

# RELOCATION OR REBUILDING IN THE SAME AREA: AN IMPORTANT FACTOR FOR DECISION MAKING FOR POST-DISASTER HOUSING PROJECTS

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## Abstract

Whether to relocate or rebuild in the same area is an important up-front decision to take in post-disaster housing projects since some projects result in failure when new settlements are refused by their intended beneficiaries. After the earthquake of 2000, permanent post-disaster houses were constructed in both new and existing settlements in the villages of Çankırı Province, Turkey. It was revealed that most of the beneficiaries refused to move to the new settlements in the region. Research was conducted in the area in order to reveal the reasons for relocation and refusal of the new settlements and opinions of the beneficiaries about the sites selected for post-disaster houses. Questionnaires were administered to the permanent users of the post-disaster houses and also to the beneficiaries who refused to move to the new settlements. Some of the data gained through the questionnaires was evaluated, while some was analyzed with the help of statistical tools.

As a result, it can be said that refusal of new settlements is due to: quick decision-making; lack of user participation in the decision-making process; inadequate site-selection criteria; lack of interdisciplinary work during site-selection; not considering the life style of the users and inadequate guidance to the beneficiaries during the construction phase of the houses. It was revealed that most of the beneficiaries to whom the questionnaires were administered did not want move to the new settlements, conversely they preferred to construct houses in their existing settlements. Recommendations which may eliminate the causes of refusal are also made in the paper.

*Keywords: Post-disaster housing; post-disaster reconstruction projects; relocation; Turkey*

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## INTRODUCTION

Whenever a disaster strikes and leaves people homeless, reconstruction projects are undertaken for re-establishment purposes. Reconstruction projects include some decisions to take such as the kind of post-disaster houses to provide (temporary or permanent or both), the financing method, the procurement method and the type of construction. Whether to relocate or rebuild in the same area is an important up-front decision to take during this process. Tercan (2001) defines relocation as removal to another location due to provision of land or housing voluntarily or involuntarily. According to Bayulke (1983) relocation takes place during the following situations:

- When the old location is subject to a natural hazard,
- When the old location is completely destroyed and to move the debris and to make new plotting in the old settlement is inconvenient for rapid recovery and housing purposes,
- When there is a chance to relocate the settlement to land which belongs to the Government since it is generally preferred not to have to pay for the land.

Barakat (2003) declares that construction of new settlements involves a great deal of effort and requires the highest level of investment. The choice of location, site selection and settlement planning; the choice of construction method and materials; and the choice of design are the considerations that must be addressed when planning new settlements. The same author states that the choice of location and site selection are the most important factors in determining the success or failure of new settlement programmes. According to Oliver-Smith (1991) refusal and abandonment of the site can be safely interpreted as failure of the resettlement projects.

Tercan (2001) declares that any attempt to remove people from their existing physical, social and economic environment will have important effects on their lives. However, negative effects can be limited if some conditions are fulfilled. Thus, the site chosen for reconstruction is one of the most important steps of the relocation process. Site selection can be done in two different ways: at the existing place of the damaged buildings or in a new residential area. If a good survey is not done, both of these ways may have many disadvantages. Sometimes relocation is done involuntarily. This often happens when the society has evolved old patterns of adaptation to its environment over many years. This relationship of a society to its land and environment may be based on economic, political or socio-cultural factors or a combination of them. Economic factors may be soil fertility, resource availability, overall productivity or access to employment or labor resources; political factors can be considered as territoriality, leadership structures and inter-group relations; and cultural factors can be considered as privacy connections between environment and religion, cosmology, world view and individual and cultural identity. Removal of a society from its environment can result in a cultural and/or physical crisis which may lead to a new disaster. Thus, many researchers state that relocation must be avoided or minimized in reconstruction projects.

In Turkey, if there is a need to construct post-disaster houses, generally, disaster stricken settlements are relocated to a different location. This is true especially for the villages in the country. A literature survey related to the topic and the case study conducted by the author revealed that relocating a settlement creates many problems. The main problem is that people refuse to move to the new settlements and this leads to most of the post-disaster houses standing empty.

## RELOCATION IN POST-DISASTER HOUSING PROJECTS

Reconstruction projects were conducted in the villages of Çankırı, Turkey after the earthquake of June 6, 2000. The Ministry of Public Works and Settlement initiated the reconstruction projects in the area; it was decided to provide permanent post-disaster housing loans with a payback period of 20 years without interest for people whose houses were demolished or heavily damaged. According to this provision method beneficiaries had to hire contractors for their houses. A construction supervision unit, which does not exist anymore, was established by the Government for the reconstruction projects in the region to check the works going on in the area and pay the loan to the victims according to the completed stages of construction.

According to this system 1,221 permanent post-disaster houses (PDH) were constructed in 5 districts of Çankırı. Three different *Typical Designs* of permanent post-disaster housing were prepared by a private firm for the area (Figure 1). However, the beneficiaries who did not like any of these three types had the option to get their houses designed professionally. Those houses designed professionally are referred to as "*Custom Designs*" in this study. Besides seven new settlements, five of which are in Orta and two in Şabanözü districts, some of the PDH were constructed in the existing villages. Some of the new settlements are far from the existing ones, while some are close to the existing villages. Table 1 shows the numbers of villages/quarters, new settlements and PDH in Çankırı.

Table 1. Number of villages/quarters, new settlements and PDH in Çankırı

District	No of villages/ neighbourhoods	No of new settlements	No of PDH
Çerkeş	16	0	98
Atkaracalar	3	0	4
Şabanözü	19	2	210
Orta	30	5	908
Bayramören	1	0	1

Source of statistics: General Directorate of Disaster Affairs

Most of the houses were completed in 2003 and the region was visited twice by the author in the winter months of 2005. Most of the PDH constructed in the new settlements were standing empty at the time of the research. The reconstruction projects in the area were investigated in order to reveal the reasons for relocation

and refusal of the new settlements and opinions of the beneficiaries about the sites selected for the PDH. The research consists of interviews with the officials of the Ministry of Public Works and Settlement and field surveys in the area. Villages in Orta and Şabanözü Districts were visited and questionnaires were administered to the permanent users of the PDH and also to the beneficiaries who refused to move to the new settlements. Although the total number of PDH constructed in the study area was 1,221, the exact number of the projects which are permanently occupied is not known, therefore, a random sample of 90 beneficiaries was selected for the study. Eighty permanent residents of the PDH were met during the field trip to the villages and everybody who happened to occupy the PDH at that time was included in the sample. During summer months however, seasonal occupants can also be contacted but it was not considered to be important for this study. In addition, 10 beneficiaries who refused to move to new settlements were met in the old settlements and they were also included in the sample.

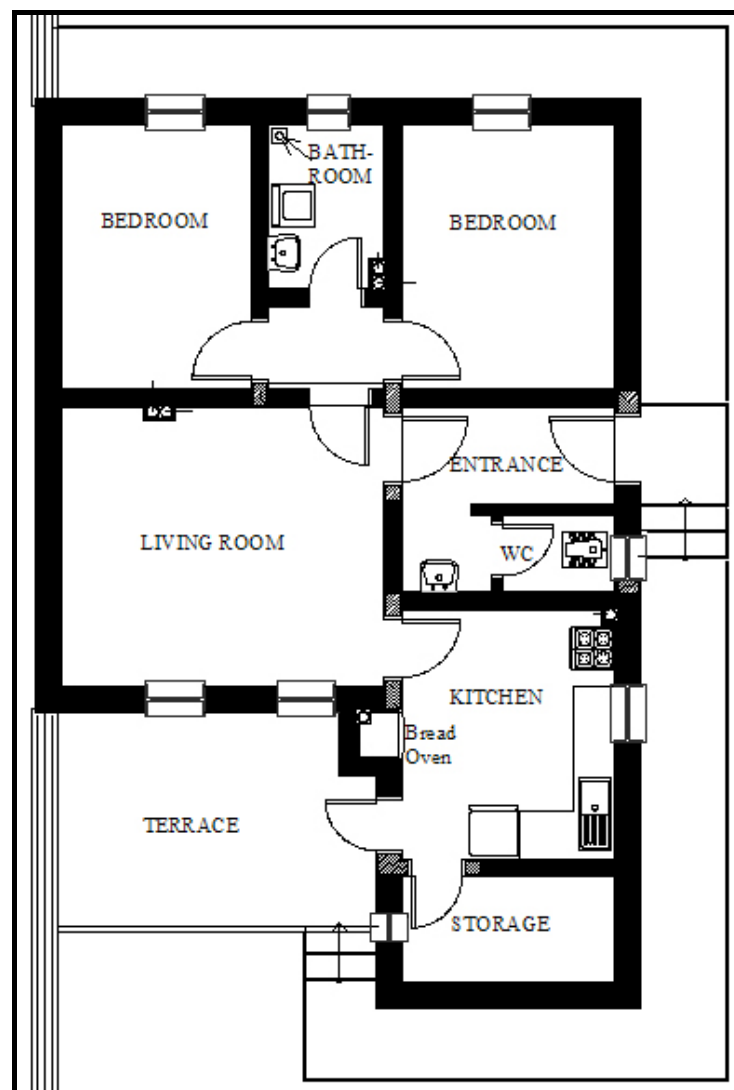


Figure 1. Plan of a PDH with *Typical Design*

Data gained through the questionnaires filled out by those 80 families who are permanent PDH users was analyzed with the help of statistical tools. Furthermore, data collected from the questionnaires administered to the 10 beneficiaries who refused to move to their PDH was evaluated. Visited villages are described as follows:

*Old Yuva Village:* Most of the inhabitants in the village were beneficiaries some of whom refused to move to the new settlement. A house in old Yuva Village can be seen in Figure 2.



Figure 2. A house in old Yuva Village

*Old Ortabayındır Village:* The new settlement with 52 houses, access to which is almost impossible, was constructed 5 km. away from the old one on top of a hill. Most of the houses in the village were not finished in the settlement and all of the houses in the new village were empty at the time the author visited the region. Therefore, the old village was visited and the owners of the houses were interviewed there.

*Aşağı Kayı Village:* 4 PDH were constructed on the lots of the demolished houses in the village. There are three PDH with *Typical* and one with *Custom Design* in the village. Two of the PDH with *Typical Designs* and the PDH with *Custom Design* were being used permanently.

*Buguoren Village:* 142 PDH, most of which are with *Custom Designs*, were constructed on the lots of the demolished houses in the village. Nearly all of the PDH were being used permanently (Figure 3).

*Kısaç Village:* 19 PDH, some of which are with *Typical* and others are with *Custom Designs* were constructed on the lots of the houses demolished in the village. Most of the houses were being used permanently.



Figure 3. Buguoren Village (PDH were constructed in the existing settlement).

*New Elden Village:* A new settlement with 87 PDH with *Typical Designs* was constructed 5 km. from the old one on top of a hill and only 7 of the PDH were being used permanently, while others were unoccupied at the time of the research. Some of the houses were being used seasonally, while some were vacant because the beneficiaries had refused to move in (Figure 4).

*New Gümerdigin Village:* A new settlement with 18 PDH was constructed approximately half a kilometre away from the old one. There are PDH both with *Typical* and *Custom Designs* in this settlement. Some of the PDH were being used permanently and some were being used seasonally at the time of the research.



Figure 4. Elden Village (A new settlement 5 km. far from the existing one).

*New Yuva Village:* A new settlement consisting of 58 PDH with *Typical Designs* was constructed next to the old one and only 6 of the PDH were being used permanently, while others were unoccupied at the time of the research. Some of the houses were

being used seasonally, while some were vacant because the beneficiaries had refused to move in (Figure 5).

*Derebayındır Village*: A new settlement with 42 PDH with *Typical Designs* was constructed next to the old one. Only 7 of the PDH were being used permanently, while others were unoccupied at the time of the research. Some of the houses were being used seasonally, while some were vacant because the beneficiaries had refused to move in at the time of the research.



Figure 5. Yuva Village (A new settlement next to the existing one).

### Data Evaluation

The beneficiaries were asked about the reasons why they refused to move to the new settlements. Data gained from the answers to this question were evaluated and the reasons of the refusal can be listed as follows:

1. Distance between the new settlements and the old ones,
2. New settlements are difficult to reach due to the distance from the villages and/or lack of proper roads,
3. New settlements are not suitable for the animals,
4. Beneficiaries can not afford to construct cattle sheds and straw sheds,
5. There is not enough space for a cattle shed and a straw shed on the lot,
6. *Typical Designs* are not suitable for an extended family,
7. Construction of the PDH is not finished because of the contractor's default.

It can be said that the first three reasons are due to the failures in the site selection criteria. Current site selection criteria for new locations are: low disaster risk, closeness to infrastructure facilities and government ownership. It is claimed by the officials of the Ministry of Public Works and Settlement that Government owned lands are preferred because it is difficult to provide large enough lots to the beneficiaries as there are more than one owners of the damaged property and it is

not easy to allot one PDH to multiple claimants. There are multiple owners because mostly, the houses in the villages are inherited by the siblings in a family or there are extended families in a house, each of whom is the beneficiary of a PDH.

A group of geologists work for site selection and Government authorities consisting of the officials from General Directorate of State Hydraulic Works, General Directorate of Public Works and Settlement, Ministry of Agriculture and Rural Affairs, Ministry of Environment and Forestry, Ministry of Internal Affairs and the District of the related town approve the selection. Possible sites for relocation are not discussed with the beneficiaries. Lack of architects and planners in the site selection teams and lack of beneficiary participation in the selection process also lead to refusal of the new sites. Furthermore, decisions on post-disaster reconstruction projects are taken after the disaster occurs in Turkey. So decisions on the house provision method, design of the houses and new locations have to be taken quickly.

The main stay of the economy depends on agriculture in the region. Since the beneficiaries got loans for only house construction, some of them can not afford to construct cattle sheds which are as important as their homes. As a result, they do not leave their places in order to be able to go on rearing their animals.

The fifth and sixth reasons are related to design concerns. Only houses were considered during lot sizing; however cattle and straw sheds were not taken into consideration in some of the new settlements. Furthermore, PDH were designed as if only nuclear families would live in them, however extended families including parents, children and families of the married sons live together in some houses in the villages of Turkey. Since PDH are not in accordance with the life style of some of the beneficiaries, they refuse to move to the new settlements.

The last reason is related to reconstruction method. Beneficiaries faced difficulties during the management of the construction phase. Since most of the beneficiaries are illiterate and they do not have experiences about construction management, most of them settled the terms of the contracts verbally. Thus, some builders got the money from the beneficiaries and made off without finishing the construction of the PDH. At the time of research, beneficiaries were inhabiting their damaged houses or they were staying in the cattle sheds in some villages, especially in old Ortabayındır Village as they can not afford to continue with the construction. Additionally, according to the regulations they had to demolish their traditional houses once they got the loan for house building from the Government.

### **Data analysis**

The permanent users of the PDH in the existing villages; in new settlements far from the old villages; and in new settlements close to the old villages were asked to evaluate the locations of the sites selected for construction of the PDH. They were asked to make the evaluations on a Likert scale of 3 (1: unsatisfactory, 2: neutral and 3: satisfactory). The evaluations were grouped and the categories were



compared. T-tests were used to find out whether there are significant differences among the opinions of the users of the PDH located in different settlements. Analyses were conducted according to the null hypothesis:

Ho:  $\bar{X}1 = \bar{X}2$  ( $\alpha = 0.05$ ) that there was no significant difference between the groups.

As seen in Table 1, the calculated t value of 3.2005441 is greater than the critical t value of 1.761310115. Thus, the null hypothesis was rejected with 95% confidence. In other words, satisfaction level of the beneficiaries with respect to the existing villages and new settlements far from the old villages differs.

Table 1. T-test with regards to the location of the PDH in the existing villages and in the new settlements far from the old villages.

	<i>Existing villages</i>	<i>New settlements far from the old village</i>
Mean	2.75	1.777777778
Variance	0.5	0.535947712
Observations	8	18
Hypothesized Mean Difference	0	
Df	14	
t Stat	3.2005441	
P(T<=t) one-tail	0.003206799	
t Critical one-tail	1.761310115	
P(T<=t) two-tail	0.006413597	
t Critical two-tail	2.144786681	
Ho is rejected with 95% confidence		

As seen in Table 2, the calculated t value of 0.446297748 is less than the critical t value of 1.710882067. Thus, the null hypothesis was accepted with 95% confidence. In other words, satisfaction level of the beneficiaries with respect to the new settlements far from the old villages and the new settlements close to the ones does not differ.

As seen in Table 3, the calculated t value of 3.142592772 is greater than the critical t value of 1.734063592. Thus, the null hypothesis was rejected with 95% confidence. In other words, satisfaction level of the beneficiaries with respect to the existing villages and the new settlement close the old village differs.

According to the results of the t-tests, satisfaction level of the beneficiaries with respect to the new settlements, whether they are close to the old villages or far from them, does not differ. However, satisfaction level of the beneficiaries with respect to the existing villages and new settlements differs. In addition, referring to the highest mean score (2.75) it can be said that existing villages were more popular than the new settlements. As a result, most of the beneficiaries to whom the questionnaires

were administered did not want move to new settlements, on the contrary they preferred to construct PDH in their existing settlements.

Table 2 T-test with regards to the location of the PDH in the new settlements.

	<i>New settlements far from the old villages</i>	<i>New settlement close to the old village</i>
Mean	1.777777778	1.642857143
Variance	0.535947712	0.862637363
Observations	18	14
Hypothesized Mean Difference	0	
Df	24	
t Stat	0.446297748	
P(T<=t) one-tail	0.329691493	
t Critical one-tail	1.710882067	
P(T<=t) two-tail	0.659382986	
t Critical two-tail	2.063898547	
Ho is accepted with 95% confidence		

Table 3. T-test with regards to location of the PDH in the existing villages and in the new settlements close to the old villages.

	<i>Existing villages</i>	<i>New settlement close to the old village</i>
Mean	2.75	1.642857143
Variance	0.5	0.862637363
Observations	8	14
Hypothesized Mean Difference	0	
Df	18	
t Stat	3.142592772	
P(T<=t) one-tail	0.002814511	
t Critical one-tail	1.734063592	
P(T<=t) two-tail	0.005629022	
t Critical two-tail	2.100922037	
Ho is rejected with 95% confidence		

## DISCUSSION AND RECOMMENDATIONS

Post-disaster resettlement projects generally result in refusal of new settlements in Turkey. According to the investigation conducted in the Çankırı Province of the country, it can be said that new settlements are refused due to the following failures in post-disaster reconstruction projects.

- Quick decisions,
- Lack of user participation in early decision-making process,
- Inadequate site-selection criteria,
- Lack of interdisciplinary works during site-selection,
- Not considering the life style of the users,
- Lack of guidance to the beneficiaries during the construction phase of the houses.

The failures mentioned above may be eliminated when required work is done in a different way. Post-disaster houses have to be constructed as soon as possible after a disaster strikes, therefore decisions have to be taken quickly. However, pre-disaster strategic planning including development of provision strategy; collection of information on possible locations and initial work on the design of post-disaster houses can be done for disaster prone areas. It is not necessary to design post-disaster houses before a disaster occurs, but some of the stages required for design can be completed before the disaster. For instance background information including house typology, user profile in the region and climatic and topographical conditions of the area where PDH are planned to be built can be gathered. Completing some of the works before the disaster will create more time for post-disaster works.

Beneficiaries should be involved in early decision-making process of post-disaster reconstruction works. Discussions with the beneficiaries will help understand their needs and preferences and also users will understand the reasons for the decisions taken.

PDH should be constructed in the existing villages whenever possible, but in case relocating the settlement is unavoidable some more selection criteria should be added to the existing ones. Current selection criteria for new locations, as has been mentioned above, are: low disaster risk, closeness to infrastructure facilities and government ownership. However, the preferences of the beneficiaries include, closeness to the old village, easy access, having acceptable weather conditions and suitability for animals, and can be added to the current selection criteria. Furthermore, team for site selection should be interdisciplinary. Architects and planners should be involved in the site selection teams in addition to the geologists.

Moreover, the life style of the users should be investigated carefully in order to be able to create new settlements and design houses which are close to their indigenous patterns. Loans should be provided not only for the houses but also for cattle sheds for people whose economy depends on animal rearing. This was done in some reconstruction projects in other regions of Turkey, but it was decided to provide loans only for housing in the villages of Çankırı. Furthermore, guidance must be given to the beneficiaries during the construction phase of the houses especially on how to hire a contractor.

## CONCLUSIONS

Post-disaster reconstruction projects generally include partial or complete relocation of settlements especially in rural areas of Turkey. This attempt can be considered as a kind of rehabilitation in vulnerable areas, but most of the resettlement projects resulted in rejection of the new settlements in the country. Most people do not want to leave their places since they stick to their indigenous patterns especially in rural areas. When new settlements are refused by some of the beneficiaries, then the villages become separated. As people living in a village have common activities such as preparing food for winter, relationships with the relatives and neighbours in a village are very important in rural areas of Turkey. Separation of villages makes this relationship become weak or disappear.

It is a fact that creating new settlements needs money, time and effort. It is also vital to mention that providing only houses is not enough to create a settlement; there should be public spaces at least a mosque and a village room “*Koy Odası*” which is another common building that is used by the villagers, and is an essential part of the daily life of the male population in a village. There is also the need for a school and a health centre in a settlement. However, it is well known that providing these spaces needs money, which of course explains why post-disaster reconstruction projects involve only housing especially in rural areas.

Decisions on post-disaster reconstruction projects have to be taken very carefully. Decisions on whether to relocate or rebuild in the same area; whether to provide loans for only housing or both housing and cattle sheds; type of designs of the houses *etc.* may lead to failure of the projects and this will cause waste of the money, time and effort spent on the projects.

**Acknowledgement:** This study was supported by the State Planning Organization (DPT) Grant No: BAP-08-11-DPT-2002-K120510 for OYP Research Project.

## REFERENCES

- Barakat, Sultan** (2003). “Housing Reconstruction After Conflict and Disaster” *Humanitarian Practice Network Paper*, Publish-on-Demand Ltd London, No. 43.
- Bayulke, Nejat** (1983). “Lessons to be Learned from Relocation of Villages and Use of Prefabricated Houses in Post-disaster Housing in Turkey” *Proceedings of the Seminar on Socio-Architectural Aspects of Housing in Earthquake-Prone Areas of Turkey*, Ankara, the Scientific and Technical Research Council of Turkey Building Research Institute: pp 17-25.
- Oliver-Smith, Anthony** (1991). “Successes and Failures in Post-Disaster Resettlement” *Disasters*, Volume 15, Number 1, pp 12-19.
- Tercan, Binali** (2001). *Post Earthquake Relocation Process in Yalova*, Unpublished master’s thesis, METU, Ankara.