

AN INNOVATIVE CASE OF LOCAL PARTICIPATION IN ~~DISASTER~~ HOUSING:  
RESETTLEMENT FOLLOWING THE 1957 ABANT AND 1967 MUDURNU VALLEY EARTHQUAKES

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SUMMARY

We think that the elements which led to success in Mudurnu Valley in the 1957-1967 decade are the following: The people of the affected area had occasion to influence the decisions on matters of detail. Village layouts and construction systems were not standardized by the government, large scale contracting firms were not employed, therefore decisions could be calibrated to special conditions. The reaction to the earthquake in terms of building techniques did not assume the form of imposing designs not only foreign to the locality but also untested in terms of earthquakes, instead the emphasis was on minor points which would make the buildings much safer against future earthquakes. We think that the few such construction-technique decisions have proved fully satisfactory.

INTRODUCTION

In Turkey 92 percent of the area and 90 percent of the population are in earthquake zones (DMTMK, 1978). In spite of this there is no established policy with respect to pre-disaster measures of prevention or damage minimization. The approach has consistently been in the form of seeking emergency solutions to extensive and multi-dimensional post-earthquake problems, more specifically to housing needs. The concept of minimizing earthquake damage has been reduced to merely "bandaging the wound" (DMTMK, 1978). The earthquake history of Turkey offers numerous examples of this "bandaging" policy.

In contrast to the repeated examples of failure, this paper examines some relatively more successful examples: resettlement and reconstruction following the 1957 Abant and 1967 Mudurnu Valley earthquakes. The overall policy remained the same, but the variations here yielded different results. The settlements (Arpaseki, Ortaköy, Yeğendere, Alaçam, Akyokuşkavağı, Yarbaşı), located on the western fringe of the North Anatolian Fault Zone, were selected for a field and documentation survey. The purpose of this study is to determine the factors that led the implementation in 1957 and 1967 to success and that distinguish these from other disaster cases.

The reconstruction and resettlement policies pursued by the State after the earthquakes of 1957 and 1967 are almost identical, despite the ten years interim and major personnel changes in the political process and in the technical staff during that period.

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The failure of reconstruction following such earthquakes that took place during the same period such as Adıyaman (1964), Varto (1966) and Hınıs (1966) make the success of the post-earthquake actions after the Abant and Mudurnu Valley earthquakes all the more interesting. Considering the partial coincidence of the earthquake zones of the two earthquakes and the similarity in post-disaster applications, the two earthquakes will be examined together. Any differences between the two will be discussed at appropriate points within the context of this study.

#### POST-EARTHQUAKE RESETTLEMENTS POLICIES

After both earthquakes, extensive damage to buildings and the situation in the damaged villages of the higher plateaus made housing provision urgent: winter arrives early. Tents and makeshift shacks served tentatively in the emergency. During the days immediately following the earthquake, geologists were dispatched to investigate and ascertain whether the ruined settlements could be reconstructed at the same sites. As a result, some of the existing settlements were selected for definite relocation, though in part this advice went unheeded. Relocation was generally recommended for settlements which were on or in the vicinity of fissures and faults created by the earthquakes. In the 1957 earthquake Arpaseki and (though not carried out) Yeğendere, and in 1967 Alaçam, Yarbaşı, Akyokuşkavağı were the villages for which resettlement was indicated in the geologists' reports.

The importance of studying the relocation decisions in clear in the experience of the 1957 earthquake. Concrete evidence shows that while Yeğendere, where the decision to relocate the village went unheeded for various reasons, was subsequently completely destroyed in the 1967 earthquake; Arpaseki where relocation was carried out suffered no further damage than a few plaster cracks, although it fell within the X force isoseismic line of the 1967 earthquake.

No other earthquake has subsequently occurred and it is thus not possible to assess relocation measures following the 1967 Mudurnu Valley earthquake. However, during examinations at the site we could clearly observe that the previous locations of the settlement were indeed unfit for reconstruction. Evidently, in this area where all settlements are silvan or forest-edge villages, with very little tillable soil, people have elected to build their homes on hillsides and steep slopes, to save for farming what precious little arable land is available, so that flat areas could be used for fields or pasture. Foundationless buildings, compounded by uneven load distribution on supporting structural elements due to the gradient of the land and the resultant 'instability' have acted as magnifying factors in the devastation of the 1967 earthquake. After the 1967 earthquake almost all settlements of all kinds have been relocated.

The Ministry of Public Works following the 1957 earthquake, and the Ministry of Reconstruction and Settlement after the 1967 earthquake maintained control and supervision over the reconstruction of demolished settlements by developing layout plans and house types. None of the rigid austerity found in the projects for eastern Turkey is seen here.

The approach did not create "physical volumes" in conflict with the living patterns of the people and at variance with natural features. Quite to the contrary, the more difficult of two choices was made. The questions such as 'Can the settlement remain in its old place?', 'Do villagers approve of the new site?' 'Do villagers approve of the plans and houses?'. 'Does the construction meet the standards?' were asked the local people-with few exceptions- in earthquake damaged settlements. The project team and prospective owner-users of the housing units jointly developed the particular types best suited to their life style and surroundings. "Details" of living, privacy, traditional baking arrangements, animal shelter and storage are best designed by the people themselves. This survey is one of the peculiarities that distinguishes the 1957 Abant and 1967 Mudurnu Valley post-earthquake operations from others in Turkey.

In this district, after the 1957 and 1967 earthquakes the practice became "help those who build their homes". Monetary aid and additional contributions in the form of construction material were also made. In the process of construction, buildings were inspected several times to ascertain whether they complied with technical requirements. The villagers point out that the foundations and building heights were very strictly controlled. Buildings in these areas, which previously were constructed without foundations and without sound sustaining walls were replaced with earthquake-resistant, soundly built houses with proper foundations. No compromises were made in functional aspects in regard to conformity with the nature, surroundings and with rural pattern of life or in local architecture and the use of conventional building materials.

The construction technique and foundation construction materials are identical in the entire resettlement project. The supporting framework is made up of wooden uprights. In this technique the wooden main pillars, anchored vertically to foundation corners by means of steel bars, are reinforced with horizontal wooden beams and cross-ties. Materials used for filling up the spaces left between elements of this supporting structure vary from one location to another. Wood, stones, bricks, adobe blocks and soft sandstone (küfeki) are the most commonly used fill materials. The use of roofing materials also shows differences according to locations and conditions of the settlements. While tin and zinc sheets are preferred in villages at higher altitudes where snow remains longer, wood shingles and clay tiles are more common at lower altitudes. Despite such minor differences, it can easily be said that the villages within the research area are rare settlements where people have persistently used their traditional construction techniques and construction materials. It is difficult to say that post-earthquake reconstruction work has spoiled these traditions of the settlements. In fact the new buildings have even accentuated these features.

#### CONCLUSION

While some snags and problems were naturally encountered during the post-disaster resettlement and housing projects, the "mayhem and plunder" which is a common occurrence in disaster areas was successfully avoided (Ataman, 1978, Our observations in these villages and discussions with the people consulted left this clear impression.

In our estimation the case of Mudurnu Valley is one of the rare instances in the world where the relocation and construction measures after one earthquake have been tested by another earthquake, especially within such a short period of time. It so happens that the measures taken proved to be to the point. Nevertheless, the 1957 and 1967 experiences should be viewed not as examples to guide long term national disaster policy, but merely as exemplary applications that may provide clues to amelioration efforts.

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The term 'bandaging the wound' is used in the "Report of Measures Required for Reduction of Earthquake Damages in Turkey", March 1978, by DMTMK, to define Turkey's earthquake policy.

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