

TOWN PLANNING AS A RESPONSE TO EARTHQUAKE

A y d i n G e r m e n

SUMMARY

The performance of town planning in response to earthquake is deficient, empirically in Turkey, presumably in the world. The main difficulties stem from the approach and practice of town planning itself, - however the "inputs" from related disciplines are also either scarce or ambiguous. The related disciplines (structural engineering, geological sciences, relief and rehabilitation and so on) have narrow views of town planning. Redefinitions are needed for the role of town planning, which is actually inextricable from earthquake response, on administrative grounds, and in locational terms in many phases of disaster problems.

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Empirical Studies

The possible contributions of town planning to earthquake response should be evaluated more on empirical grounds than on theoretical. The author has conducted two town planning studio courses at graduate level at the Middle East Technical University in 1970-1971 and 1978. The stated goals of the courses were, one, to secure for town planners the much needed grounding in planning with respect to earthquakes and disasters, two, to use the manpower in the studio (in both cases around 25 students) for nationwide empirical enquiry.

The effect of partial training for twenty-five planners per decade is naturally less than desired, even if such numbers may be very unusual for much of the world. On the other hand, many of the conclusions in this paper are based on the findings in the two courses.

Some of the studies undertaken in 1970-1971 were as follows. Day-by-day newspaper reports were collected to evaluate the effect of the immediate post-disaster period on long-range planning decisions and on "re-planning" (almost all towns in Turkey already possess pre-disaster town plans). The reports were surveyed for a period of one month. It was more difficult to survey the same periods in official reports. Surveys included several earthquakes.

A gaming method was tried against an occurrence (earthquake) which was accepted as basically unpredictable, as to location only, and as of then. The purpose was to find an optimal probabilistic distribution of resources, funds and public surveillance of construction and

planning implementation. The result was unconvincing, and the gaming approach has not been repeated yet.

"Microzoned" towns in Turkey were studied for the implications on building density and direction of expansion in the town. The real estate trends were found to be contradictory to these implications and it was tentatively concluded that restrictions derived from earthquake risks could not check "economic" tendencies.

Six towns were surveyed for the degree of implementation of town plans in Turkey. The conclusion was that it was practically nil. The same conclusion was reached for a much larger number of towns in 1978.

In 1970 the towns were a sample from the whole country. In 1978 only the towns from earthquake zones were selected, especially from the area of the North Anatolian fracture zone. The evident conclusion was that town plans not implemented in general could hardly be expected to control locations, densities and directions of expansion for purposes of earth-quake response.

The principal procedure in the study of implementation was to compare the stipulations of a previous town plan with the base map prepared for the next plan, which would show existing use at beginning of the second period. In the 1960's and 1970's Turkey has started series of successive plans for an extensive number of towns. These are purportedly final-state plans, while numerous local/partial revisions cannot be considered as updating, and while the violations are much more numerous than the revisions.

It is possible that in a large number of countries even the above basic data may not be available to conduct extensive implementation-studies.

In the Turkish context, where both restrictions and affirmative use and construction decisions are included within the same legal instruments, the line of demarcation between the two types being rather vague, it is difficult to establish the concepts for an implementation checklist. We developed detailed situation lists around three main poles: what is proposed but not carried out versus what is "only prescribed" versus what is explicitly or implicitly ruled out but came to exist.

Easier definitions may be obtained in countries where proposals and programs are found in public or private budgets and are not necessarily specified in terms of location, and where restrictions would be included in a separate instrument of zoning. It is less clear how many countries other than Turkey need such implementation study.

In the 1978 program we included extensive surveys of post-disaster town planning and reconstruction, especially in eastern Turkey. The following are our main findings. Village relocation mainly a superfluous activity. Years after reconstruction refusals to occupy new rural housing may reach 60 percent of the supply at provincial level and 80 percent at sub-district level.

In Eastern Turkey there is to be found decade-long uncertainties as to whether the new housing is temporary or "permanent". What may be called technical policies are inconsistent even within one disaster area over the years. High personnel turnover leads to repeated lack of experience. Ownership in reconstruction housing in Turkey depends on the following formal steps: damage determination, "right" to a new house, statement of future indebtedness, start of construction, construction completed. The numerical relationships among these phases are confusing, contradictory and there are many drop-outs.

Town planning, contributive or not, is inextricably tied with disaster response in Turkey, and as we would expect, is or will be in many countries. Under such circumstances town planning appears as proxy for the failures or complications of other activities as well: for administration in general, for the pressures exerted by contractors in favour of relocation near main roads (ease of construction), for intracommunal fights on the specific terrains to be expropriated (pressures either for exclusion from the program or for inclusion), for the technical and other deficiencies of persons making post-disaster damage estimations, for deficiency in services, and so on.

Some of the other work included in the 1978 program will now be listed. Personnel turnover in disaster work was studied in detail. Damage estimations were evaluated in terms of distance from epicentre, and in terms of "rural-urban".

Several correlation studies were made between population and earthquake occurrence or risk: Effect of earthquakes on population changes per settlement; Trends in population distribution and comparison of various projections for the study of effects on earthquake-affected regions; The distribution of earthquake risk versus population concentration and versus past estimations of damage. Evidently there still is a difference between countries where the main loss is in investment and those where it is in life, but in Turkey certain districts are becoming high risk areas in terms of both criteria.

Fallacies within Town Planning Approaches

Some of the mistakes are serious enough to be called fallacies. Inadequate or misinformed responses to earthquake hazard have started with the first involvements of the discipline with the

subject. However, these can be attributed not only to the lack of significant information coming from the side of earthquake studies or to the deficient interpretation of such information, but also to inappropriate habits within town planning itself.

The information flowing from earthquake-related fields (structural engineering, geological sciences, and disaster relief) is still ambiguous or controversial at best, for the purposes of planning. More serious perhaps, and presumably due to the paucity of town planners involved with disaster-related studies, the earthquake-related fields mentioned above are unaware of the transformations within the town planning field, and therefore accept among themselves views of town planning which may be called "antiquated" or simplistic. Even more serious, professionals in these fields are likely to form their own opinion as to what town planning is.

In the context given above we may now list the main planning fallacies. These have diverse origins within the planning field. Some descend directly from the "architectural" conception of town planning, now superseded for some four decades. Others are involved with certain exaggerations from the fashions of social-science-related planning theories. Both traditions seem to concur in taking disaster as an opportunity for the dissemination of what they consider modern technology, with very slight attention given to the maintenance or regeneration of productive activity or to the length of time during which the above dissemination would reach a majority of disaster-prone areas. Other "fallacies" seem to be common to all three attitudes listed above.

An "ancient" example, as it may now be called, to planning response to earthquake is the recommendation that buildings be sited with their long axis parallel to an expected travel line of seismic wave. This reached the literature if not the practice of some countries and would not deserve comment, especially at the present.

Among the attitudes still largely prevalent, one of the worst offenders is the recommendation that urban design prescribe wide streets and low population densities in disaster areas. Such a town planner's measure seems to be a favourite as well with engineers, geophysicists and relief workers. This measure is considered useful for the purposes of disaster prevention or mitigation, against damage-multiplier effects (the "secondary") and for the successful operation of relief and rehabilitation. As a matter of course it also becomes an indispensable element of new town design and post-disaster reconstruction.

Such a manner of town design may be diffused throughout the world more on account of "westernisation"/modernisation than on earthquake considerations, while "western" design standards in such respects (street width and low density) are not sufficient for disaster mitigation. In terms of earthquakes, this type of measure

has more chances of being discussed than implemented.

Its implementation moreover, is not something devoutly to be wished for. The reasons: most cities cannot afford the consequentially increased operational costs and journey distances, and furthermore, many economic activities have their own dictates as to densities. The recommendation is further irresponsible in ignoring that in the coming decades a substantial majority of the total disaster-prone urban surface in the world will consist of areas built-up prior to our present discussion.

Among other mistaken recommendations, one is involved with the assumption that squatters's settlements should and could be easily "eliminated". Another optimism equally uncalled for seeks an easy way out in recommending improved transportation, communications and power supply. Let us first remember that the provision of these services is not controlled nor financed by what is commonly called town planning, and second, that we have chances of consensus only in the case where we have rejected ineffective proposals.

Other examples to unwarranted optimism involve new cities, an attitude still alive in world literature, or the related idea of relocation, Turkey being the main example in the second instance. Here, the first negligence is of the certitude that most new settlement building will consist of extensions and not new cities. The new city or relocation approach constantly assumes that a new site will be safer and will be "scientifically" chosen, assumptions continually refuted as in the case of Turkey, or very controversial in engineering circles. This idea is converted into "urban renewal" for the case of existing or old cities. Some town planners and other disaster-oriented professions, shall we say, do not seem to realise that urban renewal is also a very controversial matter, this time in town planning.

The town planning attitudes cited above are commonly in harness with stiff building codes that are not subtly differentiated for various parts of the world. They further assume erroneously that these will be enforceable in the regions and countries to be safeguarded against disasters. Once more here less optimism will be the only way open to a search for effective proposals. The only obstacle against a decisive response to earthquake risk we have observed in Turkey which is greater than the lack of implementation in town plans, is the unlikelihood of the enforcement of strict building codes.

It must be added here that town planning and related professions should further be held to account for proposing too much research towards prevention measures and reconstruction programs. In Turkey, we think the two most ludicrous proposals concern extensive social surveys and determination of "regional" building prototypes prior

to disaster. These will naturally not be completed nor started for a very long time to come irrespective of the conditions which will be changing in the meantime.

Town planning must be dissociated here from other fields concerned with earthquakes and other disaster-producing processes: the research proposed from the planning side is at a virtual standstill compared to advances made in structural engineering, geophysics, tectonics and certain aspects of relief operations. The purported research orientation will have the single effect of postponing town planning contributions indefinitely. There are two alternative attitudes. One, that it is more effective to train people and to give them the benefit of repeated experience, -this has been often pointed out in international literature. Two, select limited matters rather than engage on a wide front.

Many of the research proposals on regional scale are too functionalist, if perhaps without awareness: they assume that given data will always produce given solutions. They also ignore that variabilities occur on less than regional scale.

In the matters we have treated in this section, international referents can only be tenuously stated: while there is also indiscriminate diffusion of ideas from one country to another, there is not much of a way of knowing the extent to which observations on single countries hold true for others.

Types of Responses

There are mainly three responses to earthquake which may assign roles to town planning. The first is post-disaster aid, where there is great wastage of resources both in relief, and in town planning. Lack of preparedness, however, results in the assignation of the largest role of planning to this type, with dire results. The other types tend to point towards prevention and mitigation. In the second case, the role of town planning tends toward minimal, if we accept the conclusion of certain structural engineering circles that with proper structural design the effect of ground characteristics on building response will be negligible under "normal" circumstances. This we should prefer to call an "engineering fallacy" on two grounds: that it is an approach oriented solely towards costly solutions, and that it is unlikely that such engineering modalities will reach all the major disaster-prone areas.

In the third case, the role of town planning will be determined in the future by the importance assigned to ground characteristics in their dynamic relationship with structures, and by advances in earthquake prediction. At the present there are no indications as to the scale at which risk zoning should be undertaken, with respect

to ground characteristics. The effect of more precise prediction on town planning may be considered in terms both of location and warning time. Extremely precise locational prediction would not be requisite for town planning, while at "district" scale it would be very helpful. If communications and services are considered as part of town planning, prediction will help especially with respect to locational planning for relief and rehabilitation. If prediction is possible within short periods only, there will be few contributions from town planning, - while in some of the more industrialized countries such prediction and warning is considered more of a problem of "social psychology". The length of the period of prediction may become more a concern of town planning than of other disciplines.

Certain Elements of the Role of Town Planning

Many of the deficiencies observed in town planning, as in this paper, are related to its general performance within societies and to the role assigned to it, and should not be thought in terms of inability to respond strictly to earthquakes. At the present we do not exclude the possibility that communities may in the near future assign more function to town planning with respect to disasters than in general.

In the field of town planning itself there have been very strong tendencies within the last decade to consider it more a social process than land use control. Such an approach may prove useful in disaster response. On the other hand such approaches have hardly been noticed in the community of professions studying earthquakes and disasters. The responsibility to acknowledge such changes in the field may belong more with other professions involved with earthquakes than with town planning itself.

At the present the role of town planning is confined much more than expected to post-disaster phases. As such phases shift the emphasis to rehabilitation, use or misuse resources lavishly, put undue emphasis to show-case functions, and are, most of all, soon out of public attention, - town planning suffers accordingly.

In the disaster aftermath town planning comes unto a scene that was previously already burdened with mismanagement, power group struggles and violations of existing plans.

Under the circumstances, a town planner sees the contribution of his field as less than desirable, disaster experts concentrate on its designation of locations for public services to be used in the post-disaster period, and the United Nations sees its main contribution in prevention.

Except for unforeseen developments in other fields prevention still

seems to be the logical concern of town planning. Much that could be contributed by town planning, and not under the best circumstances, has been listed or elaborated by the author in a booklet cited immediately below: these need to be strengthened by country studies.

REFERENCES

- UNDRO . Guidelines for Disaster Prevention Vol.3: Management of Settlements, Geneva, 1976