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MEDITERRANEAN ACTION PLAN

Fourth Meeting of the Task Team on
Climatic Changes on the Island of Rhodes

Athens, 30-31 March 1992

REPORT
OF THE FOURTH MEETING OF THE TASK TEAM ON CLIMATIC CHANGES ON THE ISLAND OF RHODES

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1. The first day of the meeting, Monday March 30, was opened by the Co-ordinators Mr C. Perissoratis (chairman) and Mr D. Georgas (rapporteur) who welcomed the participants and pointed out the presence of Mr D. Tsotsos from the Ministry of Environment, Planning and Public Works, of Messrs L. Jeftic and I. Dharat from UNEP, Mr G. Sestini (UNEP Consultant) and Ms K. Tsakiri, a Task Team member and citizen of Rhodes. The only absent Task Team member was Mr N. Margaris.

The list of participants appears as Annex I to this report. The participants adopted the Agenda of the meeting as presented in Annex II to this report.

2. Mr L. Jeftic welcomed the participants on behalf of Dr M. K. Tolba, Executive Director of UNEP and stated that UNEP through its Mediterranean Co-ordinating Unit attaches great importance to the work on implications of climatic changes in coastal areas.

3. Afterwards, Mr C. Perissoratis informed the participants that a paper with an improved scenario of climatic changes for the Island of Rhodes was sent from the East Anglia group (Guo et al.) which was distributed to all present. The Co-ordinators also stressed again the importance of the Task Team project and that it is significant that each chapter is adequately described and the impacts of the climatic changes on the particular physical parameter clearly stated. The complete report (constituted of introduction, implications and suggested actions) will then be widely distributed to experts and decision makers. Then the chairman asked Mr S. Leondaris to present his chapter on the geology of Rhodes (UNEP(OCA)/MED WG.46/2).

4. Mr S. Leondaris at the beginning gave a brief picture of the stratigraphy of Rhodes which consists of three units, a lower, middle and an upper unit. The lower and the middle unit consists of old hard formations (limestones, etc.) while the upper unit consists of younger soft rocks (Miocene and Quaternary sediments). The old hard rocks have been repeatedly folded and faulted while the young Miocene and Quaternary rocks have been affected by intense faulting. The geomorphological profile of Rhodes is smooth while a dense drainage network is present in the whole island. Regarding the coastal geomorphology, Mr S. Leondaris distinguished four coastal slope categories (5 %, 5-15%, 15-20% and >20%) and he related the low slope coasts to the presence of soft rocks and the high slope coasts to the presence of hard rocks. Finally he referred to the implication of the expected climatic changes and noted that all coastal lowlands could be subject to flooding by a future sea level rise. In the discussion, Mr S. Leondaris was asked by Mr L. Jeftic about shoreline stability and the presence of retreating or advancing coasts. Mr S. Leondaris said that he had no data on the subject. Since this is an important aspect of the chapter it was decided and agreed that Mr S. Leondaris will cooperate with Ms K. Tsakiri on this matter. Specifically Ms K. Tsakiri will collect the required data from Rhodes island which show both the recreational coastal areas and their dynamic status. Also Mr C. Perissoratis asked Mr S. Leondaris to provide the figures for his chapter with suitable lettering.

5. The next speaker was Ms M.C. Alexiadou, who illustrated the hydrogeology of the island (UNEP(OCA)/MED WG.46/4). At the beginning she outlined the hydrogeological basins which exist in Rhodes and then described each hydro-geological formation. She stressed the problem of the over-exploitation of most aquifers, due to the rising water especially in the northern part of the island. The result of over-exploitation is that in many cases the water level is lower than the sea level, which in turn causes salinization of the aquifers. Ms M.C. Alexiadou also gave a description of the springs present in the island, and she pointed out that a considerable quantity of fresh water is lost because of leakages in the city's old drainage system.

About the implication of future climatic changes the speaker cited the increase in evapotranspiration, increase in surface runoff, decrease in borehole yield and increase of salinization of aquifers. In the discussion Mr G. Sestini asked Ms M.C. Alexiadou about the collaboration between this team and the hydrology team of the Rhodes CAMP. Ms M.C. Alexiadou replied that they both have the same data.

6. Mr J. Dikaiakos presented the chapter on climate (UNEP(OCA)/MED WG.46/3), describing the geographical position of Rhodes and the dynamic factors that affect the Rhodes weather. He described the characteristic "etesian" winds which blow regularly from the north and northeast during summer time and contribute greatly to the mild climate of Rhodes. He also spoke about the human bioclimatic characteristics stating that in a great part of the year the indoor conditions in Rhodes is in the confort zone. Finally examining the scenario provided by Guo et al. for the Eastern Mediterranean and Rhodes in particular, he noted that by 2050 there should be no great change in Rhodes climate and that the island could remain as a cooler oasis in a warmer environment. In the discussion Mr L. Jeftic asked Mr J. Dikaiakos to clarify the terms dry and wet for the same period which might mislead the reader. Mr J. Dikaiakos replied that the terms can be used but he said that he will clarify this to make it more clear for the average reader. Mr C. Perissoratis asked if is it possible to predict the future climate of Rhodes when the temperature will rise by 3EC at the end of next century. Dr. Dikaiakos answered that this is not possible because for the local climate we need to know the climatic regime of the greater area. Mr G. Sestini finally asked about the possibility of discussing a frequent occurrence of extreme events in the future, on the basis of the given scenario. Mr J. Dikaiakos replied that this is not possible due to the lack of adequate data.

7. The next chapter on Oceanography (UNEP(OCA)/MED WG.46/5) was presented by Mr A. Laskaratos. He explained the importance of the oceanic circulation around Rhodes, the interannual variability of the Levantine gyre, and the presence of the warm and more saline Asia Minor Current. He also explained the effects which the changes of the properties of the various currents will have on the Rhodes climate. He then described the wave regime stressing that the southern and the southeastern part of Rhodes is exposed to more open sea and to storm surges coming from the SE, while the north and northwestern area of the island is exposed to less intense but more continuous waves induced by the north winds. Regarding the effects of the climatic changes on the oceanographic regime around Rhodes and replying to relevant questions. Mr A. Laskaratos indicated that the present scenario will not probably affect the currents and the general circulation pattern, except the wave height and the "oceanic" extreme events which are expected to increase. Mr L. Jeftic asked some reference to be added on the general circulation and Mr J. Dikaiakos asked some clarification regarding the relationship between wind direction, atmospheric pressure and rainfall.

8. The last chapter presented (UNEP(OCA)/MED WG.46/7) was that of Ms K. Tsakiri on the socio-economic aspects of the island, on the basis of the official results of the 1991 census. The population of Rhodes has increased by 17% since 1981 and most is employed by the tourist industry. In fact, at a national level the number of tourist beds in Rhodes is second place only after Attica. However, the island lacks the necessary infrastructure to meet the requirements of an increase of tourists. Industry represents a small proportion of the GNP of Rhodes and is developed to meet the needs of tourism (small manufactures of ceramics, popular art, etc.), while the primary sector (agriculture, forestry, fishing, animal breeding) has shrunk because more and more people are turning to the tourism business. Finally, regarding the implications of the climatic changes, a sea level rise would certainly affect all touristic establishments and other installations by the beach. In the discussion followed Mr D. Tsotsos asked about the number of the sewage treatment plants that exist in nearshore areas (shown a map exhibited at the meeting), and Mr L. Jeftic stressed the effects a sea level rise might have on these plants.

9. The only chapter not presented was that on Ecosystems (UNEP(OCA)/MED/WG.46/6), because Mr N. Margaris was not present. However, in a brief discussion, the participants agreed that the chapter on ecosystems does cover the subject adequately provided that there will be a section on aquatic and marine ecosystem, regardless if they are or not affected by the expected climatic changes. It is also necessary to have a map depicting the distribution of the various ecosystems on the island.

10. The Co-ordinators thanked the participants and the Task Team members for their presentations and participation in the discussion and concluded the first day meeting pointing out the following:

a. All Task Team members should give the additional material required as described in the discussion of each chapter and the transparencies of their original figures in A4 format, to the Co-ordinators within the next two weeks. For those that have figures with the island of Rhodes, a base map of Rhodes island in A4 format will be sent with the minutes of the meeting (Annex III), so that all figures used will be similar in size. Also the letters used should be readable after 50% reduction.

b. The Co-ordinators will work on the remaining chapters (introduction, implications, suggested actions) and compile the final report by the end of May or beginning of June. The complete report will be discussed between the Task Team members and then submitted to UNEP in its final form.

c. The presentation of the findings of this project to the public and the decision makers will take place in September in Rhodes along with the three other CAMP activities (Integrated planning, GIS, development scenarios), at an official meeting to be organized by the Rhodes prefecture. All Task Team members will be invited. The meeting will be placed in the framework of the celebrations of the 2400 years of Rhodes city.

d. During April the Task Team members will be asked to fill a specific questionnaire to be sent to them by the Co-ordinators. The questionnaire will refer to the economic cost of eventual recommended steps in coastal areas of Rhodes vulnerable to an eventual sea level rise. This questionnaire is included in a recent study made by the IPCC subgroup on the Coastal Zone Management Subgroup (CZMS). Copy of this report was distributed to all participants.

11. On the second day of the meeting, Tuesday March 31, the Co-ordinators met with Mr G. Sestini and thoroughly discussed the progress of the Task Team work as a whole, as well as each chapter separately. Mr G. Sestini commented on each chapter and had the opinion that all sections on implications cited in each chapter should be included in a separate chapter.

12. Another meeting was held on 31 March in which the participants were Ms K. Tsakiri, Messrs D. Tsotsos, L. Jeftic, I. Dharat, G. Sestini and the Co-ordinators. During this meeting the final presentation of four CAMP activities was discussed. It was decided that the presentation will last for two or two and half days, in which the Co-ordinators should present their projects and the present Task Team members will reply the questions asked. Mr. L. Jeftic suggested that the participation of both the specialist and the greater public must be as wide as possible. Also all agreed that a committee should be formed by Ms K. Tsakiri, Mr D. Tsotsos, L. Jeftic, I. Trumbic and Mr I. Dharat which will act as organizing committee for the final presentation meeting.

ANNEX I

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ANNEX II

AGENDA

1. Opening of the Meeting

2. Organization of work

3. Adoption of the Agenda

4. Implications of Climatic Changes on the Island of Rhodes

   4.1. Geography and Geology of the Island of Rhodes
   4.2. Climate of the Island of Rhodes
   4.3. Hydrology and Water Resources of the Island of Rhodes
   4.4. Marine Physical Processes of the Island of Rhodes
   4.5. Ecosystems of the Island of Rhodes
   4.6. Socio-economic Aspects of the Island of Rhodes

5. Programme of future work of the Task Team

6. Adoption of the report

7. Closure of the Meeting

ANNEX III

MAP OF RHODES ISLAND

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