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REPORT ON THE IMPLEMENTATION OF PAP IN 1992 AND ACTIVITIES SCHEDULED FOR 1993

Cooperative Project on Seismic Risk Mitigation
in the Mediterranean
(SEISMED)

Introductory Note prepared by PAP/RAC
Final Report of the Project prepared by UNDRO-Geneva

DHA-UNDRO/UNDP-OPS

Cooperative Project for Seismic Risk Reduction
in the Mediterranean Region

S E I S M E D

RER/87/022

T E R M I N A L R E P O R T

Geneva, October 1992

INTRODUCTORY NOTE

Prepared by PAP

"Cooperative Project for Seismic Risk Reduction in the Mediterranean Region" was concluded in the beginning of 1992.

That project was initiated, formulated and prepared within the PAP action on land-use planning in earthquake zones launched in 1984. After the completion of national reports of 9 countries and a number of topic-specific case studies, 2 seminars were organized (Cetinje, 1985; Genoa, 1987), and a project proposal was formulated. The proposal was discussed and adopted by the 5th Ordinary Conference of the Contracting Parties (Athens 1987).

In the period 1987-1989, PAP was working, in cooperation with UNDRO, UNIDO, UNESCO, and UNCHS, on the creation of conditions for its implementation. The project was finally launched in 1990 with a strong financial support of Italy. The project was implemented through UNDP, while UNDRO acted as implementing agency. In the implementation phase of the project, PAP was involved as a member of the Steering Committee, and participated in the workshops organized within the project. At that, the principal interest of PAP was the use of the project results for land-use planning (macro and micro zoning) within the process of coastal zone planning and management.

All Mediterranean countries participated in the implementation of the project.

PAP/RAC deems the results of the project important and applicable in the Mediterranean conditions, and the project itself successful.

In the 7th Ordinary Conference of the Contracting Parties, PAP was endorsed to monitor the results of the project and to propose the follow-up activities, to be performed after its conclusion.

With regard to the importance of seismic risk mitigation within the process of integrated planning and management of Mediterranean coastal zones, it is expected that the results of the project and the proposals for the follow-up will be presented by a representative of UNDRO.

The participants of the Meeting of National Focal Points for PAP, as well as all other users of this document should kindly note that, for the reasons of economy, numerous annexes and tables, which make part of the original report, have been omitted from this document. The complete original report can be obtained upon request.

I. INTRODUCTION

A. Background

Mention has already been made in the SEISMED Project Document of the background to the project: earlier earthquake disasters in the Region had engendered UN cooperation in the past. More recently, several UN Agencies, notably the Priority Actions Programme (PAP) of the UNEP Mediterranean Action Plan (MAP) together with UNESCO, UNCHS and UNDRR, continued to draw the attention of Mediterranean States to the ever rising level of seismic risk in the Region, and to the need to address it comprehensively. It is the comprehensive, multidisciplinary character of the present project, therefore, that constituted its originality and the relevance to prevailing conditions.

The Mediterranean Region is not only an area where countries share the threat of earthquake disasters, but it also possesses many cultural and historical ties. It has a distinct character of its own. The 17 countries bordering the Mediterranean Sea, and participating in SEISMED, cover about 8,000,000 square kilometres, and are populated by some 350,000,000 human beings. The level of exposure of settlements and infrastructure to earthquakes is constantly on the rise owing to rapid population growth, industrialization and urbanization. These processes combined produce large concentrations of population throughout the Region, and have dramatically increased the level of exposure to seismic risk over the years. Along the southern and eastern borders of the Mediterranean Sea, countries double their populations practically once per generation, and the size of their cities twice as fast. Hence, the urgent need for seismic approaches to planning and development where earthquake hazard is visibly a threat. The same form of reasoning applies to all aspects of the environment including, for example, integrated coastal zone management, pollution, soil erosion etc. Now, more than ever, planning and development must take into account the convergence of natural and human pressures on the environment.

B. How the project started

The seeds of the present project were first sown at the UNEP/PAP Regional Seminar on "Land Use Planning in Seismic Zones", held at Cetinje, Montenegro, during the summer of 1985. This idea was later elaborated into a draft Project Document at PAP's Centre in Split. Subsequently, the Fourth Conference of the Contracting Parties to the Barcelona Convention on the protection of the Mediterranean Sea against pollution, held in Genoa, Italy, in September 1985, endorsed the project within the framework of the Convention and PAP's work plan. In 1986, UNDP's European Programme Task Force on Science and Technology for the Fourth Programming Cycle, 1987 - 1991, also endorsed the project and recommended to the UNDP Administrator that funding be provided (\$200,000). In May 1987, the Italian Government informed UNDP of its intention to support the project as well. Indeed, Italy had

recently suffered damaging earthquakes in the Friuli region (1976) and Irpinia (1980), and wished to broaden its own cooperation with Mediterranean countries as a result. The City of Genoa offered to host the project at the Castello d'Albertis. In July 1987, the Italian Government convened an inter-Agency meeting at Genoa to discuss project content and implementation. It was agreed that UNDP/OPS would execute the project and that, by subcontract, UNDRO would assure its scientific and technical implementation, and that UNEP/PAP would be a member of the project's steering committee. Other UN Agencies were invited to participate in the project on an ad hoc basis. In addition to UNDP rules and procedures, the Barcelona Convention would also apply in matters pertaining to project relations with the countries and participation. The UN Agencies that participated actively were UNEP/MAP/PAP and UNESCO at the project Workshops.

Finally, following discussions at UNDP/OPS, New York, after the Genoa meeting, a preparatory phase was launched with UNDP funds pending the arrival of Italian funds. OPS hired a consultant who subsequently became the project manager. The preparatory phase consisted in drafting the Project Document for the first steering committee meeting held in Genoa from 6 to 8 April 1988, and finalizing it; setting up the project office in Genoa; establishing working contacts with the 17 participating countries of the Mediterranean Region; obtaining their signatures for the Project Document; and preparing the professional and operational basis of the project (how to organise the activities and outputs of the project, and providing for each a suitable format and scheme of contents).

The first tranche of the Italian contribution (\$1,000,000) was transferred to UNDP in July 1989. For staffing reasons, the Genoa and UNDRO operations were divided up as follows: UNDRO, the implementing Agency, assumed responsibility for the technical and substantive implementation of the project; the SEISMED office in Genoa took responsibility for promoting the project's objectives and philosophy, networking among the countries, and organising all project activities. All those concerned are pleased to report that the representatives of the countries, the Agencies, the project office in Genoa, UNDP/OPS and UNDRO collaborated closely and harmoniously throughout the project.

II. REPORT AND RESULTS

The scope and complexity of SEISMED measured against the duration and resources of the project suggested that it was but the start of a process. The project could probably do no more than identify issues, needs and capabilities, provide some training, and disseminate commonly acceptable methods and techniques, thus creating the foundation of a regional system of cooperation. In this sense, the present project undoubtedly constituted an important step forward in spite of shortcomings which will be referred to.

A. Development Objective

The overall aim of the project was to mitigate earthquake disasters in the Mediterranean Region by managing earthquake risk in a multidisciplinary mode. This called for synergism between countries of the Region, leading to the establishment of a permanent self-sustaining regional cooperation, together with the development, transfer and adoption of common methods and techniques in the three main areas of concern of the project (seismic hazard assessment, vulnerability analysis and seismic risk reduction). It is obvious that, as stated, the development objective was over-ambitious. It would have been more realistic to aim, in the first instance, at contributing to the reduction of earthquake risk through the promotion of cooperative arrangements and the exchange of information between the countries concerned. To reduce risk to any measurable extent would, in fact, require a much longer project period and a vastly greater budget. Nevertheless, in so far as the project succeeded in bringing the countries repeatedly together, assisting them in exchanging knowledge and experience on common topics in a systematic fashion, and promoting Regional cooperation, a move was certainly made in the right direction.

B. Immediate Objectives

The immediate objectives of the project followed the scheme of the *Thematic Framework* which was designed to ensure the application of a logical and coherent process to reduce earthquake risk:

1. Hazard (the scientific component): to evaluate the extent and importance of seismicity and earthquake hazard at regional, national and local levels;
2. Vulnerability (the engineering component): to evaluate the degree of vulnerability of structures to earthquake hazard and recommend methods for vulnerability reduction;
3. Risk (the socio-economic and planning components): to assess the expected losses due to earthquakes, as derived from the convolution of hazard, vulnerability and elements at risk; to recommend the corresponding policies, measures and techniques to mitigate earthquake disasters; and to synthesise project findings in this respect for national policy making and programming.

Once more, the project document proved to be over-ambitious in the statement of its immediate objectives. As intimated above, project resources and time allowed the sixteen countries to do no more than provide an overview of the state of the art in the Region on each topic. As was to be expected, no integration of the three topics exists anywhere in the Region. As usual, the bulk of the emphasis is laid on seismicity, somewhat less on seismic hazard, even less on vulnerability (except in terms of

building codes), and very little on earthquake risk management. This state of affairs is clearly apparent in the outputs of the project. It is one that needs to be addressed as a matter of priority in any follow-up programme. In any event, the countries themselves should, of their own accord, become more active in pulling together the threads of the problem if we are to expect a reduction of earthquake-related losses in the future. The problem is not merely scientific, but social and political as well.

C. Special Considerations

Reference was made in the project document to the protection of historical settlements and the environment, but the project was designed to address seismic risk as a general problem. Nonetheless, better construction and land use practices in the face of earthquake hazard would, for example, help to diminish the risks of industrial pollution, especially on the coast and offshore. So too with repair and strengthening in relation to historical buildings and settlements.

D. Activities¹

For reasons of logic, the activities are reported on before the outputs. The activities enumerated below relate to the corresponding Immediate Objectives 1 to 3 (i.e. 1. Hazard Assessment, 2. Vulnerability Analysis, 3. Risk Assessment and Reduction). These activities were carried out by the project staff with the advice and assistance of a chief scientific adviser, experts and institutions of the participating countries, and of the United States Geological Survey. A select group of international consultants also provided professional support to the project.

In order to instill a genuine spirit of cooperation among the countries concerned, the project management devised a simple but effective method of implementation: the project would use the Workshops as its centre of gravity, as it were, because it was at these events that all the 17 participating countries were² assembled together continuously for up to a week at a time. It was at the Workshops that current and future activities were described and discussed, formally and informally. For this reason, the Workshops were carefully prepared events.

Each Workshop was preceded by an Expert Group Meeting at which subject matter, topics, programme, agenda and group training materials were discussed, selected and written up for formal transmittal to all the countries well ahead of time. The countries were therefore meant to come to each Workshop fully prepared, and the project is pleased to report that they

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See Annex I

cooperated with enthusiasm. Each Expert Group was attended by experts from the Region, the project's Chief Scientific adviser, the project's Training Adviser, selected consultants, and Project/Agency personnel.

The Workshops themselves were essentially information exchange and group training events. There were keynote addresses by eminent specialists from around the world, national presentations, special presentations, and small group training sessions discussing questions and problems prepared by the preparatory Expert Groups. For the sake of feedback, participants were asked to evaluate each workshop at its conclusion. Those countries that had not been able to prepare their national reports or special papers in time for the Workshops were given time to do so afterwards so that these could still be included in the Workshop proceedings. All national focal points were paid a fee for coordinating their countries' inputs to the Workshops.

In order to save time and money, and also to benefit from the presence of the appropriate national representatives/experts, the project's Steering Committee met for a day at the end of each Workshop. In this manner, many issues and recommendations discussed at the Workshops were acted upon immediately, which helped the decision making process, and thus the project management, in getting on with the next stage of the work... The Steering Committee discussed all aspects of implementation which deserved its attention: the workshops, training and fellowships, data and information base, the work programme, dates, topics, priorities, the budget etc.

Concerning data collection, an OPS consultant on data bases visited Genoa at the very beginning of the project. It immediately became apparent that creating a "data base" in its literal sense was a task of enormous complexity, and logistically impossible within the project's life and resources. The project management decided, therefore, to create an "information base" from heterogeneous sources, as the project went along. Activities 1.a/b; 2.a/b; 3.a/b describe the creation of the information base. These activities were carried partly independently, partly in conjunction with the Workshops, and partly also in conjunction with expert group meetings. In June 1988, a first questionnaire on seismic hazard was prepared and sent to the countries. Twelve countries replied. This questionnaire was followed by one on vulnerability assessment, to which nine replies were received, which was hardly surprising in view of the diversity of issues addressed with that theme alone, and the unfamiliarity of the countries at the time with the notion of vulnerability. The results of the two questionnaires are contained in the information base. Preparing a meaningful or manageable questionnaire on earthquake risk would have been even more problematical.

It was realised early on that holding two separate workshops per theme/objective, i.e. two on hazard, two on vulnerability, two on risk, and a round table in addition, would put too great a strain on the time and money of the project. Furthermore, such a procedure risked reinforcing the very professional compartmentalization which the project sought to break down. The project management considered that a certain amount of consolidation could provide economies of scale and improve interdisciplinarity. The project management proposed to the steering committee that three large workshops be held (one per theme objective) instead of six smaller and specific events, and that the fellowships programme be absorbed into the workshops as well. After giving the matter much thought, the steering committee agreed, although with some reluctance concerning the absorption of the fellowships. The problem here was that, in any case, no appropriate tailor-made fellowship programme was available in the Region for the time and money available - a perennial question. The round-table idea was absorbed the last workshop.

The activities of the project were thus scaled down to manageable proportions³, the workshops being the focus and source of all cooperation, information on the state of the art, documentation, data collection and training. The steering committee gave legitimacy to how the project was implemented. All project changes were incorporated in a revision to the project document.

E. Outputs²

The outputs of the project were re-arranged in accordance with the modifications to the ultimate scope of project activities.

The final outputs of the project are as follows⁵:

1. Proceedings of Workshop I on Seismic Hazard Assessment (National Reports, Case Studies, Technical papers, Group Exercises);
2. Proceedings of Workshop II on Seismic Vulnerability and Risk Assessment (National Reports, Technical Papers, and Group Exercises);
3. Proceedings of Workshop III on Seismic Risk Reduction and Disaster Management (National Reports, Technical Papers, and Group Exercises);
4. SEISMED II Project Proposal: "Earthquake Risk Management and Seismic Monitoring in the Mediterranean Region";

² See Annex II

5. Project Pamphlet, published in English, French and Italian when the project officially started, and disseminated throughout the Region;
6. Miscellaneous Papers: a series of reports not included in the Workshop Proceedings;
7. Feasibility Study for a Mediterranean Atlas on Seismic Risk: a proposal to produce a set of maps and text concerning the major issues;
8. Preliminary Information Base: material assembled from the Region by the Genoa project office, list of institutions, experts and bibliography.
9. Evaluation Report: an independent evaluation of the project's aims and performance by a prominent specialist, as per UNDP rules;
10. SEISMED, An Overview: the overall philosophy and strategy of the project, together with the synthesis of the three Workshops;
11. Terminal Report to UNDP;

It is worth emphasizing that each of these outputs satisfies the formal requirements of the project document, and more (i.e. Outputs 4, 5, 6, & 7 are additional). The three voluminous Workshop Proceedings contain not only the reports required, but also the methodologies and case studies mentioned in the project document (Outputs 1.d; 2.c; 2.d; 2.e; 3.c; 3.d; 3.e). The entire subject of syntheses and overviews, particularly as required under Outputs 3.f & 3.g, are contained in Output 10, the project Overview as a whole.

F. Inputs

1. Italy

The Italian government provided \$1,388,000 under a cost-sharing arrangement with UNDP. The Italian Government also provided a junior professional officer for three years to assist UNDP in implementing the project. This contribution in kind has been estimated at estimated at roughly \$180,000.

As host, the City of Genoa placed at the project's disposal some 300 square metres of office space at the Castello d'Albertis. This contribution in kind is estimated at \$200,000.

2. UNDP

UNDP provided \$200,000 from IPF funds, and executed the project through OPS.

3. Participating countries

All Mediterranean countries were invited to participate in the project. Seventeen countries participated actively: Albania, Algeria, Cyprus, Egypt, France, Greece, Israel, Italy, Libya, Malta, Monaco, Morocco, Spain, Syria, Tunisia, Turkey, and the former Yugoslavia. The countries provided the knowledge and experience of their professionals for the Expert Working Groups, the Workshops, and the preparation of documents. The countries also provided one representative each at the steering committee, which met on four occasions during the course of the project.

It was noted that the participating countries were predominantly active and experienced in the seismological field, and to some extent in hazard assessment, and that they were far less so in the more practical issues of aseismic planning and building, and risk management. This trend confirmed the need to address the earthquake problem very much more actively at the user end.

4. UN Agencies

Under an interagency agreement between UNDP/OPS and UNDR0, the latter ensured the overall professional back-stopping for this initiative in comprehensive disaster mitigation, in accordance with the *Thematic Framework*. Other UN Agencies such as UNCHS (Habitat), UNEP (PAP/RAC), UNESCO and UNIDO were invited to participate in project activities, essentially the Workshops. The specialist services of UNESCO, in the field of seismic monitoring and assessment, were specifically engaged by the project. UNEP/MAP/PAP participated regularly at the project Workshops and was a member of the steering committee.

G. Results

SEISMED having been conceived of as a project to promote and establish Regional cooperation within a relatively short period and with limited resources, one cannot easily speak of results in purely quantitative terms, such as measurable country achievements in earthquake loss reduction. One should rather speak in terms of technology transfer, increased awareness and cooperation. It would in fact take years before seismic zoning and micro-zoning, followed by the corresponding land use plans and building regulations resulted in measurable results. In any case, it is only by comparing the effects of different seismic events over time in given locations that an objective measure can be made of loss reduction, and one does not wish more disasters on humanity than it must endure.

Through SEISMED, the United Nations has succeeded in assembling a comprehensive body of knowledge on earthquake disasters and response from the entire Mediterranean Region, knowledge which would have otherwise remained scattered and difficult of access.

Moreover, one cannot underestimate the political significance of enhanced Mediterranean cooperation. During the course of the project, scientists, engineers, planners and administrators from the entire Region met on successive occasions, at Workshops and Expert group meetings, and so came to know and understand each other exceedingly well. This resulted in the willingness, indeed eagerness, of those involved to create a well coordinated body of knowledge amounting to some 2000 published pages from the Workshops alone on Seismic Hazard, Vulnerability and Risk. To that, one must add all the supplementary material contained in the Information Base, the Miscellaneous Papers and the Feasibility study for a tentative Seismic Atlas. Altogether, the project published about 2500 pages of detailed scientific, technical and socio-economic information on earthquakes and their effects. In working together and exchanging experience and ideas, the many specialists from the Region quickly developed common approaches and views, with the result that the foundations for future cooperation have been well established. The problem now is not to lose the momentum achieved so far.

A further result of SEISMED is the feedback into the countries independently of the project itself. For example Algeria, Tunisia, and Turkey (and probably others at the time of writing this report) have organised national Workshops along the same lines as the SEISMED Regional Workshops. Furthermore, the project was instrumental in enhancing communication within the countries, and also among them. The project was also instrumental in confirming what certain institutions were already striving for.

A number of countries identified various fields in which they had experience and could continue to cooperate:

- Albania: seismological observations; hazard assessment; earthquake damage evaluation;
- Algeria: seismic hazard assessment (seismic micro-zoning); revisions to aseismic building codes; disaster preparedness;
- France: seismological observations (seismic zoning); aseismic building codes; disaster preparedness (ORSEC plans);
- Italy: seismic hazard assessment, vulnerability assessment, the protection of historical settlements, and disaster preparedness;
- Greece: seismological observations and hazard assessment; earthquake scenario design for disaster preparedness;
- Morocco: seismological observations (seismic zoning);
- Turkey: vulnerability analysis with special reference to traditional construction; disaster legislation, disaster preparedness;
- Former Yugoslavia: earthquake hazard assessment, damage and vulnerability assessment methodology, risk assessment and physical planning in seismic zones;

Finally, cooperative test sites were identified by the countries themselves for comprehensive earthquake risk assessment and reduction in the following localities: Benevento (Italy); Ohrid (Macedonia); Tirana (Albania); Gediz (Turkey); Agadir (Morocco); Chlef (ex El Asnam) (Algeria). These test sites, are open to all participating countries, and even to countries outside the region. The problem is to obtain support to carry such cooperative and development work forward in which 17 countries may work together on the same problems so as to better coordinate earthquake risk reduction measures and policies in the region.

III CONCLUSIONS

At a rough estimate, earthquake damage throughout the Mediterranean Region, averaged out over the last two decades, must amount to several billion USA dollars per annum. This does not account for indirect losses such as social disruption, loss of productivity, loss of employment and so on. Investment in loss reduction should, therefore, not be looked at as an occasional arrangement. The protection of capital investment, not to mention human lives, economic activity and cultural property, in highly seismic zones should be systematically assured. The only way to assure such protection is to devote a certain percentage of all capital investment to the evaluation of the risks involved and the measures to adopt in consequence thereof. Such a step should be encouraged by the United Nations system as a matter of policy, and supported by member states, especially those who have a direct interest in the matter and the means to act.

The future of SEISMED was discussed at Workshop III, the final major event of the project, held in Rome in November 1991. The outcome of that discussion is summed up in Table 3. The fact that most Mediterranean countries designated test sites is evidence that the co-operative network developed by SEISMED can be transformed into an operational regional system of research, exchange of results and implementation. Such an initiative can save funds and manpower and accelerate the application of modern methodologies. The novelty lies in the complexity of the activities planned in the proposed sites starting with local hazard and vulnerability assessments and culminating with disaster management plans. These regionally co-ordinated programmes reflect the needs of Mediterranean countries to introduce as soon as possible cost effective risk-reduction measures. In the long term, the expected outputs can undoubtedly contribute to a substantial improvement in the protection of populations and major investments from the adverse effects of large earthquakes.

Taking the foregoing into consideration, a SEISMED II proposal was prepared by the project management, submitted to the Italian Government for its consideration, and cleared by the project steering committee. This proposal also included an important instrumental component arising out of contacts established with scientific institutions in Italy desirous of co-operating with

the Mediterranean Region through SEISMED. The idea was, therefore, for the instrumental and disaster mitigation components of a new activity to be mutually supportive.

Thus, the foundations of follow-up action have been laid. It is up to all the actors involved to take a stand on the matter. Those who have had responsibility for the implementation of the project on the UN side believe that SEISMED was in fact an exploratory project, the object of which was not only to promote Regional cooperation and technology transfer, but also to ascertain whether, indeed, earthquake loss management was under control, or whether more needed to be done. SEISMED turned out to be the start of a pre-investment activity that, with adequate follow-up, ought to result in controls designed to reduce earthquake losses over time. There is no over-night curative solution. As for all preventive measures, results can only be achieved over time. Indeed, it takes time, trouble, political and social will to change land use practices, building regulations, and above all attitudes in favour of the economic advantages of mitigation. A further sustained effort among the countries concerned is required, all the more so in times of economic recession: the competition for resources has stiffened. At the time of writing this report, the project management is working on a contingency plan to revise the SEISMED II proposal as a function of diminishing resources. It is hoped that the participating countries will examine every avenue of cooperation, especially through contributions in kind.

ANNEX I

List of Activities as specified in the Project Document

The activities enumerated below relate to the corresponding Immediate Objectives 1 to 3.

1. Earthquake Hazard Assessment (Immediate Objective No.1):
 - (a) Identification of regional and national institutional and experts in the field of seismology and earthquake hazard assessment;
 - (b) Collection, recording, analysis and dissemination to participating countries of data on geology, tectonics and seismology, regionally, nationally and locally;
 - (c) Workshop on assessment and mapping of earthquake hazard based on the analysis of the data collected, macro- and microzoning as appropriate;
 - (d) Workshop on the interpretation of earthquake hazard in terms appropriate for planners, architects and administrators based on an interdisciplinary approach (reformatting), and leading to practical vulnerability analysis techniques ;
 - (e) Six fellowships;
2. Earthquake Vulnerability Assessment (Immediate Objective No. 2):
 - (a) Identification of regional and national institutions and experts in the field of earthquake engineering and aseismic design;
 - (b) Collection, recording, analysis and dissemination to participating countries of data on the behaviour of structures (including lifelines) under seismic conditions;
 - (c) Workshop on the development of damage inspection techniques for structural systems, lifelines and historical buildings exposed to earthquake hazard; and on the development of theoretical damage estimations under laboratory conditions;
 - (d) Preparation of methodologies on vulnerability assessment;
 - (e) Workshop on vulnerability assessment and its practical application to physical planning, building, and disaster preparedness;
 - (f) Seven fellowships;
3. Earthquake Risk Reduction (Immediate Objective No.3)
 - (a) Identification of regional and national institutions and experts for disaster preparedness and mitigation;
 - (b) Collection, recording and dissemination of data on loss assessment and disaster mitigation methods;
 - (c) Workshop on earthquake risk assessment: development of methods to combine hazard and vulnerability analyses in order to assess expected earthquake losses to structural systems, lifelines and historical buildings, i.e. risk;
 - (d) Workshop on methods and techniques: preparation of

- comprehensive mitigation plans and measures to mitigate earthquake disasters in regional economic planning, land use planning, urban design, building, civil defence (preparedness) and public awareness/information;
- (e) Round table for decision makers on strategies: policies and measures for reducing earthquake risk, and their implementation;
 - (f) Preparation and dissemination of synthesis of project's findings;
 - (g) Seven fellowships;

With the agreement of the steering committee and UNDP, the project management combined a number of activities as follows:

- * Workshops 1.c & 1.d into Workshop I on Seismic Hazard Assessment;
- * Workshops 2.c & 2.e into Workshop II on Seismic Vulnerability;
- * Workshops 3.c, 3.d & 3.e (Round table) into Workshop III on Seismic Risk Assessment;
- * Proceedings of each Workshop merging material requested in various outputs;
- * Activities 1.a & 1.b; 2.a & 2.b; 3.a & 3.b were combined as part of creating a Mediterranean Information Base;
- * The Fellowships were incorporated into the Workshops.

ANNEX II

List of Outputs as specified in the Project Document

1. Earthquake Hazard (Immediate Objective 1)
 - (a) An inventory of national institutions;
 - (b) Collected and analysed country reports, UN Agencies documents and information papers on earth sciences;
 - (c) Report and synthesis of a workshop on earthquake hazard evaluation ;
 - (d) Report and synthesis of a workshop on the interpretation of seismic hazard for land use planning and urban design;

In addition six fellows trained in the fields of geology, tectonics, seismology and geomorphology.

2. Earthquake Vulnerability (Immediate Objective No.2)
 - (a) An inventory of national institutions;
 - (b) Collected and analysed country reports, UN Agencies documents and information papers on earthquake structural damage classification and assessment;
 - (c) Report and synthesis of a workshop on earthquake damage assessment;
 - (d) Collected country case studies, UN Agencies documents and information papers on earthquake vulnerability assessment;
 - (e) Report and synthesis of a workshop on earthquake vulnerability assessment and its practical application to building, planning and preparedness.

In addition, seven fellows trained in the fields of earthquake engineering and appropriate building technology.

3. Earthquake Risk Reduction (Immediate Objective No.3)
 - (a) An inventory of national institutions;
 - (b) Collected and analysed country reports, UN Agencies documents and information papers on risk (loss) assessment methodology;
 - (c) Report and synthesis of a workshop on earthquake loss assessment;
 - (d) Report and synthesis of a workshop on risk reduction measures and techniques and measures;
 - (e) Collected and analysed country reports on earthquake disaster mitigation policies and strategies;
 - (f) Report and synthesis of Round Table for policy makers on earthquake disaster mitigation strategies;
 - (g) Synthesis of project philosophy and results in scientific terms and in terms appropriate for planning, decision-making and disaster mitigation.

In addition, seven fellows trained in the fields of physical planning, disaster preparedness and loss assessment techniques.

With the agreement of the steering committee and UNDP, the project management combined a number of outputs as follows:

- * Outputs 1.c & 1.d into the Proceedings of Workshop I on Seismic Hazard Assessment;

- * Outputs 2.c; 2.d; & 2.e into the Proceedings of Workshop II on Seismic Vulnerability;

- * Outputs 3.c; 3.d & 3.e into the Proceedings of Workshop III on Seismic Risk Assessment;

- * Outputs 1.c & d; 2.e; 3.e & 3.f into the Overview and Synthesis of the Project;

- * Outputs 1.a & 1.b; 2.a & 2.b; 3.a & 3.b were combined as the Information Base;

The remaining six Outputs are listed in the body of the report.