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EXPERIENCE OF INTEREST FOR THE PROCESS OF INTEGRATED PLANNING AND ENVIRONMENTALLY SOUND MANAGEMENT OF MEDITERRANEAN COASTAL ZONES OBTAINED THROUGH THE PRIORITY ACTIONS PROGRAMME IN THE 1985-1988 PERIOD

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This paper is a general information on PAP giving an overview of the most important experiences obtained hitherto in individual priority actions. It is addressed to a wider circle of users, including those who are not familiar with the activities of UNEP and MAP, the Barcelona Convention, the goals of PAP, etc. That is why these facts appear in the introduction as well as in the attached diagrams.

1. Mediterranean Action Plan and the Priority Actions Programme

An introduction to PAP should start by mentioning the Stockholm Conference of the United Nations held in 1972 under the title "Only One Earth". This Conference adopted the Action Plan of the United Nations for Human Environment. Following this Plan, General Assembly of the United Nations decided by its resolution 2997 to establish the United Nations Environment Programme (UNEP) which was to have a catalytic and co-ordinating role in the enhancement and protection of the environment, departing from the basic principle that it could and should be achieved primarily through a rational development and optimum use of resources, by a permanent monitoring of the state of the environment and by improving knowledge about the processess in ecosystems. In developing its programme, UNEP has given priority to the oceans and regional seas and established a special Programme of Regional Seas. Today, the Programme covers the protection of 10 regional seas through the co-operation of coastal states, with the support of UNEP, other specialized agencies of the UN system and other international and non-governmental organizations.

The Mediterranean, being one of the regional seas, became the first regional programme of UNEP. With the co-operation of 17 out of 18 Mediterranean countries and the European Community, the Mediterranean Action Plan (MAP) was born, its legal framework being the Convention on the protection of the Mediterranean Sea against Pollution, which was signed in Barcelona in 1976 and came into force in 1978. The organizational chart of MAP is shown in Figure 1.

The Priority Actions Programme (PAP) is a part of MAP. The task of PAP is to carry out practical actions which are expected to yield immediate results, whereas its aim is to contribute - through the exchange of available experience and co-operation among Mediterranean countries - to the protection and enhancement of Mediterranean environment, to the strengthening of national and local capacities for planning and management of coastal zones, and to contribute to the alleviation of the existing socio-economic inequalities among the countries of the Region.

The activity of PAP covers 6 priority fields selected and agreed upon by the Contracting Parties. Within these priority fields, PAP is carrying out 10 priority actions. The definition and objectives of PAP are shown in Figure 2, while the priority fields and ongoing actions are listed and shown in Fig. 3.

In the course of the Programme efforts, appart from various specific issues, a common 3-phase methodological approach crystallized in the implementation of each priority action. The first phase regularly covers fact-finding and identification of possibilities for the exchange of experience through national reports, synthesis reports, meetings of

Mediterranean experts, and seminars. The second phase is dedicated to in-depth studies, organization of seminars and workshops for the exchange of so obtained experience. The third phase is a direct exchange of experience and co-operation on specific and selected subjects through concrete studies and projects, through workshops, preparation of manuals and guidelines, and through training. A specific form of co-operation in this phase are country projects on selected pilot areas (site-specific PAP pilot projects), and the Mediterranean co-operative projects, as a form of Mediterranean multilateral co-operation. Such a methodological concept has been supported by a systematic approach, a satisfactory geographic representation of participating countries, and a gradual advancement in work. This general methodological approach is shown in Fig. 4.

Furthermore, in carrying out the priority actions PAP geared its effort towards the harmonization of activities and co-operation with relevant Agencies of the UN system, and with other competent and interested international organizations. As a result, PAP succeeded in establishing co-operation with ALECSO, FAO, UNESCO, UNDRO, UNCHS, UNIDO, WHO, WTO, and with about 50 Mediterranean and international institutions. PAP is carrying into effect its activities through a network of approx. 350 Mediterranean experts officially nominated by their respective governments.

2. A summary of PAP achievements in 1985-1988

By the end of 1985-1987, all the priority actions became fully fledged. National reports and a number of selected case studies commissioned in the frame of each priority action were completed and evaluated at respective meetings, seminars and workshops. Responding to the request of interested countries, a number of expert missions were envoyed to assist and work with local institutions in resolving problems of specific interest. Particular effort was employed in setting up professional and methodological bases in each priority action for merging and interlinking the obtained knwoledge within the process of integrated planning and management of coastal zreas. A number of substantive papers were completed, or are being prepared. They are to serve as tools in the implementation of the integrated planning process: (a) Directories of experts and institutions in six priority fields; (b) list of PAP experts and institutions involved in various priority actions; (c) demonstration studies published, or to be published, as MAP technical Reports Series each covering one specific topic; (d) Common methodological framework for integrated planning; (f) methodological guidelines for reconstruction and rehabilitation of Mediterranean historic settlements; (g) Code of practice for solid waste treatment; (h) Code of practice for liquid waste treatment; (i) guidelines for estimating the carrying capacity of coastal areas (tourism); and (j) Environmental Impact Assessment - a simplified procedure and guidelines.

In the period 1986-1987 alone over 200 reports, case studies and other substantive documents were produced, and 30 expert meetings, seminars and workshops held.

The preparation of co-operative programme proposals stands for a special form of activity which was introduced by the 1986-1987 Programme. The

objectives and basis of the co-operative programmes were defined and evaluated by seminars and/or workshops, while their contents and structures were further elaborated in close co-operation with relevant UN Agencies. These programmes were formulated in such a way as to (a) enable a synthesis of the available knowledge and an interdisciplinary approach; (b) provide elements for formulating national policies in the subject field; (c) prepare documentation and professional basis for achieving the set up objectives; (d) yield outputs for professionals to carry them into practice, as well as those intended for decision makers; and (e) secure direct exchange of experience between Mediterranean countries at workshops and meetings, and through training of decision makers.

Following these principles, the following proposals of co-operative projects were formulated:

- Seismic risk reduction in the Mediterranean Region;
- Inventory and network of rainfall-induced erosion measurements in the Mediterranean for an environmentally sound land management;
- Definition of ecological criteria for the rational development and protection of aquaculture in Mediterranean coastal zones.

In the first programme of the three as many as 17 countries of the region have taken part. Owing to generous funds provided by Italian Government, the programme was launched on 1 April 1988. Its seat is in Genoa and UNDP/OPS is its implementing Agency.

The second programme is in the preparatory stage, offered to be hosted by Spain, and the third one is currently examined for possible financial support.

Country pilot projects present a new form of advanced collaboration of PAP with national and local institutions and experts aimed at creating conditions for introducing or developing the process of integrated planning and environmentally sound management of Mediterranean coastal zones. These country projects are located on selected pilot areas, dealing with subjects of interest for the majority of Contracting Parties. The project outputs will be of practical benefit to the host country and at the same time be used at regional level as demonstration documents for the exchange of experience and training through workshops and training courses. The involvement of experts, institutions and expertise from relevant priority actions, and inputs from other MAP components such as MEDPOL, LBS (Protocol for Land-Based Sources Of Pollution), Blue Plan, Regional Oil Combatting Centre and SPA (Specially Protected Areas) will be secured. Depending on the specific features of the selected sites, the cooperation includes a number of priority actions or different combination of these. The work on the country pilot projects includes the evaluation of the state and problems of each selected site, preparation of preliminary studies for integrated plans, terms of reference for the preparation of integrated plans, assistance in the preparation of plans, and at least one EIA linked to each project.

PAP has started off in 1988 with the site-specific country projects in Turkey (the Bay of Izmir), Syria (the entire coastal zone), Yugoslavia (the Kastela Bay) and Greece (the island of Rhodos, at MAP level). The projects with Cyprus, Morocco, Algeria and Tunisia are in the process of defining.

3. Some experiences of interest for the protection of Mediterranean coastal areas

Before presenting some particular experiences from individual priority actions, it should be pointed out that the protection and enhancement of coastal areas and their environment can be achieved only through a rational development which uses integrated planning as its major tool. This important conclusion is a result of experience arrived at and synthesized through each and all actions.

Having this in mind, the second phase of the Programme have been geared so as to ensure the exchange of experience in various specific fields as well as to enable some global insights to be grasped and used as the outset elements in the process of integrated planning and management of coastal zones.

Following is a summarized presentation of selected conclusions which have been formulated and verified by various PAP meetings over several past years:

(a) Water resources management in islands and isolated coastal areas.

The majority of Mediterranean islands have limited water resources which are already insufficient or engaged. Therefore, water resources assessment and management is to be regarded as a socio-economic category in itself and not only as a sectorial problem. Prior to application of additional resources for future development the following essential actions have to be secured: protection of existing water resources against pollution; maintenance and upgrading of traditional techniques of rain harvesting; reduction of water losses in distribution networks; optimization and rational management of existing resources based on hydrological and hydrogeological studies, knowledge of the surface and groundwater systems and mathematical modelling. Reuse of heated waste water, particularly for irrigation, should be thoroughly studied and applied wherever appropriate. Solution of water resources management problems, sanitation problems and development of tourism should be trated simultaneously and in correlation. Improvement in data collection and regular monitoring is essential for optimal resources management.

It is clear, that there are marked differences in water resources management and practice between large islands, small ones and water deficient coastal areas, and therefore different approaches are required. In the case of large islands and many coastal areas there is a great competition with regard to the demand for water which has to be satisfied out of the local resources. The difference is also reflected in the degree of attainment of the internationally recommended water quality standards.

The variety of water sources, the competing ad fluctuating demand and limited resources call for unified water authorities in order to achieve optimal management of surface and groundwater, waste water, and nonconventional and external sources of supply.

On the basis of a large number of selected case studies PAP is now preparing a Mediterranean-specific guidelines for water resources management.

In the 1987 programme, a special attention was given to the problems of treatment and use of sewage effluents for irrigation.

At present, 16,000,000 ha of land is irrigated in the Mediterranean region, with an annual increase of 200,000 ha. It is expected that by the year 2025 the surface to be irrigated will increase by the additional 4,000,000 ha in the northern part, requiring 40,000,000,000 m3 of water for irrigation per year in the eastern and southern parts of the Region.

Those facts point out, among others, the need to implement, thoroughly and in time, new unconventional water resources, such as wastewater, along with the implementation of necessary measures for its reuse, sanitary protection and control.

Therefore, PAP prepared 15 reports on this subject which dwel on the experiences and problems of effluent reuse in 10 Mediterranean countries. These reports were discussed at a workshop (Split, November 1987).

(b) Soil erosion and protection

National reports from almost all Mediterranean countries and a number of selected case studies indicate that the Mediterranean coastal zones suffer, to a higher or a lesser degree, from all types of soil degradation (rainfall-induced erosion, wind erosion and sea water erosion; secondary salinization and sodication due to irrigation, encroachment of sand dunes, impoverishment of soil, and loss of productive land to non-agricultural uses). Governments of Mediterranean countries and their local authorities must be aware of the fact that soil is a natural resource the existance of their peoples depend on, and that its degradation affects the equilibrium of the entire ecological and socio-economic system of the coastal zones.

Despite of the differences of their natural conditions, historic and socio-economic development, the problems pertaining to soil protection are of a common importance to the majority of Mediterranean countries, their solution being a joint concern and task. That is where international co-operation is necessary and beneficial, particularly for developing countries in their effort to protect and enhance the quality of Mediterranean environment.

Although there are sufficient knowledge and viable technical solutions in the region, various economic, social and sometimes political constraints hinder their application. It is, therefore, necessary to understand and consider these constraints and to investigate and recommend ways of overcoming them. To make soil conservation acceptable to farmers it must be linked to increased production while at the same time maintaining or increasing soil fertility and arresting erosion.

A majority of representatives of the countries participating in this action shared the view that rainfall incuded erosion and loss of agricultural land should be considered as priority problems for the region. Therefore, the problems of rainfall erosion have been given special attention, whereas the issues with regard to loss of agricultural land has become the subject of the priority action on integrated planning and management of Mediterranean coastal zones.

Studying into greater detail, through case-studies, the essential elements of the rainfall erosion in the Mediterranean, it was realized that a cooperation in the activities on the soil protection against rainfall erosion would be very advantageous to all of the participating countries, especially for the following reasons:

- transfer of knowledge and techniques from developed Mediterranean countries to the developing ones would be facilitated;
- Mediterranean experience in the field of soil protection, accumulated through centuries in various socio-economic conditions, could serve as the basis for launching practical projects in all of the Mediterranean countries;
- diversity of natural and socio-economic conditions, characteristic of all Mediterranean countries, demands intensive research activities;
- level and quality of the training courses will be considerably raised if the entire Mediterranean territory and experience are used for training of experts in the field of soil protection.

In order to facilitate the exchange of knowledge and experience between the Mediterranean countries, it is necessary to create a unified cartographic basis, based upon comparable, if not uniform, classification. The majority of Mediterranean countries have prepared soil erosion maps which often differ between them, to a greater or a smaller degree. Therefore, it is necessary to make correlative analyses to determine the degree of their comparability and identify the possibility of their correlation, and to prepare the missing maps following the same principles. Without such a cartographic basis, a correct flow of information will not be possible and, therefore, this task represents a project segment essential for all common actions.

A modern approach to rainfall erosion stresses primarily the prevention, i.e., such selection of land uses and cultivation techniques which imply maximum soil protection against erosion. Testing of various options requires an exhaustive experimental work on the permanent monitoring grounds. The network of monitoring grounds should cover all land types characteristic of the Mediterranean coastal zones. If the monitoring stations, existing in different mediterranean countries, get connected in a coordinated network, and if that network gets larger as to cover all types of Mediterranean soils, the data obtained in such a way will be much more valuable than the data obtained by any individual country. Therefore, the establishment of a coordinated network of monitoring stations, unification of measuring methods and creation of data processing system represent the basic objectives of a possible joint effort.

In a number of Mediterranean countries there is still the dominant tendency in soil protection to place mechanical structures in river beds, neglecting the necessary activities on the slopes. It is, therefore, necessary to promote an integrated approach to catchment management which was generally accepted in the modern soil conservation practice and which is based on erosion prevention by an appropriate land use, bearing in mind, however, the socio-economic conditions.

In order to increase the necessary specific knowledge regarding the processes of rainfall erosion, to establish a network of erosion monitoring

stations, and to create a common methodology of soil protection against this phenomenon, a coordinated Mediterranean project in the field has been proposed. The long-term objective of the project is to contribute to the promotion of soil protection of the Mediterranean coastal zones against rainfall-induced erosion as a component of environmentally sound land management, while the immediate objectives are the following:

- provide for the exchange of knowledge and experience obtained during the study of rainfall erosion, the activities on prevention of erosion processes and recovery from their effects;
- establish a rainfall erosion map for the entire mediterranean coastal zone, as a prerequisite for the exchange of experience;
- establish a permanent cooperation in the field of measuring the erosion parameters and effects of various cultivation methods on the erosion intensity, by means of a coordinated network of monitoring stations.

To meet these objectives, the following activities have been envisaged by the project:

- preparation of a report on the state of soils in the Mediterranean coastal zones;
- preparation of thematic erosion maps;
- organization of a workshop to discuss the prepared thematic maps and to propose monitoring sites;
- establishment of new erosion control and assessment stations;
- development of a common erosion assessment methodology;
- monitoring of meteorological parameters, impact of human activities on soil erosion and the ecosystem, hydrological parameters and sediment;
- preparation of a synthesis report including recommendations for the follow-up of the action;
- formulation of recommendations for environmentally sound land management;
- organization of a final workshop to present project results.

(c) Application of renewable energies

Natural conditions of the region, global energy requirements, and social and environmental considerations have pointed at the need and justified the use of renewable energies in the Mediterranean region. That is why all Governments of the Mediterranean countries pay a great attention to the development of renewable sources of energy. Owing to completed and/or ongoing research programmes, the majority of these countries have developed considerable professional knowledge, as well as a network of insititutions, experts and pilot stations.

National reports and other papers dealing with energy issues have reported that there are numerous activities completed, ongoing or in preparation. These activities have been carried out by individual governments, various UN Agencies and other international organizations, or organized within the framework of bilateral or multilateral cooperation. However, harmonization and co-ordination of these activities and the exchange of information on their results are hardly satisfactory resulting in a duplication of effort and inadequate implementation.

The collected information have pointed out the fact that a number of Mediterranean countries have not made detailed assessments of the total potential of renewable energies and the role they can play in the energy-related policies, in general development country policies, and in the total renewabe energy potential at the regional level. Having in mind that the renewable sources of energy should be an integral part of the countries' global energy plans and development objectives, there is a need for an advanced assessment and evaluation of the renewable energy potentials in the countries of the region which should be made to facilitate the formulation of appropriate national energy and development policies while contributing to the creation of a regional, Mediterranean approach.

Furthermore, there is in the Region a wide gap between the acquired level of knowledge and technology on one hand, and its widespread application, on the other. The causes are technical, institutional and economic. Among them, the most pronounced are a lack of appropriate local industrial capabilities, a (still dominant) narrow commercial approach, and an insufficient knowledge of these issues by general public and decion makers.

The produced case studies confirmed that a number of applications of renewable energies were justified from the points of view of socio-economic criteria and commercial feasibility. The following systems could be listed as socially and economically justified and technically acknowledged types of renewable energies:

- systems of solar water heaters for domestic and commercial use;
- solar systems for building climatization;
- photovoltaic systems;
- passive solar systems in architecture and town planning;
- application of solar and wind energies in rural areas.

In addition to the general knowledge, some practical examples presented in the case studies can be useful while considering the inclusion of the renewable energy sources in the process of integrated planning. These are, for example:

- experiences of Cyprus, Israel, Yugoslavia in the use of solar energy for the provision of hot water for domestic purposes, and large hot water systems for hotels and industry (e.g.about 4.5 per cent of the total energy requirements in Cyprus are met through solar energy);

- application of solar energy in greenhouses (experiences of Spain, Italy and other countries) and in crop drying (Egypt, Italy, and others);

- use of photovoltaic solar energy conversion for greenhouses, irrigation, electrification, especially in isolated rural areas (Spain);

- use of solar energy in historic centres (France);

- application of solar energy to rural and agricultural development (FAO).

It should be stressed at the end, that the appropriate conditions for a wider application of renewable energies throughout the Region are yet to be created. That is why a segmet of the integrated planning and management programme should be oriented towards the raising of the general public awareness, information of decision makers, inclusion of the RSE assessment in national energy and development policies, as well as towards the promotion of the acknowledged equipment and technologies which are socially and economically justified. Furthermore, the appropriate conditions have to be created for including the wider energy-related socio-economic and environmental considerations into the economic analysis of the application of renewable energies.

(d) Mitigation of seismic risk in the Region

From the geological point of view, the Mediterranean region is a crustal section of the Earth with mutual tectonic relationships, an ever-evolving mosaic of plate interactions. The result is that the region historically and at present state is a major earthquake zone where a number of countries are often affected by earthquakes. It should be noted that where a single structured tectonic system is combined with a single political/administrative system, as for example, in the United States of Japan, it is relatively easier to cope with risk management than in such a varied socio-political environment as the Mediterranean. Furthermore, the rapid development, the growth of population, and the proliferation of urban, industrial, harbour and energy-producing facilities expected over the coming decades will dramatically increase the level of exposure to seismic risk. Therefore, the need for aseismic approaches to planning and development is more than urgent. National reports from 13 Mediterranean countries and a number of case studies indicate that a considerable amount of knowledge and experience relating to seismic risk has been accumulated among the countries of the region. But, this knowledge needs to be systematized, synthesised and disseminated throughout the Region in order to assure the widest possible application of seismic risk reduction strategies. In order to achieve this, with a view to incorporating the available knowledge in the planning and development process, a PAP seminar held in Cetinje (Yugoslavia) in 1985, recommended a common thematic framework (Figure 5) which led to the afore-mentioned co-operative project on seismic risk mitigation in the Mediterranean Region. The project is being launched, with the participation of 4 Agencies of the UN system and as many as 16 Mediterranean countries.

(e) Reconstruction and rehabilitation of Mediterranean historic settlements

This project started in 1984 providing a frame for the official linkage between Mediterranean countries, towns, institutions and experts within an action geared to the exchange of experience, scientific approach to and rehabilitation of architectural heritage. The fact alone that there are 14 Mediterranean countries taking part in the project speaks for their interest in this specific subject and gives a full meaning to their joint effort.

Less than four years since the outset of the project is not a long time, during which period a lot has been learnt about the state of architectural heritage in the Mediterranean countries. The value of Mediterranean historic towns and buildings has been long known and appreciated. As many as 23 Mediterranean sites have been included in the World Heritage List plus a large number of individual historic buildings. However,

owing to the reports produced within PAP and to a vivid exchange of expert views, many small historic entities less known on a world or a Mediterranean scale have been re-evaluated.

One of the results which deserves special mentioning is the identification of problems weighing on the old Mediterranean cores and, generally, burdening the architectural heritage. The first, but not the only problem, is a degradation of historic, artistic and environmental values due to weathering, specificity of soil properties or building material, various physical, chemical and biological factors, or natural catastrophes (earthquakes, landslides, etc.). Degradation of cultural values is also man-generated manifesting itself through war devastations, vandalism, etc. The visual degradation also has a variety of causes, such as, to mention only two, ill-concieved town plans and architectural designs. There are still more forms of degradation but they fall in the vast area of ecological considerations.

In addition to the above-mentioned ones, PAP case studies, expert reports and meetings have disclosed many problems of sociological and demographic nature. Degradation of historic cores is in the majority of cases related to the decline of traditional activities, social layers of progressively impoverished population, bad state of repair of dwellings, and inadequate infrastructure, although it has been claimed that an over-activity too - an over activity which is incompatible with the spatial, artistic and tructural characteristics of an area - can bring about serious problems in the life of historic settlements. The positive effects of tourism in the revitalization of old towns have been recognized but, simultaneously, much concern has been shown for threats coming from uncontrolled tourism development and exploitation.

With regard to the doctrine, it should be pointed out that irrespective of differences, the Mediterranean countries have been unanimous in advocating the theoretical approach to the protection and revitalization of architectural heritage which is based on the "active protection" and on an integrated work process in historic environments. At that, the notion "historic settlement" is understood as an integrated unit, with its history, inhabitants and their cultures, religions and habits. It has been accepted that the potentials for a permanent protection of historic values should be sought in the activation of historic areas by incorporating them into contemporary life. To make it possible, an appropriate methodological procedure has to be consistently applied throughout the work process, starting from the creation of a thorough documentation (based on precise architectural surveying), plans and designs, all through to concrete interventions and maintenance which includes a permanent inspection. Adhering to a single methodological approach has proved particularly useful in those Mediterranean environments where sufficient available financial resources make possible an extensive research and large-scale reconstruction interventions. Contrary to the situations when money is not a major constraint, the lack of a reliable scientific and professional basis has often brought about far more damage than the shortage of resources.

Another conclusion arrived at in the process of the project is that the rehabilitation and revitalization of historic towns and their heritage is an explicitly multidisciplinary activity which necessitates the co-operation of

various services (conservationists and urban planners, in the first place) and calls for support of relevant authorities (local- as well as higher-level) and for the participation of a large number of various specialists. That is exactly why the training of professionals in the conservation and rehabilitation of architectural heritage has become one of the priority objectives in all the countries of the Region.

The hitherto obtained experience has oriented PAP to the preparation of practical and applicable methodological instructions for rehabilitation and reconstruction interventions in Mediterranean historic settlements. Such an orientation has so far yielded gidelines for architectural surveying, analysis of the actual state, and analysis of historic evolution. By the end of 1990, instructions for carrying out socio-economic analysis and the approach to rehabilitation and reconstruction projects will have been completed and evaluated, as appropriate, at relevant workshops. Meanwhile, a large-scale action on the identification and systematization of 100 historic settlements of a common Mediterranean interest is being launched. This large project will be sponsored by French authorities and the City of Marseille.

Special attention has been paid to the problems of historic settlements in seismically active zones, because they are exposed to a very high degree of risk. An absolute priority has therefore been given to these settlements and to the preparation of relevant documentation and projects of reconstruction and revitalization which will include technical aspects of seismic risk reduction.

(f) Solid and liquid waste management

This priority action has been carried out as part of the programme related to Human Settlements, so that the hereby presented experiences refer only to urban solid and liquid waste management.

Problems pertaining to the solid and liquid waste collection, treatment and disposal and ways of their resolution have a major impact on the state of the Mediterranean Coastal States. A lack of appropriate measures and improper solutions of these problems leads to undesirable development in the region and gives rise to numerous and serious environmental conflicts.

Due to specific conditions in the Region, the Mediterranean countries largely differ in their approach to the solution of the solid and liquid waste management problems, and in the control of their coastal water quality. Although there is a large number of national laws and regulations dealing with the subject, in some countries the legislation is not adequately supported by specific regulations and not consistently implemented.

There are indeed a considerable knowledge and experience accumulated in the region, but they are not always appropriately or fully applied. As the result of inadequate solid and liquid waste management practices, there are numerous areas where the ecosystems are seriously endangered. In addition to the need for a comprehensive, co-ordinated and permanent action, such a situation calls for a number of immediate and specific actions and measures to be taken, particularly those related to the preparation of urban waste treatment and management projects. Unfortunately, many of such projects have

been made without a monitoring programme or without an environmental capacity assessment. The undesirable consequences of such an approach are costly (envisaged treatment is more sophisticated than necessary) or inadequate solutions (wrong choice of the treatment system; wrong siting or wrong design of the outfall). According to information available to PAP, the negative examples are, unfortunately, numerous.

Therefore, monitoring of waste discharges at on-shore and off-shore outlets should be organized by all the countries of the Region. Guidelines for the monitoring should be developed and applied. In order to improve the quality of sea water it is recommended that the existing regional quality criteria and standards for different uses (bathing, aquaculture, etc.) be applied. Physical plans for the development of coastal zones should include the sea-use concept.

The Environmental Impact Assessment should be a constituent part of the planning and decision-making process. A concerted effort should be directed to this end, including the preparation of EIA guidelines and organization of training, using a simplified procedure and assistance of international experts.

Although some progress has been done in the domain of public awareness, education and training regarding solid and liquid waste management, the situation is still unsatisfactory in many cases. The same is true for operation and maintenance. That is why a part of activities within this field which are related to the integrated planning process should include the preparation of training programmes for the management and maintenance of waste treatment plants.

(g) Tourism development and environment

All Mediterranean coastal states, Contracting Parties to the Barcelona Convention, are giving high priority to the role of tourism (especially international tourism) in their national development plans. This has become particularly true in several last years when some Mediterranean developing countries realized the ever increasing importance of tourism for their economies. At the same time the high-developed tourist countries (Italy, Spain and France) marked a high increase of Mediterranean tourism, while several others (Greece, Yugoslavia, Tunisia, Turkey and Cyprus) made a significant step forward.

On the other hand, so many past and present experiences of inappropriate and uncontrolled development of tourist facilities speak of serious negative impacts on the coastal environment which are endangering the basic resources of tourism and thus ruining the fundamental tourists' motivation.

The coastline, as the meeting point of land and sea has always been a focus of human activities. With the development, the demands for coastal space have increased, growing into conflicts between different users due to the physical limitations of the coast. In many coastal zones of the Region the activities reached a point of saturation overloading the coastal capacity. The Mediterranean coastal ecosystem is, as a rule, very delicate and in some cases extremely vulnerable. Due to either ill-concieved or uncontrolled distribution

of uses (tourism being among the outstanding ones) numerous undesirable consequences and situations occur and will continue to occur, let alone the recorded cases of completely encroached ecosystems and devastations of the coast and the sea.

Tourism, being a mass phenomenon and one of the heavy users of the coastline and the coastal waters, appears in many mediterranean countries only in the last few decades after other coastal activities long before materialized their right on the coastal space. Since tourism claims great, if not exclusive, need for the coast it inevitably comes into conflict with other users, the ultimate effect being the overlapping impacts on the environment. Depending on the achieved level of tourism and the point of coastal saturation, the conflicts vary in intensity and in resulting consequences. Understanding and anticipation of these are crucial for any country which wish and intend to develop its tourist trade.

Based on national reports PAP obtained from 15 Mediterranean countries, and a large number of case studies, the major conflicts accompanying the development of tourism, particularly in the developing countries of the Region, are the following:

Spatio-ecological and infrastructural aspects:

- Primary conflicts arise from inadequate land use, over- building in the immediate coastal zones (obstruction of sea access is particularly dangerous), increasing occupation of agricultural land and other areas of value by tourism structures, often of low aesthetic and functional standards.

- Secondary conflicts are caused by seasonal land use, resulting in too high concentrations of tourists on the coast and in historically significant areas, where there is a great risk of damaging objects of cultural and architectural value, directly by tourists, or indirectly, by vibrations and air pollution due to increased traffic. Conflicts arise also from the use of bathing areas by motor-boats, occupation of zones significant for food production, etc.

- The sea pollution is mostly due to wastewater discharge, motor vessels and bathers. Air pollution is caused mostly by motor vehicles, while soil pollution is greatest at the camping sites, where the fire risk is greatest, as well. During the tourist season, the infrastructure is heavily leaded, particularly the water supply, roads and some public services.

Social and demographic aspects:

- The influence of tourism on the socio-demographic structure is best seen in the increase of population or in checking its decrease. Increased immigration brings about changes in the age, sex, educational and ethnic structures. The number of young, active population with high degree of education increases significantly, while in ethnically and culturally homogeneous areas, mixing of nations and cultures occurs inevitably.

Economic aspects:

- The principal negative effect of tourism development in the field of economy is often reflected in the decrease of primary activities, i.e., agriculture and fishing, traditional activities in the Mediterranean, are being neglected. At the same time, a steep increase occurs in tertiary activities threatenning to develop tourism as a single industry.

- Other effects of tourism development are reflected in commercialization of autochtonous production, of the use of historic heritage for tourism purposes, and in the general rise of prices. This particularly refers to the prices of real estate which, in turn, causes occurance of financial speculations and widening of the gap between the social strata. The need to invest in the public standard more than needed by the permanent population represents a considerable burden for the local community (medical care, postal service, roads, water-supply and sewerage networks, etc.).

Socio-cultural aspects:

- Socio-cultural conflicts due to tourism are particularly important because they are hard to measure and too little attention has been paid to them, so far. The main conflicts between the permanent population and tourists result in the loss of cultural identity of demands and a far too easy acceptance of norms of behaviour of tourists from countries with markedly different socio-cultural background.

- Various forms of social pathology increase, as well (thefts, prostitution, use of alcohol and drugs, etc.), especially in isolated, socially and culturally specific areas, islands in particular. Although tourism, in general, has positive effects on preservation and rehabilitation of historic and cultural monuments, there are cases of their devastation and stealing by tourists.

PAP-related experts and institutions involved in this action have pointed out the need for defining a common model of the future development of Mediterranean tourism. This model would stem from identified basic principles which would secure a necessary environmental approach. As an example of basic principles within this model, the following may be pointed out:

- future tourism development in the Mediterranean should be harmonized with the environment potentials, taking a special care of the environmental sensitivity of the reception area, seismic characteristics, water-supply situation and relevant sanitary implications;

- compulsory study of possible negative effects of tourism projects on the environment (EIA);

- avoiding of exaggerated concentration of tourist activities and of developing tourism as a single industry;

- interests of the permanent population should gain greater importance, especially in islands and small coastal settlements;

- tourist motivation should be directed towards the specific natural, cultural and historic features of the reception area, but with a careful use of natural resources and historic heritage, which particularly refers to the use of historic settlements for tourism purposes, etc. etc.

The application of those and possible other principles could help arrive at a desirable concept of tourism planning and development in harmony with the environment.

Furthermore, the existing experience offers the possibility of planning and management of such tourism which can secure positive long-term economic effects, while securing an adequate environmental protection and even improvement of the present state.

An environmental approach to the planning of tourism development can not be achieved unless methods like environmental impact and carrying capacity assessments are applied. Those methods have been adequately developed and applied in the Mediterranean conditions. Such an approach implies, at the same time, the use of positive experiences applied adequately, bearing in mind the integrity of the Mediterranean eco-system, as well as its heterogeneity.

(h) <u>An environmental approach to aquaculture development - the activity of interest for all Mediterranean countries</u>

The potentialities of the Mediterranean coastal environments for the development of aquaculture have only recently been fully recognized. With this recognition, almost all the countries have implemented or are in the process of planning substantial aquaculture activities.

Although fish and shellfish have been cultured in marine waters in the region for five or six centuries, it has only been recently that intensive, more fully controlled forms of aquaculture have been attempted, and then mostly in the northwestern part. The region has had close links technologically and economically with Europe. It has, however, particular geographic and hydrobiological characteristics which dictate particular forms of aquaculture, especially in marine waters.

At least for the near future, only sites well protected from storm wave action are practical for culture purposes. This limits appropriate sites to three types: lagoons, estuaries, and sheltered coastal zones.

The open waters of the Mediterranean are relatively low in nutrients. Nevertheless, many of the lagoonal or estuarine areas receive nutrients from land-based sources. Hence those sites suitably protected for aquaculture purpose are often also those of higher nutrient concentrations. For the same reasons, however, they may also be more subject to various types of pollutions.

Marine aquaculture development started in Italy, in the delta of the Po river, and in Egypt, in the Nile Delta, many centuries ago through the progressive improvement of lagoon fisheries for mullet, sea-bass, sea-bream and eels that migrate into coastal lagoons in spring and back to the sea in the Autumn. The natural productivity of the lagoons provide excellent conditions for growth, and the techniques employed consisted primarily of improvements in the channelization of water and in the traps used to catch the fish as they returned to the sea.

During the last 15 to 20 years a new type of aquaculture has developed in the region, similar to intensive animal breeding and husbandry. To date, such "intensive" aquaculture has only proved economically interesting for relatively high priced species, owing to the high input costs and greater risks associated with disease or unusual climatic conditions. Reproduction in artificial conditions has proved particularly difficult for marine fishes. Nevertheless, there is considerable promise for such cultures in the near future. At present, there are also intermediate forms of management and culture of good quality fish and shellfish products which are suitable for protected marine waters.

The demand for seafood in the Mediterranean countries is selective, and the common coastal fish suitable for culture enjoy high prices. While only about 8 per cent of the total Mediterranean production of fish and shellfish is derived from aquaculture, their value approaches 20 per cent of the total.

While there should not be major marketing problems for these species, at least until the expected increase of 20 to 30,000 tons is reached over the next 10-15 years, a number of the countries with significant potential do not yet have the market experience and facilities needed to tap the best markets.

The aquaculture activities should be considered in a broader context of the "littoralization" which is affecting the entire area. Aquaculture, in fact, is but one of many productive activities that are exploiting more and more fully the natural resources of the coastal environments. Unfortunately, the development of aquaculture, especially in its more modern forms, has so far been seen primarily as a biotechnical problem, even though the objectives are generally spelled out in socio-economic terms. Potential interactions with other productive activities, particularly where those are mediated by environmental effects, have been little considered.

PAP, in co-operation with FAO, proposed to Mediterranean countiries the implementation of a co-operative project entitled "Definition of ecological criteria for the rational development of aquaculture in Mediterranean coastal areas" with the aim to:

- establish a conceptual and operational procedure of site evaluation and monitoring for the development and the protection of aquaculture in Mediterranean coastal environments, with special reference to lagoons; and

- to define a realistic and consistent set-up of operations necessary to calibrate and validate the procedure as a whole and its individual components.

To achieve these objectives, it is necessary to frame different production systems and their development in various environmental scenarios, to define the scenarios by means of efficient descriptors, and to choose a sampling design for each descriptor according to its specific space and time scales. Also, a set of numerical techniques has to be defined that can treat the information obtained so as to produce the desired quantitative assessments and forecasts, as well as to assess the relative significance of the selected descriptors. Furthermore, the most appropriate numerical simulation models of the ecological events that are most relevant for aquaculture production systems have to be selected and validated.

The project outputs and their associated models will be designed to be readily used by decision-makers and aquaculture professionals without a specific training. As is implicit in simulation, they can be used to perform computer experiments utilizing various types of scenarios and productive systems, prior to the real implementation of any aquaculture development.

Currently, the procurement of funds necessary for the project to be launched is under way.

(i) Environmental impact assessment - an important tool for building the environmental approach in the development activities

In September 1985, the Contracting Parties to the Barcelona Convention (the Genoa Declaration) recommended, among others, that Environmental Impact Assessment (EIA) be applied as an important tool in securing appropriate development activities.

An EIA process is often described as an assessment of how - negatively or positively - a project affects various impact indicators.

EIAs have been extensively produced and used over the last 15 years. Their wide application clearly indicates a need to ensure that environmental considerations are included in the decision making process. However, particularly in developing countries, the established procedure for EIA has met much criticism. Specifically, the following shortcomings have been highlighted:

- Collection of data for EIAs has taken considerable time, often delaying urgently needed projects;
- The infrastructure in developing countries with regard to available information, institutions and personnel has made it impossible to prepare EIAs without assistance from foreign experts. Hence, the knowledge and experience of the procedure has remained with foreign consultant firms.
- Frequently, a large proportion of the background material included in the EIAs has been excerpted from the foreign consultant's word processor memory, and ends up being identical, whether the project is proposed for wetlands of Bangladesh or the arid area of Chile.

- Past EIAs have been too voluminous (frequently more than 1,000 pages), and have often attempted to cover every theoretical possibility, with the result that they have been of little value as management tools.

- The cost of preparing EIAs is frequently high.

In order to try overcome these shortcomings amd after several meetings PAP produced, in co-operation with Oceans and Coastal Areas Project Activity Centre - UNEP (Nairobi), Co-ordinating Unit for MAP (Athens) and WHO/EURO, the proposal for a practical approach to EIA. This practical approach differs from the conventional one in the following ways:

- it recognizes and utilizes the fact that very few projects are unique in nature or size. Therefore, the knowledge about observed environmental effects in analogous cases can be used as a tool in environmental impact assessment;

- with a monitoring activity as an integrated part of EIA, errors in prediction can be observed and corrected, more knowledge about environmental consequences can be gathered on an on-going basis, and more accurate predictions can be made;

- as a consequence of better use of knowledge from analogous cases and monitoring programmes, less time-consuming and costly collection of site-specific data will be required. As a result, in the preparation of EIA one can concentrate on effects known to be of practical relevance and put less emphasis on the theoretical consequences.

The advantages of this practical approach to EIA are that in most cases;

- it can be based on existing or deducible information;
- it should be possible to produce within a few months;
- after initial training, national civil servants, administrators or scientists should be able to prepare it, so that foreign consultants should no longer be needed;
- The costs to produce EIA should be lower.

Figure 6 shows a flow chart for the EIA procedure proposed by PAP.

Currently, several countries are being testing the proposed procedure on selected projects.

(j) Integrated planning - a tool for environmentally sound development and management of Mediterranean coastal areas

Experience gained in this action has resulted from analysed and synthesised national reports obtained from 13 Mediterranean countries, from a dozen selected case studies, and a number of methodological studies.

The collected information indicates that in a majority of Mediterranean countries the integrated planning process in coastal zones has not been fully applied. Modern techniques and methods as tools of integrated planning have not yet been fully utilized. A large part of the coastal strip still calls for

adequate development and management plans, whereas the majority of completed plans deal with the coastal zones alone without taking into account the atmosphere, the adjacent marine areas (sea use), and the hinterland.

The hitherto obtained experience may be summarized in a definition of the process of integrated planning understood by the representatives of Mediterranean countries as a tool for the sound development and management of coastal areas.

"Development" can be defined as a process aimed at a general increase of the economic and social well-being of a given area which fully respects the environment and the area's resources being transformed through the achievement of the development goals. As "environment" is to be understood in holistic terms, therefore comprising physical as well as social resources, and as "development" is to be viewed as a comprehensive process, the environmental and development objectives should be complementary and interdependent.

As development has an all-embracing implication, the relevant planning process should be bassed on an integrated approach.

The integrated planning is a step forward in relation to the hitherto predominant types of planning. Contrary to the sectorial planning, such as separate economic, social and physical planning, the integrated planning strives for analytical understanding and establishment of interrelations and co-ordination among major development components. This secures a comprehensive coverage of a whole range of human activities in a given area.

The integrated planning is expected to provide a consistent and long-term framework for achieving a wished-for structure of the area's development which will be capable of incorporating and integrating economic, social, spatial and environmental components. At the same time, it should (a) provide instruments for achieving the inner balance in terms of location and distribution of activities, population, physical and social infrastructure while conserving, to the highest possible degree, the natural environment; and (b) offer a rationale of setting up a permanent environmentally sound management of the area's resources.

The character of integrated planning is process- and action-oriented.

The process-oriented character of integrated planning means that the preparation of an ultimate product-plan, as an ideal state which is to be reached in a certain future time, should not be its objective. Rather, the objective of integrated planning should be the provision of a framework for planning activities to be continuously carried out with the aim of achieving a permanent and environmentally sound management of all resources in a given area. This process incorporates several phases, namely, evaluation of the existing state and trends; formulation of goals and objectives; definition of the planning strategy, detailed proposals and policies; assessment of plan feasibility and implementation, monitoring and control over plan implementation. Continuity of planning implies a cyclic repetition of these phases or a modification of planning solutions should the monitoring register changes of the conditions which necessitated these solutions to have been proposed. Building "feedback loops" in the planning mechanism secures a degree of flexibility which is crucial for a realistic planning. Nedless to say, the

development strategy framework must be respected at all times. Such a view of the integrated planning process calls for a corresponding organizational and institutional structure.

The action-oriented character of integrated planning stems from its concern being focused on the most critical problems of the planning area (identified in the initial stages of planning), and on their resolution effectuated through specific projects which should start off as soon as their organization and financial support are secured.

Furthermore, integrated planning is a rational process since it is grounded on the existing analyses, plans, studies and projects aiming at their co-ordination. It is mostly based on available data, thus reducing the effort of collecting new information to minimum.

Both the essential characteristics of the integrated planning process underline the importance of a permanent cooperation of international, national and local authorities, experts and institutions. Such an approach differs from the approach to some other activities which start out with the commitment of a group composed of mostly foreign experts who are expected to prepare a plan which is, once their work is completed, left to local experts and institutions (usually either partially or marginally involved in the plan preparation) to carry it into effect.

Among reasons why the cooperation with local experts and institutions is essential, the following should be pointed out:

- Local experts are frequently the most competent persons for identifying the current problems of the project area. By making use of their knowledge the time otherwise needed for the analytical phases of the plan is considerably reduced.

- Involvement of local experts from the outset secures the planning to continue after PAP and MAP specialists have left the project area.

- Training of local experts either in planning tools or techniques is thus provided at a relatively low cost.

One of the aspects which have been analysed in detail in the frame of the Integrated Planning priority action, is the aspect of coast-hinterland interrelations.

Hinterland of a coastal zone should be understood as an area of dynamic natural and socioeconomic entity which does not necessarily coincide with administrative and or geographic notions and where there are interrelations and reciprocal influences.

Coast-hinterland interrelations manifest themselves in different forms and degrees in different countries of the Mediterranean region and, naturally, the consequences are different too. Despite the differences, the following categories of cases could be classified: coastal zones of high concentration in developed countries; coastal zones of high concentration in developing

countries; coastal zones in the process of developing as high-concentration zones; coastal zones of low concentration; big islands.

The commonest elements of the interrelations are: population movements, economic activities, social services, administrative links, cultural links and infrastructure.

Almost in the whole region negative effects of these interrelations have been felt. In coastal zones of high concentration they stand out as saturation of space, overpopulation, inadequacy of public services, communication problems and environmental problems, while in hinterlands they are manifested as depopulation; rural exodus, abandonment of economic activities and of agricultural land, loss of human potential, loss of attraction for capital and people, lack of development capabilities and individual initiative, high relative cost of provision of basic services, amenities and infrastructure and lack of development processes.

Measures such as national strategies of ballanced development, integrated planning, various economic incentives and restrictions have been adopted (or are to be adopted) by different Mediterranean countries in an attempt to achieve a balanced development between coastal zones and their hinterland.

Going back to the concept of integrated planning, the existing situation which has already been studied in the majority of Mediterranean countries gives cause for concern and offers a field of future cooperation and exchange of experience among Mediterranean countries.

A very significant result of this action is the conclusion arrived at by the representatives of the Contracting Parties that regardless of differences (in practice, legislation, and in planning system) there is the need for a common methodological basis for the preparation and elaboration of integrated plans in the Region. That is why PAP has prepared a common methodological framework for integrated planning in Mediterranean coastal areas.

4. Experience of general importance obtained through PAP

Drawing conclusions of general importance from each priority action of PAP is certainly beyond the scope of this paper. Also, deducing (backed up by firm arguments) the experiences of general value would be premature in the present phase of PAP. However, an attempt at dwelling on the most outstanding facts can be made.

(a) The Mediterranean coastal zone is a fragile ecosystem, already endangered and encroached in some and even irreversibly destroyed in other of its parts. It will continue to be exposed to strong pressures of development. Numerous measures and actions to protect the marine ecosystem have been taken since 1970 to reverse this undesirable process, but the formulation of comprehensive programmes to cover the protection of the entire coastal zone (sea, land, air) has still remained pending. Unless this is done quickly, the coastal areas of many countries of the Region may be further damaged by uncontrolled or ill-concieved development.

Fully recognizing this state of facts, UNEP and MAP are re-focussing their activities to coastal zone issues inviting Mediterranean countries and international agencies and institutions to employ their effort in the same direction.

(b) The programme for the protection of coastal areas should be based on a concept of environmentally sustainable development on regional as well as national levels which will secure the use of coastal areas in the best possible way.

(c) Fulfilment of such a programme should be taken as a long-term objective which can be achieved by creating the conditions for and implementing the integrated planning of coastal zones, this being a tool for their environmentally sound management, protection and development.

(d) A high degree of interest and involvement by official representatives of the Mediterranean countries and the Economic Community in the implementation of MAP and PAP has confirmed that such an important objective is hardly possible to achieve without an intensive and carefully concieved programme of permanent intra- and extra-Mediterranean cooperation.

MAP - ORGANIZATIONAL CHART

UNITED NATIONS CONFERENCE ON THE HUMAN ENVIRONMENT, STOCKHOLM 1972

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UNITED NATIONS ENVIRONMENT PROGRAMME - UNEP, 1972

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CONVENTION FOR THE PROTECTION OF THE MEDITERRANEAN SEA AGAINST POLLUTION, BARCELONA (1976-1978)

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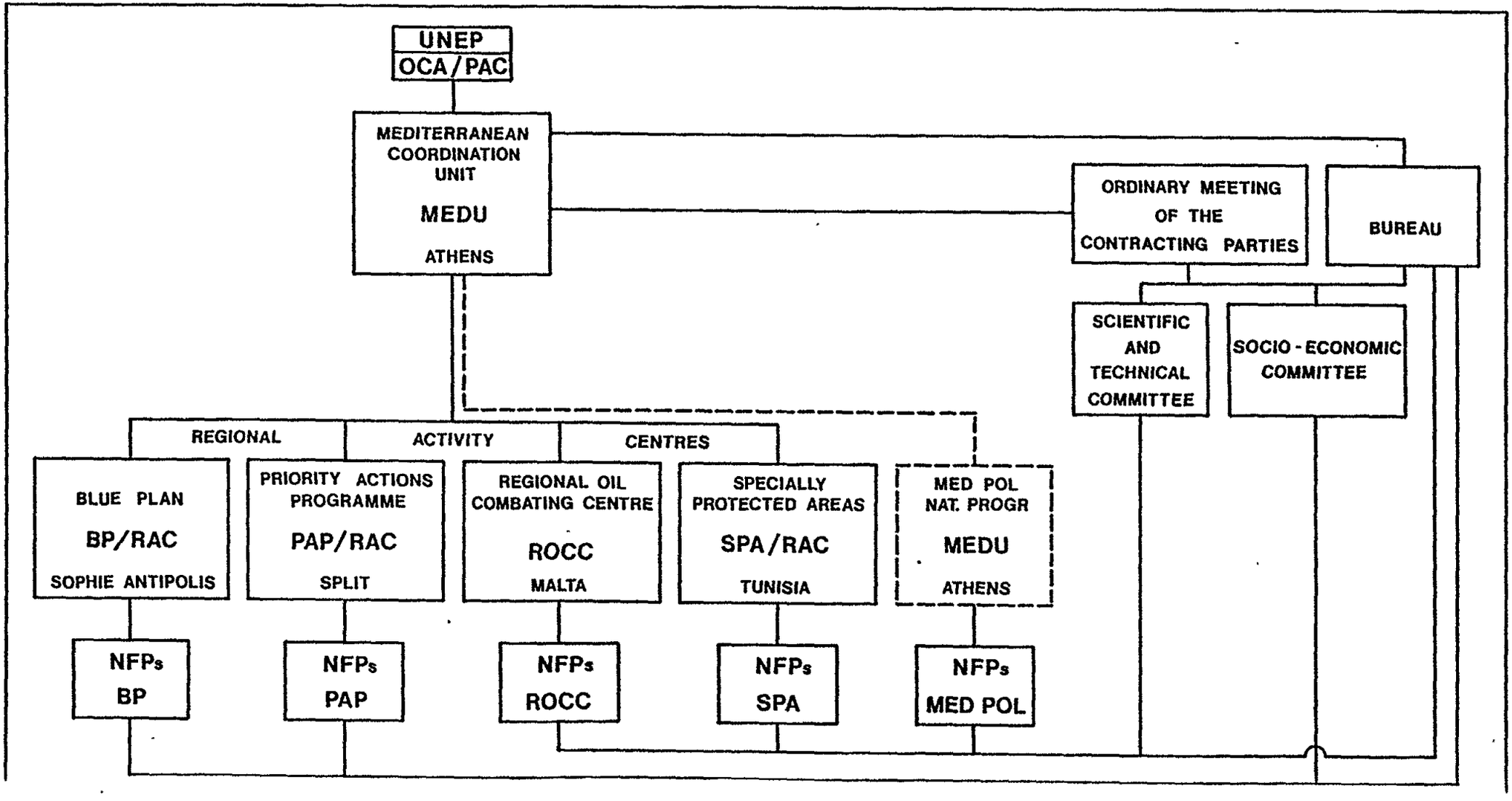
MEDITERRANEAN ACTION PLAN - MAP



PAP - DEFINITION AND OBJECTIVES

DEFINITION

PART OF THE SOCIO-ECONOMIC COMPONENT OF THE MEDITERRANEAN ACTION PLAN

A PRACTICAL ACTION-ORIENTED PROGRAMME BASED ON AVAILABLE MEDITERRANEAN AND INTERNATIONAL KNOWLEDGE

OBJECTIVES

TO CONTRIBUTE TO THE EXCHANGE OF EXPERIENCE AMONG MEDITERRANEAN COUNTRIES THROUGH:

- NETWORK OF EXPERTS AND INSTITUTIONS,
- SUBSTANTIVE DOCUMENTS (NATIONAL REPORTS, CASE STUDIES, SEMINAR AND WORKSHOP REPORTS, GUIDELINES, CODES OF PRACTICE, METHODOLOGICAL DOCUMENTS ETC.),
- TRAINING (EXPERT MEETINGS, SEMINARS, WORKSHOPS, TRAINING COURSES),
- EXPERT MISSIONS TO INTERESTED MEDITERRANEAN COUNTRIES.

TO COOPERATE WITH NATIONAL AND LOCAL AUTHORITIES AND INSTITUTIONS IN STRENGTHENING NATIONAL AND LOCAL CAPACITIES FOR PLANNING AND MANAGEMENT OF COASTAL ZONES THROUGH:

- PROVISION AND DISSEMINATION OF TOOLS AND TECHNIQUES FOR INTEGRATED PLANNING,
- TRAINING OF NATIONAL AND LOCAL EXPERTS,
- FORMULATION AND IMPLEMENTATION OF MULTILATERAL MEDITERRANEAN COOPERATIVE PROJECTS,
- DIRECT COOPERATION WITHIN SITE-SPECIFIC COUNTRY PROJECTS.

PAP - PRIORITY FIELDS AND ACTIONS

PRIORITY FIELDS	PRIORITY ACTIONS
1. WATER RESOURCES	A. WATER RESOURCES MANAGEMENT IN THE MEDITERRANEAN ISLANDS AND ISOLATED COASTAL AREAS
2. HUMAN SETTLEMENTS	B. INTEGRATED PLANNING AND MANAGEMENT OF THE MEDITERRANEAN COASTAL ZONES +
	C. REHABILITATION AND RECONSTRUCTION OF THE MEDITERRANEAN HISTORIC SETTLEMENTS +
	D. LAND USE PLANNING IN EARTHQUAKE ZONES
	E. SOLID AND LIQUID WASTE MANAGEMENT +
3. SOIL PROTECTION	F. PROMOTION OF SOIL PROTECTION AS AN ESSENTIAL COMPONENT OF THE ENVIRONMENTAL PROTECTION OF THE MEDITERRANEAN COASTAL ZONES +
4. TOURISM	G. DEVELOPMENT OF MEDITERRANEAN TOURISM HARMONISED WITH THE ENVIRONMENT
5. AQUACULTURE	H. ENVIRONMENTALLY SOUND MANAGEMENT OF MEDITERRANEAN AQUACULTURE
6. RENEWABLE SOURCES OF ENERGY	I. RENEWABLE SOURCES OF ENERGY
	J. ENVIRONMENTAL IMPACT ASSESSMENT IN THE DEVELOPMENT OF MEDITERRANEAN COASTAL ZONES +

+ Targets of the Genoa Declaration on the Second MAP Decade

PRIORITY ACTION - METHODOLOGICAL APPROACH

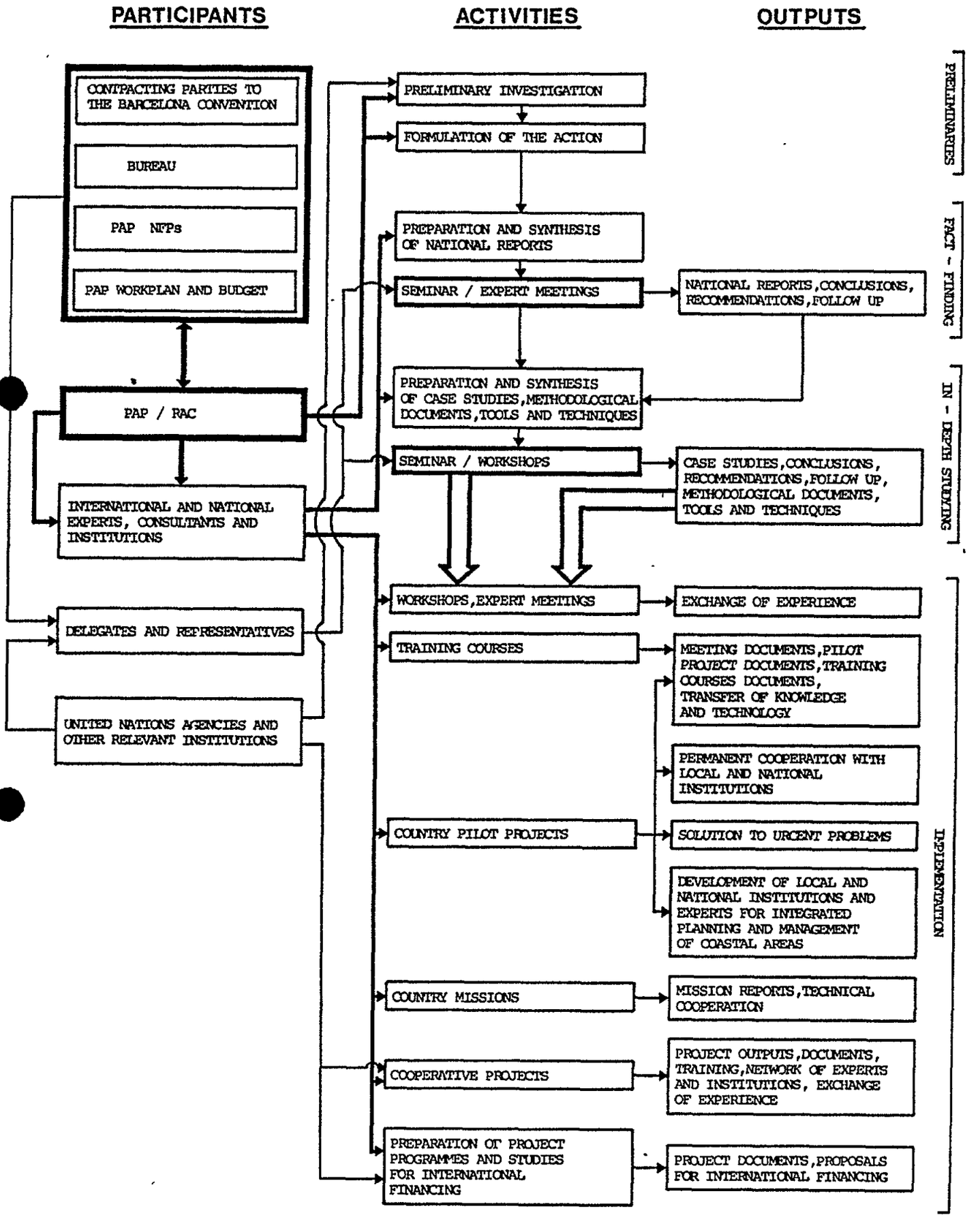


Figure 5

THEMATIC FRAMEWORK - SEISMIC RISK REDUCTION
(PAP Seminar, Cetinje 1985)

This framework provides a logical and sequential scheme for all aspects of seismic risk reduction: training, planning and application.

(a) Earthquake Hazard Assessment

The subjects to be covered are:

- Observation of seismic phenomena (instrumental networks and monitoring).
- Seismological and seismotectonic studies/maps.
- Geological.
- Seismic hazard mapping (macro and micro-zoning) for landuse planning and urban design.

Those involved are geophysicists, geologists, engineering seismologists and landuse planners.

(b) Vulnerability Assessment

The subjects to be covered are:

- The study of the behaviour of structures under seismic conditions.
- Damage analysis (empirical and theoretical).
- Vulnerability Assessment of buildings and infrastructure including life-lines.
- Aseismic building codes for interdisciplinary use.
- Understanding Vulnerability for planners and policy makers.

Those involved are civil/structural engineers, engineering seismologists, architects and builders.

(c) Earthquake Risk Reduction and Management

The subjects to be covered are:

- Physical planning and building:

  . earthquake risk (loss) assessment;
  . physical planning (regional), landuse planning and urban design;
  . aseismic building design and appropriate technologies;
  . revision of regional economic and development plans as a function of such scenarios;
  . protection of historical settlements.

Those involved are planners, geophysicists, architects, civil/structural engineers, economists, and historians.

- Legislation:

  . planning legislation for disaster mitigation;
  . building regulations and controls;

. preparedness legislation.

This involves the legal profession and legislators, administrators, civil/structural engineers, planners and civil defence personnel.

- Disaster preparedness (emergency planning and management):

  . earthquake scenario design;
  . preparedness planning;
  . access and evacuation;
  . rescue;
  . shelter and related services;
  . demolition and clearance.

Those involved are civil defence personnel, geophysicists, engineers, administrators, architects, social and related services.

- Public awareness of earthquake risk:

  . public information and education;
  . simulation based on earthquake scenarios, with special reference to access, rescue and evacuation.

This involves the media, civil defence and administrators.

- Policies and strategies:

  Synthesis of results for the benefit of national programmes and co-operation, to be considered at the decision-making (political) level.

This involves politicians, administrators, with senior planners, engineers, geophysicists and civil defence personnel as advisers.

In order to be clear on terminology, the following definitions of earthquake hazard, vulnerability and risk were used in the preparation of this framework:

Hazard, meaning the probability of occurrence, within a specific period of time in a given area, of a potentially damaging earthquake.

Vulnerability, meaning the degree of loss to a given element at risk or set of such elements resulting from the occurrence of an earthquake of a given magnitude and expressed on a scale from 0 (no damage) to 1 (total loss).

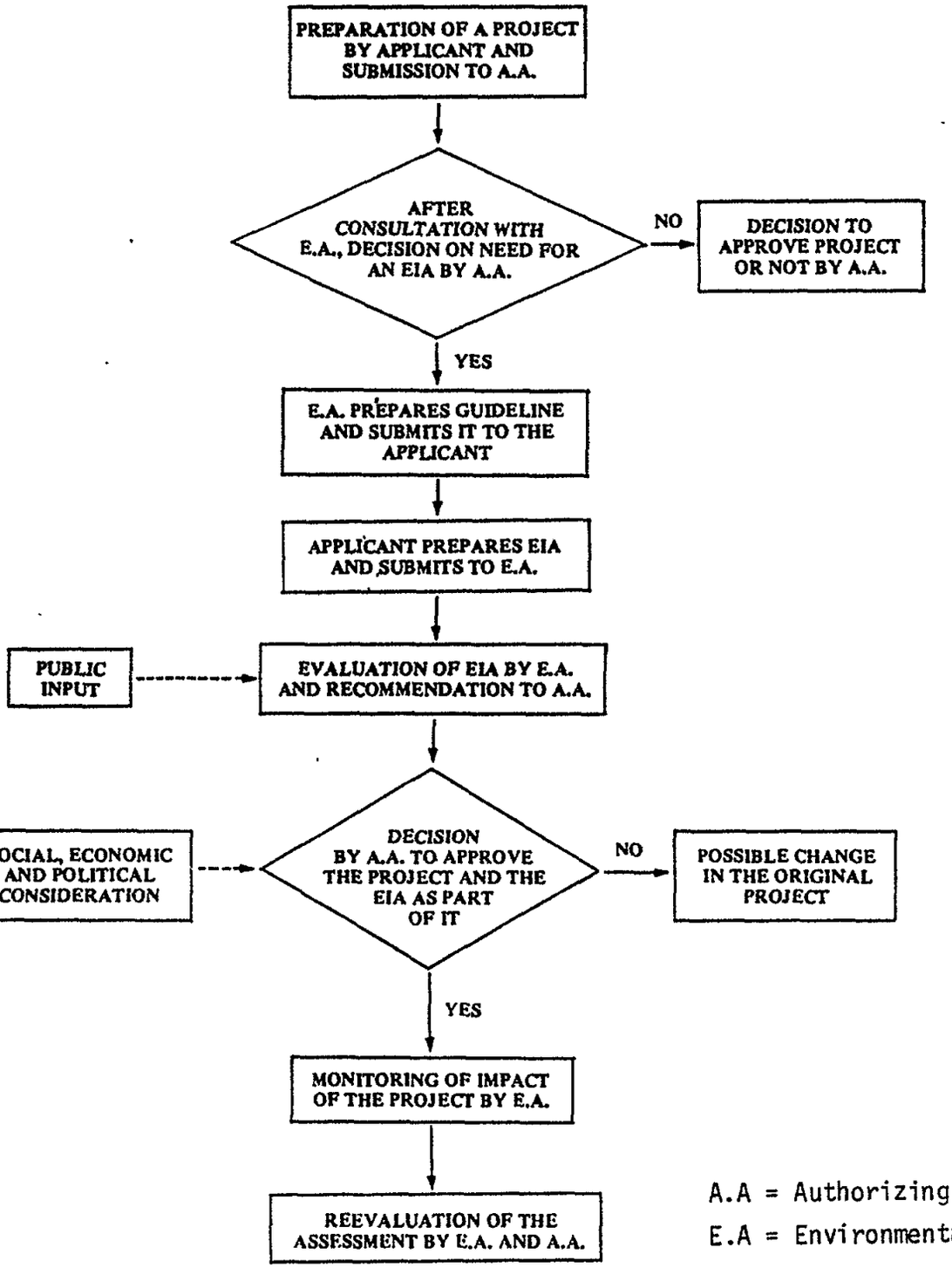
Specific Risk, meaning the expected degree of loss due to a particular natural phenomenon and as a function of both hazard and vulnerability.

Risk, meaning the expected number of lives lost, persons injured, damage to property and disruption of economic activity due to a particular earthquake and consequently the product of a specific risk and elements at risk.

Elements at risk, meaning the population, building and civil engineering works, economic activities, public services, utilities and infrastructure, etc. at risk in a given area.

Figure 6

A FLOW CHART FOR THE EIA PROCEDURE



A.A = Authorizing Authority

E.A = Environmental Authority