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A POSSIBLE APPROACH TO THE PRIORITY ACTION ON PHYSICAL PLANNING IN EARTHQUAKE ZONES

Split, October 1982

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1. INTRODUCTION

The reports and programmes of activities within the frame of the Priority Actions Programme, submitted to the Second Meeting of Contracting Parties to the Barcelona Convention, held in Cannes, in March 1981 /UNEP/IG.23/INF.22/ and to the Extraordinary Meeting of Contracting Parties to the Barcelona Convention, held in Geneva, 29 March - 1 Aptil 1982 /UNEP/IG.36/INF.5/, pointed out the need for initiating a project within the Human Settlements priority action, which would cover the problems of physical planning in the Mediterranean zones exposed to disaster risks.

This brief paper has developed the above proposal in more detail basing itself mostly on experiences obtained through the preparatory activities and methodological work leading to the "Physical Plan of Montenegro and Master Plans of Urban Centres" /YUG/79/104/ which is being prepared in co-operation with UNDP.

2. BACKGROUND INFORMATION

Earthquakes, being a natural phenomenon, are one of the greatest perils for man, his life and material goods. This phenomenon, both by its nature of emerging and its effect on the environment, is highly complicated and bears an innate danger of destroying, in practically no time, all that man's hands and mind created throughout centuries. The higher the development level of urbanized environments the greater the damage caused by earthquakes, since they strike vital structures and facilities.

Large number of powerful earthquakes which happened in the past throughout the world, together with inevitable after-effects, caused tremendous material damages and death of thousands of people.

The character of those that struck the Mediterranean area in the past 20 years have proved that the Mediterranean is one of the seismicly most active regions in the world. The likelihood of future disastrous earthquakes in this area is very high. This accentuates the necessity of making efforts, with a view to taking adequate measures, in order to relieve the consequences of the phenomenom to the lowest possible level. It goes without saying, that the protective measures undertaken through the process of physical and urban planning, designing and construction are far more efficient and rational than recovering damages once earthquakes struck.

Irrespective of the fact that there are many specialized institutions which have been dealing /for a longer period now, and to a greater or lesser extent/ with the problems of earthquake engineering and engineering seismology, and also with the problems of physical and urban planning in seismic conditions, no fruitful steps have been made towards the exchange and combining of experiences and results of their research work. However, disastrous effects of some recent seismic shocks, one of them being the Montenegrin catastrophe in 1979, finally stirred public opinion and awareness in some countries, and became the subject of higher governemental interest in affected countries and of United Nations for a joint effort in resolving this the vital problem. Hence the accentuated need for putting together the results of the research work on the level of the most appropriate methodological models for the preparation of physical plans, urban plans and designs, as the first and basic preventive measure for the protection of human lives and material goods in seismic areas.

To make sure, within this and other regional and national project, the activity oriented to the creation of preventive measures of protection from the effects of powerful earthquakes will meet its own purpose, it must primarily serve to all factors of development and be constantly improved and tested in practice. Thus, the results expected from this project should be available to the widest circle of specialists who are dealing with the issues of physical and urban planning and

designing, and who would apply these results in practice in the most appropriate way.

Accordingly, there are realistic possibilities in future for incorporating certain new elements in physical and urban planning which would make plans complete and reliable documents with respect to potential seismic impacts.

As mentioned before, after earthquake catastrophes that had struck the Mediterranean region in the last 20 years, many projects were implemented in some countries with the assistance of relevant institutions and agences of the UN system. They mostly dealt with the problems of earthquake engineering and engineering seismology /designing, rehabilitation, reinforcement of buildings, etc./, but none considered the problems of physical and urban planning under seismic conditions.

Catastrophical earthquake which struck the Republic of Montenegro, on 15 April 1979 and paralysed for a long time the majority of economic activities had a devastating effect. Apart from human losses, the estimated damage was as high as about 1.8 billion of dollars. It also proved that seismic risks play a decisive role in the development of the area which is seismicly active and that they can seriously affect its future unless taken into consideration in physical and urban planning, designing and actual construction.

3. OBJECTIVES OF THE PROJECT

Long-term objectives

Relieving the risks of earthquakes /human lives and material goods/ and increasing the economic efficiency in the utilization of space through co-operation of Governments and specialized institutions on the application and improvement of the most appropriate forms of methodological solutions in the physical and urban planning in the Mediterranean region.

Immediate objectives

- to establish permanent co-operation between research and planning institutions in the Mediterranean region, which are capable of contributing, in the frame of the physical planning discipline, to the solutions of critical conflicts emerging between various functions and users of the space, under seismic conditions.

- to develop methodological models for the preparation of physical and urban plans in seismic conditions, through research into natural conditions and man-made factors from the aspect of both favourability for and constraints of construction, and use and management of physical environment.

- to develop models and criteria for land use, spatial distribution of economic activities, building density, location and management of industries, creation of traffic centres, watersupply systems, sewerage systems, building patterns, shape of structures, etc., with a view to arriving at optimum solutions at rational investments.

4. ENVISAGED OUTPUTS OF THE PROJECT

1. Operative network of relevant institutions and experts from Mediterranean countries co-operating on the physical and urban planning in seismic conditions.

2. Recommendations for a global methodology of the preparation of physical plans, master plans, detail plans and urban designs under seismic conditions.

3. Guidelines concerning criteria for optimum physical distribution of economic activities, urban and infrastructure systems, under seismic conditions.

5. ACTIVITIES

/a/ Compilation of information on already prepared methodological solutions incorporated in physical and urban plans; in revitalization plans of historic urban entities located in the areas exposed to earthquake risks; as well as in the plans under way, with special attention to the project entitled "Physical Plan of the Socialist Republic of Montenegro and Master Plans of Urban Centres" /YUG/79/104/.

/b/ Analysis and appraisal of already applied methodological solutions in physical and urban planning, as well as in revitalization plans of old urban entities, in seismic conditions.

/c/ Preparation of recommendations containing the global methodology for the preparation of physical plans, master plans, detailed plans and designs, as well as revitalization plans of old urban entities; formulation of guidelines for their application dependent on individual characteristics of seismicly active areas in the Mediterranean region.

6. WORKPLAN

Activities ad /a/

Team of consultants engaged by PAP/RAC would compile information on accomplished projects and prepare - in direct contact with national institutions - a survey of existing plans and methodologies, and would evaluate obtained results.

Activities ad /b/

Report, produced by the consultants in co-operation with the specialists who were in charge of individual projects, would be discussed by a

Government Expert Meeting. Recommendations of the meeting, together with the report, would be the basis for the preparation of a global methodology and guidelines for their implementation.

Activities ad /c/

The team of consultants would also prepare a methodology for the preparation of physical and urban plans, revitalization plans for old urban entities in seismicly active areas, as well as recommendations and guidelines for implementation of the methodology. The produced written material would be published and disseminated to all interested countries and institutions.

7. ENVISAGED COSTS OF THE PROJECT

- Activities under /a/ and /b/ would be completed within a period of 8 months, and the approximate contribution of MTF for these activities would be US $ 26,000.

- Activities under /c/ would take about one year, and the contribution of MTF would be approximately US $ 20,000.

POSSIBLE USE OF THE MONTENEGRO PROJECT AS THE BASIS FOR THE PRIORITY ACTION TENTATIVELY ENTITLED: "PHYSICAL PLANNING IN EARTHQUAKE AREAS"

The devastating earthquake which heavily struck the Montenegro Littoral and its hinterland on 15 April 1979 proved, among other things, that the determining of functions of physical spaces had to be necessarily harmonized not only with resources they possess but also with the degree of earthquake risk they were exposed to. To identify resources and the seismic activity of each particular area prior intensive and complex scientific research must be accomplished, because without them there could not be expected neither realistic indicators nor adequate planning approach.

Bearing this in mind, in drawing up the global methodological framework for the revision of the Physical Plan of Montenegro as well as for the revision or preparation of master plans for Montenegrin urban areas, the major emphasis has been laid on the wide-range research in the domain of geoseismics /particularly relative to urban areas/, and on the resulting critical appraisal of earlier physical and urban planning solutions, so that the use of each micro-seismic zone could be decided on in consistency and according to the degree of the zone's vulnerability to earthquakes.

On the basis of such a concept, programmes for the geoseismic micro-regionalization for 20 urban areas have been accomplished; their verification prepared; and contracts made for carrying out the relevant spin-off studies which are mostly in function of the revision of the Physical Plan of Montenegro and in function of the preparation or revision of master plans for Montenegrin urban areas. The revision and preparation of these plans have been carried out with the assistance of the United Nations regulated by a project document which was jointly formulated and aproved by the UN and the Government of Montenegro. Because of the specific subject it deals with, the project document is expected to take the role of a pilot-project for similar geographic areas. It should be underlined, that the workplan for implementing this complex project, prepared by the Project Management in the middle of

1981, was sent, through HABITAT /Nairobi, Kenya/ to Algeria as a good model for eventual application in the area of El Asnam.

The project document envisages the preparation of all physical plans within the Project to be also based on the results obtained through a regional project entitled: "Alleviation of Seismic Risk in the Balkan Region" which is being jointly implemented by the Balkan countries with the technical assistance of the United Nations.

The territory of Montenegro, being relatively small /13,812 square kilometres/ is characterized by a variety of conatrasts which make it highly attradtive. Particularly attractive are the Montenegro Littoral and the Skadar Basin, but both the regional entities are seismically unstable and thus imperilled. Their economic development has been intensive manifesting itself through both the concentration of economic activities and services, and the rapid population growth of urban agglomerations. That is why the identification of regional entities according to their seismic vulnerability, and especially of micro-zones within urban areas, is most important.

The physical planning project in Montenegro has a pioneer's role. It is one of the first, if not the first one, which is being carried out on the basis of results obtained through the seismic micro-regionalization of urban areas, and of the analytical studies on expected vulnerability and acceptable seismic risk.

Since there are a number of areas in the Mediterranean Region which are potentially vulnerable to earthquakes, the experiences of this project, once it is completed, could be transfered, through a certain number of seminars, to other countries, and this would be the objective of one among the BAP actions.