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Emergency Architecture: Van and Onagawa Example

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Abstract
The need for temporary housing in natural disasters is an important issue for people to develop. During this period, post-disaster accommodation needs are often planned with temporary housing applications that require rapid installation and where the minimum needs of inhabitant can be met. Decisions to be taken in the residential area; can range from the choice of urban relations to the architectural design of temporary residences and can affect the resident's quality of life. A temporary home that will resist a recurring disaster should be a design suitable for climate conditions, close to the adequacy of basic needs in containers, security, and access to urban infrastructure, sustainability of materials, sociality, health and education facilities. In this context, environmental and architectural evaluation of Van and Onagawa container settlements planned after the major earthquakes in 2011 reveals the essence and importance of the study. It also aims to analyse and compare architectural and urban decisions in these settlements, creating a checklist for projects made with the principle of planning and design before future disasters.
Keywords: Temporary Settlements; Post-Disaster Container housing; Onagawa; Van.

1. Introduction

From the past to the present, emergencies and disasters affecting living creatures in any part of the world continue to occur. An emergency is a situation that occurs at an unexpected moment and then a counteraction, that is, a situation that requires resistance with potential powers. In such a disaster, people lose their used living space and need a temporary housing. Settlements can be separated on a permanent or temporary basis. Settlements with a short stay are called temporary settlements. During the recovery phase after major disasters, temporary settlements offer dwellers areas where they can meet their basic needs and carry out their daily activities until permanent residences are built. Temporary settlements can be seen as otherwise than the impact of emergencies. People living in such temporary settlements may practice hunting, gathering, relocation cultivation and transhumance, or they may also be in a caravan park or military camp. Usage types, materials and durations may also vary according to each situation. Temporary settlements are an urban complex in terms of architecture and urban relations and should be built in public facilities and temporary housing (education, health, green, etc.) taking into account important criteria to serve disaster victims. These residences; it consists of tents and housing systems designed for quick and easy installation in emergencies. These camps are built not permanently, and it offer short-term solutions with the contribution of architecture and environment but they can often be longer than expected. We can call it a “waiting statition” to prevent victims from living in such structures for a long time and to have a permanent home. In addition, the layout; infrastructure, and housing of a settlement will have an enormous impact on the protection and well-being of its residents. Therefore, other vital sectors like water (good quality, quantity, and simple access), sanitation, management and safety, food distribution, health, education, community services, and income-generating activities must be taken into account even during first aid intervention (UNHCR, 2020). Although the period before creating a permanent space is based on the principle of temporality, life takes place in areas that are planned or designed for a longer term than expected. As a result of the factors in the reconstruction phase not being considered for this phase, people are deprived of the quality spatial arrangement they are used to. Therefore, a practical solution is found for victims only on housing. Victims are generally associated with the lack of pre-disaster settlement plans in line with their choice of location, but the distance from public, social, interaction areas where they find opportunities, or green spaces where they can get away from the stress of their daily activities are often limited or not sufficient. As a result of the planning of areas that lack architectural decisions and urban planning criteria, such undesirable consequences may occur. Additionally, it is valuable as the importance of the study will be to shed light on such decisions.

2. Literature Review

Andrew Chalinder (1998) led a study to assess the importance of site selection and preparation that takes into account political, environmental and economic sustainability topic when planning temporary settlements. The idea

that guided the main idea of the study was that at the heart of space planning, it should have a concept of sustainability for different groups of displaced people. As a method, a number of organizations and individuals with direct field experience in different emergency interventions were consulted. By drawing parallels, as he stated, it explores possible planning methods for countries prone to natural disasters and provides a guide for organizations that will need to respond to disasters in the future based on typical scenarios.

Savasir (2008) evaluating the measures post-disaster housing design and used methods of "Benefit Value Analysis" in the framework of the proposed two-stage model of housing production. In developing the plan schemes of the houses and determining the appropriate building system, the alternative building systems and the prepared architectural plan schemes have been compared with the proposed analysis method. Research suggested that architectural plan schemes should be designed in different types depending on the number of people in the family. One of the striking suggestions of the study is that, in the case of applying architectural projects prepared with fast construction systems selected with the presented analysis method, instead of building two shelters for each family under the name of temporary housing and permanent housing, a single-core residence that can be improved for each family or individual construction proposal. Today, even the buildings or settlements produced with the basic technology should be designed with a holistic approach in the planning process and the phenomenon of transience should be examined well because this is a whole of both urban environment and architectural elements have many parameters. Especially planning a temporary settlement with the concept of space design, one of the main subjects of architecture, depends on human perception and the limitation of place, use the concepts of natural, artificial, and mixed according to the difference of the limiting elements. We perceive the concept of space with all our sensory organs and compare these perceptions with the situations in our memory. The arrangement of a block, the interior design of the unit, the direction of the entrance or door, the amount of light entering through the window and openings, and the fact that many other parameters vary and directly affect human life are architectural features. For this purpose, creating a good usage scheme for settlements, developing a temporary house plan suitable for the design geography, making a user-oriented design for dwellers, developing a holistic approach related to the environment in material selection, well planning of the temporary units and many other such main factors should be considered when we created a temporary settlement. Wagemann's search has progressed by examining the effects of disasters and definitions of temporary housing over the past 50 years, and then analyzing historical experiences in temporary housing from the last century. The research examines post-disaster temporary settlements and the solutions to these problems by presenting the results of the comparison of different figuring outs improved by architects, universities, engineers, manufacturers, NGOs governments and another proficiencies over the past decade. At the same time, the study is to map the designs developed in the last decade to identify opportunities for improvement it aims to define new approaches (2012).

Pelizari et al. (2018) conducted an integrated analysis with very high spatial resolution imagery, VHR MS and SAR guidance, and a multi-level outlook partition procedure mapping system to present a general topic for the detailed extraction of building areas in temporary settlements. Various sensor types to assess mapping in the Al Zaatari refugee camp obtained satellite instructions with very high spatial resolution. Using VHR multisensor (MS and SAR) imagery, this term has been expanded to a detailed mapping of a temporary settlement, which is particularly complex. The proposed approach helps to produce a detailed automatic area in a general and data-oriented manner, while at the same time, an approximate quantity of people living in the camp and their spatial dispersion model can be calculated in this way and provide data for this type, social, cultural, economic etc. in a camp. It is a good way to better understand the conditions and to develop and contribute to these high-density temporary areas.

Abulnour (2013) has worked in a multidisciplinary manner on the investigation of quality, management, and contextualization issues in temporary settlements. The study also forms the basis for the supply, plan and building of temporary places. The subject of the main study is to analyze many important aspects of the design and construction of temporary settlements that are presented withal a special focus on temporary housing. Sener and Altun (2009) focus on the study is the design and implementation of a temporary shelter unit. The main objectives when designing the temporary accommodation unit; taking into account user requirements under unusual conditions, temporary and multiple use of the unit, ensuring minimum adverse environmental impact at all stages. While the project aims to make a temporary settlement planning, at the same time it aims to be prepared for the expected major earthquake in Istanbul and to overcome the expected disaster and to store these temporary houses. The design process also has a methodological approach, but it is also creative. At the end of the study, making a production together with the design process makes the research valuable and the project and prototype of this post-disaster shelter unit is presented in the study.

Venable & Will and Lie (2020) researched the perceptions of post-disaster housing safety in future typhoons and earthquakes through a questionnaire of over 450 individuals in communities that received post-disaster housing reconstruction assistance following 2013's Typhoon Yolanda, which were potentially prone to earthquakes. They analyzed housing design factors for the study, post-disaster program elements, personal characteristics and hazard

type and exposure affected perceptions of safety. In general, the most efficacious factors on the sensation of housing security in the findings of the study are the materials chosen for the house, to witness construction practices (good or bad. In the social context, it includes the analysis of how the space is / is not used by the inhabitants and the perception of space shaped by human activities and is affected by environmental characteristics. In this case, if we collect the architectural space design criteria that cannot be distinguished from the outside, it will be beneficial for an effective design to develop a holistic approach to the environment in material selection, to use local and applicable materials when necessary, and to achieve sustainability.

McConnell and Bartolin worked to measure the total environmental effectiveness of Hurricane Katrina in Louisiana in 2005 on temporary housing in New Orleans. In order to better figure out displaced people and the scale of post-disaster relief as well as global warming back demand, research in New Orleans neighborhoods has revealed the core of the study. Their methodology essentially consists of three points: risk evaluation, life cycle evaluation, and the resulting total effect assessment. They tried to analyze the prominent risks of greenhouse gas emissions and the energy impacts of temporary housing use in connection with the hurricane hazard through urban relations. In addition, in the background of the study, it expresses that the environmental benefits of using containers are potentially combined in recovery practices, short-term container supply for temporary housing construction, and long-term applications where temporary housing strategies are planned for temporary housing construction and re-use as permanent residence (2019).

3. Materials and Method

3.1. Materials

The main research objective of the study is to analyse the differences and common problems of temporary settlements planning; the analysis will contribute to understanding the mismatch between them, and find opportunities for improvement for the next projects. Secondary objectives are to understand the role of temporary settlements in the past century as a relief after a disaster and different approaches that planners and designers have applied. Identify improvement opportunities for further studies to define new temporary settlement approaches with an overview of both architectural and site planning strategies from a large perspective.

3.2. Problem Statement

Temporality concept in temporary settlements longer than expected and becoming a permanent way of living for dwellers over time. In these settlements, accommodation may take longer than the estimate and in this case, it is produced with the understanding of temporality. Environmental and architectural decisions are very important for a holistic design and planning approach. Also widely known today, rapid temporary residential installation can be uniform regardless of the user profile, sometimes the design is not suitable for environmental conditions, the structures are vulnerable to a recurrent earthquake, the choice of material is unsustainable Sometimes -planned temporary settlements are not connected to or disconnected from the city, which means dwellers has lack opportunities for socialization.

3.3. Case Studies

Two different settlements planned during the post-disaster recovery phase in Turkey and Japan, the area in Onagawa and Van, and these temporary container houses are within the scope of the study. There are many emergencies or disasters occurring in the world. The type, location, and severity of these can always differ, but in this study, the two different temporary settlements established in the improvement phase are examined both the urban environment and the architectural differences, and the space production concepts that make such temporary spaces will be examined in the context of both architectural elements and the urban environment.

First sample area is that; Van, one of the most important city center of the Eastern Anatolia Region, has a long history in terms of settlement. Turkey is one of the most effective earthquake zones in the world one. Country 92% of the land is in an earthquake zone is located. The population is about 95% live at risk of earthquakes (AFAD, 2014). The geographical features and surface shapes that make up Van and its region reveal that the region was once very active volcanically and that it experienced serious tectonic movements throughout history. According to a personal interview with AFAD Van manager, container units replaced the tents and temporary housing established during the recovery phase of the disaster. A total of 32 temporary container houses were established in the city center of Van and in Erciş district, planned for earthquake victims. Second sample area is Onagawa a small fishing town on the inner part of the Oshika peninsula, has taken more damage to other areas. Locals in Tohoku Region suffered great and serious structural damage as they were left without electricity, natural gas and water. Architect Shigeru Ban proposed the main idea of building multi-storey temporary living units using recycled shipping containers for disaster and emergency relief design projects around the world. According to the project published in Shigeru Ban office website, immediately after the earthquake, the homeless found a refuge in one of the sports halls of the city, where Shigeru Ban placed 250 sets of paper tube compartments right after the earthquake.

Figure 1. Van temporary settlement (source: google earth)

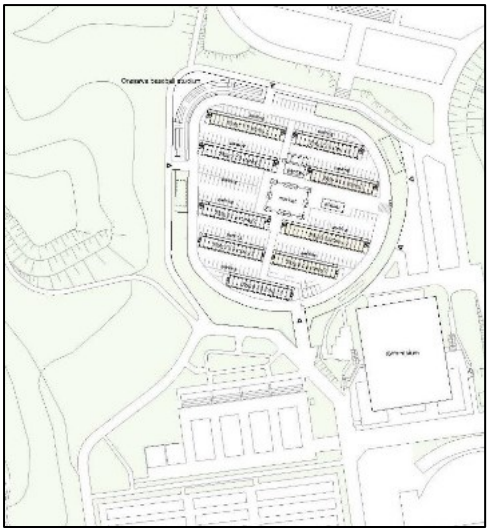

Figure 2. Onagawa temporary settlement (URL 1)

3.4. Metod

Literature search, on-site and existing plan and design findings, observations and key-point table evaluation were apply as information in this study.

3.4.1. Literature Review

In order to address the need to understand the planning and design of temporary settlements, literature research was carried out in dealing with disaster and post-disaster asylum issues, especially in the development of post-disaster living solutions and the role of the architecture that came with the concept of disaster and emergency.

3.4.2. Interview

The interview method was used in order to clarify some of the information missing in the literature for the situation of Van city after the 2011 earthquake. In addition, some data collected for Van province were collected as a result of phone calls made with AFAD official, who is responsible for disaster management, about the earthquake and planned temporary settlements.

3.4.3. Analysis

The existing environmental relations of the settlement, the immediate surroundings of the residence, private property and public (public spaces, open and green spaces) related to these, accessibility to hospitals, schools and green spaces that act as a transition between them will be examined.

3.4.4. Evaluation of Key Points

The study areas Van and Onagawa temporary settlements will be evaluated according to the key points that are important in this Table 1, together with the obtained map, plan drawings, container layouts, diagrams and environmental status information from google earth and literature review.

Table 1. Key points (prepared by author)

	KEY POINTS		ONAGAWA CONTAINER SETTLEMENT	VAN CONTAINER SETTLEMENT
Architectural Features	A temporary house design that will resist a recurring disaster			
	Adequacy of basic needs in the container unit interior			
	Sense of Space production	Safety		
		Accessibility to urban Infrastructure		
		Sustainability of Material		
		Sociability		
	Suitable design for climatic conditions			
	Variety in design according to the number of container users and profiles			
Urban Relations	City-level decisions and integration of settlements while making site selection			
	Open green spaces			
	Accessibility to health facilities			
	Accessibility to educational facilities			
	Having a special urban planning scheme			

4. Evaluation of Site Analysis

4.1. Onagawa Temporary Settlement

An analysis map was created in the Onagawa temporary settlement, which is one of the sample study areas, as a contribution of literature review. The facilities (health-education-green areas) were examined according to the accessibility criteria.

4.1.1. Health Facilities

Hundreds of hospitals and medical clinics were demolished and devastated in the Tohoku coastal region shortly after the earthquake, and due to critical first aid shortages in the Ishinomaki area, doctors and nurses were sent to reinforce the Ishinomaki Red Cross Hospital, the only remaining hospital in the area, and first aid was rendered there. It took some time to rebuild Onagawa's only hospital, one of the 13 largest healthcare facilities in the area, and it could not withstand the devastation caused by the tsunami, parts of it were destroyed. However, after the emergency relief process, which was part of a larger effort by the Swiss Red Cross, Caritas Switzerland, Swiss Solidarity, and the Japanese Red Cross Association, the JTI Foundation provided new planning for the hospital between April and June 2012 (IFRC, 2011). Furthermore, the hospital's temporary residences for the elderly built shortly after the crisis were turned into permanent care centers for elderly patients. Onagawa residents have used this hospital for health and emergencies. It has been observed that the transportation to the hospital is centrally located in the city and is convenient for use in terms of distance and accessibility. There is a distance of 800 meters between the container city and the hospital facility in the city and is convenient for use in terms of distance and accessibility. There is a distance of 800 meters between the container city and the hospital facility.

Figure 3. Urban analysis of Onagawa settlement (prepared by author)

4.1.2. Education Facilities

A few months after the disaster, many people moved into temporary housing places in Onagawa remote areas or another emergency housing type. The maintenance of the school district and the school itself became difficult, and the tsunami flooding of some school buildings and the disappearance of surrounding communities made the situation difficult. The education, which was tried to be continued temporarily at the beginning, was later combined in areas close to the container units by combining primary schools, secondary schools and sometimes high schools. According to the information obtained from the book Sustainable Development and Disaster Risk Reduction (Oikawa and Shaw, 2014), Onagawa Daini Primary and Secondary Education, Onagawa Daisan Primary Education and Onagawa Daiichi Primary School were temporarily combined in the environmental map plan and in two marked container units. It was repaired by the IFRC and completed in March 2013. The school solution was unified and continued close to the Onagawa container city, while an atelier was designed for education activities within the Onagawa settlement.

4.1.3. Green Areas

The city of Onagawa has a rich geography in terms of forest areas. Onagawa container settlement is close to public green areas. The park area called Onagawa Town Athletics Field is close to the Onagawa container settlement; there are activity areas, playgrounds and green areas. Since green areas and open green areas, which are of great importance in the urban environment, have an important place in creating a meeting center, it is of great importance to use this park, which is close to Onagawa, .Green area, playground, water element etc. in container layout, has been observed that there are no such components.

When the current situation in 2012 is examined according to the settlement plan for Onagawa, since the water, electricity and communication channels required for the citizens affected by the disaster are provided by a technological modern planning brought about by this type of container architecture, these containers are also open markets, cafeterias needed in an outdoor space other than housing. Facilities such as training center and workshop are also planned for the dwellers.

4.1.4. Architectural Features

Depending on the scheme arrangement, there are three types of plan designs: 19.8, 29.7 m2, and 39.6 m2, 19.8 m2 is designated for one to two inhabitants, 29.7 m2 is designated for three or four residents, and 39.6 m2 is designated for more than four residents (Shigeru Ban architects, 2011). Containers are ISO-compliant and have wide screens. In design, framework type ISO shipping containers without steel walls are used as bedrooms and bedrooms / bathrooms and as living room areas. Access is provided by two stairs opening to the building from outside and can use on all floors. Along with the apartment plan with separate entrances, the privacy required for the families has been given importance. The interior design with the necessary furniture and decor elements to give the residents a home feeling draws attention. In general, indoor furniture was provided by voluntary organizations, and for families affected by the disaster.

Figure 4. Site Plan: 1. Firstfloor plan, 2. Market, 3. Atelier, 4. interior (URL 2)

The basic and minimalist stance of Japanese architecture in the interior is combined with a modern structure. Although the dining area is generally designed separately, it is noteworthy that the kitchen is solved within the sitting unit and they have large windows. Considering the container dimensions, the contribution of spacious and sufficiently high ceilings creates a sense of spaciousness in people as a spatial feeling. The container units are structured like a checkerboard or staged and planned one on top of the other. ISO shipping containers are used as bedrooms or bedrooms + bathrooms according to family type and needs. From an architectural point of view, this established system has created bright and spacious living spaces. Stating that they provide high sound insulation performance between containers and between each unit, the engineers also stated that these structures can be built in a repeatable condition and can continue to be used even as a long-term residential solution if they are studied further due to their seismic performance. It has public spaces to serve.

For residents and small business owners in Onagawa, planning the food outlets, shops, services market and gathering areas for many of those who lost their original property, the establishment of the container settlement has been a good emphasis for socialization. Creative, useful, dynamic living spaces are created even in a highly single container with window openings, doors, and interior furniture systems to be opened in accordance with the architectural technique. In addition, shipping container architecture is usually tagged as a green, sustainable, or an environmentally friendly variety of buildings, because it focuses on recycling used shipping containers that will well be nobody will want to use as a living space anymore.

4.2. Van Temporary Settlement

The second site study area is the Van temporary settlement, an analysis map has been created with the contribution of the literature review and interview. The facilities (health-education-green areas) were examined according to the accessibility of public spaces criteria.

Van AFAD manager stated that, health cabins were established in the settlements and this service was provided in container cabin planned in the settlements, it was found that emergency and medical needs were met in the Van Regional Hospital close to the settlement. In addition to the health units for dwellers for an emergency medical, need.

4.2.2. Education Facilities

Planned by the provincial directorate of family and social policies of the study center, youth activity center, kindergarten where 5,216 people live and where education activities can be done for many disaster victims who will start basic education were made within the Anatolian settlement (AFAD, 2014). In addition, there is a library / reading container unit built by voluntary organizations. Authorized persons who meet frequently provide coordination and check the situation between the container women-culture center, reading room, courses, mosque, security point, and institutions. According to the information reported by the Van placed after the last initial. AFAD manager, within the scope of social activities carried out in the coordination of social centers in container settlements, cinema-theater screenings, concerts, conferences-seminars, professional/ artistic educational courses, trips, sports activities and exhibitions were organized. In addition, AFAD manager stated that students at primary, secondary and high school levels receive basic education in schools close to the residential area. There is a vocational high school in the east of the settlement and a primary school in the southeast.

4.2.3. Green Areas

Green area planned should also be sought within the settlement in the close areas that should be outside the settlement area. It draws attention to the lack of green space between the containers in the settlement. In a hot summer season like Van, the stones on the roads and roofs raise the average temperature of the sun reflected from the sheets, which caused physical and psychological difficulties for the inhabitants. The green areas and public parks outside are also far from the residential area and the residents are deprived of green and open spaces both inside and outside the settlement, which is especially problematic in terms of socializing and having some quality time.

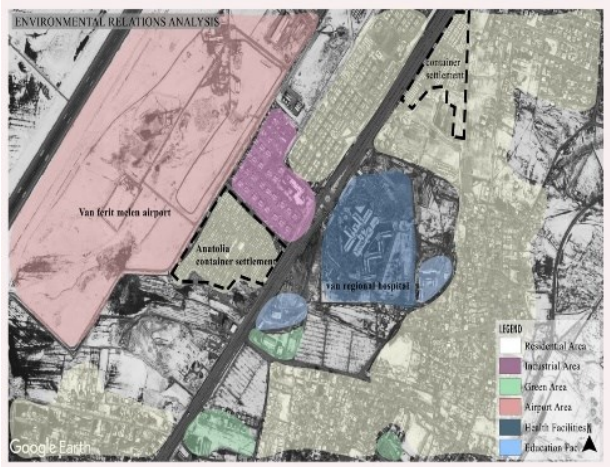

Figure 5. Urban analysis of Van settlement (prepared by author)

4.2.4. Architectural Features

There are 892 container units in Anadolu Container settlement. Containers area generally 21 square meters. Each container has a kitchen counter. There are cooking equipment here and it also functions as a living room. The room was often used for sleeping activities. Bathroom and toilet are planned together. There is no separate children's room for dwellers. The fact that it is incredibly hot in the summer and extremely cold in the winter months due to the continental climate makes living in containers challenging in this area of Van province. Living in a house for an extended period of time exacerbates the problem.

The overall appearance of the containers is the same. There are two windows (120x120) and an entrance door on the front façade. It is provided with ceiling type fixtures. Dinner area and accommodation elements, which are among the basic needs, have been considered at a minimum level. However, in the area of the kitchen unit used as a full equipment kitchen, there are minimum narrow areas in terms of eating-cooking and rest. In general, the interior-space does not give the users a sense of aesthetically high quality, consisting of the same type of walls and colors repeating each other, where the necessary equipment for basic needs can hardly fit and moreover the population structure of the Van city is generally composed of family groups with many people, it has been observed that the containers cannot meet the accommodation needs or that sufficient space is not provided. The gray and white toning used in the completely temporary housing is both slightly less costly and its positive effect on psychology played a role in its preference. PVC is used in windows and doors. Although there is no roof to protect against harsh weather at the entrance, there is no shade roof in hot summer weather. The bathroom has a sink, shower tray, electric water heater and toilet. Night lighting of the place that can receive daylight. It is stated that the container units designed with the technological achievements of the Anatolia Van settlement are systematically sufficient in terms of earthquake safe, but the planning of the units is very close to each other, although the proximity of the container units, although not multi-storey, may cause chaos in the event of a big disaster. It is a return of favorable physical conditions and time. With the specified conditions survival the search for a healthy environment should begin with security and protection, especially after a major disaster. In this new building process, existing electricity, water and insufficiency of sewerage networks, infrastructure of container cities creating in harsh winter conditions by placing victims in containers led to the prolongation of the process. There is a of news in this issue and it has been revealed that the survivors cannot tolerate this situation and even struck for a certain period in the settlement. In this case, the fact that the most important needs are not met has caused great difficulties in terms of living. It is a very important emphasis that the communities affected by disasters meet the market needs, perform their education or hobbies in the ateliers, and benefit from the meeting and socializing areas.

Public spaces that can serve Van Anatolian container residents to access socialization areas such as markets, kindergarten, women's art and community center, coffeehouse are planned within the settlement, but there is no sustainable pop up space that can interact and meet with socialization outside, even the victims have their own efforts to make wood in the spaces between the containers and they designed shaded areas with fabric pieces and turned them into a meeting and gathering center. Because it is simple and cheap, using the same container unit type for been insufficient for residents. Often uses this type of container for a sustainable approach. However, reproducing the containers, as a unit in the Van facility does not show a sustainable approach. It leaves a question mark in sustainable design, as it is the reproduction of containers, not unused shipping containers. In addition, container units should be designed and planned in accordance with physically individuals and elderly people. Temporary houses can sometimes function as permanent homes for a long time out of necessity. Especially in the case of Van earthquake, many households live in temporary container housing.

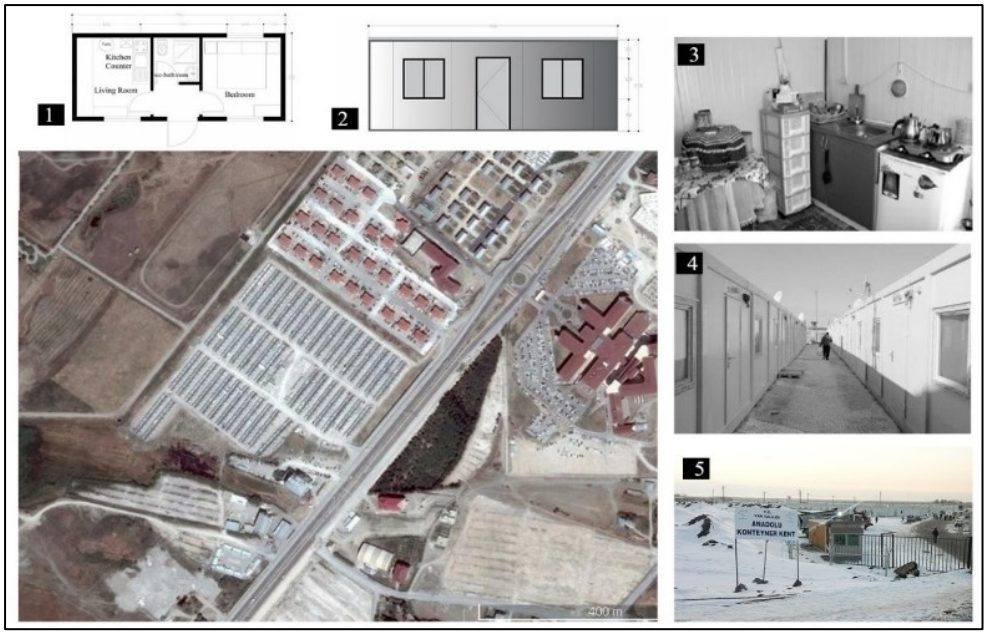

Figure 6. Site Plan: 1. floor plan; 2.facade; 3.kitchen (source: Unal, 2017); 4. Exterior (URL 3); 5.settlement view (URL 4)

Figure 7. Temporary settlements in winter condition, one unit temporary housing (URL 5)

Table 2. Results of key points (prepared by author)

	KEY POINTS		ONAGAWA CONTAINER SETTLEMENT	VAN CONTAINER SETTLEMENT
Architectural Features	A temporary house design that will resist a recurring disaster		★	★
	Adequacy of basic needs in the container unit interior		★	★
	Sense of Space production	Safety	★	★
		Accessibility to urban Infrastructure	★	☆
		Sustainability of Material	★	☆
		Sociability	★	☆
	Suitable design for climatic conditions		★	☆
	Variety in design according to the number of container users and profiles		★	☆
Urban Relations	City-level decisions and integration of settlements while making site selection		★	☆
	Open green spaces		☆	☆
	Accessibility to health facilities		★	★
	Accessibility to educational facilities		★	★
	Having a spatial planning scheme		☆	☆

★ No problem in key point

☆ Problem in key point

5. Conclusion and Comments

Both Turkey and Japan have suffered mainly from earthquakes due to its geographical location as well as found, floods, landslides, storms, avalanches, natural and war. Since it is not known exactly where, when, in what intensity, how and in what way disasters and emergencies will occur, it always poses a great danger to the safety of life and property in settlements the number of disasters and emergencies in the world, and these events are given physical, social and economic losses that are very difficult to compensate later. During the disaster recovery phase, it is important to make urban decisions while planning the layout. Location selection criterion for container settlements is also part of this. In the Onagawa temporary settlement, all container settlements are far from the coastal areas due to the tsunami effect, but since such a large tsunami is not expected, no pre-disaster planning has been made. In Van settlements, plans were made after the disaster in public lands with spaces in separate areas. For both regional planning, it was determined that some environmental and urban planning were not planned with a holistic approach based on pre-disaster, but only the basic criteria required for the dwellers were taken into consideration. In addition, it has been seen that some residents living in van settlement were deprived of the necessary urban infrastructure for a certain period. In order to minimize the adverse effects of temporary housing practices resulting from unplanned and incomplete management of design criteria, it should be ensured that accommodation practices are sustainable during the recovery phase after disaster situations. For this, it is necessary to evaluate the housing practices together with the sustainability principles during the improvement phase, and to establish the principles of sustainable housing during the improvement stage. Container units that are produced and used as ready-made in Van are insufficient in terms of sustainability. In the plan design, personal needs and basic needs for temporary housing should be sufficient. In addition, different architectural plan approaches should be made by planning as much as the number of households to live. All of the container units in Van settlement are designed as the same m^2, and there is no differentiated and specialized plan scheme. Considering the life cycle and user requirements, psychological factors, environment and architecture, besides the factors that support each other in a cause-effect relationship, the perception of space should be preserved and healthy architectural spaces should be designed.

Ban's Onagawa Container residence has given dwellers an advanced sense of space contentedness after the Japanese earthquake. By building art classes for children, community centers and open- market containers, people were able to imitate their previous lives with basic daily routines and as a result adapted to their lives there. At the same time, people affected by the disaster in Van were able to form a daily routine by establishing not only housing but also neighborly relations, youth activity centers, art workshops or small-libraries. This also contributed to the interaction between the people living there and increased socialization. Especially after a major disaster and considering the psychology of the people who lost their homes, the urban environment also contributes greatly to help them overcome this situation. It has been concluded that the duration of stay determined in temporary housing planned for disaster victims may be extended and more attention should be paid to environmental, urban, economic, technical and socio-cultural conditions in order to increase the quality of these temporary houses. More emphasis should be placed on the lives and needs of those who have lost their homes. Therefore, it has been resulted that while considering providing housing for the victims of disasters, the urban environment should be analyzed in depth the needs of the users should be taken into consideration, and measures should be taken against the difficult conditions of the climate in the design of temporary houses. Sustainable temporary space and its needs should be particularly reviewed.

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Conflict of Interests

The Authors declare no conflict of interest.

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