Urban Landuse Planning for Preparedness of Built Environment in the wake of Natural Disasters

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Urban landuse planning is a process, which encompasses variety of considerations and factors like social, economic, technical, political and physical characterstics of the area in the present context and projected future scenarios Natural disasters are but one factor, though a very important one. The success of including natural disaster considerations in the landuse planning process is governed and conditioned by legal framework for planning, social and political will of the community, and more importantly the desired level of technical knowledge, support and usefulness of data available to the architects and planners.

The extreme natural events like cyclone, landslide, etc. by themselves can not be defined as natural disasters if they do not involve significant loss of life and damage to built environment Thus, for example, an earthquake in a largely uninhabited area is merely a natural event, in contrast to an earthquake in a populated area, such as Uttarkashi and Latur in India and the more recent ones in Turkey, Greece and Taiwan. These disasters have caused extensive damage to public infrastructure and private properties, and have caused many deaths and injuries to human and animal life. Hence a natural disaster may be defined not by the event, but rather by its impact.

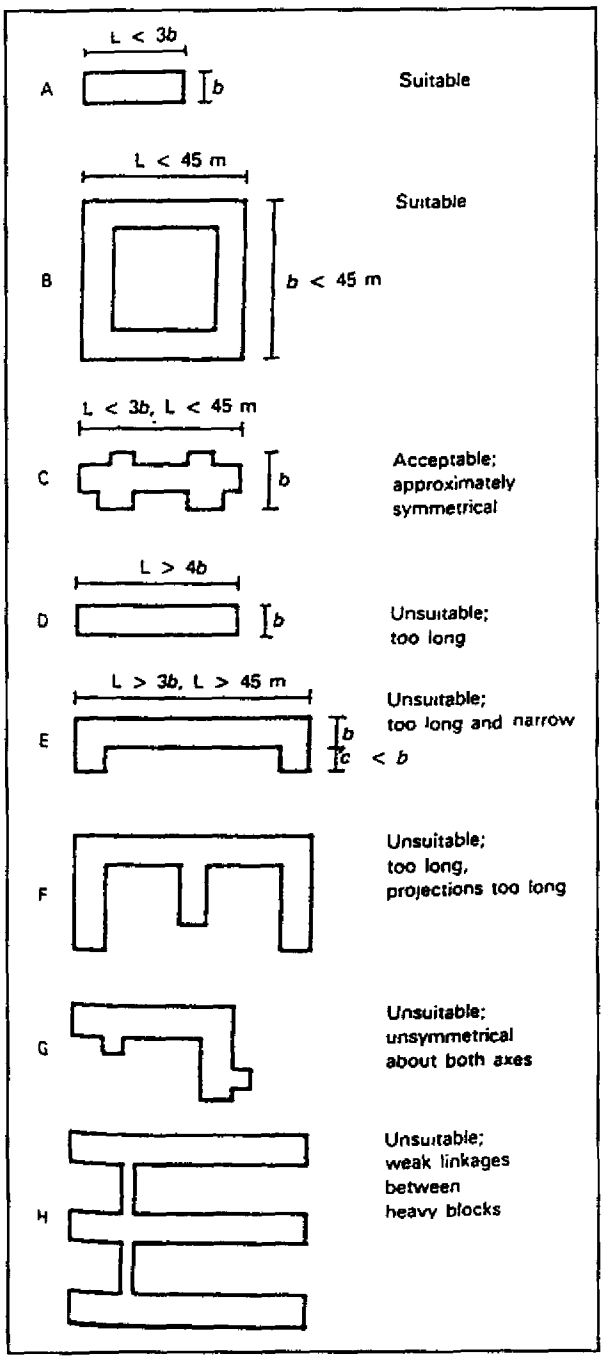
Natural disasters are caused by two types of natural hazards, namely hydrological and geological. Floods, cyclones and deserts fall under the first category, whereas earthquakes, volcanoes and landslides are in the later category. The focus of discussion in this paper is on disasters caused by earthquakes and the role of architects and planners in shaping the built environment in this context

Design of a safe built environment in a disaster prone region entails the expertise and active participation of different professionals from diverse specialisations like geology, seismology, hydrology, geo-technical engineering, structural engineering, statistics, demography, economics, sociology, political science, administrative science and above all architecture and physical planning. Accompanying figure shows an ideal schematic interdisciplinary relationship in preparation of landuse plan for preparedness of built environment in the wake of natural disasters.

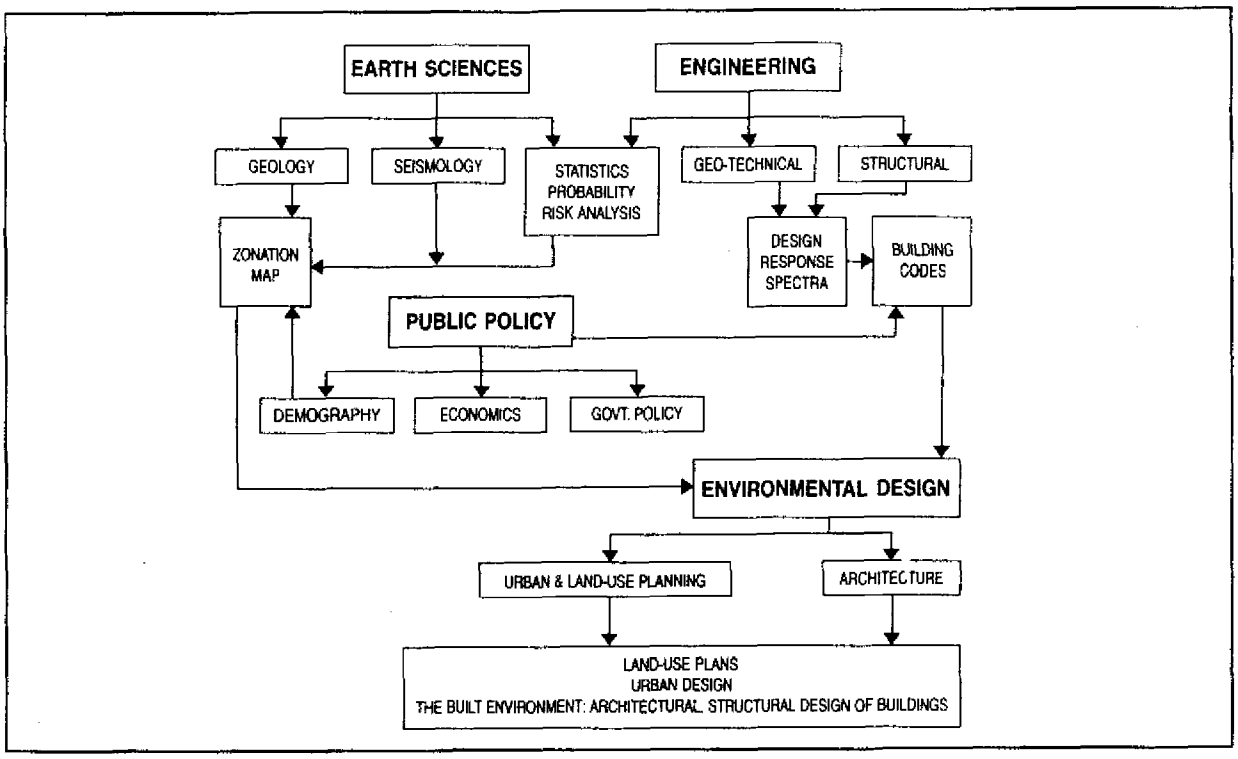
A significant feature to be noted in the process of landuse planning in the disaster prone areas is the role of geologist, hydrologist and seismologist, which heitherto had not been there in the team for making the landuse plans.

The built environment creators, particularly urban planners and architects have an unique position of being the professionals who are most responsible for decision making for the final shape, size and environment of our cities and towns, yet most removed from the critical data and research in the basic disaster related investigations in the fields of geo-sciences and engineering. Since disaster related safety is only one component of different crucial issues that the designer might be concerned with, the critical technical data with respect to geology and engineering must be prepared in such a comprehensive manner that it includes the most essential and important information, and made available to the planner for incorporation at appropriate stage.

The landuse planners on their part should make efforts to posses a fundamental knowledge of and play an active role in the strategies for disaster impact reduction like structural design for earthquake and cyclone resistant buildings and zonation of landuse based on vulnerability of the area. The significance of structural design has been well established and is being implemented through different codal provisions, mainly in public sector projects



Suitability of typical school building plan types in Asia and the Pacific



Interdisciplinary relationship in preparation of landuse plan for disaster-prone areas

in India. In private sector, though, people have not yet been sensitive enough to realise its importance. It is the zonation of landuse, which is comparatively of recent origin and has tremendous potential as a method of mitigation against earthquake disasters, where a lot of work is yet to be done by professionals. Architects and planners have a great opportunity to involve themselves in micro-zonation process of urban areas, for evolution of an effective tool for use as a defense mechanism against earthquake disasters. In Chamoli, for example, few villages damaged by 1999 quake were rehabilitated away from the original sites because the micro-zonation studies of the area revealed that these sites were vulnerable for future disasters.

At the conceptual level, the urban planners must incorporate these considerations while dealing with expansion or growth of urban/ regional areas while dealing with disaster preparedness concerns. This is a very critical issue, because historically urban settlements have been developed in places, based on parameters, many of which are not relevant today and, therefore, we tend to expand into areas which are not so safe from the point of view of disaster preparedness. When prime locations are exhausted by development, where do we expand to accommodate the growing population and the public utility services. A critical study of earthquakes during last three decades reveal that losses to life-line infrastructure and services in urban areas increased the miseries of affected people, what already was a major disaster. This phenomenon has been universally uniform.

A recent study conducted by National Capital Region Planning Board revealed that in Delhi over 50 per cent of the land is covered by built-up area, which is more than 2.5 to 3 times of the desirable limit. The study predicts in the fact sheet on Delhi, titled "Delhi 1999", major shortages in water supply, power, sewerage facilities, garbage disposal and public transport that are likely to make the city a very unlivable place. It does not, probably, warn or educate the people of what will happen if there is an earthquake of even a moderate intensity in Delhi. The fact of the matter is that preparedness for disaster mitigation through landuse planning, in Indian context, has not yet been appreciated by planners. This mind set has to change lest we face a major disaster in places like Delhi.

Urban renewal and rehabilitation of existing buildings with reference to preparedness of built environment in the wake of natural disasters is an area where attention has not been focused so far. This is a virgin area where architects and planners, in collaboration with other professionals, must play a major role in reshaping the existing stock of built environment, which is disaster resistant.

Two earthquakes within a span of 3 weeks, the first in Turkey and then in Greece have shown that with proper implementation of knowledge available to mankind, the impact of natural disasters could be minimised. Greece survived this quake relatively well compared to the more severe Turkish quake. The earthquake in Greece was relatively milder, but past experiences have taught the Greeks to maintain better planning and construction policies and government enforcement of standards, whereas in Turkey the loss and damage has been extensive because of non implementation of disaster mitigation concepts in creation and maintenance of built environment.

International Decade for Natural Disaster Reduction had provided a great opportunity to sensitise professionals, administrators and policy makers about the importance of this subject. It exhorted all countries by 2000 to have : comprehensive national assessments of risks from natural hazards integrated into development plans mitigation plans to address long-term disaster prevention, preparedness and awareness ready access to global, regional, national and local warning systems

In the future, it is hoped that each actor, who is involved in the creation of built environment, will play his role effectively, to make the disaster resistant built environment in our urban settlements a reality, where the impact of disaster on intellectual, social and economic environment will be very high and far reaching.