evaluation. Furthermore, there is a general trend for increasing requests for environmental information, for which every country should be prepared and organised. Such a workshop contributes to the harmonisation of definitions and therefore to co-ordination.

Ms. Vallée added a comment on the obvious need of a better coordination at the international/regional level to avoid excessive burdening upon the countries on the indicators issues. But also, the country could serve this purpose by co-ordinating its information system according to its national priorities and issues. This would be the first source of information to answer to these international demands but with a first objective to report on national issues. Along the way additional items and issues in the international scope could be added if relevant to the national context.

Mr. Hamilton stressed the distinct nature of Slovenia where integration into the EU strongly influences environmental requirements and gives additional work to those people who are in charge of the environment. In other countries, problems may be different.

Ms. Lesnjak and Ms. Velkavrh Pirc added that the workshop was a good experience, but that the next step would consist in selecting additional indicators (to those worked out at Tunis in the workshop on Sustainable Development Indicators) and to stop down to national level for calculation. For these activities, Blue Plan would a good co-ordinating body.

Ms. Globevnik asked for harmonisation at regional level for each indicator and for financial support.

1.2 6.2 Recommendations and Follow up Action

In conclusion, Ms. Comeau summarised the main recommendations for follow-up action as they arose from the various discussions, which were adopted by the participants:

AT NATIONAL LEVEL :

- Promoting inter-institutional co-ordination, in order to (1) identify the source of data, (2) agree on the choice of EPIs, (3) organise data collection and (4) calculate and publish EPIs
- Assessing the action required to implement the selected indicators (specific surveys, identifying financial resources...),
- Improving information systems (institutional and technical assistance: air monitoring stations, technical visits .....),
- Assessing data availability,
- Raising awareness (decision makers, national workshops, communicating with the public)

AT REGIONAL LEVEL :

- Reports: on the Internet; giving some feed-back on previous meetings,
- Improving and finalising definitions; Harmonising them
- Exchanges of technical expertise especially on solid waste management and air pollution
- Exchanges on references and targets, different ways of communicating with the public at large
- Improving the regional information system
- Co-ordinating with other international initiatives on indicators (WHO, Mediterranean Commission for Sustainable Development, UN-CSD,. . .
- Devising the next project stage on EPIs (suggestions from various countries are welcome)

Mr. Hamilton invited the participants to complete the questionnaires with the information available for the 20 selected indicators before January 1999, and to send them to Blue Plan in order to finalise reporting on this exercise.

THANKS

Ms. Mastrovic concluded the session by expressing her thanks to all participants, to Blue Plan for organising the workshop, to CAR/PAP for its logistic support and to the outside experts: Mr. Hamilton, Mr. Duval and Mr. Géraud.

Ms. Comeau added her warm thanks to all participants and especially to the Chairmen and Reporters who worked very hard for the success of this workshop. This should be considered as being a step towards the whole process of implementing efficient environmental policies in the Mediterranean.

Part 3 : Detailed Records of the 4 Thematic Groups

The detailed records and findings of the 4 group discussions are shown below.

A summary of the 4 preliminary questionnaire answers (presented by Blue Plan during the group sessions) is provided in the Appendix.

LIST OF PARTICIPANTS IN THE 4 THEMATIC GROUPS

NAME	First Name	Country	Experts in	Group3 Water	Group2 Solid Waste	Group1 Air	Group 4 Water Pollution
REME	Bujar	AL	3	X			X
JANO	Agron	AL	2		*	X	
KODRA	Cheramedin	AL	1	X		X	
FLOQI	Tania	AL	C		X		R
RANDIC	Andrija	HR	C		X	X	
STOJIC	Gordana	HR	3	R			X
POTOCNIK	Vladimir	HR	2		X		X
NECAK	Jasenka	HR	1		X	*	
MASTROVIC	Margita	HR	C	X			X
LEBLICI	Kerrin	TR	3	X			X
CELIK	Hakan	TR	2		R	X	
DEMIRHAN DARVISH	Zeynep	TR	C	*			X
TOKEL	Aynur	TR	1		X	X	
GLOBEJNIK	Lidija	SL	3/C	X			*
VELKAVRH PIRC	Anita	SL	2		X		X
LESNJAK	Melanija	SL	1		X	R	
COMEAU	Aline	PB	C	X			X
MIRAN	Patrice	PB	2		X	X	
VALLEE	Domitille	PB	3	X			X
DUVAL	Bruno	Exp	2		X		X
GERAUD	Michel	Exp	1		X		X

NAME	First Name	Country	Experts in	Group3 Water	Group2 Solid Waste	Group1 Air	Group 4 Water Pollution
HAMILTON	Kirk	WB	C	X		X	
AMER	Kamel	Exp	3	X			X
JURIC		HR	1		X	X	
TOMIC		HR	1		X	X	
Total			25	11	14	11	14

*: introduction to the issue

R: Reporter

1 Summary of Group 1 on Air Pollution

Chairman : Jasenka Neèak (Croatia)
Reporter : Melanija Lešnjak (Slovenia)

1.1 Problems and Issues

NATIONAL PRESENTATION

Ms Neèak presented the current state of air pollution in Croatia and the propositions in the national strategy in that country to decrease air pollution.

The main pollutants released into the atmosphere in Croatia are SO2, NOx, NMVOC, CH4, N2O, NH3. A decrease of these emissions has been observed between 1990 and 1995 due to the war and economic changes. Major emissions sources are : 1) Road transport 2) Combustion for energy production 3) Combustion in manufacturing industry.

O3 is only measured at 2 fixed stations. Smoke, S02 and matter deposits are the most frequently measured parameters. The standards required for some parameters have been exceeded out at Zagreb, Rijeka and Split.

The main goal of the proposed Croatian strategy for air quality management is the achievement of the highest category of air quality (clean air or slightly polluted air) over the entire territory. Setting-up appropriate economic strategies in the energy, transport, agriculture and forestry sectors, improving knowledge about air quality and implementing economic incentive measures are the most significant actions planned in order to reach this objective. Mr. Juriæ stressed the importance on trans-boundary air pollution for Croatia.

COMMON ISSUES

Ms. Lešnjak stated the relevance of appropriate network design and measured parameters as input information for defining a national strategy. She presented examples of O3 measurement data in Slovenia. She proposed discussing the following main issues for the Mediterranean :

COMMON ISSUES

GLOBAL	REGIONAL	LOCAL
• Climate change	• Photochemical pollution	• Urban air pollution
• Ozone layer depletion	• Eutrophication • Acidification • Desertification, Biomass burning • Toxic contamination (POPs,HMs)	

All countries considered urban air pollution to be the highest priority for the public and for government. The major issues were classified according to the following four priorities:

- Priority No. 1: Urban air pollution
- Priority No. 2: Acidification, Eutrophication
- Priority No. 3: Photochemical pollution
- Priority No. 4: Global problems

RELEVANCE

After having defined common problems, participants attempted to establish relations with the proposed indicators. Another criterion used for selecting the five prime indicators was relevance to each country.

RELEVANCE

No.	EPI	Priority Number	Selected by Country
1	GHG Emissions	4	Croatia, Slovenia, Turkey
2	Proportion of arable land located at altitude levels of <5m above sea level	4	-
3	Sulphur oxide emissions	1, 2	Croatia, Slovenia
4	Nitrogen oxide emissions	1, 2, 3	Croatia, Slovenia
5	Distribution of emissions over various economic sectors	deleted	-
6	Work-home distance	1	-
7	Energy intensity: primary energy consumption/Gross Domestic Product (GDP)	1, 2, 4	Albania
8	Consumption of CFC and chlorine bromine derived products	4	-
9	Frequency with which standards are exceeded	1, 3	Slovenia
10	Excessive respiratory disorder due to air pollution	1	Turkey
11	Role of renewable energies in energy balance	1,2,4	Albania, Croatia
12	Role of road transport in total transport availability	1,2,3,4	
13	Air quality measurement networks density	1,2,3	Albania, Croatia, Turkey
14	Expenditures devoted to air pollution abatement	1,2,3	Albania, Slovenia, Turkey
15	Part of clean fuels in total fuel consumption	1,2,3,4	Turkey

Participants considered the "Frequency of excess over norms" indicator to be more advanced than the "Air quality measurement networks density" one despite the latter being selected by three countries and covering three common issues. In order to calculate indicator no.9, the establishment of an advanced air quality network is needed.

1.2 Choice of Five Prime Indicators

INDICATORS

PRESSURE	STATE	RESPONSE
NOx emissions	Frequency of excesses over norms	Expenditure devoted to air pollution abatement
SOx emissions		Part of clean fuels in total fuel consumption

After the selection of those indicators, the definitions put forward in the questionnaire (see Appendix) were discussed :

- **Expenditure devoted to decreasing air pollution**: " investments and operating expenses directly connected to air pollution abatement or control " ; the questionnaire definition was retained but emphasis was put on the difficulty of using this indicator for making comparisons between countries.
- **Frequency of excess over standards**: in order to be useful this indicator should be based upon continuous measurements using automatic sub-urban stations. For the unit of measurement, the number of events exceeding national air quality standards per station has been selected. Ozone has been selected as the reference pollutant. In the case of exceeded standards, the question of the type of disseminated to public information, remained open to further discussion.
- **NOx emissions and SOx emissions**: the definitions of the questionnaire have been approved : "national man-made emissions of:
  - sulphur dioxide (SOx) (in equivalent tonnes of SO_2/annum)
  - nitrogen oxide emissions (NOx) (in equivalent tonnes of NO_2/annum) "
- **Proportion of clean fuels in total fuel consumption:** " clean " fuels should include: natural gas, liquefied petroleum gas and low sulphur fuels. The amount of sulphur content has to be further defined, preferably in accordance with relevant EU directives.

1.3 Calculation

DATA AVAILABILITY

Indicator	Short (today)	Medium (2-5 years)	Long (more than 5 years)
NOx emissions	Croatia, Slovenia, Turkey	Albania	
SOx emissions	Croatia, Slovenia	Turkey	Albania
Frequency of excess over standards	Slovenia	Turkey, Croatia	Albania
Expenditure devoted to decrease air pollution	Slovenia	Turkey, Croatia	Albania
Part of clean fuels in total fuel consumption	Croatia, Turkey	Albania, Slovenia	

1.4 Action Required for Following-up

AT NATIONAL LEVEL

- More co-operation between statistics offices and departments in charge of air pollution.
- Need to implement automatic air quality measurement stations.
- Additional surveys on certain types of emissions (Albania, Turkey).
- Additional work on input data compilation for indicator no. 15 (Slovenia).

AT REGIONAL LEVEL

- Clarification about definitions of low sulphur fuel.
- Technical exchanges: visits to well established monitoring networks /information systems.

1.5 Conclusions and Recommendations

Countries in this region have various levels of capability. However, all countries participating in this workshop expressed the need for closer co-operation at sub-regional level.

Participants made the following recommendations :

- The definition of targets for these indicators,
- Financial support for METAP in order to :
  - implement automatic measurement,
  - upgrade existing monitoring networks,
  - establish a system for disseminating air quality information, and
  - estimate indicator no. 15.
- Technical assistance for some countries in establishing an inventory of emissions (Albania).

1.6 Plenary Session Debate on the Group Work (session 6)

During the plenary session following the Group presentation, Mr. Potocnik asked for the reason why GHG emissions had not been selected as an indicator. Ms. Lesnjak answered that the decrease of GHG emissions can be indirectly monitored through changes in NOx and SOx emissions.

Mr. Potocnik suggested including two major items in the list of selected indicators:

- Proportion of renewable energies in primary energy consumption (%)
- Energy intensity (Primary Energy Consumption measured in tonnes of oil-equivalent /Gross Domestic Product expressed in US $).

He argued they could be included in indicator n° 5.

No conclusion was drawn up.

2 Summary of Group 2 on Solid Waste

Chairman : Bruno Duval (France)
Reporter : Hakan Celik (Turkey)

2.1 Problems and Issues

NATIONAL PRESENTATION

Mr. Agron Jano presented aspects of Albanian solid waste management: the institutional and legislative framework, past and current trends in waste generation in Albania (a strong increase of municipal waste generation, the privatisation of collection and transport and the lack of a drainage and waterproofing system in dumping sites which remain the sole destination for collected municipal waste). The situation is the same for hazardous waste but with smaller quantities. The Albanian waste management strategy includes the following main components: the use of taxation and economic and fiscal incentives, public information and education, training courses for staff, the collection of data for management.

A LIFE project designating sanitary landfills for 6 main cities was also mentioned.

Mr. Hakan Celik gave basic information on the Turkish situation. He stressed the importance of increasing municipal waste generation in relation to population growth and increasing living standards. He detailed the destination of collected municipal waste and the Turkish experience in packaging dumps which is the one of the tools used in Turkey for minimising packaging generation. He ended his statement by illustrating some data on hazardous waste production in Turkey.

COMMON ISSUES

Mr. Miran summarised the following common issues as they arose from the questionnaire:

- The increase of solid waste generation
- Dumping sites remain the main destination of collected waste
- The area covered by contaminated sites resulting from this situation
- Composting and recycling facilities are not very developed
- Except in Turkey, no waste reduction policy at source is implemented
- The set-up of sanitary landfill is planned everywhere
- A lack of financial resources and cost recovery
- Specific treatment for hazardous waste

All countries agreed with these topics but Ms. Velkavrh Pirc put forward an additional problem: the lack of public awareness and participation in waste management.

Mr. Potocnik suggested including non-hazardous industrial and building waste in the agenda for future workshops.

COMMON ISSUES

PRESSURE	STATE	RESPONSE
• Increase of waste generation	• Contaminated areas	• Recycling,composting facilities
• Dumping sites		• Specific treatments for hazardous waste
		• Waste minimisation
		• Cost recovery , budget allocation • Need for Public Awareness

RELEVANCE

The list of indicators proposed in the questionnaire was compared to common issues which have arisen. For each issue all relevant indicators from this list were selected.

INDICATOR RELEVANCE

	Increase in Waste generation	Dumping site	Area Contami-nated	Recycling, composting Facility	Specific treatment for hazardous waste	Waste minimi sation	Cost recovery, budget allocation	Public Awareness
Municipal waste generation	**X**					**X**	**X**	
Composition of Municipal Waste				X		X		
Collection Rate							X	
Destination of Municipal Waste Collected		**X**		**X**	**X**	**X**		
Proportion of Deposit in Packaging Prices	X					X		
Proportion of Controlled landfill Sites		X	X					
Hazardous Waste Production	**X**				**X**		**X**	
Contaminated Area		**X**	**X**		**X**			
Expenditure for Waste treatment					X		X	

	Increase in Waste generation	Dumping site	Area Contami-nated	Recycling, composting Facility	Specific treatment for hazardous waste	Waste minimi sation	Cost recovery, budget allocation	Public Awareness
Volume of waste entering controlled landfill/total volume generated		x	x					
Cost recovery							**x**	**x**
Number of Campaigns Dealing with waste management								x

The most often quoted indicators have been selected (excepting cost recovery which was chosen after a long debate).

2.2 Choice of Five Prime Indicators

INDICATORS

PRESSURE	STATE	RESPONSE
• Municipal waste generation	• Contaminated Area	• Destination of Municipal Waste Collected
• Hazardous Waste Production		• Cost recovery

After the selection of these 5 indicators the definitions put forward in the questionnaire were discussed:

- **Municipal Solid Waste Generation**: " municipal waste generation issuing from households, various institutions such as hospitals and hotels and some scattered sources, on a weight basis, at the point of production (in tonnes/ year/ in habt.) ".

  Mr. Potocnick suggested measuring the weight of materials at point of **delivery** instead of at point of production because of the impossibility of achieving this kind of measurement in Croatia. Albania supported this proposal which was adopted.

  Mr. Potocnick suggested that these indicators be calculated in % of the only population covered by an official collection system. This has also been adopted in other countries.

  The French classification of various kinds of solid waste was adopted. This classification includes : waste originated from parks, gardens, commercial buildings, food markets, sludge sewage, sewage cleaning operations, household and non-hazardous industrial waste. Mrs Tokel insisted on prevising various possibilities of landfills management.

- **Destination of Collected Municipal Waste**: "proportions of various waste destinations: landfills, incineration and recycling (in %) ".

Mr. Potocnick proposed deleting the second paragraph of the definition in the questionnaire and replacing it by the addition of "material and energy recycling, biological treatment. "

Mrs. Velkavrh Pirc added " exported waste " in destinations contained in the indicator to the definition and lastly Mrs. Tokel stressed the importance of mentioning other disposal methods.

- **Hazardous Waste Production:** " the annual production of hazardous waste (industrial, medical,...) according to the definition of the Basle convention (in tonnes/annum) "
- **Contaminated Areas**: " areas contaminated through dangerous waste pollution due to dangerous storage for industrial or related activities (military, for example) or to accidents and for which no rehabilitation programme has been undertaken "

  Mr. Potocnick proposed to add disused municipal solid waste landfills.
- **Cost Recovery**: Has been defined as the proportion of collection and treatment system expenses covered by collection and treatment system users. The unit is a percentage and the geographical level is national or local.

2.3 Calculation

DATA AVAILABILITY

Indicator	Albania	Croatia	Slovenia	Turkey
Municipal Waste Generation	D.A.	D.A..	D.A.	D.A.
Destination of Municipal Waste Collected	D.A	D.A	D.A	D.A
Hazardous Waste Production	D.P.A	D.A	D.A	D.A
Area Contaminated	D.P.A	D.P.A	D.N.A	D.P.A
Cost recovery	D.A	D.P.A	D.P.A	D.A

1.3 D.A: data available ; D.N.A: data not available, D.P.A: data partially available

2.4 Action Required for Following-up

For indicators 1 and 2 (Municipal Waste Generation and Destination of MW) no follow up action is necessary, because they are already calculated in every country.

For the " Hazardous Waste Production Indicator ", an aggregation of local figures is needed in Turkey, and recalculation is on-going in Croatia.

For the " Contaminated Area Indicator ", the introduction of a Geographical Information System and additional geographical surveys are necessary in Slovenia, Croatia and Albania.

For the " Cost Recovery Indicator ", additional economic surveys have to be carried out in Slovenia and Croatia.

2.5 Conclusion and Recommendations

Mrs. Lesnjak proposed preparing data for these five indicators so as to calculate them, and in order to discuss their differences, comparisons and use in the next meeting.

Mrs. Velkavrh Pirc asked for reference values for these indicators. Mr. Miran answered that it was possible to calculate these indicators for Germany or in Scandinavian countries, which could help to assess the performance of those countries present.

2.6 Plenary Session Debate on the Group Work (session 6)

Ms. Mastrovic asked if Croatia and Slovenia had made national presentations. Mr. Celik answered that Croatian and Slovenian representatives took an active part in the discussion but did not make a specific presentation.

3 Summary of Group 3 on Water Resource and Demand Management

Chairman : Margita Mastrovic, Croatia
Reporter : Gordana Stojic, Croatia

3.1 Problems and Issues

NATIONAL PRESENTATION

Ms. Zeynep Demirhan Darvish (Turkey) presented the situation of water resources and the extent of wetlands in Turkey. The detailed description of her presentation has been distributed to participants.

The main issues are the following :

- management options (the need for institutional reforms with a shift to resource management in water basins and for stronger co-ordination between different institutions),
- the need for cost recovery in order to ensure operation and maintenance cost coverage
- the need for improving information systems and raising public awareness

It was also emphasised that agricultural use amounts to more 70% of the total use of water.

COMMON ISSUES

After the presentation, Domitille Vallée set out the main common issues which were highlighted in answers to the questionnaire5 from 3 countries. The debate with national experts from the 4 countries allowed this initial understanding of the situation to be revised and completed.

The Slovenian representative introduced the specific issues in her country which are mainly :

- the need for preserving ecosystems linked to water
- the inadequacy of drinking water supply distribution.

This last point was supported by the Albanian representative who mentioned the high level of leakage in drinking water distribution systems (50 to 70% losses) and focused on the problem of the impact on health.

The Croatian stressed also that water was generally abundant but its spatial and temporal distribution is unequal. Water quality is also temporally limited for drinking purposes. These problems are amplified by seasonal tourist activity in the coastal area and islands.

Discussion commenced on the main causes of degradation in quality of drinking water. The following ideas came out: insufficient management (need for co-ordination, better organisation, and an overall lack of financial resources to cover rehabilitation and O & M costs. For example, in Tirana 150 million $ will be necessary to rehabilitate the water supply system.

Then the following issues summarised below were agreed upon:

[5] See appendix

COMMON ISSUES:

PRESSURE	STATE	RESPONSE
• growth in water demands and discharges from the **industrial,** and **urban sectors ;**especially in summer with **tourism** • **high agricultural water demand** in Turkey	• **local events of water shortages** in coastal and islands areas.	• need **reform** of institutional framework • problem of **mis-management** for water resources and demands especially inter-sectoral management – **lack of optimisation** of allocation of water resources
• increasing withdrawal with events of **over exploitation** of coastal and islands aquifers	• **degradation** of natural resources and **supply** sources in **quality ;** especially in coastal aquifers , with important health impacts.	– **lack of water use efficiency** in the urban and agricultural sectors
• **leakages and misuse** of water especially in the urban sector • **Water works** (dams, diversion etc.) affect natural habitats and river regimes	• change in river regimes and wetlands degradation; **what is really exploitable water resources?** – environmental conservation criteria need to be define in addition to the technico - socio-economic criteria	• **lack of financial means for investments** (including rehabilitation) and **O&M** of water supply and waste water in each sector – reallocation of water benefits (taxes, prices...) to the water sector. – treat water as a socio - economic good – economic pricing of water or at least recovery of costs (for example % of cost recovery for piped water)

RELEVANCE

After an intense discussion on the issues, causes and solutions presented in the table above, we came to an analysis of the most relevant indicators from the 20 stated on the questionnaire list. The result of the discussion is set out below. The indicators which were finally selected are shown in bold face type.

INDICATOR RELEVANCE[6]

PRESSURE	STATE	RESPONSE
• growth in water demands • *n° 6 ; n° 7, n° 8* • *(descriptive indicators)* • *n° 10*	• **local shortages of water** in coastal and islands areas. • *n° 11*	• need **reform** of institutional framework • *important but no indicator available yet* • problem of **mis-management** – **lack of optimisation** of allocation • *it is an aim but difficult to set a limit*
• **over exploitation** • *n° 4* • *(but difficult in karstic aquifers)*	• **degradation quality** ; • *to be discussed in group 4*	– efficiency in allocation among sectors • *n° 7* – efficiency in use in each sectors • *n° 14, n° 15, n° 10*
• **leakages and misuse** • *n° 15* • **Water works** (dams, diversion etc.) • *n° 19, n° 11*	• environmental conservation • *n° 1 and n° 2*	• lack of financial means for investments (including rehabilitation) and O&M • *n° 20 :* • *(% of cost recovery for piped water)*

A new indicator for better monitoring environmental conservation concerns was proposed and discussed (but not selected later): *the number of watersheds where an acceptable " ecological " flow regulation is implemented.*

3.2 Choice of Five Prime Indicators

On the basis of the analysis of relevance, the group tried to reduce the number of indicators to 5 and did succeed as shown below.

PRESSURE	STATE	RESPONSE
• **Preventing over-exploitation of water resources** • *Indicator n° 4 " Aquifer Over-exploitation Index* • *Indicator n° 11 " Exploitation Index "*	• **Assessing status of water system** • *(related to indicator 4 and 11)*	• **Managing demands** • *Indicator n° 10 " Irrigation Efficiency"* • *Indicator n°15 " Economic Efficiency Index for Drinking Water Demand* • *Indicator n° 20 " Cost Recovery for Water Supply "*

[6] Numbers refer to the list of proposed indicators in the questionnaires -see Appendix-

- **Indicator n° 4 " Aquifer Over-exploitation Index"** is defined as the following R*atio = (V1 - (V2 +V3))/V1* where
  - V1 = total water extracted from the aquifer
  - V2 = annual renewable groundwater volume
  - V3 = volume of recharge water

  This indicator was felt to be difficult to calculate in karstic areas. Also, it should be emphasised that this indicator is only relevant in cases of over-exploitation when the volume extracted is higher than the renewable volume.
- **Indicator n° 10 " Irrigation Efficiency"** is defined as the total on-farm efficiency of each type of irrigation (surface , sprinkler, micro) weighted by their respective areas in each country.

  Ratio = (E1 +E2 +E3) / S where :
  - E1 = land irrigated by surface ir. * average efficiency of surface irrigation
  - E2 = land irrigated by sprinkler ir. * average efficiency of sprinkler irrigation
  - E3 = land irrigated by micro ir. * average efficiency of micro irrigation
  - S = total irrigated land in the territory

  Since in Albania, Croatia, and Slovenia, there is no significant irrigation water use, this indicator concerns mostly Turkey.
- **Indicator n° 11 " Exploitation Index** " is defined as the ratio of annual withdrawals of ground and surface water, over exploitable water resources.

  Ratio = V1 / V2 where
  - V1 = total annual withdrawals for all uses
  - V2 = exploitable water resources

  It is important to **carefully define Exploitable water resources.**

  The following criteria should be taken into account :
  - ecological aspects (such as ecologically acceptable flow)
  - technico-economic aspects
  - quality aspects, ...

  This is a general definition and each country should adapt it to its own specific situation and its own criteria.
- **Indicator n° 15 " Economic Efficiency Index for Drinking Water Demand "** is defined as the ratio of piped water paid for, to total piped water.

Ratio = V1 / V2 where
- V1 = volume of piped water paid for
- V2 = total volume of piped water distributed

- **Indicator n° 20 " Cost Recovery for Water Supply "** can be defined as two indices :
  - index 1 = the proportion of operating and maintenance costs that are recovered from users

    ⇒ This index tells whether or not one can maintain the existing distribution system; for future investment one should consider index 2
  - index 2 = the proportion of recovered long term marginal costs of water supplied

    ⇒ This index ensures that one can maintain and expand the system for future needs.

Most of the countries agreed that water would be better managed if it was treated as a socio-economic asset. As a minimum, this implies setting a price equal to the (long term) marginal cost of supply.
Full economic pricing would imply setting a price equal to the willingness to pay on the water consumers' side.

3.3 Calculation

The following table summarises the data availability in the short, medium or long term.

DATA AVAILABILITY

Indicator	Short (today)	Medium (2-5 years)	Long (more than 5 years)
n° 4		AL, HR, SL,	TR
n° 10		TR, (EG witness)	AL, HR, SL not relevant
n° 11		HR, SL	AL, TR
n° 15	AL, HR, SL but more work is needed to gather information	TR	
n° 20			AL, HR, SL, TR

3.4 Action Required for Following-up

The following ideas were proposed by participants.

AT NATIONAL LEVEL

- Setting-up a working group to help the process along
- Co-ordinating institutions that decide the necessary steps (financial, institutional, information sources and availability...)
- Raising the awareness of decision-makers
- Holding national discussions on definitions, methodology, and strategy, and the following subjects should be considered especially: exploitable resources, cost recovery etc.

AT REGIONAL LEVEL

- Exchanging information and expertise using all possible means (the internet, workshops, meetings etc.)
- Sources of funding for working on EPIs

It was proposed to address **conclusions and recommendations** after the work of group 4 on qualitative aspects.

3.5 Plenary Session Debate on the Group Work (session 6)

The results of the group did not raise any particular comments in the plenary session.

5 4 Summary of Group 4 on Water Quality

Chairman : Margita Mastrovic (Croatia)
Reporter : Tania Floqui (Albania)

4.1 Problems and Issues

NATIONAL PRESENTATION

The representative from **Slovenia**, Mrs. Lidija Globevnik, gave a national presentation and provided a detailed description of water pollution, and initiatives for pollution abatement and for monitoring quality problems in Slovenia.

The main issues highlighted were the following :

The major sources of pollution are :

- sewage discharges: out of a population of 2 million people, 31% is connected to a sewage system (collection and treatment); 44% have septic tanks (some with low efficiency) and 25 % of the population is not connected to any system. Treatment is divided as follows: 5% primary; 30 % pre-treatment, 65% secondary. In 1990, 63 % of the total waste water produced (292 mill m3) was untreated. In 1994 , 49 % of 237 mill. m3 of waste water was treated. The estimated efficiency of the waste water treatment plants is 60% to 95%.
- Another important issue is agro-chemical contamination of ground and surface waters, especially from fertilisers and pesticides. Overall, since 1980, there has been a reduction in the use of agro-chemicals per hectare, but groundwater pollution due to past use is still increasing. In 1994, 1% of sampled groundwater contained more than 0 ,1 µg/l of atrazine, but 8 % of sampled groundwater contained more than 0 ,1 µg/l of atrazine in 1995. The concentration of nitrates in groundwater is increasing, but the number of samples which exceed limit values is decreasing.

Slovenia has a very extensive monitoring system for surface waters (100 sampling locations), for groundwater (84 sampling points where 37 parameters are monitored), for springs (in 18 places). To assess the overall quality of the rivers, a classification system is used (with four classes).

COMMENTS FROM THE OTHER COUNTRIES ON THEIR SITUATION

- After the presentation, Domitille Vallée presented the **main common issues of the region** from the answers of the 4 countries to the preparatory questionnaire[7]. this initial understanding of the situation was used as a building block to facilitate the identification of common issues with the national experts from the 4 countries.
- The **Albanian** representative focused comments on the industrial pollution problem in that country.
  - There are very diverse industrial activities and heavily polluting sectors include those which produce heavy metals, chemical industries, steel industries, refineries, leather industries etc. All industrial discharges are released directly into the surface or ground water without any pre-treatment.

[7] See Appendix

  - The total industrial discharge is estimated at 250 million m3 per year, and this contains more than 30 pollutants. The impact of this industrial pollution is particularly visible via the oil contamination of two major rivers where all flora and fauna have been destroyed.
  - Another important issue are health problems connected with the contamination of the water supply network. Water is not available at all times within the network, and there is a permanent risk of water-borne diseases for the population. In 1994, there was a cholera outbreak due to this problem.
  - Eutrophication is also an issue but no data is available on the use of agro-chemicals today.
  - A legislative framework exists but there is no real enforcement as yet.
- In **Croatia,** the main issue is the sewage problem and it is important to refer to pollution prevention rather than focusing only on curative measurement. This implies the following :
  - building and developing public sewage systems in small urban areas and partly in larger ones, and developing secondary treatments especially in protected areas,
  - rehabilitating treatment plants in order to improve efficiency and repairing basic sanitation leaks in protected areas,
  - passing legislation to adjust effluent standards and to define deadlines for constructing waste water treatment plants,
  - constructing pre-treatment plants in older industries to be adapted to existing and new targets and legislation or investment in clean technologies,
  - developing better information systems on water resources and the environment
- In **Turkey**, the major issue is waste water management since population growth is high and tourist and industrial activities increase.
  - There is a lack of waste water treatment, low treatment efficiency in existing plants, and seepage in sewage systems can contaminate groundwater. Also most industries have no treatments at all.
  - There is environmental legislation and discharging permits for industry exist but penalties are still too low.
  - There is a monitoring system for surface water and a classification system is used with 4 classes of quality.

COMMON ISSUES

After this quick overview of national situations, the group summarised the common issues concerning pollution and water quality aspects. The initial analysis presented by D. Vallée was revised and completed, as follows :

COMMON ISSUES

PRESSURE	STATE	RESPONSE
• **domestic waste water** primary source of pollution. • **toxic industrial discharges is** a major concern**,** especially due to lack of pre-treatment • risk of pollution by agro-chemicals • solid and industrial waste disposal drainage and leakage	• **overall degradation** of **quality** of natural resources (river, lakes, wetlands, groundwater) and supply sources **;** serious for groundwater • **degradation of quality in the distribution system** ; lack of compliance with standards ; affect health : waterborne diseases.	• lack of **sewage systems** (**collection and treatment plants)** especially in tourist resorts. • **low efficiency** of sewage treatment ; • lack of **pre - treatment** of industrial plants and development of clean technologies ;
• **For some areas, over-exploitation** leads to salinisation of groundwater	• **degradation of coastal water quality**	• lack of **regulations or standards enforcement** , especially on water resources protection zones, industrial discharges, waste water treatment. • **lack of financial means** for investments and O&M of waste water mgt in each sector (no recovery of costs for it)
• waste water discharges into the **sea**	• **eutrophisation** of water resources and coastal waters	• **lack of monitoring and coordination of information production** among institutions in the environment and water sector. • **low public awareness**

RELEVANCE

On this basis, the most relevant indicators were selected for each issue. They are summarised below :

INDICATOR RELEVANCE[8]

PRESSURE	STATE	RESPONSE
• **domestic** waste water. • *10* • toxic **industrial** discharges • *10* • risk of pollution by **agro**-chemicals • *2 /3* • solid and industrial waste disposal drainage and leachate	• **overall degradation** of **quality** of **natural** resources and supply sources • *1* • **degradation** of quality in the **distribution** system ;. • *5 ; (6) ; 1 ; 4* • degradation of **coastal** water quality	• **lack of sewage systems** (collection and treatment plants) • *6* • **low efficiency** of sewage treatment ; • *7 ; 12* • lack of **pre - treatment** of industrial plants • *8* • lack of **regulations** or of standards **enforcement** • *(5)* • **lack of financial means** for investments and O&M of waste water mgt • *11 ;9*
• **For some areas, over-exploitation** leads to salinization of groundwater	• **eutrophisation** of water resources and coastal waters • *1 ; (3/2)*	• **lack of monitoring and coordination of information production** among institutions in the environment and water sector. • low public Awareness

4.2 Choice of Five Prime Indicators

The choice of the prime indicators focused on those activities which favour pollution abatement (examining treatment and preventative measures) and the assessment of health and environmental degradation in the water system (measurement of impact). All the indicators which were deemed to be only descriptive were not considered further.

It was determined that the following aspects should be taken into account in addition to the set of indicators.

- intersectoral co-ordination among all institutions involved in the production of information
- the enforcement of standards and regulations
- the development of monitoring and financial capabilities
- development stake-holders and public awareness raising

[8] Numbers refer to the list of proposed indicators in the questionnaires -see Appendix-

The following five indicators were finally chosen.

PRESSURE	STATE	RESPONSE
• **Preventing pollution risks** • *Indicator 2' " Agro-chemicals Use "*	• **Assessing conformity for use and overall quality of water system** • *Indicator 1 " Water Quality Indicator "* • *Indicator 5' " Drinking Water Supply Compliance with Quality Standards"*	• **Mitigating pollution risks** • *Indicator 6' " Waste Water Collection and Treatment Index"* • *Indicator 8' " Indicator of Efficiency of Industrial Waste Water Treatment*

- **Indicator 1 "Water Quality Indicator "** "the concentration of a given parameter of surface and groundwater compared with the standards used in the country. "

  It was said that there are two major objectives for the use of this indicator :

  – the first one is stressing the measurement of priority parameters which relate to environmental and health impacts such as : BOD, COD, N, P, Heavy metals. The selection of parameters and related reference values will depend on each the country;

  – the second one is assessing **overall water quality** using a summary Water Quality Index. This requires the definition of a classification system for quality based on a set of parameters. Classification systems exist in all countries represented except Albania.

- **Indicator 2' "The Use of Agro-chemicals"**: which is defined as the " National Consumption of Agro-chemicals per hectare of arable land. "

  – the main Agro-chemicals are : pesticides ; fertilisers N, P,.....

  – Level : national was the one most approved of.

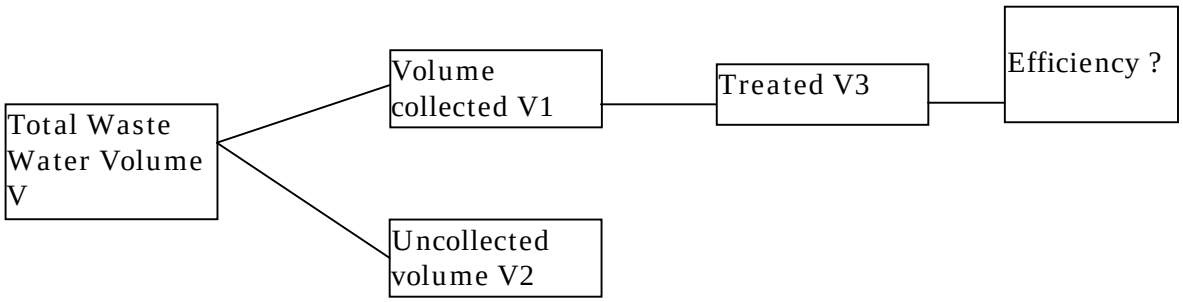
- **Indicator 5' " Drinking Water Supply Compliance with Quality Standards"**

  – definition : the proportion of total samples from drinking water distribution units which do not comply with standards (WHO or national; in %)

  – this indicator can be also defined in order to check the conformity with different standards of bathing waters (river, lake , or sea).

- **Indicator 6' " Waste Water Collection and Treatment Index ":** this is defined as "the total volume of treated urban waste water / total volume of urban waste water discharged. "

  This indicator is the result of multiplying former indicator n° 6 " Population with Access to Basic Sanitation " and n° 7 " Waste Water Treatment Index ". It was felt necessary to clarify the steps taken to arrive at this indicator by using the following diagram:



V = V1 + V2 where

Indicator n° 6 =V1 / V ;

Indicator n° 7 = V3/V1

and the selected indicator n° 6' = V 3 / V= Indicator n° 6* Indicator n° 7

It should be noted that this indicator is a step towards measuring pollution prevention initiatives but it does not include treatment plant efficiency, which could be considered at a later stage.

The total volume of treated waste water should be detailed according to each level of treatment :

- primary
- secondary
- advanced

- **Indicator 8' " Industrial Waste Water Treatment Efficiency "**

  After discussion it appeared that the initial suggestion of comparing treated industrial **volumes** to total industrial waste water **volumes** did not define the **load** of pollutants treated. Therefore, the following definition was adopted :

  - Definition : total industrial pollutant **effluent output** by treatment unit / total pollutant **inflow into** the treatment unit.
  - It measures the pollution removal rate by pre-treatment facilities.
  - Unit : %
  - The pollution is defined here as a quantity of pollution load. Pollutants should encompass : COD, Heavy metals, toxins, according to the type of industry.
  - The volume and composition of industrial waste water varies considerably depending on the industrial sector and even the individual firm concerned (due to the specificity of each process).
  - This applies to each industrial unit and can be aggregated at national level.

1.1 4.3 Calculation

The table below details the views in each country on the time needed for calculating each indicator. The long term nature of this implies that further monitoring systems with additional financial resources will be needed.

DATA AVAILABILITY

Indicators	Short term (today)	Medium term (2 to 5 years)	Long term (more than 5 years)
1	AL, HR, SL, TR		
2'	SL	AL, HR, TR	
5'	AL, SL (drinking waters)	TR (both) SL (bathing waters) HR (both)	AL (bathing waters)
6'		AL, HR, TR, SL	
8'		TR, HR	AL, SL

Indicator 5' can be calculated either for drinking water purposes nor for bathing waters. Data availability for both purposes is then different, as shown above.

4.4 Action Required for Following-up

AT NATIONAL LEVEL

- improving the involvement of different institutions through all possible means (national workshops, incentives, ,..),
- identifying sources of data sets, collecting and harmonising data using a common methodology (especially calibration, ...),
- co-ordinating the institutions involved in water quality and waste water management ; setting-up an inter-institutional working group could favour this co - ordination process. In some countries it was felt that a reorganisation of institutions was also needed,
- improving access to and the dissemination of information to the public and to stakeholders in order to enhance awareness,
- privatising management services and industries could improve environmental capacity and efficiency,

AT REGIONAL LEVEL

- favouring the exchange of information and expertise using all available means,
- training people and organising workshops on specific issues.

4.5 Conclusions and Recommendations

- Now there is a need to agree on a common set of indicators for the whole region ; it would also be interesting to see if common strategic objectives could be agreed upon for all Mediterranean countries since they share a common sea.
- The issues tackled in group 3 and 4 are strongly inter-related and could be gathered together under the general topic of " Water management" .
- In order to work on EPIs, it is essential to strengthen inter sectoral co- ordination
- EPIs appear to be a very useful tool for strengthening this co-ordination as they require team work and are used for environmental reporting.
- It is important to connect this EPI work to other current initiatives such as the WHO work on " indicators for the environment and health " whose results will be discussed at a conference in London in June 1999.

1.2 4.6 Plenary Session Debate on the Group Work (session 6)

The results of the group did not raise any particular comments in the plenary session.

Part 4 : Workshop Evaluation

6 Synthesis

During the last session of the workshop, the participants were kindly requested to complete an evaluation form concerning the workshop.

The main results of this evaluation are summarised below on the basis of 14 fulfilled evaluation forms.

OBJECTIVES : WERE THEY ATTAINED ?

yes	no
14	

WORKSHOP SESSION

Session	Clarity			Utility			Length		
	1	*2*	*3*	*1*	*2*	*3*	*1*	*2*	*3*
session 1	1	3	10	1	2	11		5	8
session 2		3	11		2	12		4	9
session 3		3	11		2	12	1	3	9
session 4		2	12		1	13		3	9
session 5		3	11		2	12		3	10
session 6		2	12		2	12		3	10
session 7		2	10		1	11		4	8

1: low; 2: average; 3: good

For most of the participants, the objectives of the workshop were attained, as they think that indicators are very important as tools for monitoring environmental progress of the Mediterranean countries policies and the choice of the 5 prime indicators shows the importance of having such meetings.

It was also considered as important to know to which environmental problems Mediterranean countries are faced with and which specific or common strategy and policy could be chosen to improve environment. Also, exchanging experiences during the workshop seems to be very useful for some countries.

Participation of experts (Kirk Hamilton, Kamel Amer, M. Géraud et B ; Duval) was appreciated and there was an excellent preparation of material for working. All needed documents were provided in time for the sessions. Good organisation and logistic.

Someone expressed the intention to introduce and implement the PSR model in this future activities.

CLARITY, USEFULNESS AND LENGTH APPRECIATION

Sessions were well structured and balanced in general, with intensive work.

ACTIVITIES THAT CAN BE IMPROVED

Clarify whether or not the objective of defining 5 prime indicators is to make possible comparison between countries for environmental performance.

GAPS

Some participants thought that the objective of the whole activity (from Damascus until now) was not clearly presented.

It has been asked for the establishment of a time schedule for further work (harmonisation and definition of indicators).

SUGGESTIONS

They were very few suggestions, as for several persons it was the first time they were participate in such a kind of workshop. But generally they ask for a follow up of the activity on EPI with other workshops and especially on one regrouping all the Mediterranean countries. This will be fruitful in exchanging information, experience and methodologies and discuss feedback of other similar workshops.

Part 5 : APPENDICES

PART 5 : APPENDICES LIST

Appendix 1 : Agenda

Sub-regional Workshop on « Environmental Performance Indicators»

Split, 26-28 November 1998

MAP - BP-/RAC

Thursday 26/11/98	**Friday 27/11/98**	**Saturday 28/11/98**
9h00 ***S1 - Opening and Introduction*** Welcome and introduction (SDPNE, PAP/RAC,BP) Context, objectives and overall Workshop organisation (MAP/Blue Plan) Round table	***9h*** ***Plenary session : methodology debriefing*** ***9h30*** ***S4 - Thematic groups (2/2)*** Group 1 : Air Pollution / Group 4 : Water pollution	***9h00*** ***S6 - Conclusions of the 4 thematic groups*** Presentation and discussions (15 minutes/group)
10h00 - Coffee break	**10h30 - Coffee break**	**10H30 - Coffee Break**
10h30 ***S2 - Environmental Performance Indicators (EPI)*** 1. Conceptual Frame for EPI 2. Practical examples of EPI: Air : ATMO index Solid waste 3. Working method for thematic groups	***11h00*** ***S4 - Thematic Groups (Follow-up)*** Group 1 : Air Pollution / Group 4 : Water pollution	***11h00*** ***S7 - Conclusions*** Conclusions and recommendations Evaluation
12h00 - Lunch	**13h00 - Lunch**	**13h00 - Lunch**
14h00 ***S3 - Thematic Groups (2/2)*** Group 3 : Water resources / Group 2 : Solid waste	***14h30*** ***S4 - Thematic Groups (Follow-up)*** Group 1 : Air Pollution / Group 4 : Water pollution	
16h00 - Coffee Break	**16h00 - Coffee Break**	
16h30-18h30 ***S3 - Thematic groups (follow-up)*** Group3 : Water resources / Group2 : Solid waste	***16h30-18h00*** ***S5 - Project EPI*** Conceptual frame for Environmental Performance Indicators in projects Examples	

Appendix 2 : List of participants

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Appendix 3 : context of the Programme Performance and Monitoring System (MAP/METAP) on Environmental Performance Indicators

THE MEDITERRANEAN ACTION PLAN AND THE BLUE PLAN

The **Mediterranean Action Plan** (MAP) has been active since 1975 in formulating and adopting a series of legally binding agreements. With its Regional Activity Centres, including the Blue Plan, it recommends measures through which individual Mediterranean countries can address resource degradation and pollution.

After the Earth Summit in 1992, significant efforts have been made to integrate Sustainable Development concerns in the Mediterranean region:

- a Mediterranean Environment and Development *Observatoire* was initiated by the Blue Plan with the European Union's assistance in 1993;
- an Agenda MED 21 was prepared in 1994, with an important involvement of the civil society;
- sustainable development principles were taken into account in the amended Barcelona Convention and Phase II of MAP was endorsed in 1995, at the time of MAP's twentieth anniversary;
- the related Protocoles were also renewed especially that related to land-based sources while new Protocols were signed concerning protected areas and biological diversity as well as hazardous waste;
- the Mediterranean Commission for Sustainable Development (MCSD) was established in 1996.

Within this context, **indicators** are considered as important tools for decision making, and constitute a major component of the *Observatoire*, the Agenda MED 21 and the Commission (MCSD). Once the launching phase of the *Observatoire* (1993-1996) was completed, the Contracting Parties to the Barcelona Convention requested the Blue Plan to replace the work initiated on environmental indicators within the frame of Sustainable Development Indicators in the Mediterranean region. Later on, this subject was also considered as a priority concern for the MCSD.

Since the work on indicators requires "downstream" and "upstream" complementary activities, the Blue Plan has strengthened co-operation with Eurostat on environmental statistics, with the European Environment Agency on indicators for State-of-the-environment reporting, with OECD and the French Institute for Environment on indicators framework and presentation aspects, and finally with METAP on "Environmental Performance Indicators".

METAP III

METAP is a cooperation programme among the four partner organisations, the European Commission, the European Investment Bank, the United Nations Development Programme, and the World Bank. METAP was created in 1990 as a partnership between donors and 13

countries on the southern and eastern rims of the Mediterranean. The program is part of the broader process of collaboration and co-operation taking place in the region with the Mediterranean Action Plan (MAP), and, globally, the Blue Plan was precursor to the EPM (Environmental Program for the Mediterranean). These previous initiatives had stressed that the Mediterranean's natural resource degradation and pollution problems are regional in scope.

Since 1990, METAP has contributed in bringing together the southern and eastern countries of the Mediterranean to better address those common environmental problems. During the first two phases of the program (1990-1995), METAP provided assistance to the Mediterranean countries for carrying out pre-investment activities for priority environmental projects, formulating sound policies, and building the necessary institutional capacity to implement them. Funds were mobilised to support nearly 100 technical assistance activities which have helped the developing countries of the region initiate environmental action.

The **third phase of the program** (1996-2000) was officially launched in April 1997. METAP III incorporates a country driven approach to developing and managing the METAP portfolio of individual country activities and of regional initiatives.
METAP III technical and financial assistance focuses on three **priority areas** of environmental management in the region:

- integrated water and coastal resources management,
- addressing emerging pollution problems at "hot spots",
- capacity building and participation.

The portfolio proposition for each country emphasises in-country strengthening capacity to identify and prepare investments in those priority areas.

Gradually, METAP functions are being transferred to the region. A Regional Facility has been established at Cairo, consisting of a Project Preparation Unit (PPU) and a Capacity Building Unit (CBU), together with the UNDP Regional Bureau for Capacity Building (RBCP). These units comprise international and regional staff and provide continuing support in policy formulation, project preparation, institutional building, and regional co-operation.

In designing METAP III, attention was directed towards ensuring the **complementarity of the program's activities** with other important and inter-related initiatives taking place in the Mediterranean region, especially with MAP and the preparation of National Environmental Action Plans.

- METAP complements MAP through its capacity building activities in coastal zone management, pollution control, and the formulation of monitoring and performance indicators.
- National Environmental Action Plans (NEAPs) have been completed or are under preparation in nearly every developing country of the Mediterranean. These initial plans constitute the first systematic framework for reviewing and establishing environmental priorities. Together with Sustainable Development Strategies, they are central to the development process. Their periodic evaluation and revision must also take place in order to incorporate changing priorities and needs as new problems arise. Moreover, most countries have numerous sectoral and local plans that are generally not put together in the context of a sustainable development strategy.

METAP III focuses on programs that co-ordinate and build on existing NEAPs and sustainable development strategies so that priority policies are defined, options for resource

requirements and mobilisation are provided, and performance indicators are developed and monitored.

A Program Performance Monitoring system has been incorporated into METAP's implementation phase to help countries monitor progress in achieving their environmental objectives for which they already have made national and international commitments.

THE COOPERATION MAP - METAP : THE PROGRAM PERFORMANCE MONITORING SYSTEM

The performance monitoring system is based on four premises:

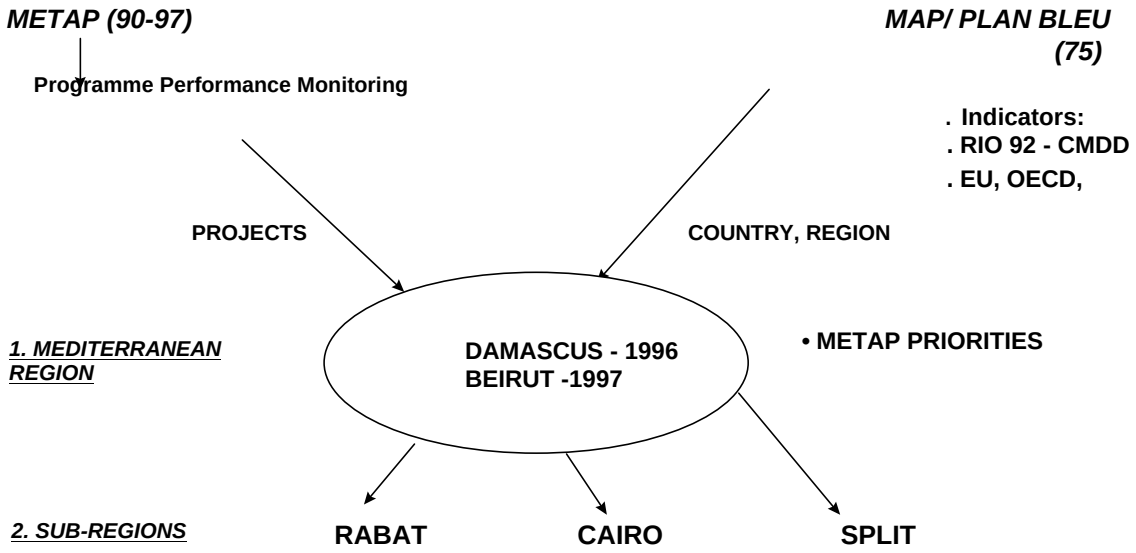
- performance monitoring is not a conditionality for METAP financing; rather, it is a gauge of each country's progress;
- participation in the performance monitoring system will be tailored and paced according to country-specific conditions and resources;
- the proposed system is largely based on existing resources, institutions, and other performance monitoring activities;
- the process will yield capacity building and information systems benefits from a collaborative, interactive, and regional approach.

Environmental and programme performance monitoring is therefore a specific field of co-operation between the Blue Plan, on behalf of the Mediterranean Action Plan, and METAP.

With the exception of Jordan and Palestine, **MAP** and **METAP** work with and for the same countries, mostly the same national agencies and often the same persons. Moreover, they usually concentrate their efforts on similar problems and projects. Therefore, for the sake of synergy, in order to avoid or reduce duplication, and to come out with more and better added-value, METAP and MAP have decided to co-operate on this important question of Environmental Performance Indicators that will obviously benefit from other indicator activities within METAP partners, as well as within the Mediterranean Action Plan, especially the *Observatoire* and the MCSD.

In addition to providing information on environmental targets and progress achieved, the **objective** of this regional initiative is to provide the incentives, impetus and resources for countries to ultimately build and own an efficient monitoring system, in particular the emerging network of national environmental *observatoires*, that would support both their national and regional environmental management systems.

Appendix 4 : History of the Programme Performance and Monitoring System :



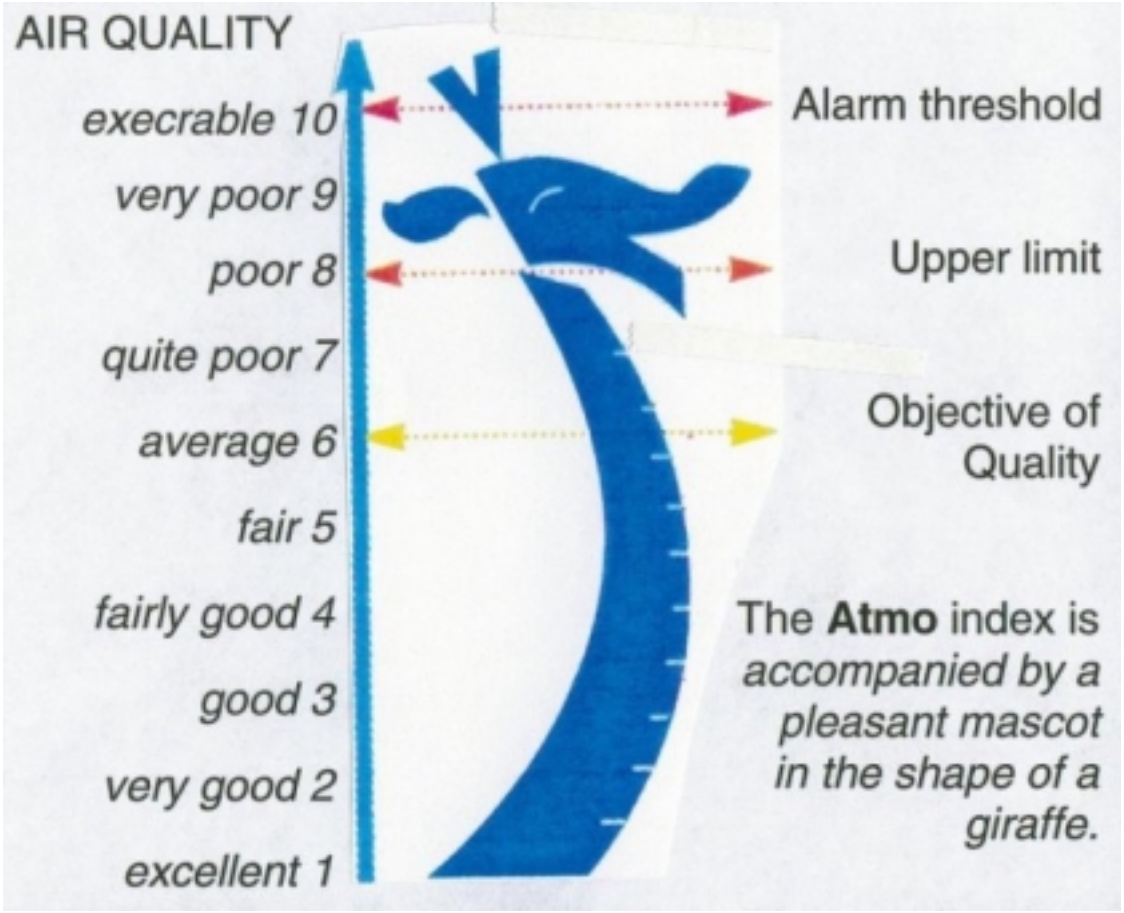
Appendix 5 : ATMO Index for air quality monitoring

INFORMATION ON AIR QUALITY IN FRANCE

Today, the population's demands for information on air quality is becoming ever stronger. Air quality monitoring bodies ensure the distribution of the aggregated results of their measurements by means of newspapers, local television and radios stations, the publishing of regular bulletins or via a minitel service. The Ministry of the Environment and the ADEME are responsible for the distribution of national summaries.

The Atmo index, daily information on the quality of air in your conurbation.

Calculated every day by members of the **Atmo** team, the **Atmo** index allows overall air quality in a conurbation to be identified along a scale from 1 to 10. It is built up from four sub-indices on the following indicators: Sulphur Dioxide (SO_2) Nitrous Oxide (NO_2), Ozone (O_3) and particulates. The **Atmo** index is the highest of these 4 sub-indices.



A National Database on Air Quality

The National Database on Air Quality (B.D.Q.A.) managed by ADEME, brings together all the measurements collected by the **Atmo** network. This data allows the creation of national summaries on air quality, which will soon be available on minitel *3614 Envir* and Internet *www.environnement.gouv.fr.*

Information in the Case of Peak Pollution

In addition to the regular summaries on air quality, the law on air and rational energy use of the 30th December 1996 requires public information whenever high concentrations, called alarm thresholds, are exceeded.

When one or more alarm thresholds are exceeded, the Préfet shall put in action a protection plan by degrees in accordance with the concentrations of pollutants reached.

This plan usually includes three levels. The data, supplied to the population by the Préfet or by the air quality monitoring body and relayed by the media include in particular information about the concentrations observed and their forecast changes, areas particularly implicated and appropriate advice to persons at risk (for example limiting physical exertion).

The authorities shall make know to the public the measures chosen to improve the situation; closure of certain industrial facilities, restrictions to car traffic, making public transport free of charge,...

Appendix 6 : List of Proposed Indicators in the Questionnaires

The list of indicators proposed in the questionnaires as starting point for group discussion is reminded below :

CHAPTER 1 : AIR INDICATORS

Indicators	PSR Type	Sheet N°
GHG Emissions	P	1
Proportion of arable land located at altitude levels of < 5m above sea level	S	2
Sulphur oxide emissions	P	3
Nitrous oxide emissions	P	4
Distribution of emissions over various economic sectors	P	5
Work-home distance	P	6
Energy intensity : Primary energy consumption/Gross Domestic Product (GDP)	P	7
Consumption of CFC and chlorine bromine derived products	P	8
Frequency of excesses over norms	S	9
Excessive respiratory disorders due to air pollution	S	10
Role of renewable energies in energy balance	R	11
Role of road transport in total transport availability	R	12
Density of quality measurement network	R	13
Expenditures devoted to air pollution abatement	R	14

CHAPTER 2 : WASTE INDICATORS

Indicators	PSR Type	Sheet N°
Municipal solid waste production	P	1
Composition of municipal waste production	P	2
Collection rate of municipal waste	R	3
Destination of collected municipal waste	R	4
Proportion of deposits in packaging prices	R	5
Proportion of sanitary landfill	R	6
Existence of national regulations on waste management	R	7
Hazardous waste production	P	8
Area covered by contaminated sites	E	9
Expenditure on waste treatment	R	10

CHAPTER 3 : WATER RESOURCES INDICATORS

Indicators	PSR Type	Sheet N°
Exploitable water resources per capita	S	1
Wetland areas/ total area	S	2
Dam silting indicator	S	3
Aquifer over-exploitation index		4
Density of hydrological measurement networks	R	5
Per capita water demand	P	6
Water demand per sector of use	P	7
Domestic consumption of water per capita	P	8
Agricultural water demand per irrigated hectare and per crop type	P	
Industrial water demand per sector	P	
Irrigated arable land	P	9
Share of water demand per sector	R	
Irrigation efficiency	R	10
Exploitation index = Withdrawals of ground and surface water / total available freshwater	P	11
Fresh Water final consumption index = Final consumptive use / total available	P	12
Index of depletion of dam sites	R	13
Index of diversification of water provisioning sources (reuse, desalinisation, imports)	R	14
Economic efficiency index for drinking water demand = Volume of drinking water invoiced / volume of drinking water produced	R	15
Regulations to limit withdrawals from natural ressources	R	
Existence of economic tools to recover the water cost in the various sectors (price and/or charges)	R	

CHAPTER 4 : WATER POLLUTION INDICATORS

Indicators	PSR Type	Sheet N°
Water quality: Biochemical oxygen demand in water bodies	S	1
Use of agricultural pesticides	P	2
Use of fertilisers per hectare	P	3
Drinking water distribution rate	R	4
Index of distributed water conformity to quality standards	S	5
Population with access to basic sanitation	R	6
Wastewater treatment index	R	7
Industrial wastewater treatment	R	8
Expenditure on water resource protection	R	9

Appendix 7: Synthesis of questionnaire answers

The present annex summarises the main answers to the preliminary questionnaires sent before the workshop. This summary was distributed and presented by the Blue Plan during the groups sessions in order to enrich discussion. It does not include the comments and changes introduced during the session (for this, see Part 3).

1. Analysis of Answers to the « Air Pollution » Questionnaire

Four countries answered our questionnaire : Turkey, Croatia, Albania and Slovenia.

1.1 Outlook

Air pollution is considered as actual problem by the 4 countries. They already established air quality monitoring systems. They calculated their Green House Gases (GHG) emissions, except Turkey.

In all the countries, fixed monitoring stations networks have been set up. These networks are focused on sulphur dioxide and particulate matter measurements. For GHG emissions Turkey and Croatia use IPCC/OECD guidelines which is very useful for comparisons.

Pollutants emitted by countries are very similar to the ones emitted by the Northern Mediterranean countries but at minor levels and with a greater importance for sulphur compounds .The most emitting sectors are transports and energy (especially domestic heating which use lignite or other high sulfur content fuel). Waste is also a great contributor.

In GHG emissions, CO2 is quantitatively the most important gas.

1.2 Impacts

Respiratory disorders represent the first quoted impact. All the countries mentioned it as a main point. Unfortunately, only few data is available. None of the countries provided information related to the indicator n° 10 : Excessive Respiratory Disorders due to air pollution.

None of the countries produced the requested geographical information concerning global warming impacts (i.e proportion of arable lands at altitudes of < 5 meters above sea level). It does not appear as fundamental issue for them.

1.3 Responses

For GHG emissions, no abatement policy was presented.(except for Croatia and Slovenia which just quoted a quantified target). It is understandable because of the low contribution of these countries.

For local emissions, Turkey, Croatia and Albania concentrate their efforts on industry. For air pollution due to traffic, use of clean fuel appears as the first response. No quantified target is quoted at the exception of Croatia which as member of the United Nations Framework Convention on Climate Change is bound to « freeze » or reduce its CO2 emissions in reference to 1990.

1.4 Indicators

Indicators	Type	Form. N°	CR priority	AL priority	TK priority	SL priority	Total priority	CR value	AL value	TK value	SL value	Value	Final selection Rabat	Final selection Cairo	Final selection Split	Total
GHG Emissions	P	1				0	0	5	18	48	24	95	1	1		2
Sulphur oxide emissions	P	3				1	1	5	18	0	18	41	1	1	1	3
Nitrous oxide emissions	P	4				1	1	5	0	0	18	23	1	1	1	3
Energy intensity : primary energy consumption/Gross Domestic Product (GDP)	P	7				1	1	0	3	0	18	21		1		1
Frequency with which standards are exceeded	S	9				1	1	25	0	0	8	33	1		1	2
Excessive respiratory disorders due to air pollution	S	10				0	0	0	0	0	0	0	1	1		2
Role of renewable energies in energy balance	R	11				0	0	0	18	0	18	36	1			1
Expenditures devoted to air pollution abatement	R	14				0	0	0	0	0	0	0			1	1
Part of clean fuels in the total fuel consumption								0					1	1	1	3
Emission des MPS included in N°3																
Total													7	6	5	18

2. Analysis of Answers to the « Solid and Hazardous Waste » Questionnaire

Four countries answered our questionnaire :Slovenia, Croatia , Turkey and Albania.

2.1 Outlook

Blue Plan outlook of the sub-regional situation of waste management is globally shared except informal economy the importance of which has not been mentioned (except Turkey for its southern and eastern parts).

Technical resources needed by improvement of landfill management have not been quoted. Turkey and Croatia provided national figures and desegregated data at town level. No data for Albania.

Authorities responsible for collection and treatment are municipalities in the framework established by national bodies (departments of environment and local government).

Desagregation of some indicators has been required (as for instance the hazardous waste production between hospital, industry and sludge).

2.2 Waste Production and Treatment

HAZARDOUS WASTE

Hazardous waste production has been provided by Croatia and Slovenia while in Turkey sources of production are identified. No data is available for Albania.

MUNICIPAL SOLID WASTE (MSW)

In Turkey the MSW generation level is quite high (for instance, around 1,3 kg/per capita/day in Ankara in 1995) and has increased very quickly (for instance in Ankara it raised from 880 g/per capita/day in 1991 to 1300 in 1996).

In Croatia trends are the same ones (0,105 Tonnes/y/per capita in 1970 to 0,203 Tonnes/y/per capita in 1990) but this indicator dropped between 1990 and 1995 because of the events.

In Slovenia the MSW generation is comparable to EU standards : 1,2 kg/per capita/year.

No data is available for Albania.

The organic part is not very important in Turkey (not more than 22,5 % in large settlements in 1991).

In Croatia, only local figures have been provided and no data is provided for Albania

Collection is rather usual in urban area but remains at relatively low levels in rural areas (76 % of the population is included in regular collection of municipal waste in Slovenia.63 % in Croatia in 1995 , but 71% in the Croatian coastal region while the collection rate is 86 % in Rijeka). No data is provided for Turkey and Albania.

Dumping sites remain the main destination of collected wastes in all these countries (around 85 % in Croatia and 88 % in Slovenia, 100 % in Albania, no data for Turkey). But in Croatia, 5 % of

collected MSW are already recycled and 5 % of dumping sites became sanitary landfills. In Slovenia, 12 % of collected MSW are recycled.

2.3 Responses

None of these countries mentioned waste source reduction policy.

Incineration of hazardous waste is developed for hospital waste but for MSW, it is considered as too expensive, except in Slovenia where a first incinerator with a capacity of 200000 tonnes/year will be operational by the year 2000 or 2001(for a 850000 tonnes yearly national generation).

In the four countries establishment of sanitary landfills is planned.

2.4 Indicators

Indicators	Type	Form. N°	CR priority	AL priority	TK priority	SL priority	Total priority	CR value	AL value	TK value	SL value	Value	Final selection Rabat	Final selection Cairo	Final selection Split	Total
Municipal solid waste production	P	1				1	1	36	0	14	6	56	1	1	1	3
Composition of municipal waste production	P	2				0	0	3	0	1	4	8	1			1
Collection rate of municipal waste	R	3				0	0	5	0	0	4	9	1	1		2
Destination of collected municipal waste	R	4				1	1	6	1	0	1	8		1	1	2
Hazardous waste production	P	8				1	1	6	0	1	1	8	1	1	1	3
Area covered by contaminated sites	E	9				1	1	1	0	0	0	1			1	1
Volume treated in discharges/total volume produced						0	0	0	0	0	0	0	1			1
Recovery rate of collection and treatment cost						0	0	0	0	0	0	0	1	1	1	3
Total							0						6	5	5	16

3. Synthesis of Questionnaires on Group 3. Water Resources

This summary prepared the 23/11/98 is based on the answers received from Croatia, Albania, and Slovenia. There is a need of additional work on the indicators sheets as the they were only analysed by the Croatian expert and partly by the Slovenian expert

3.1 Outlook

The main points of the overlook prepared by blue plan are shared by the countries. It has been stressed that situations differ greatly between this sub-region and the two others « Maghreb and Machrek » as water is **relatively abundant** is the Balkan/Turkey sub-region and irrigation is not as developed except in Turkey.

However, **severe scarcity** does occur in some coastal areas and on the islands (Croatia, Slovenia) especially in drought events. **Tourism** increases pressure over coastal resources.

The major issues highlighted by the countries are :

- On the supply side :
  - the **development and maintenance of drinking water supply system** in the country and on the islands together with the development of supply sources.
  - The **protection of natural resources especially the quality** which requires the setting of protecting areas around supply sources not yet in place. In Albania, supply sources are degraded in quality by discharges from industrial and urban areas. Saline intrusion in coastal aquifers also occurs with local over-exploitation practices.
- On the demand side
  - **Leakages** in the distribution network system lead to excess demands and is linked to a lack of maintenance. In Albania, the current system is considered **outdated**.
  - There is a need for improved monitoring of resource and demands for a better control of demands.
  - In Albania, local conflicts occur between the agriculture and urban sectors.

3.2 Impacts

From the questionnaire answers, the following ideas can be highlighted.

Water is abundant in the region but long term water resources management requires a clear **assessment of water currently available**, taking into account the socio-economical and environmental constraints and management criteria..

In order to achieve water demand management, the key challenge for the Mediterranean is to **finalise and implement the institutional reforms of the water sector** and strengthen water authorities capacities together with real financial means for their stability especially in the drinking water sector. Furthermore, it is necessary to enhance public awareness and create incentives for local partnerships.

These major issues for water management could be summarised in the PSR framework as followed.

MAJOR ISSUES

PRESSURE	STATE	RESPONSE
• growth in water demands and discharges from the industrial and urban sectors	• local events of water shortages in coastal and islands areas.	• priority put on development of supply first with further mobilisation
• increasing withdrawal with events of over exploitation of aquifers	• overall degradation of natural resources and supply sources **quality ;** especially in coastal aquifers	• lack of measures to control both allocation and withdrawal • lack of monitoring of withdrawal and demands
• misuse of water especially in the urban sector	• **what is really exploitable ?**	• lack of measures to improve water use efficiency in the urban sectors • lack of financial means for O&M of water supply and waste water mgt in each sector (recovery of costs)

3.3 Responses

MANAGEMENT PRIORITIES

The first priority is the provision of safe drinking water to the population. The second one is the development and allocation of water resources.

INSTITUTIONAL AND SOCIO ECONOMIC ASPECTS

- institutions

Many government bodies share the responsibilities or are involved in water management process ; 10 institutions in Croatia with a central body the « Croatian Water Authority », in Albania 11 institutions with a central body the National Water council in charge of setting rules, standards and regulations for water management.

Drinking water is often managed by local authorities which often contract it out to public water supplying utilities in Croatia.

- legislation

Such dispersion of competence makes more imperative the need for an adequate legislative framework for water which would promote the objectives of national policies on the rational use of resources and environmental protection (see Table).

MAIN EXISTING LEGISLATIVE TOOLS

		Water legislation enabling		
Country	**Framework law**	***The monitoring of water withdrawals***	***The control of demands for the different sectors of use***	***The pollution control***
Slovenia	Water Law ,1981			environmental protection act, 1995
Croatia	Water Act ,1995	same law regulation on record keeping of withdrawn and conveyed water, 96	Law on financing water management activities, 95 Regulation on assignments of concessions on waters, 96, Regulations on drinking water property	National water pollution control master plan
Albania	Water Resources Law n° 8093, 1996	Law for regulating water supply and removal sector, n° 8102, 1996 Law on water tariff	Water supply and sanitation Regulation de 1996	law on environment protection , revision N° 8364 , 1998 On sate sanitory inspectorate law n° 7642, 1992
Turkey	Environment Act, 1983			Regulation on water pollution control , 1988

- economic aspects

It seems difficult to estimate the weight of water in the national economy (spending for water resources and demand management in the two countries at all levels : state, local authorities, enterprise, users). No data was provided in this table.

Financial tools do exist in the countries to cover the costs common to supply and sewage treatment.. They are usually estimated from the metered volumes of water. In Croatia, the tariff system for drinking water varies according to the users (households aver 0.6 $/m³ ; industry aver. : 0.9 $ / m³) ; it covers the cost of drinking water production, taxes and depreciation and sewerage.

TECHNICAL ASPECTS

- planning

In Croatia, there is no specific master plan for water resources. A Spatial Planning Strategy was accepted by the parliament (June 1997). It includes water management aspects as planned by the Croatian Waters. One of the **quantified objective** cited is that at the end of 2000, around 81% of the population get access to public water distribution system.

In Albania, there is a national water strategy which defined the main orientations of the water policy. It aims at improving responsibilities definition, planning of catchment management, information production, discharge control and infrastructure investments. A strong focus is on rehabilitation of distribution networks.

- monitoring

In Croatia, there is a well developed monitoring system for surface water flow. There is a new program for groundwater but it is not yet implemented. Water producers and self-supplied users have to measures withdrawals and conveyed water. Therefore data are available on these aspects.

In Albania, the monitoring system of surface and groundwater in quantity and quality is under the responsibility of the IHM (Institute of Hydrometeorology). It measures groundwater levels, variability in water yields, and evolution of chemical contents.

3.4 Prime Indicators

RELEVANCE

The major policy objectives that come out of the previous summary are :

- satisfaction of water supply requirements
- develop supply sources with resources development and keep water production cost at their lowest.
- control water demands in the different sectors and especially urban sector

Constraints for assessment appear to be :

- The availability of data could delay measurement of some indicators (HR). Croatia water departments are setting a systematic and regular data collection.
- The institutional capacity to act upon water resources or demands, and lead integrated management.

Most of the indicators are considered relevant to assess progress towards these objectives. The rating is very varied depending on the country. Croatia has stressed upon all the indicators of water demands control but not in the irrigation sector In the table thereafter appear only the maximum relevance to assess the problem(4. Very good).

The expert agreed generally with the definition proposed in the questionnaire.

PRIORITY AND COMMENTS, CALCULATION

Thereafter are cited the following indicators that were cited as prime ones by t least two countries :

- **Exploitable water resources per capita** : HR commented this indicator stating that exploitable resources should be defined according to the quality and that the relevant level was the catchment area ; the indicator was calculated with the theoritical volume of water resources.
- **Exploitation index** : this indicator was proposed by HR , but it was given only a relevance 3 not 4 in the previous table. It shows in Croatia that there is no quantity problem as the indicator is lower than 2% but there could be a quality problem.
- **Demand per sector of use** : HR it is difficult to discriminate the industries from the communal, tourist and administration users as there is no separate data collection.
- **Consumption of water per capita** : HR stated that this indicator is useful to see how far we are from the targets set in the country for water distribution. This indicator stating that it should be completed by the indicator on conformity with standard proposed in group 4. In Croatia, the recommended values for projects are : 250 l/day in urban areas and 200 l/day in rural areas, 400l/day per tourist in hotel, and 120l/day per tourist in camping.
- **Economic efficiency index for drinking water demand** : HR : it is proposed to review the definition and state that « if losses and leakages are reduced, withdrawal of freshwater from the natural environment are also less ». In reference value is set : maximum accepted losses 25%.

LIST OF INDICATORS FOR PROBLEM AND PERFORMANCE MONITORING

Indicators	RELEVANCE	PSR[9] Type	Sheet N°	Calculation
• **Water resource and ecosystem conservation**				
Exploitable water resources per capita,	HR,SI	S	1	HR
Wetland areas (including RAMSAR sites)/ total area		S	2	HR
Dam silting indicator		S	3	no
Aquifer over-exploitation index			4	no
Density of hydrological measurement networks		R	5	HR
• **Demand control**				
Per capita water demand	HR, SI	P	6	HR
Water demand per sector of use	HR, SI	P	7	HR
Domestic consumption of water per capita	HR, SI	P	8	HR
Agricultural water demand per irrigated hectare and per crop type		P		
Industrial water demand per sector		P		
Irrigated arable land		P	9	
Share of water demand per sector (agriculture, leisure, industry) covered by waste water		R		
Irrigation efficiency per type of irrigation: surface, sprinkler, micro		R	10	no
Exploitation index = Withdrawals of ground and surface water / total available freshwater	SI	P	11	HR
Water final consumption index = Final consumptive use / total available		P	12	no
• **Management framework for water availability and demand**				
Index of depletion of dam sites		R	13	no
Index of diversification of water provisioning sources (reuse, desalinisation, imports)		R	14	no
Economic efficiency index for drinking water demand = Volume of drinking water invoiced / volume of drinking water produced	HR, SI	R	**15**	
Regulations to limit withdrawals from natural resources	HR	R		
Existence of economic tools to recover the water cost in the various sectors (price and/or charges	HR	R		

COMMENTS ON THE DIFFICULTIES ENCOUNTERED IN FILLING THE QUESTIONNAIRE :

HR : difficult but useful as it provides a good overview of the number of issues to tackle when looking at water management. For the moment, as data are not available, it is difficult to calculate the indicators but this should be overcome in the medium term.

[9] [9] P: Pressure ; S: State ; R: Response

4. Synthesis of Questionnaires on Water Pollution

This synthesis prepared the 25/11/98 is based on the answers received from Albania, Croatia, Turkey and Slovenia. Unfortunately, the only complete answer especially on indicator evaluation was from the Croatian expert.

4.1 Outlook

The experts agree on the general assessment proposed in the preparatory document but insisted on the great diversity among countries. It was also said that water quality is part of the water management of a whole and its chemical, physical and biological aspects should be considered as an indicator of water resources management (group3).

- the major sources of pollution are the urban waste waters often untreated. The problem is greater in coastal areas with an important seasonal effect from tourism. The existing treatment plants are often ineffective due to the lack of maintenance.
- the second major concern is the industrial pollution and mining effluents. In Albania, most of the industries are not equipped with pre-treatment facilities and discharge directly into the environment. .There is no inventory of industrial pollution yet in most of the countries. In Slovenia, pollution from industries has decreased due to the reduced economic activity.
- the agricultural non point pollution is not a problem for the moment, but agro-chemical use is expected to rise in Albania. Aquaculture is considered a source of sea pollution in Slovenia.

4.2 Impacts

In most of the countries the waste water treatment capacities are well inadequate and under sized. In rural areas, there are often no sewers systems (Turkey). Measures are taken in the countries to prevent pollution, rehabilitate existing systems and develop needed sewers but it requires important financial means.

There is a need of institutional strengthening to have an efficient inspection system, regulations and standards enforcement and development of monitoring means.

Two major impacts of these pollution sources can be observed : on health, and on the water resources itself.

ON HEALTH

Mismanagement of waste water and the low level of collection and treatment lead to risks for the population. No data is yet available on water diseases.

Waste water is reused for irrigation but it is often not treated. Contamination of soils and crops is another important health issue.

ON WATER RESOURCES, ESPECIALLY GROUNDWATER

According to the Slovenian situation, the most important pollution indicators are considered to be Oxygen content, chemical oxygen demand, biological oxygen demand, phenols, nitrogen compounds, detergents, formaldehyde and mineral oil.

Waste waters are discharged directly into the rivers or the sea. Problems of groundwater and coastal waters contamination arise as well as eutrophication events especially in summer. The effect of industrial pollution on groundwater in Albania is expected to be serious but it is not monitored.

SUMMARY OF THE MAJOR ISSUES

PRESSURE	STATE	RESPONSE
• **domestic waste waters** primary source of pollution. • **toxic industrial discharges** also a concern **,** especially due to lack of pre-treatment • limited agricultural pollution • waste water discharges into the **sea** • **over-exploitation** lead to salinization of groundwater	• overall degradation of natural resources and supply sources **quality ;** serious for groundwater • degradation of quality in the distribution system ; lack of compliance with standards • degradation of coastal water quality • eutrophisation of water in dams and coastal waters	• lack of **sewage systems** and **waste water treatment plants** in urban areas, especially in small centres and touristic resorts. • lack of **pre - treatment** of industrial plants • lack of **regulations** or **enforcement** especially on water resources protection zones, and waste water treatment. • **lack of financial means** for O&M of waste water mgt in each sector (no recovery of costs for it) • lack of measures to **reduce pollution** at source (clean technologies for industries) • Lack of **exchange of information** related to environment and water resources

4.3 Responses

INSTITUTIONS IN CHARGE

Quality aspects of water resources are under the supervision of various public bodies : the environment administration, the water administration and health body and a number of research institutions. There is therefore scattered information and action means.

MONITORING AND INFORMATION SYSTEMS

In Croatia, Slovenia and Turkey, there is regular monitoring of surface and ground water quality as well waste water collection and treatment systems.

In Slovenia, a classification system is used to synthetise information on water quality for surface waters : first class : good ; second class : need pre-purification before use ; third class : polluted with degradable compounds ; fourth class can not be used for any direct use. Such a system is not used for groundwater.

Data are collected by licensed Laboratories and Croatian Waters. The quality parameters monitored are : physico-chemicals and microbiological parameters.

Data are generally available but often scattered in different administrations depending of the subject.

MANAGEMENT PRIORITIES

Top priorities to be regularly monitored are the following :

- compliance with quality standards for water use and efficient inspection system ; prevention of health risk and pollution hazards (indicator 6,7 ;8)
- long term protection of water resources and aquatic systems ; therefore preventing quality degradation of the natural water resources (Indicator 1, 2,3)

PLANIFICATION

- In Albania, a national strategy for water was prepared in 1995 and strategic measures are proposed especially to improve the regulatory framework and institutional capacity especially for monitoring :
  - For example, setting of environmental permitting system, establishment of groundwater protection zones., setting of receiving body quality standards
  - updating of water quality baseline information.
- In Croatia and in Slovenia, there is so far no master plan for sewerage and waste water treatment. For Croatia, it is part of the Spatial Planning Strategy (accepted by parliament in 1997) and annual programmes of the Croatian Waters. There is no planning for waste water reuse.
- In most of the countries, the polluter-pays principle has been introduced in the legislation. In Turkey, a number of polluting firms committed themselves to voluntary agreements for pollution reduction.

LEGISLATION

Situation are very diverse depending on the country. In Croatia and Albania, there are various major laws available : the most important is the Law on water that regulates water pollution protection. In Slovenia, the framework law on water is under preparation (for 1999).

In Croatia, Turkey and Slovenia, exist specific regulation on water classification defining quality classes.

In most of the countries, discharge regulation are in agreements with the EC quality directive.

ECONOMIC ELEMENTS

It is difficult to get an overview of the spending in this sector. But it is estimated to be very high.
For the moment there is no specific systems of cost recovery for waste water management. In Slovenia, a regulation introducing a waste water tax was introduced in 1995. The tax is either applied to the volume of waste water discharged or in the absence of proper measurement, to the water supplied.

IMMEDIATE PROJECTS AND QUANTIFIED OBJECTIVES

In most of the countries, major efforts is put on developing a sewage treatment scheme with all the technical, economical, institutional, educational set up. In Croatia, focus is put on new waste water treatment plants. In Slovenia, it is estimated that 105 million US$ is needed for waste water and water resources remediation and protection measures.

In Albania, there is also a focus on rehabilitation of the drinking water supply system.

4.4 Prime Indicators

RELEVANCE

- The only complete answer on relevance of indicators was provided by Croatia and Slovenia. This part will be completed during the workshop.
- All the indicators are considered relevant.
  - Stress is put on **drinking water availability**, its **quality** and **prevention of pollution** especially the condition of the sewerage system.
  - It is also felt that **agro-chemical use** in agriculture are to be monitored (Slovenia

One of the major difficulty for the calculation of these indicators is the access to relevant data sets and definition problems. For example, it is also difficult to measure industrial impacts as some of the industries withdraw directly groundwater and technologies used are not public. Therefor it is easier to measure quality than quantity of water used.

LIST OF INDICATORS FOR PROBLEM AND PERFORMANCE MONITORING

Indicators	Relevance 3 HR -4SL	Type PSR[10]	Form N°	Calcul (HR)	Choice in Rabat 1and Cairo 2
Water quality: Biochemical oxygen demand in water bodies	SL	S	1	possible, maps	1/2
Use of agricultural pesticides		P	2	yes	1/2
Use of fertilisers per hectare		P	3	yes	1/2
Drinking water distribution rate	HR, SL	R	4	yes	1
Index of distributed water conformity to quality standards	HR, SL	S	5	partial	1/2
Population with access to basic sanitation	HR, SL	R	6	yes regional	
Wastewater treatment index	HR, SL	R	7	yes regional	1/2
Industrial wastewater treatment	SL	R	8	yes national	1/2
Expenditures on water resource protection	HR	R	9	no	
Pollution flows (DBO, DCO,)					1
Recovery rate of water treatment and protection					1
Collective treatment efficiency					1

REMARKS ON INDICATORS

SL : For all indicators, the relevant level would be the **catchment area.** For the drinking water, the city is also a good level.

Indicator 1 : SL : this indicator is relevant but the geographical level and measuring point should be defined. The catchment area is the right level. HR : this indicator is not really relevant in coastal areas as often below maximum level set by regulations. Other parameters should be monitored : agro-chemicals contamination.

Indicator 2 and 3: SL important but difficult to evaluate and would be more relevant if they consider the diversity of agricultural practices, crops, soils, leaching etc. Perhaps easier to measure resulting quantity in water and soils.

Indicator 4 : SL : very relevant but also proposed efficiency and rate of use (per person, per industrial sector etc).

Indicator 5 : HR : Index of distributed water conformity to quality standard . The definition should be revised as follow : number of tests not in conformity for each parameter and each water source used for drinking water purpose. SL : should be coupled with water classification system and usage standards.

[10] [10] P: Pressure ; S: State ; R: Response

Indicator 7 : HR, SL: This indicator does not address the efficiency of the treatment. It is proposed to add a de-pollution indicator depending on parameter (BOD, SS, COD). SL : the problem is the state of the sewerage system.
Indicator 8 : HR : Industrial waste water treatment ; it is necessary to define what an industrial plant is (city industries as dairy, or refineries,...). There is a need to establish national, local industrial waste water discharges. SL : hard to get statistics.

CALCULATION

Time limitation in the preparation of the questionnaire lead to incomplete answers from the countries, except from Croatia. But it has been proposed to complete the work after the seminar.

Thereafter is presented a summary table on the number of data available from the country answers to the questionnaire.

DATA AVAILABILITY

Indicators	Sheet N°	total priority	HR value	AL value	TK value	SL value
• Water quality: Biochemical oxygen demand in water bodies	1		1			
• Use of agricultural pesticides	2	1	3			
• Use of fertilisers per hectare	3	1	1			
• Drinking water distribution rate	4	1	5			
• Index of distributed water conformity to quality standards	5	1	1			
• Population with access to basic sanitation	6	2	3			
• Wastewater treatment index	7	2	6			
• Industrial wastewater treatment	8	2	1			
• Expenditures on water resource protection	9		0			
• Pollution flows (DBO, DCO,)						
• Recovery rate of water treatment and protection						
• Collective treatment efficiency						

COMMENTS ON THE DIFFICULTIES ENCOUNTERED IN FILLING THE QUESTIONNAIRE

SL :difficult as require to cover subjects which are under the responsibility of diverse institutional bodies : some deal with monitoring, some with statistical data collection, other with supply management, other with waste water treatment. Therefore there is a need of more Time, Evaluation, Opinions from specialists. There should be no division between group 3 and 4 as it should be all under the Water Topic.

There is a need for additional identification of indicators, discussion on difficulties, availability of information.

HR : The preparatory work was felt useful to increase awareness and exchange with relevant organisation especially on data availability. Another important topic should be tackled : problems of waste water treatment into the sea an to define adequate treatment.