

URBAN DESIGN AND REGIONAL PLANNING IN SEISMIC AREAS

Experiences and Reconstruction Procedures in Southern Italy

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SUMMARY

The adequacy and effectiveness of standard planning tools and techniques when dealing with urban systems located in earthquake-hazard areas are discussed in the following paper. In particular, stress is placed on how gaps in a pre-designed and dynamic overview of the range of possible policies to be adopted in cases of emergency can lead to a major waste of efforts and to malfunctions hampering and limiting the results of assistance and reconstruction. This topic has, within the Italian institutional and structural setting and in the light of some recent experiences, become increasingly pertinent: to the point where the recent creation of a Ministry for the Coordination of Civil Protection must - to a significant extent - be viewed in this context. The Ministry's assigned tasks are focussed mainly on the definition of nation-wide emergency action programs as well as of a coherent structure of political and functional responsibilities to be allocated to peripheral (regional and municipal) decision-makers and government bodies.

INTRODUCTION

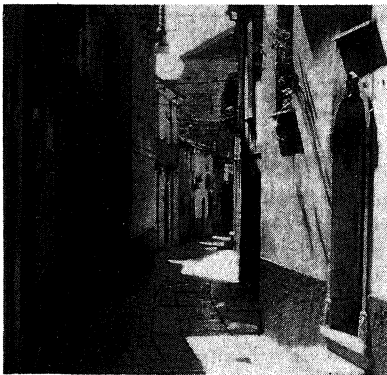
More than 70 % of Italy's national territory is subject to some level of seismic hazard. As a matter of fact, earthquakes are relatively frequent although high intensity shocks are rare. A comparison of return periods, magnitudes and intensities of seismic phenomena in Japan and Italy allows to note that the major earthquakes that occur in our country could somehow be considered just a little bit more than "every-day" events in Japan.

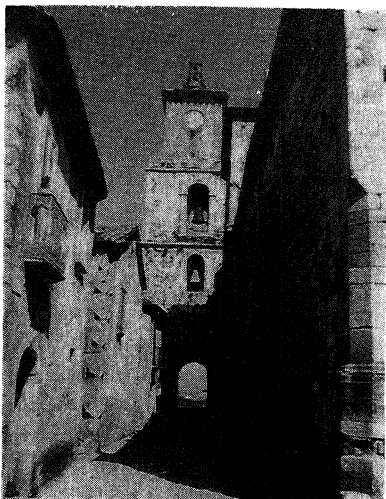
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- Project Coordinator for several major regional and urban reconstruction plans drawn up after the earthquake that hit Southern Italy in November 1980;
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Yet a quake of 5.0-5.5 on the Richter (or 7.0-7.5 on the Mercalli) scale is sufficient to produce significant damage to the existing building stock in the greater part of the Italian settlements. Age; out-dated building techniques; uneven land morphology and low slope stability; irreplaceable (and therefore untouchable) monumental value of many historic districts; winding layouts and narrowness of inner road systems and poor accessibility of the minor centers of the hinterland: all these can be considered to be country-wide features of the Italian settlement patterns, with a special emphasis on those located in the Southern regions which are, in addition, even more prone to seismic events.

Recent experiences in Sicily, Friuli (a north-eastern region on the Yugoslavian border), Campania and Basilicata (Southern Italy) and the on-going seismic/volcanic activity in the Pozzuoli area (Campi Flegrei) close to Naples, not to mention a series of minor events or emergencies, have brought to the attention of the Italian Government the need to set up a central coordinating office and to enact a law for Civil Protection with a national budget for coping with disaster situations.

Since the Friuli earthquake of 1976 the Government generally appointed a Special Commissioner whose functions consisted merely in dealing with the management of the emergency and recovery action in specific disaster areas. It was only after the 1980 earthquake that the "Ministero per il Coordinamento della Protezione Civile" was created and entrusted with the preparation of nation-wide emergency plans and management programs as well as the responsibility for a whole spectrum of coordinating activities aimed at preventing and mitigating the effects of different kinds of disasters. The Ministry's mandate requires it to undertake the very delicate task of setting up - I could better say "negotiate" - the clear subdivision of





responsibilities and duties among the different national, regional and local administrative bodies (e.g. the ministries of Public Works, Defense, Transportation, Forestry and Agriculture, Internal Affairs; regional and municipal-level administrations), and institutions (e.g. the National Council for Scientific Research, the Military Geographic Institute, the Universities, the National Institute for Nuclear Energy, and so on).

Coverage of the Ministry's coordinating action ranges from seismic events to forest and other fires, hydrogeologic phenomena, chemical and nuclear emergencies. Technical support to its policies is provided by the "Dipartimento Nazionale per la Protezione Civile", an agency answering directly to the Presidency of the Council of Ministers.

SOME PLANNING EXPERIENCES FOR DISASTER AREAS

Our company, ITALECO, has been involved in the reconstruction planning effort for a significantly large number of settlements that were destroyed by the 1980 earthquake that hit Campania and Basilicata. In fact, we have been acting largely as a "relay" between the central Government and the regional authorities, our main task being to assist the local governments in preparing reconstruction programs to be submitted for funding under the Special Act (II) which the Government enacted with a view to providing aid to the populations struck by that earthquake.

(II) Legge 219, May 14, 1981.

I personally led a group of city and regional planners engaged in the definition of the methods and technical and formal specifications to be adopted when preparing the master and detailed plans and implementation programs.

During this two-year exercise a significant effort was made to develop - among the administration's policy-makers and within the professional circles - a flexible and, to so say, "creative" attitude towards planning procedures when dealing with urban safety norms and satisfactory design techniques for the different levels and types of hazard conditions. In this respect, we have been working on methods for evaluating and defining measures that are intended to reduce the level of "vulnerability" of the urban system as a whole. These planning tools have to be understood as basic inputs of city and regional planning with a focus on the definition of wide-scale hazard-mitigation management policies.

In my opinion, two major constraints deriving from the usual repertory of planning techniques have to be matched:

- constraints deriving from the rigid specifications of city planning documents - such as those prescribed by Italian legislation - and which are based mainly on the design of "land-use" patterns through "zoning" maps, building codes and urban regulations established with reference to preconceived standards;
- constraints deriving from the widespread opinion that seismic hazard-mitigation has to be mainly (or only) based on the enforcement of seismic building norms, to be extended to any and every single unit.

The problems raised by both categories of planning assumptions depend on a naive over-simplification of planning procedures during the early (design) stage and on lack of care in the defining of steering tools to be applied in the standard planning management procedures, even before emergency conditions arise.

All this generates a crystallization of the decision-making processes and false problems. During the early reconstruction phases, for instance, I recall that a main question that was floating persistently in the air during the hectic meetings for the preparation of emergency programs had to do with whether or not the so-called "Piano di Recupero" (rehabilitation plan) referred to by Law No. 219 ought to be considered from the institutional standpoint as being a "detailed plan" the specifications of which are defined by Law No. 457 or as an "implementation program" which

falls under Law No. 10 (National Housing Plan). As a matter of fact, that topic could have been a very interesting theme for a National Planners' Congress, but I assure you that it sounded rather awkward in the context in which it was raised since the final users of the emergency plans being discussed were freezing in tin containers.

Yet, to adopt the second assumption (calling for seismic adaptation of all housing stock) would soon lead to a fatalistic attitude since it is hard to conceive of a nation-wide action being implemented when - as already said - 70 % of the housing stock of the hazard areas is composed of ancient, monumental or traditional rural buildings. In this situation, any attempt to enforce a given set of norms, bylaws or prescriptions does not sound easy. The "do-it-yourself" solution(III) proposed by some theoreticians (notably by the architect Renzo Piano and some others) would have been of utmost interest had it been possible to carry out a preliminary promotional and educational program. The constraints involved in carrying out this task - in theory so simple but in fact so huge in dimension when it is a question of putting it into practice - lead to the typical "let's-wait-for-a-better-time" policy.

It is my opinion that the sclerosis affecting the decision-making process (to the point that most of the reconstruction programs for settlements hit by the November 1980 earthquake are still stuck three years later) can be attributed mainly to the lack of nimbleness on the part of the authorities when dealing with this kind of problem.

Of course, a set of other side-effects exists that have been hampering the process of recovery (by the way, it seems to me that they can be considered as the consequences of those mentioned above more than independent phenomena): examples are the inevitable slowness of institutional processes, conflicts arising from the uncontrolled interaction of local interests, the lack of attention to - or perhaps effectiveness of - the policies to be implemented for a balanced (and rapid) revitalization of the activity pattern that was injured by the disaster.

(III) The idea is to provide the communities living in hazard areas with some basic equipment and to popularize, through appropriate literature and demonstrations - some essential building techniques and hence involve the owners personally in an active process of housing reclamation.

SETTING UP A NATIONAL SEISMIC EMERGENCY MANAGEMENT POLICY

Some Tentative Technical Guidelines

ITALECO has been appointed to provide technical assistance both to the "Dipartimento Nazionale per la Protezione Civile" and the "Ministero per il Coordinamento della Protezione Civile", a task for which a consortium between ITALECO and FIAT Engineering has been created. On behalf of ITALECO, I am in charge of the coordination of this activity which consists mainly in the laying out of basic and thematic mapping as part of the nation-wide information system on the one hand and, on the other, in the design of the technical procedures and models for hazard evaluation and preparation of emergency programs.

Dealing with regional and city planning topics, the basic assumptions of our job are the following:

- A - Vulnerability has to be considered as the leading factor determining the hazard level of any system: its evaluation must be thought of as depending on conditions and features present within the system (urban, infrastructural, productive) in its entirety. Therefore, if we assume that the term "vulnerability" is understood to describe one of the parameters contributing to the possible loss of efficiency of the system under a particular stress or following a specific shock, the elements to be considered for the measurement of "vulnerability" can be classified in two main categories:
- A.1. Functional: accessibility, efficiency of inner mobility network, activity pattern and structure, open space structure, spatial organization and typologies of public buildings and service structures. Age, historic value, building typologies of housing stock must be considered at the aggregate level (district, community).
 - A.2. Related to temporal factors: for seismic safety measures, this category includes the elements for evaluating and adjusting the requirements for emergency facilities according to forecasts based on "Probability Calendars" and consequently on "scenarios" related to the seasonal cycle, return periods, changing patterns of the inner organization of the system itself (roads, communications, vegetation coverage, etc.) and the spatial distribution of possible resources to be used in cases of emergency (military personnel, health personnel, temporary housing facilities, machineries and equipment, and so on). The elements to be taken into consideration for the construction of the nation-wide "potential

emergency calendar" must be continually updated, requiring the implementation of a suitable monitoring system at the regional level.

- B - As already said, the Ministry is entrusted with coordinating the different phases of disaster management (prevention, emergency action, recovery programs) and its tasks therefore include substantial actions (to be developed in connection with the state and local authorities responsible for urban development) aimed at bettering the urban safety norms. This leads, in particular, to the definition of city planning requirements and consequently of the specifications to be adopted when designing the Master Plans for communities in hazard areas. In other words, apart from the seismic-safety building codes mentioned above, it is necessary to implement a set of measures that can ensure, within the urban frame as a whole, the equipments and facilities for emergency management and recovery action.

ITALECO is collaborating with the Ministry in a promotional action aimed at strengthening the institutional image of emergency programs. The documents describing the measures to be adopted in order to mitigate the effects of different types of potential events have to be considered as basic planning documents along with zoning or infrastructural plans: according to the emergency program involved, it is necessary to adjust the planning specifications and standards for a whole set of public facilities such as open spaces, government and health services, public buildings in general, main road and communication systems, and so on.

SOME CONCLUSIONS

From the standpoint of urban and regional planning, a situation like the one existing in Italy can be viewed as an outstanding opportunity for developing research and testing new, flexible and comprehensive emergency management techniques.

When defining operational objectives, two main strategic guidelines must, according to our team of experts, be adopted.

- The concept of "vulnerability" has to be referred mainly to whole systems rather than to single units; the overall planning strategy should aim at reducing the factors that could determine the collapse of the system in the case of disaster. In other words, a stress-resistant backbone ensuring the continuity of the essential functions in emergency conditions has to be created within the system (urban, infrastructural or productive).

