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RESEARCH ARTICLE

The Economic, Social and Environmental Effects of the Kahramanmaraş Earthquakes: The Case of Elbistan

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ABSTRACT
This study aims to compile the economic, social, and environmental impacts of the Kahramanmaraş earthquakes and analyze these impacts with qualitative data, focusing on the Elbistan case. To achieve this goal, data was collected after the earthquakes centered in Kahramanmaraş on February 6, 2023, which affected 11 provinces, to identify the economic, social, and environmental problem areas in Elbistan, the epicenter of the earthquake, and to develop solutions that contribute to regional development. To this end, semi-structured interviews were conducted with key sources of information in Elbistan, including local authorities, district residents, the chambers of commerce, İŞKUR (Turkish Employment Agency), union representatives, industry and university representatives, and local businesses. Qualitative research methods were used in the study, and content analysis was performed. Based on the results obtained through content analysis, policy recommendations have been presented in a structure that aligns with the economic development plans strategy, aimed at restoring or improving the economic, physical, social, cultural, and environmental assets of the affected district, reversing economic decline, and enhancing societal resilience.

Keywords: Earthquake, Elbistan, Kahramanmaraş Earthquake, Qualitative Analysis, Economic Impacts of Earthquakes, Social Impacts of Earthquakes

Introduction

Among natural disasters, earthquakes are the most impactful on society due to their sudden occurrence and destructiveness, both in terms of human and property losses. Depending on their intensity, earthquakes result in social, vital, environmental, and economic losses.

Türkiye is located on the highly seismic active Anatolian Plate, which has a history of significant earthquakes. From 1900 to 2023, Türkiye experienced more than 20 earthquakes with a magnitude of 7 or greater. This places Türkiye at the top of the list of countries affected by earthquakes. Between 1900 and 2023, 269 earthquakes in Türkiye caused loss of life or damage. Among these, the largest earthquakes in terms of casualties and severe damage are the 2023 Kahramanmaraş earthquake, the 1939 Erzincan earthquake, and the 1999 Gölcük-centered Marmara Earthquake (SBB, 2023: 6). As will be discussed in the following sections, considering the magnitude of the economic, social, and environmental costs and damages caused by the 2023 Kahramanmaraş earthquake, it becomes evident once again that the establishment of earthquake-resistant cities and infrastructure and the promotion of earthquake awareness are of great importance.

In addition to the heavy human losses in earthquakes, the damage to physical capital is also quite costly. The burden of resources required to get cities back into operation is substantial. Considering these costs and burdens, the analysis of earthquakes

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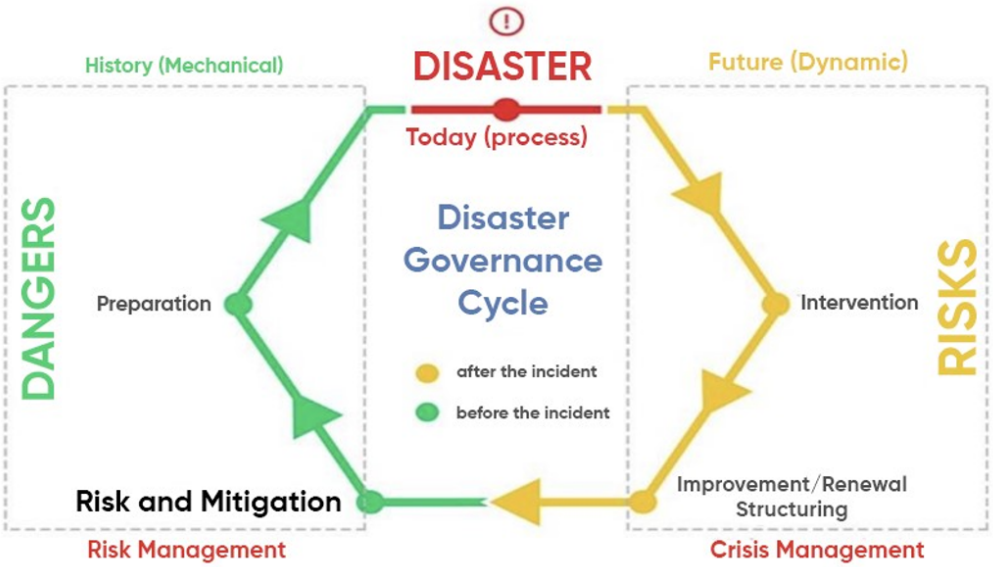
becomes significant from an academic perspective. In this context, the following section includes concepts and literature related to earthquakes.

It can be said that the literature on disasters began to develop in the 1970s. Among natural and human-induced disasters, earthquakes stand out in terms of frequency of occurrence and their social and economic impact and costs. Especially in the prevention of post-disaster costs and the effective use of resources in this regard, global organizations, primarily the United Nations (UN), play a leading role in national reports and academic studies.

The literature that emerged in the 1990s has been shaped within the framework of the "disaster cycle approach," which covers the stages before, during, and after disasters in disaster management. Within the context of these developments, it is believed that the creation of a development model that supports existing efforts in earthquake-prone areas will contribute to the literature.

Figure 1. Disaster Management Cycle



Source: Kahraman et al., (2021), Key Terms in the Disaster Management Cycle, Eurasian Term Journal, 2021, 9 (3), p.8.

The preparation phase within the disaster management cycle encompasses activities such as identifying risks and hazards before disasters, risk reduction efforts, and the preparation of the necessary professional disaster workforce and volunteer groups for situations involving unavoidable damage. The formula "Risk = Hazard × Exposure × Vulnerability" is used to determine the vulnerability levels of the population and settlements that could be exposed to hazardous situations. It is emphasized that disaster management in Türkiye is a significant issue for sustainable development, not limited to search and rescue operations and that the initial and most crucial phase of disaster management is risk reduction (TMMOB, 2023:6).

Following a disaster, the main stages include "response, recovery, and reconstruction." During a disaster and in the immediate aftermath, the focus is on search and rescue and healthcare. In the post-disaster phase, it is necessary to execute evacuation and rescue plans to protect people and structures, as well as to engage in reconstruction and improvement efforts to return damaged physical and human assets to their normal state (Kahraman et al., 2021: 13). According to AFAD (2013:11), response is the "work aimed at providing life and property rescue, health, subsistence, infrastructure, security, property and environmental protection, and social and psychological support services in case of disasters and emergencies." According to UNDRR (2021), it involves "measures taken immediately before, during, or right after a disaster to save lives, reduce the impact on health, ensure public safety, and meet the basic needs of affected individuals."

In the days following a disaster, efforts shift towards recovery and reconstruction. The duration of recovery and reconstruction depends on the scale and nature of the disaster and can span from several months to several years (Kadıoğlu: 2011:64). According to UNDRR (2021), recovery is defined as "restoring or improving the livelihoods and health of a community or society affected by a disaster, as well as economic, physical, social, cultural, and environmental assets, systems, and activities." In this context, the efforts of workers, employers, public employees, and self-employed individuals to return to economic activities during the post-disaster recovery and reconstruction phase are of particular importance. Zhang et al. (2019) have shown that economic recovery in Fukushima required innovation and adaptation by the local population, ultimately reversing economic decline.

Revitalizing local production capacities with post-disaster emergency support programs to create employment and income-generating opportunities is seen as a fundamental requirement for achieving societal resilience.

Vulnerability assessments are conducted to answer questions about why disasters occur, what their impacts are, why specific settlements and groups are more affected by these disasters, how differences in the capacity to cope with disasters can be explained, what the reasons and consequences of different sensitivities are, and how future disaster risks can be predicted (Eakin and Luers, 2006; Anderson and Woodrow, 1998: 10). Being able to predefine specific characteristics of the population affected by disasters in the disaster-affected area makes it easier for the state and aid organizations to intervene in disasters (Kolars, 1982). However, researchers from different disciplines working in the field of disasters are trying to conceptualize the concepts of risk, vulnerability, and hazard from the perspective of their own disciplines. For example, researchers from the social sciences, such as historians, psychologists, sociologists, and anthropologists, often treat the concept of risk as a social construct, using constructivist assumptions. From this perspective, the risk concept takes into account individual and collective perceptions and the interaction of social actors (Cardona, 2004: 45), and those working on the vulnerability approach do not see disasters as the effects of physical events only. They examine how culture and certain groups are related to vulnerability (McEntire, 2003). They do not accept modernization theory and its technocratic and scientific solutions to hazards or external interventions for the problems of developing countries as a solution. In fact, scholars in the field argue that these interventions harm the goal of reducing the impact of disasters. According to their approach, vulnerability is the result of the social, economic, cultural, and educational conditions that exist within society. This vulnerability that has occurred is derived from social organization established over time (Gencer, 2007: 45). However, engineers, geologists, economists, and epidemiologists often adopt approaches based on hypotheses that can be realistically defined, quantified, and measured objectively. They mathematically express the problem and make decisions in this way. Applied sciences focus on the effects of the event rather than the event itself. This approach makes real risk predictions only for certain situations. Risk is evaluated in economic terms, and the term "social impact" is used for the number of dead and injured in loss scenarios. While this information is important for emergency preparedness and response, this approach, which points to a limited perspective, shows that applied sciences ignore social, economic, cultural, and political approaches that should be included in risk and vulnerability predictions (Cardona, 2004: 45). Researchers like political scientists and public administrators observe how policies and their implementation affect risk, sensitivity to disasters, resilience, and the ability to recover. (McEntire, 2003).

As evident from the literature review, the recent increase in human and material losses due to natural disasters like earthquakes has shifted interest in disaster studies toward the field of social sciences. It has prompted the examination of the phenomenon of disasters from a broad social perspective. After the first earthquake on 06.02.2023 in the Pazarcık district of Kahramanmaraş with a magnitude of Mw7.7, a second major earthquake centered in Elbistan with a magnitude of Mw7.6 occurred at 13:24 (AFAD, 2023: 2,5). Due to the resulting damage and loss of life, it was referred to as the disaster of the century. These earthquakes affected Kahramanmaraş, Hatay, Adıyaman, Malatya, Gaziantep, Şanlıurfa, Diyarbakır, Adana, Osmaniye, Kilis, and Elazığ provinces, causing significant damage and losses. This study examines the economic, social, and environmental impacts of the major disaster within the framework of qualitative research findings conducted in Elbistan. In this context, the subsequent sections of the study primarily address the economic, social, and environmental effects caused by the earthquake. Then, the methodology and findings of the research are analyzed. The study concludes with a discussion of the results.

Economic Effects of the Earthquake

According to Panwar and Sen (2019) although there is a clear consensus on the fact that natural disasters result in significant monetary and human losses, there is still uncertainty in the existing research about how they will affect the economy as a whole. Based on panel data covering 102 countries between 1981 and 2015 (29 developed and 73 developing), they revealed that different types and intensities of natural catastrophes have different effects on the macroeconomy, which vary across economic sectors. While the effects of earthquakes were shown to be favorable for the entire sample of countries, they appeared to slow non-agricultural growth in developing nations. Despite having a negative effect on non-agricultural growth, severe earthquakes did not appear to have a major effect on any other economic sector. Furthermore, this analysis demonstrates that while the macroeconomic effects of natural disasters are substantially stronger in developing nations, direct disaster damages are higher in wealthy countries (in absolute terms).

There is little doubt that the earthquake has had a direct negative impact on economic activities. However, two elements that usually balance each other out govern how economic activity behaves after a seismic event. The earthquake's destruction of physical capital has the potential to reduce economic activity, but rehabilitation efforts—which are frequently supported by governmental grants—have the potential to increase it locally. The findings imply that public grants make up for the economic blow caused by an earthquake which is felt by towns just below the grant threshold (Trezzi and Porcelli, 2014). Porcelli and Trezzi (2019) also demonstrate that, even after the most destructive earthquakes, the effects on economic activity are transient, do not spread beyond the epicentral region to the neighboring areas, and typically subside within a year of the incident. Nevertheless, understanding other crucial factors, such as the sectoral responses of output and employment, requires further study.

According to research on disasters, government aid programs that offer quicker, less constrained money will likely be more successful in assisting with company recovery as well. Factors such as debt burden, bureaucratic burden, and facilitating adaptability will apply to both pandemics and disasters. Whether the initial shock is a flood, earthquake, or pandemic, a business's impact and recovery depend on factors like its ability to continue operating, the survival of its suppliers and customers, its pre-disaster financial health, and its ability to adapt to a changing environment (Chang et al., 2022). Thus, the economic impact of the Kahramanmaraş earthquake needs to be considered at both the macro and micro levels. In line with this notion, this study is structured to exhibit the opinions of a variety of representatives from public bodies, NGOs, and industry.

The earthquakes that occurred in Kahramanmaraş, Türkiye on February 6, 2023, resulted in significant loss of life and property, with seismic activity exceeding a magnitude of 7, causing widespread and severe damage due to its shallow depth (Duran, 2023). The region affected by the earthquake constitutes approximately 17.8% of Türkiye's land area and about 13.4% of its population. Referred to as the disaster of the century, these earthquakes claimed the lives of over 50,000 people. According to the Ministry of Treasury and Finance, the total material damage caused by the earthquake is 1.6 trillion Turkish Liras. The Türkiye Earthquake Recovery and Reconstruction Assessment (TERRA) report states that the total material and financial cost is 103.6 billion dollars, which could account for approximately 9% of the country's GDP in 2023 (SBB, 2023:8).

Emergency support expenses in the earthquake-affected region, debris removal efforts, insurance payments, income loss compensation, and all other support expenses have placed a significant burden on the economy. In addition, following the earthquake, government agencies such as AFAD and the Ministry of Agriculture and Forestry (TOB) activated emergency payment allowances for use in urgent situations, initially allocating 87 billion Turkish Liras (SBB, 2023: 33).

The disruption of production capacity during the earthquake has caused interruptions in the supply chain. Disruptions in the production of raw materials and intermediate goods have led to production setbacks and have had a negative impact on the rest of the country. For example, Kahramanmaraş, which used to supply 27% of the country's yarn production before the earthquake, experienced interruptions in yarn production. This has negatively affected textile manufacturing companies in Bursa (Demiralp, 2023: 4-5).

The 11 provinces affected by the earthquake account for 10.1% of Türkiye's GDP (Bakır, 2023). In terms of the contribution to Türkiye's economic growth in 2021, these 11 provinces had a combined contribution of 0.91%, with Gaziantep leading at 0.25%, followed by Adana at 0.21%, and Hatay at 0.20% (Kıvanç, 2023).

Analyzing the economic sectors in the earthquake-affected region, it can be observed that the agricultural sector made the most significant contribution to the national income as of 2021. Approximately 14.3% of Türkiye's 2021 agricultural production of 402 billion dollars came from this region. The provinces that contributed the most to the agricultural sector in the earthquake region were Şanlıurfa with 3.0%, Adana with 2.5%, and Diyarbakır with 2.2%. These provinces also had a GSYH share in the industrial sector of about 11.2%. Gaziantep led with 3.6%, followed by Adana with 2.2%, Hatay with 1.8%, and Kahramanmaraş with 1.4% (SBB, 2023: 13).

The physical damage caused by the earthquake, such as damage to capital stock, transportation, and supply infrastructure, is expected to lead to a loss of approximately 2.6% of GDP in terms of production and income. These losses are expected to put negative pressure on 2023 economic growth rates and affect important economic variables negatively, such as investment stagnation, loss of momentum, reduced workforce quality, and increased inflation (Doker and Yiğit, 2023:200). This situation is also reflected in the reduced production capacity of firms at the micro level. In Kahramanmaraş, a significant hub for yarn production, production facilities and yarn machines suffered damage, rendering approximately 35% of machine lines unusable. This has led to a decrease in yarn production and a rapid increase in yarn prices (Hurriyet, 2023). The main reasons behind these declines include difficulties in sourcing raw materials and intermediate goods, the workforce being unable to work actively due to migration, health, or psychological issues, logistical problems in reaching customers, and damage to buildings, machinery, and equipment (Dündar, 2023: 270).

Due to the housing problem in the region, people have been forced to migrate. To prevent these migrations, the government has set up temporary housing centers near Industrial Zones (OSBs) for 1,000 people each, with a total capacity of 5,000 people. The preference for housing centers in the region aims to facilitate the transition of people to normal life and activate factories and industrial establishments, thereby increasing production capacity in the earthquake-affected region (TİM, 2023: 10).

Therefore, the cessation of economic activities in the earthquake-affected region has also pushed prices upward. The price increases are triggering inflation, especially in essential goods such as housing, food, and basic necessities (Aydınbaş, 2023: 183). Inflation figures in Türkiye saw significant increases in 2022, but from November of the same year, there was a decline. Prior to the earthquake, the Central Bank had kept the inflation target for 2023 at around 20%, but after the earthquake, these targets were disrupted (Günaydın, 2023). Moreover, the additional expenses due to the earthquake are expected to have an inflationary effect. These developments have increased Türkiye's inflation by the end of 2023, according to the Central Bank of the Republic of Türkiye (TCMB, 2023:43).

Furthermore, the earthquake has caused interruptions in foreign trade due to its impact on production and logistics networks. The 11 provinces affected by the earthquake make up 8.6% of Türkiye's export volume. The region primarily exports textiles, clothing, carpets, cereals, agricultural products, and dried fruits. The share of export volume, which was 8.6% before the earthquake, has decreased to 6% after the earthquake (TCMB Inflation Report, 2023: 35). The disruption of businesses producing for export and intermediate goods for export, along with labor shortages and logistical problems in the logistics sector, is the main reason for this decline. This has adversely affected cash flows for exporting companies and left many firms facing financial difficulties (Şen, 2023: 13).

Social Effects of Earthquakes

The acute effects of disasters, such as loss of life, injuries, and material damage, begin to manifest themselves in social, psychological, and socio-economic dimensions in the long term. These effects play a pivotal role in shaping post-disaster recovery and reconstruction efforts within the disaster management cycle. Empirical studies on disasters and their social impacts have revealed how disaster victims and general social life in disaster-affected regions are affected in the short and long term. Initially, local impacts become evident, but social effects quickly spread regionally and to the entire population, necessitating recovery efforts in the medium and long term.

Following an earthquake, there is often a migration wave towards areas perceived as safer due to the primary concern for personal safety and the desire to move away from traumatic effects. After the 1999 Izmit earthquake in Türkiye, for instance, it was reported that at least 25,000 people migrated from the cities of Sakarya and Kocaeli to different regions (Südaş, 2004). Similarly, after the 2011 Van earthquake, displacement to other cities occurred due to housing problems and adverse weather conditions (Deniz et al., 2017: 1438-1439). Those who migrate after earthquakes are typically individuals who have relatives in other cities and possess a socio-economic status sufficient to cover the costs of relocation. Poverty exacerbates the negative consequences of post-earthquake migration and temporary relocations.

The economic hardships experienced by the poor after earthquakes, coupled with their reliance on social assistance in disaster-affected regions, often lead to their continued residence in these high-risk areas. Factors like production halt in workplaces due to earthquakes; disruptions in business operations, building collapses, and losses of raw materials and products, contribute to unemployment and poverty risks. To mitigate these risks, the Ministry of Labor and Social Security has implemented measures within the scope of the State of Emergency (SOE) after the earthquakes centered in Kahramanmaraş, and, through Presidential Decree No. 32112 dated February 22, 2023, decided to provide short-time work allowance and cash wage support during the state of emergency due to regional crises.

Earthquakes are unavoidable, sudden events that are an integral part of social life. Compared to other natural disasters, earthquakes have more profound effects. Reconstruction of damaged areas and resettlement of the affected population typically entail long-term repercussions. In addition, earthquakes can cause psychiatric illnesses such as sleep disorders, and depression, which significantly reduce individuals' quality of life. The psychosocial impact brought about by earthquakes can make it difficult for some individuals to cope, leading to negative emotional states such as shock, panic, helplessness, and insecurity. Therefore, earthquake victims experience increased psychological stress, and their quality of life is significantly lower compared to others (Marangoz and İzci, 2023: 16). Consequently, the Ministry of Family, Labor, and Social Services deploys psychosocial support teams that conduct work including psychological assistance and individual consultations in hospitals, disaster scenes, and wherever citizens are housed (SBB, 2023: 109).

The destruction of buildings housing institutions serving people with disabilities, children, women, and the elderly, makes these groups more vulnerable during earthquakes. Those who are as vulnerable as children are unable to protect themselves during an earthquake, which increases the degree of harm they may face. According to a study conducted by the International Pediatric Association (IPA), approximately 4.8 million children were affected by the earthquake disaster. As a result, one out of every five children in Türkiye were reported to be psychologically, socially, or physically affected by the earthquake. Around 1,133 disabled and 533 elderly individuals who required care were placed in institutions in different cities following the earthquake (SBB, 2023: 108).

In addition to psychological problems, another significant issue, from a public health perspective, resulting from earthquakes is the occurrence of epidemic diseases. Particularly, infectious diseases tend to increase after earthquakes. The unfavorable conditions post-earthquake contribute to the spread of epidemic diseases. Factors such as limited access to clean drinking water, the inability to maintain personal hygiene, increased human mobility, lack of access to safe food, and increased air pollution due to adverse weather conditions have led to a significant increase in epidemic diseases. According to the Ministry of Health, 448 healthcare workers lost their lives, and approximately 528 people were injured (Azap, 2023). According to data from the Presidency of Strategy and Budget, 42 hospital buildings, including 27 belonging to the Ministry of Health, 9 to the private sector, and 6 to

universities, are in severe or moderate damaged condition (SBB, 2023: 57-58). This situation makes it more challenging to provide emergency interventions in the healthcare sector in the region.

One of the social areas most affected by earthquakes is the education system. Earthquakes have created adverse effects on the education system due to various factors, and these adverse effects often have a long-lasting impact. After the Kahramanmaraş earthquake, for example, schools were initially closed for a period of 3 to 7 weeks depending on their damage status. Subsequently, to prevent longer interruptions, many students were transferred to educational institutions outside the disaster zone for the sake of continuity (TERRA, 2023: 151-152). Later, distance education was introduced to ensure the continuity of education. During this process, students, parents, and teachers were adversely affected both physically and psychologically. To address such psychological problems arising after earthquakes, a Psychosocial Support Action Plan was prepared and implemented. Seminars were organized for approximately 1.2 million teachers nationwide through the Teacher Informatics Network to inform them on topics such as mental health following disaster and crisis management (SBB, 2023: 45). Additionally, several institutions and organizations, particularly Dokuz Eylül University (DEU, 2023), established social activities and play areas for earthquake-affected children, aiming to provide psychological support.

In addition to the adverse effects of earthquakes, some positive effects have been observed, such as an increased sense of solidarity. After earthquakes, people and the state join forces to respond to the disaster. Various forms of assistance have been provided through the support of both individuals and civil society organizations (Akkaş, 2023: 26). The "Türkiye Stands United" campaign, which aired on numerous television and radio channels both domestically and internationally on February 15, 2023, is one of the most significant examples of this solidarity and mutual support.

Environmental Effects of Earthquakes

Earthquakes can lead to adverse environmental effects, in addition to causing physical and socio-economic destruction. These effects include water pollution, air pollution, soil contamination, disruptions in ecosystem balance, and loss of biodiversity (Dindar, 2023). Following the earthquakes in Kahramanmaraş, the region's water and sewage systems, as well as wastewater treatment facilities, suffered significant damage. The most significant adverse impact of the earthquake was undoubtedly on the water systems. Groundwater mixed with drinking water due to the tremors, and harmful bacteria and heavy metals were detected in water samples (Yazan, 2023). Failure to provide suitable ground and location for the storage of debris left from collapsed buildings after an earthquake can lead to harmful consequences for human health and the ecosystem. This debris contains chemicals leaking from insulation materials, harmful plastics, concrete, iron, bricks, glass, paint, and other materials. Additionally, dust particles generated during debris removal activities and increased air pollution in the earthquake-stricken area due to the inability to supply electricity and natural gas have been observed (TTB, 2023).

Problem Area, Purpose, and Method of the Study

According to the Presidency Strategy and Budget Directorate (SBB) Earthquake Post-Assessment Report, major earthquakes occur along the boundary faults that correspond to the relative movements of the African, Eurasian, and Arabian plates. In terms of loss of life and significant damage, the largest earthquakes have been the 2023 Kahramanmaraş earthquake, followed by the 1939 Erzincan earthquake and the 1999 Gölcük-centered Marmara earthquake. On February 6, 2023, two earthquakes of magnitudes Mw7.7 (depth=8.6km) and Mw7.6 (depth=7km), with their epicenters in the Pazarcık and Elbistan districts of Kahramanmaraş, occurred at 04:17 and 13:24 local time in Türkiye. Additionally, on February 20, 2023, at 20:04 local time in Türkiye, another earthquake with a magnitude of Mw 6.4 and its epicenter in Hatay Yayladağı took place. Field observations have confirmed the relationship of these earthquakes with the East Anatolian Fault Line (DAFH). Eleven provinces on the DAFH were affected by these earthquakes. As a result of these earthquakes, more than 50,000 people, including 6,807 foreigners, lost their lives in the earthquake-stricken region. Therefore, the assessment of the economic and social consequences of the earthquake, not only in terms of loss of life but also in terms of impact on agriculture, livestock, industry, tourism, food, textiles, and other sectors, as well as the loss of jobs, labor, and production, constitutes the fundamental problem area of the study.

According to the Turkish Statistical Institute (TÜİK) data, the share of the provinces affected by the earthquake in the Gross Domestic Product (GDP) in 2021 is approximately 10%. The region generates around $79 billion of national income. The per capita income level in the region is below the Turkish average. Considering this data, the study aims to identify economic, social, and environmental issues in Elbistan after the earthquake, gather data that will contribute to regional development, and analyze it. To achieve this goal, semi-structured interviews were conducted with important sources of information, such as local authorities, residents of the district, the chambers of commerce, the Turkish Employment Agency (İŞKUR), union representatives, industry representatives, and local businesses in Elbistan. A qualitative research method was used in the study. Verbal informed consent was obtained from all participants before the study and the ethics committee approval of this study was obtained from Dokuz Eylül University Scientific Research and Publication Ethics Board (Date: 28.03.2023; Number: 25). Within this framework, it is

believed that creating a regional development model that will support existing efforts in Elbistan will contribute to the literature. The research focuses on the analysis of the economic, social, and environmental impact and damage in Elbistan following the Kahramanmaraş-centered earthquakes, which have the characteristic of being the largest disaster in terms of impact area and affected population to date, and aims to obtain information and data for post-disaster reconstruction efforts, offering solution proposals for various dimensions of the problem.

Research Design and Sample Selection

Within the scope of the qualitative research method, various authors and researchers have proposed various research designs for the use of researchers in various disciplines from the past to the present, and as a result, numerous qualitative research designs have emerged in the literature. In this study, a case study design, one of the research designs, was preferred. A case study is a qualitative research method that involves a detailed and in-depth analysis of data obtained through various sources of information (observation, interviews, document analysis, etc.) for a specific problem related to an event, situation, process, program, relationship, organization, etc. (Yin, 2012; Hancock and Algozzine, 2006).

The research sample consists of the Elbistan district of Kahramanmaraş. The rationale for selecting this district is the high potential of economic and social impact believed to have been created by this district in the region. Additionally, in the SEGE-2022 report on the Socio-Economic Development Rankings of Districts published by the Ministry of Industry and Technology, it is listed among the third-level developed districts, similar to most districts in the region. It is believed that it represents the general social and economic structure of the region with these characteristics.

Data Collection and Analysis

Within the scope of the study, 15 semi-structured interviews were conducted. Various representatives and stakeholders from Elbistan, including the Coordinator Governor and District Governor of Emergency, the Mayor, the Elbistan Social Services Center Director, an AFAD volunteer, the President of the Elbistan Chamber of Commerce and Industry, the President of Elbistan Sugar Beet Producers Cooperative, the Director of Elbistan Vocational School, a representative from the Social Solidarity and Assistance Foundation, the District Agriculture Director, a representative from İŞKUR Elbistan Service Center, and private sector representatives, were interviewed using semi-structured questions. The participants' views were analyzed from multiple angles. Within this framework, various topics were discussed, including the pre-disaster general economic and sectoral infrastructure, labor inventory, natural resources, technological infrastructure, local lifestyle, disadvantaged groups, economic expectations and issues, as well as post-disaster labor inventory, macro and microeconomic factors believed to trigger economic development, factors desired or not desired in the reconstruction plan, and strategy recommendations, among others. This method allowed for the presentation of different perspectives from academic, administrative, and economic actors in the region and ensured that all opinions contributed to the study as data.

Findings and Policy Recommendations

Elbistan is one of the largest districts of Kahramanmaraş in terms of population and land. It is bordered by Darende and Gürün to the north, Akçadağ, and Doğanşehir to the east, Afşin, and Göksun to the west, and Ekinözü to the south. The district is primarily engaged in agriculture and agriculture-based trade. Elbistan Thermal Power Plant and Sugar Factory are significant sources of employment. The Sugar Factory processes sugar beets grown in the surrounding provinces and districts and brought to Elbistan. The Organized Industrial Zone established in the district aims to promote industrial production and the production of high-value-added products in the district and its surroundings. The Afşin-Elbistan thermal power plants in Elbistan play a crucial role in Türkiye's electricity production. Elbistan, according to the SEGE-2022 report on the Socio-Economic Development Rankings of Districts published by the Ministry of Industry and Technology, has risen 45 ranks from the previous report, placing it at 294th in 2017. Elbistan, the third most developed district in Kahramanmaraş province, is among the Third-Level Developed Districts in the national development ranking (SEGE, 2022).

The results of the 15 semi-structured interviews conducted in the study, aimed at improving economic and social conditions in Elbistan, reducing vulnerability, and finding solutions to local employment and production challenges, were shaped using qualitative data analysis. The findings, goals, recommendations, and implementation suggestions outlined in this study are expected to guide and support post-earthquake economic and social recovery in the district. The study includes sectoral breakdowns and specific recommendations, which form the basis for the development of short-, medium-, and long-term strategic plans and the design of micro and macro-level actions.

Goal 1: To evaluate agricultural production as an effective area in Elbistan's economic development process.

Primary Aim: To strengthen the short-, medium-, and long-term potential of agricultural production and marketing in Elbistan, which has Türkiye's 4th largest plain and a significant plain status.

Existing Potential

- Elbistan, located in the southwestern tip of Eastern Anatolia, has a plain of approximately 3,000 square kilometers, with a length of 60-65 kilometers and a width of 40-45 kilometers.
- Elbistan Plain can be fed by significant water sources such as the Ceyhan River and Söğütlü Creek.
- Elbistan Plain is also rich in groundwater resources.
- In the production of popcorn maize and sunflower seeds, Elbistan accounts for 1/3 of the total capacity in Türkiye.

Limitations

- Only 350,000 hectares of irrigated agriculture can be practiced in Elbistan. This constitutes approximately 1/3 of the total cultivated land.
- The limited nature of irrigated agriculture creates a disadvantage in terms of utilizing the production potential and productivity.
- The existing dams in Elbistan and its surroundings are insufficient to meet the district's agricultural water needs.
- The use of groundwater for agriculture can lead to financial challenges for farmers, especially in terms of electricity and water costs.
- The use of groundwater is directly linked to the risk of the formation of sinkholes.

Policy 1: In the short and medium term, a transition from traditional irrigation to modern irrigation methods should be prioritized.

Implementation Strategies

1. The rapid implementation of the Kavaktepe Dam project should be ensured.
2. The completion of existing dam projects in Elbistan and its surroundings, along with the rapid implementation of new dam projects, should be expedited to reduce the use of groundwater for irrigation.
3. By solving the irrigation problem, agricultural production and productivity in Elbistan should be increased.

Policy 2: Develop greenhouse farming in Elbistan Plain in the short, medium, and long term.

Implementation Strategies

1. The greenhouse facility, currently established on 6,000 acres in the district, should be considered a good practice example.
2. The proliferation of semi-automated greenhouses in the short term will provide diversity in agricultural production and productivity in Elbistan.
3. The development of early seasonal crops in Elbistan can be accelerated by establishing semi-automated greenhouses.
4. In the medium and long term, efforts should be made to use the water from thermal power plants for greenhouse farming. The water vapor emitted from thermal power plants should be utilized for this purpose.
5. With the expansion of greenhouse farming, in addition to crops such as tomatoes, lettuce, cucumbers, and peppers, alternative agricultural products should also be cultivated.

Policy 3: Conduct soil and agricultural analyses in the short and medium term.

Implementation Strategies

1. Laboratories for soil and agricultural analysis should be established.
2. The existing laboratory at the Elbistan Chamber of Agriculture should be made operational.
3. Government support for soil analysis should be revitalized, and penalties should be introduced for non-compliance.

Policy 4: Enhance the production, marketing, and use of fertilizers to improve productivity in Elbistan in the short and medium term.

Implementation Strategies

1. The utilization of leonardite and gidgee found in Elbistan's soil should be expanded after necessary processing and marketed to surrounding areas.
2. Processing facilities for organic fertilizer production should be established and developed, and investments in this area should be increased.

3. Research and development efforts to maximize the effectiveness of leonardite and gidgea should be accelerated, with priority given to relevant projects.
4. Feasibility studies should be conducted under the leadership of the Ministry of Energy, MTA, and Ministry of Agriculture and Forestry for the utilization of leonardite and gidgea.
5. Private sector investments and the opening of licensed areas for this purpose should be encouraged.
6. Farmers affected by the earthquake should be rapidly supported with fertilizers, agricultural chemicals, and fuel. The sustainability of incentive mechanisms created through the use of leonardite and gidgea should be ensured.

Policy 5: Expand the trading area for popcorn maize, sunflower seeds, chickpeas, and beans in Elbistan in the short and medium term, and enable direct market presentation through processing and packaging in Elbistan.

Implementation Strategies

1. Licensed warehousing in agriculture should be promoted.
2. A strategy in conjunction with Turkish Grain Board (TMO) for the proliferation of licensed warehousing should be developed during this process.
3. Product purchase guarantees should be provided through licensed warehousing.
4. Export of popcorn maize and sunflower seeds to regions such as Africa and Algeria is currently taking place. The direction of this export should be expanded to include Europe.
5. Processing and packaging facilities should be established for popcorn maize, sunflower seeds, and grains, and existing enterprises operating in this field should be supported to ensure these products are branded under Elbistan. In addition to production and marketing, employment opportunities in the field should be increased.

Policy 6: In the short and medium term, alternative agricultural products should be produced and marketed in Elbistan. Processing and packaging facilities should be expanded.

Implementation Strategies

1. Evaluate alternatives for the production of absinthe wormwood in Elbistan.
    - Absinthe wormwood is among the alternative agricultural products that can be considered for production in Elbistan, considering its compatibility with soil structure and other conditions.
    - Additionally, absinthe wormwood is suitable for both greenhouse farming and rural areas. It can be grown in arid areas.
    - The plant, which can be used as a raw material for construction materials in the construction sector, is also essential as a raw material for making halva, soap, and skincare products.
2. Initiatives related to cumin production should be considered, taking into account the structure of Elbistan's soil.
3. The production of products such as cotton and rice may be pursued through the establishment of the necessary infrastructure and the investigation of suitable conditions.
4. The production of previously attempted and successful products such as grapes and lavender should be revitalized in the region, and the processing of these products through modern facilities should be expanded, contributing to the promotion of Elbistan.
5. Mechanisms promoting the production of alternative agricultural products on treasury lands, especially horticultural products, should be developed.
6. Production of agricultural products that require minimal water usage should be accelerated in the short term.
7. Drying fruit and vegetable facilities should be expanded, and the capacities and employment opportunities of existing facilities should be improved.
8. Elbistan has approximately 1.5 million apricot trees on around 100,000 hectares of land. The Elbistan Plain has untapped resources that can increase apricot production and quality. Being close to Malatya, the region should be evaluated in terms of marketing strategies and production infrastructure. Investments related to apricot production and processing should be encouraged, and an apricot processing facility should be established.

Goal 2: Development of livestock farming in Elbistan, increasing the efficiency of production and marketing networks for industrial animal products.

Primary Aim:
To increase the efficiency of production and marketing networks for livestock farming and industrial animal products in Elbistan, which has a total of 3,000 farmers involved in livestock farming, consisting of 2,500 cattle and 500 small ruminants.

Existing Potential

- The presence of an active slaughterhouse in the district.
- The region has potential for alternative fields such as apiculture and aquaculture, in addition to cattle and small ruminant farming.
- The Specialization Organized Industrial Zone for Large Cattle Feeding, based on agriculture, has been established.
- Elbistan has one of Türkiye's prominent animal markets.
- Opportunities related to apiculture and trout facilities.

Limitations

- Shortage of animal feed due to the earthquake.
- Loss of cattle and small ruminants after the earthquake.
- Hive losses in apiculture due to the earthquake.
- Mass fish deaths in trout farms.

Policy 1: Compensation for earthquake-related damage and revival of livestock farming in Elbistan in the short, medium, and long term.

Implementation Strategies

1. Import of the required animals should be carried out.
2. Selection of special/high-quality breeds during the animal import process to maintain the meat quality of Elbistan, with support through grants for large cattle imports.
3. Establishment of integrated facilities for slaughter, processing, and packaging to establish branding and create brand value in meat and meat products.
4. Quick clarification of the operation process of the Specialization Organized Industrial Zone for Large Cattle Feeding.
5. Establishment of milk processing facilities in Elbistan.

Policy 2: Development of apiculture and trout farming in Elbistan in the short and medium term and the realization of necessary investments.

Implementation Strategies

1. Elbistan has 110 beekeepers and 95,000 active beehives under the District Directorate of Agriculture.
2. Necessary support for increasing honey production and expanding its marketing, as well as encouraging investments in apiculture.
3. Expedited implementation of initiatives for brand registrations in the field.
4. There are two trout production facilities in Elbistan. The produced trout is marketed in different provinces in its juvenile form. Increasing the capacity of these facilities and encouraging new ones.

Policy 3: Establishment and development of integrated facilities for agriculture-related and animal-based products in the short and medium term.

Implementation Strategies

1. Establishment of milk processing facilities in Elbistan.
2. Revival of leather production in Elbistan, establishment of leather processing facilities, and consideration of investments in related sub-industries (shoes, leather garments, etc.).

Goal 3: Strengthen the textile, manufacturing, and logistics infrastructure in Elbistan within the scope of the region's redevelopment.

Primary Aim:
To promote local development beyond economic growth through developments in the manufacturing, textile, and logistics sectors, and to make it possible to fairly distribute the share of added value created.

Existing Potential

- The Organized Industrial Zone (OSB) in Elbistan has not been physically damaged by the earthquake, which provides an essential advantage for the district.

- The OSB covers an area of 112 hectares and consists of two phases. The first phase is fully occupied, and the second phase has been planned, with related studies initiated.
- Land costs in Elbistan are low.
- Elbistan is centrally located on a south-north commercial route from Kayseri to Adıyaman.

Limitations

- High transportation and logistics costs.
- Lack of a rail system (railway).
- Elbistan's geographical location does not align with the preferred route of transportation vehicles.

Policy 1: Resolution of Elbistan's transportation and logistics issues in the short and medium term.

Implementation Strategies

- Stabilization of transportation and freight costs.
- Establishment of a South-North connection of the Kapıdere Railway for Elbistan.
- Provision of incentives and support for the improvement and development of transportation and logistics facilities.

Policy 2: Revival of the economy and support for employment in Elbistan in the short and medium term through textile product manufacturing.

Implementation Strategies

1. Providing the necessary credit support or facilitating access to credit for textile/knitting workshops operating within the OSB in Elbistan to ensure that they continue their activities.
    - Under these circumstances, BYK Textile, which employed 100 female workers before the earthquake, has halted production due to the earthquake and economic constraints. The maximum number of employees the company plans to work at full capacity is 500.
    - Maksem Giyim A.Ş. started production with 300 workers before the earthquake. The company plans to employ up to 1,000 workers at full capacity.
2. Providing rental support to textile workshops operating within the OSB.
3. When the rent is covered by the state, the management of textile workshops should be carried out by the existing operating companies.
4. Fast resumption of activities by relevant companies for production and employment contributions.
5. Provision of support to relevant companies after vocational training through the Public Education Center and İŞKUR (Turkish Employment Agency) for employing a specific number of female workers.
6. Ensuring agreements with large retail chains in the region to procure services from the companies, contributing to the continuity of their production activities.
7. Leasing of empty parcels in the OSB or, in case of insufficient financial resources, the operation of existing textile workshops by large companies with a policy of hiring local workers.
8. In cases where this is not possible, purchase of the relevant textile workshops by local authorities or operation in collaboration with the private sector.

Policy 3: Development of agricultural machinery manufacturing and maintenance facilities due to the high concentration of agricultural production, and the development of existing facilities in Elbistan.

Implementation Strategies

1. Determination that agricultural machinery is currently developed and produced only in a mechanical way and therefore, creating a technological impact in the field, producing agricultural machinery in a much more technological environment by using Mechatronics and artificial intelligence.
2. The inclination of farmers to use agricultural machinery makes investments in this area even more crucial. In addition, the damage to the region's agricultural tools due to the earthquake makes investments in the field more strategic.
3. Increasing the capacities of agricultural machinery manufacturing companies operating in Elbistan and providing incentives for new companies to motivate investments.

Goal 4: Revitalizing the economy and employment through construction and related sectors in Elbistan's recovery and development process.

Primary Objective:
The post-earthquake reconstruction process is aimed to be considered as an economic and social revival factor for Elbistan.

Current Potential:

- Numerous residential and commercial buildings need to be reconstructed after the earthquake.

Constraints:

- Many buildings were destroyed due to the earthquake.
- Many people have left the district due to housing-related reasons.
- The shortage of qualified labor in the construction sector is one of Elbistan's significant problems.
- In particular, housing facilities created in the mining and thermal power plant areas are not suitable for workers to live with their families. This situation is among the factors that make it difficult for workers to return.

Policy 1: In the short and medium term, priority should be given to reviving the region economically through the construction sector during the reconstruction process.

Implementation Strategies:

1. During the process of reconstructing Elbistan's residential and other construction areas, efforts should be made to revitalize the capital of the region by sourcing materials from the district as much as possible.
2. If possible, Elbistan's employment should be prioritized, especially in terms of unskilled labor, in construction areas, and supplier companies should be encouraged in this direction. Ensuring this interaction will significantly contribute to the rapid recovery of the district in the short term.
3. It is expected that the government will provide incentives to companies in Elbistan in terms of VAT, income tax, etc. during the construction process.
4. Investments in the construction and related sectors, especially within the OSB, should be encouraged, and necessary incentives and policies should be implemented to bring them to life quickly.
5. In permanent housing campaigns initiated through organizations such as The Union of Chambers and Commodity Exchanges of Türkiye (TOBB), similar emphasis should be placed on Elbistan in terms of supply and employment, and support should be provided.
6. Moving the aesthetic concern to the new construction areas will also be among the significant demands of the district to make it an attractive center for living.

Goal 5: Strengthening the culture of collaboration and institutional connections in Elbistan's recovery and local development process.

Primary Objective:
The creation of locally compatible new entrepreneurial areas, the development of social sectors, and the establishment of effective social dialogue mechanisms aim to strengthen inter-institutional solidarity and cooperation.

Current Potential:

- The open structure of public institutions and organizations for dialogue.
- The establishment of container markets has been effective in reviving both social and economic life.

Constraints:

- The difficulty of coordination processes after the earthquake.
- Lack of entrepreneurship spirit.
- Lack of a cooperative culture.

Policy 1: In the short and medium term, all parties should be encouraged to produce joint policies for the resolution of problems to revive the culture of solidarity and the efforts to return to life together in Elbistan.

Implementation Strategies:

1. Multilateral social dialogue mechanisms where public institutions, civil society organizations, unions, employers, and local government representatives come together should be put into practice quickly to develop policies for solving problems and planning implementation steps.

2. Experience-sharing opportunities in Elbistan should be mobilized quickly. In this regard, good practices from regions that have previously experienced earthquakes and successfully recovered should be closely examined.
3. Other provinces and districts that can establish partnerships with Elbistan's stakeholders should be identified, and especially inter-institutional collaborations should be strengthened, and similar institutions in different provinces or districts that operate in similar sectors should support Elbistan's stakeholders and conduct learning activities from each other.
4. Similarly, institutional collaborations should be established among regions with similar categories or compatible structures to Elbistan.
5. Organizations such as industrial zones, chambers of commerce and industry, and trade associations located in different disaster areas should also create coordination among themselves.

Policy 2: In the short and medium term, especially in container cities, women's employment can be strengthened through piecework.

Implementation Strategies:

1. Establishing piecework production in the framework of this employment and production method through sectoral associations (such as the Istanbul Textile and Apparel Exporters' Association (ITKIB), the Aegean Clothing Manufacturers Association (EGSD), Denizli Exporters' Association (DIB)) and making it operational under the coordination of the Ministry of Industry.
2. Making this production method widespread in container cities, especially in Elbistan, and providing it in other container cities in various regions.
3. Production of various home textile products under this model, including fabric napkins, tablecloths, bedding and kitchen sets, and decorative and gift items.
4. Transmitting the issue urgently to the Ministry of Industry, and ensuring coordination through sectoral associations and companies.
5. Creating thematic collections under the umbrella of social responsibility in some product patterns, where the name or note of an earthquake victim woman is placed on the product.
6. Initiating an urgent support program with the slogan "Dokuz Eylül University is Building a Bridge of Hearts to Elbistan, Contributing to the Economic Recovery of Elbistan" by Dokuz Eylül University, Elbistan central management, local government, and Public Education Center, enabling the people living in tents and containers to produce handicrafts, and selling them through Dokuz Eylül University S.S. Dokuz Eylül Cooperative (Elbistan's Voice, 2023). Similar practices should be designed for other institutions, districts, and production areas.

Policy 3: In the short and medium term, to ensure the security and continuity of piecework production, women's cooperatives should be established, or existing women's cooperatives should be supported. This way, women's labor can be made visible in the region.

Implementation Strategies:

1. Through cooperative work, the production of region-specific products such as food, milk, and dairy products should be encouraged.
2. Registration of regional products' brands in cooperatives.
3. Since the cooperative culture is undeveloped in the region, cooperatives should be established and managed by the local government to develop cooperatives and for the public to take ownership of the relevant processes.
4. In the cooperative's establishment process, the need for information and structuring should be met through experience sharing with various cooperatives that have been active for a long time or by providing direct mentoring.
5. The establishment of women's cooperatives should be supported by chain supermarkets at the marketing stage, especially after the production of local food products.

Policy 4: Enhancing Digital Literacy and Creating Alternative Employment Opportunities for Youth in the Short and Medium Term for Rapid Adaptation to Both Societal and Economic Life

Implementation Strategies:

1. Inclusion of youth in employment by attracting call center centers of specific major companies to Elbistan.
2. Organization of digital literacy training programs, including digital design programs, in collaboration with the Turkish Employment Agency (İŞKUR) and Public Education.
3. Establishment of digital platforms or collaborations with existing platforms to connect Elbistan's youth with companies interested in providing design, social media management, content production, and advertising services related to the earthquake-prone area.
4. Provision of incentives and rapid support through local government and industry cooperation for the evaluation of projects

and ideas created by young people already involved in software and digital innovation processes. The establishment of an effective operational unit within this context.

5. Establishment of a technopark in Elbistan and allocation of space for it. The establishment of the technopark is crucial for the development of Elbistan's employment prospects.
6. Elbistan's Technology Faculty has been transformed into an Engineering Faculty. Despite the existence of a faculty, it is not actively operating. It is recommended that the relevant faculty be activated to conduct research and project activities that will contribute to Elbistan.

Conclusion

Natural disasters like earthquakes, floods, landslides, and others have significant impacts from various perspectives and lead to various outcomes for a society, region, or city, both in the short and long term. These impacts are often challenging to measure, as they affect not only life and property but also have societal and economic consequences in areas such as migration, sectoral changes, education, and healthcare policies. Therefore, it is expected that studies aiming to measure the economic, social, and environmental effects of natural disasters in general, and earthquakes in particular, will contribute to the development of policies and strategies for reducing the effects of natural disasters and for the recovery of development, both in the short and long term.

In this context, this study aims to determine the economic, social, and environmental effects of earthquakes centered in Kahramanmaraş and provide a roadmap for potential strategic actions that can be taken during future natural disasters. For this purpose, a field study was designed, and data was collected through semi-structured interviews with opinion leaders who play significant roles in economic and social life, which is unlike previous studies. The study identified six primary objectives, and goals, policy recommendations, and implementation strategies were designed for each of them, taking into account the existing potential and constraints.

The most important finding from the interviews was the existing economic potential of Elbistan. Especially in the field of agricultural production, the region has significant potential. Recommendations include the construction of dams for agricultural irrigation at the macro level, the transition to modern irrigation systems, and the development of policies to reduce the use of underground water. Additionally, the establishment or strengthening of laboratories for soil and agricultural analysis, the production and marketing of organic fertilizers, the establishment of processing and packaging facilities for agricultural products such as cotton, sunflower, chickpeas, beans, etc., and the development of micro and sectoral recommendations for the positioning of the sector's value chain in the region to make it attractive to new investments.

Considering the livestock potential of the region, priorities were determined for the recovery of the region. In this context, a series of policy recommendations, from the establishment of processing facilities to beekeeping and trout farming, were presented.

The study found that one of the biggest shortcomings in the district is the lack of logistics and rail systems. In light of the findings related to infrastructure investments, which are among the significant supporters of economic development, it is suggested to provide public support in terms of road and railway logistics alternatives, freight, and transportation. Additionally, it is recommended to encourage investments in the textile industry to benefit from the sector's employment potential and to prioritize the manufacture of agricultural machinery and equipment as a complementary sector. Recommendations for the revitalization of construction and related sectors, with their importance in the reconstruction of the region, were also developed.

Social capital and togetherness will support the reduction of vulnerability by strengthening social bonds and increasing the morale and motivation of the region's people in the economic recovery process, in addition to economic triggers. In line with the parallel relationship between social capital and development indicated in various studies, a focus on corporate culture and the strengthening of corporate bonds led to the conclusion in this study. In this context, policies were developed and implementation strategies were defined, such as the establishment and operation of mechanisms in which public institutions, civil society organizations, unions, employers, and local government representatives come together with an inclusive governance approach, designing active learning processes through experience sharing, and establishing collaborations with other districts in the same category.

In particular, the study identified the need for the development of entrepreneurship policies for women to participate in economic life and the strengthening of women's employment through piecework. These findings parallel with a study on women entrepreneurship in Elbistan (Yıldırım, 2020), which found that women engaged in agricultural production predominantly benefit from agricultural support and significant progress has been made in the entry into working life among women through agricultural entrepreneurship.

The limitations of the study include the selection of a single district as the sample. However, considering that the earthquake disaster causes similar destruction in almost every city and district and that many cities and districts in the region have similar socio-economic development levels and structures, it is believed that the Elbistan example has the potential to represent the entire earthquake region. Another limitation of the study is that the individuals interviewed were selected through judgmental sampling.

The idea that this method was chosen as the main basis in choosing a sample is to ensure that the planned sample represents different segments and to include everyone who is thought to be able to answer the research problem. In future studies, conducting longitudinal studies on a larger sample and at certain periods after natural disasters may be more beneficial in reaching more integrated findings. Furthermore, a comparative study of the situation in different cities and districts will provide a scientific basis for developing more comprehensive policies.

Ethical Approval: The ethics committee approval of this study was obtained from Dokuz Eylül University Scientific Research and Publication Ethics Board (Date: 28.03.2023; Number: 25).

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