Creative city design / Vol. 4, No. 3, 2021, 33-42

Management of Tehran earthquake asylum seekers using relief settlements

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Submit Date: 2021-08-21, Accepted Date: 2021-12-05

ABSTRACT

The purpose of this study is to manage asylum seekers by designing and creating relief settlements in the event of an earthquake in Tehran. This study is a post-implementation evaluation method and is an applied type in which a descriptive-analytical method is used. In order to collect information, various methods of documentation, library and field studies have been used through emphasis on questionnaires. In total, the evaluated criteria were evaluated in separate tables with Likert scale scoring. In this research, Cochran's formula, which is one of the most widely used methods to calculate the statistical sample size, has been used. The results show that the management of asylum seekers is weak in terms of quality components and speed of creating spaces and relief settlements and in terms of average price component. The components of "strength", "Age of materials" and "energy loss", "waste of materials", "lightening", "performance optimization", "environment", "permanent labor" and "quality control in the factory" from the quality criterion, components "Reduction of construction time", "Possibility of serialization", "Possibility of modular production" and "Energy saving" from the criterion of speed and "Reduction of construction time", "Optimal use of materials", "Mass production" and "Scale savings" from Price criteria are the weakest management criteria in the discussion of asylum management in Tehran after the earthquake. With measures such as creating relief settlements with industrialization system, standardization and creation of medical spaces and the like, and new management strategies, the necessary measures can be taken to help asylum seekers.

***Keywords**: Asylum Seekers, Earthquake, Management, Relief Towns, Tehran*

1. INTRODUCTION

There are many natural disasters in the world that threaten human lives, but in the meantime, earthquakes are much more destructive and harmful than other types, and it is one of the reasons that force people to leave their homes. Despite all the scientific and technological advances of human beings and despite the advanced devices and machines in this field, human beings have not yet been able to predict the occurrence and severity of earthquakes.

The metropolis of Tehran with a population of more than 8 million people and an area of more than 700 square kilometers includes the main economic, political and governmental centers of the country [7].

However, the city is located in an area with a very high risk of earthquakes, and historical evidence shows that cities and settlements that were previously located in the current location of Tehran have been repeatedly destroyed by severe earthquakes.

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According to estimates, the earthquake in Tehran will cause severe damage and on the other hand, high population density and unfavorable urban fabric in many areas of Tehran will make it very difficult to provide relief and assistance to the survivors of the accident [2]. In this situation, planning to prevent and reduce the risks of earthquakes, or in simpler terms, risk management seems to be very necessary and the only solution. The aim of the present study is to manage earthquake asylum seekers in Tehran by using relief settlements and quality improvement strategies tailored to the needs of asylum seekers. The management of earthquake-affected asylum seekers should be done in the shortest period of time and without delay in various fields such as management of accommodation, treatment, transportation, food supply, etc., which should create a suitable space for displaced people to help such as relief camps. The questions that are examined in the present study are what components are affected by the management of asylum seekers after the Tehran earthquake and what are the characteristics of relief settlements with the ability to meet the needs of asylum seekers and victims.

2. Theoretical studies

Crisis management is a term in the field of management that refers to a set of activities, solutions and guidelines, which the management of an organization performs in the face of crisis and its purpose is to reduce the process, control and resolve the crisis. In general, crisis management means purposefully shifting the flow of affairs to a controllable routine and expecting things to return to pre-crisis conditions as soon as possible. Unlike risk management, which involves assessing potential threats and finding the best way to prevent them from occurring, crisis management involves dealing with threats before, during, and after the threat. Having a crisis-oriented insight requires the ability to think about the worst-case scenarios while providing countless solutions. Since the first method may not work, trial and error is an accepted method. There must always be a plan in place to deal with potential threats. Organizations and individuals must have a rapid response plan for emergencies and be adequately prepared with maneuver and practice [3]. In the research on earthquake and asylum management, we are faced with three categories of short-term, medium-term and long-term management.

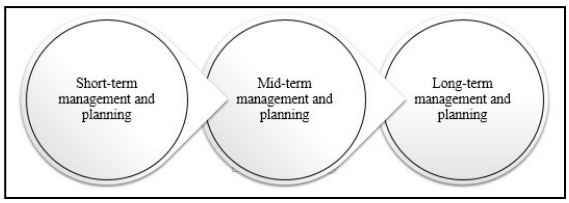


Figure 1: Management classification process after an earthquake crisis, Source: Authors

Often the following three concepts should be used in studies of management levels and post-crisis planning such as earthquakes:

A) Short-term management and planning: In most critical situations, short-term management and planning is intended for an immediate and emergency period, which is less than a period of one year. Short-term goals lead to short-term expectations such as rapid settlement and so on. The vision of short-term planning is important to satisfy asylum seekers who want to see results. As a result, the Tehran Crisis Prevention and Management Organization can provide additional funding for long-term goals.

However, the organization must ensure that short-term management and planning also facilitate medium- and long-term achievements. Short-term concerns such as may include plans for management and short-term planning. However, corrective action will also affect long-term goals.

B) Medium-term management and planning: This model of management and planning is located between two categories of short-term and long-term periods, which addresses the issues and challenges between these two periods, and sometimes does not apply if the two categories of short-term and long-term meet the needs of earthquake asylum seekers.

C) Long-term management and planning: Long-term management and planning focuses on achieving the goals set for the foreseeable future. In most cases, organizations and officials want to solve problems permanently and achieve their overall goals. Some consider management and strategic planning to be long-term planning. Long-term management and planning assess the threats that may be posed in terms of social, economic and political situations, both locally and globally.

Relief settlements can be considered all activities, including collecting and identifying

asylum seekers, relocating them, and creating safe and healthy living conditions until they return to their original homeland or original habitat. Short-term management and planning time is estimated from 6 months to 2 years depending on the conditions, type of crisis and facilities, and some researchers and relief organizations consider it as the primary nucleus of permanent housing [4]. In order to provide the necessary facilities and the possibility of achieving a standard and desirable relief town, it is necessary to study and evaluate case examples of crisis management of past incidents in order to obtain their characteristics and strengths and weaknesses and use them in new designs. Table 1 examines the limited examples of refugee management used at home and abroad after the earthquake (Table 1).

Table 1. Experiences of housing and relief settlements after the earthquake crisis

Row	Year of earthquake	Earthquake location	Power - Richter	Type of accommodation and relief town	Investigating the characteristics and management issues of asylum seekers
1	1952	Kamchatka in Russia	9 Richter	Prefabricated houses and Conex	-Insufficient resistance to atmospheric factors such as cooling. -High cost -Crisis management at a poor level
2	1960	Valdivia in Chile	9/5 Richter	Prefabricated houses and Conex	-Inadequate for large households -High cost -Crisis management at a poor level
3	1964	Alaska - USA	9/2 Richter	Prefabricated houses and Conex	-Insufficient resistance to atmospheric factors such as cooling. -Crisis management at the intermediate level
4	1968	Belice earthquake - Sicily in Italy	5/5 Richter	Prefabricated houses and Conex	-Failure to meet the needs of asylum seekers -High cost -Crisis management at a poor level
5	1976	Friuli - Italy	6/5 Richter	Prefabricated houses and Conex	-Failure to meet the needs of asylum seekers -High cost -Crisis management at a poor level
6	1980	Irpinia in Italy	6/9 Richter	Prefabricated houses and Conex	-Failure to meet the needs of asylum seekers -High cost -Crisis management at a poor level
7	1995	Kobe in Japan	6/8 Richter	Conex	-Inadequate for large households -Lack of design for the disabled and disabled users -Crisis management at the intermediate level
8	2000	Enggano - Indonesia	7/9 Richter	two basic housing units of 21 sq. meters and 36 sq. meters	-The Provincial Government is developing a scheme to provide the building materials for one of these houses, together with 10% of the cost of building, to eligible families. - People in this region do not habitually use mosquito nets but any increase in the incidence of malaria may warrant their use, particularly by those living outside destroyed or damaged homes.

9	2001	Gujarat in India	7/6 Richter	Temporary houses using building materials	-Providing construction materials for asylum seekers -Assistance through private organizations and public participation -Crisis management at the intermediate level
10	2002	Hindu Kush - Afghanistan	7/4 Richter	Tent	-Failure to meet the needs of asylum seekers -Limited health facilities -Crisis management at a poor level
11	2004	Sumatra in Indonesia	9/1 Richter	Temporary metal buildings	-High cost of the structure -Incompatibility with the climate of the region and high sunlight -Crisis management at a poor level
12	2005	Kashmir in Pakistan	7/6 Richter	Prefabricated houses	-Inadequate for large households -Failure to meet the needs of asylum seekers -Limited health facilities -Crisis management at a poor level
13	2007	Pisco in Peru	8 Richter	Temporary shelters and Conex	-Inadequate for large households -Crisis management at the intermediate level
14	2011	Sendai in Japan	8/9 Richter	Prefabricated houses and Conex	-Popular participation and solidarity of asylum seekers -Optimal and timely crisis management -Strong and desirable crisis management
15	1990	Rudbar and Manjil	7/4 Richter	Temporary Zogali houses (with local construction system)	-Suitable against slipping -Structure and skeleton made of wood with an area of 12-14 square meters -Crisis management at the intermediate level
16	1990	Tarom in Zanjan	7/4 Richter	35-meter rooms	-Providing limited construction materials for asylum seekers -Public participation in the construction of rooms -Crisis management at a poor level
17	2003	Bam in Kerman	6/6 Richter	Desert tent and Conex	-Inadequate for large households -High cost of the canopy -Insufficient resistance of tents and Conex -Inadequacy against atmospheric factors such as wind and rain -Crisis management at a poor level
18	2006	Doroud – Broujerd in Lorestan	6/1 Richter	Tent	-Inadequate for large households -Lack of security -Poor quality of tents -Crisis management at a poor level

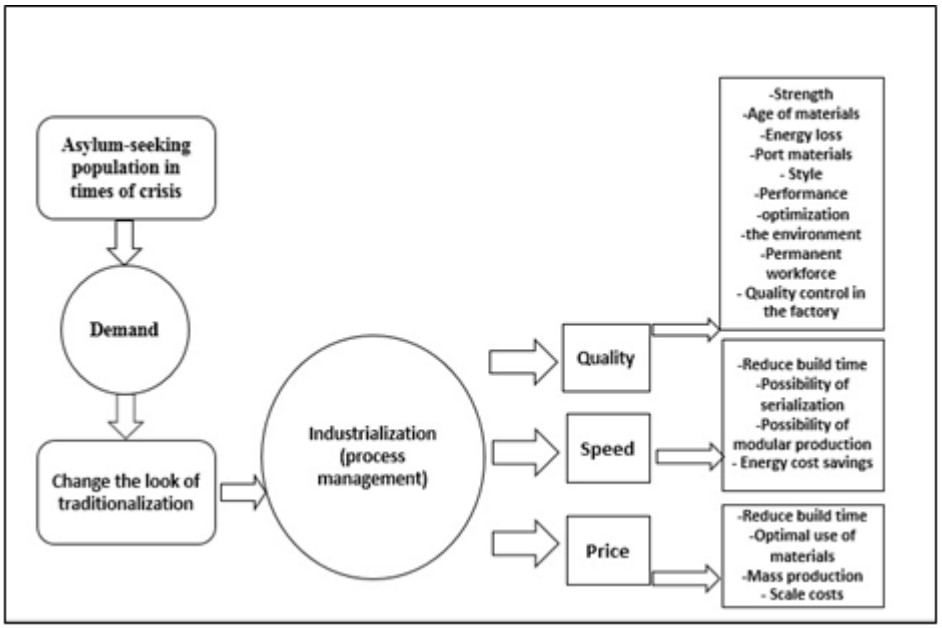
19	2012	Ahar – Varzaghan in Eastern Azerbayjan	6/3 Richter	Tent and Conex	-Inadequate for large households -Lack of health facilities -Improper ventilation -Lack of heating facilities -Existence of problems to provide hot food -Crisis management at a poor level
20	2018	Sare Pole Zahab in Kermanshah	6/3 Richter	Tent and Conex	-Inadequate for large households -Lack of health facilities -Improper ventilation -Lack of heating facilities -Existence of problems to provide hot food -Crisis management at a poor level

Source: Authors

2.1. Theoretical model of research

According to the issues raised about relief settlements, its characteristics, reviewing and analyzing the experiences of temporary housing relief settlements of past earthquakes, and the scales: micro-including spaces within the relief town; Middle includes public space or open relief town; And macro including the components presented by relevant experts, the theoretical framework and research model (Figure 2) was developed. Each of the influential factors in the occurrence of managerial weakness is classified into three connection of housing and micro-spaces with the relief town.

Figure 2: Theoretical model of research
Source: Authors



In the present study, industrialization factors in process management have been expressed as intervening variables. In this study, the management of asylum seekers at different levels related to relief settlements is considered as a dependent variable and the effect of quality factors, speed, and price are considered as independent variables. Quality factors include components such as strength, Age of material, energy loss, material waste, lightening, performance optimization, environment, permanent workforce and quality control in the factory; Speed factors to components such as reduced manufacturing time, possibility of serialization, possibility of modular production and energy cost savings, and finally economic and price factors to components such as reduced manufacturing time, optimal use of materials, mass production and economic savings; Were divided.

2.1.1. Materials and ways

Based on the data of the Seismological Center of Iran and recent studies have shown that there is a possibility of severe earthquakes in Tehran in the coming years. Urban growth in Tehran has been done incorrectly and about 8 million people in Tehran are in a very dangerous area. A geological survey predicts that an earthquake measuring 7 on the Richter scale in Tehran destroyed 640,000 homes out of a total of 1,100,000 homes, killing more than 1.5 million people in Tehran and killing about 4.3 million. It injures thousands [1]. In 2001, the International Earthquake Studies Agency of Japan (JICA) presented two reports based on the study of land, soil, street width, number of floors of buildings, population of Tehran, slope of Tehran and many such cases, according to which the North Tehran fault has the potential to occur Earthquakes up to 7.2 Richter and southern faults have the power of earthquakes up to 7 Richter. The report also calculated the number of casualties and predicted that the Tehran earthquake would result in several hundred thousand deaths and twice as many injuries. Based on (Figure 3), earthquakes larger than 2.5 Richter that occurred in Tehran province and its surroundings during the years 2006 to 2018, can be seen, which shows the upward trend of earthquake strength.

As dangerous faults in Tehran, we can go to the North Tehran Fault from Karaj to Lavasanat, the South Tehran Fault or the North Rey Fault and the South Ray Fault, which can cause earthquakes between 7 and 7.6 Richter. Damavand extends to Kandovan and its length is at least 200 to 300 km and its potential for earthquakes is more than 7 Richter. In the past, this fault has been active many times (Figure 4).

(Mw)

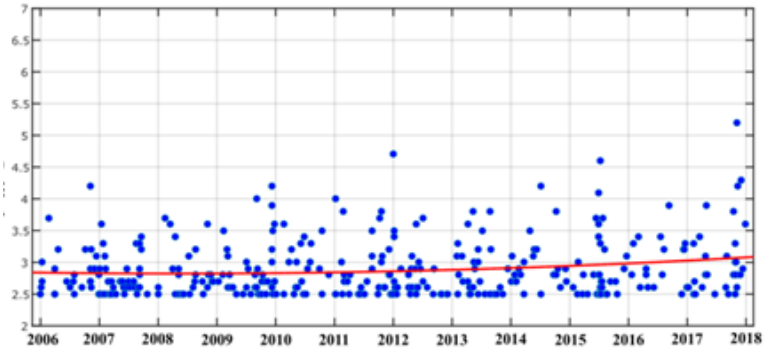


Figure 3: Earthquakes larger than 2.5 Richter occurred in and around Tehran province (area between latitude 35 to 36 degrees and longitude 50.5 to 53 degrees from the beginning of 2006 to 2018, Source: National Seismological Center (Institute of Geophysics, University Tehran)

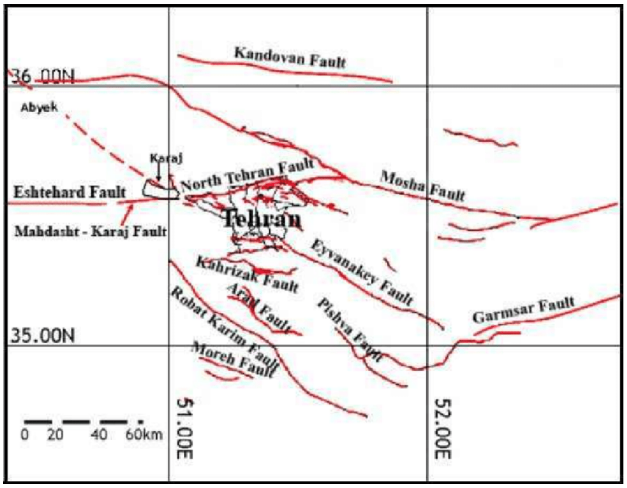


Figure 4: The map of active faults in Tehran region. Source: https://www.researchgate.net/publication/267277765

This research is applied and descriptive-analytical method has been used. Various documentary and library methods and field studies have been used to collect information. In this study, further focus has been on providing the qualitative components needed to manage

asylum seekers using post-earthquake relief settlements. At the beginning of a series of criteria based on comparative comparisons and crisis experiences and how to manage the crisis after the disaster, criteria are selected whose nature and basis are close to the management of relief settlements. To evaluate each criterion and its quality, special methods of field perceptions, such as questionnaires were used.
In this study, to determine the number of sample population size, Cochran's formula has been used, which using this formula, the minimum required sample size of the statistical population was estimated. To estimate the sample size using statistical methods, it is necessary to know the information and parameters about the community from which we intend to select the sample. Sampling methods and formulas for determining the sample size are different. To estimate the sample size using statistical methods, it is necessary to know information and parameters about the community from which the sample intends to be selected. For example, the distribution status of one or more of the traits being studied in the community must be known. In other words, it should be known what percentage of society has those traits and what percentage do not. The sample size should also be estimated by the standard deviation of the population and using statistical methods. The error rate of this method is 5%. This amount of error can be very small compared to our statistical community. According to the areas that were previously mentioned as dangerous faults in Tehran, according to the formula, 300 people were obtained. In the next step, the criteria and factors to be measured and evaluated based on the Likert scale were presented in the form of tables. For assessment and evaluation from grades 1 to 3 (agree, indifferent and disagree) it was determined that the opponent had the lowest score of 1 and the agents scored 3 and each criterion has intervals with the highest and lowest score [6].

3. Research findings

In general, the findings of this study were classified into three groups of quality, speed and price criteria regarding the industrialization of the asylum management process using relief settlements and then evaluated.
The total scores resulting from the quality criteria of the management of Tehran earthquake asylum seekers were classified into three categories: weak, medium and strong, using relief settlements with a range of 150 to 300. In general, it can be said that the management of Tehran earthquake asylum seekers using relief settlements to operate in terms of poor-quality criteria, including management criteria and components in terms of strength, material life, performance optimization, environment and permanent labor in the range Weak and components of energy dissipation, material wastage and quality control in the medium-range factory, and finally the lightening component were present only in the strong range. (Table 2)
Therefore, according to the findings and evaluation, arrangements and solutions should be made in the discussion of earthquake asylum management in terms of the strength of relief settlements, the life of materials used in these settlements, optimizing the settlement and its spaces, preserving the environment and not harming it, as well as permanent labor. Provided local asylum seekers and contributions and improved the quality of management and construction of relief settlements.

Table 2: Evaluation of quality criteria for the management of Tehran earthquake asylum seekers using relief settlements

	Total evaluation	Total earned	Scores			Criteria
			3	2	1	
(150-300)Weak	Weak	20-50	*			Strength
	Weak	10-25	*			Age of materials
	Medium	20-35		*		Energy loss
	Medium	25-40		*		Throwing materials
	strong	20-25			*	Lightening
	Weak	10-35	*			Performance optimization
	Weak	10-30	*			the environment
	Weak	10-35	*			Permanent workforce
	Medium	15-25		*		quality control

Source: Authors

The total scores resulting from the management criteria of Tehran earthquake asylum seekers were classified into three categories: weak, medium and strong, using relief settlements with a range of 100 to 200. In general, it can be said that the management of Tehran earthquake asylum seekers using relief settlements in terms of low-speed criteria, among which criteria and management components in terms of reducing construction time, the possibility of modular production and energy savings in the poor range and the component of serialization became mediocre. (Table 3) Therefore, according to the findings and evaluation, arrangements and solutions should be provided in the discussion of earthquake asylum management in terms of reducing construction time, modular production and saving energy costs in the implementation of the town and upgrade its spaces, speed in planning, managing and creating settlements reliefs.

Table 3: Evaluation of the criterion of management speed of Tehran earthquake asylum seekers using relief settlements

	Total evaluation	Total earned	Scores			Criteria
			3	2	1	
100-) Weak (200	Weak	20-55	*			Reduce build time
	Medium	45-60		*		Possibility of serialization
	Weak	20-50	*			Possibility of modular production
	Weak	15-35	*			Energy saving

Source: Authors

The total scores resulting from price criteria in the discussion of management and planning for Tehran earthquake asylum seekers using relief settlements with a range of 200 to 250 fluctuations were ranked in three categories: weak, medium and strong. In general, it can be said that the management of Tehran earthquake asylum seekers using relief settlements in terms of price and economic costs in a moderate level, among which the management component in terms of reducing construction time in the poor range and components of optimal use of materials, Mass production and economies of scale were in the middle range. (Table 4)

Therefore, according to the findings and evaluation, measures and solutions should be provided in the discussion of earthquake asylum management in terms of reducing the construction time of relief settlements and improving the price in the management and construction of relief settlements through this parameter economically.

Table 4: Evaluation of price criteria for the management of Tehran earthquake asylum seekers using relief settlements, Source: Authors

	Total evaluation	Total earned	Scores			Criteria
			3	2	1	
200-) Medium (250	Weak	20-50	*			Reduce build time
	Medium	35-50		*		Optimal use of materials
	Medium	80-100		*		Mass production
	Medium	40-50		*		Scale savings

4. Conclusion

Based on the materials and findings presented in this research, the quality criterion with a score of 150 and the speed criterion with 100 points are in the poor ranking and the price criterion with a score of 200 is in the middle category (Figure 5). The important issue in this study is solving the problems by providing solutions that are further expressed for the optimal and better management of Tehran earthquake asylum seekers using relief settlements (Table 5). Therefore, as a summary of the two criteria of quality and speed should be promoted in the discussion of management and also better solutions in terms of economic management should be considered.

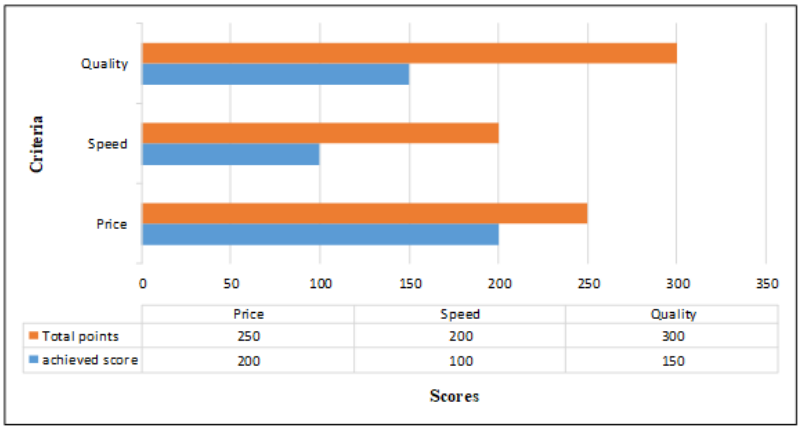


Figure 5: Score of reviewed criteria, Source: Authors

Table 5: Providing solutions to improve the management of Tehran earthquake asylum seekers using relief settlements

Row	Criterion	Item	solutions
1	Quality	Strength - power Age of materials Energy loss Throwing materials Styling Performance optimization the environment Permanent workforce Quality Control	-Securing the structure and building -Use of quality materials and technical implementation along with supervision Observance of national regulations -Use of double-glazed windows Prefabrication of parts -Activation and supervision of QC department of factories in order to produce prefabricated parts -Design for people with disabilities -Design for different areas tailored to the needs of users -Installation of fixed waste bins with suitable lids -Provide a large container on site for garbage collection -Specialization and the use of skilled and trained personnel in various parts of crisis management
2	Speed	Reduce build time Possibility of serialization Possibility of modular production Energy saving	-Participations of local people -Educating people living in the area to face the crisis -Coherence in timely information and accurate media coverage -Reducing post-crisis bureaucracy in decision-making and management areas and creating units with direct and immediate performance -Possibility of replacing and replacing parts -Performing part of the assembly steps at the production site
3	Price	Reduce build time Optimal use of materials Mass production Scale savings	-Granting free loans -Establishment of National Crisis Financial Fund -Establishment of self-sufficient workshop units in relief settlements for the production or connection of parts and materials (if possible) -Use of sustainable energies to provide light, cooling and heating in towns

Source: Authors

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