

A POST-DISASTER DILEMMA: TEMPORARY SETTLEMENTS IN DÜZCE CITY, TURKEY

Esra Bektaş*

Erasmus University Rotterdam, IHS

Abstract

The long written history claims that disaster events have resulted worldwide in dreadful damages during the past thousand years. In 1999, Turkey faced two major earthquakes -7.4 and 7.2 Richter magnitudes- which affected deeply the public routine and the sustainability of the urban growth and development. Within this tragic picture, Düzce city was one of the particular samples that almost collapsed due to the two disasters—especially in terms of housing. In view of this, the city was gradually reconstructed through the execution of 15 temporary settlements and permanent housing complexes. On one hand, temporary constructions met the urgent needs of families affected by disaster (i.e. shelters, sense of secure, safety, privacy and daily life requirements). On other hand, they hindered the maximization of the opportunity given by the disaster itself to be turned into sustainable re-development due to their negative impacts in a long-term.

Based on this conflict, the present study aims to review the temporary housing and examine their affects starting from the preliminary design to the uncontrolled growth of urban areas. According to the findings, the main reason was an outcome of access obstacles to permanent housing in both physical and financial terms whereby the need of improving the quality of living environment by self-demanding of the community occurred.

Keywords: Temporary Housing; Post-Disaster Reconstruction; Housing Recovery

* esrabek@gmail.com

INTRODUCTION

“Turkey is a country with a high risk of natural disasters. But one of the criteria of livable settlements is that they should not be confronted with such a risk or that they should take the necessary precautions against it. In Turkey, a destructive earthquake occurs every 1.5 years or less. The statistics of structural damage caused by natural disasters during the last seventy years show that the number of houses wrecked/damaged by natural disasters is estimated to be 600,000; 66 percent of the damage is caused by the earthquakes, 15 percent by floods, 10 percent by landslides, 7 percent by failing rocks, and 2 percent by avalanches and meteorological disasters.” (Habitat, 1996)

In 1999, Turkey was faced with two major earthquakes with magnitudes of 7.4 and 7.2 on the Richter scale causing around 19,000 deaths and 50,000 wounded. They also caused losses of approximately 300,000 and 50,000 residential and business units respectively. In this tragic incident, the city of Düzce almost collapsed. The city took a special place due to its position as a seismic centre in the second earthquake of November 12, 1999.

Consequently, it caused large number of housing shortage that needed urgent covering. The major issues were defined as rescuing victims, providing emergency sheltering and afterwards reconstructing the living environment. However a conflicting environment occurred because of the need to provide urgent requirements and the need for long term planning requested for by the properly structured plan for the redevelopment opportunity of the City. As a consequence of shortcomings in recovery program, the temporary housing program did not work successfully. This has put the city in the previous vulnerable position with informal settlements and vast slum areas.

The study is exploratory and aims at developing a better understand the implementation of housing recovery through lessons-learnt from previous experiences. It describes the main tasks of reconstruction planning and focuses on temporary sheltering and housing with alternative approaching in providing these.

The research title, *“Disaster Dilemma”*, was chosen as a result of its contradictory meaning to the previous experiences which show that most temporary housing settlements stay longer than their expected life.

Research Objectives

The research comprises 2 main objectives;

- To examine physical features of the selected temporary settlements in Düzce in between their 3 years life line (2000-2003), in order to figure out their negative and positive sides.

Research Questions

The proposal research questions as follows;

- What are the preliminary and present conditions of settlements?
- What are the changes between initial and existing situation, and Why?
- What are the circumstances behind the captured picture of Düzce city in the selected period?(year 2000 and 2003)

DISASTER AND HOUSING

Housing is essential to well-being and development of most societies. It is a complex asset with links to livelihoods, health, education, security and social and family stability (Barakat, 2003). It is also a complete system embracing whole human activities determined by specific requirements and cultural patterns (Ibid, 2003). The World Bank reports (2002) that most vulnerable assets for disaster are housing in housing sense and developing countries have been affected more than industrialized ones. The reason of this vulnerable position is the unfortunate consequence of the process of rapid uncontrolled urbanization in developing countries, which has resulted in the proliferation of vast slums and squatter settlements (Huque, 1983).

According to the conditions occurred on post-disaster period, the major issue is usually defined as re-building the physical environment by emphasizing housing in the recovery programs. For all ages the humanity tends to have a shelter to settle down and continue to improve their standards. Therefore, this basic attitude is generally seen at the afterwards of a catastrophic event; sheltering is a necessity to provide safety conditions, reduce the tensions and maintain community's security with protection from climate conditions and sanitation problems. It is also important for human dignity and to sustain family and community life as far as possible in difficult circumstances (Shelter Project, 2004).

Temporary Housing

"...Temporary housing is usually provided by wealthy governments, and it is extremely expensive in relation to its intended life-span. The provided units are expected to last for a period of several months to several years, prior to replacement with permanent housing..." (UNDRO, 1982) As Johnson discusses (2002) temporary housing refers to disaster-affected families' lodging between the onset of the disaster and the period when they regain permanent housing. Temporary housing is usually preferred by national authorities when the disaster consequences point large number of housing shortage that permanent construction takes long time. In addition, it is observed as a necessity because of recovering physiological destruction of the community (Ibid, 2002).

At the international platforms, constructing temporary house in disaster affected regions has become a big debate. The main reason is observed as difficulties on controlling its time span and undesired circumstances caused by this exceeded life. With the light of all local and international discussions, it is still considered as the crucial joint part in housing recovery as a key of puzzle and in many disaster occurred regions it has a great tendency to implement in reconstruction program frequently.

RESEARCH STUDY: Düzce City

In 1999, when two massive earthquakes¹ shook Düzce in Turkey, the City is left with huge amount of housing shortage within a ruined public routine. According to consequences of disasters, Düzce had been left with 300.000 residential and 50.000 business units' losses² (Tercan, 2001) Due to the volume of housing shortage, the Ministry of Public Works and Settlements had tendered the construction of provisional settlements to 25 private contractors. Approximately 20,000 prefabricated houses were constructed in the effected areas, and around 8000 units were donated by Turkish Military, national private companies and foreign countries including Japan, Israel, Germany, USA, Greece, Russia, Czech

¹ The earthquakes, occurred in 1999, had 7.4 and 7.2 magnitude level. And Düzce was the centre territory of second earthquake.

² According to assessments, the total material damages are estimated over 10 billion US\$ which is about 5% of the GNP of Turkey (Tercan: 2001)

Republic and the Cyprus Federation (Ibid, 2002). In addition to the housing donations as units, the Spanish Government provided a loan of 400 million US\$ for housing reconstruction and good supply by stipulation on purchasing the products from Spain (The Annual Report of Prime Ministry of Turkish Government, in Ibid, 2001).

Temporary Housing Settlements in Düzce

As mentioned above, for reconstruction response, 15 settlements were constructed in both inner city and the surroundings with all the aids and provisions supplied by Turkish Organizations. The process was conducted by the Directorate of Prefabricated Constructions of GGDA³. Municipality of Düzce and Ministry of Public Works cooperated together for provision of infrastructure and site services, even though the neighborhoods were not included in municipal authorization boundary. Besides, the plans and layouts were prepared by the GGDA as seen on Figure 2. On other side, the GGDA also constructed various units in the same neighborhoods by using their wooden prefabrication technology. In addition, different typed constructions were built by international donors and organizations' aids that comprised igloo type, containers, steel-structured units, paper log houses and also constant prerequisites of aid organizations.

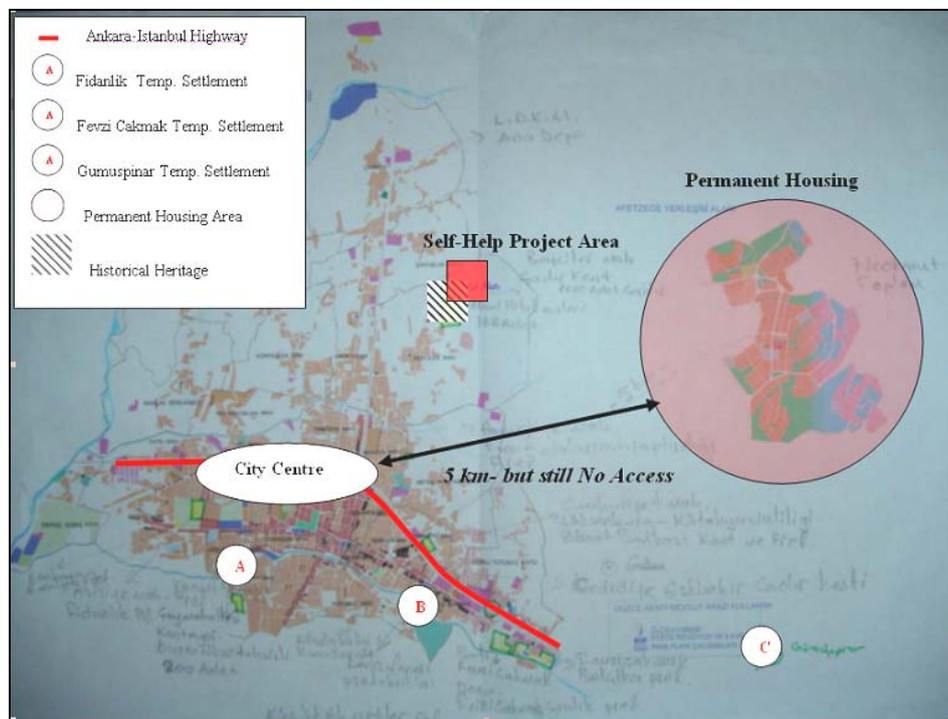


Figure 1 the relation between permanent, temporary housing and city centre in Düzce city, adapted by author (2004)

This diversity has created the different tendencies and attitudes seen on the residents. Due to their time span, the physical changes are observed and they have a character to be a tool to identify the local behaviors and prototyped products. For a researcher it is observed an opportunity to analyze the mismatches and positive sides of the implemented approach, “Temporary Housing”. By basing on this opinion, Temporary Housing reviews are done with different design layouts and prototypes of provision houses are given above. The research is important to explore the physical features and design ideas behind the executions, directly related with use of time expectation.

³ GGDA is General Directorate of Disaster Affair located in Ankara. It has seven departments in order to response mitigation and reconstruction issues for disasters including preparedness, risk analysis and need assessment studies.

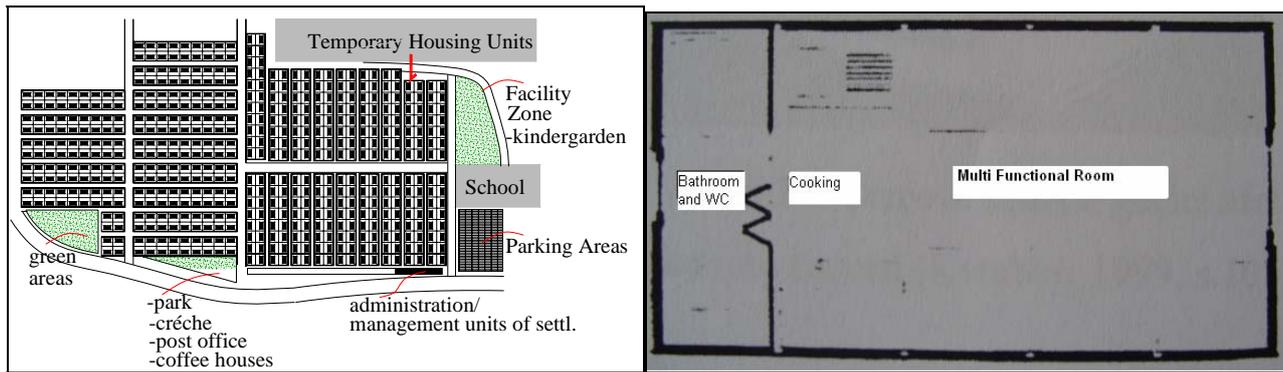


Figure 2 the Layout Map of Fevzi Çakmak Temporary Settlements, data obtained from Municipality of Düzce, drawn by author (2004)

Figure 3 Separated functioning within one room, Source: Baradan (2002)

QUICK REVIEW OF THE TEMPORARY HOUSING SETTLEMENTS IN DÜZCE

This section analyses the data obtained in fieldwork briefly explained above. In order to illustrate research analysis, the framework is constituted to perceive the logic that comprises land and location, physical features and environmental aspects.

Land and Location
<ul style="list-style-type: none"> ▪ Adequacy for settling ▪ Accessibility ▪ Ownership definition ▪ Development possibilities
Physical Features
<ul style="list-style-type: none"> ▪ Necessary activities ▪ Road systems ▪ Zone planning within master planning ▪ Relations to the activities ▪ Relation to the neighborhoods ▪ Layout patterns ▪ Spatial organizations ▪ Space dimensions ▪ Cultural codes in space formations ▪ Building technology use ▪ Traditional construction methods ▪ Contemporary construction methods ▪ Labor skills ▪ Experience on related technologies ▪ Material selection ▪ Resistance of materials ▪ Economic life of products ▪ Local materials ▪ Imported materials
Environmental Aspects
<ul style="list-style-type: none"> ▪ Climate ▪ Cultivation/plantation facilities

Spatial Discussions

In order to figure out the physical changes of the settlements, the open ended interviews were conducted among the residents. According to the results of questionnaires⁴, the most adequate space organization is chosen as Fevzi Çakmak settlements. The main reason of the

4 In the extended research, the questionnaires bringing us to the results and conclusions are conducted. Due to the limitations it is not placed in this paper.

relatively higher satisfaction level is because of the stage of privacy with multi-roomed character and size of the units.⁵ Nevertheless, when the modifications of the units are analyzed, the most-frequently applied scheme manifest a need of covering the functional insufficiency that is demonstrated by the conflict between average family size and imported design conflicts.⁶ For instance, the extra parts rank as main bed room, kitchenette, rooms- depending on the number of children in a family-, storage and greenery.⁷ The changeable character is loaded to the main living room as being flexible in day-night period, according to the number of children. Although extra constructions make the total area smaller, the main rooms are divided into different functions by isolating the kitchen from living place due to ventilation problems and fire risk. Depending on family size, the kitchen created by dividing living space, is used to create an extra space for family member. The site surveys show that the proficiency of the households creates considerable differences between tailored units in sense of quality, creativity on the space organizations. For instance, furnishing elements used as tools to identify spaces with re-forming the units by storage, shadowing and gardening constructions.

In all the settlements, greenery re-arrangement in their close neighborhood is also observed. Mainly, these gardening efforts represent two meanings; Firstly, it fills the missing part, privacy, in the “given space”. Secondly, it revives living environment as aesthetic point of residents view and to enable cultivation attempts for the families. Moreover, most-frequently observed action is to have windbreaks, added for basic requirements. It claims that there is no buffer zone from public to private area. These parts are also used for giving the privacy for each unit between neighbors. The mentioned additional gardens also are constructed to isolate the houses from public areas and to have a place which is adequate for grow and sell the products by cultivating. On the other side, it is an extra effort to create better living environment due to lack of environmental aspects inside the settlements. (See the figure 5)

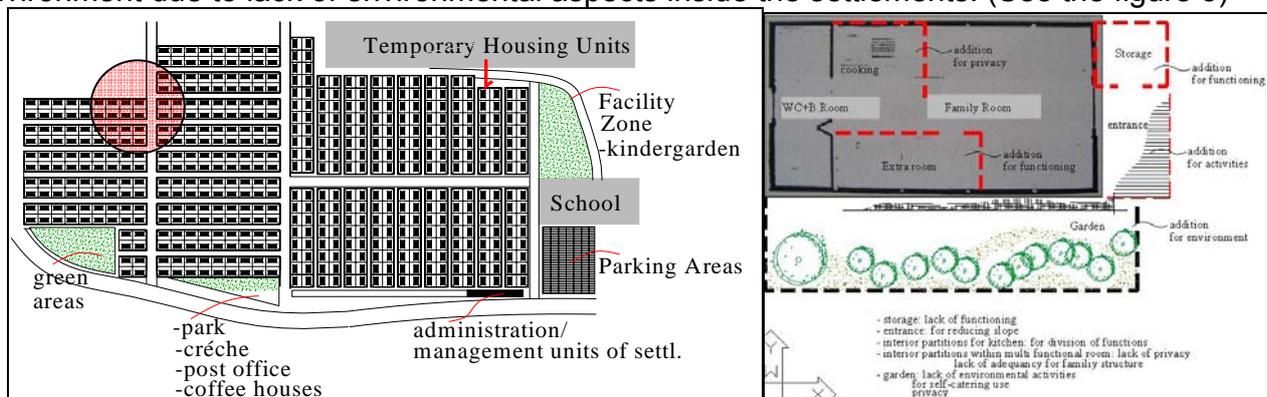


Figure 4 The initial layouts of Fevzi Çakmak Settlement adapted from Arslan, drawn by author (2004) and selected part for identifying the modified patterns (see next figure)

Figure 5 Modified Housing Units by residents, adapted by author (2004)

When the settlements are analyzed in layout scale, the content comprises necessary activities, road systems, relation between activities and housing units, similarity or discrepancies with regional urban patterns and size of plots. As seen in the figure 4 layouts are tended by grid system.

⁵ The unit area is approximately 30 m², with additional constructions it was increased to 45 m² including the greenery.

⁶ The average family size was 4, 97 and it was gained from the GDDA's report. (see the reference)

⁷ The most private space is separate bed room was given to the parents or –if exist- grandparents, in spite of the small sized area.



Figure 6 Additional gardens for cultivation and privacy supply, picture taken by author (2004)

Figure 7 and Figure 8 Additional garden for cultivation and privacy supply, picture taken by author (2004) and Source: Johnson (2003) and Author (2004) Construction methods and materials

The schemes in Figure 6 and 7 stresses that users are identified their living environment. A buffer zone necessity between units can be read on figure 8. In particular, traditional codes in spatial planning are displayed in re-formed conditions by breaking the strong feeling of grid systems. Culturally, land use transition in planning are followed from public to semi private then private in spatial chain. By looking at the two schemes, this effort is explored as users interferes their close surroundings in order to adapt themselves by using the tools as changing the orientation of possible elements and re-identifying their defined spaces. It demonstrates the alien character of housing settlements and necessities of inhabitants to reformulate their interactions within settlement scale. In particular, gardening, re-positioning of the entrances with extra constructions and elements built for terracing and shadowing point out the need of proper planning that should match to the social structure as seen in figure 9. Indeed, these modifications prove that improperly prepared designs and circumstances of the failures. Originally, the target of temporary use is to cover the needs in rehabilitation phase but taking the preventions to hinder sense of belonging. In Düzce case it is clear that wrong ownership sense, among community seeing occupation is their rights, is supported by the authorities with provided services and high facilitating level of the settlements. While this idea doesn't reflect the design choice of the units, eventually contradicted actions with the idea occurred too. While re-using possibilities are missed, the solution is suggested as demolishing the settlements with the support of military.⁸

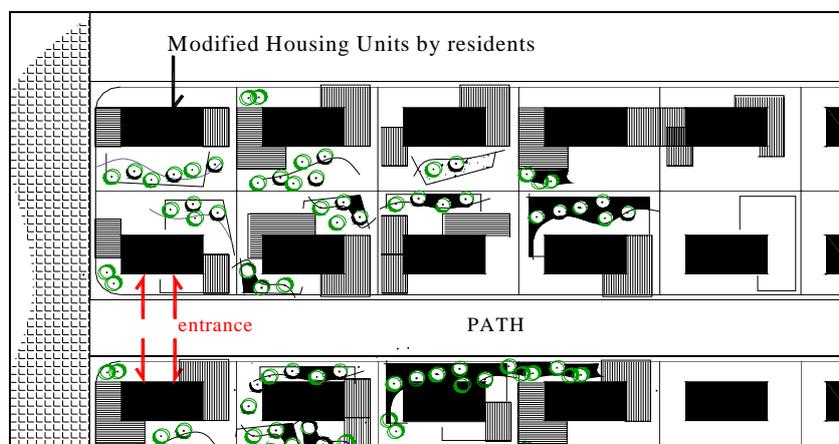


Figure 9 the Schematic view of modified settlements in Fevzi Çakmak Settlements, drawn by author (2004)

⁸ It is claimed by the authority of the GDDA in Ankara as a result of open-ended interview (2004).



Figure 10 Fevzi Çakmak Settlements, Source: Johnson (2003)

Figure 11 Modified Housing Units, Source: Johnson (2003)

Figure 12 Constructing house by using container type of temporary units as a core, Source: Johnson (2003)

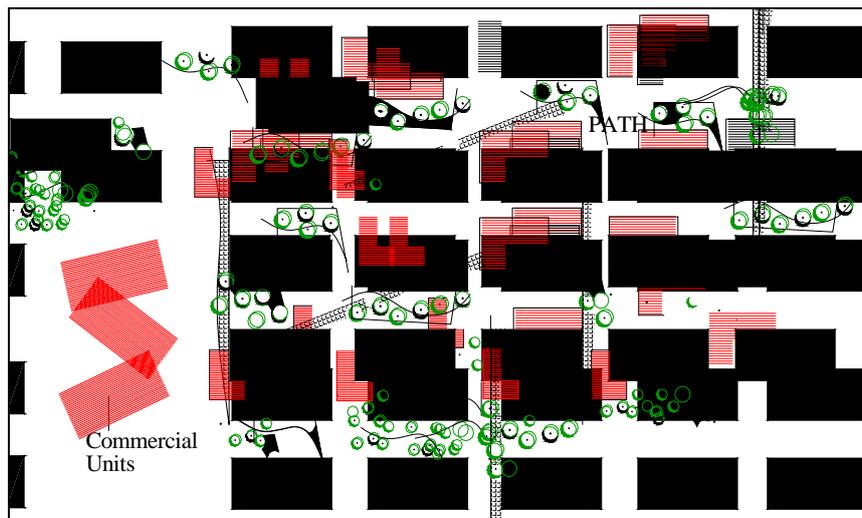


Figure 13 Schematic Drawing to express modifications and spontaneously built commercial units in Fidanlik Settlement, drawn by author (2004)

Analyzing the housing by construction methods and material use includes building technology use (traditional and contemporary methods and their reflection), labor skills on construction and their affects on housings' economic life span. For the same purpose, material selection is elaborated with understanding the resistance of materials, their local or imported features, applicability to the region and expandability characteristic.

As mentioned, the building technology requirement was set through the construction scheme of General Directorate of Disaster's. The GDDA prepared the tendering documents, including layouts design, material choices, and decision of construction technologies. The proposed system pointed prefabricated concrete panel constructions built on site, even though on site efforts doesn't fit the prefabrication logic because of requesting long time. Since international and national aids are received, there is a variety occurred among housing types. In terms of technology and material selection, from local to highly sophisticated systems are monitored in close neighborhood. This diversity played important role to create conflict among the community because of significant differences between different types⁹.

⁹ Figure 10, 11 and 12 express that different schemes create different demand on changing the living environment.

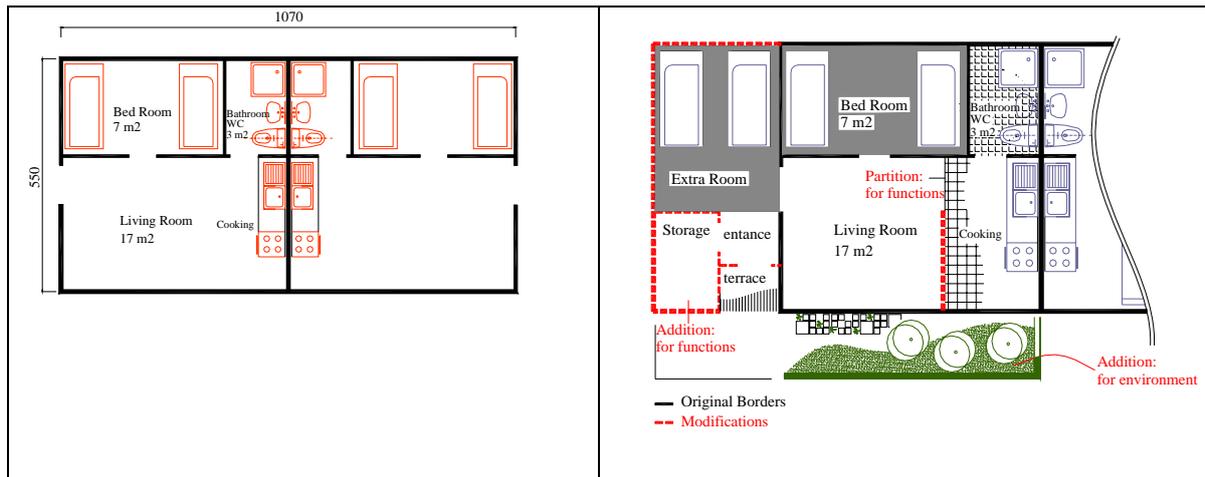


Figure 14 Initial design of temporary housing unit in Fevzi Çakmak Settlement adapted from Arslan (2004), drawn by author (2004) and Modified Units by residents: drawn by author

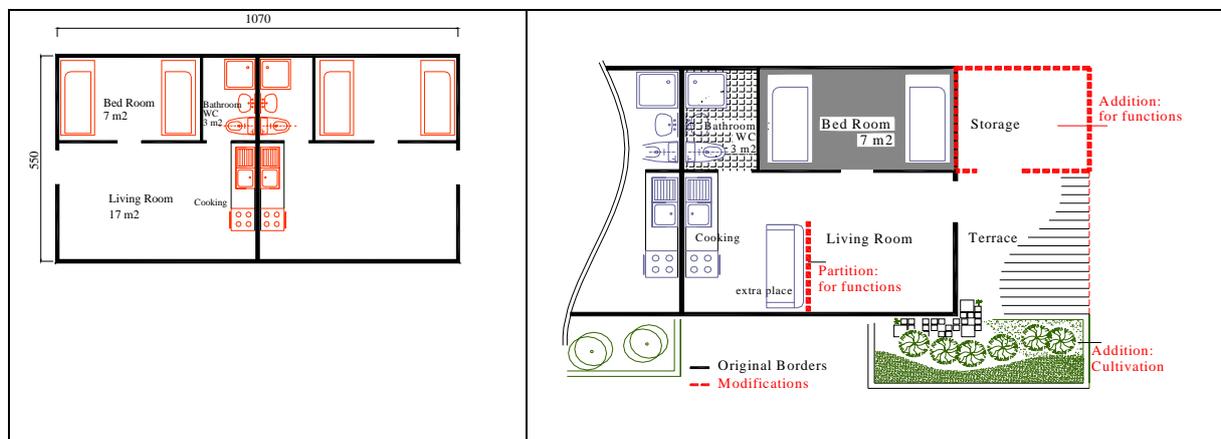


Figure 15 Modified Unit by residents: adapted from Arslan (2004) drawn by author (2004)

Particular feature of imported products is that they are not considered being resistant against extreme climate conditions in disaster affected region as high humidity or dryness. In Düzce, main problem is that the structural applications aren't adequate for specific climatic features. In particular, Düzce has climate with high humidity caused early rusting of steel framework system compounds. Moreover, the sub compounds comprised by wooden products become unusable because these required protections among the layers (between day-night and among the seasons) were not counted in reconstruction phase against extreme temperature changes.

The typical resident attitude observed is to modify housing to tackle with this problem by using own capabilities. However, In Düzce case it concluded with failures because of quality of the additional constructions. On one hand, components of the failure show self-efforts of the community that create a shield for survival needs as protection, security and privacy. On the other hand, these drudgeries were done unconsciously due to lack of know-how.¹⁰

It is necessary to mention that the extended research done for this paper show that permanent housing reconstruction in Düzce city comprised mass housing and self help projects. In pre-disaster conditions, the main reason observed as physical, economic and

¹⁰ For instance one type of temporary housing, paper log houses, although the economic life is 6 months, by plastic sheets, additional insulation layers the use of houses were exceeded. However, due to over use it is common to be demolished by itself.

environmental vulnerability, increased by man-made efforts. The indicators ranked as inefficiently applied building codes, mismatches on task delivery in related public organizations, ineffective legislations on overall constructions that were guided by political interests –i.e. settling the city centre in most hazard-risked areas etc. In addition, the fragility was doubled by not ignoring the hazard risk into urban planning and development issues. Although, land use zoning and physical plans were considered in master planning within national development programs, actual implementations were conducted by political interest, individual or common wants.

According to the findings and tendencies both community and governmental sides, the positive and negative points can be found in SWOT analysis below.

SWOT ANALYSIS

Strengths (*in short term*)

- Necessary for comfort conditions

(In short term; the basic comfort conditions, including minimum privacy, utility and necessities, have been given)

- Necessary to reduce tension

(By given service, facility and infrastructure level, it helped to rehabilitate community's physiological structures, totally collapsed because of two major earthquakes, although temporary constructions delayed in first earthquake)

- Provided as components of new constructions-in short term when expected time span is fulfilled (see-annex-3)
- Had alternative uses in the future

(Depending on building technology use, there were alternatives to re-use the housing units by re-functioning or improving the existing conditions as UNDP-primary school and GDDA's housing projects).

- Had resistance against climate

(Depending on the building technologies, some housing units were relatively higher resistance against climate to meet the requirements of their economic life.)

- Maintained by local material additions

(The sense of self-sustained system had started to be reflected by community efforts)

Strengths (*in longer term with the affects of modifications*)

- Self-assistance among the community members have been developed the neighborhood conscious. Due to the necessities of population living and being in the same conditions, aiding attitudes were enhanced by itself in terms of strengthening the houses or improving their environmental conditions.
- Local capacity has been increased due to modification of the houses by community.
- In some cases, self implementation of traditional codes by modified houses made layout patterns more livable.
- Self surviving methods attempted because of the cultivation efforts in built gardens and commercialization of the grown products.
- Imported technologies allow the local sector/population to be aware of the new systems and develop their construction skills due to the experiences on maintenance.
- Alternatively uses for light industrial or commercials, educational/administrative buildings, storage for farming. (It is seen that various assembled units have transferred to the new settled industrial zones)

- Secondary product market created by trading additional constructions within the community, spontaneously achieved the goals of prefabricated systems.

Weaknesses

- Except for specific samples, slow delivery occurred on construction process. It started to ruin reconstruction chain following permanent housing settlements.
- General idea was concentrated on their inflexibility and lack of individuality. In terms of technology transfer, imported designs didn't match the exact requirements of population. Most-frequently observed complaints were titled in basic design principles as opening the side of the doors through the neighbor units and missing the individual privacy. The material selection following the same problems were inappropriate in isolation sense.
- The discrepancies between temporary units, varied by funding organizations and their prerequisites, caused conflicts and created unfair atmosphere among the disaster affected families.
- They are frequently too small for a family type in Turkish standards in the region. It was inevitable to take some precautions in order to reflect their lifestyle.
- The quality of the materials was very low. Deterioration of the elements in housing units started earlier than the expected life time. This problem is also a consequence of insufficiencies of the organizations.
- Since the time of use was extended, there has been a conflict between the landowners and residents in sense of ownership and occupation.
- By additional constructions and re-characterizing the physical features, the temporary settlements have created a bad image on overall the city. The substandard of built environment is another issue for tackling with overall housing construction.
- Concrete prefabricated and wooden framework systems didn't resist against climate conditions, except containers. On the other hand, strongly supported systems of containers -by adequate-sized insulation materials and isolation layers, and their nonexpendable character- cause to change the attitudes on modifications.
- Immobilization of initial building materials, except self-added products, didn't match the logic behind prefabrication systems
- Slow delivery of permanent houses and temporary constructions extended the time period to re-sustain the public routine and it caused that provisional houses stay permanent. Therefore, the defected periods caused the infinitive loop.
- From inflexibility to acceptability, the conditions were obtained by force of community's needs-privacy, functional, environmental, cultural, climatic
- In terms of transport, shipping and relocating the units were too costly. Instead of dismantling and displacing, It is understood that reconstruction from scratch is much cheaper.
- Speed was low due to inexperience of contractors, unskilled labors and construction defects.
- Lacking of individually-broken by additional construction and gardening was observed as a significant missing point.
- Infrastructure was constructed for temporary aims. Therefore, in a number of cases it is not possible to re-function the settlements by using existing infrastructure as a consequence of selecting low quality system, which was aimed to reduce the total cost for the government

- Lack of alternatives contradicted with different typed units in one settlement due to households' allocation done by lottery. Significant distinctions between housing types created the sense of unfairness because of donated units, the GDDA's houses, and private contractors' applications.
- Expensive to maintain if it is desired to keep the housing units within their original manner.
- Inconvenient additions of utilities (i.e. heating systems) created danger as fire risk. Depending on the materials resistance, fire spread in larger areas as Fidanlik Settlement.
- Selection of the beneficiaries was difficult due to lack of pre-studies, creating a profile for needs assessment. Especially after second earthquake in 12th November 1999, temporary housing settlements, where there was no demand after first occurrence, was illegally occupied in overnight due to the fear and availability.

Opportunities

- The efforts of community should be canalized by consciously prepared modification projects-as self help logic.
- Local economy should be enhanced by product trading, high construction demand.
- It has high Speed on construction (Depending on contractors' capability and interrelation between organizations, high speed can be achieved with synchronizing infrastructure and superstructure constructions)
- When the prefabrication logic worked, the materials and building systems can be transferred for covering the needs of homeless. The temporary housing units can be used in slum upgrading facilities for both strategy implementations: contractor based mass housing projects until the construction is completed and material subsidization by reusing the parts. If the transportation problem is solved, there will not be any resource loss.
- Each plot area, except the presence of housing units, was adequate to use the different functions as individual environmental efforts, cultivations and even though to add new removable parts into the existing construction as core systems within temporary aims. The problematic is about quality of materials and concluded with un-patternized approach by missing the identity aspects as Gümüşpınar Case.

Threatens

- When initial aim, being temporary, doesn't follow the executions, long term impacts always bad on the city and re-development chance can be almost lost. The image of the cities can be ruined as Düzce case, having totally temporary look. Due to the exchanged materials used in temporary settlements and occurrence of new prefabrication market in construction sector, the building types has shifted to totally low-quality structures, spread overall the city. Besides re-curing any kind of mistakes on implementation requires too much effort.
- Land selection wasn't fulfilled properly i.e. forestry, agricultural valued lands, inadequate soil conditioned areas were settled by loosing the potential use or increasing the vulnerability.
- Insufficiencies in administrative bodies created problems such as delays on constructions following to the entire execution processes- i.e. determining the content of contracts, tendering process, selection of contractors, financing through the budget allocations, mismatches among public, private and assistance organizations.

- Even though the time period is well-determined within accelerated permanent housing constructions, they are very attractive areas to immigrate. It causes to start having same circle ending with vulnerability.
- The attitude of community made the units deteriorated much shorter than expected life time. Untrained and unskilled family members damaged the units by extra constructions. Due to this reason, it has become impossible in terms of relocating and re-using for probable disaster on rehabilitation phase.
- Foreign assisted housing designs were enhanced in their initial countries. Since international labor assembled the units in Düzce city, there was a problem occurred in dismantling phase, due to lack of knowledge. This is another handicap, hindering the re-using possibilities.

CONCLUSION

Theoretically, when temporary settlements target to fill two gaps, emergency and permanent sheltering (Johnson 2002), initial aims and applications follow each other. For this purpose, a clear-cut division on time spans and forming both temporary and permanent settlements are recommended to be well-defined in terms of budget allocation that comprises technology use, design task and material selection. However, implementation for the earthquake response showed that extra efforts have been spent to make temporary settlements more attractive in Düzce. Instead of stimulating the population to re-settle to permanent housing complexes, land selection, facility and services, activities and building technology decisions have demonstrated as if provisional housing was built to fulfill any permanent housing requirements. Nevertheless, in theories temporary time span, In Düzce, related applications have pointed to opposite direction.

Previously implemented program concluded temporary housing areas with modified settlements called as “premature slums”. Basically they are simple outputs to prove the conflicts between demand and supply side. The basic indicators were comprised with missing the coherent needs assessment, overlooking the local capacity, mismatches between requirements and provided elements. Even though the material selection and building technologies within well-designed housing concepts were done properly, the tendency of community were observed to exploit the supplied materials in provisional housing due to the ownership clarification. As a consequence, it doesn't leave a chance to re-use for possible reconstructions or relocate to likely disaster affected regions. On the other side, the actions taken to demolish infrastructures, cleaning out the settlements and converting the functions doubled the cost of investments. Moreover, dismantling and storing the materials required for special warehouses because of the large number of assembled housing units and to protect them from climate conditions. Similarly, it is claimed that these actions are more costly than building new settlements from scratch in long term. As the Municipal authorities of Düzce claimed in 2004, 10% of losses in total produced housing occurred by shipping or transporting. Besides, high percentages of products have become unusable due to detriment done by residents. In that respect, the importance of physiological consultancy, which creates the ownership senses and reconstruction chain of permanent housing, has become important. Therefore, it is necessary to train the population to create the mentality on the using scheme of housing units in order to utilize the compounds again and to respect other likely disaster victims. Moreover, given privacy conditions and transformed functions by resisting the environmental conditions and availability for re-constructing into the individual owned plots are preferred by a significant number of the community due to fears of another catastrophe risk.

Spatial growth tendencies, inefficiently controlled constructions-in spite of existing earthquake building codes-, climate challenges, planning obstacles, which does not fit social structure and concluded modifications, and housing finance problems cause provisional settlements to be exceeded. In order to avoid undesired consequences, affecting city re-development opportunities, the equilibriums should set delicately to reduce the vulnerability of cities to natural disasters.

REFERENCES

Baradan, Berna (2003) “Geçici Deprem Konutlarının Yapım Sistemleri Açısından İncelenmesi, Dokuz Eylül Üniversitesi, İzmir, p.13-75”

Barakat, Sultan (2003) “Housing Reconstruction After Conflict and Disaster, Network Paper, Humanitarian Practice Network at ODI, p.1-35”

Bayındırlık ve İskan Bakanlığı (2000) “17 Ağustos 1999 İzmit Körfez Deprem Raporu, T.C. Bayındırlık ve İskan Bakanlığı; 17th August 1999 Earthquake Report of İzmit Gulf, the General Directorate of Disaster Affairs, Demirtaş, Ramazan, Ankara”

GDDA (1999) Handbook, The General Directorate of Disaster Affairs, Education, news and Science Magazine, Ankara, Volume 2

2001^a Handbook, the General Directorate of Disaster Affairs, Education, news and Science Magazine, Ankara, Volume 1

2001^b Handbook, the General Directorate of Disaster Affairs, Education, news and Science Magazine, Ankara, Volume 2

Gonzalo Lizarralde and Colin Davidson (2001) “Models of Reconstruction Projects”, IF Research Group. Université de Montréal. Faculté de L'aménagement

Huque, K. Asraf (1981) “Disaster Aid, Emergency Shelter and Mitigation Planning”, Proceedings of the Seminar Stockholm, p.12-100

Jonhson, Cassidy (2002) “What’s the Big Deal About Temporary Housing? Planning Considerations for Temporary Accommodation After Disasters: Example of the 1999 Turkish Earthquakes”, Conference Papers at the 2002 TIEMS Disaster Management Conference in Waterloo, Canada, Online access at www.grif.umontreal.ca

Lizarralde, Gonzalo (2002) “Organisational Design, Performance and Evaluation of Post-Disaster Reconstruction Projects”, Mc. Gill University, Montreal, Canada

Oakley, David (1981) “Transition Housing for Victims of Disasters, Disaster Assistance Manual”, Office of Housing, Office of U.S. Foreign Disaster Assistance, Volume 1, Padco, Inc.

UNDRO (1982) “Shelter after Disaster, Guidelines for Assistance”, Office of the United Nations Disaster Relief Organisation, Geneva

Shelter Project (2004) “Transitional Settlement, Displaced Populations”, The Martin Centre for Architectural and Urban Studies department of Architecture, University of Cambridge and online access at www.shelterproject.org