

_THE EVALUATION OF COMMUNITY PARTICIPATION IN HOUSING RECONSTRUCTION PROJECTS AFTER DUZCE EARTHQUAKE

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Abstract

Housing reconstruction after earthquakes is a crucial issue because of physical, social, psychological and environmental effects. However, natural disasters may also cause the generation of physical, social and economic models that can realize urban and rural renewal in the settlement. Therefore, an improved strategy is the key to accelerate the reconstruction process for upgrading condition of human settlements.

This paper examines the housing reconstruction process carried out in Duzce city that was heavily damaged by the Marmara Earthquake of 17 August 1999 and latterly Duzce Earthquake on November 12 1999. Priority of the Turkish government can be summarised as: firstly, physical reconstruction by means of reconstructing or improving the existing infrastructure and superstructure of the city as soon as possible and secondly, construction of houses for house owners only. The social and psychological situation of the affected population seemed to be not clearly considered in all reconstruction phases. In this study the problem of sheltering and housing after the disaster is determined and evaluated from emergency shelter to temporary housing and permanent housing in case of Duzce. For this purpose, primarily interviews are made with the administrators. Latterly questionnaires were conducted to determine users' expectation level about the shelters, housing units and their environment. Permanent housing projects are comparatively analysed according to the community participation level. Post disaster housing implementations are studied in a broad view including social, psychological and environmental variables. This study aims to assist design and planning guidelines for future housing project implementations.

Keywords: Housing Reconstruction; Post-disaster Housing; Community Particip

INTRODUCTION

This study examines the impact of the social facts in housing reconstruction projects after earthquakes. Community participation is a key term to understand the communities social needs. The housing projects evaluated from social

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reconstruction point of view so that physical reconstruction is not solely give an answer to community needs. Also the interaction between social and physical reconstruction tried to be pointed out by criticizing:

- Is there a direct relationship between social and physical reconstruction of the community after earthquakes?
- Does the community participation affect the succes of housing reconstruction projects?

The goal of the study is to find more satisfied solutions for victims by evaluating the housing reconstruction projects from social point of view.

Turkey is exposed to various kinds of natural hazards sometimes causing substantial losses of life and property as a result of its geological, seismological, topographical and climate features (Tercan, 2000). In the last six decades the effects that natural disaster caused directly economic losses in Turkey approxiametly at the rate of 4% of the Annual Gross Income per Person (Ergünay, 1996). Turkey is located in the "Alpine-Himalayan Zone", which is the most seismic continental zones in the world. Most earthquakes take place in zones between gradually moving tectonic plates (Tercan, 2000). In the last 14 years approximately 385.000 houses were destroyed or damaged (Figure 1). Specially, after Marmara and Duzce earthquakes approximately 300.000 houses are collapsed or damaged. Emergency shelters were needed for 600.000 people. The shelter needs in Turkey after disasters cause different habitation modes, which can be summarised in these alternatives:

- Moving to shelters of friends and relatives
- To move to a second undamaged house or rent a house. This option also includes using of empty public buildings
- Organisation of camps or tent shelters beside the damaged buildings (Price et al., 2000).

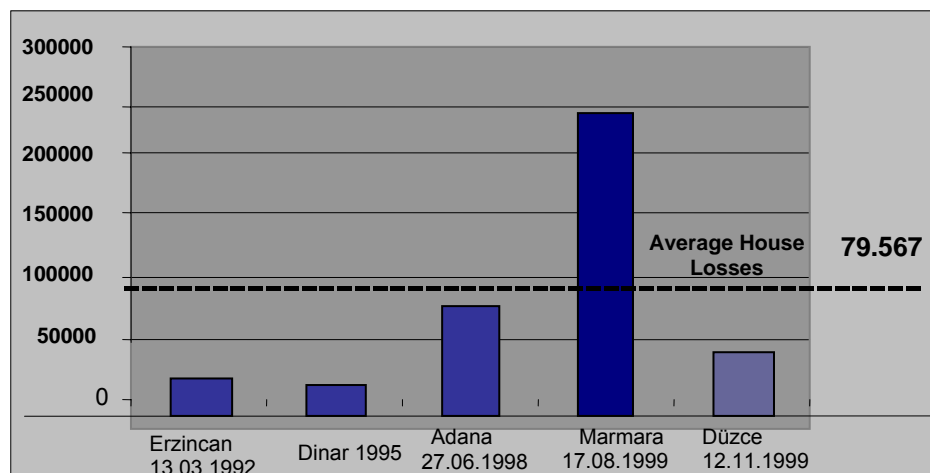


Figure 1 Distribution of Housing Losses in Turkey due to Earthquakes (1992-99)

RESULTS OF 1999 EARTHQUAKES IN DUZCE

Duzce province is located on the North Anatolian fault line in Duzce plain (Figure 2). As a result of the rapid industrialization in 1980-1998, migration to the city from the rural areas increased and therefore housing demand rapidly increased. The total area of the city is 2593 km² and the population is 307.056 according to 1997 census, the density of 111 people/ km² which is much more than Turkey's average (83 people per km²). Rapid migration caused unplanned construction in the city where users often added floors to old buildings which had been constructed on weak soil. New buildings were constructed rapidly with untrained labour and substandard material. Furthermore, there were no reliable control systems for building construction (Duzce Municipality Chairmanship, 2000).

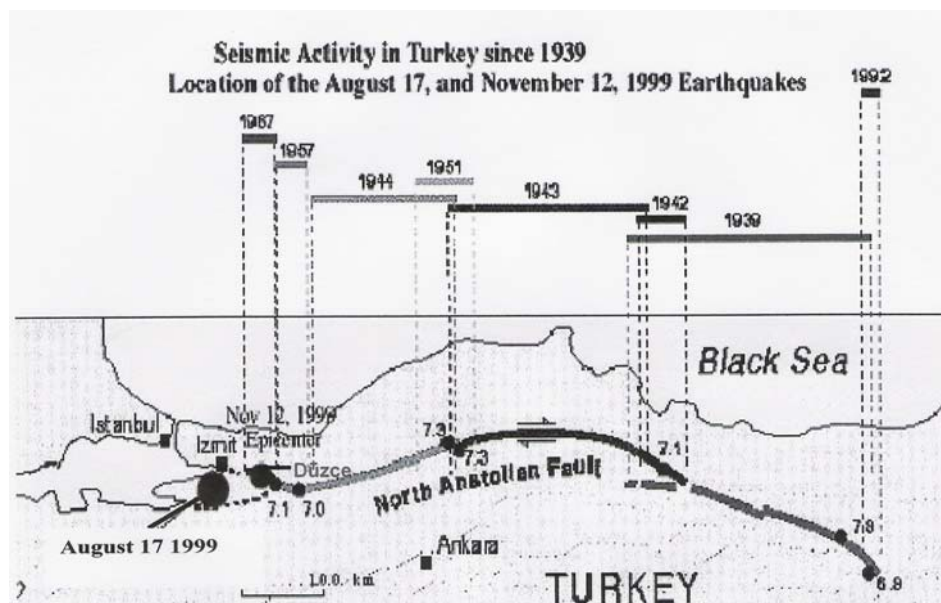


Figure 2 North Anatolian Fault Line and Location of Duzce

The devastating earthquake with, 7,2 magnitude occurred in Düzce province on the 12th of November, 1999. Approximately 43000 buildings were damaged. Generally damages occurred 84% in houses and 16% in work places, 980 people died and 38939 were injured (Ministry of Public Works, 2000).

THE CASE OF DUZCE POST DISASTER HOUSING

This study examines emergency shelter and temporary housing implementations in Düzce. As well, the permanent housing process of three sites are evaluated and comparatively analysed within the context of social approaches and community participation.

The studied areas are:

- i. Permanent Housing Site
- ii. World Bank Housing Site
- iii. Beyciler Social Housing Site

The initiative is given to construction of houses by the ministry of Public Works and Settlement in Turkey. The Ministry of Public Works and Settlement produced houses only for the home owners through the agency of contractors. In addition to this, Catholic Relief Services (CRS) and International Blue Crescent (IBC) gave donation for housing for the low income victims as well. But there was no effort for the tenant's housing problem. The only study was made by DEPDER (Association of Earthquake Victims) which is an NGO established after the earthquake but is still at the level of obtaining property for housing and therefore has not yet built any houses.

POST DISASTER HOUSING PROCESSES IN DUZCE

National and International aid organizations, with the help of Red crescent and civil defending directors, established tents cities; distributing 26,665 tents to 112,000 earthquake victims. However, some victims built the tents on their own. The first precaution that governorship took was to settle some victims to the state buildings in other provinces. Most of the victims refused to leave the city, since they wanted to be in contact with their relatives and friends, they also wanted to be in charge of funerals and they desired to stay in the areas of damaged and collapsed buildings. In the following phase, the decision for building a temporary earthquake house was taken by the Ministry of Public Works because of insufficient infrastructure of tent cities, the lack of protection from the climatic conditions and long construction time of permanent houses (Duzce Municipality Chairmanship, 2000). In Duzce province, 6,669 temporary houses were constructed. More than half of the houses were donated by national and international aid organisations. Priority in rehabilitation process is given to the public property for temporary housing areas. Infrastructure facilities were made by the General Directorate of Construction Affairs (Duzce Governorship Public Relation Director, 2002). Although 6 year passed after Duzce earthquake, 10 % of temporary housing areas are still in use.

The most important problem occurring in tent cities was the location of toilets-baths which were mostly located at the end of the sites. The location of hygiene areas were difficult to reach especially for children and elderly peoples at night. In emergency shelter phase, central government was late in evacuation and demobilization phase of tent cities. So by time, the disaster region pulled the migration from the outside the province. The causes of migration were the desire of people who had insufficient income level to benefit from shelter and food services in the disaster region.

In emergency shelter process, the community participation was at the lowest level. Because most of the victims were in a traumatic case even they had no injuries or damaged buildings. They were all in need for help. From the view points of organisers, these periods could be used for evaluation of the damages and effects of the earthquake and predicting the tool for the development of planning actions in temporary and permanent housing processes based on existing resources.

TEMPORARY HOUSING SETTLEMENTS

The bid with contractors for the construction of temporary houses were made after the selection of the sites and 3258 temporary houses were constructed by the ministry of Public Works and Settlement and 3.411 were donated by various national and international aid organisations. These houses are generally constructed in the state property especially in rural areas.

Generally social areas are found insufficient by the users (Figure 3). (Cosgun and Arslan 2004).

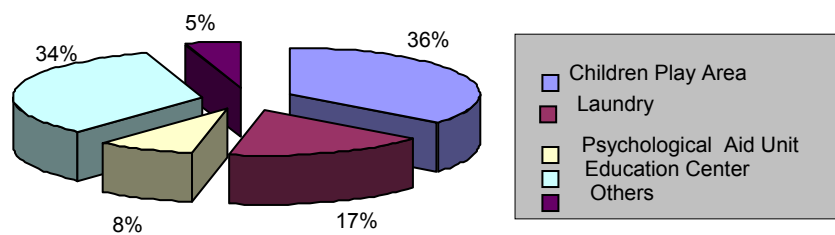


Figure 3 Expectations on Social Needs in Duzce Temporary Housing Sites

The construction process does not cover the community participation (Cosgun and Arslan, 2003). Thus, the lack of participation caused low maintenance and damages after the evacuation (Figure 4).



Figure 4 View of the temporary houses after evacuation

Studies in Duzce showed that there was a gradual evacuation plan for temporary housing areas. The house owners were moved to permanent houses. Tenants were collected in two big temporary housing sites however the real situation was not as planned. Temporary houses were occupied by new settlers from different social groups. The existing users denied evacuating the houses. As a result the Central government used intended to turn off electricity and water of the sites for evacuation and demobilization.

PERMANENT HOUSING SETTLEMENTS IN DUZCE

The Ministry of Public Works and Settlement was obliged to construct permanent Houses up to the number of house owners who were influenced by the disaster. The selection criteria were;

- i. Appropriate Soil Structure
- ii. Property of the State

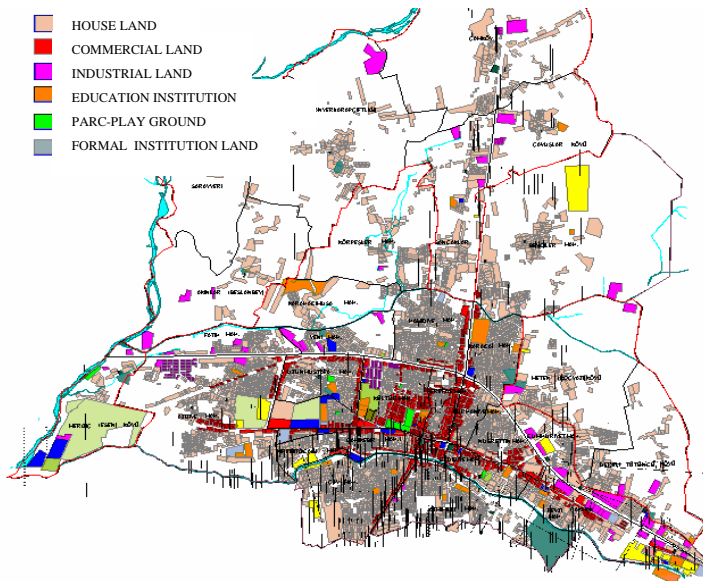
8004 housing units were constructed in Duzce and primarily the ministry gave a grant to house owners who are willing to buy houses or to construct houses in their own properties.

New permanent housing sites were constructed by the Public Works after the occupancy of the temporary houses. The new settlement was 6 km away from the city center and was located in the northeast of Duzce between Kazıkoglu, Sallar and Nalbantoglu villages (Figure 5)(Ministry of Public Works, 2000).The permanent housing site is located on the outskirts of the Duzce Municipality boundaries and its size is approximately 350 hectares.

There are 14 regions in the new settlement and 7000 housing units. The houses are designed as 3-5 storeys. The victims moved to their permanent houses after the establishment of building lots (Figure 6-7). There are reserved housing lots in the settlement as well. The development of existing axis between the old and new settlement caused serious problems. In a prospective way new houses will be built on these enriched agriculture property and this will change the whole ecosystem in this area. New houses have been built in this axle in last 2-3 years.

Although the decision for relocation of the housing site is given after the earthquake the transportation between old city center and permanent housing or work places have not been established yet. The filling of the property between these three points is not possible because of social and political forces of social groups which had work places in the old city center. The permanent work places in the permanent housing sites are not still fully used. The old city center has become more active by time and the city could not enlarge the outskirts of the new settlements

DUZCE CITY EXISTING LAND USE



DISASTER VICTIMS SETTLEMENT

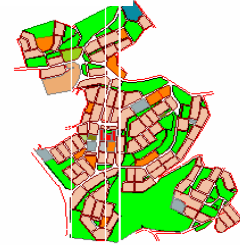


Figure 5 Duzce city and location of new permanent settlement

The interesting situation is; although the central government transferred resources for infrastructure and construction of houses the connection way which is 6 km long between the new settlement and old city center has not been finished yet. The region can not adequately benefit from the municipality services because of still being outside the municipality boundaries. The striking point is that the religious buildings are constructed rapidly usually by the community donation. All the open spaces are arranged but the users have a low tendency to use these spaces (amphitheatre, publicgardens).

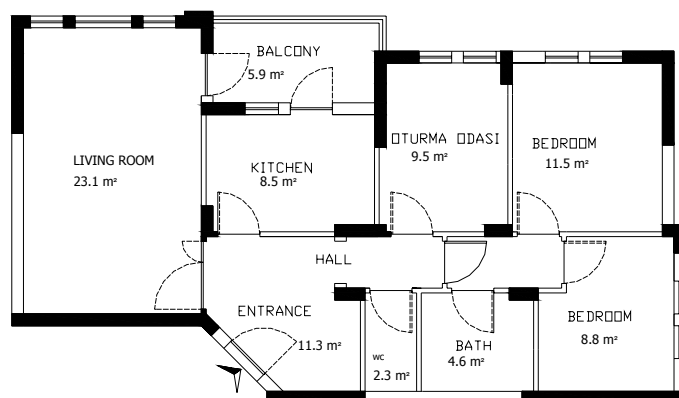


Figure 6 Permanent House Type F plan



Figure 7 View of the houses

Yıldırım and Arslan stated the lack of community participation both in design and in construction processes of permanent housing site. They also found in a public survey which is conducted from 100 permanent house settlers that;

- They had no information about the house cost and re-payment process
- They had transportation problems /options between the old and new settlement
- They expect to live in 2 storey houses rather than apartement blocks.

People coming from different income levels and social statue began to liveside by side in the same housing blocks because of the arrangements of building lots. Some of the house owners were village settlers before the earthquake and they reject to live in this type of life style. This shows the lack of organisation and effects to the social reconstruction. People live in rural areas may have houses in their own places. Donating those houses in a new settlement does not mean they will live there. These social facts must be taken into consideration during the planning phase of post-disaster housing. Another problem is exposed from the old city settlers which had different life habits when they live in the old city. The work places are close to their houses so they do not use transportation vehicles and majority of them had houses with gardens so they have neighborhood relationships. But new settlement offered them a public life, responsibilities and much more isolation. But some users have not even left their old habits and they continued growing vegetables in the new settlements.

WORLD BANK PERMANENT HOUSING SITE

During the reconstruction process, World Bank gave grant for construction of 622 houses. These houses projects were type (Figure 8). Social and cultural differences in occupants were not very well considered in the design process. Using typical housing layouts, cues or phrases in architectural and planning actions should cause critical solutions especially in flexible use of spaces implemented by The World Bank. Thus, the congruence level with behavioral pattern issue is completely neglected even in World Bank implementations (Ünlü, 1998).

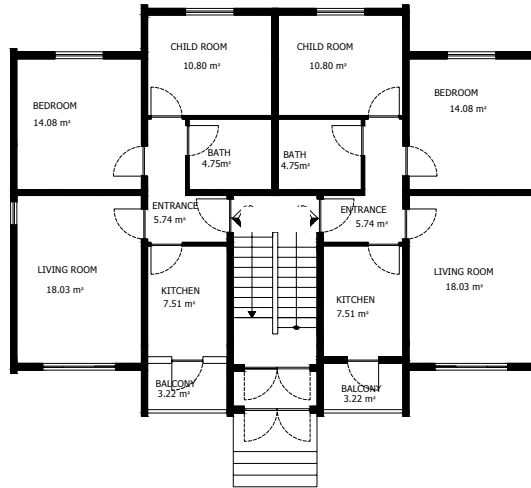


Figure 8 World Bank typical house plan

The houses were constructed with tunnel moulding system type and eventually this construction system blockades the flexibility of living in there. The height of the floor is 2.52 m and it is found low by the users. Houses had 2 rooms and 1 living room. The toilet and bathrooms are shared. The European-style toilet is found inappropriate by the users so that they were shared by the households. The plans were typical and they were not designed due to number of families and family composition. The window in the living room is found nonfunctional by the existing users. The flexibility of living room due to occupant's satisfaction level in World Bank Houses and Permanent Houses were shown in Figure 9 (Uzun, 2006).

Different arrangements in Living Room and Satisfaction		Permanent Houses		World bank Houses		Total	
		F	%	F	%	F	%
Different Arrangements	Appropriate	48	48	31	31	79	39,5
	Inappropriate	49	49	64	64	113	56,5
	Undecided	3	3	5	5	8	4
Satisfaction Level	Appropriate	50	50	31	31	81	40,5
	Inappropriate	44	44	67	67	111	55,5
	Undecided	6	6	2	2	8	4

Figure 9 Flexibility of living room and occupant's satisfaction

Figure 9 indicates that % 55, 5 had dissatisfaction and 56, 5 % of occupant's think that they had no chance for different arrangements.

BEYCILER SOCIAL HOUSING SITE

By cooperation of IBC (International Blue Crescent) and CRS (Catholic Relief Service) Beyciler Social Housing Project started as a result of this cooperation. By the light of data IBC provide, CRS donate 2.500.000\$ to the housing project prepared by IBC. IBC construct 168 house projects with social and management center to families which had no security.

The first duty was to select house owners in the project. Families were at the lowest income level. Construction of houses began in the first months of 2003. House owner's worked and participated in construction process (Figure 10-11-12).

Four independent houses were designed in adjacent order as a block type. Houses had an independent house characteristic. This approach is considered for efficient usage of the property and supported "neighborliness" concept in a physical scene.

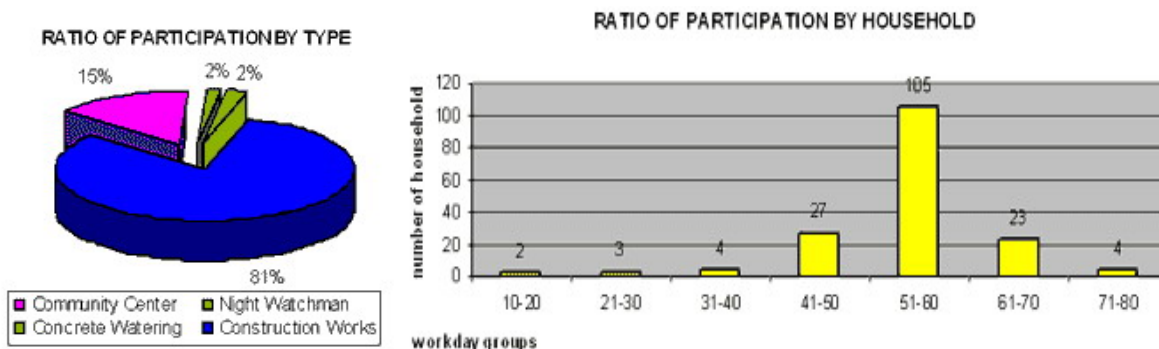


Figure 10-11 Community Participation Level in Beyciler

Beyciler social housing Project had an "Incomplete" delivery approach which the houses were constructed by the NGO's but interior of houses should be finished by the users (Figure 13). The ground floor serves a standart living area for an average family and is a "new beginning" opportunity. The users had a change to enlarge by their own efforts as well. "Incomplete approach" preserve low-priced, social characteristic of the houses and gives opportunity to construct more houses for families.

Families had chance to make changes in interior design. The flexibility of housing plan motivated the occupants to alter for their families. The observed attempts can be indicated as below;

- Living room and children room can be joined together and became a bigger living room,
- A door can be added to the hall,
- The living room's door can be eliminated and joined with the hall,
- Selection of Toilet (Either European Sytle or Turkish Style)
- Selection of interior paint color due to choises.



Figure 12-13 Public Participation to the Construction of Permanent Houses

Consequently, when Beyciler Social Housing Project and World Bank-Permanent Housing Project are compared according to their advantages as disadvantages. It can be pointed out from Beyciler Social housing Project that;

- Only open to low income families
- The houses constructed by the social house Project is 168 and has a small scale whereas the total house need is nearly 8000
- The people benefits from the project need help and organisation for the sustainability of the sites in future. This new NGO's should not be easily produced by the efforts of these low income families. So they need to be strengthened by the other NGO's.
- People can participate in different stages with different roles and tasks in the housing process.
- There is flexibility in design which includes possibilities for future changes.

On the other hand World Bank and Permanent house projects had;

- In the long run finance are made by the earthquake victims
- The users own completed houses and environments. But the lack of participation in housing processes caused not to meet their expectations and broken down their old social relations.
- There are no flexibility in house plans so that the construction systems were with tunnel moulding system type and with reinforced concrete skeleton.

CONCLUSIONS

The implementation of post-disaster housing showed that decision makers in disaster housing should consider all phases of housing process not only from physical point of view but also socially as well. The psychological reconstruction of the affected society should be considered from a humanitirian point of view as well as physical approaches. Determination of user expectations is the key word that

should be used in design process and, it should convey a multi disciplinary approach to housing.

Participation of the victims in reconstruction process will not only help to produce sustainable environment but also it accelerates the reconstruction of the affected region. The Case studies in Duzce showed the lack of community participation in housing projects. The participatory planning process has a small ratio when compared to total housing. Thus, although 6 years passed after earthquakes some of the victims are still living in temporary houses and some of them have dissatisfaction from the permanent house which they live in. The central government had a great impact on housing decisions in Duzce whereas the local government's role in the housing has not been defined yet.

Social and physical reconstructions seemed to be independent from each other, but they had an interaction and they affect each other in the spatial usage decisions reciprocally. After the disaster or NGO's low level perception of the local culture may prevent to produce original synthesis for housing implementations. Thus, The success of post disaster housing implementation is much related to the planning and preparation process of the organizations and decision makers before the disaster.

In order to increase the community participation level and satisfaction of expectations is appropriate for small scale housing projects like Beyciler had to be joined. In this way, big housing projects which the municipality and NGO's had more contribution should be formed. This project should be planned according to cultural, social level of the countries and their ideological perspective so that they could be sustainable. So, housing reconstruction will be quicker.

Relocation of affected population to new and safe sites can be an effective tool to reduce the probable future seismic risk and to create a resilient community. But the evaluation of the case studies are pointed out that relocation has always effects on the behavioral attitude of the disaster victims by means of changing their daily activities like transportation, traditional life style, etc. Different people with different social status and their old neighbor relations must be taken into consideration in order to gather them in the same or close neighborhood. This approach will accelerate the congruence level of the society and will blockade the social segmentation. Adaptation problem for victims to the new settlement will be minimized as a result of change in the spatial organisation.

Evacuation and demobilization processes are crucial and they must be planned well either in emergency shelter or in temporary housing sites. Social mobility must be taken into the consideration and future projections should be made. The method of evacuation must be considered from social points of view as well.

Different organisations and stakeholders (not only house owners and low income families but also the tenants) should have roles directly in the housing process. Tenants had great impact on existing damages of the affected regions and poor quality construction of buildings rooted from the tenants demand.

For producing high quality buildings disasters may also boost for providing high quality buildings at the region, and this also make political changes. In that way, affected population should respond to their own needs. This should be done for accelerating the congruence level of the occupants, moreover social ties and bounds rather than separate them from each other. Therefore community consciousness should be formed. This will not only help the affected population to form new settlements but also new and sustainable communities quicker. Finally the reconstruction of the city will be in a short time and more effective.

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