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FINAL REPORT

Workshop on
"The Analysis of the Industrial Component in the Coastal Areas of the Adriatic Sea"

Split, Croatia
23-25 March 2000

organized by

ICS-UNIDO

in collaboration with the

ITALIAN MINISTRY OF FOREIGN AFFAIRS

the

CENTRAL EUROPEAN INITIATIVE

and the

UNITED NATIONS ENVIRONMENT PROGRAMME
MEDITERRANEAN ACTION PLAN
PRIORITY ACTIONS PROGRAMME
REGIONAL ACTIVITY CENTRE

BACKGROUND INFORMATION

1. ICS-UNIDO is carrying out a programme dealing with the sustainable industrial development of coastal areas. This programme foresees to foster the creation of a network of Mediterranean institutions and specialists dealing with this theme. The programme would facilitate Mediterranean developing countries to design and implement a pollution reduction programme giving priorities to cleaner production but also including pollution control and waste management. The programme endeavours to identify synergies with other international and national initiatives related to sustainable development in the Mediterranean areas and, to this end, a close co-operation has been already established with the Mediterranean Action Plan (MAP) of UNEP.

2. Priority Actions Programme Regional Activity Centre (PAP/RAC) of UNEP/MAP carries out several priority actions in the entire Mediterranean with the participation of all Mediterranean countries, as well as of relevant UN agencies and numerous international organisations and highly renowned experts. It is an action-oriented organisation aimed at carrying out practical activities, which are expected to yield immediate results contributing to the protection and enhancement of the Mediterranean environment, and to the strengthening of national and local capacities for integrated coastal zone management. Principal activity of PAP over the past ten years has been Integrated Coastal and Marine Areas Management (ICAM) within which a clear methodological approach has been defined, and a large number of plans, projects and studies prepared.

3. Under the ICS Subprogramme 2.2 on Coastal Zone Management, and following the recommendations of the Workshop on Monitoring Technologies for Industrial Pollution in the Mediterranean Coastal Areas held in Trieste, Italy, from 8 to 10 June 1998, ICS decided to organise the Workshop: "The Analysis of the Industrial Component in the Coastal Areas of the Adriatic Sea" in collaboration with the PAP/RAC. The aim of the Workshop was to discuss the role of ICS within this initiative and to contribute in co-ordinating the initiative in the context of the Mediterranean Action Plan. The Italian Ministry of Foreign Affairs and the Central European Initiative co-financed the organization of the Workshop that was convened in the premises of PAP/RAC in Split, Croatia on 23-25 March 2000.

JUSTIFICATION FOR THE WORKSHOP

4. Industrial development requires knowledge-based management of natural resources and the environment. The Adriatic Sea is one of the most studied seas of the Mediterranean. According to MAP reports, pollution might include heavy metals, dissolved organics, nuclear traces and other pollutants in a very wide spectrum. The origin of pollution is not clear in many cases because the inventory of the industries and of their technological level along the coastal areas is very difficult to achieve. Field observations and other direct measurements of the coastal areas have to be integrated with the results of proper interpretations of remotely sensed data. However, for a set of different reasons, a comprehensive information system that could be used by decision-makers for planning sustainable industrial development is still lacking. Also there is a lack of co-ordination among different initiatives, and especially as far as industrial development is concerned. It is envisaged that this

collaboration will be extended to future related activities in co-ordination with the Working Group on Industry and Sustainable Development of the Mediterranean Commission for Sustainable Development (MCSD). The development of an integrated information system for sustainable coastal development will be a necessary step towards re-assessing national industrial plans with the aim of reducing the spread of industrial plant location, and meeting the urgent need to develop programmes for cleaner production, monitoring industrial development and pollution, as well as towards assessing the industrial risk of already established industrial areas.

5. Industry is one of the most important economic activities, indispensable for the economic growth and development. On the other hand, industry takes a huge part of responsibility for the state of the environment and future sustainable development. Several Adriatic countries are experiencing similar economic problems. The slowdown process of industrial activity is causing extremely high unemployment and numerous economic and social problems but also, recently, it has caused the reduction of industrial pollution. Improvement of the environment should be seen only as a temporary situation because for several Adriatic countries currently in transition, industry will play a significant role in their further development. Keeping in mind that Adriatic is a rather small, enclosed sea, with limited assimilative capacity, industrial development indispensably needs to be planned and managed in an integrated manner.

PARTICIPATION

6. The Workshop was attended by 26 participants, from Italy, Slovenia, Croatia, Bosnia and Herzegovina, and Albania, as well as from several international organisations active in planning and managing industrial development in the Adriatic area (UNEP-MAP, SES/PEM-UNIDO, ICS, PAP/RAC, CP/RAC, MEDPOL, CEI). Although invited the representative from Greece was unable to attend the Workshop. The complete list of participants is attached as Annex I.

OPENING OF THE WORKSHOP

7. Mr. I. Trumbić, Director of the PAP-RAC, welcomed the participants. He emphasised different initiatives in this region, including those by EU, CEI, Stability Pact and others. Mr. Trumbić stressed that Adriatic is a stable region, which will surely prosper in the future in spite of the current political and economic problems. Although presently there is a significant slowdown of the industrial activity in the Adriatic region, industry will surely play a significant role in its further development. He pointed out the importance of the globalisation process and its impacts on the future development of the Eastern Adriatic countries. He raised hopes that the workshop would produce good results and wished the participants fruitful work and a pleasant stay in Split.

8. Mr. E. Feoli, Scientific Consultant of ICS-UNIDO, Italy, greeted the participants on behalf of ICS-UNIDO. He reminded the participants of sensitive nature of coastal areas, and of different conflicts occurring among economic activities. He pointed out that in order to harmonise industrial development with economic activities we must be deeply acquainted with the system of planning and management. The contribution of ICS in this field could be the development of an integrated information system to

re-assess national industrial plans. He expressed his regrets that certain invited representatives of the industry had not come. They should understand that the protection of the environment is our common issue. He emphasised that ICS wanted to spend the funds dedicated to industrial development in a fruitful way, so he wished the participants fruitful work.

9. Mr. I. Šimunović, President of the City Council, welcomed the participants in the name of the Major of Split. He pointed out that the City Council was very proud of the work of the PAP/RAC. He stressed that the Strategy of Economic Development of Croatia was in a preparation phase. It should determine which technology to use and where to locate it along the coast. He also wished the participants good work and a pleasant stay in Split.

ADOPTION OF THE AGENDA

10. Mr. I. Trumbić presented the proposed agenda of the meeting. The agenda was adopted as presented in Annex II.

OBJECTIVES OF THE WORKSHOP

11. Mr. E. Feoli presented the objectives of the Workshop. The major objective of the Workshop is to help defining the role of ICS and other actors in the sub-region in the transfer of technology with the aim of enabling the countries of the Adriatic Sea to apply techniques for:

- identifying optimal sites for the development of new industrial areas;
- evaluating the technological level of production systems and developing programmes for cleaner production;
- developing networks suitable for monitoring the state of the environment, to assess risks and, eventually, to plan for mitigation, remedial, and recovery actions in case of disasters.

Mr. Feoli also presented the Aide-Memoire, which was prepared in advance to the Workshop.

EXPECTED OUTPUTS

12. Mr. E. Feoli informed the participants that the expected outputs of the Workshop were the following:

- Review of national and international projects concerning the monitoring of industrial development in coastal areas of the Adriatic region;
- Review of case studies related to the application of the technological framework of the decision domain;
- Identification of common activities, goals and priorities, within the co-operation with the Mediterranean Action Plan, for monitoring industrial development and industrial pollution, and, for planning of future related activities;
- Recommendations for future activities; and
- Proposals for the immediate follow-up.

PRESENTATIONS AT THE WORKSHOP

13. The list of the presentations given by the participants is contained in Annex III.

14. Mr. I. Trumbić talked about the importance of industry for the economic development. He emphasised the advantages of the coastal area, which attract industry, among other economic activities. The Strategic Action Programme for the Mediterranean (SAP MED) was presented. Under this programme, priority pollution hot spots and sensitive areas in the Mediterranean were identified in 1997. Their contributions have been briefly presented. There are a number of organisations in the sub-region responding to the pollution problems. Mr. Trumbić concentrated more on PAP/RAC's work in this area. It consists of different initiatives, projects and programmes carried out during the last two decades, as well as of the different tools and techniques. Mr. Trumbić emphasised the importance of Integrated Coastal Area Management (ICAM) which could be defined as an adaptive process of resource management for sustainable development in coastal areas. The socio-economic situation in the Adriatic countries was then briefly presented, characterised by the slowdown of industrial activity and the consequent improvement of the state of the environment. He stressed that in a balanced regional development strategy industry would retain a strong presence in the coastal areas. Therefore, it should be planned and managed in an effective and integrated way. He concluded by stressing that the present slowdown in industrial activity and the consequent reduction of industrial pollution was a momentary phenomenon. New forms of employment, however, will have to be found. The new industry will have to incorporate new environmental standards, and planning for it will have to avoid environmental conflicts with other uses in coastal areas.

15. Mr. A. Iacomelli, representing MEDPOL, began with a brief presentation of the industry in the Italian coastal area, with the special emphasis on refineries. He stressed that the answer to the global problem must be through local actions. Then he elaborated on the SAP MED programme. He presented the SAP MED general targets by the year 2025 regarding the sewage treatment and disposal, urban solid waste, and industrial development. He pointed out the general targets for industrial development as follows: by the year 2025, point source discharges and air emissions from industrial installations to be in conformity with the LBS Protocol and other provisions; over a period of 10 years to reduce, by 50%, discharges, emissions and accidental losses of substances that are toxic, persistent and liable to bioaccumulate, and the substances from industrial installations in hot-spots. He presented the targets for the TPBs –POPs, for nutrients and suspended solids from agriculture and in industrial wastewater, hazardous wastes, air pollution and capacity building. Then he described the regional and national actions regarding the above mentioned issues. Finally, he presented the SAP activities for the biennium 2000-2001, and raised hopes that the participants would identify concrete actions by the end of the Workshop.

16. Mr. G. Cicognani, Central European Initiative (CEI-ES) expert for science and technology, stressed the importance of Regional Co-operation in the Central Europe and, in particular, among the countries of the Adriatic Basin. He pointed out the role of Italy within the Central European (CEI) and the Adriatic-Ionic Initiatives. Mr. Cicognagni presented the policy of the development of the Adriatic countries:

programmatic priorities and implementation approach (sustainable use of the "territorial resources" and major role of the SMEs, including Service Centres development and Technological Transfer related programmes). He described the "Technological Foresight" approach as the best medium-term tool for identifying the proper national development strategies in terms of opportunities, priorities and objectives. The importance of a short-term pragmatic approach was described through fostering the Adriatic co-operation along a few selected lines of a clear common interest: sustainable agriculture development, environment-friendly technologies identification for a proper use of the Adriatic Sea resources (including agro and cultural tourism), improvement of informatics, telecommunication and technological networks, and transport infrastructure development. He reminded the participants that the identification of projects was of regional interest for further development of proposals eligible for financial support by international donors, and then gave a brief description of selected activities promoted by CEI, as well as those foreseen by all, in co-operation with universities, research centres and international organisations.

17. Mr. V. Macià, Director of CP/RAC of UNEP-MAP, reminded the participants of the necessity for a cleaner technology and waste minimisation. He pointed out that cleaner technology for the North European countries is not the same as for the countries of the Mediterranean. However, it should be seen as a competitiveness tool, rather than an added cost, as it was generally seen in the past. Then he listed all the advantages of the cleaner technology over the end-of-pipe measures. However, these two approaches are complementary and compatible. Incentives to pollution prevention can be economic, legislative/administrative, technical and organisational/corporative. Finally, he elaborated the model of Cleaner Production within an enterprise. He divided the process in several phases. After taking the decision, the company should establish the objectives, identify the internal and external teams, identify and quantify measures and diagnoses. For this phase the CP Centre developed a diagnosis tool called "Minimisation Opportunities Environmental Diagnosis". The next step involves the search of pollution prevention alternatives, like internal recycling, products and processes redesign by applying good practices, new technologies, and changes in raw materials. External recycling and valuation are held as secondary options. Further phases are technical and economic feasibility, implementation, and finally evaluation.

18. Mr. G. Guerrieri, of the Italian Ministry of Environment, talked about industrial activities in the Italian part of the Adriatic coast. He emphasised that for a complete survey of the industrial impact all industrial activities carried out in all river basins draining into the Adriatic Sea should be taken into consideration. He described the present legislation system of Italy. At present, it is converting towards its conformity with EU Commission. This process has some operational difficulties, but these should be overcome in the near future. He illustrated the permit issuing system in Italy, and described the best available techniques for cleaner production. Then, he presented different sectors of activities, their energy and water demand, and environmental impacts they are generating. Emergent issues in the seven Adriatic Regions were presented, with particular attention to the different certificates obtained, and to the actions that have to be carried out in a new approach in favour of the environment of the Adriatic coastal strip. Although the collected information is not homogeneous, it appears that satisfactory standards and environmental performances have been reached owing to the recent legislation. In the near future

the crucial problems will be the substantial reduction of waste production, and the recovery of the polluted sites. There is a clear need for industrial renovation, dislocation or reorganisation planning. He concluded by stressing the importance of the seawater and the fresh water for the 21st century.

19. Mr. N. Malbaša, Director of Ekonerg Holding in Zagreb, presented the risk identification of industrial activities along the coast of Croatia. He started by a brief presentation of the Croatian coastal region and its industrial facilities. He described the decline, stagnation, and regression in almost all fields of industry and tourism and the resulting improvement of the environment. He analysed the industry in physical planning documents and environmental protection legislation. He reminded the participants of the accidents related to industrial activities that occurred in the last twenty years. An overview of potentially hazardous substances was given with the special regard to individual industrial activities. He pointed out that the most of the existing industrial plants in Croatia had been constructed ten or more years ago, so that their emissions and risks are probably higher than in modern facilities. On the other hand, there are relatively few facilities the environmental impact of, which could be significant at the regional level. Therefore, environmental impact is not dramatic under any parameters. Many improvements can be done with small funds, like better organisation, training of key personnel, better public relations and communication with mass media, standardisation of methods and procedures, use of up-to-date methods in preventive protection from industrial hazards, and others. However, if possible consequences are not noticed in advance and prevented, problems are likely to arise due to future greater pressure on this area. He concluded by stressing that professionals should fight for professional and scientific approach to problems and acceptance of their analyses and evaluations by the Government and local authorities, as well as by the general public.

20. On the second day of the Workshop Mr. L. Chabason, Co-ordinator of the Mediterranean Action Plan, opened the session and greeted all the participants. He presented the Mediterranean Commission for the Sustainable Development, stressing that Commission and MAP were supporting regional co-operation and activities towards sustainable development. In that context he focused on the industrial activity in the Adriatic region. Then he gave a brief overview of MAP activities with particular accent on the SAP MED project. One of the objectives of the SAP MED is to reduce industrial pollution. This is also a global task of the Mediterranean Commission for Sustainable Development. Finally, he suggested to the participants to identify the Adriatic Region as a key study area, with special attention to some places where hot spots are concentrated.

21. Mr. A. Randić, Head of the Adriatic Section of the Croatian Ministry of the Environment, talked about the industrial development in the coastal zone of the town of Rijeka. He started by the description of geographic, socio-economic and administrative characteristics of the Primorsko-Goranska County. He described the transport system, including port, railway, road, air and pipeline transport. He pointed out the importance of the oil and petrochemical industry, and the shipbuilding industry. Industries are almost completely dependent on electric power, since there is no natural gas in this area. However, by the year 2000 it is expected that natural gas will be extracted from the Adriatic Sea. In future, the County can be supplied by gas in three ways: with domestic gas from the continental part of the country, from Russia, and from Algeria via the transport system of Italy. Finally, he stressed that in

most part of the Primorsko-Goranska County protection of the environment was on the highest ecological level. He also stressed that in order to provide adequate waste disposal; a new "Waste Management Zone" was planned. It will consist of municipal waste disposal units, recycling plants for civil engineering waste, bio-composts, and interim disposal storage for industrial waste. The costs are estimated at US$ 40 million. In order to comply with the high level of environmental protection in the area, all investors must make provision in their investments for the latest equipment for environmental protection.

22. Mr. M. N. Moore, of SES/PEM of UNIDO, presented the methodology of impact and risk assessment in integrated environmental management. He gave a brief overview of the situation of coastal areas and catchment basins, most heavily used yet vulnerable zones of the planet. He pointed out that one of the major difficulties in impact and risk assessment was to link harmful effects of chemical pollutants in individual animals and plants with the ecological consequences. Eco-toxicological tools, like "bio-markers" and immuno-chemical tests for contaminants, recently available, can help overcome this knowledge gap. Such eco-toxicological tools can provide information on the health status of the populations based on relatively small samples. Now the "bio-markers" can be used to link processes of molecular and cellular damage through to the higher levels, where they can result in reduced performance and reproductive success. He described the development and the use of process simulation models, which will further facilitate the development of a predictive capacity for future risks. He stressed that an integrated environmental management strategy must be truly cross disciplinary if an effective capability for risk assessment and prediction is to be developed. Therefore, collaboration needs to include remote/satellite surveillance, risk assessment, interpretation of complex information, predictive modelling and precautionary anticipation of novel environmental hazards. Finally, he stressed the importance of education of politicians, industrialists and environmental managers concerning the long-term consequences of pollution. Rising consumer awareness exerts pressure on industry to make the production and the products "environmentally friendly".

23. Mr. D. Rumenjak, of the Ministry of Environment and Physical Planning of Croatia, presented the EIA for industrial projects in Croatia. He said that Croatia had a long tradition in EIA. The "Rules of EIA" were adopted in 1984. He briefly explained Croatian legislation and institutional structure for the EIA, and pointed out the key elements of EIA procedure. Then he described the structure of the EIA study. He listed the industrial projects for which EIA is obligatory in Croatia. He informed the participants on the statistics of EIA in the period 1997-2000 according to activities category and the branches of industry. Having analysed the methodology of EIA, he paid special attention to public participation. It is obligatory according to the existing legislation, with key elements as follows: commission assessment of the project on the basis of EIA study; public participation and hearing and the investigation of the whole previous phases as well as new or unrecognisable elements. After the EIA procedure the decision is granting or denying consent for the project. Having analysed the potential problems, he pointed out that EIA for industrial project was generally a very sensitive and complex procedure demanding an appropriate methodological approach.

24. Mr. L. Alberotanza, director of ISDGM-CNR of Venice, Italy, presented the Adriatic Sea remote sensing and monitoring results in the framework of the

PRISMA2 project. In this project particular attention was paid to making technologies operational and more effective in relation to complex phenomenology of this sea after an evaluation of instruments, platform and measurement methods. Having analysed the subprojects of the PRISMA2, he paid special attention to monitoring activities. A part of Mr. Alberotanza's presentation that followed was dedicated to remote sensing. This activity can be subdivided into two parts. In the first part preliminary data and quasi-real-time data analyses are performed. In the second part, new or improved products, experimenting new sensors and data analysis are to be done. He showed several maps made in the framework of this project. He informed that the project PRISMA 2 was in its conclusive stage of analysing the observed data and writing of the final reports. He stressed that the final evaluation would be possible only when the obtained results are transferred to competent organisations and their application extended to the whole basin, since some have been developed as a prototype.

25. Mr. B. Tomšić, of the Port of Koper, Slovenia, presented the port. He talked about its advantages, certifications, organisation, development plans, environmental management system and policy, investment programmes and research projects. Regarding the investment programmes he pointed out the Centre for Waste Management, control system for the electricity and water consumption, and the green areas that are to be planted between the terminals and other locations of the port.

26. After the presentation of the port of Koper, the videotape was shown presenting the port of Monfalcone. Since the representatives of the port of Monfalcone couldn't manage to come, they have sent the videotape.

27. Messrs. E. Feoli and M. Ghribi presented the ICS - UNIDO Centre. They pointed out the ICS role in promoting sustainable industrial development through the creation of a network of Adriatic and Mediterranean institutions and specialists, the design and implementation of a pollution reduction programme, the identification of synergies with other initiatives and extending related activities in co-ordination with the Working Group on Industry and Sustainable Development of the Mediterranean Commission for Sustainable Development. To that end, they stressed the importance of a flexible and accessible information system for planning the sustainable industrial development, co-ordination between different initiatives, and the integration of the field observations with results of remote sensing. They expressed the hope that this Workshop will achieve the following objectives for projects concerning the monitoring of industrial development in coastal areas of the Adriatic, reviews the case studies related to the application of the technological framework, and provide suggestions for capacity building for sustainable management and planning of industrial coastal zones.

28. Mr. M. Ghribi presented the use of GIS, remote sensing and decision support systems for landscape monitoring and environmental management of coastal areas through several case studies. He began with the case study for the Region of Tunis-Bizerte in Tunisia. For years the Tunisian coastline has seemed to be infinite in its capacity to support human pressures. Today, the concentration of human activities provokes a series of environmental problems. He illustrated a Multi-Criteria Evaluation for Urban Management and Industrial Siting as a contribution to decision-making. Having analysed the methodology of this process, he described its

aims and concepts. In addition he illustrated a hazardous waste analysis. Then he presented the case study for the Governorate of Sfax, Tunisia, done by M. A. Tlili, where he used the same methodology. He presented the case study for Monfalcone, Italy, done by Mr. A. Altobelli and at the end the case study for the municipality of Koper, Slovenia, done by Mr. M. Russi.

29. Mr. M. Host from the Special Waste Agency in Zagreb, Croatia presented the Centre and their projects. UNIDO, the Czech Government and the Croatian Government initiated the project "Capacity Building in Cleaner Production" in July 1997. Under this programme three main activities were planned: training of trainers; implementation of CP demonstration projects; and establishment of the Croatian CP Centre. Mr. Host informed the participants that during these three years 58 Croatian experts were educated in CP, 21 demonstration project were developed and partially completed in 18 industrial companies with an estimated annual savings of 3.89 million USD. Over 40% of the implemented projects were not or were low-cost investment projects, with immediate payback or within less than 1 month. He pointed out the importance of having the right people in the company who will implement the project in the right manner. Finally, he stressed that, through the UNIDO Project, significant environmental benefits had been achieved. Discharged wastewater volume was reduced by 2.4 million m3/year, wastewater burden (COD) by 33.4 tons per year, and industrial waste generation by 16 540 tons/year. Financial savings are estimated at 3.89 million US$ per year. He concluded by stressing the importance of further strengthening of the cleaner production programs and institutions, and promoting commitment among industrial and government personnel.

30. Ms. S. Midžić of the Hydro-Engineering Institute of Bosnia and Herzegovina, talked about the situation in Bosnia and Herzegovina with regard to planning for industrial development in coastal areas. Having analysed the natural characteristics, she pointed out the importance of the Adriatic Sea catchment area in Bosnia and Herzegovina. She gave a brief description of spatial planning activities in the past, and the categories of the plans that have been developed. Then, she focused on the industrial pollution sources. Non-point sources of pollution, pollution from agriculture, and air pollution in Bosnia and Herzegovina have not been identified. Furthermore, no effective legislation for the regulation of emissions to the air exists, nor an effective framework for environmental licensing. Regarding the future actions, Ms. Midžić presented EU Life-Third Countries Programme "Institutional Strengthening of MAP Office in Bosnia and Herzegovina". With this programme the basic activities on addressing industrial planning and pollution reduction have been performed. She then described the national priorities regarding the environment. Finally, she pointed out the importance of Integrated Coastal Area and River Basin Management (ICARM) concept and the integrated approach to be used in Bosnia and Herzegovina in order to reach better co-ordination of policy making across economic sectors and environmental protection.

31. Mr. M. Majstrović, of the Croatian Energy Institute "Hrvoje Požar", presented the concept of regional energy planning and industrial development of Croatian coastal counties. The Croatian Government, through the Ministry of Economy, charged the Energy Institute "Hrvoje Požar" to carry out the project "Development and Organisation of the Energy Sector in Croatia". The introduction of the regional dimension constitutes a new issue, and is expected to play a significant role in the

new Croatian energy policy. This approach was applied in two coastal counties, Istrian County and Split-Dalmatia County. It enables a high-quality analysis of energy consumption and the energy supply system. Then, he focused on the industrial sector, presented assumptions on evolution of industrial economy, and forecasting of energy demand and intensity. He concluded saying that the future development concept of regional energy planning in Croatia is based on the information system development, regional database connection and software development. In this new concept environmental protection will play a significant role.

32. Mr. G. Deliu, of the Albanian National Environmental Agency, talked about the Albanian experience in planning for industrial development in coastal areas. Having analysed the Albanian natural characteristics, he talked about the Albanian economy and the coastal development. He mentioned two studies on ICAM carried out by UNEP and METAP II. He gave a brief description of the current situation regarding economic activities and industry in particular. He talked about the Albanian future trends, the present data collection, and environmental monitoring of the coastal zone performed by the National Environmental Agency. Then he described the current legal framework, physical planning, and the best available clean technologies in Albania. Finally, he pointed out the most important and needed fields of co-operation and assistance.

33. Mr. A. Barić of the Institute of Oceanography and Fisheries in Split described the historical context of industrial development in the coastal areas of Croatia. He began with the period before the World War II, coming to the nineties, which are characterised by privatisation, recession, temporary industrial closures and plants decommission. The following part of his presentation was dedicated to the national monitoring programmes. He presented the national monitoring programme of land-based sources of pollution, marine environment monitoring programme and the VIR-KONAVLE monitoring programme. Mr. Barić gave a brief description of the present state of the environment and the consequences of such a state. The new comprehensive monitoring programme, initiated in 1997, was presented with its sub-programmes. Finally, he described the legal context for industry development in Croatia.

34. Mr. M. Jambrešić of "Aluminij d.d." of Mostar, Bosnia and Herzegovina presented the factory. After a brief description of the industrial development in Bosnia and Herzegovina, Mr. Jambrešić talked about the general characteristics of the "Aluminij" factory. He described the process of aluminium production, and on the emission sources, composition and effects. Then, he presented the two processes of gas cleansing used in the factory: dry treatment and wet treatment. The dry treatment is based on chemosorption of gas hydrofluoride to aluminium. Efficiency of this treatment is 85-90% in conditions where the lids on cells are opened from time to time. To stop 10-15% of secondary gases from being emitted from the plant to the atmosphere, they apply wet treatment. He described this process pointing out that the efficiency of such a wet treatment plant is usually 85-90%. He pointed out that, at the moment, the factory was modernised. The water treatment has become efficient, so that the river Neretva cannot be polluted. If a factory wants to survive in the future, the most important issue is environmental protection. They are paying attention to the aesthetic surroundings of the factory, and they have obtained the ISO 9001 certificate.

GENERAL DISCUSION

35. The third day of the Workshop was dedicated to the general discussion.

36. Mr. Trumbić proposed the topics for the discussion as follows:
    - Issues that participants think might be particularly important for industrial development (technical, environmental, socio-economic, institutional);
    - Defining the characteristics of the "new industry";
    - The role of industry in sustainable development;
    - The industrial development in the coastal areas: importance, size, type, environmental and social dimension;
    - Elements of "new" industrial development in the coastal areas of the Adriatic countries.

37. In the discussion that followed participants pointed out the importance of the development strategy for the Adriatic region. They reminded of the short yearly duration of the tourism, the main activity in this region. Therefore, it is necessary to have other complementary activities. Chemical and metal processing is not a good solution. They pointed out the high technology, as the best activity for the coastal areas. Participants were informed by Mr. Rumenjak that spatial planning strategy, economic development strategy and environmental protection strategy for Croatia are in their creation phase. Since he is in the team preparing the environmental protection strategy, he promised that some of the Workshop suggestions would be taken into consideration.

38. Mr. Malbaša argued that the new industrial sites, particularly polluting ones, would not be located in the coastal areas. Mr. Host stressed the importance of the selection of the right type of industry to be located in the coastal areas. The future will bring new technologies, with monitoring and good control of the process, and without waste. Nowadays, we can only do some improvements with the technology we have. Ms. Midžić pointed out the need for a network between CP centers in the region.

39. Mr. Feoli pointed out the importance of the policy for the environment and economy. Therefore, it is of extreme importance to co-operate with the governments and with the industries. Some participants pointed out that the biggest part of industrial producers in our region were small and medium enterprises (SME). They often operate on the edge of the profitability, but producing cumulative negative effects on the environment. Mr. Majstrović informed the participants that the Croatian Government intention was to reduce large energy consumers. For example, Dugi Rat and TLM factories are closed, the only large energy consumer that will stay is Dalmacijacement.

40. Mr. Moore proposed and demonstrated the model of Information and Support Network for environmental monitoring which includes Monitoring and Risk Assessment, Pollution Control, Cleaner Production and Waste Management.

41. Mr. Trumbić proposed the development of pilot projects aimed at identifying new activities for the abandoned industrial sites. Local governments should organise training for the redundant local capacities on the new skills. To accomplish this task they need limited financial resources. He pointed out the need for establishing active

development agencies, which could take the leading role in the future development of the region. Mr. Rumenjak gave the example of one such center in the Slavonsko-Požeška County. This is a Technological Scientific Center, which is partly financed by the Croatian Government.

42. In a further discussion the participants proposed several interesting initiatives, like:
    - the development of a common code of practice and common criteria for the siting of industrial activities;
    - SME location guidelines;
    - publishing of Cleaner Production booklets;
    - study of the trend in industrial training activities;
    - distant learning training courses;
    - development of pilot projects and case studies;
    - strengthening of the environmental component in the "Stability Pact";
    - participation in the preparation of draft recommendations for the conference in Ancona where "Ancona Charter" will be adopted;
    - introducing Cleaner Production and eco-labelling into the "Adriatic Initiative";
    - possible links of MAP and the Adriatic Initiative;
    - network for co-operation among different international organisations and Governments.

43. The participants proposed that the Workshop recommendations be based in the following format:
    - strengthening of the co-operation and networking among the institutions (international, intergovernmental, universities, scientific and technological community, NGOs);
    - promoting capacity building and training activities in the Adriatic Region;
    - developing projects to be promoted within the Adriatic Initiatives: types of projects, role of actors, MAP, MCSD.

44. After the discussion the participants adopted the conclusions and recommendations as presented in Annex IV to this Report.

CLOSURE OF THE WORKSHOP

45. Mr. Feoli, on behalf of ICS and UNIDO, expressed his satisfaction with the work and organisation of the Workshop. Joint work of the participants from different countries, institutions and companies, in the spirit of the Agenda 21, made the Workshop very interesting.

46. Mr. Trumbić thanked the participants for their contribution to this, in his opinion, very successful Workshop. He pointed out that the participants had many ideas, and that was what this region needed. There are some initiatives in the region that could serve as instruments in implementing these ideas, and the task is to make these ideas succeed and transform into something fruitful for the future. Finally, he raised hopes that better times were coming for this region, which would certainly contribute to the improvement in its environmental situation.

Annex I

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Annex II

Agenda

Thursday, March 23

09:30-09:45	Registration
09:45-10:00	Opening and Welcome by the host **Mr. Ivica Trumbić**
10:00-10:15	Briefing on the scope of the Workshop **Mr. Enrico Feoli** Presentations of the participants
10:15-11:00	Review of national and international projects concerning the monitoring of industrial development in coastal areas of the Adriatic Sea **Mr. Ivica Trumbić**
11:00-11:30	Coffee break
11:30-12:15	Strategic action programme to address pollution from land-based activities (SAP) **Mr. Aldo Iacomelli**
12:15-13:00	Environmental protection in the regional co-operation promoted by CEI and related scientific and technological activities **Mr. Gianfranco Cicognani**
13:00-14:30	Lunch break
14:30-15:15	Evaluating the technological level of production systems and developing programmes for cleaner production **Mr. Victor Maciá**
15:15-16:00	The industrial activities having impact on the Italian part of the Adriatic coast environment **Mr. Giovanni Guerrieri**
16:00-16:15	Coffee break
16:15- 17:00	Risk identification of industrial activities along the coast of Croatia **Mr. Niko Malbaša**

Friday, March 24

09:00-09:30	Mediterranean Commission for the Sustainable Development and the industrial component **Mr. Lucien Chabason**
09:30-09:45	Industrial development in coastal zone of Rijeka Mr. **Andrija Randić**
09:45-10:30	A methodology for impact and risk assessment in integrated environmental management **Mr. Michael N. Moore**
10:30-11:15	Environmental Impact Assessment in industrial plants in Croatia Mr. **Damir Rumenjak**
11:15-11:30	Coffee break
11:30-12:15	The use of remote sensing for monitoring industrial development and industrial impact on the Adriatic coastal areas **Mr. Luigi Alberotanza**
12:15-13:00	Port of Koper **Mr. Bojan Tomišič**
13:00-14:30	Lunch break
14:30-15:15	The use of GIS – examples of application in coastal zone management **Mr. Enrico Feoli and Mr. Mounir Ghribi**
15:15-17:00	Experiences in the different participating countries in planning for industrial development **Mr. Ante Barić, Mr. Marijan Host, Ms. Sanda Midžić, Mr. Marijan Jambrešić, Mr. Gani Deliu, Mr. Matislav Majstrović**

Saturday, March 25

09:30-11:00	Round-table: Development of integrated information systems for industrial development on the coast
11:00-11:15	Coffee break
11:15- 13:00	Conclusions, recommendations and closure of the meeting

Annex III

List of presentations

Alberotanza L.: The use of remote sensing for monitoring industrial development and industrial impact on the Adriatic coastal areas
Barić A.: Croatian experiences in planning for industrial development in the coastal region
Cicognani G.: Environmental protection in the regional co-operation promoted by CEI and related scientific and technological activities
Deliu G. and Zuna V.: The Albanian experience in planning for industrial development in coastal areas
Feoli E. and Ghribi M.: The use of GIS – examples of application in coastal zone management
Guerrieri G.: The industrial activities having impact on the Italian part of the Adriatic coast environment
Host M.: Cleaner Production in Croatia
Iacomelli A.: Strategic action programme to address pollution from land-based activities (SAP)
Jambrešić M. and Lukić J.: Aluminium factory and environment protection
Maciá V.: Evaluating the technological level of production systems and developing programmes for cleaner production
Majstrović M.: Rational energy planning and industrial development of coastal counties
Malbaša N.: Risk identification of industrial activities along the coast of Croatia
Midžić S.: Bosnia And Herzegovina Statement of planning for industrial development in coastal areas
Moore M. N.: A methodology for impact and risk assessment in integrated environmental management
Randić A.: Industrial development in coastal zone of Rijeka
Rumenjak D.: Environmental Impact Assessment in industrial plants in Croatia
Tomišič B.: Port of Koper
Trumbić I. and Povh D.: Review of national and international projects concerning the monitoring of industrial development in coastal areas of the Adriatic Sea
Tryfona-Panagopoulou V.: Analysis of the industrial component in Greece

Annex IV

Conclusions and recommendations

The participants have proposed to the organisers of the Workshop, as well as to other interested stakeholders in industrial development in the Adriatic Sea area, that the actions aimed at sustainable industrial development be concentrated into three major groups: development of co-operation and networking among the Adriatic countries; promotion of capacity building and institutional strengthening; and implementation of the concrete (thematic or site specific) pilot projects. The following was recommended:

a) Co-operation and networking

- The countries should utilise the advantages of the present political initiatives directed towards a better development of the Adriatic sub-region. The forthcoming meeting of the Adriatic Initiative to be held in Ancona, in May 2000, should be the opportunity for pointing out the needs for industrial development of the sub-region, and proposing concrete projects for financing. To that end, also other sub-regional initiatives should be instrumentalised, such as the Stability Pact, CEI and SECI.

- A special networking project should be prepared by UNIDO/ICS & UNIDO SES/PEM to link interested institutions and experts in industrial development. The goal of the network would be to use in a rational way the existing professional capacities, to provide mutual support among the countries of the sub-region in industrial development, and to create a "critical mass" of human resources for planning and implementation of complex interventions. The project should provide an insight into the existing state of professional capacities for planning and implementation of industrial development, identify the gaps, evaluate the needs, interests and financial possibilities, and propose modalities of the functioning of the network.

- A special networking project should be prepared by UNIDO and MAP CP/RAC to link Cleaner Production (CP) centres in the region. The goal of the network would be to build capacity of the centres in the region, to provide mutual support among the Adriatic countries in the promotion and improvement of CP.

- It should be necessary to consider the possibility of establishing development agencies whose primary task would be the promotion of industrial development with particular emphasis on opening of new workplaces, specially in the areas with the increasing unemployment rate, and on the protection and enhancement of the coastal environment. Networking of development agencies should result in synergistic effects.

- Information exchange among interested subjects in industrial development should be improved. This exchange could be organised on the thematic, geographic or economic interest basis.

b) Capacity building

- The existing capacities for training should be instrumentalised for the industrial development capacity building in the Adriatic sub-region. Particular role in this process should be played by MAP CP/RAC and ICS/UNIDO, whose efforts in the Adriatic should be intensified. Also, the possibility of the implementation of a distant learning process should also be considered in realisation of this goal.

- The common methodological approaches to particular aspects of industrial development in sustainable development of the Adriatic sub-region should be developed and implemented. These approaches would deal with issues, such as: evaluation of the impact of industrial development on the coastal environment; evaluation of the impact of the existing industries in the countries in transition and evaluation of possibilities to reorient existing concept of big scale industries towards small and medium scale ones, organic agriculture and use of hydropower; criteria for siting industrial facilities respecting the requirements of the protection and enhancement of the environment; determination of assimilative capacities of the Adriatic Sea for pollution; definition of new sorts of industry in line with the requirements of globalisation and the "new economy"; etc.

- There is a need for the preparation of guidelines and manuals (on development of industrial zones for siting the SMEs; on implementation of economic instruments aiming at reducing negative environmental effects), good practices guides (for clean production; for economic effects of implementation of measures for environmental protection), and codes of practice (for industrial zones; for avoiding of conflict situations in the coastal areas).

c) Projects

- Support should be provided in the preparation of national strategies of industrial development, which should be integrated into national development strategy, and be complementary to the national spatial strategies and strategies for environmental protection. Particular attention should be paid to the role of industrial development in sustainable development of the coastal areas, with the emphasis on increasing employment, and avoiding conflicts with tourism as well as on establishing complementarity among industrial, agricultural and tourism development.

- The areas characterised by a sudden decline of industrial activity, often followed by an decrease of the employment rate, should be identified. Projects should propose sub-regional strategies for sustainable development and the role of industrial development in it.

- Effects of globalisation on the Adriatic Sea area should be examined, evaluating the possibilities of including the countries of the sub-region into these processes, in particular with regard to the industrial development processes.

- An optimal concept of industrial development of the sub-region should be defined particularly in the view of the development of small and medium size industrial enterprises.

- Pilot projects should be identified, designed and prepared in the areas with a high risk of industrial accidents, and measures should be proposed for reducing the risk. These should include capacity building for environmental monitoring and effluent testing in order to ensure regulatory compliance and the development of an effective "Regional Risk Management Strategy". All of these are directly linked to the development of sustainable "environmentally-friendly" industries, which will facilitate economic improvement and employment, hence contributing directly to environmental protection within the framework of regional security.

- A transboundary project for sustainable development in the coastal areas should be prepared in the countries of the sub-region. The project would place particular emphasis on the promotion of possibilities for industrial development and protection from oil pollution and hazardous substances; all in harmony with the protection of biodiversity. In that sense, the possibilities within MAP and their Coastal Area Management Programme (CAMP) should be used, in particular in Slovenia, Italy and Croatia, where the institutional support has already been provided.