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Investigation of Urban Transformation Process, Methods, and Techniques: Elazig Province Sample

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Abstract: This study aims to examine and present the general results of the urban transformation studies methods and techniques applied in the province of Elazig after the Sivrice earthquake. The study used a descriptive approach method within the scope of qualitative research. Urban transformation project data applied in risky areas were obtained from technical analysis and interviews. The research covers the results of urban transformation in risky areas of Elazig province. Cleaning, renewal, and post-disaster transformation methods were used in urban transformation works in risky areas. The general situation after the earthquake has revealed some weaknesses in selecting methods and techniques for urban transformation applications. As a result of urban transformation practices, bioharmological buildings that are more compatible with the current earthquake legislation, with a stronger carrier system, more comfortable, and in terms of user identity and purpose of use, are offered to the use of beneficiaries.

Keywords: Elazig, Urban Transformation, Urban Transformation Process, Urbanization, Risky Area

Kentsel Dönüşüm Süreci, Yöntem ve Tekniklerin İncelenmesi: Elazığ İli Örneklemi

Öz: Bu çalışma, Sivrice depremi sonrası Elazığ ilinde uygulanan kentsel dönüşüm çalışmaları yöntem ve tekniklerinin genel sonuçlarını inceleyerek sunmayı amaçlamaktadır. Araştırmada nitel araştırma kapsamında betimsel yaklaşım yöntemi kullanılmıştır. Riskli alanlarda uygulanan kentsel dönüşüm proje verileri teknik analiz ve görüşmelerden elde edilmiştir. Araştırma, Elazığ ilinin riskli bölgelerindeki kentsel dönüşümün sonuçlarını kapsamaktadır. Riskli bölgelerdeki kentsel dönüşüm çalışmalarında temizlik, yenileme ve afet sonrası dönüşüm yöntemleri kullanıldı. Deprem sonrası genel durum, kentsel dönüşüm uygulamalarına yönelik yöntem ve tekniklerin seçiminde bazı zayıflıkları ortaya çıkarmıştır. Kentsel dönüşüm uygulamaları neticesinde güncel deprem mevzuatıyla daha uyumlu, daha güçlü taşıyıcı sistemli, daha konforlu, kullanıcı kimliği ve kullanım amacı bakımından da biyoharmolojik binalar hak sahiplerinin kullanımına sunulmuştur.

Anahtar kelimeler: Elazığ, Kentsel Dönüşüm, Kentsel Dönüşüm Süreci, Kentleşme, Riskli Alan

1. Introduction

Cities are transformed due to reasons such as industrialization and migration specific to the urban development process, as well as natural disasters, human-induced positive or negative actions, and war. This transformation often destroys urban areas. In this context, areas subject to urban transformation have become obsolete or are outside the development plan [1-3]. In addition, areas in need of urban transformation may arise as a result of natural disasters such as earthquakes, floods, and fires; urban transformation practices are carried out to eliminate the deterioration that occurs after a natural disaster or to minimize the damage that may occur before a natural disaster [1]. Urban transformation is defined as the demolition of unlicensed buildings and the creation of planned mass settlement areas [4]. Urban transformation is also carried out to stop the physical destruction in cities and make the cultural fabric sustainable, revitalize the economy in urban areas, increase the quality of life, and ensure the participation of all segments of the population [5]. The concept of transformation is the state of changing the risky area or structure from its current state to a different state [6]. In our country, after the building demolitions and loss of life following the Duzce and Golcuk Earthquakes in 1999, the issue of urban transformation came to the agenda. It became one of the most discussed topics. After this date, urban transformation projects began to be developed and implemented to minimize natural disaster risks, transforming unplanned urbanization areas and safe construction against a possible natural disaster that will occur again. In addition to the new local government laws

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that give powers to local governments regarding urban transformation within the framework of the legislation, these practices have been put into practice by issuing legal regulations and many regulations on many issues such as natural disaster risks, eliminating unhealthy residential areas of cities and increasing economic vitality in these regions [7].

There are two methods used in urban transformation projects. These are individual urban transformation methods and public urban transformation methods. The public urban transformation method is the transformation and rehabilitation of areas that do not allow a healthy and safe urban life, both in infrastructure and superstructure areas. Recycling of risky buildings in these regions is done by demolishing them and building solid, earthquake-resistant buildings in their place. In this context, it is aimed to identify risky structures located in risky areas, demolish these structures, and build buildings by the new zoning legislation. In individual urban transformation applications; owners of occupied title deeds, floor easement title deeds, and shared title deeds within or outside the risky area carry out the transformation of their buildings by applying to the individual urban transformation method [8].

It is seen that public urban transformation methods are implemented within the framework of legislation. When the literature is examined, there are 11 application methods in public urban transformation projects [9-11]. These methods are protection, integration, renewal, rehabilitation, regulation, reanimation, redevelopment, cleaning, refreshing, gentrification, and development by filling the gaps [1, 5-7, 12-17].

- **The protection** method is evaluated within the scope of studies aimed at integrating the urban texture with contemporary life and reintroducing it to the people living in the city. It is taking steps to prevent an existing area or social structure from disappearing due to environmental conditions. Importance is given to harmonizing contemporary life with the urban texture and making cultural assets more useful for the people living there. The characteristics of the area are preserved or very limited changes are made [12].
- **The integration** method aims to create a rich environment by adding new buildings next to the existing buildings integrated as a result of regulating the physical conditions of historical buildings that have not lost their original qualities as a result of urban rehabilitation and preserving the urban identity [13].
- **The renewal** method is the removal and reconstruction of all or part of the buildings in areas where it is not possible to improve the living and health conditions in terms of both the settlement layout and the condition of the existing buildings and to raise the living standards by restructuring the urban space. It is especially applied in slum areas. It is aimed to change the obsolete urban structure in these regions [18].
- **The rehabilitation** method includes the principles of partial renewal of urban collapsed areas and the repair and restoration of the old urban fabric while preserving the existing structure. Urban rehabilitation can also be defined as restoration works in cases where the original qualities of cities are not damaged. With the urban rehabilitation method, all formations that harm the original character of the city are cleared. In practice, the intervention is physically intervened on the exterior of the buildings, not on their structure. The aim is to improve deteriorated conditions [19].
- **The regulation** method is a type of forward-looking public action that aims to establish a relationship between the functions of the settlement and land use to prevent the spontaneous development of a city, a town, or a part of a location, and to shape this development for the benefit of society [19]. Regulation is achieved by taking forward-looking steps. There is no practice here as demolishing and rebuilding. There are all of the legal/administrative applications. The aim is to impose restrictions in some regions to prevent them from experiencing problems in the coming years. In other words, unwanted growth of the city is prevented, and guidance is given to ensure the positive development of the city.
- **The reanimation** method can be defined as the elimination and modification of the factors that cause the collapse in cities or parts of cities that are in the process of physical collapse in economic, physical, and socio-cultural aspects, and revitalization by bringing them back to life. It is to move away from space-oriented renewal and replace it with an approach that produces social, economic, and environmental problems with new solutions. Revitalization aims to revitalize the area and add it to the city as a whole by addressing the problems experienced in collapsed areas and finding solutions as a result of identifying the sources of the problems [20].
- **The redevelopment** method is defined as the improvement of buildings in terms of life and health and the redevelopment of regions. The redevelopment action, which is also expressed as the demolition of residences in a new design scheme of the city part, aims to maximize the use of the land [16].
- **The cleaning** method is defined as the removal of unhealthy qualities of houses and other buildings in areas where low-income groups live [21]. In other words, it is the elimination of unsanitary conditions in houses and similar structures located in places where low-income people live.

- **The refreshing** method refers to the revitalization of historical areas through the use of landscape elements and urban furniture, which play an important role in creating the urban image and a unique character of the city. The aim is to revitalize historical areas. Landscaping materials and urban furniture are used extensively here. Great importance should be given to ensuring that the landscape materials and urban furniture in question reflect the urban image and character of the city [22].
- **The gentrification** method is the rehabilitation of the social structure in areas that have lost their social-cultural and aesthetic importance, have fallen into disrepair, and whose physical environment has been damaged. The difference between gentrification and other methods has emerged as a result of urban transformation practices. In other words, the class and spatial separation of depression areas can, in a sense, be defined as inter-layer displacement movement [23].
- **The Development by filling gaps method** is the addition of new activities and buildings to the existing texture in a region [24]. It can be defined as development by refilling existing empty lands or abandoned areas in the city. It can be said that these areas, which have become collapsed areas where slums and unplanned urbanization have increased, are transformed by opening new residences or workplaces.

Some techniques are also used in urban transformation projects. These are the consensus process components and the Abelson technique [4-18, 23, 25, 26]. The reconciliation process components technique aims to create a culture of reconciliation with broad participation during the implementation process and to increase the level of participation [1]. According to this practice, it is necessary to create a culture of consensus with broad participation in the planning and project development decision process and increase participation. To increase the level of participation in the reconciliation process; “Information”, “Awareness”, “Meeting”, “Expectation”, “Uncertainty”, and “Adoption” components are gaining importance.

- **Information process component:** The project implementer must ensure that uncertainties are eliminated by sharing accurate and timely information with the parties directly and indirectly affected by the project. The information process covers topics such as project justification, determination criteria of the project area, planning principles, project approach and model, problems and opportunities, legal process, reconciliation process, sharing approach, market conditions, urban risks, plan and project documents, and legal documents [26].
- **Awareness process component:** Awareness-raising activities should be carried out by the parties, especially for the property owners or tenants who are primarily affected by the project, about the innovations, opportunities, and gains that the project will bring [27].
- **Meeting process component:** In comprehensive transformation projects, the level of participation should be increased, and bilateral and multiple meeting environments should be created where all parties in the project development process will come together to decide on all decisions from design to implementation [26, 27].
- **Expectation process component:** Establishing the delicate balance between "individual interest" and "social interest" among the parties directly or indirectly affected by the project, including the municipality, investors, property owners, tenants, and non-governmental organizations, and the management of the expectations of the other party from the other party. The most fundamental question to achieve balance is to what extent and how the public/society will share in the value created in the project [27].
- **Uncertainty process component:** As a result of various reasons, decisions cannot be taken on time decisions cannot be implemented, and problems arise, especially for those living in the project area and property owners. To eliminate uncertainties, authority should be shared, monitoring and evaluation methods should be developed, and political determination should be demonstrated [28].
- **Adoption process component:** Parties are involved in issues such as policies, strategic goals, vision, planning and design principles, participation approach, consensus principles, strategy and action plan, strategic social plan, bureaucracy approach, political determination in all decision processes, from the project approach to the sharing of the resulting value. It is expected to be determined to adopt [27].

To achieve consensus, basic questions of how new living spaces will be created, with whom the projects will be carried out, who will finance the project, and how the created value will be shared must be answered. Nowadays, economic and social development and locally focused approaches should be taken as a priority when developing projects. The method of reconciliation process components should be included in the process of reducing the tension that arises in public-oriented projects and taking into account the spatial, social, and economic dimensions of comprehensive transformation. Ankara Orange Blossom Valley, Ankara Dikmen Valley, Istanbul Tarlabaşı 1st

Stage Renewal Project, Istanbul Kartal New Center Project, and Istanbul Cendere Valley Urban Transformation Projects can be given as examples of reconciliation projects [26, 27].

The Abelson urban transformation technique employs different methods to guarantee public involvement in urban transformation projects and gather their feedback on these projects [19]. These methods can be categorized into two groups: public participation and public consultation. [1, 2, 4-7, 19, 29].

- **Public participation techniques** are techniques that enable local people to actively participate in decision-making processes through deliberative means. Public juries, public panels, planning cells, consensus conferences, and deliberative voting are the main public participation techniques.
- **Public consultation techniques** are techniques used by central government, local governments, and private sector organizations to measure the reaction of citizens to the decisions they make. These techniques; focus groups, consensus-building exercises, surveys, public hearings, open invitations, advisory boards, social planning, vision development, referendum, structured value referendum, information, and solicitation of criticism [25, 29].

When we look at the literature, urban transformation projects are being prepared in our country and around the world to transform urban areas and reduce disaster risk. Urban transformation projects should be carried out in cities where urbanization planning was not well organized in the past and where rapid and incomplete urbanization took place. It is important to select and prioritize appropriate urban transformation projects in cities where there are multiple problems such as earthquake risk, flood risk, and landslide risk. In this context, many researchers have examined urban transformation processes for various purposes.

Buildings in cities require high amounts of energy to maintain physical comfort, which leads to environmental problems due to the increasing demand. To address this issue, Chang, Yoshida, Castro-Lacouture, and Yamagata proposed a building conversion strategy that utilizes a Bayesian multilevel modeling approach of buildings to achieve energy efficiency while maintaining thermal comfort [30].

Sabeeh Lafta, Antón García, Venus Suleiman, Salah Lafta, and Khalid Safa suggest that urban restoration and preservation of historical buildings should be performed in compliance with legislation and through techniques that maintain urban identities and cultural heritage. Furthermore, they emphasize the importance of raising public awareness about such practices [31].

Zhou et al. argued in their study that the urban designers' transformation method used in the renovation of Nantou Village was a more balanced solution than the traditional demolition, reconstruction, and renewal method employed by the regional government. The designers considered various conditions related to the urban background, historical context, and spatial rights of the village residents while developing their proposal [32].

Hong conducted a study on the Sewoon Renewal Promotion Project and Kwun Tong Town Center Project, which are urban renewal projects in Seoul and Hong Kong. The study aimed to identify problems related to the participation of urban residents and to diversify the ways of active participation of the public in these projects. The study offers specific measures that can be implemented immediately to encourage resident participation. It also suggests practical ways to benefit from resident participation at all stages of the project [33].

Moloney and Ralph conducted a study on the low-carbon policy actions taken by the Australian government to promote sustainable urban development. They carried out field studies in Melbourne and concluded that the policy was not effective in practice and could not provide a viable solution. However, they recommended the use of infrastructure and walking paths instead of public transportation in projects aimed at reducing carbon emissions in urban areas [34].

In Dr. Ekinci's proposed model, the engineering and architectural features of buildings can be easily determined during the planning, designing, and implementation stages of the urban transformation process. This model uses 12 main criteria and 600 inquiry questions to determine the engineering properties of buildings and their certificate classes. Additionally, 12 main criteria and 300 inquiry questions are used to determine the architectural properties of buildings. By doing so, the current status of the produced buildings in terms of user identity and purpose of use is clarified [35].

The purpose of this study is to investigate and present an overview of the methods and techniques used in urban transformation projects carried out in Elazig Province and Sivrice County, particularly after the 2020 Elazig-Sivrice earthquake. The study aims to evaluate the outcomes of the decisions made during the process as a whole.

2. Research Method

The focus of this study is the city of Elazig, particularly the areas that are at risk of earthquakes. The purpose of this qualitative research is to examine the results of urban transformation implementation in these areas through a field study. The study utilizes a descriptive approach, which involves the use of observation, interview, and

documentary scanning techniques. The observation technique is used to examine the physical characteristics of the buildings, while the interview technique involves gathering the opinions of building rights holders and users. The documentary scanning technique involves interpreting the reflections of literature information used in practice. To compare the literature information, the project technical documents obtained from the Ministry of Environment, Urbanization and Climate Change (MEUCC) and Elazig Municipality (EM) were used. The research sample consists of nine areas that are at risk of earthquakes, located in the center and neighborhoods of Elazig province, which have been included in the scope of urban transformation. These areas are the Karşıyaka Neighborhood, Cumhuriyet Neighborhood, Abdullahpaşa Neighborhood, Mustafapaşa Neighborhood, Rüstempaşa Neighborhood, Sürsürü Neighborhood, Kızılay Neighborhood, Güneş Site, and Gölbaşı Neighborhood of Sivrice Country (Figure 1).

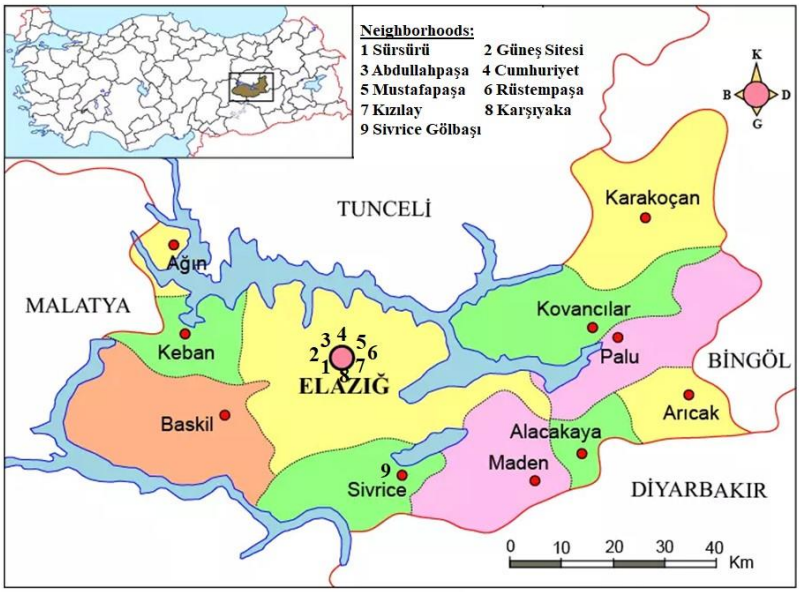

Figure 1. Distribution of urban transformation projects on the map of Elazig

3. Findings and Discussion

On January 24, 2020, a 6,8 M_w earthquake hit Elazig, causing severe damage to buildings that were constructed before 2006. The unplanned urbanization and the earthquake accelerated the urban transformation process throughout the Elazig province. The urban transformation practices implemented in Elazig played an important role in reducing the risk of damaged buildings during earthquakes and renovating earthquake-resistant buildings.

According to the following is a report from the Firat University Building and Concrete Application and Research Center, numbered 2020/D001 following the Sivrice earthquake that occurred on January 24, 2020, it was discovered that out of approximately 51792 buildings located in Elazig city center, 37290 were either undamaged or slightly damaged, while 1554 were moderately damaged, 6763 were severely damaged, and 6185 were in urgent need of demolition [36]. The MEUCC announced that the data changed after the Kahramanmaraş Pazarcık and Elbistan earthquakes on February 6, 2023. The main reason why the situation did not become worse during urban transformation works was that the implementation was completed after the Sivrice earthquake [37].

Some of the buildings in the Karşıyaka Neighborhood, located in the center and the eastern entrance of Elazig, are adobe structures and some are officer residences built in 1969. The Karşıyaka Neighborhood urban transformation project had been carried out within the scope of Municipality Law No. 5393 and redevelopment, renewal, and cleaning methods were applied (Table 2). The project started in 2014 and was completed in 2020. Renovation work has been carried out on the officers' lodges located in the risky area, but no renovation work has been carried out on the adobe buildings. An area of 50.30 hectares was declared as a risky area, but the project was implemented in an area of 6 hectares. The number of demolished independent buildings is 468. In addition, the demolished independent building type is reinforced concrete and the number of floors is five. The project was carried out in cooperation with Elazig Municipality and TOKİ. The municipality took part in the planning, design,

and administrative aspects of the project, and TOKİ carried out the construction and construction phases. The flats within the scope of the project are designed as 2+1 and 3+1. After construction, the number of independent units is 439 and the number of workplaces is 29. The constructed buildings are four-story, five-story, and six-story (Table 1). Although the consensus was at a moderate level in the first phase of the Karşıyaka Neighborhood application, it is seen that the consensus decreased towards the end of the application, however, public participation was very low in the first phase and there was no participation at the end of the application (Table 3).

The application area in the Cumhuriyet Neighborhood urban transformation project was declared as a disaster risk area. The declared risky area is 18.84 hectares. As a result of the failure to reach an agreement between some of the right holders in the risky area and the municipality, the transformation in the area could not be made, instead the treasury land close to the risky area was transferred to the municipality and the land was declared as a reserve construction area. The area of this reserve structure is 2.84 hectares. The redevelopment method was applied in the Cumhuriyet Neighborhood (Table 2). There are 28 reinforced concrete and 110 masonry structures in the risky area. It is seen that there are one-story, two-story, and three-story buildings in the area. Three-story buildings are located in the eastern part of the area, and two-story buildings are densely located in the western part of the area. The project started in 2014 and was completed in 2020. 277 independent units were built in the reserve building area. The buildings constructed are nine-story reinforced concrete. The design, planning, and reconciliation process of the project was undertaken by the Municipality, and the construction phase was carried out by TOKİ (Table 1). Although the consensus was at a moderate level in the first phase of the Cumhuriyet Neighborhood application, it is seen that the consensus decreased towards the end of the application, however, public participation was very low in the first phase and there was no participation at the end of the application (Table 3).

An area of 32.99 hectares in the Abdullahpaşa Neighborhood had been declared a risky area within the scope of Law No. 6306 by the decision of the President in 2020. After the 6.8 M_w earthquake in Elazig, the project application area was declared as a risky area. The post-earthquake transformation project was carried out in stages and these stages were implemented as 1st, 2nd, 3rd, and 4th stages. Cleaning and post-disaster transformation methods were applied in the Abdullahpaşa Neighborhood (Table 2). The project was carried out by MEUCC and implemented by TOKİ. The project start year is 2020 and the end year is 2022. Within the scope of the project, 2164 independent units and 156 workplaces were demolished, and the destroyed buildings were four-story, five-story, and six-story reinforced concrete structures. The total parcel area of the application is 32.99 hectares. Instead of the independent units and workplaces in the risky area, 2287 independent units and 287 workplaces were built, the structures were designed as five and six floors of reinforced concrete, and the flats were designed as 2+1 and 3+1. In addition, 63 flat owners in the Sivrice Gölbaşı Neighborhood were placed in these buildings (Table 1). In the Abdullahpaşa Neighborhood application, it is seen that the consensus was low in the first phase, and the consensus disappeared towards the end of the application, however, the participation of the public was very low in the first stage and there was no participation at the end of the application (Table 3).

An area of 11.62 hectares in the Mustafapaşa Neighborhood had been declared a risky area within the scope of Law No. 6306 by the Presidential Decree in 2020. After the earthquake with a magnitude of 6.8 M_w, the project application area was declared as a risky area. The post-earthquake transformation project was carried out in stages and these stages were implemented as 1st, 2nd, 3rd, and 4th stages. Cleaning and post-disaster transformation methods were applied in the Mustafapaşa Neighborhood (Table 2). The urban transformation project was carried out by MEUCC and implemented by AFAD and TOKİ. The project start year is 2020 and the end year is 2022. 1635 independent units and 409 workplaces in the risky area were demolished, and the destroyed structures were four-, five-, and six-story reinforced concrete structures. The total parcel area of the application is 11.62 hectares. The number of independent units built in the risky area is 1829, the buildings are designed as five and six floors of reinforced concrete, flats are 2+1, 3+1 and flat square meters are 90 and 125 m^2 (Table 1). In the Mustafapaşa Neighborhood application, it is seen that the consensus was low in the first phase, and the consensus disappeared towards the end of the application, however, the public participation was very low in the first stage and there was no participation at the end of the application (Table 3).

An area of 6.02 hectares in the Rüstempaşa Neighborhood had been declared a risky area within the scope of Law No. 6306 by the Presidential Decree in 2020. After the earthquake with a magnitude of 6.8 Mw, the project application area was declared as a risky area. The post-earthquake transformation project was carried out in stages and these stages were implemented as the 1st and 2nd stages. Cleaning and post-disaster transformation methods were applied in the Rüstempaşa Neighborhood (Table 2). The urban transformation project was carried out by MEUCC and implemented by AFAD and TOKİ. The project start year is 2020 and the end year is 2022. 793 independent units and 293 workplaces in the risky area were demolished, and the destroyed structures were four, five, lower, and seven-story reinforced concrete structures. The total parcel area of the application is 6.02 hectares. Instead of the independent units and workplaces in the risky area, 614 independent units and 195 workplaces were

built, the structures were designed as five and six floors of reinforced concrete, and the flats were designed as 2+1, 3+1 (Table 1). In the Rüstempaşa Neighborhood application, it is seen that the consensus was low in the first phase, and the consensus disappeared towards the end of the application, however, public participation was very low in the first stage and there was no participation at the end of the application (Table 3).

The Sürsürü Neighborhood urban transformation project had been implemented in Stage 1 and Stage 2. While the 1.20-hectare area of the 1st Stage was declared a risky area within the scope of Law No. 6306 in 2020, the 2nd Stage 17.72-hectare area was declared a "risky area" within the scope of Law No. 6306. Sürsürü Neighborhood 1st Stage urban transformation project was carried out by MEUCC and implemented by TOKİ. Cleaning and post-disaster transformation methods were applied in the Sürsürü Neighborhood (Table 2). The project start year is 2020 and the end year is 2022. 191 independent units and 2 workplaces in the risky area were demolished, and the destroyed structures were four, five, and six-story reinforced concrete structures. Instead of the independent units and workplaces in the risky area, 179 independent units were built, the buildings were made of reinforced concrete with five floors and the flats were designed as 3+1. The Sürsürü Neighborhood 2nd Stage urban transformation project was carried out by MUECC and implemented by TOKİ. The project start year is 2013 and the end year is 2022. 434 independent units and 25 workplaces in the risky area were demolished, and the destroyed structures were four-story, five-story, and six-story reinforced concrete structures. Instead of the independent units and workplaces in the risky area, 802 independent units and 40 workplaces were built, the buildings were made of reinforced concrete with four and five floors, and the flats were designed as 1+1, 2+1, and 3+1 (Table 1). In the Sürsürü Neighborhood application, it is seen that the consensus was low in the first phase, and the consensus disappeared towards the end of the application, however, the public participation was very low in the first phase and there was no participation in the end of the application (Table 3).

The 26.96 hectares area in the Kızılay Neighborhood had been declared an urban transformation and development project area in 2015 with the Municipality Law No 5393 and the Decision of the Council of Ministers. 7.05 hectares of the 26.96 hectares area was determined as a reserve building area by Law No. 6306. The urban transformation project, which started in 2015, was implemented by Elazig Municipality. There are 978 independent units in the urban transformation and development project area of 26.96 hectares. The buildings are one, two, and three-story adobe, masonry, and reinforced concrete structures. The application area is a reserve structure area of 7.05 hectares (Table 1). In the Kızılay Neighborhood application, it is seen that the consensus was low in the first phase, and the consensus disappeared towards the end of the application, however, public participation was very low in the first phase and there was no participation at the end of the application (Table 3). Redevelopment, renewal, and cleaning methods have been applied in the Kızılay Neighborhood (Table 2).

The Güneş Site, situated in the center, was designated as an urban renewal area under Law No. 6306 by Presidential Decree in 2020. This decision was made due to the extensive damage and collapse of the structures within the site following a 6.8 Mw magnitude earthquake. The application area of the post-earthquake transformation project was made on 0.38 hectares and one parcel. Block A on the site was destroyed during the earthquake, and blocks B and C were heavily damaged. The number of independent units in the site is 72, the flats are 165 m^2 and the building type is reinforced concrete. The buildings to be constructed were designed and implemented as 72 independent units, flats of 3+1 and 100 m^2. The project was carried out by MEUCC and the implementation phase was carried out by TOKİ (Table 1). Cleaning and post-disaster transformation methods were applied at the Güneş Site (Table 2). It is seen that there is a lot of agreement in the first and second phases of the implementation, but the consensus disappears towards the end of the implementation, however, public participation is very low in the first phase and there is no participation at the end of the implementation (Table 3).

An area of 35.47 hectares in the Gölbaşı Neighborhood of Sivrice Country had been declared a risky area within the scope of Law No. 6306 by the Presidential Decree in 2020. After the earthquake with a magnitude of 6.8 Mw, the project application area was declared as a risky area. The post-earthquake transformation project was implemented as the 1st Stage. The urban transformation project was carried out by MEUCC and implemented by TOKİ. The project start year is 2020 and the end year is 2022. 377 independent units and 98 workplaces in the risky area were demolished, and the destroyed structures were one or two-story adobe and reinforced concrete structures. Instead of the independent units and workplaces in the risky area, 305 independent units and 83 workplaces were built, the structures were designed with reinforced concrete, one and two floors, and the flats were designed as 2+1. In addition, 63 beneficiaries in the risky area were placed in residences in the Abdullahpaşa Neighborhood (Table 1). Cleaning and post-disaster transformation methods were applied in the Gölbaşı Neighborhood of Sivrice Country (Table 2). It is seen that the consensus was moderate in the first and second phases of the implementation, and the consensus was low towards the end of the implementation. However, public participation was very low in the first phase and there was no participation at the end of the implementation (Table 3).

Karşıyaka Neighborhood | Cumhuriyet Neighborhood | Abdullahpaşa Neighborhood

Mustafapaşa Neighborhood | Rüstempaşa Neighborhood | Sürsürü Neighborhood

Kızılay (Kesrik) Neighborhood | Güneş Site | Sivrice-Gölbaşı Neighborhood

Figure 2. General view of some buildings in risky areas before urban transformation [14, 38, 39]

Karşıyaka Neighborhood | Cumhuriyet Neighborhood | Abdullahpaşa Neighborhood

Mustafapaşa Neighborhood | Rüstempaşa Neighborhood | Sürsürü Neighborhood

Kızılay (Kesrik) Neighborhood | Güneş Site | Sivrice-Gölbaşı Neighborhood

Figure 3. General views of buildings after urban transformation [14, 38, 39]

Table 1. Elazig urban transformation project information [14, 38, 39]

Urban Transformation Application Information	Karşıyaka Neighborhood	Cumhuriyet Neighborhood	Abdullahpaşa Neighborhood	Mustafapaşa Neighborhood	Rüstempaşa Neighborhood	Sürsürü Neighborhood	Kızılay Neighborhood	Güneş Site	Sivrice Country Gölbaşı Neighborhood
Project Start Date	2014	2014	2020	2020	2020	2013	2015	2020	2020
Project Completion Date	2020	2020	2022	2022	2022	2022	2022	2021	2022
UT Project Area (ha)	50.30	18.84	32.99	11.62	6.02	18.92	26.96	0.38	35.47
Application Area (ha)	6	2.84	32.99	11.62	6.02	18.92	7.05	0.38	35.47
Number of Independent Units Destroyed	330	138	2320	2044	1086	193	356	72	424
The Type of Independent that Destroyed	RCB	RCB /MB	RCB	RCB	RCB	RCB	RCB /MB	RCB	RCB /AH
Number of Independent Units Made	468	277	2574	1829	809	179	369	72	388
Type of Independent Made	RCB	RCB	RCB	RCB	RCB	RCB	RCB	RCB	RCB
Managing Institution	EM	EM	MEUCC	MEUCC	MEUCC	MEUCC	EM	MEUCC	MEUCC
Producer Institution	TOKI	TOKI	TOKI	TOKI / AFAD	TOKI / AFAD	TOKI	EM	TOKI	TOKI

AFAD: Disaster and Emergency Management Presidency AH: Adobe House EM: Elazig Municipality
MEUCC: Ministry of Environment, Urbanization and Climate Change MB: Masonry Building
RCB: Reinforced Concrete Building TOKI: Housing Development Administration UT: Urban Transformation

Table 2. Elazig urban transformation projects implementation methods [39]

Project Information		enewal	Rehabilitation	Protection	Reanimation	Redevelopment	Regulation	Cleaning	Refreshing	Integration	Gentrification	Development by Filling Gaps	Post-Disaster Transformation*
Elazig Center	Karşıyaka Neighborhood ***	✔				✔		✔					
	Cumhuriyet Neighborhood ***					✔							
	Abdullahpaşa Neighborhood ***							✔					✔
	Mustafapaşa Neighborhood ***							✔					✔
	Rüstempaşa Neighborhood ***							✔					✔
	Sürsürü Neighborhood ***							✔					✔
	Kızılay Neighborhood ***	✔				✔		✔					
	Güneş Site**							✔					✔
Sivrice Country	Gölbaşı Neighborhood***							✔					✔

* Post-Disaster Transformation Method is a method that emerged as a result of urban transformation projects implemented in areas where risky buildings are located after the earthquake [39]
**Individual Urban Transformation
*** Public Urban Transformation

Table 3. Elazig urban transformation projects implementation techniques [39]

Project Information		Compromise			Public Participation		
		First Phase	Second Phase	Third Phase	First Phase	Second Phase	Third Phase
Elazig Center	Karşıyaka Neighborhood ***	+++	++	++	✔ ✔	✔	✔
	Cumhuriyet Neighborhood ***	+++	++	++	✔ ✔	✔	✔
	Abdullahpaşa Neighborhood ***	++	+	+	✔ ✔	✔	✔
	Mustafapaşa Neighborhood ***	++	+	+	✔ ✔	✔	✔
	Rüstempaşa Neighborhood ***	++	+	+	✔ ✔	✔	✔
	Sürsürü Neighborhood ***	++	++	++	✔ ✔	✔	✔
	Kızılay Neighborhood ***	++	++	+	✔ ✔	✔	✔
	Güneş Site**	++++	++++	+	✔ ✔	✔	✔
Sivrice Country	Gölbaşı Neighborhood***	+++	+++	++	✔ ✔	✔	✔
No Agreement: + Little Agreement: ++ Moderate Agreement: +++ Lots of Compromise: ++++							
No Participation: ✔ Low Participation: ✔ ✔ Medium Participation: ✔ ✔ ✔ High Participation: ✔ ✔ ✔ ✔							

4. Conclusion and Recommendations

The earthquake that occurred in Elazig in 2020 seriously brought urban transformation projects to the agenda and accelerated the projects. In addition, it was seen that the province was not ready for the earthquake and its consequences, and this situation also affected the choice of methods and techniques in urban transformation applications. In this context, although there are mistakes in the method and technique selection of urban transformation works implemented throughout Elazig, the identification of damaged structures and the continuation of the transformations by including these structures in urban transformation and the completion of the applications have minimized the effects of the 6 February 2023 Kahramanmaraş Pazarcık and Elbistan earthquakes throughout the province.

The improvement and change (Figure 3) experienced as a result of urban transformation practices of pre-earthquake buildings in risky areas (Figure 2) had a positive impact on the urban identity. Some of the situations resulting from the reflections of these effects are summarized below;

- The Karşıyaka Neighborhood was declared as an urban transformation and development area within the scope of Article 73 of the Municipality Law. However, the methods applied were in the form of redevelopment, renewal, and cleaning methods due to the impact of the earthquake.
- The Cumhuriyet Neighborhood has been declared as a disaster risk area by the Municipality Law. An area of 18.84 hectares was declared a risky area and an area of 2.85 hectares was declared a reserve building area. The method is redevelopment. However urban transformation was not implemented here. New buildings were built only in the reserve building area.
- The Abdullahpaşa Neighborhood has been declared a risky area within the scope of Law No. 6306. The methods used were cleaning and post-disaster transformation.
- The Mustafapaşa Neighborhood has been declared a risky area within the scope of Law No. 6306. The methods used were cleaning and post-disaster transformation.
- The Rüstempaşa Neighborhood has been declared a risky area within the scope of Law No. 6306. The methods used were cleaning and post-disaster transformation.
- The Sürsürü Neighborhood was declared a "Risky Area" by the Decision of the Council of Ministers in 2013, it was declared a "Risky Area" again within the scope of Law No. 6306 after the earthquake in 2020. Here, the use of cleaning and post-disaster transformation methods was preferred.
- The Kızılay Neighborhood was declared as an urban transformation and development area within the scope of Article 73 of the Municipality Law in 2015. Redevelopment, renewal, and cleaning methods have been used in these areas.
- The Güneş Site was declared a risky building in a risky area by the Presidential Decree within the scope of Law No. 6306. The methods used were cleaning and post-disaster transformation.
- The Gölbaşı Neighborhood of Sivrice Country has been declared a risky area within the scope of Law No. 6306. In the Sivrice Country, the cleaning and post-disaster transformation methods preferred in Elazig city center were used.

As explained above; these are important parameters in the success of the methods and technical applications to be chosen in the urban transformation process and in reaching the desired goal. In choosing these parameters,

choices should be made by examining each city individually. Because the places within the scope of transformation have their cultural characteristics, economic conditions, and natural disaster risk situations. For this reason, the methods and techniques to be chosen should be chosen and implemented by considering these features. In urban transformation projects, general principles can be determined at the upper scale, but as sub-applications progress, it will be useful to determine methods and techniques specific to each region. In addition, urban transformation practices around the world are carried out in cooperation with the public, private sector, and public. When we look specifically at Elazig, it can be seen that public participation in urban transformation projects is at the initial stage, which is the stage of being declared a risky area. In this context, while urban transformation practices should be continued with the participation of the public, starting from the first phase until the last phase of the project, unfortunately, this method could not be implemented due to the urgency of housing construction within the scope of post-earthquake urban transformation.

As can be seen in Table 1, Elazig Municipality has completed the urban transformation applications in three risky areas, and MEUCC has completed the applications in six risky areas. The producer organization of seven of these applications is TOKİ, one is TOKİ and AFAD Partnership and one is Elazig Municipality.

As can be seen in Table 2, the "Renewal and Cleaning" method was applied in the Karşıyaka Neighborhood and the Kızılay Neighborhood, and the "Cleaning" method was applied in other risky areas. In terms of the urban transformation application method, only the Güneş Site was completed based on the individual urban transformation method. Additionally, as can be seen from the table, the post-disaster transformation method has emerged as a result of urban transformation projects implemented in areas where risky buildings are located after the earthquake.

As can be seen from Table 3, only in the Güneş Site, a general specialization was achieved among the flat owners in the early stages of the implementation process, but serious problems were experienced in compromise due to the physical characteristics of the flats during the project completion phase. The draw has caused some problems between the flat owners and the developer regarding issues such as the square meter of the flats and the orientation and location of the flats.

After February 6, 2023, Kahramanmaraş Pazarcık and Elbistan earthquakes, the completion of the transformation works of damaged buildings throughout the province, especially those with moderate and severe damage, will contribute to urbanization that is more resistant to earthquakes that may occur in the future. In addition, pre-disaster, disaster, and post-disaster risk reports prepared through microzoning studies throughout the province will also be useful.

In conclusion, more qualified urban transformation results will be achieved by reducing the problems arising in public transformation projects and by including the reconciliation method in the recycling process, taking into account the spatial, social, economic, bioharmological, ecological, and environmental dimensions of the comprehensive transformation.

Note

This study is derived from the Doctoral Thesis titled "Bioharmological Investigation of the Engineering Properties of Urban Transformation Buildings Constructed in Risky Areas: Elazig City Center Sample", conducted by B.E under the academic supervision of C.E.E. Additionally, it was supported within the scope of project number FÜBAP TEKF.23.55.

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