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Cultural Landscape of VAN, TURKEY

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Preface

Silk Road was a trade route in the history starting from China going to Europe, by the second century BC to the end of the fourteenth century AD. Silk was the major trade product that was carried by caravan on this road, interaction the socio-economy and culture and community.

By the time efficiency of the silk dropped-off by the industry of syntactic fibber, but the "silk road" can be revived as significant route of "Science Road" and of "other products".

At the east border of Turkey, city VAN is also on the silk road. The slow interaction in the nature and social life can be followed by **Cultural Landscape**.

This work examines the most up-to-date information on **Cultural Landscape** at the **VAN** era to exchange, disseminate and to share the material.

The key-words of the book "**CULTURAL LANDSCAPE OF VAN-TURKEY**" are as: Regional history, climatic factors, citizen values, city bazaar, gardens, urban land, castle, church, rural development, domestic architecture, education buildings, eco-village, earthquake influence, structural characteristics.

Editorial Team

CHAPTER NUMBER 1

RURAL SETTLEMENT PATTERN AND STRUCTURAL CHARACTERISTICS IN THE ERÇEK BASIN OF VAN

ALEV ERARSLAN

Rural settlement and rural architecture researches in Anatolia date back to the recent past. Many different rural settlement regions and housing culture that changes as per the region determined by different climate, geography, culture, traditions, and social needs are available in Anatolia. Rural settlements are the settlement units whose economy is based on agriculture and animal breeding, have distinctive and homogenous social relations, where the population is low, which have certain settlement border. Rural settlement types are continuous and temporary settlement types which are called as village and sub-village settlements which are smaller than the village. Aggregation of rural settlement structures together also forms settlement textures such as collective, distributed, series, group, etc. Yet, the rural house is the most important living area in rural settlements. Rural house is described as a structure produced under the traditions of a certain region depending on historical, geographical, economic and social factors. Regarding the determination of the type of a rural house, various social, cultural and economic factors, notably climate and topography also play an important role.

This study is carried out in the villages Karagündüz, Ilıkaynak, Dereüstü (Anzaf), Gölyazı, Aşağıgölalan, Yukarıgölalan, Kozluca, Aşağıçitli, Irgat, Aktaş, Erçek mahallesi, Yalınağaç, Baklatepe, Çomaklı and Gedelova located through coast of the Lake Erçek Basin, Van Province. Objective of this study is to establish settlement characteristics in the region and to reveal the rural architectural house plan types, dominant settlement type of the region and to explain the factors which are effective in the formation of these plans.

Keywords: The Erçek Lake Basin, settlement characteristics, rural architecture.

I. Introduction

Settlement is a concept that covers the environment created by humans. Rural settlements are the settlement units whose economy is based on agriculture and animal breeding, which have homogenous social relations peculiar to themselves, the population is low, possess certain settlement border. Rural settlement types are the continuous (farm, sofa, arable field, neighbourhood) and the temporary (plateau, large nomad tent, kom, fold) ones which are called as village and sub-village settlements smaller than village. Combination of rural settlement structures also forms settlement patterns such as collective, distributed, series, group, etc. (Selvi 2011, 25).

People have been affected from natural environmental conditions during palaeolithic ages; landforms, climate conditions and vegetation have been of great importance for them (Sütgibi 2008, 62). First settlements have been established in overflow areas of large streams, plateau plane and valley grooves having fertile soils depending on water and fertile soil characteristics (Sütgibi 2008, 63).

Rural settlements emerge in various regions under different circumstances. Different ecological and geographical niches result in the exhibition of diversified settlement models. Environmental factors take the lead in the selection of rural settlement areas. The most important factors that influence rural settlements are topography, climate, flora and fauna; these factors constitute the natural habitats.

2. Topography

Topography is one of the essential factors that determine the settlement type. Topographic characteristics, as one of the most significant example of the relationship between human and nature, have direct or indirect effects on the distribution, population and economic activities of settlements. Since the first ages, the proximity to freshwater bodies such as stream, lake and river have become main criteria for selection of a place to settle for human beings. Rural settlements are divided into two as collective and distributed ones as per the characteristics of land structure and water resources. These settlements show differences throughout valley, in-canyon, hill and stream according to topography.

The relation of the inclination and the elevation with the population density is explicit in land use. While the amount of population and settlements is low in mountainous and rugged lands, these numbers are high in plain lowlands. As no drought is felt on mountainous lands, the streams fed from snowmelt are available; therefore, they have their own ecosystem fields. These places are appropriate for plateau. Another factor dependent on elevation is bioclimatic factors.

As an example of relation of topography and settlement, in rugged topographic lands split by streams, limited and distributed structure of arable lands give rise to emergence of dispersed settlements. Mountain settlements display an aggregation which is dispersed and disconnected from each other. However, these aggregations have a structure whose pattern is dense within its body. Access difficulty makes protection of original structures of these settlements easier. The common point that make plains attractive for settlements are fertile lands and existence of water supply. In general, settlements develop at shores of plains towards hillsides in order to evaluate agricultural land because plains have valuable soil (Selvi 2011, 27).

3. Climate

One of the elements of natural environment that have an impact on rural settlements is the climate. According to altitude difference, the climate elements such as the wind, rainfall, and temperature show some alterations. In places where effects of climate elements are maximum, inhabitation is rarely seen. In plain lands where rainfall and water is low, collective settlements whose structures are close to each other are seen. In humid climate regions where rainfall is abundant, dispersed settlement types including field, vineyard and garden areas are observed. The reason why the selection of valley lands is that they are sheltered against climate conditions. Temperature values are also important for determining the vegetation period, which is important for livestock activities. Various climate regions differentiating from each other have direct impact on settlement and architecture such as local topography. Among the effects of climate on physical environment; topography, type of soil, vegetation, stream flow rate and regimes, lake formation, salinity ratios of seas may be sorted (Tunçdilek 1986).

4. Flora and Fauna

The presence of climate-friendly vegetation and animal communities is vital for the survival of human life. Places where nutritional needs can be obtained more easily play role in selection of settlement places. The presence of rich flora makes conditions favorable for animal communities which survive thanks to this vegetation, this leads to emergence of very diversified and rich animal communities as well. People of Neolithic Age settled in the lands suitable for agriculture, grew wild grains and cultivated them. Rich grasslands and pastures as well as water resources are important for animal breeding. Abundancy of flora in the region has improved cattle and sheep breeding. High altitude, rich water resources and abundance of mountain meadows and pastures turns district into very convenient plateau environment. The richness of tree species is also important in terms of meeting the need to build house's door and roof and the need for fuel in winter (Tunçdilek 1986).

5. Rural Houses

The living space of the rural settlements is the housing structures. Rural house can be defined as a structure produced under traditions of a certain region depending on historical, geographical, economic and social factors. In determining rural house type; social, cultural and economic factors as well as environmental/physical ones, notably climate and topography also play important role (Tunçdilek 1967).

Climate is a key factor in formation of housing. Architecturally, climate has an impact on the direction and orientation of building, in terms of material, construction technique, dimensions of building, splitting rooms, façade characteristics, dimensions and locations of doors and windows, roof and open- closed spaces (Yakar 2000, 145).

Another physical factor efficient in rural house formation is also topography. In the formation of house forms; the boundaries of the land and inclination play a role. Topography designates the direction of houses. For instance, houses are settled towards the north in general because of the scene provided by the roughness of Black Sea region (Gür 2005, 67). Topography becomes effective on building material. While stone, adobe and wood are used in alluvial plains, the material in high altitude is stone or wood (Yakar 2000, 145).

While worldview, cultural values, family, relatives, society relationships and life style are listed among cultural factors; social factors are demographic structure, socio-economic structure of family, family structure and life style (Gür 2005, 165). Rapoport has suggested concepts “peculiar to culture” and “cultural values and selections” for rural house design (Bretonne 1979, 116). According to Rapoport, buildings, especially houses are not only physical products but also cultural products.

Lifestyle shows different features in each culture. As each community has its own attitudes and traditions, this expectation also determines the architectural structure (Selvi 2011, 19). The place of family in society, the habits of daily life, confidentiality (privacy) of family life also affect the design of the house. Religious belief is also another social symbol in shaping of rural dwelling. Religion studied within the scope of socio-economic factors affecting house design is a phenomenon that regulates and influence human relations. Rapoport has mentioned that religion is a factor that has impact on environment and people (Rapoport 2004). Gender segregation based on religious traditions affects the space.

In general, rural settlements are places where large family type is enable to maintain their culture. Therefore, concept of large family is a significant factor in the establishment and the shaping of the structure in rural settlements. Large families live in larger houses because they tend to live and work together. Social bond in rural settlements is also based on strong kinship relations.

Another determinant parameter of rural house is economic organization of householder. Some changes in structure determine the identity of the user. The size of house reflects economy-production relationship. The housing structures of the region where economic model whose main income source is shepherding is dominant differs from those of the settlements established on agriculture based economy [5: 145]. Farming families have larger living areas than average houses, as they have space for storage and additional activities (Yakar 2000, 146).

Another social element related to the housing culture is the building tradition. The architectural cultures that exist in the historical memory of the regions are transferred to the generations as heritage. Rural architecture has originated as a result of cultural continuity. Traditional rural architecture is less influenced from rapid cultural changes. Rapoport mentions that traditional houses has made it possible to maintain the social habits more easily. It usually reflects thousand of years of accumulation and tradition. The less influenced and hardly changing characteristics of rural settlements increases this effect. Even though structure material and construction technique evolve in time, it is known that plan types are affected less. This can be observed in a region where the plan of a structure is historical while it has been built with the current material and construction system. Despite changing user requirements over time, original identity belonging to each region and culture forms as a result of continuity and architecture in plan types. Newcomer communities in a region, especially those with a nomadic social life, adopt the architectural tradition in that area when it comes to turning a settled life. Despite ethno-cultural diversity, they adapt to the tradition of materials and structures that are appropriate for that particular topography and physical environment.

6. Settlement Characteristics In The Lake Erçek Basin

The Lake Erçek has an area of around 106.2 km² at 30 km. east of The Lake Van Basin at 1803 m. altitude. The region forms a separate closed basin within the Lake Van's closed basin. The basin involves some sections of Van Centre and Van Özalp, Saray and Gürpınar districts administratively. The main stream flowing into the lake is Memedik Stream that rise from Iran border and joins in the Lake Erdek from the east and Irgat Stream that joins it from the south. Other basic streams in the region are Karasu Streamlet and Değirmendere. Apart from The Lake Erçek; the Lake Gövelek, the Dam Lake Sarımehmet and the Lake Bostaniçi fall within analysis area (Duman and Çiçek 2011, 170; Duman and Çiçek 2012, 247). The lake is surrounded with the ridges extending from the south to the west. Out of these, Mount Ahte the closest point to the lake is at the highest point with 2864 m. Other important ridges are Ziyaret Hill (2793 m.), Şehitmirza Hill (2796 m.), Gündüz Hill (2840 m.) at the east; Seyhhasan Hill (2616 m.) at the southeast, Mount Kazan (2860 m.), Kızkalesi Hill (2714 m.), Boztepe (2717 m.) at the south; Zozan Hill (2729 m.), Bireş Tepe (2704 m.), Seyan Hill (2636 m.) and Karataş Hill (2690 m.) at the north (Duman and Çiçek 2011, 170). Plains exist around immediate vicinity of the Lake Erçel, based plain and straits are also found.

The Van region is a high and remote region from the sea with an average altitude of 2000 m. The Lake Van at 1646 m. height forms the minimum-altitude section of the region. In the region whose annual temperature average is 9 °C, the summer is cold and the winter is hot. Average temperature of January, the coldest month of the year is -3.5 °C. Maximum temperature in August, the hottest month is 28.1 ºC. The plains positioned on the shore of the lake constitute lands suitable for settlement and agriculture in terms of climate (Kalelioğlu 1991, 156). Prevailing wind in the locality is levanter. The wind which is blown from the east is called as "Persian Wind". The winds with western sector are encountered at second degree. Annual average rainfall amount of the region is 385.0 and 498.8 mm (Kalelioğlu 1991, 161; Duman 2011, 172).

Village is dominant settlement type in the region (Figure 1). 50 village settlements are available in the basin. Firstly, physical features such as topography, climate conditions, soil characteristics and water resources have affected settlement places of village settlements in the basin. The villages in the basin are classified under two groups in terms of their geographical properties according to their locations and altitude steps. The villages within the basin have generally altitude between 1800- 2250 m. The number of the village higher than 2250 m. is low (Yılmaz 2014, 300). The villages at completely high altitude are settled mostly in mountain foots and plains due to water resources, easy access and proximity to agricultural lands rather than bottom of the basin. Number of settlement established in mountain foots is dominant in number. The villages here benefit from the pasture ground in mountainous area and the agricultural lands on the plain (İzbırak 1951, 109).

Fig. 1-1. Settlement Examples in the Lake Erçek Basin a) Valley Site, Anzaf b) Yamaç Village Yukarıgölalan c) Plain site, Aşağı Gölalan

A very small part of the basin villages are established on the mountainous land and ridges that climate and transport conditions become harsh and soil productivity drops. In these settlements founded on inclined surfaces; grassland and pasture lands cover much space (Yılmaz 2014, 305). In the basin that is quite high compared to Turkey's average, number of village settlement reduces following 2251 m. because of inconvenience of climate and topography conditions. Changes in temperature conditions has restricted agricultural activities in this area, livestock activities have become the main source of income for the few villages that have been established in this land.

In addition to environmental factors, human factors such as agriculture and livestock activities and means of transport have also been taken into consideration in place selection of the Lake Erçek Basins villages. The economy of the villages within the basin is based on agriculture and animal husbandry.

The population of Erçek, the most populated village, is 3649 persons according to the results of census 2012 (URL 1). The smallest village in the region is Kozluca village. Again, as per the results of census 2012, total 44749 person- population is available in 50 villages within the Lake Erçek Basin (Yılmaz 2014, 309).

7. Architectural Properties Of Van Lake Basin

This study was carried out in Karagündüz, Ilıkaynak, Dereüstü (Anzaf), Gölyazı, Aşağıgölalan, Yukarıgölalan, Kozluca, Aşağıçitli, Irgat, Aktaş, Erçek mahallesi, Yalınağaç, Baklatepe, Çomaklı and Gedelova villages located on the coast of the Lake Erçek Basin (Figure 1-2).

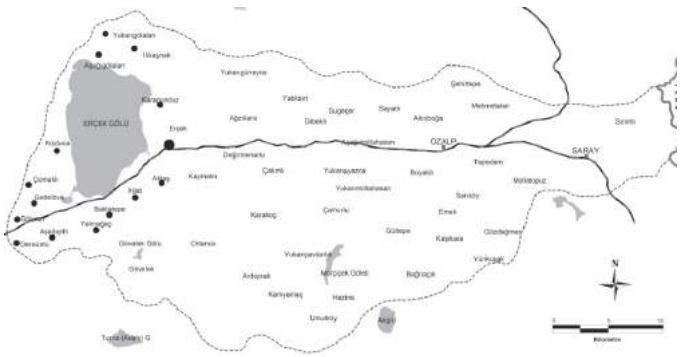

Fig. 1-2. Analysed villages (Yılmaz 2014, Map 3)

In house structures of the region, five basic plan types; without sofa, the outer sofa, the inner sofa, with tandır room are used;

1) The plan without *sofa*: The first plan to be used in the region is the type of plan that is found in few examples and is called "without sofa".. This plan scheme utilized at limited number of structures in the region consists of two rooms of which one is horizontal and another is vertical and the space in front of these rooms, whose top is open (Figure 1-3). At these structures designed as single storey, the space whose top is open is a front of a house; its boundaries are determined by dimensions of rooms. This space is transition area between indoor and outdoor, a circulation area providing connection between rooms.

Fig. 1-3. The plan without sofa. Dereüstü Village

2) The outer *sofa* plan: Another plan type employed in the region's houses are the plan known as "outer sofa". House structures with outer sofa found in the region are constructed according to "the outer sofa surrounded with two way room line" type (Eldem 1955, 84-85).

This type of sofa is surrounded by chambers perpendicular to each other in two directions. The main planimetris of the plan are two consecutive rectangles of equal width, with the main axes parallel to the façade. The leading sofa is an open portico, sometimes with wooden columns. The back room behind is the main room (Figure 1-4). In a wing of a hall there are two rooms, sometimes a single room and sometimes a sofa and a parallel main room on the back. Sofa is reached by a staircase.

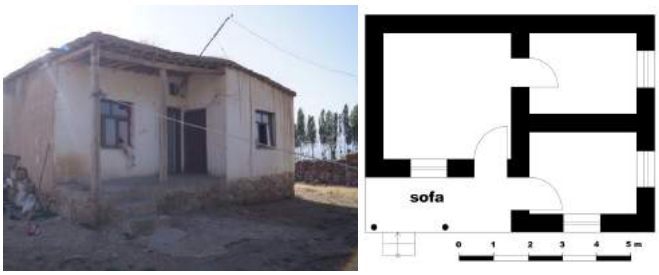

Fig. 1-4. The outer sofa plan. Yalınağaç Village

3) The inner *sofa* plan: The most commonly used plan in the area housing is the type of plan called "inner sofa". In this plan, the sofa is the inner section, a line with rooms that facing each other is available for each two wings. For the inner sofa plan within the region, the rectangular sofa is taken at the centre of house, surrounded with one row of rooms throughout its two long wings. House is reached from the door at the centre of the sofa looking at façade. The sofa retreated to form an entrance area (portico) which has the same width with sofa; covered, with or without wooden columns. In this type of area, two-room, three-room and four-room inner sofa type; used in three different variants. (Figure 1-5).

Fig. 1-5. The inner sofa with 2 rooms. Kozluca Village

4) The Inner Sofa with *tandır* room: In this type of house with a small number of examples in the district, a house built according to the two-room inner sofa plan, behind the sofa, a room with a horizontal rectangular shape with the house tandır room is located. (Figure 1-6). A courtyard is located in front of the tandır room. In this building type that one of side rooms on one wing of the sofa is extended forward, there is a wooden columned porch in front of the structure.

Fig. 1-6. The plan with tandır room. Gedelova Village

5) The complex plan type: This type of structure found in several houses in the region consists of combining external and internal sofa type. The front of the building was made in the form of a single room standing upright on the sofa's wing, an application of the outer sofa type in the district. However, a new room is added near this single room this time. Back part of the structure is constructed according to the inner sofa with two rooms type (Figure 1-7).

Fig. 1-7. The complex plan type. Yukarıgölalan Village

Local houses are settled in the direction of north-south. Entrances face the south. Structures have generally single storey, raised over the stone basement. In the case of a small number of two-storey buildings, the lower floor is used as a barn, warehouse, cellar or haystack. The sofas/porch raising over basement are accessed via steps. Basement and steps are walled with stones whilst gaps are filled with small stones. Mortar is used sometimes. Construction material used in the walls of structure is adobe. Walls are plastered in some instances. Wood is only used as lintel in order to strengthen adobe wall in upper and lower parts of window (Figures 1-6, 1-11, 1-12). In some repairs at structures, it is seen briquette tile is used. In general, flat roof is dominant in region's houses; hipped roof samples are also available in limited number as well.

In the rooms there are windows on both the front and side façades. It is observed that attention is paid to symmetry concern for the number of windows. In inner sofa type, there is a triple façade organization consisting of room-porch-room order (Figures 1-8, 1-12, 1-15).

A part of structural design of inner and outer sofa type is porch columned/columnless space that extends before rooms. This space is called with the names such as "balcony, ladder, döşk, tence, pilekan" etc. in the district. However, most widely usage for this area in the region is the word "balcony". Main room of house is called as "saloon".

In houses where no wet volumes such as toilet and bath is available, wood covered area

in a corner of a room of the house is used as bathing area. Outside of the structures, there are different functional spaces such as a tandır house, cellar, stables, stables, haystacks and banisters which are used as kitchens.

It is seen that environmental factors such as climate and topography and the cultural factors are efficient in plan selection of the region's houses. "The inner sofa plan", the most prevalent plan implemented in the region's houses shows compatibility with climate conditions. The harsh continental climate of the region necessitates the use of the sofa indoors. "The outer sofa" type, another plan type in the region is a semi-closed space whose sofa is wooden columned porch that extends in front of rooms. Plan type without sofa which is found in a small number of examples at limited number in the region's houses is a less preferred plan template due to climate conditions.

Another factor in configuration of the region's houses is structure tradition which is an important cultural parameter. The architectural cultures that exist in the historical memory of the regions are passed on to the generations as inherited legacies (Rapoport 2004). In the vernacular housing, there are traces of Urartu and its close neighbors from Hittite residential architecture in terms of plan, construction systems and building materials.

8. Conclusion

Van region is one of the most important regions that incorporates rural architecture and cultural heritage patterns of Anatolia. The rural settlement features of the region and local architectural examples have important characteristics in terms of rural settlement characteristics of Anatolia with their unique characteristics. In Erçek Lake basin, local settlement texture exhibited settlement examples suitable for physical conditions. The rural architecture of the region is the product of both material and plan types, as well as the environmental conditions of the region as well as the result of the rich historical background.

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CHAPTER NUMBER 2

INFLUENCES OF 2011 ERCİŞ EARTHQUAKE ON RURAL HOUSING IN VAN

CANER GÖÇER

The province of Van is located in the east of the North Anatolian fault line and is under the impact of a seismic belt that has been active for hundreds of years. The last earthquake in the region which has occurred on October 23, 2011 at 13:41 local time and of which moment magnitude value (Mw) changed between 7.1 and 7.3 according to different institutions has caused a significant damage both in the central region of the province of Van and especially the district of Erciş and the villages in the vicinity. In this study the damages incurred by the rural residences made of adobe material as a result of the said earthquake have been examined and evaluated. The evaluations are based on observational structural examinations carried out in terms of the types and degrees of the damage. At the end of the study general evaluation of the earthquake impact of the structural properties of the adobe houses was made and proposals were summarized that would highlight the measures to be taken for the residences in our country which have properties similar to those of the residences in the earthquake zone.

Keywords: Rural region of Van, earthquake damages, adobe, sustainability.

I. Introduction

There are three seismic belts in Turkey, namely North Anatolian, South-eastern Anatolian and West Anatolian seismic belts. There regions are under the impact of earthquakes

with differing magnitudes and destructiveness. The said earthquakes have posed a big threat in terms of the protection and sustainability of the architectural legacy in Anatolia for hundreds of years. The use of adobe and stone material in the construction of houses is wide spread in Anatolia in respect of economy, easiness of construction and providing the climatic conditions of comfort. Various improvements have been made within the framework of the local means and level of knowledge depending on the performance of these material against earthquake. The earthquake performance of the adobe and stone material has been developed to a great extent as a result of the scientific studies about the material and construction technology carried out in the recent years.

In this study the damages incurred by the rural residences made of adobe material which have been affected by the earthquake in Van in the year 2011 have been examined and evaluated. The study comprises the villages of Karagündüz, Ilıkaynak, Dereüstü, (Anzaf), Gölyazı, Aşağıgölalan, Yukarıgölalan, Kozluca, Asağıçitli, Irgat, Aktas, Erçek Mahallesi, Yalınağaç, Baklatepe, Çomaklı and Gedelova. The evaluations are based on the observational data depending on the types and degrees of damage that has occurred. A general evaluation on the earthquake impact of the structural properties of the adobe houses has been made at the end of the study and proposals were developed related to the measures to be taken for the houses with similar properties in the seismic belts of our country.

2. The Earthquake In Van and Its General Impact On The Rural Housing

The province of Van which is located in the east of the North Anatolian fault line is under the impact of a seismic belt which has been active for hundreds of years. The last earthquake in the region which has occurred on October 23, 2011 at 13:41 local time and of which moment magnitude value (Mw) changed between 7.1 and 7.3 according to different institutions has caused a significant damage both in the centre of the province of Van and especially in the district of Erciş and the villages in the vicinity. The central base of that earthquake is the North of the province of Van and its exact location differs according to different institutions. Furthermore, the earthquake of Van-Edremit with a magnitude of Mw 5.7, which occurred as a result of the aftershocks, of which central base was located just at the southwest of the central region of the province of Van and of which source was a different fault line has also caused loss of lives and property.

The buildings with a bearing system of reinforced concrete structural framework predominantly exist in the central areas of the cities and districts while the rural regions are predominated by buildings made of briquette material made of adobe, stone and cement and has a masonry type bearing system. The main material of which use in the region dates back to a long past is adobe. The use of stone material is very rare. Briquette material is frequently used to replace the demolished adobe buildings or in new buildings because of the fact that it provides a rapid way of building a structure. The said buildings have incurred damage in different degrees as a result of the last earthquake.

3. Earthquake Impact on the Adobe Houses in the Rural Region of Van

Observational examinations have put forward the fact that the adobe houses in the rural regions of Van have incurred various damages as a result of the impact of earthquake. The types of those damages may be classified as follows:

- Vertical cracks and opening damages on the external walls
- Damages due to door or window apertures
- Damages on the corner junctures of the external walls
- Damages on the juncture points of the internal and external walls
- Damages on the junctures of the beams of the roof and external walls

Depending on the types of damages mentioned above, It would be useful first to have a glance at the visual material related to the observational findings obtained in the rural region of the province of Van and to examine the causes of the occurrence of such damages. The vertical cracks and openings in the form of splits that have occurred in the structure of the external walls are based on two causes. First of these is the lack of continuity in the mesh system due to the addition made to the building afterwards. The damages that have occurred both on the foundations and the walls, at the points which have no continuity in respect of bearing capacity and have continuity regarding impermeability which has accelerated the degradation process and caused the increased degree of damage as a result of the leakage of water and humidity through the structure of the external wall. The second type of vertical cracks and splits that have occurred on the external walls on the main body of the wall which has a mesh system. This type of cracks may be easily differentiated from the first type of cracks because they have uneven broken lines. The cause of the occurrence of such damages is generally the tensile stress that has emerged in the structure of the wall depending on the vertical loads that effect the junctures of the internal walls. In the Figure 1 below an external wall on which the both types of damages are observed is demonstrated. The crack on the left hand side depends on the lack of the continuity in the mesh system while the crack on the right hand side depends on the tensile stress that have occurred inside the structure of the wall.

Fig. 2-1. Vertical cracks and opening damages on the external wall

The damages in the form of cracks that have occurred in the door and window apertures in the rural houses generally begin at the end of the lintel that forms the wall aperture and continues in the vertical direction until the end of the wall. A typical example of this is seen on the Figure 2 below. Generally the total size of the window apertures is at a low level compared to the size of the wall. For that reason the number of this type of cracks and splits were rare.

Fig. 2-2. The formation of damages as a result of the window spaces in the external walls

The corner junctures of the masonry structures were the places which were forced at the highest level during the earthquake. The connections of the corners have an important role in respect of resistance because it provides the possibility for the walls to move and vibrate together. The cracks and splits that take place at the corners cause the bearing walls to break free and subsequently the roof components and walls to be demolished. In the observations made about the damages at the corner junctures of the external walls, formation of cracks has been detected despite the fact that there was no discontinuity in the mesh system. The damages in the form of cracks that have occurred on the corner junctures of the external wall are shown in the Figure 2-3 below.

Fig. 2-3. Damages on the corner junctures on the external walls

Two types of crack damages occurred with regard to the damages on the junctures of the external walls and internal walls. The first one of them was the vertical cracks that have occurred on the structure of the external walls mentioned above and the second one is the vertical and transverse cracks in the internal wall at the juncture of the external wall. The cracks formed on the bearing internal wall have been caused by the stresses that have occurred as a result of the horizontal loads being parallel to the external wall. An example of the said damage is given in Figure 2-4.

Collapses have occurred due to the pressure exerted on the external wall by the wooden beams in the form of round wood which bears the soil roofing.

Fig. 2-4. Damages formed on the junctures of internal & external walls

This type of damages occur more frequently on the weak walls on the window and door apertures in which there is no continuity in the vertical direction. The heavy roofing has increased the collapse at those points. It has been observed that there is no beam on the external wall in the buildings about which a damage assessment has been made. An example of such a damage is shown in the Figure 2-5 below.

Fig. 2-5. Damages formed on the wall junctures of the beams of the roof

4. Assesment Of The Damage

The adobe buildings which have a masonry type structural system has a rigid nature. For that reason they incur more vertical loads during the earthquake. The reciprocating motion of the earth during the earthquake brings about an effect of inertia in the building and elements which previously carried only vertical loads like the wall and vertical beam also incur the impact of the horizontal loads that have came into being as a result of the earthquake. The characteristic features of the masonry type construction material is that they have a middle or high level of resistance against the pressure loads and stresses and a low level of resistance against the tensile stress (Krawinkler 1995; Sanchez-Silva et. al. 1994; Işık et. al. 1996).

The material used in the masonry type adobe buildings crack even in very low translations since they have a crispy structure. Cracks are formed in the structural elements like the walls when tensile stresses exceed the existing pressure stresses due to bending. The effective cross-sectional area against the cutting strength decreases after the occurrence of the crack. The crack widens and turns into a split when the shearing strength of the material has been exceeded too. While the behaviour of the rural building was elastic before the occurrence of the crack, the dynamic properties of the building changes along with the occurrence of the crack. As a result of the crack, the building which is made of walls turns into independently moving pieces rather than remaining as a whole and a partial or whole collapse occurs during the subsequent displacements.

The first of the types of cracks that have occurred in the adobe houses in the rural region of the province of Van have been caused by the addition made to the building. Another reason of this type of cracks is that the flank walls of the additional building is not built and the joint use of the existing wall as flank wall. In the plan the U shaped bearing walls incur a high level of tensile forces under the influence of earhtquake. A structural framework in the form of a box in a building of masonry type reduces the tensile forces on the external walls against the earthquake forces to the minimum level. For that reason, the additional spaces which were added to the building later must have an independent flank wall in its juncture with the existing wall (Özge 2002; Önel and Akbulut 2002**)**.

When the cracks formed in the middle regions of the external wall are examined, no dimensions in terms of the length and height of the wall beyond the limits in respect of the earthquake have been found out. The fact that there are no beams on the bearing walls is the most important factor that have caused the formation of this type of cracks. Besides the unilinearity of the wooden beams of the roof and their settlement directly on the end points of the walls diminishes the rigidity of the building during earthquake. The rigidity of the building shall increase if beams are built on the bearing walls and the wooden floor beams are connected to the beam at a sufficient level. The tensile forces that shall occur in the structure of the external wall shall decrease and the formation of cracks shall be avoided in this way **(**Türkiye Deprem Yönetmeliği, 2007**)**.

The damages in the form of cracks in the door and window apertures generally begin at the end of the lintel that forms the wall aperture and continues in the vertical direction until the end of the wall in the lower and upper points. The tensile forces that take place under the impact of the horizontal loads bring about bigger shear stress on the cross sections of the walls that have shrunk due to the wall aperture, cracks occur in these regions in this way. While the cracks that occur in the non-bearing walls in the concrete structural framework system are generally in the form of X, the cracks in the adobe bearing walls are generally in the vertical direction. First of all, attention must be paid to the proportion of the size of the window to the size of the wall. The thickness of the wall must be built so that it can confront such forces. Besides the adobe structures must have a high level of ductility against the tensile forces. Besides, the adobe structures must have a high level of ductility against the tensile forces. The framework beam which shall be placed on the bearing wall shall increase the rigidity while decreasing the tensile stress and shear stress that shall be formed on the external wall.

The corner junctures of the masonry structures are the parts which are challenged the most during an earthquake. The walls which are perpendicular to the direction of the earthquake under horizontal loads which pass the loads over to the corner junctures, roof construction and floorings. If the connection between the walls was made in a good manner then the walls vibrate together during the earthquake movements. If the connection between the walls is insufficient the walls shall be unable to move together during the earthquake; therefore the resistance of the building against the earthquake shall decrease **(**Özmen and Ünay, 2007**)**. In the applications made in the rural region of Van there is no fault in respect of the thickness of the wall and mesh system. The reason of the damages in the corner junctures of the external walls was predominantly the lack of beam framework and rigid floor slab on the external walls. Notably the wall breaks free since it was not supported from the top against the earthquake loads which come in a direction perpendicular to the axis of the external walls parallel to the unidirectional floor beams. Consequently the inclination of the released wall to be toppled to the side increases. The damage caused by the earthquake on the junctures of the corners shall be avoided to a great extent if a beam framework system which is continuous in both directions and of which corner junctures are rigid is applied. In addition, the risk of damage at these points shall be minimized if a light flooring system which is rigid in both directions is applied if possible.

The cause of the cracks in the junctures of the internal and external walls depends on the juncture systems of the external walls. Roof system distributes the earthquake force to the walls in proportion to their rigidity. If the roof or flooring has not adequate rigidity and is not connected to the walls sufficiently, the load distributed to the walls changes and the weak wall is subjected to a greater force. Furthermore the fact that the lay-out plane of the building is very long increases the tensile forces in the long junctures of the internal and external walls. Besides, the junctures of external and internal walls must be supported by a beam and flooring system that increases rigidity in both directions. Besides the proportion between the length and width of the building must also be determined in accordance with the regulation **(**Arslan 2010).

Shear stress occur in the structure of the wall as a result of the pressure exerted by the round wood shaped wooded beams that bear the soil roofing on the external wall. This type of damages occur more frequently on the weak walls on the window and door apertures in which there is no continuity in the vertical direction. In addition to the heavy roofing the roof load which increases as a result of the snow load becomes very effective on these points. The fact that there are no beams on the external wall renders it impossible to turn the point loads coming onto these points into distributed loads. In addition to this, the resistance of the Wall decreases to a significant extent as a result of its absorption of water and humidity within the course of time. Consequently ruptures occur in the wall and that is followed by the collapse of the roof construction. The solution of this problem is, first of all, to transfer the unidirectional roof load to the walls in two directions. The transfer of the point loads of the roof beams to the wall as distributed loads by means of the beam framework shall lead to the decrease of the shear stresses that cause collapse in those regions (Göçer 2014).

5. Conclusion

Various types of damages have been found out as a result of the observational examination of the earthquake impact on the adobe houses in the rural regions of the province of Van. The said damages may generally be classified under five groups, namely vertical cracks and opening damages in the external wall, damages arising from the apertures of the doors and windows, damages on the corner junctures of the external walls, damages on the junctures of the internal and external walls and damages on the external wall junctures of the roof beams. The decisions on structural design which must be taken into consideration in this study in which the causes of the damages and the proposals of solutions have been evaluated may be summarized as follows:

- Planning and application of U shaped bearing wall must be avoided in the external wall junctures of the horizontal parts added to the building later because of the discontinuity of the wall pattern. The new added part is made of four walls has a structure in the form of a box.
- Beam with a continuity must be placed on the bearing walls in order to decrease the tensile strength and shear strength that shall be formed on the external walls as a result of the impact of earthquake. In this way the framework beam would increase the rigidity and ensure the building to exhibit the behaviour of a box during earthquake.
- Another application that would increase the resistance in adobe buildings is the bi-directional positioning of roofing beams or in the form of reinforced concrete plate.
- A light covering with the required level of insulation performance must be preferred instead of the application of earth–sheltered home which increases the weight of the structure as a result of the impact of snow load and causes much more damage under the impact of earthquake.

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CHAPTER NUMBER 3

RESTORATION PROCESS OF CHURCH OF THE HOLY PILGRIMAGE-AGHTAMAR IN VAN

FATMA SEDES

Church of the Holy Pilgrimage - Aghtamar and a monastery complex around it are on the Aghtamar Island within the boundaries of GEVAŞ district which is at 4 km far from the coast of Lake Van towards the west side of central Van. Departing from the peninsula so-called Çumar Peninsula transportation is organized by boats. The Kartalkaya Firm, which has executed the restoration implementations and landscaping here established a temporary pier for the reason of easing and accelerating the actions, beside the pier from which the traveler boats depart. Transportation, lasting approximately 20 minutes to the island was being provided and the materials required for the restoration have been transported in this way.

In this article, history of the monumental building, its current condition, architectural features and restoration process are evaluated.

Keywords: Akdamar, Aghtamar church, monumental architectural restoration

1. Introduction

From all the building complex, which remained to us are the main church building and a belfry, on the west, Jamadun was established in 1763. There also exists a the Katalikos Zakarias Chapel dating from 1296 and the Saint Stephan Chapel from 1293. As found in the northern side of the church and called summer chapel, the construction date of the building is not known (Öney 1990).

1.1. History of Aghtamar

When it is about the short history of the monument and its surrounding; we shall mention whole Eastern Anatolia and especially the Van region witnessed wars among Byzantine and Sasanians in the middle ages, and a continuous change in management occured. This region started to be ruled under the domination of Muslims in the midst of seventh century, that is to say in the Omer period. Armenian domination again began towards the end of the century; as for in the Abbasid state period, it turned to the Governorship of the Province. The Vaspurakan Armenian Kingdom could survive its existance dependently on Abbacies as its foreign affairs (Doğanay 1983).

According to the historians, Caliph Mukdedir has rewarded the Vaspuran King Gagik by giving him a crown as a gift, in the beginning of the tenth century. Together with this guarantee King Gagik began to carry out actions with the aim of prospering its kingdom in terms of management and artistic aspects, and charged Monk Architect Manuel -who was under his command at the time- in the name of holy pilgrimage to establish the Aghtamar Church and the Monastery Complex in the Aghtamar Island (Güzeloğlu 1996).

According to the historians, it's known that simultaneously a magnificent palace was built in the Island. After the expiration of this kingdom in the beginning of eleventh century, additional chapels and buildings around the Church of the Holy Pilgrimage and its Monastery for meeting different functions were established (Güzeloğlu 1996).

Fig. 3-1. General view of the Aghtamar Church

1.2. Current Situation of the Monumental Building

The Aghtamar Island and these historical- monumental buildings embrace numerous local or foreigner visitors every year. Before starting implementations of restoration and conservation, the Holy Pilgrimage Church and its additional buildings had been affected by earthquakes. In its close surrounding, the sepulchral monuments, called as KAÇKAR with their low reliefs were also open to destruction (İpşiroğlu 2003).

Fig. 3-2. Central dome of the Aghtamar Church

1.3. Architectural Features of the Monument

From architectural point of view, the Aghtamar Church is similar to the other Armenian churches four – sectioned and has a plan with central dome. The building confronts us as an original monument with its high reliefs on its fa**çades. Besides religious figures,** also hunting scenes, different animal figures, vintage representations, princes and figures of Saints exist. On the inner surfaces of the church wall paintings, scenes from the Torah and the Bible are found (Bingöl 2007).

Fig. 3-3. Inner frescos of the Aghtamar Church

2. Restoration Process of Monumental Buildings

Depending on the decision of the Ministry of Culture and Tourism, as constituting a base for the restoration of the monumental complex by ensuring the relief, restitution and restoration projects were prepared. Then, they were submitted to the examination and confirmation of the Cultural and Natural Heritage Preservation Board in Diyarbakır. After the confirmation of the projects which were interpreted to be sufficient, **t**he Ministry of Culture and Tourism initiated a tender for restoration by an allowance assignment to Special Provincial Directorate of Administration of Van in 2005. Because of the Kartalkaya Firm's offer and conditions were considered to be suitable, they started to work by controls assigned by the General Directorate of Cultural and Natural Heritage, project owner, and with the participation of consultant seniors too in May, 2005. During the restoration of that artwork -as which is a gift on this geography-, Mr. Zakarya MİLDANOĞLU was also added to the team. In the end of the research conducted, by confirming that the tuff stone which was used to build the monument and further added a great feature to the building by giving its color to it, was brought from KOTOM, which is now a village in Tatvan. So, for the considered places in the restoration project, original stone has been used.

Since a restoration work does not accept any uncompatible interventions, as material and technique,maximum effort for being careful during taking the steps in its implementation has been carried out (Sedes 2005).

Fig. 3-4. A scene of restoration process.

Fig. 3-5. Restoration of frescoes

Departing from this idea, Paolo PAGNIN, a stone conservator who has made successful applications in stone conservation field was invited from Italy, and his opinions and suggestions were asked. In direction of PAGNIN's specialized knowledge, in the future from the members of Council of Science will be also approved stone conservation, pyramidal (conical) roof insulation and restoration of the other outbuildings' roofs, and the hardening processes of Saint Stephanos chapel have been carried out. With the thought as the restoration act should be realized by taking opinions of experts from various occupational groups, with patience and care, the implementations in this work were determined as the primary purpose in its application. As a consequence of seasonal conditions, the suspended works started again in April 2006.

The objective of these works was once more with the same patience and care. The conservation of the wall paintings with their religious scopes, which was found on the inner surfaces, its consolidation were carried out.

The residue of building was revealed at the close environment of the church, and to hardening by protective measures. During the excavation, monastery rooms, which were 13, a cistern and other annexes' residual and building foundations, have been unraveled.

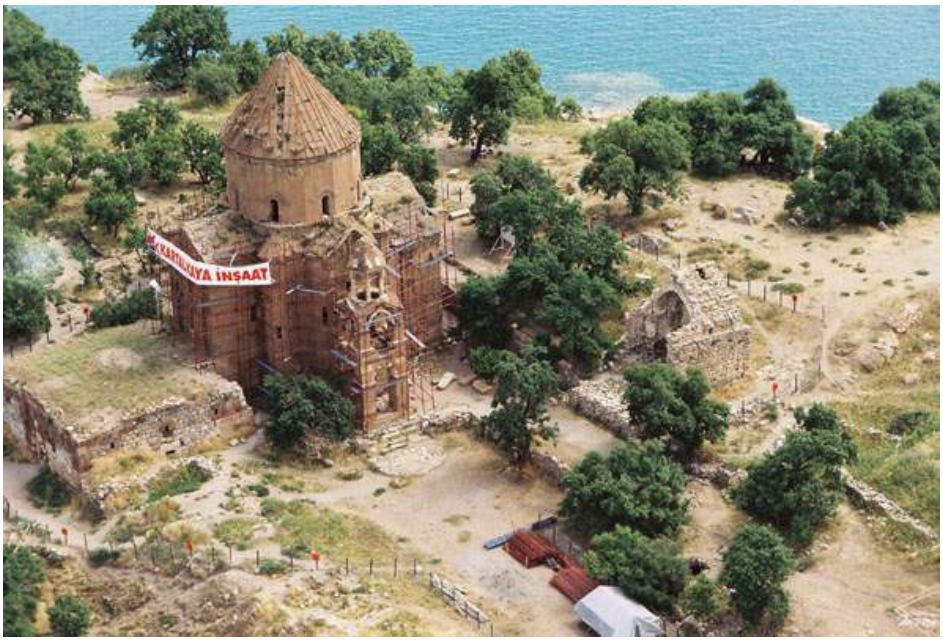

Fig. 3-6. Aerial view

Examinations about the type of the material on construction of monument and its current situation and analysis were accepted as the first step for forming a methodology of appropriate clearing, consolidation and protection. Therefore, during construction stages of the relief, restitution and restoration projects and before beginning of the implementation, laboratory analyses have been made by taking material samples (stone-mortar-plaster) which belong to the Aghtamar Church. In this stage the Istanbul Restoration and Conservation Central Laboratory Directorship has given to the work a great support. Also supports of Ülkü İZMİRLİGİL who was the Director of Istanbul Restoration and Conservation Central Directorship, Assistant Manager Güven GÖKÇE and controller Master Restorator Gülseren DİKİLİTAŞ who was assigned to this project by the Ministry of Culture and Tourism. In this regard all the mentioned issues are important in name of performing a healthy analysis and implementation.

Considering that restoration is an interdisciplinary work, during the restoration of Aghtamar Church, in the name of the success of implementations, we have been benefited from scientific approaches. In association with this, determination of construction materials (chemical, physical, mineralogical and petrographical features), environmental, biological factors in the restoration, processing shape of stone and the mortars, determination of the reasons of deteriorations, were realized as primary steps (Sedes 2005).

Fig. 3-7. Aerial view (Before the restoration)

After the determination of material features and analysis of questions which caused deteriorations, strengthening stones on the façade and the wall paintings inside and cleaning were to be started.

As mentioned before, for the construction of the main walls of the Aghtamar Church the tuff stone was used, which was brought here from the KOTOM region (now the Küçüksu Village) of Tatvan. Besides, it was determined that the roofs were covered with stone plates with various dimensions, which had been formed by cutting the Ahlat stone (Ignimbrite). During determination of the cleaning method, the concept of the method was asked to the experts of Directorate (above stated), besides the Restoration Expert Rıdvan İşler (A Member of Aghtamar Science Council) and Italian Expert Paolo PAGNIN were asked for their opinions (Sedes 2005).

Fig. 3-8. Frontal view (During the restoration) photographed by the author

As valued unique by the art history of the world, the cleaning method was determined as low pressure water application, instead of chemical and mechanical cleaning methods, with the purpose of cleaning and strengthening the reliefs on exterior surface (low reliefs) and in the way without causing destruction on them.

It was easily processed in the time while the stone was moved out from mine, but at the same time with the factors of light and nature, in time of hardening the tuff stone it's known that controlling the chemical cleaning methods progressed hard. Therefore a gel, clay and pulp applications were abstained. On the other hand, as being the world's masterpieces, on these reliefs mechanical cleaning (by using sanding, comb and sandpaper) was never considered for application. Unfortunately, in our country this cleaning method usually and incorrectly is used, by cutting off the protector patina the stone surfaces become open to pollution and other harmful formations. During the cleaning processes onto the stone surfaces with reliefs low pressure soda less water for protecting the formed patina in Aghtamar Church has been used. By virtue of the water of Van Lake includes soda components, it's not preferred for usage and for the cleaning process the water was carried by tankers to the island and was stored (Sedes 2005).

Fig. 3-9. Scaffolding, photographed by Uğur Kartav

While using the hardening material it has been given maximum importance to that the material was recoverable and usage of chemicals that will react with stones. While using the filling materials, the mixtures which were prepared depending to the features of original material, were used (such as mixtures of tuff powder, brick powder, hydraulic lime, washed stream sand).

2.1. Tuff Stone Used on the Walls of the Aghtamar Church

As being lighter than marble and site -when compared to them-, tuff is an easily processable stone type. Since it is processed easily, it was preferable due to the fact that it can undergo a change in color with natural factors (from yellow to golden-brown) and its resistance and hardness increase in time. While it was first extracted from the ground of mine, its color was grey. Its density is 2,01 kg/cm^2, porosity 29,2%, and water absorption in atmospheric conditions 22,6%. Due to this feature, it does not remain in grey color and turns to dark golden brown.

Fig. 3-10. Scaffolding, photographed by author

2.2. Basalt Used on the Floor of the Interiors of the Aghtamar Church

Basalt stone that was used on the floor was largely destroyed. Remained as approximately 1,5 x 2 m^2 from the original floor, it was understood that this stone was basalt, and by supplying different dimensions of it, the floors of chapels and and abscissa's inner have been covered. It is known that the basalt stone is of volcanic masses. Because of imposed rapid cooling it shows a crystalline structure in the frit. Its color is dark grey and by fading in color in time it retrieves to its natural color. Because of Van region basalt is fine-grained, dense, and long-lasting it is appropriate for usage as paving stone. Hardness degree of basalt reaches up to 6 (Mohs) is extracted in our country. Also volumetric water absorption of it is 0.3%.

Fig. 3-11. Frontal view, photographed by Uğur Kartav

2.3. Ahlat stone (Ignimbrite) Plaques Applied On the Roofs of The Aghtamar Church and Its Attached Buildings

Because of the reason of destructions which especially occurred on the roofs, the buildings were open to natural effects like snow, rain and wind Entering from the roof the water accelerated a destruction on the main structure and inner ornaments. According to the consequence of the analyses made, by confirming that used stone plaques on the roofs were the local Ahlat stone, in the restoration project, as with its projected dimensions, they were applied on the insulation layer without ignoring the main details. Ahlat stone is the volcanic remains of the Mount Nemrut. Stone color varies from fawn to dark chestnut red. Silica in the stone gives resistance to the stone. When extracted from the ground of mine, it bears a feature partially smooth and easily processable. In contact with the air, the stone hardens in time (Sedes 2005).

Fig. 3-12. Belfry, photographed by Uğur Kartav

3. Conclusion

By considering the most important principle of the **Venice Code,** it has been avoided from completions that depend on several assumptions during the restoration of Aghtamar Church. As another important principle, the qualified annexes and elements belong to various periods have been protected.

Fig. 3-13. Old picture taken in IXX. Century.

Also while the building was protected, maintenance of its surrounding was considered too. For this purpose, a drainage system was set . Moreover, the walk ways, vista points, stairs which provided the connection with the pier were arranged by the natural stone executed on the Palladian tissue. Restoration is an unending process. In order to transfer the building/ production (of art) to the future -to sustain its continuity-it should be restored carefully.

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CHAPTER NUMBER 4

AN EVALUATION ON VAN RURAL SETTLEMENTS IN THE CONTEXT OF LEGAL AND REGULATORY FRAMEWORK

GÜLHAN BENLİ

Since the rural areas in our country differ from each other in terms of their topographic and geographical features, the problems they have and the needs for solutions are also different. The gaps in existing legislation for the protection of rural settlements with their natural environment and consequently practical uncertainties raise the risk for the rural settlements to lose their original structures. In fulfillment of these needs, the most important factor in terms of the development of rural and non-deterioration of its naturalness; is the effective use of environmental resources of the rural region. At the same time the traditions inherited from generation to generation, beliefs, views of life and assumptions, some indigenous social rituals, are the most important factors in the sustainability of the local identity. However, economic and social interventions coming from outside the rural, affect not only the physical constructions but also the social lifestyle and the socio-cultural habits that the rural have, in a negative way. Within the scope of this study, the definition and implementation on the rural settlement will be examined in the context of the existing legal framework and legislation in our country and the assessment will be held for the protection issues of the areas including rural settlements of Van province located on the eastern border of Turkey.

Keywords: Rural Areas, Rural Settlements, Rural Development, Rural of Van, Legislation.

1. Introduction

In rural areas in our country, the risks brought by decrease of population and aging are increasing and a significant difference between the nearby and distant rural areas from the cities is observed. While the population of rural settlements in the western part of Turkey is

on the increase, some rural settlements in the hinterland where the climatic conditions are harsh and especially in the eastern regions, began to vanish as they faced with the danger of losing their whole population. Therefore, there is need for the enrichment of the existing rural area policy and the development of an approach in design and implementation which is not limited only to the village and its units. Protection of regional characteristics, sustainability of rural originality and characteristics, protection of cultural and historical wealth, also seeing and meeting the changes in the needs of rural communities, are of great importance for the development of the region-wide as well as the whole country.

Fig. 4-1. Examples from Van rurals

3. Rural Settlements in our Country Planning and Policies

It is known that the efforts to improve the living conditions of the rural people living in our country started from the foundation years of the Republic. In 1924, the "Village Law No. 442" was enacted in order to make the villagers acquire a legal personality at that time when a significant part of the population lived in the villages, and a general growth process took place in the agriculture sector until 1950s.

Product types in the agricultural sector increase, relaxing in employment and labour is seen. But rapid industrialization and as well as in all areas, intensive use of the machines based on technology in agriculture, also brings divergence and fractions in agricultural production.

After the 1950s in Turkey, the high population growth accelerates the migration to cities from rural, where the new job opportunities are limited, and our country enters a rapid urbanization process after this period (T.C. Başbakanlık Devlet Planlama Teşkilatı 2013:36).

In the planned period started in Turkey with the First Five-Year Development Plan covering the period 1963-1967, various strategies have been implemented in order to deliver the infrastructure and public services to rural areas and for accelerating development and

progress in villages and rural (T.C. Başbakanlık Devlet Planlama Teşkilatı 2013:36). Since the 1970s, the rural development projects, whose significant part of financed by external sources, those completed or currently being implemented, have aimed at improving quality of life by diversification of economic activities in underdeveloped regions and increasing income.

3.1. National Development Strategies

When rural settlements are examined within the scope of laws and legislation in force in our country, it is seen that the definition and criteria of rural settlement have not yet been clarified in existing laws. Taking into account that the population in rural areas immigrate and the rural contribution to country economy diminishes, the development of a systematic strategy for rural development and implementation is of great importance. In this direction, as needs arise for ensuring the distribution of population of Turkey throughout the country, improving the quality of life in villages and turning them into attraction centres, by providing facilities such as housing, infrastructure, social facilities which encourage peasants to urban, also in the villages, "National Rural Development Strategies" covering many provinces in accordance with our country's rural development policies are being prepared.

When rural areas are examined in the Development Plans, started in 1963 and prepared in five-year periods; it is seen that it took part in the Eighth Development Plan in detail for the first time and establishment of the Specialized Courts on rural areas was proposed (T.C. Başbakanlık Devlet Planlama Teşkilatı 2000**,** 30). Nevertheless, the main definition was made to emphasize urban areas, with a threshold of 20,000 population, and settlements with populations on these populations were regarded as cities.

Urban settlements in the Ninth Development Plan are designated as settlements with population of over 20.000; however, the rural areas are also emphasized as the settlements below this threshold (T.C. Başbakanlık Devlet Planlama Teşkilatı 2006, 48). As stated in the Tenth Development Plan, from the year 2008 "Attraction Centres Support Programme" was started under the execution of the Ministry of Development within the scope of "Priority Transformation Program", the program includes also Van province (T.C. Kalkınma Bakanlığı 2013, 119). However, as the rural area contains differences regarding the indigenous and perception, as emphasized in the tenth and effective final Development Plan, the definition of rural area must be clarified primarily.

The Village Infrastructure Support Project KOYDES which was started in 2005, was put into effect. However, the fragmented and amorphous structure of rural settlement units has limited the effective and widespread supply of the physical and social infrastructure services. Starting from 2010 KOYDES project has been transformed into an integrated rural development programme with the components of small-scale agricultural irrigation and in 2011, reuse of wastewater in rural areas.

In the common objectives of the "Rural Development Plan" of the Ministry of Agriculture and Rural Affairs covering the period 2010-2013 and the "Strategic Plan" of the Ministry of Rural Development covering the years 2010-2014; determining the principles and criteria of the rural planning in accordance with the characteristics of rural areas and with the needs of rural communities, protection of rural settlements, development of physical infrastructure in rural areas and increasing the quality of life are taking parts. In the scope of the rural development projects; fields of activity such as the development of agriculture and raising livestock, irrigation, reclamation of wetlands, construction of village roads, forest road construction, drinking water ponds, drinking water supply, increasing agricultural and animal production and forestation are taking parts.

As for the development of institutional capacities; Agriculture and Rural Development Support Institution (ARDSI), founded by the resources of the "European Union Instrument for Pre-Accession Assistance on Rural Development" (IPARD) provided by the European Union, Development Agencies, existing Special Provincial Administrations and also the unions of service delivery to villages that are supported for rapid development, are the units active in the field of rural development.

The "Urban Classification Study" was made in the Regional Development National Strategy prepared to reduce the differences of inter-regional development levels in our country and covering the period of 2014-2023, and Van Province was among the provinces that have regional growth centres. Within the scope of the same study, the village settlements and the cities with rural character have entered the classification of "rural areas" (T.C. Kalkınma Bakanlığı 2014, 92).

3.2. Rural Settlements in the Existing Laws and Regulations

Regarding the laws regulating the practices to be performed in rural settlements and the regulations on the legal framework, a survey was carried out in accordance with the existing laws and regulations in our country. The laws and regulations expressed below have been found associated with the subject of "rural settlements".

- *Village Law No. 442*

Village Law No. 442 enacted in 1924 has taken on the present state with the articles added in the years. In the content of this law the definition of rural settlements was not mentioned. However, the village settlements have been defined as "People with common properties such as mosques, schools, grassland, pasture, coppice and inhabiting in collective or scattered houses, together with their vineyards and orchards and fields, constitute a village". Village Law regulates the necessary process for the functioning of the necessary works to be done in the village and defines the tasks of village headman and board of alderman

as village administration and the village people. It is important because it is the oldest law where the village-like settlements are defined.

- *Law No. 6360*

The Law enacted in 2012 is one of the latest legislation affecting rural areas. With this law, the fundamental changes related to administrative division throughout the country were brought. At the same time in the administrative size and also in the meaning of rendering service, a new structuring has been envisioned. With this law, the authorities are equated with the provincial administrative boundaries in all the Metropolises newly established. Public entities of the village settlements in the provinces that have become Metropolis, have been removed, they have been removed from village status and passed to the neighbourhood status. As for the small town municipalities in the Metropolitan Municipalities, they have come to the neighbourhood position of the cities they are subordinated to. The services rendered to and infrastructure works for the villages transformed into the neighbourhood, were give to the authority of the Metropolitan Municipalities. Special Provincial Administrations in the Metropolitan Municipalities have been annulled; their authorities are shared between the relevant institutions. On the other hand, in the provinces out of the metropolises, municipalities with population fewer than 2.000 have been closed and transformed into the villages.

- *Zoning Law No. 3194*

By the amendment made with the additional clause no. 6495/73 dated 07.12.2013 of the Zoning Law, which is the basic legal document regulating the country-wide zoning practices; regarding the village design guidelines, the provision of "... in the villages that are significant in terms of the settlement and construction characteristics, architectural texture and character, the level and potential of development, with the objective to protect, develop and maintain these characteristics, village design guidelines can be prepared by the related administrations with the participation of neighbourhood unit. Village design guidelines are approved and implemented by the decision of the related administrative council ..." was enacted. With the same clause, the provision of "... In the villages and other settlements showing rural characteristics, studies and projects of the structures can be prepared by the architects and engineers of the provincial organization of the relevant authorities or the Ministry ..." has been added.

- *Unplanned Areas Zoning Regulations (Official Gazette Date: 02.11.1985 Official Gazette Number: 18916)*

Rural areas and villages also take part among the areas where the Unplanned Areas Zoning Regulations are implemented. Some areas within or outside the boundaries of the municipality and adjacent areas and constructions in areas without plan are also subject to unplanned areas zoning regulations. Related regulations can be applied in built-up area areas and surroundings of the villages and hamlets within or outside the boundaries of the municipality and adjacent areas. It regulates the realization of the zoning practices in this area in accordance with the science, health and environmental conditions. In the regulati-

ons, there is no definition made about the rural areas. However, with regard to the villages, the structuring principles to be taken into account in the construction applications and the process works related to construction permits are explained.

- *Other Laws Related to the Rural Settlements*

Especially the Soil Conservation and Land Use Law No. 5403, partaking in our national legislation; legal arrangements, such as Rangeland Law No. 4342, as well as the Forest Law No. 6831, when necessary, the Protection of Cultural and Natural Heritage Law No. 2863, Coastal Law No. 3621, Tourism Incentive Law No. 2634 are the other legal documents that are regulatory in nature, for the development of the rural areas and in the processes of the use and protection of their natural-cultural values.

3.3. Interim Evaluation

Examining the legal regulations in our country, as a result, rural areas in our country have different definitions in different sizes. It is seen that the definition of rural settlements has not been clarified yet. The only settlement unit which is legally defined and has its own laws is the village and it is an administrative unit. Accordingly, the villages are defined as the settlements with the population of less than 2,000, under the Village Law No. 442. On the other hand, according to the law No. 6360, the villages within the territorial boundaries of the Metropolitan Municipality are transferred into the neighbourhood status and the small towns are transferred into the neighbourhood status with the same name.

According to the Municipality Law No. 5393, the population of 5.000 is considered as a threshold and it is specified that a municipality with the population under 5.000 cannot be established. Hence, considering the Zoning Law no. 3194, it is indicated that, the settlements transformed into the neighbourhood within the scope of Law No. 6360 and of which the rural characteristics are continuing with the population of under 5.000 are to be addressed as the village. On the other hand, in the administrative sense the population threshold of 20.000 may include a part of the cities and a part of the small towns together. In this context, it is not possible to consider only the settlements which have the village status as the rural settlements. Not indicating, within the scope of any laws, of what the rural nature is, leads to some confusion. In Metropolises the status may be more misleading. When this threshold is taken for neighbourhoods, neighbourhoods being in the urban space, with non-rural nature, will create problems in the context of the local needs and planning, by being considered as rural.

With the Law No. 6360 the boundaries of Metropolitan Municipalities have expanded in a way to include rural settlements. However, as it is known the rural settlements, often spread over a large geography, have different characteristics than the settlements with the urban nature and they need different types and kinds of infrastructure and services. In this sense, meeting the needs of rural settlements, especially by and from the budget of the Metropolitan Municipalities, brings a troubled process along.

In addition, with this law, the authority is given to the Metropolitan Municipalities for making or getting made of the typical projects and engineering projects for non-commercial buildings in the old village settlements that turned into neighbourhood. For rural areas formed by geographical, historical and natural characteristics, the implementation of typical projects must be executed in a way not to take precedence over originality and authenticity. In the processes of directing the management and development of rural settlements, defining the environmental and socio-cultural values that form the rural characteristics in a right way and handling with an approach to give priority to them in planning, are having importance.

4. Statistical Regional Units, Van Province and Its Rural Area

4.1. Statistical Regional Units (SRU2)

With the Council of Ministers Decision No. 2002/4720 in 2002, Statistical Regional Units at three different levels in Turkey were established for the purpose of the collection of regional statistics, making socio-economic analysis, determining the framework of regional policies and establish a comparable database conforming to EU Regional Statistical System. Regions defined in the names Level 1, Level 2 and Level 3, were analyzed based on regions and provinces in Turkey, according to their status of human capital and employment, income, economic structures, entrepreneurship and innovation, social and physical infrastructure, accessibility, digital life and communication, natural structure, environment and climate change, energy, institutional structure and social capital, settlement pattern and development (Table 4.1). This status, named as Statistical Regional Units, is indicated in the following table for "Van province" (T.C. Kalkınma Bakanlığı 2014, 41)

Table 4.1. Statistical Regional Units of Van province (Source EADA, SRU2 Region Current Situation Analysis, p. 31)

Level 1 code	Level 2 region name	Level 3 code	Level 4 provinces covered by the region
TRB	Middle East Anatolia	TRB2	Van, Muş, Bitlis, Hakkâri

4.2. Van Province Certain Data within the scope of Statistical Regional Units (SRU2)

4.2.1. Population

In the book *Turkey's Statistics 2014* published by the Turkish Statistical Institute, in the

population data by provinces, the population of Van Province is indicated as 1.051.975 (Türkiye İstatistik Kurumu 2014, 72). It is estimated that at least the half of the population of Van province are inhabiting in rural. This figure is expected to be 1.183.062 for the year 2023, according to the predictions made by Eastern Anatolia Development Agency (EADA) (Table 4.2) (Doğu Kalkınma Ajansı-DAKA 2013, 412). Because the migration from rural to urban in Turkey, is generally from east to west, from inland towards the coastline, Van city centre also has a disadvantage in terms of immigration. A development strategy developed for a rural region may not be appropriate for any other region. As the rural settlements having different characteristics and nature from each other, have problems of again different characteristics and nature from each other, the rural development strategies to be used must be different from each other. Therefore, offering solutions to the problems of all rural areas with common strategies is rather difficult. In order to change this situation, specific strategies to own rural areas of Van province should be formed with an integrated approach to the legal and administrative framework prepared in our country.

Table 4.2. The population projection from 2017 to 2023 for Van province (Source: EADA, SRU2 Region Current Situation Analysis, p. 412)

Years	2015	2017	2020	2023
Van Province	1.087.719	1.112.035	1.148.392	1.183.062

4.2.2. Human Capital and Employment

In 2012, in respect of education level of labour and employment, Van has been one of the lowest regions (T.C. Kalkınma Bakanlığı 2014, 41). Regarding the employment in construction sector, while Istanbul has the largest share, accumulation above the country average was determined in Van. Van is still stated among the regions with the lowest efficiency in the manufacturing industry (T.C. Kalkınma Bakanlığı 2014, 57).

4.2.3. Social and Physical Infrastructure, Accessibility

In terms of social, physical infrastructure and accessibility, as the data of Van province being in TRB2 region, could not be obtained alone; the data in this heading have been transferred within the whole TRB2 region. While the ratio of the population served by drinking and potable water networks, to the total population, is about at the level of 100% in many

provinces, this ratio remains at low levels in TRB2 region provinces (Van, Mus, Bitlis, Hakkari). In terms of cinema and theatre halls in the framework of Social infrastructure, when examining the number of seats per 1000 (one thousand) person, the level of Van province for benefiting from this service also needs to be increased. When provinces analyzed in terms of the number of the libraries and books per thousand people, as Van province is at a very low level in terms of the population factor and the width of the alternative access sources, improvement needs to be made. Education infrastructure in the SRU2 Region provinces (Van, Mus, Bitlis, Hakkari) which is one of the low-income regions of the country, in the field of primary, secondary and vocational and technical education, cannot fully meet the requirements. In these regions, the numbers of students per branch, classroom and teacher are lower status than the country average. In terms of the total number of hospital beds per hundred thousand people, especially SRU2 (Bitlis, Hakkari, Mus, Van), located in the east of the country, is well below the national average. When examining the level of seaway accessibility, interior and the eastern regions are known to have the lowest level of accessibility in this regard. The accessibility index values of Van province are also rather low. Especially, the strengthening of the railway-seaway link will affect both the economic geography of the country and the regional development, rather positively. (T.C. Kalkınma Bakanlığı 2014, 73-79).

4.2.4. Regional-scale projects

In 2010, programming works were started in cooperation with the Ministry of Development, the Eastern Anatolia Development Agency, Van Governorship and Special Provincial Administrations of Van. In this context, in order to ensure the viability of the tourism industry in Van province, Urartu Museum (ongoing), Abali Ski Resort (completed) and Lake Van Pearl Tour Ship Acquisition (completed) projects were put into practice. Within the scope of Van Province ACSP (Attraction Centres Support Programme) Implementation 2011, "Tekstilkent Project" and "Tusba Fair and Congress Centre Project" was planned and these works are continuing (T.C. Kalkınma Bakanlığı 2014, 116,117).

When examining in terms of Van Province zoning plan activities, it is seen that the 1/100,000 scale Environmental Master Plan is available to cover many provinces, however, sub-scale development plans are in need of revision according to these plans (T.C. Çevre ve Orman Bakanlığı 2011, 51). Especially, some areas on farmlands situated to the south of Van city centre nearby Hakkari road, are seen developing contradictious to the development plans. Therefore, fertile agricultural lands and irrigation areas on Van Plain are adversely affected by urban development. Especially after the entry into force of the Law No. 6360, reconsideration according to the new administrative structure of Van province, which is new metropolis in the region, and performing new planning works to determine the urban development strategies for Van, have gained importance. In this respect, planning, organization and service rendering models of the metropolises that are given the servicing liabilities to cover the boundaries of the whole province, including rural areas, need to be developed.

4.2.5. Cultural Assets

Cultural heritage assets in Van province, in terms of scale and varieties, are rather high. However, very few things were done for the protection of these artefacts or to the common benefit of the local people and tourists, for their benefit in a sustainable manner. Distribution in numbers of these artefacts is described in table 4.3. It is considered that all of the artefacts in the whole province could not be determined and the inventory on this subject is defective. It is known that the temples, churches and monasteries belonging especially to Urartu and Armenians are located as much in Van. A large part of these structures shedding light on the different times of the city, have been destroyed and have faced with the danger of extinction. Akdamar Church which is located in Akdamar Island and of which the construction date goes back to years 915-921 A.D., was opened as a Memorial Museum as a result of the restoration made in 2007. Statues and paintings on the walls of the Church are quite interesting and detailed. St. Bartholomew Monastery built by Armenians in Bahcesaray which also received restoration in 2009, is another very important artefact in the region. Carpanak Church and Seven Churches (Warak Wank Monastery) which is established at the foot of Mt. Erek and shedding light on the periods of Urartu and Armenian, are among other important cultural assets. Among many artefacts extant from Principalities, Seljuk and Ottoman periods, the Grand Mosque, constructed on Ahlatsahs time and of which only the minaret is extant, Kaya Celebi Mosque extant from the year 1660, Suleyman Han Mosque, Izzeddin Sir Mosque, Hamurkesen Mosque and Red Mosque are among the other important artefacts in the province.

Table 4.3. Cultural Assets located in Van Province (Source: EADA, SRU2 Zone Current Situation Analysis, p. 334)

Numbers of cultural asset in Van													
Mosque	Tomb	Castle	Church	Cemetery	Bath	Inn	Fountain	Madrasahe	Martyrs monument	Mound	Mansion	Bridge	City gate
22	11	24	30	29	1	2	4	6	1	3	3	11	3

4.2.6. Urbanization Ratio

Research made by East Anatolia Development Agency is indicated in Table 4 for making comparison to Turkey in general. It is seen that in the period covering the years 1980-2010 the urbanization process continues rapidly. It is seen that the urbanization ratio is climbing from 52% to 34% in Van province, as for the proportion of rural settlements it seems to fall from 67% to 48%s. In the period of 2010-2012, it is observed that the same ratio continued stable.

Table 4.4. The ratio of urbanization in Turkey and Van province (%) (1980-2012) (EADA, SRU2 Zone Current Situation Analysis, p. 417)

Years	1980		1990		2000		2010		2012	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Turkey	44	56	59	41	65	35	76	24	77	23
Van	34	67	41	59	51	49	52	48	52	48

5. Conclusion

It is necessary to approach the rural areas as a whole with the villages, common properties, fields, gardens and village inhabitants. Rural areas can be sustained with the survival of these elements together in a balanced way. Many developments in recent years have worn the said elements. As can be observed in the legislation mentioned above, the definition of rural area, the scope and the protection of the existing construction in these areas, the limits of the new construction are quite deficient. Although there are very certain rules related to misuse of the common properties of villages that are not subject to private property (Rangeland, pasture, winter pasture, grassland, harvest and fairgrounds) the ways are sought for opening especially rangelands to structuring (Öğdül 2002, 46, 47). Rangelands that are vital for small and medium-sized agricultural enterprises are also needed for healthy food production. While the misuse of the rangelands requires imprisonment up to three years according to Article 154 of the Turkish Penal Code (TPC), it is determined with the amendment made in the Metropolitan Municipalities Law that the rangelands, pastures and winter pastures within the boundaries of municipality will not be in the same status, and in case of misuse, the subject of what the legal dimension would be left controversial (Gülümser 2009).

Other elements of rural areas are the agricultural production areas, fields and gardens. In the legislation regarding the planning of the village, only the provisions related to construction in village built-up areas are included. Descending agricultural income now ruptures the villages from agricultural production. The migration of young population living in villages and rural to big cities is continuing rapidly. If no new sources of income are found, as a result of the rural poverty, the abandonment of the villages will be next on the agenda. In a process where their needs are not met, it does not seem to be possible for the inhabitants of the rural areas to live in their city where they grew up around, in the long term.

As architects and planners, in contrast to the approach which sees rural areas as potential construction areas, we need to develop a new approach to establish a comfortable rural life that continues its existence in a balanced way with all its elements, of which the quality of life has increased, and we need also to add the rural areas into our research and application fields. Regional architectural construction systems seen in rural settlements of Van province located in the eastern border of Turkey, building material, existence of rural authenticity and characteristics, are very important in terms of protection and sustainability of the cultural and historical wealth. Changes in the needs of the rural societies should be visible by all levels of society. Considering the geographic and topographic conditions, natural and physical data of the rural settlements, inventory study should be done, if needed for each rural area, village or settlement. Accompanied by the inventory study, the preparation of the "Design Guides" for rural area, according to its own local and environmental characteristics, is essential (Boyacıoğlu et al. 2015, 16). These guidelines should cover not only the physical field but also many topics such as pasture use, livestock farming, agriculture and tourism and all these features should be handled in relation to each other in the guide. Rural settlements need systematic analysis and rehabilitation that are specific to their own. Rural settlements have needs for systematic analysis and rehabilitation that are specific to their own. This can only be done by eliminating the deficiencies in our legislation and by clearly describing the practices.

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CHAPTER NUMBER 5

PROLIFERATION OF THE ECO-VILLAGE IMPLEMENTATION IN VAN WITHIN THE CONTEXT OF SUSTAINABILITY

PELİN KARAÇAR

Various suggestions have been developed in order to create sustainable alternative life environments for solutions against environmental, economic and social problems being experienced in urban areas in a world where sources have been rapidly consumed, climate change has been experienced, social inequality has been globally increased, disengagement with nature has been expanded and social cooperation has been gradually weakened. One of these suggestions is eco-village model which is based on sustainable development principles and ecological findings. Eco-villages of which examples have been situated throughout the world have existed through combination of environmental approaches arose in 1960s and 1970s. Migration from rural to urban areas which is a common problem in Turkey has been also seen in nearby the province of Van. In this study, examples of eco-village had been applied around the world will be examined within the framework of sustainability, green building and ecology. Further studies concerning the expansion of eco-villages, which will be established according to the regional and settlement characteristics of Van; and this will be evaluated within the context of sustainability in order to extend the usage of Eco-Village model with physical and regional components of rural settlements of the province of Van for cultural and social development.Cultivation by using bio-areas of the region, supporting organic food production, establishment of settlement units by using local materials, using renewable energy while remaining faithful to ecological working principles, protection of bio-diversity can be provided by the proliferation of eco-village applications in the province of Van and its environs. Beside raising awareness of life cycle, practicing waste energy management for clear air, water and soil, and protection of nature and the control of ecological footprint can be promoted.

Keywords: Van, sustainability, ecology, eco-village, mud-brick.

I. Introduction

There are considerable numbers of traditional villages which are self-sustainable in Turkey. Recently, it has been observed that young population residing in villages has declined and migration towards urban areas has been increased. This migration has caused important problems for both rural and urban areas whilst traditional villages and provinces as well as eco-villages have experienced problems related to sustainability. In order to solve such problems, it is required to share facilities and experiences among eco-villages, traditional villages. Moreover, provinces should adopt the idea of coexisting together instead of excluding each other.

The term of eco-village (ecological village) has been firstly coined by Robert and Diane Giane's article *Ecovillages and Sustainable Communities* in 1991 and defined in a comprehensive way. Eco-Village model is described as "settlement that a group of people have been living together with all creatures and nature with a sustainable and satisfying life style." Therefore, Eco-Villages are very genuine and multi-layered in terms of local naturalness and social environment. The aim of eco-villages is to develop and apply sustainable settlement in a small scale based upon ecological principles. Eco-villages with examples from throughout the world has arisen from combination of environmental approaches appeared during 1960s and 1970s (Gilman 1991).

The term of sustainability has been defined as "development meeting the needs of today without endangering capabilities of meeting needs of future generations" in Brundtland Report; thus, future vision has been put at the forefront for the first time. This brought ethical and social responsibility ideas into agenda again along with dimension of time. Hence, the concept of sustainability, today, refers a wider perspective with a longer period. Recently, concept of sustainability has been used in almost all sectors related to architecture, from design to building construction (Ciravoğlu 2006).

By taking future generations into consideration, sustainable architecture is the entire eco-friendly activities regarding building construction by giving priority to use of renewable energy resources, using energy, water, material and current area in an active way, protecting health and comfort of human beings within the current circumstances in each period of its existence (Sev 2009).

Sustainable buildings; in other words, green buildings protect and develop health, comfort and productivity of users through natural light and indoor air quality. They are sensitive towards the consumption of natural sources during their construction and utilization and it does not cause pollution. They also provide resources for other buildings after their destruction or return to their place in nature without an environmental damage (Sev 2009).

In the architectural structures built in the past, “green” approaches have been noticed in real terms, the most important factors playing role in these approaches are climate and materials. Materials are selected as natural and healthy and sun, wind and climatic characteristics are considered. Various sustainable solutions have been developed depending on the current environmental circumstances. Regional architectural examples and settlements contacts with climate and topography; and shapes natural design processes of environmental knowledge which utilizes natural and renewable materials (Moore 1992).

Material is the most important structural element that has effect on environment throughout life cycle of sustainable and ecological architecture. Sustainable materials are environmentally conscious while considering the limitations of using non-renewable resources in the process of production and they utilize raw materials efficicently. It should be considered that the environmental effects of material and product while choosing sustainable building materials and how this usage of materials can impact the ecological system beside the possible prevention of such effects (Sev 2009).

The concept of ecology in terms of sustainability defines a worldwide known system which is more recognized (Ciravoğlu 2006). In the end of 1980s, “ecological design” replaced with “green design” or “eco-design” regarding sustainable buildings. The reason of this change of concept is the idea that definition of “green” will be inadequate in future and a wider environmental approach will be defined with term of eco or ecology. In the end of 1990s, “sustainable design” as a reconciliation platform in social, economic and environmental dimensions including “eco-design” or “ecological design” has become the main topic (Madge 1993**)**. Ecological sustainable design suggesting that building is together with its environment brings along evaluation of settlement patterns within this framework. Topography as one of the settlement components that will create a pre-data to ecological sustainable design may be reviewed as natural envelope and orientation land data (Toudert 2007).

Ecology investigates the relation and interaction between creatures and their environments. Due to the fact that environmental problems have appeared and these problems have caused negative results, human beings have tried to understand the reasons and to find the sources of such adverse results. The situation known as “ecological awareness” may be explained as the awareness of human beings as part of nature and as the consciousness that they are required to be in systematic relation with nature. After ecological consciousness, several methods to solve environmental problems and measures to be taken in economic, social and technical aspects have been researched. Environments with buildings designed in an ecological approach are known as ecological settlements. Such settlements are established through ecological planning methods (Tönük 2007).

Eco-villages are human-scaled settlement areas in which people composing society are encouraged for interaction with each other and gathered with people who have common understanding of public spirit for the purpose of reducing overuse of resources and increasing the value assigned to environment (Gilman 1991). Svensson defines eco-villages as intentional societies with sustainable life vision in compliance with creatures and land.

Eco-village settlements are generally developed by being designed by future residents of the society that are engaged to live within a society (Dawson 2006).

There is no certain equation for an ideal eco-village. Development of each eco-village has appeared in different situations. There are several themes and characteristics that are common related to successful ecovillages (Dawson 2006);

- Partnership with an institution such as university
- Connection with Eco-village Network for support and building
- Moral freedom of expression
- Sufficient amount of agricultural land
- Organized economic system managing personal and group financing
- Adequate population size (approximately between 50-100)
- Sustainable applications such as organic agriculture, composting, usage of grey water, bio-filtering, recycling and transformed buildings and stockbreeding
- Collective decision-making process
- On-site enterprises producing food and goods

The most well-known definition of Eco-villages is made in the report of Gilman under the title of "Ecovillages and Sustainable Societies" that is defined as "full-featured settlement areas that are human-scaled and integrated to natural world with a supportive manner to healthy development of human without any damage to human activities and that may be maintained successfully for an indefinite period" (Gilman 1991). Approaches related to this definition will be analyzed as follows:

- "Human-scaled" development encourages connection of society-participation within the process of decision-making. It has been decided in the report that ideal limitation for populations of this type of settlement will be 500 people.
- The term of "full-featured settlements" defines a public life summarizing each dimension of life such as residence, occupation, trade, social life, leisure time but this definition does not mean being totally sufficient or isolated from the current society.
- The term that "Human activities are integrated to natural world without any damage" means equality between human and other life forms and effort of environmental sustainability.

- The term of "supportive to healthy development of human" means balanced combination of all aspects of human needs with personal life in physical, mental and psychological manner. The Report of Gilman indicates that all needs of life must be included in social life.

- The term that "maintaining successfully for an indefinite period" means avoidance of misuse of life systems and commitment to justice (Gilman 1991).

Common Characteristics of Eco-villages

There are a few Eco-villages with different life styles and structures in global level: According to Dawson, five main common characteristics of many Eco-villages are as follows (Dawson 2006):

- "Public value". This characteristics reply to needs of living in an environment in which human beings feel themselves productive, beneficial and valuable.

- "Next residents initiate formation of Eco-villages". This factor encourages independent living act by emphasizing researches on self-efficiency and public participation in each phase of establishment and management.

- "Human beings participating into Eco-village act are people who seek for control over their sources and faiths."

- "While sharing resources, people also exchange values at the same time" tolerance, freedom towards different beliefs, restructuring the society etc.

- Eco-villages act as research and demonstration centers for models and application of new ideas and technologies regarding sustainable lives.

2. Worldwide Examples of Eco-Village

The significant characteristics of Eco-villages are researched by reviewing examples of these villages throughout the world. It has been determined that each of them has been established in different geographical circumstances and designed in different sizes. Along with having different population, they have been established in different years by terms of historical process. These villages have different features within the context of local characteristics such as climate, socio-cultural structure and economy. All of the examples chosen are related to GEN institution. The said examples of Eco-villages are Finhorn, Ithaca, Sieben-linden and Auroville, respectively. As the result of the research, data required for extending eco-villages in the region of Van has been detected.

2.1. Findhorn Eco-village

The foundations of Findhorn Eco-village settlement have been founded by Peter and Eileen Caddy and Dorothy Maclean in 1962. These three people brought their children and

began to live in a camper in a camper park close to Findhorn village located in the most North of Scotland in 1962. In the first year of its establishment,

Findhorn society has been established as a training institution in order to adapt to Laws of Scotland. Components of enterprise were cooperatives and could adopt to Laws of Scotland. Residences established with old whiskey tubs in Findhorn Eco-village became popular throughout the world. The first whiskey tub residence was built in 1986 (Figure 5-1). This type of residences may be shown as a sample application for ecological architectural designs (Findhorn Foundation)

Fig. 5-1. Findhorn Eco-village (Findhorn Foundation)

As mentioned previously, ecological footprint is required to be low in a settlement in order to become a sustainable and ecological settlement. In Findhorn Eco-village, footprint analysis was made in 2005. As a result of this analysis, it has been seen that ecological footprint of a Findhorn Eco-village was half of the average result in the United Kingdom (Dawson 2006). The result of this analysis is shown as the evidence of environmental sustainability of Findhorn. 61 ecological buildings in total situated in Findhorn eco-village has been designed with ecological design principles which are respectful to nature. In the website of Findhorn eco-village, it has been stated that a particular ecological construction system has been developed within the context of experiences obtained for years. Thanks to such construction method it has been suggested that environmentally conscious and energy-active buildings can be constructed (Figure 5-2).

Findhorn Eco-village residents aim at creating “breathing” walls by using natural and nonaggressive materials; hence, they experienced to establish building with a bale of hay. Thanks to “breathing” walls, balance between steam and air circulation has been provided (Findhorn Ecovillage).

Fig. 5-2. A house situated in Findhorn (Findhorn Foundation)

As in active energy recovery methods, demand of electricity in the community are met with renewable energy resources such as Sun and wind and surplus electricity production is sold to main network. By using solar panels, hot water is supplied, rainwater is collected, recycled, and reused for gardening. Sewage treatment is done by a biological treatment system [11].

Fig. 5-3. General view of Findhorn eco-village (Findhorn Ecovillage)

Findhorn supports traditional organic and biodynamic agriculture applications, and 70 percent of fresh food demand is supplied by Findhorn society. Supported agriculture project established in 1994 is the largest and oldest project of its kind in England (Figures 5-3, 5-4). It has been deemed worthy of Candidateship for United Nations Habitat Best Applications in 1998. This eco-village has become a great inspiration source with its success of 14.000 visitors per year. Knowledge and experiences regarding Findhorn has been expanding through publications. Findhorn Eco-village also supports a larger society larger than the project itself (Findhorn Foundation).

Fig. 5-4. Settlement View of Findhorn Eco-village (Findhorn Foundation).

2.2. Ithaca Eco-village

The date of establishment of this eco-village is year 1991. Being among one of the Eco-villages with the highest profile, Ithaca Eco-village (EVI), which is located in the state of New York, is a suburb Eco-village growing in the coast of small university town. Having been established on a 70.8-hectare field, this Eco-village has 3 different neighborhoods. These neighborhoods are referred as FROG, SONG and TREE based upon the order of construction (Ecovillageithaca).

Residents of this village, which has consisted of 60 houses with single-four bedrooms, whose aim is to show sustainable life style by conveying the main culture through educational courses and media (Figure 5). The first design was made in 1991 and following the completion of the first houses, it took residents 5 years to move in. All buildings are super insulated duplex houses with have passive solar power and some of them have systems integrated to network with solar-powered electricity (14 of 60 houses) (Figure 5-6). Besides, solar panels are located in four houses for water, whilst compost toilets are located in five houses; and two houses were built with a bale of hay (Ecovillageithaca).

Fig. 5-5. An ecological house situated in Ithaca Eco-village (Ecovillageithaca).

Fig. 5-6. Picture 6 View of Frog neighborhood (Ecovillageithaca).

The remaining 90 percent of the site has been separated as green area composing of meadow, forest, stream and ponds in order to create various regions for wild life and natural recreation (Figure 5-7).

Fig. 5-7. Top view of Ithaca Eco-village (Ecovillageithaca).

There are two organic agriculture projects supported by community in order to feed a local habitants consisting of nearly 1400 people during vegetation period (Figure 5-8).

Compactness of social areas located in Ithaca eco-village draws the attention. These social areas have been designed to allow common social activities. Even though everybody has contributed several hours in a week to protect autonomous structure of society, many people have possibility to work in paid employment including outdoor cleaning, management, finance and project topics to be prepared related to future thanks to settlement's proximity to the centre.

Ithaca College which may be offered as a model to the projects of residents regarding their own villages and may be used to create an extensive platform in which experiences may be transferred, have connections with Cornell University and Wells College (Ecovillageithaca).

Fig. 5-8. Organic agriculture in Ithaca Eco-village (Ecovillageithaca).

2.3. Sieben Linden Eco-village

82-hectare area, which is close to a small abandoned village called Popau, has been obtained in 1997. In 82-hectare land, there are different types of various houses, gardens and farms. The founders of Sieben Linden settlement have stated that they would like to create an alternative model for life style in which rural and urban culture are balanced in their enterprises (Ökodorf Sieben Linden)

In Sieben Linden Eco-village, it has been seen that the balance was tried to be redressed between public and semi-public areas while planning settlement (Figure 5-9). While public and social areas are situated in the regions closer to the center of settlement, semi-public areas and private residence areas are located farther away from the central area. Vehicles are not allowed in the settlement under no circumstances. All areas are covered with pedestrian walkways, and social areas are situated all along the main pedestrian way. Commercial areas, areas causing noise such as woodworking ateliers are situated to the point close to the entrance of settlement. Thus, the problems regarding both the material supply and noise pollution are solved.

Residents of Sieben Lieden village nearby Altmark in Germany divide their Eco-villages into the neighborhoods according to their life styles for the purpose of creating a model being respectful to nature and of understanding the differences. Contradiction between the largest two neighborhoods emphasizes this point: The first one is more radical society in which machines are not allowed; the other one is a society in which people are gathered due to their children with almost same ages. This society has experienced several different management models such as forum and supervision. It has been stated that people with very distinctive cultural backgrounds and life standards are living together with a common purpose and collective consciousness in the settlement (Ökodorf Sieben Linden).

Fig. 5-9. Top view of Sieben Linden Eco-village (Ökodorf Sieben Linden)

Lastly, settlement area has continued to expand by buying additional 77-hectare Sieben land. Along with approximately 6-hectare land which is separated for residential zone, majority of such area forms forest and agriculture land. Even though many of the residents have been still living in their campers, there are modern houses with low energy, also one of the first hay bale houses has obtained permit for planning from Germany (Figure 5-10). Since then, two hay bale houses were also built (including the largest one in Europe with its living area more than 500 square meters) and the other two houses are still under construction. Sieben Linden has conducted a strict lobbying activities for the purpose of change in building regulations in Germany for easier and cost- effective house construction with a bale of hay. In this settlement area, there are also water source, water disposal and solar pow-

ered heating. Today, there are also tradesmen, consultants and artists including an organic vegetable cultivator and a carpenter as well as some small enterprises such as a jewelry shop and a small publisher (Ökodorf Sieben Linden)

Fig. 5-10. General view of Sieben Linden (Ökodorf Sieben Linden)

2.4. Auroville, India

Settlement of Auroville has been known as “universal town” (Auroville Universal Township) in literature and also as eco-village (Auroville Eco-village). Due to the superiority of their sizes and population, it can be said that it has changed from the eco-village into the eco-town (The City of Dawn).

Auroville has been established in the region of Tamil Nadu of India in 1968 in order to create an “experimental” settlement by Mirra Alfassa who has been known as “The Mother” throughout the world and architect Roger Anger. Being situated in 12 km north of the town of Pondicherry in South India, Auroville consists of 2.160 people from 45 different nations, age groups, social classes and cultures [14]. The settlement of Auroville has been supported by UNESCO, United Nations and Government of India. According to the functions of settlement, it has been divided into 6 sections as 1) Peace Area 2) Industrial Zone 3) International Zone 4) Cultural Zone 5) Residence Zone 6) Green Generation (The City of Dawn).

Auroville has been following and using innovative Technologies regarding energy recovery. The most important renewable energy resource of the settlement is solar energy. In the settlement, solar energy systems have been used for many energy requirements such as heating water, building street lighting, producing electricity and pumping water (Figure 5-11). The other system being used in order to contribute into environmental sustainability in Auroville is waste water treatment systems. Waste water is recycled and utilized for the composting system. (The City of Dawn).

Fig. 5-11. Common area located in the center of Auroville (The City of Dawn).

There is a building which is known as “Solar Kitchen” in the settlement of Auroville for common use (Figure 5-12). All energy required in this kitchen is provided through a hybrid system consisting of solar and diesel motor. In Solar Kitchen of Auroville, food is provided for 1000 people in total per day (Sobo and Hoberg 2010).

Fig. 5-12. Solar Kitchen, Auroville (Sobo and Hoberg 2010).

2.5. Evaluation of Eco-village implementations in the World

In these given examples, it is possible to see many structures in which technological and modern architectural knowledge and traditional architectural knowledge have been used in combination. In the world-wide examples, there are eco-villages built in lands close to urban areas. Ithaca Eco-village is one of these examples. It may be said that the settlement which has enriched itself through urban areas have significant developments regarding self-sustainability. Settlements such as Ithaca are also defined as "urban eco-village". All buildings have passive energy power, are insulated duplex houses and some of them have solar-powered electricity and systems integrated to network.

In Findhorn village, thanks to "breathing" walls, balance between steam and air circulation is provided. In Sieben Linden ecovillage, there are water source, waste disposal and heating with solar power in the settlement. Today, there are organic vegetable cultivators as well as various occupational groups in the settlement. The most important renewable energy resource in Auroville is solar power. In the settlement many energy requirements such as heating water, building street lighting, producing electricity, pumping water are obtained through solar energy system. Besides, the idea of common kitchen is quite a successful system.

In the world-wide examples of eco-village, statements related to mission and vision aim at transforming not only their own settlements but all areas into an ecological settlement.

3. Architectural and Settlement Characteristics of Van From Past To Present

The province constitutes 2.5% of Turkey with its 19.060-square kilometer surface. In terms of surface area, Van is the 6th largest city in Turkey. Van is built on a very low-inclined land which is 5 km away from east side of Van Lake, situated in the hollow part covered with volcanic mountains of East Anatolian Region. Turkish and Armenian people have been living peacefully for years together with good neighborhood relations in the city (Günel 1993).

Continental climate is dominant in the province of Van. Winters are harsh and long. Van Lake provides warmer weather during winter in the higher regions. The weather is under 0°C during winter almost for 150 days in a year. The temperature is above +30°C during summer.

Soil is covered with snow for 80 days. Annual rainfall amount varies between 370 mm and 5700 mm depending on the districts. During summer, rains are very scarce and weather is very hot. Temperature varies between -26.9°C and +36°C. Even though around Van Lake and valleys are covered with rich vegetation, mountains are generally covered with bald areas. The soils offer a landscape of moorland. 70% of soils are covered with meadows and forages, 23% of them are covered with plantation and 2% of them are covered with forests

and brushes. Plateaus and flatlands consist of 33% in total of the surface in the city. Generally, plateaus are located between the mountains. There are signals and characteristics regarding that they have been formed in 3.period. There are 93 villages within the borders of the province (İl Kültür ve Turizm Bakanlığı)

Van has carried the traces of many civilizations from past to present. Within this framework, cave paintings related to prehistoric periods take an important place. Tilkitepe and Dilkaya Mounds and findings obtained from various excavations show the existence of cultures that has survived uninterruptedly as of the Neolithic period in the region. Urartians firstly has Van reached to a higher civilization level. Many castles, temples, rock graves, trenches and other soil and cermet works that have survived from Urartians prove this suggestion (İl Kültür ve Turizm Bakanlığı)

The factors that were effective in formation of architecture of Van which is a city hosted many civilizations and even became capital city in the past are the materials such as climate, geological-topographical structure mentioned above and the materials found nearby.

In the formation of civil architecture, particularly materials of mud brick and stone were dominant in the past in Van and its environs. Windows and doors which are few in number, placed in small gaps within mud walls with 70-80 cm of thickness, were spaces on the surface of wall on which compactness was predominant. Particularly mud was an indispensable material for such regions in the past whereas natural materials such as wood and stone were rare and expensive beside industrial materials such as brick and cement were not cost-effective due to the transportation (Direk 2013/14).

Mud was used for bastion and rampart in military architecture; for church and mosque in religious architecture; for residence building in civil architecture as a significant construction material throughout the history in Van and nearby settlements (Figure 5-13). The most important characteristics of soil used in mud is that it is barren, impermeable and ideal in rate of sand and clay. This type of walls ranging side by side which are smooth and easily shaped are completely dried under the sun and are more resistant and long lasting against snow, rain, wind, cold and hot circumstances than the other mud walls. It is a fact that mud structures are the most appropriate building material for life of all creatures, particularly human beings, in respect of physical and chemical characteristics (Öztürk 1996).

Fig. 5-13. Mud View of Urartian Fortress of Ayanis (Öztürk 1996).

4. Proliferation Of Eco-Village Implementation In Van Within The Context of Sustainability

It is understood that various architectural approaches have been adopted in eco-villages in the world. In these settlements, it is possible to see many structures in which technological and modern architectural knowledge and traditional architectural knowledge have been combined and utilized. It has been thought that experimental architectural approaches would result in proliferation of eco-villages and formation of successful examples around the province of Van. It is required to consider sustainable improvement principles in order to extend applications of eco-village in Van firstly. Accordingly, it is required to;

- prefer usage of natural materials related to the geography where the structure is located,
- combine traditional construction methods that have survived and developed with experiences and recent information; and find the most appropriate solution for the nature,
- create local and basic design products,
- be accessible to anyone with active user participation.

As a result of the researches, it is seen that mud and stone structures from the past has remained until today when environmental characteristics of Van taking into consideration. Thus, usage of mud and stone as primary material will be preferred for active usage of material.

It is seen in world-wide examples of eco-village that eco-village models may be developed in cooperation with the universities. For the city of Van, it has been considered that eco-village implementations can be performed with corporation with a university and private enterprises in relation with other eco-village establishments around the world. Awareness of society in terms of economic, cultural and social requirements without destroying traditional fabric is necessary for proliferation of eco-villages. Projects that will support economic system must be developed. By using rural areas close to the province of Van adequately, a planning must be performed. Organic agriculture, composting, grey water usage, bio-filtering, recycled and transformed structures must be provided. Establishment of enterprises for changing the production into the trade will contribute to village economy as the way it does in other examples.

In the suggested eco-villages, some effective solutions can be obtained by using solar power, wind power, biomass energy or geothermal energy. Incentives, lending facilities, tax deduction, absorbing some part of the cost in first investment may encourage private entrepreneurs. In case of disputes arising in these eco-villages, keeping the written records of management decisions and property sharing may prevent in-group conflicts and confusions.

In the settlements where renewable energy systems are often applied, it is seen that innovative and experimental studies have been proceeded to increase energy production. In world-wide examples, there are eco-villages built in lands close to urban areas. Ithaca eco-village is one of these examples. It may be said that the settlement improving itself by means of urban areas shows some significant developments regarding sustainability. It has been stated that proximity to the town has positive effects on eco-villages. The idea of solar kitchen in Auroville Eco-village and formation of zones in eco-village planning may be taken as an example. In a similar manner, no admission of vehicles into the settlement in Sieben-Linden eco-village and usage of pedestrian ways are other positive arrangements. Designing commercial, social and residence areas by considering them separately as seen in Auroville is an appropriate solution. Producing design solutions for the regions nearby Van by taking these areas into consideration will contribute to formation of eco-villages.

Findhorn supports traditional organic and biodynamic agriculture application and meet majority of food requirements. It is important to increase ecological agriculture and stock-breeding to meet the requirements fully for the prosperity of eco-villages which intended to be expanded in Van. Eco-village entrepreneurs and residents have to establish closer relations with traditional villages located nearby in order to provide social and economic sustainability of their settlements.

It has been seen that eco-villages are conscious societies and they have been established within the context of some concepts such as sustainability and ecology. However, ignoring and excluding traditional village settlements totally which may sustain in a healthy way for years in rural areas may result is superficial perspective. Eco-village enterprises may adopt the mission of awareness in the traditional villages situated nearby. In order to transform current village settlements into eco-villages, awareness must be raised among the village folk with a comprehensive education regarding sustainability, permaculture, ecology and organic architecture.

5. Conclusion

According to these findings, presentation of a model has been provided by using an IDEF0 modeling technique in order to extend eco-villages. Each of the processes in the developed proposal consists of inputs, controls, limitations, mechanisms and outputs (Figure 5-14) (Karaçar 2010).

Input is defined as the inclusion of accepted product to the process. Control and limitation enables the control and limitation of the process. Process directly orientates and manages the works. Mechanism operates the process by transforming the input to output. Yet, output is the result of the process and transfered to the other processes (Karaçar 2010).

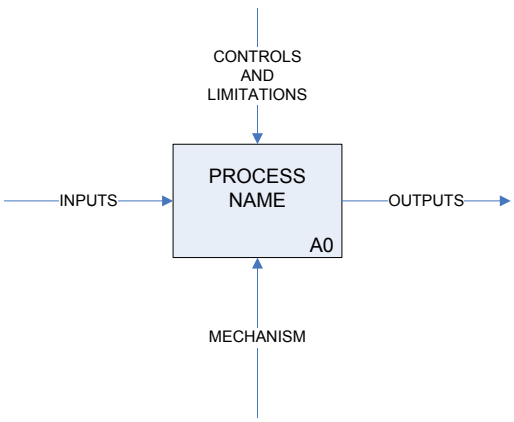

Fig. 5-14. IDEF0 modeling methodology (Karaçar 2010).

Input is defined as eco-village inputs that we would like them to be extended. Inputs are conscious eco-village planning, conscious eco-village users, organic agriculture and raising livestock, climate conditions, materials and tecniques utilized in the past, solar energy resources, sustainability design principles, using mud-brick (adobe) materials, education and ecological resources. Control and limitation enable controlling and limiting this process of proliferation. Control and Limitations are environmental issues, community disputes, economic problems, government policies, regulations and lack of knowledge. The process has directly influences and conducts the studies. Mechanism manages the process by transforming input into output, and output is the result of this process. Mechanisms are the university cooperation, social, cultural, and commercial development, private sector support, sustainability development plans, government supported ecological agriculture projects and global eco-village networks. Suggested model is defined in Figure 5-15. This model's output is proliferation of eco-village implementation in Van within the context of sustainability.

Fig. 5-15. Suggestion Model for proliferation of eco-village implementation in Van within the context of sustainability

Solution seeking regarding environmental problems in the world should be taken into consideration in order to avoid environmental damage and protect natural balance. Using resources ideally, minimizing damage against environment and being in compliance with natural environment is important for the future. This suggested model may help the proliferation of eco-village implementation in Van.

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CHAPTER NUMBER 6

MADRASAS AS EDUCATIONAL BUILDINGS IN VAN

SEYHAN YARDIMLI

Located in the eastern part of Turkey, Van is an important city since it is a settlement dating back to the Ancient Age. The fact that it hosted many civilizations throughout the history and it was located on the Silk Road increased its architectural significance as well and its location highly developed its commercial and cultural wealth. Depending on its geography, Van had many buildings with historical significance such as inns, Turkish baths and madrasas during the Ottoman period. These buildings are important as they show social and cultural development of Van.

Silk Road had always been crucial for transport throughout the history but technological advancement of means of transport decreased its importance. However, Silk Road has regained importance today due to competition against time and Chine's position in global trade and is updated with the projects that are prepared. Since the fact that Silk Road is on the agenda again will affect Van and its vicinity, it is important to protect artefacts of the city that are significant in terms of architectural history and to determine data in the renewal process.

Reasons such as historical wealth and geographic location of Van (the Silk Road) and having an extensive rural area reveal the necessity and importance of studies on the city that involve findings and suggestions. The genuine value of study is to determine the current state of madrasas in terms of architectural characteristics, building technologies and materials by highlighting the importance of educational buildings during the programming of developments to occur in Van.

Keywords: Silk Road, Van, madrasas, building materials.

I. Introduction

Artefacts dating back to the Chalcolithic Age were discovered in Van City that is a very ancient settlement. The state with its capital Thuspa was founded by Urartian King in the mid-9th century B.C. over said location. It was captured by Turks after 1071 and came under the domination of the Ottoman Empire after 1548. Current Van City was established over a flat terrain in the southern region of the Castle.

Van has fertile soils in terms of agriculture due to its geography and city's economic and social structure prospered due to the advancement of handicrafts and existence of mineral deposits. The city has become a popular destination for many civilizations due to its natural beauties originating from Lake Van. It is a commercial hub and a gate of Turkey opening to foreign countries due to its location on the Silk Road. Despite these facts, Van was included in the "fifth degree developed cities" group that is determined to be the most underdeveloped group in terms of development according to the 2000 Economic Report of Chamber of Commerce and Industry. Van is the 67th developed city among all cities (Van Ticaret ve Sanayi Odası 2000). Thus, it is a region with development priority.

Given the fact that the city is located at an advantageous geography and its social structure, it hosts many important works in terms of architectural history. Architectural works that document living conditions and culture of a city should be determined and preserved since they indicate the wealth, social and cultural structure of that region. This study examines madrasas that are located in Van and have a significant place among the documents of social culture.

2. Position of Van In The Region And The Silk Road

Located at the east of Turkey, Van is the neighbour of Iran and is located close to Iraq, Syria and Armenia (Figure 6-1). Its close distance to Mesopotamia that is the cradle of civilizations and its location on the Silk Road has allowed it to become an important centre for culture and economy. All these reasons urged the public to give importance to education and many madrasas were built in the region.

Fig. 6-1. Van's geographical position according to its land border neighbours (URL 1)

Silk Road that crosses Van has been a crucial trade route between European and Asian countries throughout the ages. A journey of 1,000 miles by German geographer, cartographer and Explorer in 1877 coined the term Silk Road (21st Century Silk Road - OBOR China's Initiative & Related Trade Routes 2015**)**

2.1. Alternatives of new Silk Road today

Reviewing the Silk Road today, China and Asian countries are the economic leaders in terms of direct manufacturers or raw material suppliers. The process of transporting said commodities, semi-finished products or raw materials to Europe by sea and its challenges brought the modern Silk Road alternatives to the agenda again (Kulaklıkaya 2013**).**

According to news covered by The Diplomat in May 2014, the proposal of China for new Silk Road involves two lines. According to the map that shows these lines, Silk Road starts from Asia and runs through Northern Iran, Iraq, Syria and Bosporus Strait in Turkey and through Bulgaria, Romania, Czech Republic, Germany, the Netherlands in Europe and is linked to Maritime Silk Road that is the second proposed road over Italy (Tiezzi 2017).

In 2012 Issue of National Geographic magazine, Silk Road is shown as two main lines, one of which involves more northern areas, on the land apart from marine route (URL 2).

According to Jeremy Page from the Wall Street Journal, 2014, China's plan is to transform this dormant transport network into an international railway, energy road and logistics hub. This plan that is called "Silk Road Economic Belt" that will connect China, Central Asia and

Europe to each other and create a new trade and transport line was announced by President Xi Jinping in the previous period (Figure 6-2) (The Wall Street Journal 2014**).**

Fig. 6-2. Silk Road Line from The Wall Street Journal publication (The Wall Street Journal 2014**)**

When the points outlined above are considered, it can be understood how this matter is current and important. In general, two or three transport lines are shown in the publications on Silk Road and in both cases, our country exists on these lines and Van is located on these lines. Thus, this region will definitely experience economic and cultural revival. In this case, preservation of architectural heritage in this region is crucial. The fact that Van is located on the Silk Road will strengthen the city economically and the promotion of its cultural structure and its contact with the neighbouring countries in this sense will increase its wealth and make significant contributions.

3. Madrasa Buildings

Educational and cultural buildings have always been important in all societies since the ancient ages. Libraries in societies that settled in Mesopotamia region such as Egyptians, Sumerians and Babylonians were located in temples (Yıldız 2003**).** The fundamental educational institution in the Ottoman Empire was madrasa and madrasas were often a part of Islamic social complexes depending on state structuring. Multiple madrasas were available in empire's social complexes in the capitals in order to form universities. Madrasas that were located in the social complexes were integrated with mosque courtyard in time (after 15th century until 19th century, Karakök 2013).

Madrasa buildings were designed in terms of architectural form in the Ottoman architecture to contain a courtyard in the middle, student rooms at the edge of the courtyard and a classroom in the large space across the entrance. Some madrasas were built as two-storey. Every madrasa generally comprises a classroom (Tayla 2007, Dobrowolski 2001**)**.

Madrasas are named according to the type of education that they will give. They are divided into Darüşşifalar (medical madrasas), tabhaneler (guest rooms), darülhadisler (madrasas where the prophet's sayings are taught), darülhuffazlar (madrasas where the Holy Quran is recited), darülkurralar (madrasas where the Holy Quran is taught) and they are the most important educational buildings of that period. Their educational level is equivalent to the level of current universities. Hospices where social and religious affairs are conducted constituted city centres in the Ottoman city formation. Although madrasas were often included within hospices, they sometimes were built as madrasa buildings alone (Cerasi 2001, Güven 1998**)**.

They can be regarded in the historical process generally as indoors or with courtyard. Student rooms that surround the central space and two or four iwans that are opened to the central space and tomb that is sometimes added to this structure form the basic madrasa plan for madrasas with courtyard. Large crown gates appeared in entrances since 13th century.

First indoor madrasas that were discovered in 1140s are without courtyard and are small-scale buildings, of which central space is covered by a dome. These buildings do not have outward-opening windows and they are lighted by a lantern on the central dome (Figure 6-3). Dome space is highlighted instead of iwan as structural characteristic in indoor madrasas.

Fig. 6-3. Yağıbasan Madrasa, 1142-1164, Tokat as an example of indoor madrasa **(**Kuban 2002**).**

Iwan is an important element for outdoor madrasas (Figure 6-4). Two or four iwans are used in the planning. Mostly, a symmetrical set up was chosen over the large iwan axis. Iwans were decorated with glazed bricks or mosaics. Crown gates, portico vaults, door arches and door frames have a well-developed stone masonry. Crown gate shows the monumental characteristics of structure. Crown gate is often a type of iwan without depth and can accommodate rich ornaments (Kuban 2002, Kuran 1969).

Fig. 6-4. Example of madrasa with courtyard, Sahabiye Madrasa, 1268, Kayseri (Kuban 2002**)**

Six madrasa buildings were determined in Van that gave education at university level. Information obtained from Cultural and Natural Heritage Preservation Board of Van of confirms this figure. The high number of madrasas is surprising. This results from the fact that the city is located on a commercially important line like the Silk Road and in Mesopotamia region that was then culturally, commercially and scientifically developed.

Madrasa buildings in Van are examined as a subchapter where their history and architectural characteristics are mentioned and in a second subchapter where their material types and production technologies are mentioned.

3.1. History and Architectural Characteristics of Madrasas in Van

Six madrasas were determined in Van that are regarded as important in architectural terms and of which names appear in written sources. Madrasas are discussed in alphabetical order.

3.1.1. Evliya Bey Madrasa

Information of the building obtained from Cultural and Natural Heritage Preservation Board of Van is given in Table 6-1.

Table 6-1. Archive records showing the general condition of building from "Cultural and Natural Heritage Preservation Board Directorate of Van"

Location	Map section	Block	Layout	Status of Ownership	Date of registration	Type of registration	Type of monument/	Remark
Güzelsu (Hoşap) Willage	L51b17d	154	14	General Directorate for Foundations	22.10.1993	Monument/	Madrasa	-

Madrasa is situated in Hoşap, on the east of Gevirhan Cemetery. Madrasa is thought to have been built in 17th century. It was commissioned by Mahmudi Evliya Bey. The general condition of building before restoration is given in Figure 6-5. Building has a size of 20.5x19.5 m, which is close to square form. The courtyard has madrasa rooms on the east (two rooms) and on the west (three rooms) and a prayer room on the south with octagonal plan and two rooms on the east of prayer room. Prayer room is also arranged as a classroom. Courtyard has a size of 13.8x4.7 m and the building is accessed through the main gate on the northern side and from the southern side (URL 3). Rooms are covered in almost square form by barrel vault from the inside and flat soil roof from the outside. Madrasa was built of rubble stones (Figure 6-6).

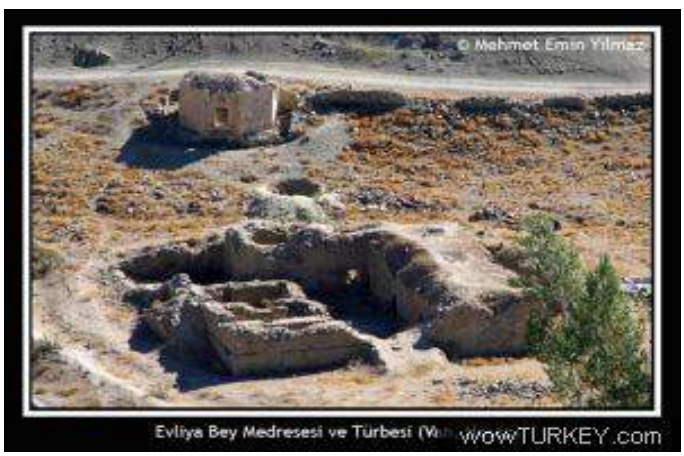

Fig. 6-5. General condition of building before restoration, photo by Emin Yılmaz (URL 3)

Fig. 6-6. Views of Evliya Bey Madrasa after renovation, photos by Architect Hakan İrven

3.1.2. Gevaş İzzeddin Şir Madrasa

Information of the building obtained from Cultural and Natural Heritage Preservation Board of Van is given in Table 6-2.

Table 6-2. Archive records showing the general condition of building from "Cultural and Natural Heritage Preservation Board Directorate of Van"

Location	Map section	Block	Layout	Status of Ownership	Date of registration	Type of registration	Type of monument	Remark
Orta quarter	1	250	1	General Directorate for Foundations	02.04.1993	Monument	Mosque Madrasa	Simple Restoration Decision dated 05.05.2005

Madrasa is situated in Hişet quarter. The building, which does not have an inscription, is considered to be commissioned by İzzettin Şir, Judge of Van and Hakkâri. Constructed in 14^{th} – 15^{th} centuries, the building comprises of a square-plan mosque and madrasa that was built adjacent to the northern side of the mosque. The courtyard is surrounded by rooms from three sides. Room sizes vary. Rooms are covered by barrel vault and built of dimension stones. Crown gate on the west of building provides access to madrasa courtyard and a

second gate here provides access to the mosque. Minaret in the middle of the west side has been added in our day (Figure 6-7) (URL 4).


Fig. 6-7. Entrance side of İzzeddin Şir Madrasa (URL 4).

3.1.3. Hasan Bey Madrasa

Information of the building obtained from Cultural and Natural Heritage Preservation Board of Van is given in Table 6-3.

Table 6-3. Archive records showing the general condition of building from "Cultural and Natural Heritage Preservation Board Directorate of Van"

Location	Map section	Block	Layout	Status of Ownership	Date of registration	Type of registration	Type of monument/	Remark
Güzelsu (Hoşap) Village	L51b16c	179	1	General Directorate for Foundations	22.10.1993	Monument	Madrasa	Restoration30/ 11/ 2008

Hasan Bey Madrasa was commissioned by Mahmudi Hasan Bey in 1563 in the cemetery at the entrance of Hoşap on Van-Hakkâri road. The tomb in the madrasa was commissioned by Şir Bey, son of Hasan in 1585. The general condition of madrasa before restoration is given in Figure 6-8 (URL 5).

Fig. 6-8. The general condition of Hasan Bey madrasa before restoration, photo by Mehmet Emin Yılmaz (URL 6)

Madrasa was built in asymmetric form. Madrasa courtyard has a length of 8.45 m on the north direction, 8.75 m on the south direction, 16.3 m on the east direction and 16.85 m on the west direction. Courtyard is accessed through a uniform stone-framed door the middle of dimension stone wall with 110 cm thickness on the North. Student rooms exist on the east and west side of madrasa and a classroom on the south and a tomb that was later added exist. Cell doors are uniformly stone-framed from the outside and drop arched. Openings of doors with 0.8 m width are closed with pointed arches. A pentagon prayer room that protrudes from the building exists on the south of the building.

A door exists on the northern side of prayer room and one crenel window on each lateral facade. It is understood from the traces that the prayer room is plastered. Upper sides of student rooms are covered by barrel vault and are in the form of flat soil roof (Cumhuriyetin 75. Yılında Van).

One window is placed in the middle of dimension stone covered south and west sides of the tomb (Figure 6-9).

Fig. 6-9. Views of Hasan Bey Madrasa after renovation

3.1.4. Hüsrev Pasha Madrasa

Information of the building obtained from Cultural and Natural Heritage Preservation Board of Van is given in Table 6-4.

Table 6-4. Archive records showing the general condition of building from "Cultural and Natural Heritage Preservation Board Directorate of Van"

Location	Map section	Block	Layout	Status of Ownership	Date of registration	Type of registration	Type of monument	Remark
Eskişehir quarter	164	611	23	Revenue Treasury	10.12.1993	Monument	Madrasa/	Restoration 16/07/2010

The building, which is considered to be among the works of Architectural Master Sinan, is accepted to have been built in 1567. The building survey can be seen in Figure 6-10 (URL 6). Madrasa is situated on the North of the Mosque within Husrev Pasha Social Complex (Figure 6-11). Madrasa is built in the main form shaped by U-shaped student rooms and porticos located in front of them. Classrooms are available in the narthex and on the west of the mosque. The building features Ottoman madrasa plan. Square planned madrasa cells, where rubble stones were used, were covered by a dome. A fountain exits in the middle of courtyard, in front of the rooms. A major part of top coat and walls collapsed (URL 7).

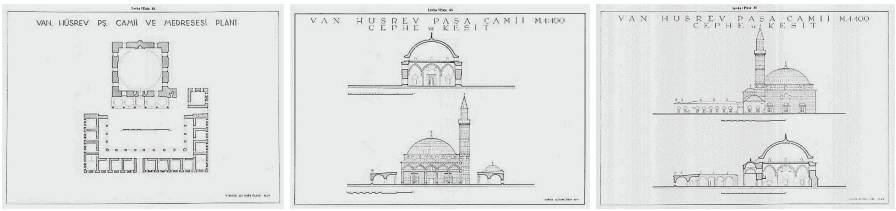

Fig. 6-10. Plan, Cross-Section and Views of Husrev Pasha Mosque and Madrasa (URL 6)

Fig. 6-11. Husrev Pasha Mosque and Madrasa (URL 8)

3.1.5. Mir Hasan- ı Veli Madrasa

Information of the building obtained from Cultural and Natural Heritage Preservation Board of Van is given in Table 6-5.

Table 6-5. Archive records showing the general condition of building from "Cultural and Natural Heritage Preservation Board Directorate of Van"

Location	Map section	Block	Layout	Status of Ownership	Date of registration	Type of registration	Type of monument	Remark
Islam quarter	L49c12a4d L49c12a4c	190	1	Bahçesaray Municipality	20.06.2012	Monument	Madrasa	Group 1 building

Madrasa is situated in the cemetery of Bahçesaray. It is understood from the inscriptions that the building, which was built in 16th century, was renovated in 1737 and 1858. Ground floor cells of the building, a major part of which collapsed up to the basement level, survived. Madrasa is in almost square rectangular form. The building is accessed from the southern side. It is thought to have a courtyard in the middle and two large rooms at both sides. Five rooms exist on the north and their top coat is made of vault. The building, which is thought to be two-storey, is built of rubble stones (Cumhuriyetin 75. Yılında Van)

3.1.6. Pizan Madrasa (Hüsrev Bey)

Information of the building obtained from Cultural and Natural Heritage Preservation Board of Van is given in Table 6-6.

Table 6-6. Archive records showing the general condition of building from "Cultural and Natural Heritage Preservation Board Directorate of Van"

Location	Map section	Block	Layout	Status of Ownership	Date of registration	Type of registration	Type of monument/	Remark
Orenkale (Pizzan) Village	M51b10a1a	142	2	Foundation for the Protection of Cultural and Natural Heritage	26.03.2009	Monument	Madrasa	Group 1 building

Madrasa is situated in Pizan (Örenkale) Village of Başkale. It was commissioned by Hüsrev Bey in 1653. It is one of the independently-built madrasas. The building that is situated in the northeast-southwest direction has a rectangular plan and two storeys. Cells are placed in two storeys on both sides of the rectangular courtyard. Four rooms exist on the southeast direction and three rooms exist on the northwest direction. The number of rooms does not change in both floors. Prayer room is located at the northwest ground floor. The building is accessed by a pointed-arched door on the northeast side. Madrasa is built with rubble stone wall masonry with a simple understanding and without ornaments. Madrasa is thought to be covered with flat roof over soil cover on vault that is frequently used in the region (Figure 6-12) (Cumhuriyetin 75. Yılında Van)

Fig. 6-12. Views from Pizan Madrasa, photos by Architect Hakan İrven

3.2. Types of Materials and Production Technologies Used in Madrasas

Given the traditional building materials in Van City, it is seen that earthen material (adobe) is commonly used in civil architectural buildings. This material is advantageous since it is eligible for climate in terms of thermal comfort, easy-to-produce and economic. However, when madrasas examined in this study are considered, it is seen that all of them are built of stones.

These buildings, where stone material is used, are of course protective in terms of protecting indoor thermal comfort in every climate condition and have longer lifecycles. The fact that madrasas examined in this study are educational buildings puts to the forefront their prestige and magnificence. Stone material is chosen to emphasize the importance of building.

It is seen that domed roof system is used only in Husrev Pasha Madrasa as roofing and barrel vault roof is used in almost all of the other buildings. Almost all of the roofing, where barrel vault is built of stone material, is covered with soil (Figure 6-13). The purpose of soil covering on stone vaults of buildings in harsh climates is to provide a better protection for their roofs.

Fig. 6-13. Covering technique used in madrasas in Van, photographed by author

The significance given to buildings necessitated the use of stone wall. However, cut stones were employed only in one madrasa as wall masonry system and rubble stone was used in others.

Year of built, types of materials used and stone masonry system of six examined madrasas in Van are given in Table 6-7.

Table 6-7. Years of built and types of materials used in Madrasa in Van

1.Evliya Bey Madrasa	2. Gevaş Izzeddin Şir Madrasa	3. Hasan Bey Madrasa	4. Hüsrev Pasha Madrasa	5. Mir Hasan-ı Veli Madrasa	6. Pizan Madarasa (Hüsrev Bey)
17th century	14th-15th century	16th century/	16th century/	16th century	17th century (1653)
Rubble stone wall roof: soil roof on barrel vault	Cut stone wall roof: soil roof on barrel vault	Exterior cut stone interior rubble stone wall roof: soil roof on barrel vault	Rubble stone wall roof: domed roof/	Rubble stone wall roof: soil roof on barrel vault	Two-storey rubble stone wall roof: (thought to be) soil roof on barrel vault

4. Conclusion

First large madrasas in the history started to be built in 11th century and as an institution, they supported Sunni State. They became widespread especially in the 13th century for raising statesmen when the state also gained strength. It is noted for example that Sivas had 13 madrasas in the 13th century. Although many mosques changed in time according to daily needs of the public, except large-scale mosques, madrasas were well-preserved as buildings that would maintain the continuity of state (URL 4). Madrasas have always been nested with the state structure in every period and are buildings that both raise statesmen and give education at university level in all fields of that period.

When it comes to Van City, six madrasas were built in the period from 14th century to 17th century. Although these buildings were built of stone in order to be used for many years, they, of course, needed renovation in time and natural disasters gave great damage to the buildings.

The protection of works in the city based on the vision that it will become a significant commercial and cultural hub in the future since it is located on the Silk Road has a particular importance. Among these works, madrasas that show the value the people attached to education are the most important buildings that bring our past culture to the present. In this context, when madrasa buildings are considered, it can be seen that a serious protection program is needed. Given Evliya Bey and Hasan Bey madrasas that have been recently renovated, it is evident that renovation criteria should be reviewed. It is sad that the same awareness is not shown today although madrasas could be protected throughout the history with a higher level of awareness. Their importance and place in the city culture should be stressed and their maintenance and renovation should be prioritized.

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CHAPTER NUMBER 7

"POLAT YÖRÜKOĞLU HOUSE", AN EXAMPLE OF THE VAN TRADITIONAL CIVIL DOMESTIC ARCHITECTURE

ŞAHABETTIN ÖZTÜRK

The houses situated in the old Van city were completely vandalised during the time Russians and Armenians retreated from the region in 1918. After the year 1900, new houses in groups were added to the houses which had been previously built as vineyard houses in the modern-day city of Van. The houses constructed as single or two-storey were built in the flat, mud-roofed and adjacent order with adobe material. Since 1970, as a result of the quickly changing and developing social life conditions and public's emulation for the ferrocement buildings, traditional houses were abandoned and/or demolished one after the other in the modern-day city of Van. As a result of the neglect and indifference, first, the traditional Van houses among the civil architectural examples which made up the authentic city texture of Van and later the streets and neighbourhoods perished away by being demolished. Today, the number of the remaining historical Van houses in the modern-day Van city, the number of which was 40 until the year 1994, is three. Despite all the negative problems experienced in the modern-day Van city, *Polat Yörükoğlu House* is one of the examples of the traditional Van civil domestic architecture which is struggling to survive. In Polat Yörükoğlu House, there is a yard, a tandoor house and a garden in the back of the house which was built as two-storey. Today, the house which had been used as a dwelling until 1995, is unoccupied and left to its own fate. The curtain flat roof of the house is partially demolished and is struggling to survive. In the yard of the house, there is a water-well and mortar stone which is completely built from stone.There are not written data about the construction date of Polat Yörükoğlu House. Polat Yörükoğlu House was registered by Van Regional Directorate of Cultural Heritage with the declaration no. 854 dated 21.04.2014. The house which is unoccupied today is left alone to its fate.

Keywords: Civil architecture, flat roof, adobe, Van city, clay plaster

I. Introduction

From the ancient times to the beginning of the XXth century, Van province and its surroundings have maintained its importance due to its strategic location and geographical characteristics. The domestic architecture in Van showed development in the Old Van City until the beginning of the XXth century. The houses were built single or two-storey with a flat roof in an attached order (Figures 7-1,7-2, 7-3, 7-4).

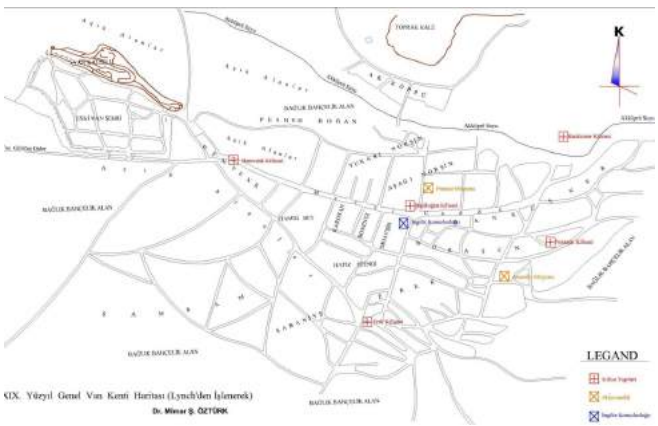

Fig. 7-1. XIX. Century Van City Map , Lynch edited drawn by author.

Fig. 7-2. Modern-Day Van City Van Houses Map, drawn by author.

Fig. 7-3. Panorama of Old Van City (Before 1915)

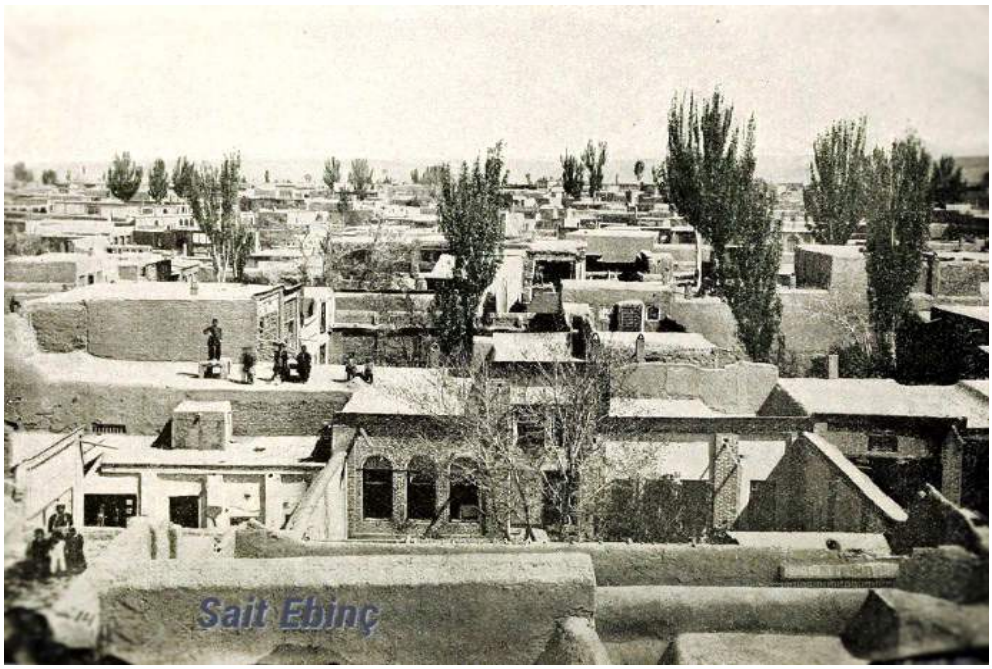

Fig. 7-4. View of Old Van City, photographed by Sait Ebinç

The houses situated in the Old Van City were completely vandalised during the time Russians and Armenians retreated from the region in 1918 (Figure 3,4). After the year 1900, new houses in groups were added to the houses which had been previously built as vineyard houses in the modern-day city of Van. The houses constructed as single and two-storied were built in the adjacent order with flat mud roof and adobe material. Later, the domestic architecture was carried out in the detached order due to the width of the area in various neighbourhoods of the modern-day Van City. Since 1970, as a result of the rapidly changing and developing social life conditions and public's emulation for the ferrocement buildings, traditional houses

were abandoned and/or demolished one after the other in the modern-day city of Van. As a result of the neglect and indifference, first, the traditional Van houses among the civil architectural examples which made up the authentic city texture of Van and later the streets and neighbourhoods perished away by being demolished. Also, that the *Reconstruction Plan for Protect* of the city was not prepared by the authorised institutions, that the institutions did not exercise due care in the registration and determination works accelerated this destruction process. Thus, Van, which had the historical accumulation of hundreds of years, took its place in the forefront among the cities which do not have an identity and lost their cultural memory as its domestic architecture was rapidly being wiped off.

Today, the number of the remaining historical Van houses in the modern-day Van city, the number of which was 40 until the year 1994, is three. There is not an observed big difference between the Muslim and Christian-Armenian houses in terms of outer and inner architectural characteristics (Ünsal and Öztürk 1997, 54-58). When the components such as the position, functional structure, size, number of floors of the complementary proportions of the Van houses are taken into consideration, it is possible to evaluate the Van houses as *Plan Type with Inner Sofa* into two groups as *Single Storey Houses, Two-Storied Houses*

(Öztürk 1998, 24-28).

Despite all the negative problems experienced in the modern-day Van city, *Polat Yörükoğlu House* is one of the examples of the traditional Van civil domestic architecture which is struggling to survive.

2. Location

Polat Yörükoğlu House is located in Cevdet Paşa *(Dere)* Neighbourhood, on Zübeyde Hanım Street, on the north side of the Çalık Street, no. 192 (Figure 7-2, 7-5, 7-6, 7-7). In the back of the house which was built as two-storey, there is a yard, tandoor house, and a garden. Today, the house which had been used as a dwelling until 1995, is unoccupied and left to its own fate. The curtain flat roof of the house is partially demolished and is struggling to survive.

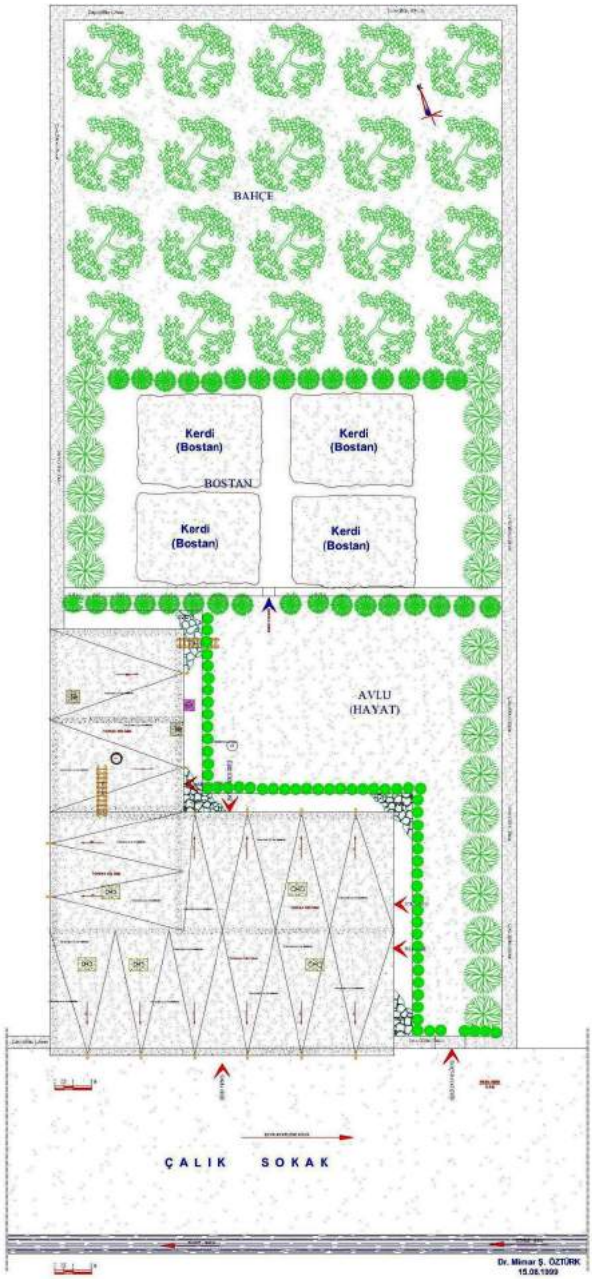

Fig. 7-5. Polat Yörükoğlu House Condition Restitution Plan, drawn by author.

Fig. 7-6. Polat Yörükoğlu House Southwest Panorama, photographed by author

Fig. 7-7. Polat Yörükoğlu House Southeast Panorama, photographed by author

Polat Yörükoğlu House is surrounded by the boundary wall *(möhre)* the entire circumference of which is 2.80 m in height and 0.50 m in width, and which is completed by being pointed and constructed by using the bat construction technique (Öztürk 2013a, 103-114; Öztürk 2013b, 121-133). The southern side of the house is surrounded by a road; the western side is surrounded by a neighbour parcel with a slate flagstone pavement with 1.00 m width. In the yard of the house, there is a water-well and mortar stone which is completely built from stone. The yard located on the northern side of the house is arranged as an orchard and a garden.

3. History

There are not written data about the construction date of Polat Yörükoğlu House. According to the account of Yalçık Kitapçı, one of the neighbourhood residents, Polat Yörükoğlu had the local constructors built the house in the year 1920.

Polat Yörükoğlu House was registered by Van Regional Directorate of Cultural Heritage with the declaration no. 854 dated 21.04.2014 with the proposal of Van Metropolitan Mu-

nicipality. The house which is unoccupied is left alone to its fate. The archive and documenting studies were completed by having the building survey, restitution, and restoration projects and all the data prepared by the relevant experts.

4. Examination of the Structure

4.1. Plan

Polat Yörükoğlu House was built from adobe material as *"Two-Storey, in a Detached Order, with an Inner Sofa, with Two Facades, Having more than Two Rooms, Without a Manor, and Flat Mud-Roofed*" (Eldem 1984, 16-41; Arseven 1983, 570-575; Pektaş 2014; 227-231; Öztürk 2016, 201-214). In terms of inner functionality, Polat Yörükoğlu House is one of the rare houses with the harem and selamlik plan design. The yard located on the northern side of the house, and the south and the east of the garden are surrounded by the möhre wall. The rectangular planned sofa of the Polat Yörükoğlu House is entered through a double-wing hammered metal sheeted wood door with 1.70 m width, which opens in the direction of the street *(south)* (Figure 8, 9,10). The sofa was planned in the 3.75x4.70 m. sizes and in a rectangular form. While the room door situated in the west of the sofa is two ladder steps above, the entrance to the room is enabled through the single-wing wood door with 0.90 m which opens towards the wall. The room is planned in the 3.10x5.15 m. sizes in rectangular form, with two similar bird-wing loophole windows, opened towards the southern main wall, and there are two similar cabinet niches in the western wall.

The room is entered through a single-wing wood door with 1.05 m width, which is situated in the east of the sofa. The room was planned in 3.10x5.05 m sizes in the rectangular form, with three similar bird-wing loophole windows open to the southern main wall, and there are two bird-wing loophole windows open to the east wall (Figure 7-8, 7-11). The interior portion of the room was turned into hole, bathroom and toilet by being changed recently. A curna *(water reservoir)* leaning on the eastern wall of the hole is situated. Through the half-turn single-flight staircase which has 1.10 m width and leaned on the eastern and northern walls of the hole, one can climb upstairs. Through the double-wing wood door situated in the north-western corner of the sofa with the width of 0.95 m. one can proceed to the sofa of the harem portion of the house. The sofa has a rectangular planned order in 3.75x4.75 m sizes.

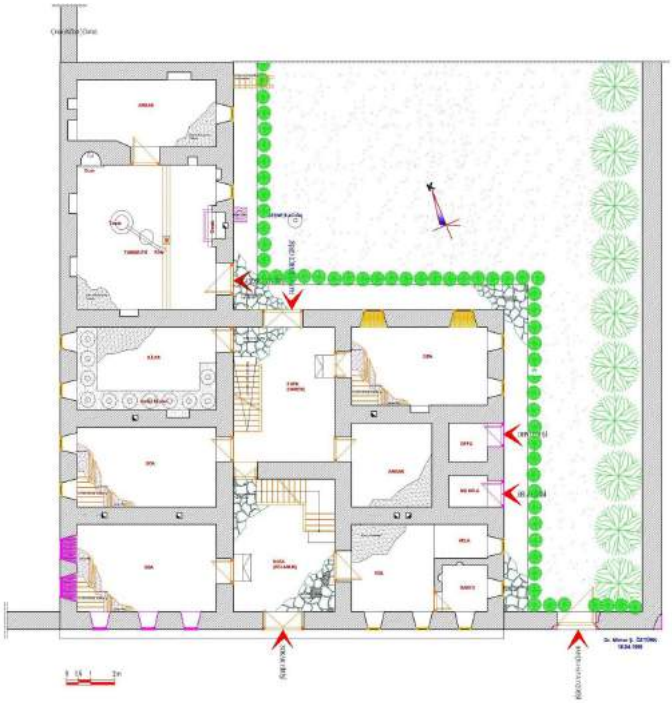

Fig. 7-8. Polat Yörükoğlu House Upper Floor Restitution Plan, drawn by author.

Fig. 7-9. Polat Yörükoğlu House Southeast Panorama, photographed by author

Fig. 7-10. Polat Yörükoğlu Evi Güneybatı Genel Görünüşü, photographed by author

Fig. 7-11. Polat Yörükoğlu House Northeast Image, simulated by author.

Through the single-wing door situated in the north-western corner of the harem portion, with the width of 0.90 m, the access to the room planned in a rectangular form with 2.78x5.10 m size is enabled. There are two bird-wing loophole windows with similar architectural characteristics on the western main wall of the room. There are two bird-wing loophole windows open towards the west main wall with the similar architectural characteristics in the northwest corner of the sofa. While the entrance of the room situated in the northeast of the sofa has the width of 0.90m, the elevation difference between the sofa and itself is climbed over by a two-step staircase. The room has a rectangular formed arrangement in 2.68x5.00 m sizes. Along with two bird-wing loophole windows on the north and east main walls of the room, there is a cabinet niche in the middle of the south wall.

Through the single-wing wood door with 1.00 m width which is situated in the southeast of the sofa, the place in 2.90x3.05 m sizes which is used as a storehouse is entered. There are two toilets situated on the outside of the east wall of the storehouse. One of these toilets is built to meet the needs of people who are indoors, and the other one is built to meet the needs of people who are outside the house, in the garden and in the yard. Through the double-wing wood door with the width of 1.40 m situated on the north main wall of the sofa, one proceeds to the yard, garden and the tandoor house of the house. There is a water-well in the northwest proportion of the yard. The entrance to the tandoor house which is built in an adjacent order to the house is enabled through a single-wing door with the width of 1.10 m (Figures 7-8, 7-12).

Fig. 7-12. Polat Yörükoğlu House Southeast Panorama, simulated by author.

Tandoor House has an arrangement with approximately square form in 5.10x5.15 m sizes. The tandoor house was reinforced with a rounded wooden post in the middle, and wooden supporting beams. In the tandoor house, there are two hearths, one of which to be used every day, a tandoor and five niches in various sizes. Through a wood door with the 1.00 m width, which opens in the middle of the north wall of the tandoor house, one proceeds to the rectangular planned storehouse. There are wood and flour sacks which are used in lightening the hearth and the tandoor in the storehouse (Figures 7-8, 7-12).

Through the single-flight stairs leaning on the western wall of the sofa in the harem portion in 0.95 m sizes, one climbs to the sofa of the upstairs. The sofa was planned in 3.71x4.71 m sizes in a rectangular form. Through the double-wing wood door situated in the northwest of the sofa with the 1.05 m width, the entrance to the room is enabled. While the room is planned in 2.90x5.15 m sizes, in the rectangular form, there are five bird-wing loophole windows in total, three of which are opened on the north main wall of the room, and two of which are opened to the west main wall of the room, and there is a wood cabinet niche in the south-eastern corner of the room *(*Figures 7-13, 7-14). Through the single-wing door situated in the southeast of the sofa with 0.95 m width, one proceeds to washbasin and toilet of the harem portion. While the hole is planned in 1.30x3.02 m sizes and in the rectangular form, there are niches opened to the south and north walls of the hole, one for each. Through a door in the east hole, the toilet is entered. There is a bird-wing loophole window opened to the east wall of the toilet (Figure 7-8).

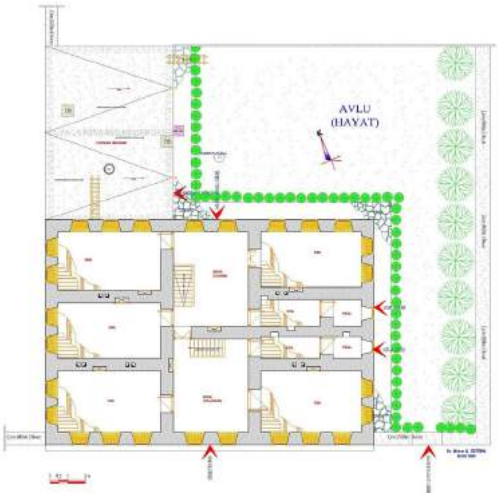

Fig. 7-13. Polat Yörükoğlu House Upstairs Restitution Plan, drawn by author.

Fig. 7-14. Polat Yörükoğlu House Northeast Panorama, simulated by author.

The entrance to the room is made through the single-wing wood door with the 1.05 m width situated in the southeast of the sofa. The room is planned in 2.83x5.13 m sizes, in rectangular form, and there are two bird-wing loophole windows opened to the west walls and a cabinet niche on the north wall. Through the wood door with 1.32 m width opened to the south wall of the room, it is brought into connection with the selamlik proportion room in the south (Figure 7-13). There are two similar loophole windows on the north main wall of the sofa, and with the help of a niche on the south wall, there is a double-wing wood door with 1.00 m width which enables the entrance to the sofa of the selamlik proportion (Figure 7-13). The sofa has a rectangular plan in 3.70x4.75 m sizes. There are two bird-wing loophole windows on the

south main outer wall and a niche on the west wall of the sofa. Through a double-wing wood door with 1.05 m width situated in the southwest corner of the sofa, the entrance to the room which has a rectangular plan in 3.10x5.15 m sizes expanding in the east-west directions is enabled. There are five similar bird-wing loophole windows in total, three of which are opened to the south main wall of the room, and two of which are opened to the west main wall, and a cabinet niche and a double-wing wood door are situated on the north wall (Figure 7-13). Through a double-wing wood door with 1.05 m width situated in the southeast of the sofa, one proceeds to a rectangular planned room which is in 3.15x5.00 m sizes expanding in the east-west direction. There are five similar bird-wing loophole windows in total, tree of which are opened to the south main outer wall of the room, and two of which are opened to the east main outer wall, and a cabinet niche situated in the middle of the north wall. Through a single-wing wood door with 0.95 m width situated in the northeast of the sofa, the entrance to the washbasin and the toilet of the selamlik proportion is enabled (Figure 7-13).

4.2. Facades

The entrance facade of the Polat Yörükoğlu House has a more dynamic structure when compared to the other facades. The entrance south facade of the house is 18.51 m in width, 7.50 m in height. Through the door situated in the east of the entrance facade, entrance to the garden of the house is made. The two and three lines of freestone stone blocks situated on the both sides of the entrance door situated in the middle of the south facade of the house, which is the most dynamic facade of the house, and in the east and west corners of the facade, are taken in the frame by wood sills (Figures 7-15, 7-4, 7-5, 7-10). The windows with metal railings situated in the south facade of Polat Yörükoğlu House brought dynamism to the facade with a symmetrical order by being situated on the same axe in the horizontal and vertical.

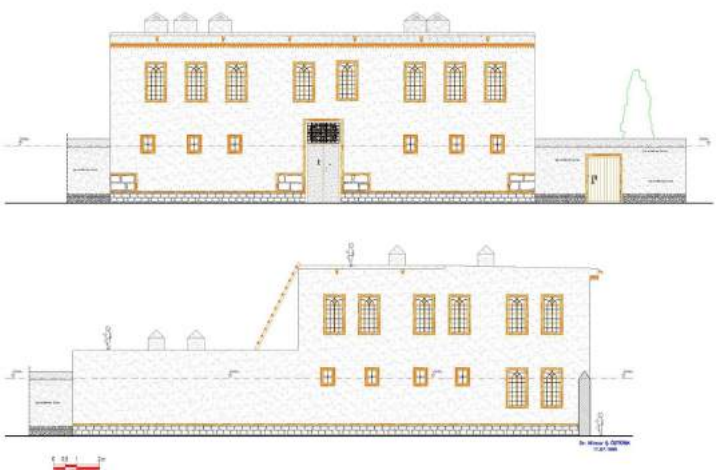

Fig. 7-15. Polat Yörükoğlu House South-West Facade Restitution, drawn by author.

Fig. 7-16. Polat Yörükoğlu House Southeast Panorama, simulated by author.

The western facade of the house is 22.56 m in width and 7.50 m in height. While the single storey tandoor house of the house is entirely dull, there is not a window. Along with the six windows on the ground floor of the house, four of which are small, and have symmetrical metal railings, and two of which are big, and there are eight windows with rectangular form upstairs. There are two wood gargoyles *(*şoratan*)* in the facade without eaves (Figures 7-17, 7-8, 7-9, 7-16). The eastern facade of the house is 22.56 m in width and 7.50 m in height. There are a door and two little windows in the single storied tandoor house facade of the house. The facade was livened up by two symmetrical toilet doors and six symmetrical little windows in the ground floor of the house, and along with them, four rectangular formed windows which are two little windows in the middle, and two nearby on both sides (Figures 7-18, 7-9, 7-11, 7-14).

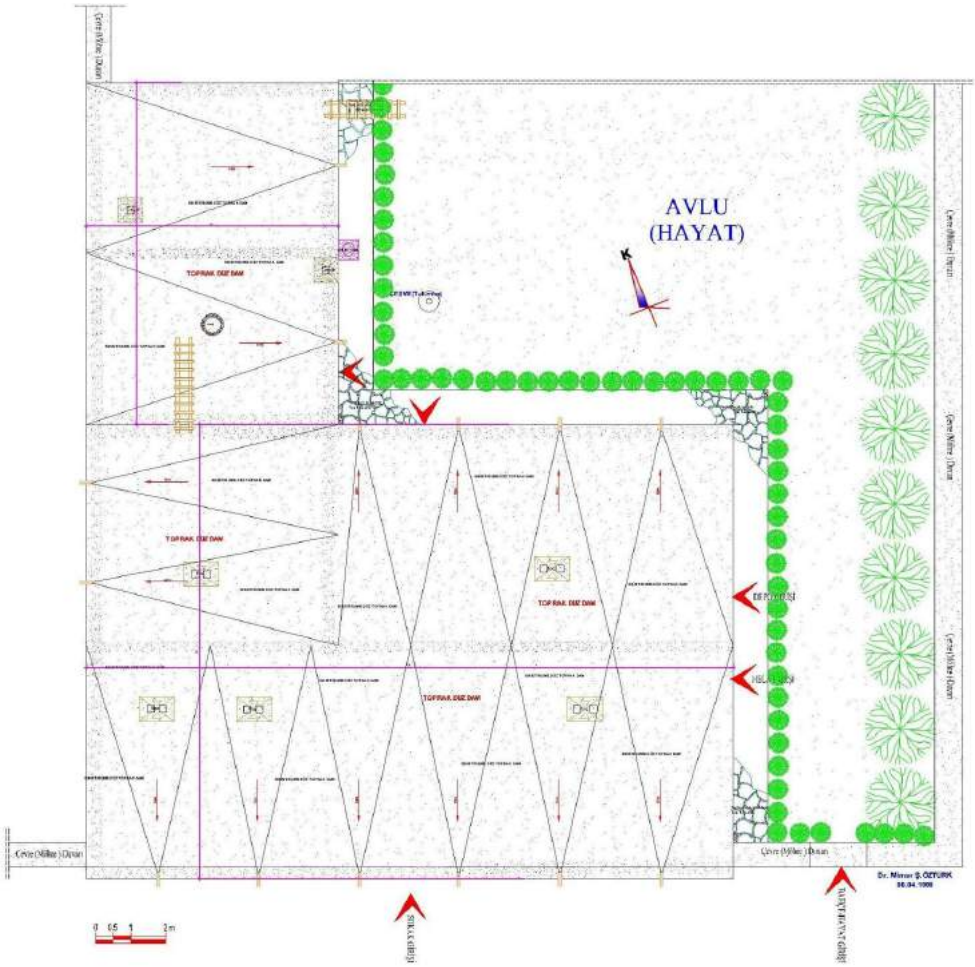

Fig. 7-17. Polat Yörükoğlu House Flat Mud-Roof Restitution Plan, drawn by author.

The main walls of Polat Yörükoğlu House enabled the passing to the flat mud roof through the ornamental wood eaves on the south main walls with the width of 0.30 m, as for the other facades, they are without eaves. The surface of the facades was elevated up to 0.45 m height with two lines of rough freestone and the crossing to the mud-wall was enabled through a wood bond beam. The rhyme order in the vertical and horizontal axis of the windows on all facades apart from the dynamism they provide in all facades, the harmonious integrity and blankness rate is in a harmonious structure with the entire facade (Figures 7-18, 7-9, 7-11, 7-14).

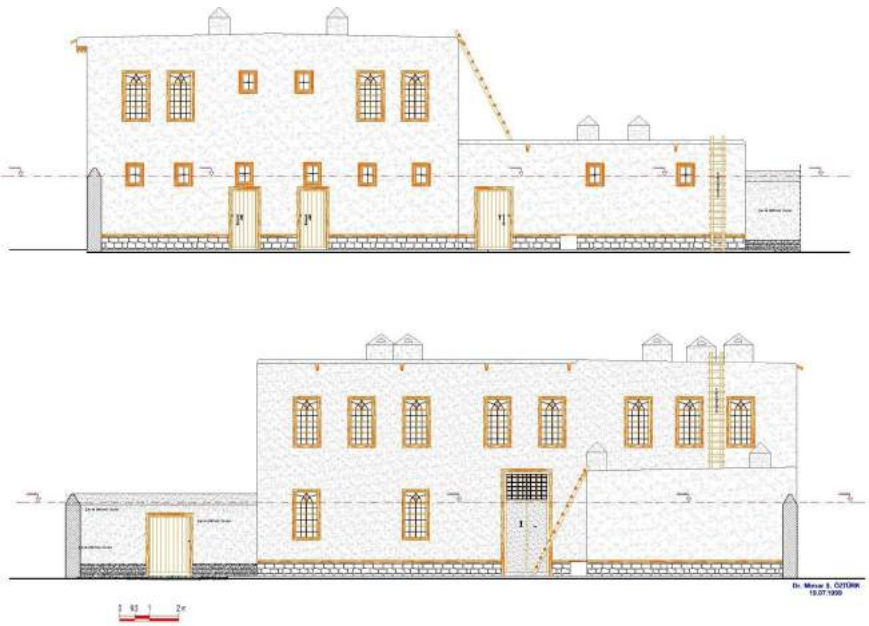

Fig. 7-18. Polat Yörükoğlu House North-East Facade Restitution, drawn by author.

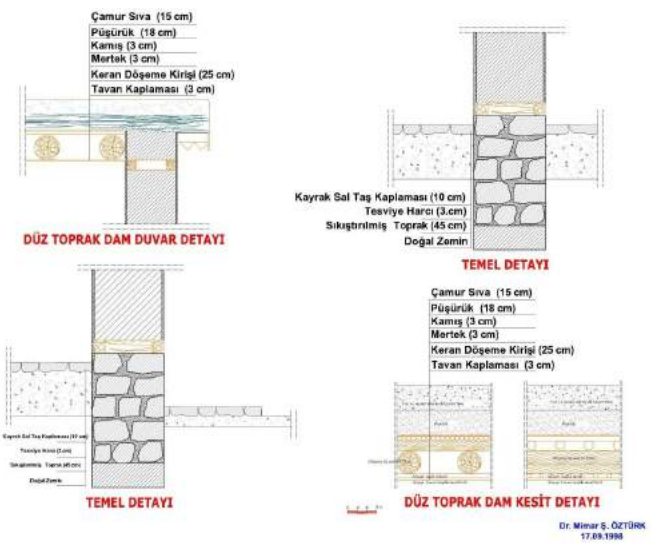

Fig. 19. Polat Yörükoğlu House Main-Wall and Covering Details, drawn by author.

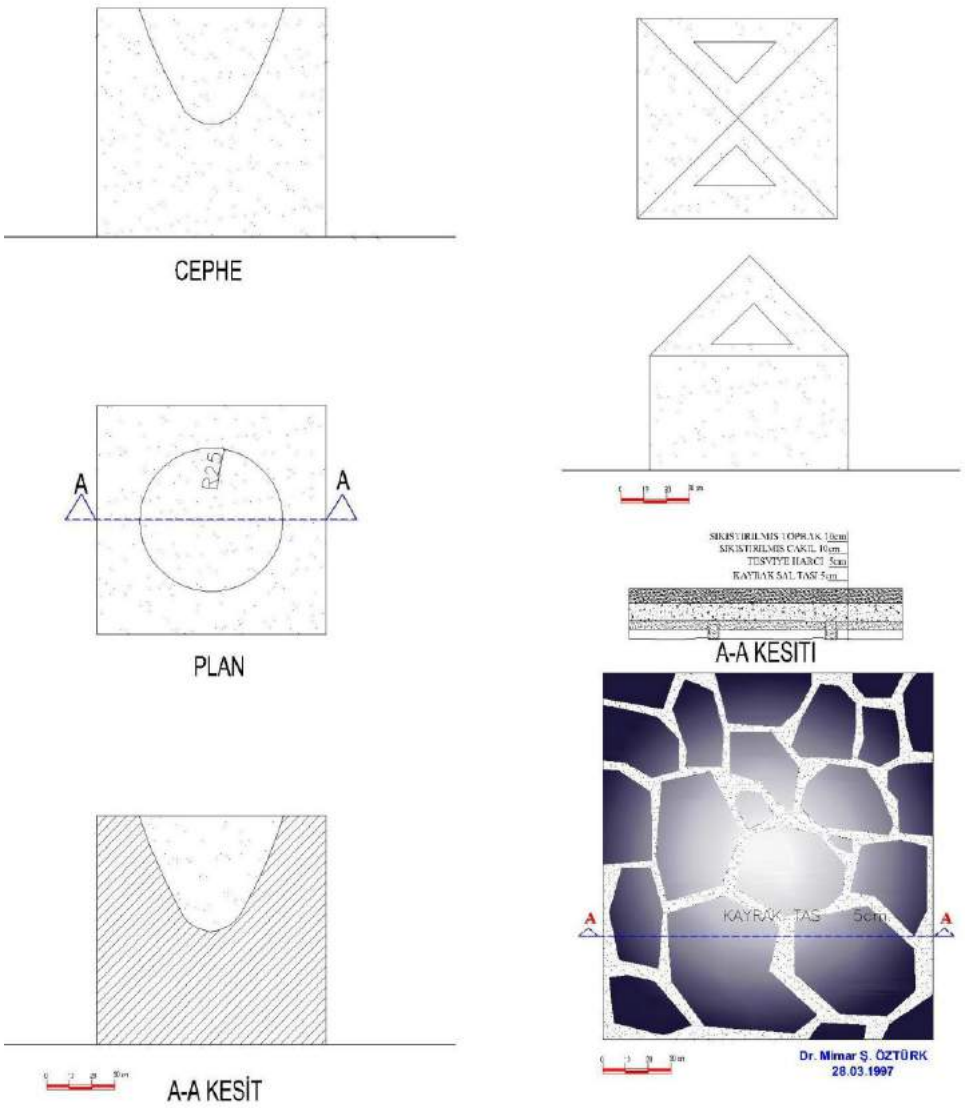

Fig. 7-20. Polat Yörükoğlu House Mortar Stone, Chimney and Flagstone Details, drawn by author.

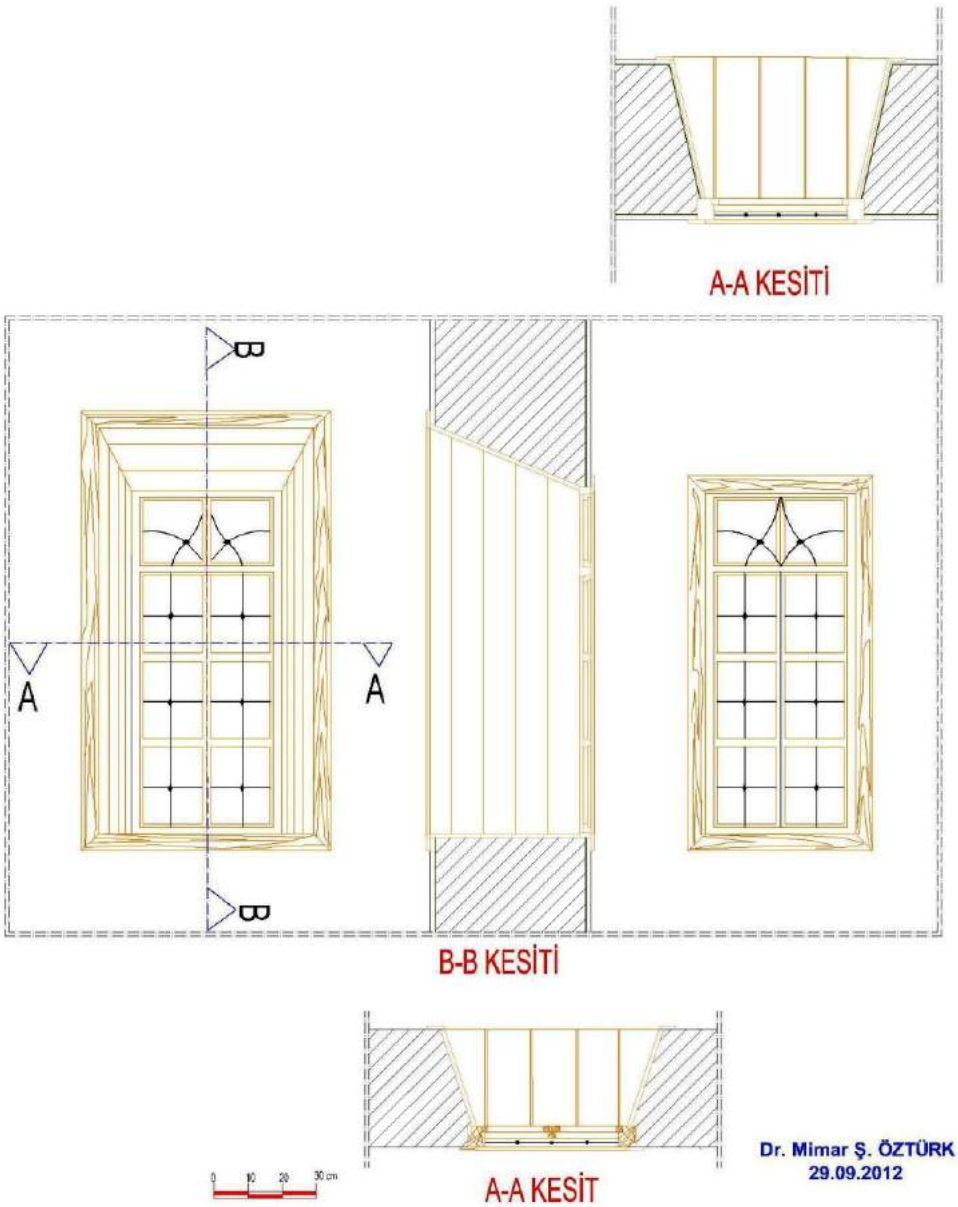

Fig. 7-21. Polat Yörükoğlu House Window Details, drawn by author.

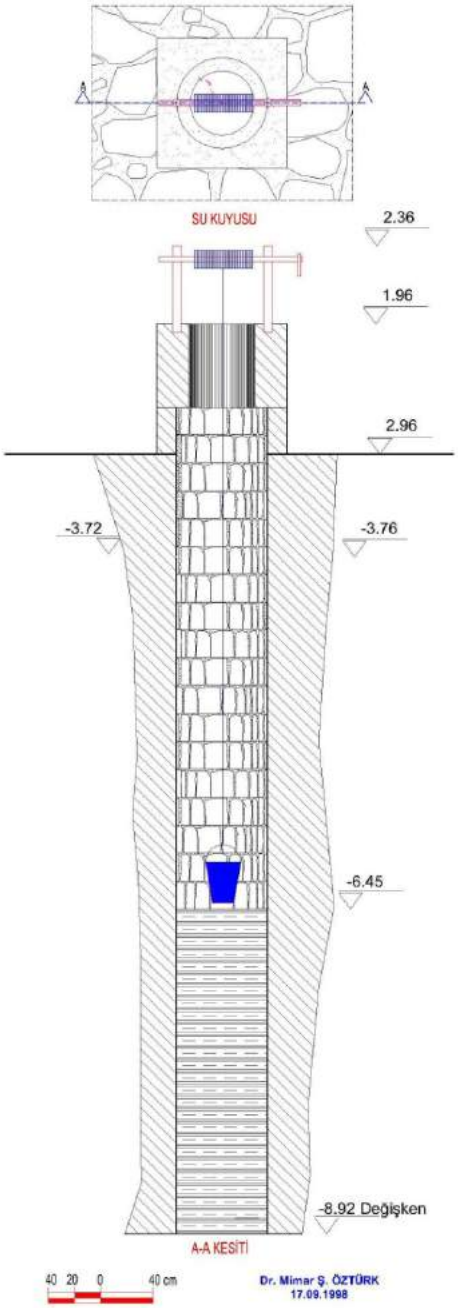

Fig. 7-22. Polat Yörükoğlu House Water Well Details, drawn by author.

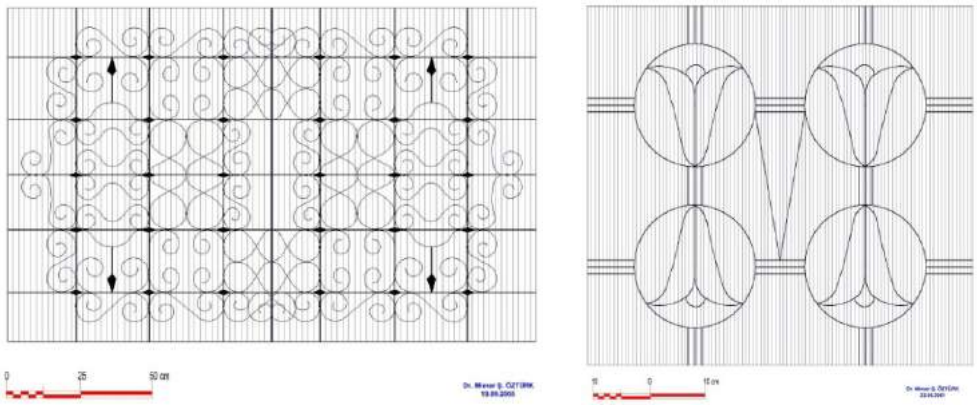

Fig. 7-23. Polat Yörükoğlu House Entrance Door Metal Wrought Iron Details, drawn by author.

Fig. 7-24. Polat Yörükoğlu House Window Metal Wrought Iron Details, drawn by author.

4.2. Facades

The tandoor house proportion of Polat Yörükoğlu House was constructed as single-storey, the other proportion was constructed in the two-storey traditional fashion as a flat mud roof. One can climb to the flat mud roof of the tandoor house with the help of a wooden portative ladder. As for the flat roof of the two-storied other proportion, one can climb there from the mud roof of the tandoor house with the help of another wooden ladder (Figures 7-15, 7-11, 7-12, 7-14).

The proportion where among the cleaning and maintenance tools for the snow falling in winter; cleaning tools such as stone roller, broom *(sekavil),* snow shovel *(berfink)* taptap are present is protected in a place in the tandoor house. The rammed mud roof of the house is in 13.08x18.51 m sizes. 12 wooden gargoyles *(*şöratan*)* in the north and west directions of the flat mud roof and five chimneys were placed to discharge the snow and rain water. The tandoor house flat mud roof is in a rectangular form in 7.21x9.38 m sizes. While the flat mud roof is inclined to the east to discharge the snow and rain water, three wooden gargoyles were placed on a chimney. In the middle of the flat roof of the tandoor house, there is a chimney with 0.50 m diameter (Figures 7-15, 7-11, 7-12, 7-14).

5. Conclusion

The houses in the Eastern Anatolia Region, which is exposed to heavy winter conditions, differ from the houses in other regions of Anatolia in terms of climate, material, plan type, architectural function and shape (Öztürk 2004, 103-114; Arseven 1960, 535-585). Polat Yörükoğlu House is the only registered residential building in the modern-day Van city which is struggling to survive. The relation of the house which is built in the harem-selamlik understanding in terms of planning, with the street, yard garden and vineyard is one of the rare civil architectural structures. The architectural structure of the house is a result of the reflection of the cultural, economic and custom and traditions of the user. This instance was built using the climate conditions, the location of the parcel, and the regional materials.

It is necessary to carry out restoration works by the related intuitions for Polat Yörükoğlu House without losing any time. With the intention of protecting the disappearing the urban regional civil architectural texture, it bears importance in terms of transferring it to next generations and urban culture and architecture.

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CHAPTER NUMBER 8

DEVELOPMENT OF THE COMPARATIVE RISK ANALYSIS WITH FUZZY MODEL APPROACH FOR SUSTAINABLE RURAL DEVELOPMENT: THE EXAMPLE OF VAN

UFUK FATIH KÜÇÜKALİ

In the scope of this study which puts forward the requirement for preparing basin protection action plans and management targets for the purpose of management of water resources that are one of the most important components for sustainable rural development in Turkey and fulfilling the requirements of the Water Framework Directive, ecological risks in Van Province are determined and a comparative risk analysis has been developed. The development of a comparative risk analysis for determining ecological risks of Van Province aims at determining ecological values of the field of study and negative conditions which these ecological values are subject to and risks resulting from them. The process of field survey and putting forward geographic and physical characteristics of this field, subject-related literature review and evaluating available information, ecological values of the field, problem formulation, determining management targets, revealing direct and indirect relations between physical, chemical and biological pressure element sources and evaluation end points and developing comparative risk analysis are pursued during this determination. Thus, it seems inevitable to set management targets specific to the research area that take into consideration socioeconomic and ecological components for the primary goal of sustainable rural development.

Keywords: Ecological risks, rural development, ecological planning, comparative risk analysis, Van

I. Introduction

To avoid confusion, it is necessary to first define a couple of important concepts. “Risk” is an often defined term with wide-ranging conceptualizations depending on the perspective (e.g., economic, social, toxicological/epidemiological, actuarial, etc.) (Renn 1992). For the purposes of this paper, risk can be broadly understood to mean the potential undesirable

hazard associated with a particular substance, technology, or activity (Davies 1996). More specifically, since this paper concentrates on the human impacts posed by environmental degradation, risk in this paper is conceptualized as the potential--a function of toxicity and exposure--for an environmental stressor (like industrial facilities) to cause environmental problems. “Environmental problem area” is another concept referred to throughout this paper that requires clarification. A critical component of CRA project design is the delineation of what to rank. Although a CRA could conceivably rank a variety of things, most comparative risk projects have opted to consider the risks posed by environmental problems and environmental degradation.

Besides three concepts were analyzed in the study also: sustainable rural development, comparative risk analysis and fuzzy model approach. Sustainable rural development can be defined as: improving the quality of life for the rural poor by developing capacities that promote community participation, health and education, food security, environmental protection and sustainable economic growth, thereby enabling community members to leave the cycle of poverty and achieve their full potential. Sustainable rural development is generally recognized as the product of those human activities that use the resources of rural territories to increase welfare. Development can be considered as sustainable if it meets the needs of the present generation without compromising the ability of future generations to meet theirs (Errington 2003). Sustainable rural development can be achieved through different means or tools, e.g. providing local populations with vocational and technical training and improving access to information, resources and innovative technologies. Rural development actions mainly aim at social and economic development, encompassing tourism, manufacturing and information and communications technologies (ICT). Rural development concerns several sectors, such as forestry, energy, tourism, and agriculture. This is why it is important to recognize the multifunctional dimensions of agriculture, forestry and tourism, which are generally the key economic sectors (EEA 2010). Sustainable rural development is also based on the involvement of different levels of government and various local stakeholders, and on the promotion of the sustainable use of local assets and resources as essential for supporting competitiveness. Recourse to investment rather than to subsidies also appears to be one of the key features of sustainable rural development.

Since different definitions of sustainable rural development exist and are accepted in the different countries, a common understanding of this concept was sought. Underlying all definitions of the scope of rural development in the different countries is the understanding that “rural development” is about governing the development of all primary areas, i.e. zones located outside of urban areas, while at the same time acknowledging the strong interdependence between rural and urban areas.

Comparative Risk Analysis (CRA) is an environmental decision-making tool used to systematically and consistently measure, compare, and rank environmental problems or issue areas. The process typically focuses on the risks a problem poses to human health, the natural environment and quality of life, and results in a list (or lists) of issue areas ranked in terms of relative risks. CRA are undertaken to achieve numerous goals. The most common goal is to establish priorities for a government agency, political body, or community at-large. It is

often used to determine how to best allocate limited resources for reducing or preventing environmental risks. CRA generally investigates “residual risks” -- the risks remaining after a problem is addressed by current regulatory controls. For example, a state may determine that its current drinking water quality efforts leave little residual risk to human health, relative to the higher level of residual health risk posed by criteria air pollutants. In this case, CRA suggests that future efforts should be directed at reducing the risk associated with criteria air pollutants and not drinking water quality. Additionally, comparative risk analyses are often conducted to help spur collaboration between government agencies, industry, interest groups and the general public. CRA was introduced by the U.S. Environmental Protection Agency (EPA) as a method for allocating agency resources across environmental issues.

The purpose of the initial EPA staff CRA, Unfinished Business, (U. S. EPA 1987) and of the follow-up study by the EPA Science Advisory Board, Reducing Risk, (U. S. EPA 1990) was to compare the relative magnitudes of threat posed by environmental factors under EPA jurisdiction with the agency staff, budget, and attention allocated to each factor. The initial report found that EPA resources were not allocated primarily toward what its staff viewed as the largest risks, but that EPA resource allocations followed public perceptions of the most significant risks, as determined from public- opinion polling. The CRA study found that hazardous air pollutants, indoor radon, and global-scale issues like climate change and stratospheric-ozone depletion ranked lower in terms of public perception and agency priority than the agency staff CRA suggested they should. Following efforts by Administrators William Ruckelshaus and Lee Thomas to orient EPA activities toward risk reduction, Administrator William Reilly used CRA as a central element in developing a process of risk-based priority setting within the agency (Henry 1994).

Evaluation of CRA risk-ranking results in a comparative manner is difficult for two important reasons. For one, the degree to which a problem presents a risk to health, the quality of the environment, or any other endpoint, is dependent on numerous factors that vary by geographic area. These factors include physical characteristics (e.g., size of area, background environmental conditions), demographic composition (e.g., degree of susceptible populations), and risk perception (e.g., historical factors, political concerns). In other words, the magnitude of risk from an environmental problem depends, in part, on where it is occurring. The disparity in local conditions represents a key reason there has been a proliferation of comparative risk projects on the state and local level in recent years, as policymakers attempt to match management priorities with the problems presenting the most risk in their respective areas. A second difficulty that complicates comparison of CRA ranking results is the extensive variability in project designs.

Despite this general agreement on the rationale for undertaking comparative risk projects, CRA processes can vary substantially. Practitioners must make important decisions regarding the specific design of CRAs, and these decisions may have significant implications for the resultant risk rankings. Accordingly, it is necessary to dissect the CRA process in order to establish the connection between project design and risk ranking results.

A CRA generally is comprised of three components:

Problem list: Determination of the set of environmental problem areas to be analyzed and compared. This list is often wide-ranging in scope and typically consists of about two dozen problems.

Criteria for evaluating problems: A set of analytical criteria define what the participants think is important to measure, such as pollution levels or various types of risks to human health, to ecosystems, or to quality of life. These criteria often specify what type of units analysts should use for measuring impacts under each criterion. Some of the criteria will allow for quantitative estimates of harm or risk (e.g., water quality), but others will require qualitative descriptions of such impact (e.g., aesthetic degradation or injustice).

Ranking: Process that participants use to sort out the data and draw conclusions about the relative severity of the problems or their sub-components. The ranking inevitably involves comparing problems along several dimensions or criteria at once. The ranking most often is in the form of an ordered (e.g., 1-10) or categorized (e.g., high, medium, and low) list (Minard 1991).

The definition of detailed variables provides the basic elements and references for understanding sustainable rural development. The relevant literature was studied to compile a list of detailed variables in accordance with the guidelines for variable selection. Large numbers of variables however make building the model more complex and difficult. There are also some semantic uncertainties in how some sustainability variables should be evaluated, making a clear answer difficult to give. This study looked at the multitude of fuzzy theory derived analytical methods before finally settling on the Fuzzy Delphi Method. This will be used to establish a basis and method for evaluating an urban sustainability variables system. A general outline of the Fuzzy Delphi Method's characteristics is followed in methods section.

1.1. Study Area

Lake Van Basin located south of Eastern Anatolia encompasses catchment areas of the water courses pouring out to Lake Van. The basin is separated from Euphrates and Aras Basins with its watershed situated on the volcanic cones of Nemrut, Suphan and Tendurek in the west and north. The basin area that covers approximately 2% of Turkey's surface area is mountainous and has generally an altitude of 1,600 - 2,500 m. The largest lake in Turkey in terms of area, Lake Van is ranked the 15th among the closed lakes in the world. Despite this fact, it has a total water volume of 607 km³ due to its depth which earns it the fourth place among the closed lakes after the Caspian Sea, Aral Sea and Lake Issyk-Kul. Considered as an alkaline lake due to the high amount of soda in its salt content, Lake Van is also the largest alkaline lake in the world (**Çiftçi** et al. 2008). Van city is located at an altitude of 1,725 m

above the sea level. It is surrounded with mountains and has continental climate characteristics. The fact that Lake Van affects the climate and it makes it milder. As the lake is warm in winter, the temperature is moderate, and the weather is cool in summer. The distribution of precipitation varies according to altitude, aspect and effects of Lake Van. The western and southwestern shores of the lake receive more than 600 mm of precipitation between Reşadiye -Ahlat. Northeast winds that blow over the lake and get humidified has an effect on high precipitation. Precipitation increases as altitude rises from the shore toward the inner land. The section between Van, Özalp and Gürpınar receives the low precipitation. Altitude is relatively low in these regions. East and north direction winds cause precipitation on higher parts (Van Environmental Status Report 2011).

2. Materials and Methods

In order to make the comparative risk analysis that is put forward by this study functional, the model used for weighting potential risk components, determining their sequence and priorities, evaluating weights of these priorities according to each other and for analyzing, sequencing, scoring and prioritizing different alternatives such as fuzzy relation analysis and model was employed and analysis plan was developed.

The Fuzzy Delphi Method is an analytical method based on the Delphi Method that draws on the ideas of the Fuzzy Theory. The Delphi Method is a type of collective decision-making method (Linstone and Turoff 2002), with several rounds of anonymous written questionnaire surveys conducted to ask for experts' opinion. As a direct prediction method based on the expert judgment and expert meeting investigation method, it possesses the following properties:

Anonymity: The experts involved with the prediction process do not see each other, remain anonymous and don't know how many experts are involved. This helps to prevent them from influencing and encourages objectivity.

Feedback: The survey feedback gives the participants an idea about the main ideas in the group. They can then draw from it information relevant to them, make a new judgment, and then submit it to the group again.

Statistical: The expert opinions are processed statistically and a splines graph produced with the expert opinion frequencies arrayed chronologically. The top is the majority consensus (50% experts) representing the prediction team's opinion. The

top and bottom quarter percentile (each representing 25% of the experts) represent the prediction deviation.

Convergence: Through multiple reverse feedback make the final prediction results converge (Linstone and Turoff 2002).

The purpose of the Delphi Method is to achieve a consensus among the experts on the subject being evaluated. When used with one-to-many objectives, multi-principle, multi-proposal and multi-participant decision-making problems, the method not only serves to draw on a large body of opinion but also meets the requirement for independence in the experts' judgment.

The Delphi Method requires multiple repetitions when asking experts for their opinion. This must continue until the experts arrive at a consensus. As a result, it generally has the following weaknesses (Ho and Chen 2007):

- Repeatedly surveying experts and collecting their opinions is very time consuming.
- Experts must be surveyed and the collated results analyzed multiple times, increasing costs.
- Expert cooperation is required before a consensus is reached, needlessly increasing the difficulty of coordination and communication.
- Consensus of expert opinion occurs during a certain part of the analytical process. The fuzziness of this part is however not taken into consideration. This makes it easy to misinterpret the expert's opinion.
- The analytical process has problems with some opinions being systematically weakened or suppressed.

To solve the problem of fuzziness in expert consensus in group decision making, researchers from around the world came up with new methods: Murray, Pipino & Gigch (1985) proposed the application of Fuzzy Theory to thDelphi Method, with semantic variables used to solve the problem with fuzziness in the Delphi Method (Murray and Pipino and Gigch 1985). Klir and Folger (1988) proposed a mean normalization mode (Klir et al. 1988). Ishikawa et al. (1993) used the Maximum-Minimum Method together with cumulative frequency distribution and fuzzy scoring to compile the expert opinions into fuzzy numbers **(**Ishikawa et al. 1983). The expert prediction interval value was then used to derive the fuzzy numbers, resulting in the Fuzzy Delphi Method. Hsu and Chen (1996) proposed the fuzzy similarity aggregation method (Hsu and Chen 1996). Using the similarity function, similarities between

experts were collated and fuzzy numbers assigned directly to each expert to determine the agreement degree between them. The consensus coefficient was then used to aggregate all experts' fuzzy evaluation values. If the agreement degree between experts is too low however the survey must be conducted again. Comparison of the strengths and weaknesses between the Fuzzy Delphi Method and the traditional Delphi Method is provided below in Table 8-1.

Table 8-1. Comparison of the strengths and weaknesses between the fuzzy Delphi Method and the Delphi Method (Ho and Wang 2008).

Method Description		**Strengths and Weaknesses**
Traditional Delphi Method	Goal is to achieve consensus in expert opinion. Draws on a wide range of opinions while providing quality of independent expert opinion. The expert survey is repeated and experts asked to revise their own opinions based on the results from the previous survey until the opinions converge.	Takes more time to collate expert opinions.
		Higher cost.
		Survey must be repeated multiple times.
		The survey recovery rate is low.
		In pushing for a consensus it' easy to misinterpret expert opinion.
		Consensus of expert opinions only applies to a certain rage. The fuzziness of that range is not taken into account.
Fuzzy Delphi Method	As Delphi Method surveys have some semantic fuzziness in both the questions and the answers, cumulative frequency distribution and fuzzy scoring were therefore used to collate the expert opinions into fuzzy numbers. Here similarity function is used to evaluate the agreement degree between two experts. The consensus coefficient for each expert was then used to derive the fuzzy evaluation value from all experts.	Saves survey time.
		Lower cost.
		Reduces number of surveys, increases questionnaire recovery rate.
		Experts can fully express their opinions, ensuring the completeness and consistency of the group opinion.
		Takes into account the fuzziness that can't be avoided during the survey process. Does not misinterpret experts' original opinions and provides a true reflection of their response.

Use of fuzzy analysis in this study is the only method for identifying and ranking priorities. Therefore, the hypothesis of an impact scoring matrix with expert opinion and the creation of an effect ranking points reached by the said sum. Each cell contains a sequence ranging from 0 to 3. A measure of the matrix. 0 = no effect, 1 = less effective, 2 = effective, 3 = very effective (U. S. EPA 1996a).

3. Research Result

Physical, chemical and biological stressors

The stressors in Van can be ranked as follows:

- Pollutants likely to result from agricultural/animal breeding activities
- Untreated industrial wastewater discharges
- Untreated/partially-treated domestic wastewater discharges
- Air and water pollution due to transportation
- Pollutions resulting from animal breeding activities
- Erosion
- Geothermal waters

Stressors, types of stress and their impact on water resources in Van are summarized in Table 8-2. Point-source pollution loads are examined under two main headings as urban and industrial pollution loads. Urban pollution loads include treated and untreated domestic wastewater as well as leak water loads resulting from solid waste regular storage facilities, whereas industrial pollution loads include loads from treated and untreated industrial wastewaters. Diffuse pollution loads include agricultural activities, industrial activities, animal breeding activities, land usage, erosion and atmospheric transport. Diffuse pollution reaches the basin or sub-basins with the help of complex transport and transformation reactions through various environments (air, water, soil) which result from land usage activities and atmosphere-polluting emissions in urban and rural areas (as a result of factors such as heating and industrial production) and which occur discretely subject to the receiving environment, climatic and meteorological conditions (rain and snow meltdown), geographical and geological conditions (Küçükali 2015).

Table 8-2. Stressors, Types of Stress and Effects in Van (Küçükali 2015).

Sources of Stressors	Stressor Characteristics	Ecological Effects
Agricultural Activities		
Fertilizer use	Acute / Widespread	N and P pollution, dissolved oxygen depletion
Pesticides use	Acute / Widespread	N and P pollution, dissolved oxygen depletion
Excessive cultivation	Chronic / Spot	Erosion
Excessive irrigation	Chronic / Spot	Desertification, salinization
Industrial Activities		
Mining	Chronic / Spot	Groundwater and surface water pollution
Storage areas	Chronic / Spot	Toxic substances pollution
Solid waste landfills	Chronic / Spot	Heavy metal pollution
Industrial wastewater	Acute / Widespread	Organic substances, N and P pollution
Settlement		
Urban	Acute / Widespread	Organic substances, N and P pollution
Rural	Chronic / Spot	Organic substances, N and P pollution
Transportation		
Highway	Acute / Widespread	Habitat change
Seaway	Acute / Widespread	Dissolved oxygen depletion
Livestock Activities	Chronic / Spot	N and P pollution, dissolved oxygen depletion
Erosion	Acute / Widespread	Increased suspended solids
Geothermal Waters	Chronic / Spot	Heavy metal pollution

According to the state of the relationship with the end point of each stressor element mentioned above for the Van province were obtained the following hypothesis impact matrix. The connection between each stressor element of the hypothesis impact matrix and assessment endpoints include changing sorted by 0 (no effect) to 3 (very effective).

Table 8-3. Hypothesis impact matrix

SOURCES OF STRESSORS	Water quality	Dynamic water level	Wetlands	Habitats	Endemic Species	Lake trophic levels	Coastal ecosystems	Reedy areas	Grasslands
AGRICULTURAL ACTIVITIES									
Fertilizer use	3	0	3	3	2	3	3	1	1
Pesticides use	3	0	3	3	2	3	3	1	1
Excessive cultivation	0	1	1	2	0	0	0	0	0
Excessive irrigation	1	3	1	2	1	1	0	0	0
INDUSTRIAL ACTIVITIES									
Mining	1	3	1	1	1	0	1	0	0
Storage areas	0	0	0	1	0	0	0	0	0
Solid waste landfills	3	0	2	3	1	2	1	0	0
Industrial wastewater	3	1	3	3	2	3	3	1	1
SETTLEMENT									
Urban	3	0	1	2	1	2	1	0	0
Rural	3	2	1	2	2	2	1	2	2
TRANSPORTATION									
Highway	1	0	1	2	1	0	1	1	1
Seaway	2	0	2	2	0	3	2	0	0
LIVESTOCK ACTIVITIES	0	0	0	3	0	1	1	3	3
EROSION	2	0	1	2	1	0	2	1	1
GEOTHERMAL WATERS	2	2	1	1	0	1	1	0	0

Considering sum total weight range is as follows:

- Industrial wastewater: 20
- Fertilizer use: 19
- Pesticides use: 19
- Rural Settlement: 17

Having studied the hypothesis impact matrix the highest weight of total weights is industrial wastewater. Followed fertilizer use, pesticide use and rural settlement. The reason for this source of stressors that demonstrate high weight in Van, detailed analysis of what has been utilized as shown below.

Referring to the industrial structure of Van; Van Cement Factory (Edremit district), Turkey Sugar Factories Inc. (Erciş district) and Van Integrated Meat Industrial Facilities (Gürpınar district) is not located in the central district. Outside the, all of the major industrial facility is located in the central of Van.

Industry in the provincial economy; handle over the raw materials, to ensure the needs and employment which sees an important function for their contribution. Some of the wastewater occurs in plants is treated by biological systems, and a portion of pre-treatment or directly after making discharged into the municipal sewage system. Van industrial zone located in the province of Van is continuing its activities.

The following sections are included in the calculation method and the results caused by industrial pollution are used for organized industrial zones and individual.

While pollution load from industrial plants calculate, industrial facilities are discussed under four main groups in Van:

- industrial facilities which discharge permit
- industrial facilities which without discharge permit
- organized industrial zones with a wastewater treatment plant
- industrial facilities which discharge wastewater directly into the environment in the organized industrial zones

Calculation is made in two ways, whether discharge permits of industrial facilities:

- Based on the list of the situation permits from Provincial Directorate of Environment and Urban Planning of Van these facilities are grouped. For those who discharge permit, the Water Pollution Control Regulation (WPCR) load limit values for pollutant discharge standards set of concentration are taken into account is multiplied by a certain factor. The values used were compared with earlier studies [20]
- For those who without discharge permit, considering the Water Pollution Control Regulation (WPCR) sector table, given that the limit values of COD (Chemical Oxygen Demand), BOD (Biological Oxygen Demand) and TSS (Total Suspended Solids) , TN (Total Nitrogen) and TP (Total Phosphate) treatment load calculations have been made.

Calculation is performed as follows for organized industrial zones:

- For those who discharge permit (organized industrial zone has a single treatment plant and / or separately treatment plant status) Located in RCWP for organized industrial zone "Table 19: Receiving environment of mixed industrial wastewater discharge standards for small and large organized industrial zone and other industry sectors identify any specification" load calculations were made, taking into account limit values.
- For those who without discharge permit, considering the Water Pollution Control

Regulation (WPCR) sector table, given that the limit values of COD, BOD and TSS for 80%, 15% to 35% for TN and TP treatment load calculations have been made.

While pollution load calculations are based on certain assumptions. The assumptions are listed below:

Data collecting

- The scope of the project industrial facilities visited in the study area. Information was obtained (These data are from April to September 2012)
- Data on visits to other industries (working in small capacity and facilities do not have a significant pollutant load) was obtained from the Provincial Directorate of Environment and Urbanism

Industrial facilities are divided into two groups depending on whether the discharge permit: facilities that discharge into the environment of the recipient (intra-basin), facilities that discharge to sea (basin off).

- Significant pollution sources within the basin and discharged to the receiving environment. All industrial plants which have been included in the calculation. Gas station and small facilities such as industrial sites are not included in the calculations. For such facilities, each basin was used as a safety factor. These factors for Van is 10%.
- Only industrial facilities which has domestic waste water as discussed in including the industrial load calculation.
- In the calculation of urban pollution load of watershed pollution load of the sewage it was added as a proportion of industrial facilities specified.

Determining the concentration of pollutants

Sectors and sub-sectors on the basis of the Water Pollution Control Regulation (WPCR) determining pollutant concentrations assumptions have been made below:

- Sector and sub-sectors on the basis of COD, BOD, TSS, TKN, and TP values were calculated.
- For those who discharge permits WPCR contained in the sectoral tables, 2 hour

limit is used for composite samples.

- For those who without discharge permit, relevant sectors taking into account in the table of WPCR, the limit values given here of COD, BOD and TSS to 80%, TN for 35% and 15% for TP it would be obtained if the treatment provided projections in the untreated wastewater has been made for about concentration value prediction is performed.

- The rates in the literature were used to the absence of contaminant concentrations (TÜBİTAK 2010).

Load Calculations

Calculations were made for 2012, 2020, 2030, and 2040. In 2012 the industrial output value is used for calculations. These values were adopted to the same in 2020, 2030 and 2040. While pollutant load calculations, it is assumed to be the difference over some years in the treatment efficiency. Therefore WPCR discharge limits vary from year was multiplied by coefficients. These coefficients are given in Table 8-4.

Table 8-4. Treatment performance factors (TÜBİTAK 2010).

Year	Coefficient	Explanation
2012	More than 20% discharge limits of WPCR	To stay on the safe side
2020	Same with discharge limits of WPCR	Consideration of the treatment plant performance will improve
2030	90% of the discharge limits of WPCR	Consideration of the treatment plant performance will improve
2040	80% of the discharge limits of WPCR	Consideration of the treatment plant performance will improve

The For 2020, 2030, and 2040 in the Van province may be related to differences in the number and capacity by years, calculations are made about the current state of industrial facilities in 2012.

Assuming that the project assessed all settlements by 2020, sewage 100% would be linked, to the urban pollution load which are calculated as a point pollution since 2020 (TÜBİTAK, 2010).

4. Results

Pollutants from industrial plants; after purification and / or is discharged untreated into the environment in Van. The distribution of pollution load discharged is given by years in Figure 8-1. The reason for the assumptions of the decline made for years, in the expected load of industry is to be improved in the industrial wastewater treatment plants.

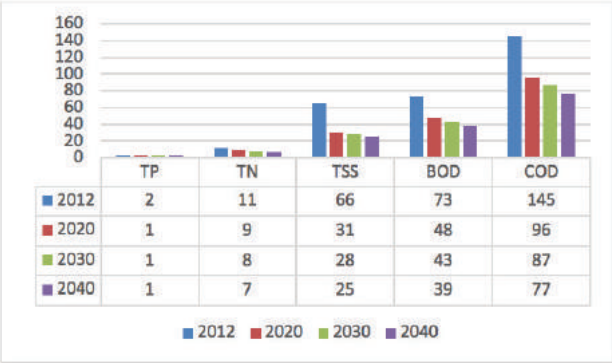

Fig. 8-1. Changes of pollution load depending on the years

According to data obtained from the field work the condition of treatment for the pollution load from industrial sources in 2012, is given in Figure 8-2. Accordingly, approximately 70% organic matter removal, TSS 58%, while TN and TP are purified in 21% and 7%, respectively.

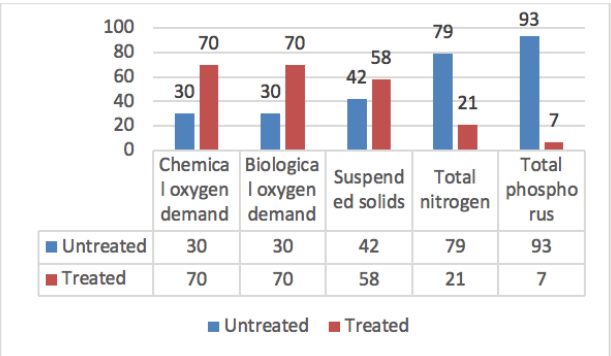

Fig. 8-2. Treatment status of pollution load

The pollutant load value varies according to the treatment efficiency of the industry. It might be known that the number of industrial plants and differences in capacity changes in the coming years in the Van province. Calculations were made on the current situation.

The basis of the industrial pollution load distribution (COD pollution, representing the parameters BOD, TSS, TN and over TP) in 2012 is given in Table 8-5.

Table 8-5. Distribution of industrial pollution loads of Van Lake Basin (TÜBİTAK 2010).

		Pollution Loads				
2012	**Wastewater (m3/year)**	**Chemical oxygen demand**	**Biological oxygen demand**	**Suspended solids**	**Total nitrogen**	**Total phosphorus**
East Van Lake	304.739	108	54	31	10	1,5
West Van Lake	66.248	37	19	35	1,1	0,1
VAN LAKE BASIN	**370.986**	**145**	**73**	**66**	**11**	**2**

Besides, chemical fertilizers used in conventional farming methods, mainly nitrogen, phosphorus or potassium salts. Necessity leads to the accumulation of soil salinization of soil widely used fertilizer, which leads to unproductive. Dissociates into ions when contacted with water soluble fertilizers are mixed with the flow of the groundwater and surface water resources. When the information can get some use cases examined in Ercis district of fertilizers are being used annually 1465 tons and 1070 tons of fertilizer annually in the center of Van. When the pesticide data that can be used in examine the annual 18 445 kg of Ercis and center of Van in the annual 15 538 kg (Hsu and Chen 1996). As can be seen from these high-value sum it is consistent with the values observed in the highest range of total weight.

5. Conclusion

Given the entire set of direct and indirect relations between ecological sensitivities and pressure elements that are specific to Van Province, management targets that consider socioeconomic and ecological components must be set for primary goal of sustainable rural development. These management targets require a clear definition of all scientific and operational phases, from determining policies at the highest scale to their application, according to international criteria and healthy implementation of supervision mechanisms and con-

stant monitoring processes. It is foreseen based on this study that determining ecological risks and developing a CRA will add systematic to relevant studies in order to create a base/ pool for urban planning in Van Province and it will serve as a guide for presenting measurable and quantitative risks and determining proper policies for decisions to be made in connection with basin management planning.

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CHAPTER NUMBER 9

EDREMIT "MAIDEN'S CASTLE CHURCH, CHRISTIAN CEMETERY" CONSERVATION PLANNING APPROACH

EMİNE EKİNCİ DAĞTEKİN
VAHAP KARAKAYA

Conservation is an act with economic, political, social and cultural dimensions that provides answers to the questions "What" and "Why". Historical conservation is a phenomenon that ensures the revitalization of historical-cultural environments by converting built areas healthy.

Historical-cultural environments can, when these are correct utilized, generate new business areas and lines as an efficient tool of public development by vitalizing local economies. But it gets inevitable that the historical areas, monuments convert into spaces without any identity when the primary target of the intervention to be performed is not the area or the monument.

This study covers the revision process of the Conservation Development Plan established for "Edremit Maiden's Castle" and "Old Edremit Cemetery", being both archeological sites, and "Edremit Church" in the monumental buildings group in the Province Van – District Edremit, which are located in the city, but convert progressively undefined.

Keywords: Edremit, Alniunu, Edremit Maiden's Castle, Old Edremit Cemetery, Edremit Church, Planning, Conservation

1. Introduction

Conservation is an act with economic, political, social and cultural dimensions. The main intention of conservation should be to create healthy living spaces for societies by preserving the cultural background and values, the authenticities (Tek 1993, 135; Uydaş 1993, 6-9). Historical conservation is the revitalization of historical-cultural environments by converting built areas healthy (Fitch 1998, 39; Erder 1999, 37). The attitude to be maintained now at the conservation of historical environments in order to transmit the values from the

past to future pursuant to the principles and targets to be established is determinant (Kiper 2004,13).

We face the archeological sites in historical cities as a cultural heritage, where the urban pressure within the built environment of the growing city is felt the most (Tuna 1998, 39-48; Madran 2000, 243; Kejanlı et al. 2007, 185). In a country like Turkey with historical urban areas, but a rapid urban growth potential, will the joint performance of the conservation and planning processes be an efficient method at transmitting the areas to be preserved to the future. Archaeological site areas are being affected by the urban development despite the increasing number of "Conservation Oriented Zoning Plan" established during the recent years, the conservation borders are progressively shrinking or the conservation grade is being decreased.

Archeological sites located in urban settlements are either insulated from their environment and not integrated into the urban built environment as a result of the conservation and planning works, or archeological artefacts are being damaged, resulting in that archeological sites and the integrity of the area is directly or indirectly being harmed (Levent 2009, 43). Despite all negativities, the works conducted in order to create conservation purposed areas in the cities should be promoted, tracked and ensured that these are shared with the public.

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2. Historical Researches and Settlement

While the initial foundation date of Edremit is not known; it is determined by the archaeological works conducted at the Tilkitepe tumulus that there was a settlement in about 3,500 BC (Reilly 1940, 145). The history of Edremit coincides with the history of Van during the Urartian period. The Urartian King Sardur I had established a stone workshop and a settlement named Alniunu in the castle site of Edremit in the 7th century BC in order to furnish construction material for Van Castle and the construction of the Sardur Tower at the west end of the castle (Belli 1982, 120). It is indicated in the Sardur (Madır Tower) Inscription in the north-west of Van Castle that the stones were brought from the town of "Edremit" Alniunu. This indicates that the settlement history of the city of Alniunu is as old as of the Sardur Tower (Belli 1982, 126; Öziş 2002, 38; Kılıç and Saruhan and Tatlı 2006, 34, Kılıç and Biber and Varol 2006, 124,152). It is known that Armenians have settled in the region after the Urartion period (Deniz 1996, 20).

The Urartian cuneiform scripts and waterway inscriptions belonging to the Urartian King Minua at the retaining walls of the 52 km long Menua (Shamram) waterway, which is a

masterpiece of the Anatolian and world's water engineering that is still functioning, are attracting the attention on the historical background of the area (Öziş 2002,17).

The development of the region is also to be seen at the remains of a palace built by the Urartian King Minua for his daughter, terraces established for vineyards and orchards and irrigation systems at the archeological site known as Maiden's Roof (Giant's Roof) on the hill in the south of the Shamram Waterway (Öğün 1970,17).

The stone workshop in the town Alniunu is today connected to the Van-Edremit landroad by an earth road. The quarry in the town of Alniunu, located 17 km in the south of Van Castle, was a preferred area since it was located at high slope above plains of Van and due to reasons like that the prepared stones could be brought easily down to Lake Van (Belli 1982, 121-122; Salvini 2001, 149). The yellowish, coloured, hard block stones obtained from the quarries in the environment were processed in the stone workshop and used as tomb stones and at the construction of monasteries in the Medieval Age (Baş 2016, 47) and today being used at the repairs and reconstruction works.

Edremit was named as Alniunu during the initial and as Artemid during the last Urartian period, and later it was named as Gümüşdere or as Sarmansuyu inspired from the Shamram Waterway and finally named as Edremit (Ar 1944, 48).

While Edremit had a circular shape during the first period of its foundation with the present castle in its centre, it showed a horizontal development in parallel with the lake shore during the time. It is seen from the artefacts that reached present that it had a bright era during the Urartian period like Van. As there is not much information about the subsequent periods, it brings the assumption closer that their interactions with Van in the history were similar, and had created similar influences during the conducted wars and invasions (Deniz 1996, 21, 47).

The population of the district decreased to 350 persons in 1918 when the non-muslim had left. An immigrant population of 158 persons from Bulgaria were settled in the district after the war in 1938 and the settlement around the castle moved towards the shore (Deniz 1996, 20). Province Van expanded towards Edremit between 1914 and 1980 after the establishment of the Van-Tatvan railway connection, and the settlement united with Edremit at the shore in 2000 **(**Deniz 2008, 182).

Fig. 9-1. The Location of the Town in the Country and Region

Edremit is Van's largest recreation area established on a coastline of 18 km of Lake Van. The settlement area of Edremit, today consisting of 10 quarters, is 600 km² and its altitude above sea level is 1846 metres. It is surrounded in the north by Van Centre, in the south by the District Gevaş, in the west by Lake Van and in the east by the District Gürpınar. There are a district governorship and other rural institutions in the district. It has developed among agricultural areas along the coastline of Lake Van. The cement plant on the Van-Bitlis land road has partially restricted the development of the town towards this axis. In 1990, it became a district municipality and in 2014 a central municipality within the borders of the metropolitan city. The settlement area expanded and the population increased with the TOKI housing built after the Van Earthquake in 2011. Its total population in 2015 was 118.786 persons.

Edremit has a continental climate and is the settlement with the most sun-days in the region. Any type of fruit trees suitable for the climate of the region are grown, except citrus fruits, bananas, figs etc., which grow in the southern provinces of Turkey. The industrial facilities in the district are, being each one, the cement, meat, flour, sugar and soap plants and a mosaic mill.

The large majority of the working population is concentrated in the agriculture and livestock sectors. Along with the worker and civil servant class, also animal trade, sub-contracting, day-labouring and commercial activities in the transportation branch hold an important place.

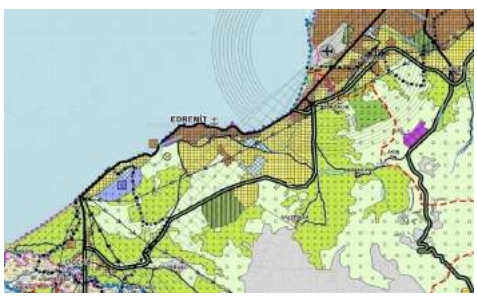
3. Analysis Related To The Planning Area

The planning area in the District Edremit of Van covers the Edremit Maiden's Castle and Old Edremit Cemetery and Edremit Church (Chapel) and the environment within the intera-

ction transition area. Despite the fact that the cultural assets constituting the planning area are in an area with tourism focussed development potential; have the physical damages and illegal housing resulted in that the area was neglected.

The development plans for the district centre of Edremit are prepared on different dates by different institutions. In the current development plans are the archeological sites not defined and there are no plan decisions made. The "Conservation Oriented Zoning Plan" suggested for the planning area are prepared by taking into consideration the current development plan decisions and pursuant to the principle of plan integrity.

When we examine the "1/100.000 Scaled Muş- Bitlis-Van Environmental Plan", which is the upper scale plan related to the planning area of Edremit; it is to be seen that there are one-day tourism areas planned at the Edremit coastline, a university area in the west, agricultural and natural type areas in the south and that the archeological sites are left within the urban development area as residential and housing development areas.



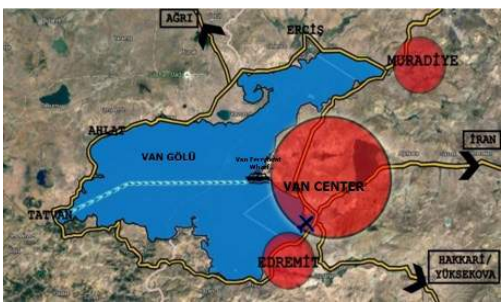


Fig. 9-2. Edremit Region in the 1/100.000 Scale Muş-Bitlis-Van Environmental Plan (MEU 2016)

Fig. 9-3. Edremit's Close Environment and Access Axis

3.1. The Cultural Heritage in the Planning Area and its Physical Status

The Maiden's Castle and Old Edremit Cemetery are 1st Grade Archeological Site Areas and the Edremit Church is a registered monumental building and they are cultural assets to be preserved within the area.

Fig. 9-4: Edremit Planning Area's Location in the Town and Access Axis, **Fig. 9-5:** Satellite Image of Registered Real Estates (www.googleearth.com)

Edremit Maiden's Castle within the borders of the conservation area*;* is located in Sarmansuyu (Erdemkent) Quarter, Block 219. The parcel belongs to the Revenue Office's Treasury. It is registered by the Diyarbakır Conservation Board as 1st Degree Archeological Site area (castle) on February 16th 2006 with the resolution number 623.

Edremit Castle was built in the 7th century BC (Deniz 1996, 47). The Maiden's Castle, where the ancient Armenian Kingdom settled, was built on rock blocks on a hill dominating the environment. Today, its area is limited by the road in its environment, of which the borders are partially destroyed, looks like a natural castle and is being used as a panorama terrace.

The fact that the construction stones of the castle in the area are unprotected and the concrete railings in wood-look present an unconscious conservation approach.

Fig. 9-6. The Maiden's Castle and Its Environment

***Edremit Church**;* is located in Sarmansuyu (Erdemkent) Quarter, Block:192 and belongs to the Revenue Office's Treasury. It is registered by the Diyarbakır Conservation Board as 1st Degree Archeological Site (Monument Church) on September 28th 2005 with the resolution number 429. In 2005 measured drawings, restitution and restoration projects were approved and in 2007 the restoration practice was completed.

There is no information with regards to when the Edremit Church was built. but when its plan, the used construction material and its construction technique is compared with the other Christian buildings in the environment, it's thought that it might be built 16th century (Top et al.2006, 186).

The church, which is also known as the "Maiden's Church" due to Maiden's Castle, has a rectangular plan and a single nave. The interior space of the church, entered into through an arched door in the centre of the western wall, consists of a naos and an apsis. The naos is covered by a barrel vault in the east-west direction supported by each two arches from the sides. Each one crenel window in the east and west illuminate the interior. The inner walls are painted with whitewash on plaster. Despite its unsophisticated architecture, it attracts the attention with the spolia stones with cross figures on them in the walls, which are thought to be tomb stones. Although the church was restorated, its landscaping isn't performed and the entrance door is accessed from house locating on the adjacent parcel in the east.

Fig. 9-7. Edremit Church and its Environment from Maiden's Castle

Fig. 9-8. Edremit Church (Plan, Şahabettin Öztürk)

Old Edremit Cemetery; is located in Sarmansuyu (Erdemkent) Quarter, Block:113, belongs to the Revenue Office's Treasury and is registered by the Diyarbakır Conservation Board as 1st Degree Archeological Site (cemetery) with the resolution number 582 of March 19th 2014.

The cemetery consists of Armenian tombs, tom stones from the Medieval Age and later and of remains from the Urartian period (Top Biber 2017, 58,61). There are cross engravings, ornaments and Armenian texts on the tombs. 2 quarries, which were being used in the 1970s, but presently not more used, are located at the eastern edge of the cemetery. The western and northern regions of the area are destructed by the traffic roads that provide the access to the (Housing Development Administration's Area) TOKI area and by treasure diggers. The eastern part of the cemetery is completely destroyed. There are no measures related to conservation taken. Next to the cemetery, there are the Deed Office and buildings of the municipality and there are 2 water storages of the Van Water and Channel Administration (VASKİ) within the cemetery area.

Figs. 9-9, 9-10. The Christian Church and its Close Environment, Tomb Stones

3.2. Physical Status of the Transition Region of the Planning Area

While the settlement of Edremit had the look of a recreational area at the coast of Lake Van that gained importance with its nature until close history, it became one of the new development, housing areas of Van after the earthquake in 2011. The planning area is in a bad condition with regards to the physical environment quality and reminds a rural settlement area, where the natural structure is not much deteriorated.

The general environmental features of the buildings in the impact transitional region of the planning area are as follows: The utilization of the ground floor is residential and commercial. Stable, coops etc. reflecting the livestock activity are widespread at the buildings. The number of floors is mostly 1 floor, but there are also 2-floor buildings. The utilization of yards is widespread in the region. The street pattern is undefined. Disorderly orchards and roads result in the development of undefined gaps in the parcels. There is no area reserved for parking lots and road sides are used for this purpose. The main access roads are generally asphalt covered, and the by-roads consist of asphalt or stabilized roads. The conservation area in Edremit province is rich in culture and tourism; and located within a coastal settlement which has a land, air, rail and sea (Van Lake) transportation.

The SWOT (Strength, Weakness, Opportunity, Threat) Analysis conducted in the planning area is a method used in order to determine the strong and weak aspects, the opportunities and threat based on the external environment of the examined area. The aim of the SWOT Analysis is to create opportunities from the existing strong aspects and to minimize the threat to incur from the weak aspects by taking into consideration the internal and external influences. The SWOT Analysis is conducted by the joint examination of the natural environment, built-up environment and the socio-economic environment.

That the region is not dominated by mechanization, the conduct of organic agriculture, the preservation of the ecological values, the existence of a university, the evailability of labour force of the young population able to be directed towards agriculture and tourism constitute the strengths of the planning area.

That agricultural areas are being opened for construction, the unplanned and disordered development of the settlement, the lack of an urbanization infrastructure, the deficiency of the public and green areas, that there are settlements in the proximity and on the archaeological areas, that the activities vitalizing the town (socio-cultural areas) are accumulated only in the town centre, the insufficiency of mass transportation and access alternatives are important deficiencies. Beside this, that industrial areas are on fertile agricultural land, and are close to the coastal areas cause the pollution of the lake and underground waters.

The unemployment rate in the District Edremit is above the Turkish average in terms of the health and education indicators. The fact that the district is immigrating, the housing is disordered and that the touristic infrastructure is poor, are determined to be the weak character of the planning area,

The potential for cultural and religious tourism, the potential for eco-tourism in the Lake Van Basin, obtainment of agricultural incentives, availability of alternative tourism potential, existence of local press, non-governmental organizations, presence of an agriculture purposed organization, the pressure on the natural and cultural environment by the unplanned housing, the pressure on the fertile agricultural soil by the settlement areas, the unqualified migration to the region, the pollution of the environment due to the inability to control the wastes are the threats faced in the planning area.

4. Assesments Related To The Planning Area

4.1. Statistical Regional Units (SRU2)

Within the scope of the "Conservation Oriented Zoning Plan" in the planning area constituted the conservation of the historical, archeological and cultural assets with close environmental and landscaping elements, to avoid a further damage, to eliminate contradicting or the silhouette disturbing structures, to assess the area as a whole and its transfer to future the targets of the planning.

There are mostly unplanned developed housing areas around the conservation area in the District Edremit and in its south are the planned developed TOKI housings, (Housing Development Administration's Area) official and administrative institutions. The fact that TOKI had selected a place in this area has increased the pressure in this direction.

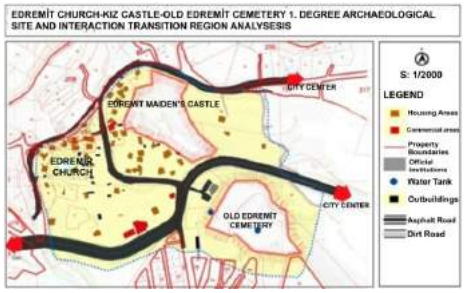


Fig. 9-11. Planning Area Analysis Sheet

Fig. 9-12. Archeological Site Area and the Influence Transition Region

In the site development plans of the development housing areas within the "Edremit District Interaction Transition Area Border" are the housings planned mostly in separated order and with the condition to be two, three floors, and the precedent to be P:0.60 P:0.90. And the buildings in the close proximity of the conservation area consist, except the TOKI (Housing Development Administration's Area) housings, of 1-2 floor masonry and stone-brick buildings with rural character. These buildings are jerry, unplanned, without any project built buildings with yards. Also with the influence of the place selection of public institutions, constitute the construction of reinforced concrete high rise blocks in the environment of the conservation areas a risk for the area.

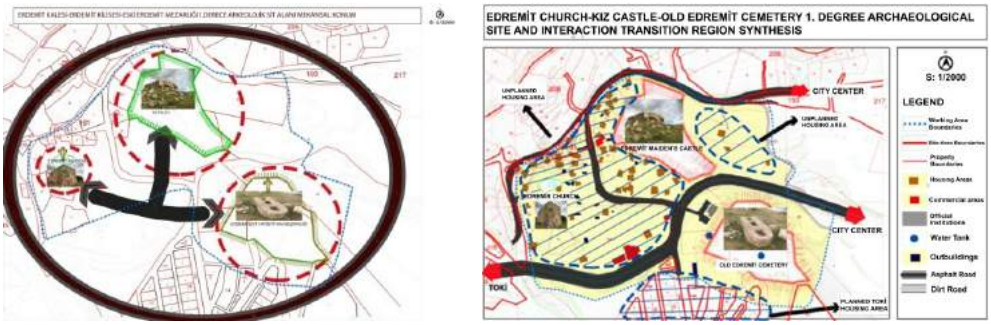


Fig. 9-13. Edremit Planning Area Spatial Location Sheet

Fig. 9-14. Edremit Planning Area Synthesis Sheet

The scenario established related to the planning area; expresses the urban-cultural tourism and nature-coast tourism focussed image and identity establishment process of the local, authentic identity values. In this context, the Tatvan-Van-Muradiye corridor is explored and development corridors for the work area are determined. The western development corridor will show a cultural-religious-nature tourism development towards Tatvan such to include the Akdamar Island; agricultural activities will be conducted on fertile agricultural soils. Tourism activities in the northern development corridor will be vitalized and areas with tourism potential will be converted attractive. The commercial activities in the city centre will be continued and maintain their vitality. A tourism route towards mountain tourism will be established in the eastern, southern and northern development corridor.

The Edremit planning area will be assessed within the scope of this scenario with a focus on coast tourism and culture tourism. The Edremit planning area, which is at the same time correlated with the other touristic centres in the Van Lake Basin, will also be an important centre for tourism activities like eco-tourism, mountain and tableland tourism, winter tourism, religious tourism in the region. It's central location between centres like the Akdamar Region, Van Castle, on the coastline of Lake Van and able to be deemed close to the planning area, Tuşba Castle, Gevaş-Abalı Ski Centre, convert this area more important. On the other side, the importance of the Edremit planning area will further increase on a tourism route that is correlated with the Muradiye Waterfall, Muradiye Castle and Tendürek Mountains in the north of Van.

Fig. 9-15. Scenario and Planning Approach Regarding the Edremit Planning Area

5. Conservation Oriented Zoning Plan Resolutions

The borders of the "Conservation Oriented Zoning Plan" cover the 1st Degree Archeological Site constituted by the Edremit Church, the Maiden's Castle and the Christian Cemetery and the Registered Monuments' Borders and the "Impact Transitional Region".

The basic principle of the planning; is the planning approach that observes the social benefit based on equality, and is based on the principle of participation and transparency and the "*sustainable urban conservation*" principle, which allows the conservation and improvement of the cultural heritage. In this context, planning studies aims to preserve the archeological sites in the centre of the planning area and to contribute to the intention to develop new social and economic possibilities with these areas. In the "Conservation Purposed Zoning Plan" are works conducted towards. The conservation of archeological site areas and registered buildings, to perform the distinction between pedestrian and vehicle, to convert the pedestrian axis continuous and to create squares, to determine the building-parcel relations, to develop their cultural and commercial activities.

The 1/5000 Scale "Conservation Oriented Master Zoning Plan" is prepared under the influence of the resolutions regarding the 1/100.000 Scale Environment Development Plan

and the site master development plan. The upper scale plan resolutions and the resolutions of the 1/5000 Scale “Conservation Oriented Master Zoning Plan” were determinant and influential at the preparation of the 1/1000 “Conservation Oriented İmplementary Zoning Plan” for the Edremit Church, Maiden’s Castle and the Christian Cemetery. Beside this, detailed plan provisions are determined by taking into consideration the utilization criterions, housing structure, urban structure elements, urban furniture, the principle of a balance between conservation and utilization in the planning area.

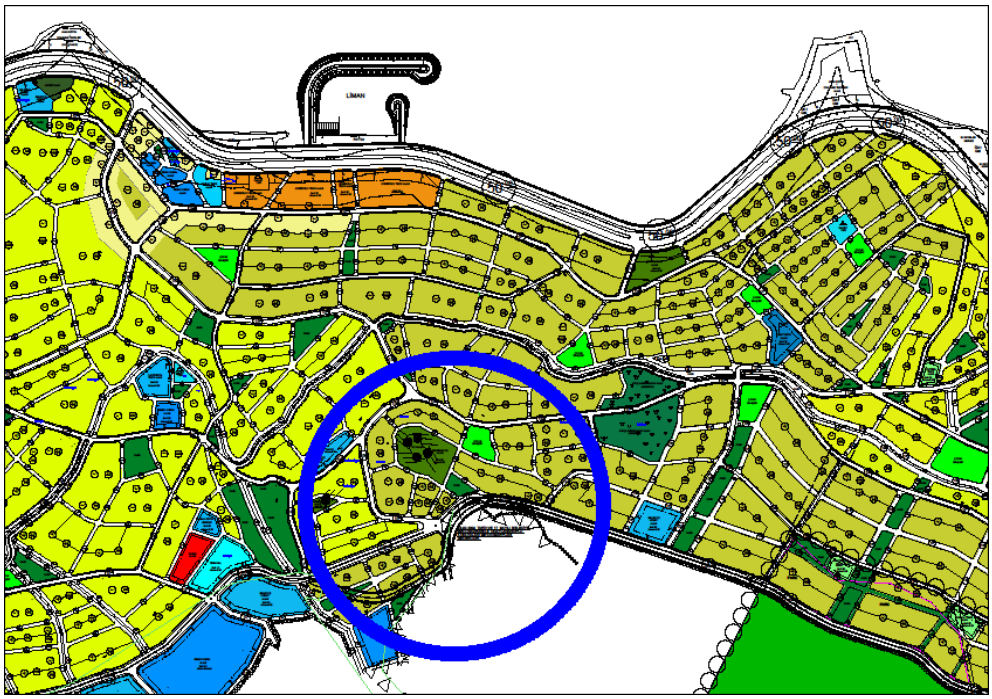


Fig. 9-16. Edremit Working Area and Urban Development Plan

At the work performed related to the utilizations within the borders of the “Impact Transitional Region” of the planning area are the special approaches related to the establishment of the plan resolutions regarding the land usage resolutions and related to the area with regards to the urban design are summarized below; to correlate the planning area with the whole of the town, to ensure the access of the archeological sites to each other, to solve the vehicle and pedestrian access problem with a pedestrian focussed transportation system, to obtain a housing structure with a low concentration established by a street structure leading to open green areas, to ensure the visual and physical interaction between the coastal settlement and the archeological-cultural areas and to increase the accessibility of these areas, to develop a design that enables the unification of the panorama terrace and the coast, to establish the resolutions during each stage of the planning and design always pursuant to the human scale.

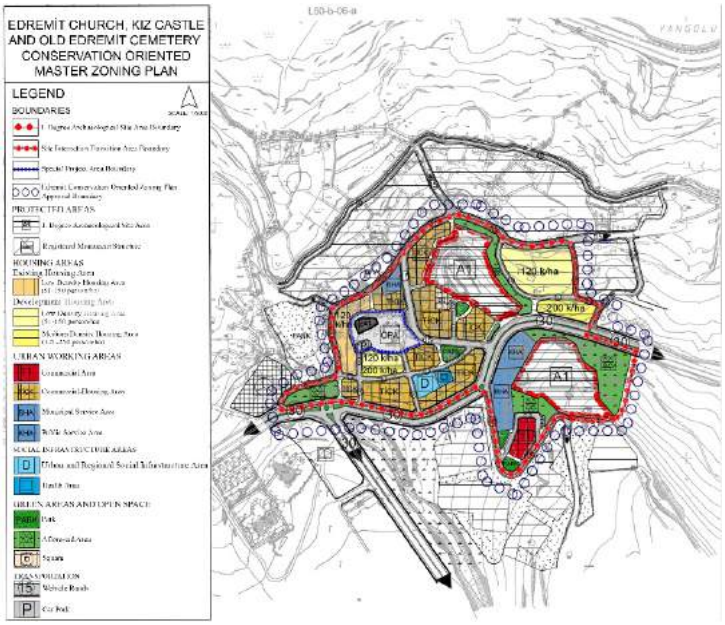


Fig. 9-17. Conservation Oriented Master Zoning Plan for the Edremit Maiden's Castle and the Old Edremit Cemetery

Green areas and related squares and pedestrian axis within the planning area, which is correlated with the coastal region in the town, are designed such to constitute a buffer around the archeological sites by ensuring the continuity, integrity, transmittance of the urban green areas. Pedestrian and service roads and green areas at suitable size are arranged in order to establish the street structure around the main pedestrian axis connecting the utilization areas in the planning area. The inclined slopes of the archeological sites are constituted of green areas, particularly in the north and east direction, in order to increase the visual quality of the historical-cultural focus points.

Green areas are established around the Edremit Maiden's Castle, Edremit Christian Cemetery and Edremit Church in order to decrease the pressure towards housing. Plan resolutions complying with the street structure of generally 10 m and 7 m wide roads are made. In the planning area, the housing conditions regarding the residential areas are planned to be Ground Area Coefficient of GAC:0.30 varying between 2 and 4 floors in separate arrangement and the Floor Area Coefficient of FAC: between 0.60 to 1.20. The housing values in question correspond to the low and medium intensive and developing residential areas in the planning area.

The commercial areas suggested in the planning area, the construction conditions from the closest area to the outmost area from the cultural assets is planned to be P: 0.60-0.90 of the precedents and the highest building height is planned to be maximal: 6.50-9.50 metres. The housing intensity values of the commercial-residential areas on the axis of the road to TOKI with a width of 30 metres is planned to be 4-floor for the separate arrangement, with TAFC: 0.30 and precedent of P: 1.20.

There are 3 types of roads planned in the area, which are vehicle roads, pedestrian roads and service roads that allow the passage of vehicles when necessary. The main road of 30 metres dividing the area into 2 parts and the collective roads of 15 metres and 12 metres are preserved.

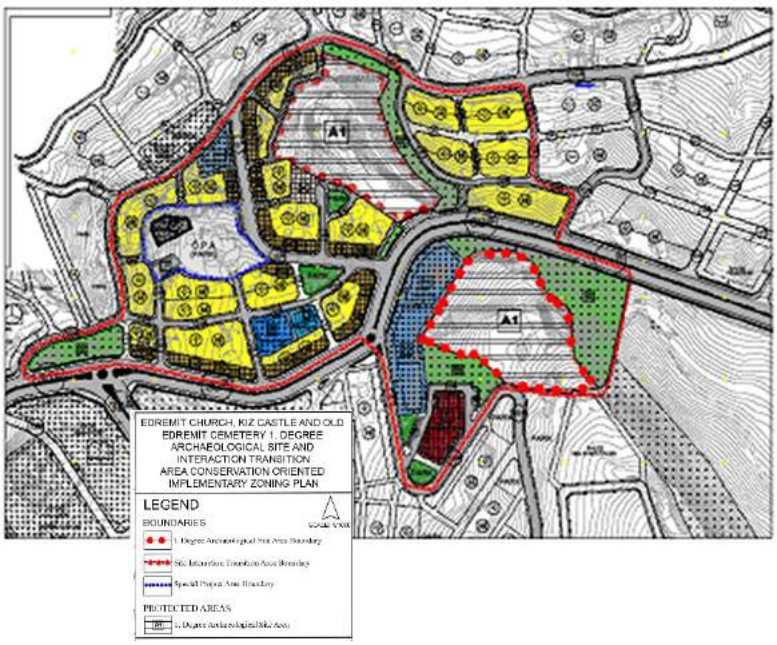


Fig. 9-18. Conservation Oriented Implementary Zoning Plan for the Edremit Maiden's Castle and the Old Edremit Cemetery

A "Special Project Area" is established and a square arrangement is planned, which brings the Edremit Church to the forefront and is cleared from the illegal housings around it. Beside this, a square is designed within the scope of one-day tourism activity on the slope inclined in the south-east direction of the Maiden's Castle and by taking into consideration the panorama factor that dominates the coastal line.

The district governorship and the metropolitan and the district municipality are the bodies that have administrative authorization in the Edremit planning area. In addition, due to the archeological, historical and cultural features of the area, the Van Culture and Nature Assets Conservation Regional Board, Directorate of the Van Museum and the Conservation Application and Inspection Office (KUDEB) within the entity of Van Metropolitan Municipality are the institutions that undertake tasks.

The financing of the processes regarding new housings in the planning area that are in harmony with the fabric pursuant to the resolutions of the conservation purposed development plan and the "restoration and functionalizing", "infrastructure and social outfit refurbishment", "environment planning and landscaping" processes for cultural asset buildings is not possible to be met by only the budget sources of the local administrations. Private sources like that of the property owners, persons/companies/cooperatives/foundations etc. and the sources to be transferred from the budgets of all institutions authorized in the area for public projects, the projects to be supported by the Development Agency, Chamber of Commerce and Industry, Chamber of Merchants and Craftsmen and funds of the European Union can be used.

The areas to be protected and the neighbouring areas are under the pressure of unhealthy urban development since the "Conservation Oriented Zoning Plan" (CPZP) and the "Zoning Plans" are not dealt with jointly in Turkey. That the archeological sites are indicated in the development plans as empty parcels, that the border are rather determined by short termed surface surveys instead scientific methods and that the transition regions are planned without any connecting content between the archeological sites and development areas result in that the archeological site and the transition region convert into an introverted part of the town. The conservation purposed development plan of Edremit is designed such to integrate the planning transitional region and the conservation area into the urban system without taking this separate into consideration from the upper scale development plan resolutions.

With regards to their locations and the historical and cultural features have the conservation areas of Edremit a potential to be evaluated together with other cultural assets in Van and its environment. Planning approaches are shaped by the principle of transferring the multi-layered cultural heritage of the region to the future by preserving past cultures and differences. In the implementation stage of the planning, a balance must be provided between conservation and use. Also in this stage, presentation of cultural heritage to the public along with landscaping works and formation of qualified constructions in transitional area will enhance the quality of life in the area.

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CHAPTER NUMBER 10

ASSESSING THE LONG TERM PERIODIC URBAN LAND USE DEVELOPMENT OF VAN BY REMOTE SENSING

ONUR ŞATIR, PINAR BOSTAN,

OKAN YELER, ŞEVKET ALP

Many factors can effect urban land use development such as physical, economic and social structures. In this study, Van urban land use development was evaluated in 3 different socio-economic conditions from 1973 to 2015 by remote sensing. First term covered 1973 – 1987 time period and rural population of the region was higher than urban population in this time. Second period was evaluated between 1987 and 2002 years. In this term, region was a security problem, particularly in rural areas and Turkey's economy started to transform from agriculture to industrial production. The last term was 2002 – 2015 period. In this period, rapid urbanization was a big problem and types of the economical income were changed. As a result of the study; urban development has been detected in a regular form until 2002. However, in last term urban development has been increased faster than before because of immigrations and earthquake effects. After the earthquake, new build up areas were established around the city, and this situation was supported urbanization to the far regions from city center.

Keywords: Remote sensing, Van urban development, social dynamics, change detection, object based classification

I. Introduction

City of Van has a very long term historical story. According to the historical researches, the city dates back to 5500 BC. Tilkitepe mound that is located next to the Van airport was settled firstly in Van region in 3500 BC (Relly 1940). However, city got importance in Urartian time (900 – 600 BC). Urartians built their capital in here and called Tushpa (Sunny city). Asurians, Scythians and Meds invasions were destroyed the Urartian Empire. After the Urartians many civilization (Armenian, Persian, Roman, Sasanian, Araps, Byzantium, Selchuk, Ilhans, Karakoyun, Akkoyun, Safevi and Ottomans (after 1548) used this region as a strategic tran-

section zone orderly (Tukin 1945). As the known from historical processes that City of Van has a dynamic structure because of strategic geographic position. Nowadays, this dynamic structure is still alive. In the last half century, the science of remote sensing has been actively utilized in the evaluation of the physical development of the cities (Xu and Min 2013, Alsharif and Pradhan 2014). Because remote sensing is provided time, energy and cost saving (**Şatır** and Berberoğlu 2012).

In this study, urban sprawl of Van was detected from 1973 up to 2015 (43 years) periodically using Landsat satellite dataset. Van urban areas for 1973, 1987, 2002 and 2015 were determined applying object based classification approach. Periodic urban sprawl was discussed based on socio-economic developments in interested terms. So that urban sprawl of the Van city has been evaluated using urban change as an indicator of the social situation.

2. Study Area And Dataset

Study area was defined respect to today's Van urban area. Because, past urban areas were less than today's areas and defined study site must be covered all Van city in all time periods (Figure 10-1).

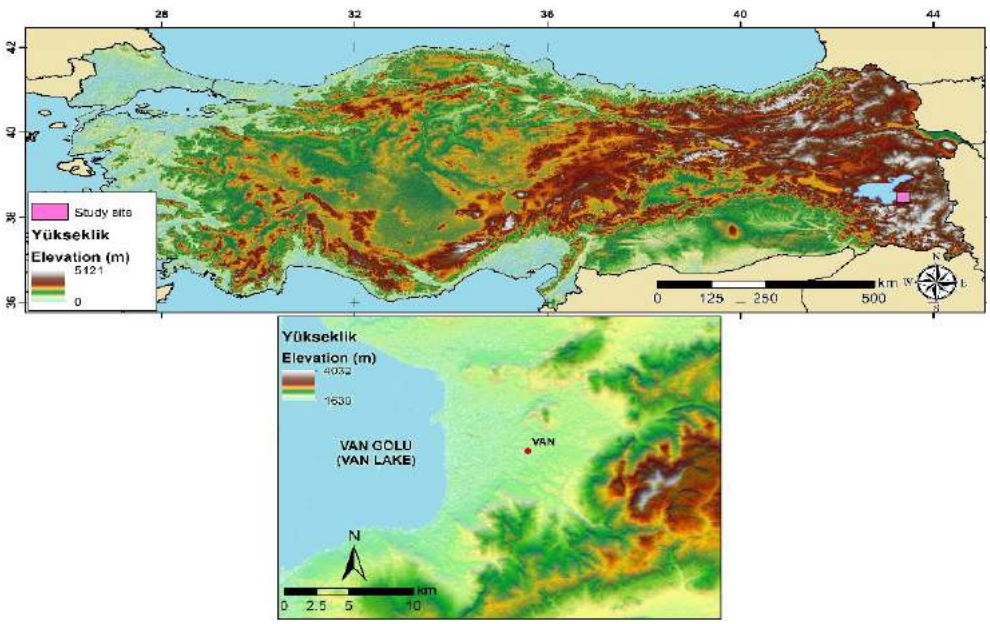

Fig. 10-1. Location of the study area

Landsat satellite images were used as the main dataset of the research. Landsat dataset is provided a very good opportunity in change detection analyses due to good archive, appropriate spatial and spectral resolution and free data availability (**Özyavuz** and **Şatır** and Bilgili 2011). Basic specifications of Landsat dataset that was used in the study is shown in Table 10-1.

Table 10-1. Used satellite dataset in the study

Satellite data	Acquire Date	Spatial resolution	Spectral resolution
Landsat MSS	14.07.1973	60 m	Visible and near infrared (NIR)
Landsat 5 TM	03.07.1987	30 m	Visible (V), NIR and shortwave inf. (SWIR).
Landsat 7 ETM	16.08.2002	30 m	G, YKÖ, OKÖ V,NIR, SWIR
Landsat 8 OLI	23.08.2015	15 m	G,YKÖ, OKÖ V, NIR, SWIR

Except the main dataset old topographical maps, soil map, forest map and aerial photos were used for accuracy analyses of classifications.

3. Method

Research is designed in three stages as; i) object based classification (OBC) of the satellite images, ii) accuracy analyses and iii) urban change detection.

i) Object based classification, is based on grouping pixels logic according to the spectral and structural spesifications of the pixels. So that classified objects become more stable than pixel classification alone (Berberoglu et al. 2000). This progress is included three main

levels to be, segmentation, classification and correction. Segmentation is the main step of the OBC. In this study, multi-resolution segmentation system was used with mean shifting algorithm. In this algorithm, shape versus color and compactness versus smoothness and object scale factors must be defined. Generally this progress is done by the user experimentally (**Şatır** and Berberoğlu 2012; **Şatır** 2013). Supervised maximum likelihood approach were used as the main classification algorithm in classification stage. This is one of the most known approach in remote sensing studies and if there are enough training dataset, results are very good.

ii) Accuracy analyses, is an initial part of the post-classification change detection studies. Reliability of the study directly connected with classification accuracies. Kappa accuracy assessment system was applied to all classified images. If kappa value is "-1" it refers no match (low accuracy), if kappa value is close to "1" it refers perfect match (high accuracy).

iii) Urban Change detection, processes were completed after the classification. In this stage, periodic urban sprawl of the each terms were detected and all changes were discussed according to the interested terms socio-economic conditions.

4. Results

Results were evaluated periodically from 1973 to 2015. To understand the urban sprawl reasons and dynamics, we must know the type of effects and periodic socio-economic policies and conditions.

First research term was covered between 1973 and 1987. In this term urban population of Van city was around 30% of total population **(**TSS 2016). Animal husbandry was the main income in 1970s.

In second research term (1987 – 2002), immigrations from rural areas to cities were started in the region prominently because of regional security problems and industrial subventions instead of agricultural development (Hurma 2003).

In the last term (2002 – 2015) urban population of the Van city was almost 53% of total population, and city life has been more popular anymore. Therefore, Van earthquakes happened in this term and it directly effected the urban sprawl dynamics.

As a result of the study; the total of Van urban areas was 431 hectar and city population was about 90,000 in 1973. In 15 years, population was raised to 191,000 and urban areas was increased up to 1,082 hectar in 1987. Although population was two times more than before, total rural population ratio was still 65% in 1987. City population was continued to rise with urban areas until 2002 linearly (almost two times). However, rural and urban

population ratio was changed significantly between 1987 and 2002, and rural population was become 49%. Changes in this term was mostly caused by security problems, economic situations and very low agricultural subvensions. Urban areas were changed dramatically in last period (2002 – 2015). The main reason of the this change that two Van earthquakes damaged particularly the city center and built up areas were needed to establish new accomodation areas. Total urban population was increased to 564,000 from 450,000. However, urban areas were increased from 2315 to 7581 hectar. There has been a balance between population rise and urban extension until 2002, but as a result of the study this balance was broken in last term (Figure 10-2).

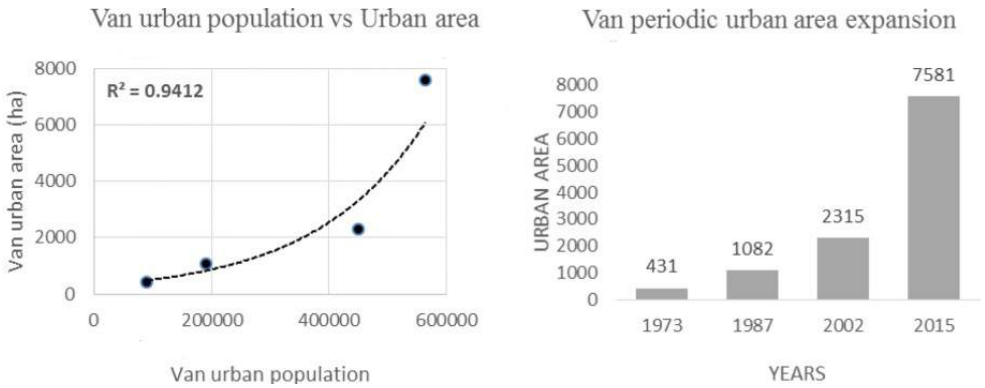

Fig. 10-2. Periodic urban expansion and relationship with urban population

As shown in figure 10-2 clearly, there is a significant difference on urban sprawl in last period. New built up areas were established particularly South part of the city (Edremit region), and North part of the city Kalecik region after the earthquakes. So that city center started to loose its importance.

All urban land use classifications (built up areas and roads) were accurated by the ancillary dataset. Kappa accuracy co-efficiencies were obtained to be 0.93, 0.94, 0.92 and 0.96 for 1973, 1987, 2002 and 2015 respectively.

According to the classification overlays, Van city was expanded to NW and SW directions, and built up areas has been close to the lakeside gradually. Additionally, there was a sprawl to East side particularly between 1987 and 2002. Earthqakes effects were created new construction areas far from the city center in last term (2002 – 2015) (Figure 10-3).

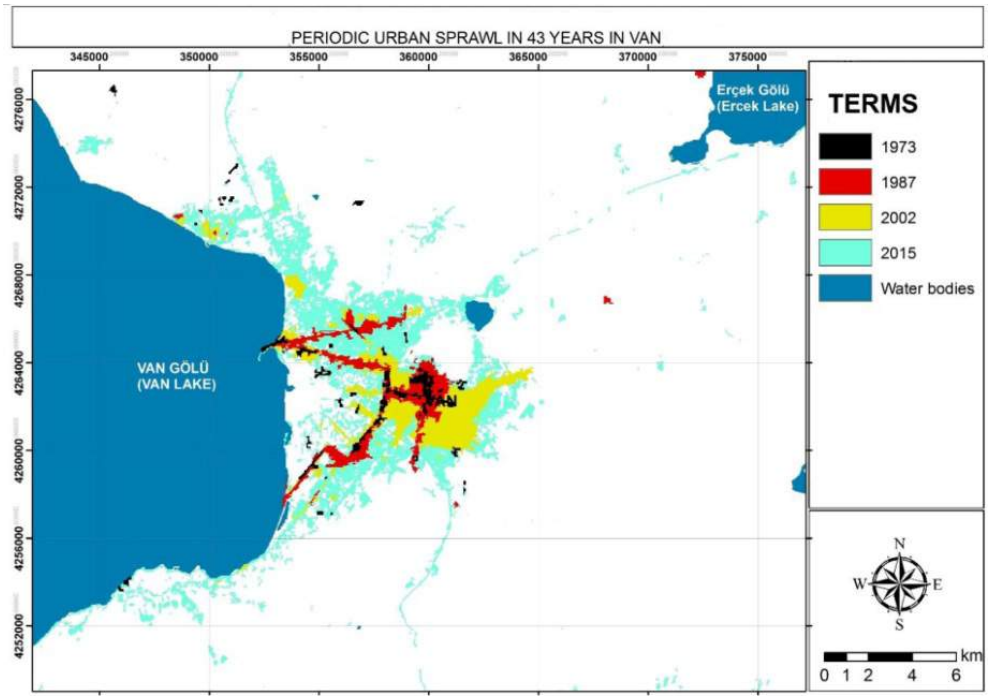

Fig. 10-3. Periodic urban sprawl of Van city

5. Conclusion

In conclusion, periodic socio economic and natural factors impacted Van urban sprawl directly in time. While rural population ratio was 70% in 1970s, today rural population ratio was decreased to 47%. Particularly, urban population increased between 1987 and 2002. Not only the security problem was the reason of the this change, but also economic structure of the country and changing government subvensions effected this change. Although Van region has very big grassland areas, the grasslands were transformed to field agricultural lands and settlements (Satir and Erdogan 2016). So animal husbandry lost its importance and small industry, marketing and field agriculture were raised in the region. Today animal husbandry started to gain importance again thanks to government subventions. However, people adapted to city life finally and especially young generation is not interested in animal production.

As a result of the Satir (2016) study on potantial urban sprawl areas of Van city that urban sprawl will be continued to the NW and SW part of the city (**Şatir** 2016). Housing areas will be located mainly in Edremit side and industrial regions and big shopping malls will be moved to the NW sides.

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CHAPTER NUMBER 11

WHAT HAPPENED TO TRADITIONAL VAN GARDENS?

ŞEVKET ALP

The culture of traditional gardening of Lake Van, within the understanding of the civil architecture, has continued from Urartians until present day. For this reason, Van was a sparsely textured settlement in the midst of vineyards and gardens until the end of 19th century. In addition to the architectural structures, the region's land structure and the climate, the interaction with the outside world, the demand for local building materials and traditional cuisine, all played a role in the creation of Van's Gardens. Traditional Van gardens have developed a unique identity over the time. The beauty of Van's gardens has found fame with the famous statement "Van for this World, faith in the Other World".

For the last 30 to 40 years; the city's own natural population growth and immigration from neighbouring provinces and districts has resulted in further construction in the city. While this has required the establishment of new residential areas, it has also brought up the need for the reconstruction of old settlements. The traditional gardens have been affected and damaged considerably by these physical changes to the city. At the same time, facing impacts of modernism and globalization, the city has developed an identity problem. For Van to escape the differentiation that many cities are facing and for it to shine through as a unique city in order to acquire an identity that will make it renowned amongst other famous cities in the world, it needs to preserve the garden culture that had an important place in the old city's identity and transfer this to the new city identity.

Keywords: Lake Van, urban identity, Urartu, cultural heritage, dedifferentiation

I. Introduction

Van and its surrounding communities, have had cultural and commercial relations interacted in almost every aspect with North Mesopotamia since the early days of history. One of the issues that Van's locality has been influenced is, the art of building and arranging gardens which were developed in Mesopotamia and spreaded out from there. Beginning

with the Urartuan King Ispuini (830-820 BC), the kings all spent great effort and cared on creating vineyards and vegetable gardens in the Van Lake regional basin. In fact, the vineyards and gardening activities have become a defined activity that, must seen and must be remembered as important as the establishment of the cities (Sevim 2001; Alp et al. 2010).

Initially, starting with Assyrian sources in the works under taken towards the end of the XVIII. Century, Van; has been specified as a wooded place and decorated with gardens. In those works the mostly described subjects about Van is, the two storeys houses, which have their own architectural lines, made of mud brick and covered with soil, with large gardens which holding a variaty of ornamental plants, mainly roses and including various of fruit trees (Öztürk 2004; Alp et al. 2010).

Towards the late XIX. Century, Van had a rarely-textured settlement features between the vineyards and gardens (Figure 11-1). The "Upper City", which was located above the walled city, was famous for its large vineyards - gardens, beautiful fruit and rich wine production. In those gardens, various roses were grown; especially the "Van Rose". The houses, were disappeared between the gardens and were not noticeable, but were only can be seen as/if they reached to the main streets. The legendary and the epic beauty of the region was transferred by generation to another with an illustration: "Van for this world, the faith for the other world" (Günel 1994; Alp et al. 2010; Alp and Koyuncu 2010).

Fig. 11-1. Van Garden ruins

2. Van Gardens and Current Situation

When the general characteristics of the Van gardens are examined, which have survived from the Urartuan period to present day; it is determined that the most significant feature of those gardens are, being natural. There is no exact axle on the whole of the gardens. In Van's Gardens, habitation and usage area are at the front-line. Eating, drinking, having fun, resting, traveling, playing games, can all be done in those gardens. For those mentioned reasons, it is important that the gardens are functional and have been designed accordingly and that's why they come in the foreground as the places not only can be viewed and watched, they are the places for resting and living in (Alp et al. 2010).

Fig. 11-2. Front entrance of building

Van gardens are made up of two main parts. The front garden is, usually close to the main building and which called "Hayat/life"(Fig 11.3) is, and usually showcased one. Flower beds are set around the house and in the seating areas. A variety of colorful plants and flowers can be seen as important elements in the gardens and they add color and mobility. Generally, flowering plants would be in the section which is close to those areas where women's daily life passes (Alp et al. 2010).

Fig. 11.3. Hayat (Back garden and door)

The second parts of Van Gardens are, the section where fruits and vegetables are grown. Because of its functionality in Van gardens, fruit trees and vegetables are more common in the front gardens. The fields where the vegetables are grown are located between the fruit section and the courtyard. In those gardens, there is always enough space left for vegetable so that the families can grow enough vegetables to meet the needs of the whole family (Alp et al. 2010).

Fig.11-4. Traditional wall.

This section which is known as the "kerdi" in the region and where each different kind of vegetables are grown, such as; onions, potatoes, carrots, cabbage, peppermint and parsley are grown here. The fruit trees would be planted in a certain order, after the vegetable growing area. Summer species would be located near the house and winter species are located at the back of the garden (Alp et al. 2010).

While the water was required for fruit and vegetable cultivation would be provided by ducts connected to the canal in the gardens beneath the historic Şamran Canal, the gardens above the Şamran Canal, would be irrigated by the water from the Urartuan period canals called "kerhiz" (Alp et al. 2010).

In the fruit section which forms as the second part of the garden, the soil beneath the trees were not being plowed and would be left as meadow. Thus, from time to time, it was also possible to graze the domestic animals kept in the house domestically, as well as providing the fodder for them. This area might also be used as the children's playing area.

Van, which is an historical city that roots its identity in the radical values of the Urartian civilization, has also been influenced by its Iranian neighbor's garden culture. Both Mes-

opotamian and the traditional Iranian garden cultures have very strong influence on the formation of Van Gardens.

In the 19th century, the presence of the British consulate in Van and the major foreign institutions such as Russian, Iranian and French mission, American schools opened Van's gardens to be influence by the western world (Alp et al. 2010; Alp 2012).

In the late 19th century, the Van area was severely damaged by conflicts, wars and occupations in the area. During the Republican period, the city was re-established on the upper part of the old settlement, in the vineyard gardens and over the time, it took a new identity (Günel 1994; Alp 1999). It is seen that the newly established city continues to use the large brick houses made from mud bricks.

Unlike in Anatolia, where until 1960's, several large cities including İstanbul and Ankara; were modernised which brought the change, dynamism, rapid economic development, prosperity and consequent of all possibilities. The remaining cities in Anatolia, such as Van; proved to be a province and places where stagnation, poverty, and conservatism tradition was dominated. With the increasing urbanization after the 1960's, this formation was gradually shaken off and with the new constitution the dynamism remarkably has developed (Alp 1999).

The city of Van, which was established in 855 BC along the shores of Van Lake and had historical, military and strategic precaution. Van was situated the intersection of important civilizations and naturally participated in this, changing period of the time in Anatolia (Alp 1999).

As the traditional Van city culture transformed into a modern city, the structural problems, the identity problems began to emerge with in the area. The first indication of these, appeared in the 1980s, when the first major wave of urbanization happened. This was as result of migration from the villages to the city. A rough planning and modernist architecture became a reflection of the city as result of that immigration. The city was planned as centering the public institutions and organizations same as in all other cities of Anatolia; which began to develop a different city model that, produced itself with highly unappealing reinforced concrete structures, ceremonial spaces and boulevards.

After the 1980s, due to the city's natural population growth as well as the migration from surrounding cities and provinces, led to extensive zoning activity became mandatory and since than the city's change, has been accelerated. The city of Van, was caught unprepared, in this rapidly changing process. The result of increasing unconscious and unplanned construction, caused loss of its traditional characteristics. One of the most important indicators of this change was, the construction of 5733 units of the 155 Construction Cooperative in 1986-1998 which opened up those large gardens gradually for the establishments which had an important place in the city texture (Alp 1999).

During the 19th century, while we were talking about the globalization, in the urban structuring, there was a new mobility and a process of creating a different identity. A wave of urbanization, which centered on shopping, and consumption, all around the world, with the same planning approach, reduced the situation to a purely technical level has also influenced Van. This effect, at the same time, began to leave no space for the traditional Van City life. The present process, which shows no more the accumulation of the past, the traditional Van gardens, which gave the city its unique identity, are rapidly disappearing; It is caught up in a wave of globalization and is almost made into an artificial imitation of the other open green areas, in the world.

3. Conclusion

Urban texture in Van; is becoming a growing problem with reasons such as; inadequate national income per capita, problems caused by terrors, lack of infrastructure, wrong land use, unplanned construction. Recently, as a result of such factors as the luxurious acceptance of the gardens, the speculation of the land, and the hostility of the green space areas created by economic interests; causing those old houses with large gardens, only left in the city not to be preserved, shrunk or destroyed completely.

This new wave of likeness which the city is exposed to, further deepens its search for a new identity and personality. Although one of the most important missions of the local government is to preserve, develop and bring new values to the historical and traditional identity of the city, unfortunately the municipalities do not see it and cannot produce the right solutions.

Despite all of this negativity, it seems that in recent times there has been some search in order to find the identity of the city. During these searches, it is important that the cultural heritage should be converted and that this heritage should be reasonably assessed. In this regard, there are also some points, where the city of Van is more advantageous than the region.

Van can be appreciated because of the rich cultural heritage it has inherited from the Urartians in a meaningful way. Van can be also spoken about it, by gaining a contemporary city identity among the world cities. To this end, the socio-economic developments as well as the projects of traditional civil architecture and traditional gardens that reflect the historical past, the contemporary and original solutions must be established in Van City.

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CHAPTER NUMBER 12

LIVELINESS PATTERN OF VAN CITY CENTRE (BAZAAR) FROM THE VIEWPOINT OF FLÂNEUR/ FLÂNEUSE: SPATIAL TOPOLOGY OF TWO MAIN AXES WITH OPEN AND GREEN AREAS

YASEMIN İLKAY

Within the evolution of urban space, city centre has been the place where the heart of city pulsates. Although the relationship between public facilities and economic-political functions has a significant place on the basis of this positioning, it cannot be explained solely with this relation. City centres provide a stage for the commercial activities, administrative and political buildings; function as a node for the transportation modes and routes; and also enable both social and individualistic experiences side by side; furthermore, city centres take part at the focus of the spatial pattern of public spaces and open-green areas of cities. A flâneur/flâneuse can sense the urban rhythm and soul especially while moving through main roads of the city centre and stopping at the open-green spaces (squares, streets and parks) on these axes; so he/she can read the character and vitality of this city. Since the pattern of public facilities at their centres differ from city to city, the form and rhythm of this pattern brings a specific identity and liveliness to each and every city. However, recently, we can observe that city centres have been exposed to dis-identification and fragmentation (into sub-centres) especially in metropolitan areas. Differently, Van city centre preserves its vitality even in different seasons and at different time periods during day and night time; although Van is located in a relatively cold and eastern part of the country, she presents an example of a lively metropolitan city centre. This result is suspicious to be led by a conscious planning policy; nevertheless a planner/ designer better examine and reveal such an authentic urban vitality within a flâneur/flâneuse perspective at first hand.

The vitality of city centre is related with the pattern of public facilities beyond commercial activities. This pattern is not solely formed by the physical structure; the reciprocal processes among daily routines and festivities on this physical structure contribute to the publicness pattern by constituting the collective memory and activity repertoire. This formation is one of the social-spatial dimensions of cultural landscape of the city. As the rhythms, forms and physical patterning changes, this landscape also changes; which knits the urban breath, circulation and pauses. This text is a first step to write out the socio-spatial and temporal analysis of a major part of the linear city centre in Van, called as Çarşı (meaning “bazaar”) by the local

inhabitants. This study is based on the observations and evaluations on the two main roads (Maraş Road –whose official name is Kazım Karabekir Caddesi– and Cumhuriyet Road which cuts Maraş Road towards Beşyol Square towards the north and new built Shopping Mall towards the south), and the urban open spaces and green areas on these axes such as Kurtuluş Park, Sanat Park and Sanat Street, and Feqıya Teyran Park, with Beşyol Square and Governor's Building eventually. This paper aims to document the stations/stops and routes of the linear city centre of Van through the two main axes reaching at Beşyol Square and evaluating the vitality within the socio-spatial mechanisms, and rhythms in the example of Van city centre, from a flâneur/flâneuse's perspective.

Keywords: Street, public space, flâneur/flâneuse, spatial topology, rhythmanalysis, Van.

I. Introduction: Reading The Soul Of The City Centre With The Eye Of "Flâneur/ Flâneuse"

The heart of the city beats at the 'city centre' although it has been transformed within its content, form and meaning in the historical phases and differs among geographies. Public facilities, commercial activities and political struggles have a crucial role in this role; nonetheless the essence of city centres via urban pattern is not limited to these functions. City centres –where commercial activities are operated; administrative and political structures are located; the axes and nodes of transportation are gathered; social interactions and individualistic activities are settled side by side– also constitute the focus of the pattern of urban public, open and green spaces. This pattern is not just a physical phenomenon; rather it both gives clues on the semantic worlds, symbols and urban everyday routines of the inhabitants and indicates the traces of the soul and character of the city which differentiates it from other cities. Therefore, the initial impressions of a newcomer are critical to grasp the soul of the visited city within a purified mind through the first contact with urban space. Flâneur/ flâneuse can sense the rhythm of the city centre while wandering and pausing along its roads, and urban open-green spaces (such as squares, parks and streets); he/she can read the soul and character of the city which will intensify if he/she has a background information and experience on the *nature* of urban space.

Since the pattern of public facilities at centres differentiate from city to city, the form and rhythm of liveliness bring an authentic identity to each and every city which is specific to that urban area. However, recently the city centres have become undefined and fragmented especially in metropolitan cities. Van City Centre is an interesting example since it seems lively at different time periods, in various seasons and day time, although it is located at a relatively cold climate. It is questionable that this liveliness is a result of planning policies; however, examining such a social-spatial phenomenon within the authentic soul of Van would be worthwhile within the viewpoint of a flâneuse planner. The lively character of the city centre is related with the pattern of public activities beyond commercial landuses. This pattern does not solely consist of physical structure, but also the daily routines and carni-

valesque events contribute to the publicness pattern by creating a repertoire of collective memory and public activities in the minds of citizens. This formation constitutes one of the socio-spatial dimensions of cultural landscape at urban space. As the rhythms and physical patterning changes, this landscape would also transform while knitting the breaths, circulations and pauses of the urban space.

The problematic of this study has been shaped on the basis of the question what ***the liveliness of city centre*** in Van (especially characterized by linear movements) ***means*** with respect to the discipline of city planning. The text roots in the observations of its writer since June 2016 (when she moved to Van from Ankara) to May 2017 – especially the initial sensations (for route see Fig. 1.). Therefore, this text should be regarded as a scientific essay or a philosophical query rather than a finished scientific paper. The study is a first step to a rhythmanalysis and socio-spatial inventory of a great section of Van City Centre, which is a mentioned as Çarşı (*Bazaar*) by the citizens and especially by the public transportation drivers. This analysis is based on the observations made on the two essential axes of the city centre Maraş (officially Kazım Karabekir) and Cumhuriyet Streets within the open, green or public spaces located along these axes such as Kurtuluş Park, Sanat Park and Street, Feqıye Teyran Park, Beşyol Square and the building of Government. The aim of the study is to document the character and origins of the stops along these two axes within their socio-spatial mechanisms, rhythms and forms from the view point of a *Flâneur/Flâneuse.* The inventory starts from the beginning of bold red route, from Kurtuluş Park and ends with Beşyol Square, where the bold blue line ends (see Figure 12-1).

Fig. 12-1. The route of the Flâneur/Flâneuse while observing and walking through Van city centre (Red: Maraş Street, Blue: Cumhuriyet Street) *Googleearth ©2017 DigitalGlobe*

2. (Re) Production Of Public Space By "The Body" While Moving Through Urban Space

Thierry Paquot (Paquot 2011), who is mentioned as an urban philosopher, begins his book *Urban Bodies* with a discussion on the possible pain the body feels while moving in the city (p. v.):

> How do we live in cities today? How do our bodies harmonise with the urban rules? … Today cities comprise of structures stacked on top of each other. Settlements, capital cities, metropolitan areas and megalopolis exist. Sometimes, cities resemble dormitories. The body should learn how to live, move, breathe, protect oneself, and relax at these spaces sometimes modest sometimes airless in turn… Well, has the body achieved finding its place? Will it confront the noises and smells attacking, the madness of everydayness and the gazes surrounding it, violence and aggression threating? How can the body reside in its own city really and how can it be free at its motilities?

Starting from this point we can argue that the city is a spatial scale *touching* our bodies. Why is this hypothesis valuable? Why is it crucial to start the spatial analysis from the point where the city contacts our bodies? Just because *the body* transmits the collective imagination and symbols of the humankind (which have been collectively created in human made fantasies and have influenced the history of civilization) parallel to Yuval Noah Harari (Harari 2015)'s argument in his story-like book –Sapiens– on the history of mankind. These symbols and fantasies exist through body's movements and pauses in the and along the city. Although Harari does not focus on *space*, we can argue that the form of the motion and the ways of leaving traces at space have penetrated the evolution of modes of production and development of cities. While Sennett (Sennett 2008) is discussing the urban history in his book *Flesh and Stone: The Body and the City in Western Civilization* through the bodily experiences of human beings, he also criticizes the negative aspects of planning similar to Jane Jacobs (Jacobs 2011) and Paquot (Paquot 2011). Sennett studies how the men and women move in the city, how they smell and what they see and hear in cities from Ancient Athens to modern New York (Sennett 2008). His observation –in his terms 'sensory deprivation'–urged such a study; he recognized that citizens have lost their active bond with the structures and urban spaces in modern constructions as a result of the design approach of modern planning and architecture. However, as he deepened his examinations he distinguished the further historical roots of such a rupture in his study. He gives an example of a spatial illusion and geographical shift at the very beginning of his book: He with a friend was watching a war movie in a shopping mall in the suburbs of New York with a group of people who were easily watching the violence presented in an aesthetical frame; then when the film finished and when outside the cinema saloon these people saw Sennett's friend's hand –which was damaged during the war– almost all of them ran away from him and avoided to contact with them. With this example, Sennett argues that the spatial relations of the body also influence how people interact with each other. According to him, being 'audience' at the space *passivates* the human body (Sennett 2008).

Interactions which take place with and at the space create the boundaries of the self-construction processes at psychological levels, and on the other hand they penetrate

the societal organizational forms as well. Certainly, such interactions have both spatial (physical) and temporal dimensions. The relationship developed among humans and the built environment provides reproduction of both the self and urban everyday life via daily rhythms and routines developed through personal movements-pauses at urban space. Lefebvre did not specifically concentrate on the scale of "body" while developing his spatial trilogy (Lefebvre 1991), however some authors attempted to re-read his studies by relating his concepts to the concept of "body" like Simonsen did (Simonsen 2005). She proposes the "spatial" and "temporal" body by looking at Lefebvre's conceptual trilogy (*perceived space, conceived space, lived space*) (Simonsen 2005). The spontaneous contacts of body with urban space in definite rhythms and repetitions compromise of cognitive-behavioural processes; at the same time, they are influenced from political-economic-societal contexts and they are shaped in and with the space. Also, these contacts can change the space (its meaning, form and function) in return. It is obvious that in such processes both individualistic-psychological and behavioural and societal components/mechanisms exist. This issue is generally examined via the concept of *place attachment* in the literature.

Lewicka talks about the increasing attention on the relations of place-person via the concept of "place attachment" and discusses the methodological obstacles in her text which turned out to be one of the basic studies within literature (Lewicka, 2011). The concept was first used and defined by Altman and Low [8]. Scannel and Gifford proposes a triple model of the concept: person, place, and process (3 P's) (Scannel and Gifford 2010). With reference to this conceptual pattern place attachment is defined as: the emotional bonds between the people and a definite place or environment (Seamon, 2013). In fact, the emphasis on 'emotional bonds' makes the place attachment studies complex with respect to methodological issues. As an extension of conceptual pattern, we can add three more concepts to this frame: (a) *place identity*, (b) *sense of place*, and (c) *meaning of place* (Manzo and Wright 2013), which gives clues on the relations and mechanisms converting space to place. The place experience plays a crucial role in the transformation process of space to *place* –which is defined as 'a meaningful location' by Seamon (Seamon 2013).

The relations become crucial between body-place and body-space considering the concept of spatial practice introduced by Lefebvre parallel to lived space. In her study, Simonsen aims to highlight Lefebvre's contribution as the geographical theory of body (Simonsen 2005). According to her, Lefebvre emphasizes the body as a creative part of social activity via his spatial conceptualization and he mentions the lack of the concept of body and *homo ludens* (playing man); he criticizes Marxist theory and Marx since they usually concentrated on *homo faber* (working man). This gap can be filled with the concepts of spatial and temporal body which indicate the *creative* and *moving body*. These emphases can be followed in Lefebvre's studies on rhythmanalysis (Lefebvre 2007a.) and daily life (Lefebvre 2007b). By proposing *the body in space* Lefebvre locates the body in the space, and tries to write a history of space in relation with history of body. In the light of such emphases, body, daily life and rhythmanalysis can be related. Simonsen argues that the critical contribution of Lefebvre is his frame regarding the body as a crucial productive scale of social practice; human –with his/her body– conquers the space and also be conquered by the space surrounding him/her as well (Simonsen, 2005). In this sense, although Paquot examines how the body is exposed to several negative aspects of urban life (Paquot 2011), can the body still be a scale of political resistance? Neil Smith presents a fruitful example on this issue in his paper

that the homeless people constructed an opposition at urban space while they were moving along the streets with their homeless vehicles (containing their daily routines, habits and forms) (Smith 1992), similar to the shell of a turtle, which disturbed the middle and upper classes. This way, the homeless vehicle turned out to be a tool of political opposition in the hand of homeless, who are regarded as one of the most fragile and powerless groups in the city. At this point, within its movements and stands (in relation with class positions) the body carries the traces of urban conflicts, and societal contradictions; moreover, it turns out to be a scale of opposition and struggle while leaving *marks* at space. Homeless were perceived as a threaten with their own spaces, rhythms, routines, movements and interactions; but also, they could create a basis for a political struggle within the societal fabric though their weaknesses.

On the basis of all these discussions, three phenomena occur while connecting the body to space and time: (1) Rhythms and routines, (2) Move and pause, (3) Contact. Then, what do these mean for the city? Paquot writes by quoting Julian Gracq as: "Living in the city is knitting a lace of routes generally articulated around various main axes through daily traffic" (Paquot 2011). Let's consider the urban open public spaces–which is the issue of this study as well: streets, parks, squares, streets… What makes these spaces 'public'? Why is 'home' (putting in another way 'private' space) not sufficient while the self is creating oneself, constructing his/her identity? We should have a number of assumptions on why people get out to public spaces, since we are discussing the soul/liveability of urban space. If we had in a great number of more comfortable private spaces would we have left the public spaces (streets, parks, cades, bars) off? Jane Jacobs (2011) answers such a question in the third chapter of her book, named as *The Uses of Sidewalks: Contacts*; she proposes that the ones who think such a possibility did absolutely misunderstand the reality of cities. Especially sidewalks "enable people gathering without knowing each other via intimate, private sociality which does not disturb the sides" (Jacobs 2011, 75). "Thrust" is the phenomenon which gathers people and restrains them from feeling disturbed, however this is not created institutionally. Jane Jacobs emphasizes that such collective feeling is "spontaneous public thrust" which is (re)produced by movements and stops along space; such a frame would be more interesting in a city like Van which has a relatively small urban scale (though being a large city among Turkish cases), where inhabitants mostly knowing each other wander the city centre frequently.

We can link the mentioned term "contact" with the phenomenon of spatial appropriation as well since the spaces which we concentrate in this examination are "public". The public spaces (such as park, square, street) root from two modes of appropriation or possession; one is the bottom-up appropriation of the "public"/the "people" (possession) and the other is an institutional ownership which indicates the reproduction of public spaces by the hand of state institutions (İlkay 2016). Yet we consult the Lefebvre's frame at this point, we can argue that urban space has a structure on the one hand perceived and on the other hand conceived. Nonetheless, beyond these, as in a third dimension, urban public space is reproduced again and again via spatial practices by *public/people* as a *lived space*. During this reproduction process struggles among user-designer emerge, which shape both the spatial appropriation and the moves-pauses within this appropriation. By this way, urban everyday life, spatial pattern, the political-social content of living environments have been produced over and over again within three socio-spatial scales (İlkay 2016): (1) identity and

self-reproduction of the body via place attachment, (2) the construction of urban everyday life environment at the scales of neighbourhood and street, (3) reproduction of urban everyday life and urban spatial patterning of public spaces via spatial appropriation mechanisms at urban scale. Considering these three scales, "appropriation" stands in a critical position within spatial practice (moves and stops). If we consult to spatial appropriation which generally indicates a relatively more personal/private sphere, then do the public spaces become more liveable when they are perceived and appropriated like 'home'? Regarding this, a bulletin text of a creative studio work named *Kentte Bedenin Oluşturduğu Ev* (can be translated as: The Home Formed by the Body at the City) examines the spatial practices in the form of 'movement' and 'action' within daily life and the interrelations between the urban contacts and ownership via this way (Aykaç and Kay 2014). By placing this relation on the concept of "home", daily routes are aimed to be mapped in a part of İstanbul via a spatial topology analysis. In this unique study, home and work places are determined as two forms of ownership; the route among these two fixed destinations occurs as a critical object of analysis. The workers of the studio questions how far the actions and objects belonging to home can refer to the city. They particularly use the term "topological" since "topography" indicates the concrete knowledge belonging to a site, however the term "topology" implied a pattern of more dynamic and abstract knowledge on the relationship between man and a specific environment. The terms "bridge space" and "station space" also takes an important role in their conceptual framework via their spatial topology analysis while relating daily life, urban space and the body. Since connecting with urban space is complex through space-body relations which are relatively subjective, an experimental approach shines out as an obligation similar to this bulletin, which inspired a spark for a similar study in Van.

3. Spatial Topology Of Linear And Circular Urban Experiences At Van City Centre

How does the body move at urban space –especially at the city centre and public spaces? What kind of activities and *spatial practices* are experienced by the body? Jan Gehl presents *spaces for walking* and *places for staying* in the last part of his book *Life Between Buildings* which is on the usage of urban public spaces; he concentrates on the activities and situations such as: *walking, standing* and *seeing-hearing-talking* (Gehl 1987). As some of them are presented in the bulletin text of *Kentte Bedenin Oluşturduğu Ev*, the spaces which are the scenes of these activities are: road, station, street, sidewalk, bench, square and park. Mixed activities –such as sitting on the sidewalks, reading at the bus stop, watching sinevision at park – may constitute a part of this phenomenon. Here, an attempt come into a question to spatialize the knowledge of the space and on its liveability/soul. As mentioned before, at this point, while gathering the knowledge of spatial practice differentiating with respect to space, either topological or topographic approached to collect data can be preferred. While topographic approaches present concrete data of the space, the relations among person-place are ignored, which are very crucial in fact. Nevertheless, topological approaches, which has a potential to link experience to spatial form, are held with the concept of 'spatial syntax' usually, but though their potential physical dimensions are frequently put forward different from the example of *Kentte Bedenin Oluşturduğu Ev*. Ratti talks about the transformative effects of built

environment and architectural structures on humanbeings in his paper on urban texture and space syntax. However, he adds that though the extensity of this idea, it is not as much extensive as "to quantify the interrelationship between built environment and social life" (Ratti 2004). The computer technologies enable inquiries on urban patterning via "spatial syntax". Within this issue, the books written by Hillier and Hanson (Hillier and Hanson 1984) and by Hillier can lead us to comprehend the social logic and patterning of urban space (Hillier 1996). We can assume on the basis of arguments in these books that, the patterning of space (which is formed by social relations and environments) can be represented. Ratti prefers the term "*configuration*" rather than the term "*pattern*" (Ratti 2004). however we think "pattern" is better to use in this study since it promises a more flexible, organic organization of space. Space syntax (or generally expressed as spatial topology) roots from mathematics and linguistics; in space studies usually concentrates on the movements of pedestrians and it can be related to graphic theory. A *graph* compromise of ***vertices*** (*nodes*) and ***edges*** (*arc*); and the graphic which is showing the distribution of the movement and the relations on movement is called as ***topology*** (Ratti 2004). In another introductory text on spatial topology, Jiang and Omer introduce two overlapping map layers: ***contextual layer*** and ***primary layer***. Social relations are explained as these two layers overlap; contextual layer contains *vertices (corners)* and primary layer is composed of *simplices (one way lines / routes*). The vertices and simplices together make up the *simplical complex* (Jiang and Omer 2004). The studio work, *Kentte Bedenin Oluşturduğu Ev* mentioned above, focuses on the everyday spaces in İstanbul with respect to *movement* and *action* via spatial topology approach. In that study, a weekly route of a specific person was examined, "points" indicate the spaces where the inhabitant arrived and stayed, and the "lines" represent the routes; i.e. ferry ports are regarded as "bridge spaces"; Taşkışla, home or any café are evaluated as the "station spaces" (Aykaç and Kay 2014). However, our study attempted to seize the nodes of the linear movement within its density on the two main axes of the city centre of Van, which define the Çarşı; this route is analysed, and on this axis usually commercial activities under housing blocks are observed, which supports the liveability of the centre both day and night time; on the same route, the public transportation exists with the stations and bus stops (See Figure 12-1 for the route).

The spatial topology analysis, presented in this text, relies on the early observations and evaluations of the author –as a Flâneuse planner who moved to Van from Ankara– since June 2016; at the city centre of Van, Çarşı, the nodes (stops) and the character of movements were observed in different time periods during day time and in different seasons by especially walking and also by taking public transportation and sometimes (rarely) driving. In this study, the concepts of "linear" and "circular" spatial experience are used; ***linear experience*** indicates mostly walking, and moreover passing through the Çarşı / Maraş Street by either public transportation or private car; ***circular experience*** is defined as the spatial practices on the basis of pausing such as stopping, sitting, parking, chatting with the friend at park, and waiting for the bus. The problematic of the study was shaped around the meaning of the liveability at city centre (where linear movements and pace are dominant) with respect to the planning discipline, this liveability; the main question is: what the liveability and soul of city centre means with respect to the reproduction of public space by the body via urban everyday life in the case of Van.

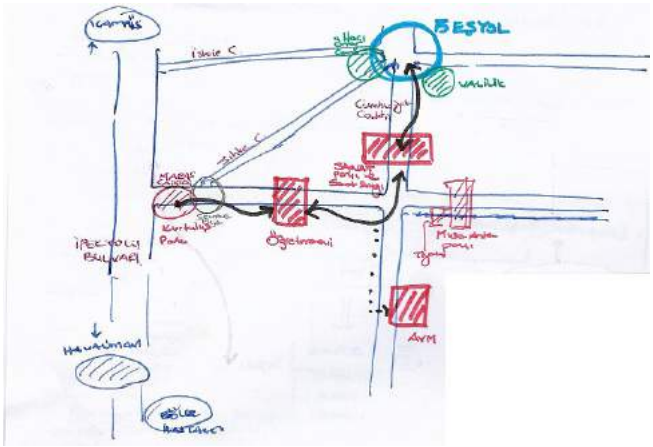

Fig. 12-2. The initial mental map of Flâneur/Flâneuse on the city centre of Van

This study is a first step to evaluate the socio-spatial inventory of a great part of the city centre in Van, called as Çarşı by both the inhabitants and the drivers of public transportation. This inventory is based on walking along the two main roads Maraş Street and Cumhuriyet Street which connects Maraş to Beşyol Square and the Governorship of Van; with the public nodes on these axes such as Kurtuluş Park, Van Şişli Öğretmenevi, Sanat Park and Street, Feqıye Teyran Park, Beşyol Square and the building of Governorship. These significant nodes with primary routes were targeted to be documented within this inventory and observations (see a rough mental map in Fig. 12-2). By this way, the soul of the city centre was aimed to be sensed. From the İpekyolu Boulevard, entering the city centre, the first location meeting the Flâneuse is ***Kurtuluş Park***, which functions also as a bus stop which resembles a gate to the Çarşı and Maraş Street. This park constitutes the first vertice of our analysis area which is roughly resembling a triangle (Figure 12-3).

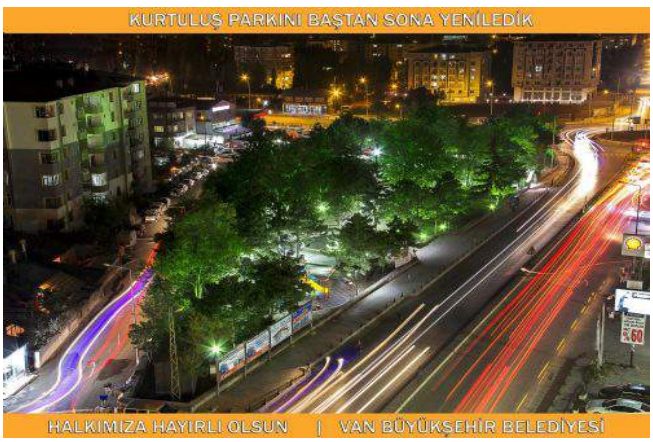

Fig. 12-3. Kurtuluş Park (URL 1)

The observations displayed that the park functions as a passage or a bus stop where people pass through rather than a dense usage and experience. This may be a result of its location, at the intersection of two intense traffic and roads (İpekyolu Boulevard and Maraş Street) and also there is another road passing behind the space; therefore, it resembles and so is probably perceived as an island at the centre of a dense vehicle traffic entering the centre, Çarşı. However, it is still critical since it is located and perceived as the entering gate to the centre by the eye of pedestrians as well. At this location, although it is not densely used by the pedestrians, we can argue that there occurs a circular experience just near to the vehicles' linear movement. According to a newspaper article, the park, which was idle before, was renewed and presented to the use of citizens in 2013 (Figure 12-3). Opposite the park, there is a Carrefour and Vatan Computer which turns the space to a resting area for the people who return their home after shopping. In this direction moving towards the city centre, Beşyol, a junction confronts us, which is called ***Semaver Square*** with a samovar statue. From this point two alternative ways occur: we can follow either Sıhke Street, which is relatively more fluent for the cars, but boring for the pedestrians, as this site is a backyard of the city centre; Maraş Street is quite dense and difficult to move with cars, since the traffic coming from both campus and the airport (two sub-centres of Van in opposite directions one is towards Erciş, the other is towards Edremit).

The traffic is dense at Semaver Square, although its name contains the term 'square', this location is far from a pedestrian site, rather walking, passing to the opposite site may be challenging at peak hours. However, when the vehicles pass to the Sıhke Street then the traffic from this point decelerates, but still this site is perceived as an obstacle for the pedestrians at the entrance of the city centre (Figure 12-4).

Fig. 12-4. Semaver Square (URL 2)

After this area, the next critical circular node interrupting the linear movement is ***Van*** Şişli Öğretmenevi. Before coming this node, the specific atmosphere of the Çarşı is raptured towards a more elite form at the point where *Elit World Van Hotel* (one of the most luxurious hotels in Van, constructed after the earthquake in 2011) and *Desotti* Café (of which previous name was *Kahve Durağı*) are located looking at each other. This space appears to be a spatial hole which invites to a circular experience, stop and take a breath while eating, consuming, chatting with a friend, doing sports, having message. On the one side of this hole, there is a decent hotel where the upper or middle class strangers (coming from other cities to Van as doctors, teachers, officers, academicians) have opportunity to do sports, swim and have message, on the other side of the hole, there is café with specific offers of coffee and meal of high quality. This mutual site selection hints a similar atmosphere to Tunalı District in Ankara, or some café streets in Beyoğlu, Taksim in İstanbul (Figure 12-5).

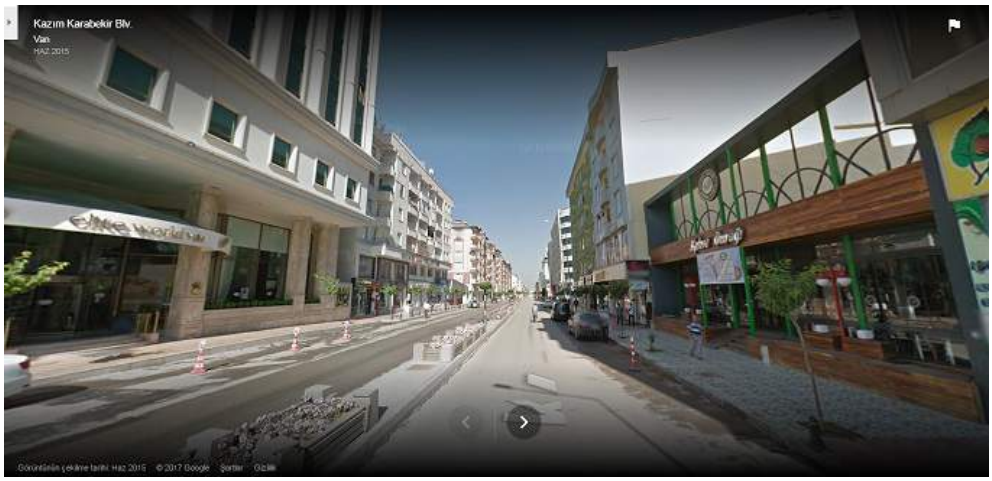

Fig. 12- 5. The mutual site selection of Kahve Durağı (Desotti Café) and Elit World Van Hotel , ©2017 Google Earth, Street View

One of the astonishing features of Van City Centre for a new comer is that this linear flood (which possesses and pulls the walking body with this movement) has holes at some points and from such points the perception on which class appropriates where shifts; this feature is interesting and creates cognitive gaps in the flâneuse's mind – i.e. it is possible to feel as if you are wandering in Kızılay, Ulus or Tunalı, each of which sprawls in greater areas in Ankara, however in Van, this feeling is concentrated on a smaller area with a dense feeling, you perceive these shifts next to each other, the atmosphere of the place changes suddenly and the character of spatial appropriation shifts. Öğretmenevi constitutes an essential bus stop and a symbol for new comers, as it is a widely-known point of both accommodation and public transportation (dolmuş and buses) node. With the public garden in front of its building, it invites not only the visitors of the guesthouse, but also the inhabitants of the city who are passing along that way; therefore, it creates an open space on the flowing linear experience and functions also as a family tea garden.

Fig. 12-6. Van Şişli Öğretmenevi (URL 3)

The section after Şişli Öğretmenevi resembles the Kızılay District in Ankara, Taksim-Beyoğlu District in İstanbul and Konak Square and its surrounding in İzmir. This region is defined more of a middle class wandering space with eating spaces. When we dive into the back streets on Maraş Street, these side streets are seen as covered with cafes, bars, restaurants. Especially getting closer to the junction where Cumhuriyet and Maraş streets intersect, the density increases and when we enter the back streets opening to Beşyol Square then we confront second hand commercial functions within a more deteriorated spatial pattern like Ulus in Ankara. The other side, where the route is going to AVM and İki *Nisan* Avenue along which relatively more expensive housing units are located, a more decent atmosphere is dominant. Landuses like residences and private hospitals are encountered along the side-streets from Maraş Street towards İki Nisan Boulevard. When we reach at the junction of Maraş and Cumhuriyet streets, three alternative ways appear in front of us: One is directly following the Maraş Street towards Kültür Stop and the building of Van State Theatre; this route is the public transportation way reaching to Beşyol. However, both the vehicle traffic and pedestrian density decreases from this point on this way. In this region, the Musa Anter Park is located, where a biking group (Pedalkeş) meets and start their cycling from this point on Wednesdays even in winter time. Second alternative route is towards the Van AVM, which is on the opposite site of Beşyol and near İki Nisan Boulevard, and which is open to service in December, 2015. This route is relatively quiet, as well. There exist clothing stores especially with country-wide known brands, furniture shops and branches of banks; along this relatively wider street especially in Ramadan evenings samovars with portable tea tables and sitting places are settled which seems lively at nights. One of the foremost features of liveability of Van is that the usage of shop keepers' utilising open spaces, streets and sidewalks in front of their shops and restaurants, though the cold climate of the city (these two routes are displayed as more obscure colours in Fig.12-1).

The third route is the one which takes us to Beşyol and the building of Governorship. This route contains probably one of the most crucial nodes of the city, ***Sanat Park*** and ***Sanat Street***. Although it is a small park, an integrity can be observed between the park and the pedestrianized street which is stuck to the side-streets towards Bahçıvan Neighbourhood, the backyard of the city centre. The park with the street seems to be used during the carnivalesque events especially in Ramadan evenings such as cinevision and collective iftar events; and beyond this with respect to observations this integrated spatial pattern is subjected to specific political agglomerations; on the opposite side of the park and street there is huge mass of City Van, the bazaar of jewellery shops, which is idle now. Next to this great mass of construction, Feqıye Teyran Park is located. This circular node constitutes also one of the main stops and distribution points of the linear movement; which is in the form of both spatially and socially a liveable node. It is not possible to observe such a liveable circular node till Beşyol Square, which is defined on the one side Hacı Ömer Mosque and on the other side the building of the Governorship. This point is on the junction of five roads, though being at the junction it presents a –may be the most– liveable spatial experience for pedestrians, where circular and linear movements clash and intertwine.

Beşyol Square is different from Semaver Square and the junction of Cumhuriyet-Maraş streets since it is perceived and experienced as a circular node although it is located at the intersection of five roads, which have usually dense vehicle traffic. At this space, pedestrians gather and are distributed towards different ways. The dense traffic seems not to disturb their circulation. However, even this space makes the Flâneuse move constantly; presents cafes and restaurants or shops to stop which provide private services rather than free spaces, such a pattern offers the citizens a tiring spatial practice. Since there is pace and movement on this liveability, the reproduction of this soul is hang by a thread.

5. Conclusion: The Meaning Of The Liveability In The City Centre Of Van

All these readings and investigations about the city indicate that a linear spatial practice and a movement dominates and reproduces the liveability and soul in the city centre of Van. A dense traffic encounters the visitors entering all through the day (apart from too early and too late hours) beginning at Kurtuluş Park, the entrance from İpekyolu Boulevard. The physical boundaries and narrow spatial organization of especially Maraş Street and similar organization in Cumhuriyet Street make the pedestrians move constantly which supports the image of liveable city centre. Dense vehicle traffic enables pedestrians cross over the streets easily even in peak hours. This may be reason why the pedestrians are secondary (in fact not considered) in the organization of traffic lights and symbol in the city centre in addition to the small scale of the city facilitating pedestrian movement. Therefore, pedestrianizing projects were not required in the region although the centre is liveable in different seasons at different time periods during the day. Nonetheless, reaching Beşyol Square through Maraş Street is painful for the private cars and public transportation vehicles with the citizens using them. Regarding this issue Metropolitan Municipality worked on alternatives in 2013 Master Plan to relieve such a dense city centre by the strategy of spreading the centre; however,

from now the influence of such a strategy is difficult to predict on the spatial patterning, the pedestrians' movements and the soul of the city.

Although Van Çarşı is perceived as a liveable city centre, Maraş and Cumhuriyet Streets usually encourage pace, wandering and continuous movement. Nonetheless, it is fact that in such a city with a huge potential of pedestrians and a humane urban scale (which has been transforming in the negative aspect with the new built residences, and structures after the earthquake) more open spaces are needed along especially Maraş Street, which would enable circular experiences and pauses in spatial patterning rather than holes in the form of mini-squares and green areas. The situation of moving fast is valid for the cars and vehicles as well. Even the new built housing blocks were observed to lack sufficient parking spaces. Certainly it is not correct to propose landuses which encourage car usage in the city centres however in a city like Van –having a small scale though its size– the character of the liveability within urban space should be considered, in Van the inhabitants living in the central district, Çarşı constitutes a great part of the users of the city centre in different time periods during the day, which prevents the collapse of centre in this case and it is different from the metropolitan areas like Ankara, and İstanbul. Housing and commercial facilities support each other in Van case. Therefore, it is essential to make stay and use the centre by the inhabitants of the centre beyond the visitors coming from campus and peripheries which would guarantee the sustainability of the soul of Van city centre.

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CHAPTER NUMBER 13

ROLE OF CLIMATIC FACTORS IN THE FORMATION OF ARCHITECTURAL IDENTITY IN RURAL AREAS: THE CASE OF THE DISTRICTS OF ÇALDIRAN AND ÖZALP IN THE PROVINCE OF VAN

ŞEFIKA ERGİN

The cultural background, natural and environmental factors in a region have a major influence on the constructional design in rural areas. Way of life and conditions of physical environment varying from one region to another are the most important factors that determine the diversity of rural architectural identity in a region. Topography, availability of materials and climatic conditions are the physical factors that have the key influence on the formation of local architectural fabric in a region. From these factors, the climatic factors do also play a part in the formation of local architectural diversity. It is observed that construction plans and designs of dwellings in rural areas are developed in line with the requirements of climate. Defining the role of climate as a factor of key importance in the formation of architectural identity in rural areas enables us to identify local architectural features in an effective way. Construction plans of local architectural expression based on the local climatic factors are of significance in respect of a sustainable architectural identity in a region. An analysis of the climatic factors as important determinants in the formation of the architectural identity in the rural areas in the province of Van can provide an understanding of the physical aspects of the dwellings in this region. Offering some insights into the residential culture arising from regional differences, such an analysis can provide valuable indications and orientation with respect to new constructional designs. The present study aims to investigate, to this end, the dwellings in rural areas in the districts of Çaldıran and Özalp in the province of Van, with particular focus on the villages of Salahane, Alikelle and Yavuzlar in the said districts, all villages typical of local architecture. In this respect, the study has sought to investigate and unravel the role of climatic factors in the formation of architectural identity in the rural areas researched.

Keywords: rural architecture, architectural identity, climate

I. INTRODUCTION

Factors such as geography, topography, available materials, social and cultural life which vary from one region to another are determinants of great importance in respect of cultural aspects of housing construction and architectural identity. Such local influences inspire people to create diverse architectural designs in line with regional requirements. Physical environmental conditions specific to a region lead to the formation of a diverse architectural identity in rural areas. Constructional designs created in line with the needs specific to a region reflect the local architectural identity of that region, and it is the architectural integrity in structures that give a locality its main character. Dwellings are the structures which best represent the characteristics of the local architectural fabric in a residential area. The most outstanding differences in the architectural fabric of housing at local level are specific designs developed in line with climatic conditions. One can see, in every rural area, specific examples of dwellings built on the basis of rational solutions specific to climatic conditions prevailing in that area.

Dwellings in rural areas are structures which people develop in a process of adaptation to the environment they live in, whereby they make great efforts to overcome the challenges the nature poses to be able to sustain their lives. Structures in rural areas, be it a detached house or a group of dwellings, reflect the interaction between the structure and elements of the natural environment such as climate and topography as determinants of architectural expression. It is a fact that the features of architectural identity which the climate imposes on structural designs with traditional lines reflect similar trends across regions, but differences do certainly also exist, being mainly due to material preferences and utilization methods. Structures built in regions of different cultures with similar climatic conditions can have differences in form and materials used, but there can be similarities in the arrangement of inner spaces. People create similar comfort conditions by using different materials (Sümerkan, 1990).

2. Features of Dwellings in Rural Areas in the Province of Van

The geographical and topographical features of the region and resources of income of local people are the prominent factors that determine the characteristics of dwellings in rural areas in the province of Van. Depending on the geographic and topographic features of the region, agriculture and cattle breeding make up the main income resources of local people. While rural residential areas are mainly concentrated at altitudes between 1600 m and 2000 m above sea level, dwellings can also be seen at altitudes up to 2400 m. Because lower temperatures resulting from harsh weather conditions in wintertime make it almost impossible to carry out cultivation practices, people do not prefer to reside at altitudes over 2000 m. The majority of dwellings are therefore seen at altitudes between 1700 m and 1800 m, the most favourable altitude range in respect of agricultural practices. Despite scarcity of cultivated land at higher altitudes, breeding of cattle and sheep is quite widespread, a fact

evidencing that economic factors do play a major role in giving particular preference to an area in terms of using it for residential purposes (Gürbüz 1996).

The areas included in the study in Çaldıran and Özalp are at altitudes of 2050 m and 2008 m respectively (URL-1). As for the location of the villages investigated, while the villages of Alikelle and Yavuzeli are located on a hillside, Salahane is in a lowland area. In lowland settlement areas administratively under the districts of Çaldıran and Özalp, people earn their livelihood largely from agricultural activities. Breeding of cattle is, however, more widespread in communities living on hillsides or in locations at higher places, where the soil is not good for cultivation. Economic activities mainly depending on cattle breeding have made it necessary that units such as stables; folds or mangers have been built or installed next to or in close proximity to dwellings.

In the area investigated in the present study, the structures stand closely side-by-side. Factors such as family bonds, social relations and common needs have always played a role in determining the spatial distance of buildings to one another. Residential areas have developed rather in an unplanned manner depending on relationships and needs arising from economic activities, rather than on an arrangement based on specific planning.

Fig.13-1. Lay-out of a garden in a dwelling.

In rural residential areas in this region, there exists no space in central location for common usage. Every dwelling has a garden area on its plot, where units such as stables and food storehouses used for economic activities are built. The size of the garden area varies depending on the income of the proprietor (Fig. 15-1).

Construction of streets has not been a primary concern in the region due to a relatively different usage of the garden area and scattered arrangement of dwellings. Passage is provided through openings from one plot to another bordered by garden walls. The road used for vehicle traffic, on the other hand, passes through the location on the central axis.

3. Climatic Characteristics

The province of Van stands at an altitude of 1725 m over sea level. It is surrounded by mountain massifs. Continental climate dominates in the province, with harsher conditions in the east, especially in the northeast to the region. Besides, the coastal areas within the basin of the Van Lake are micro-climate areas that have a moderate continental climate compared to the one dominating in the region of Eastern Anatolia. The main actor generating this moderate climate is the Van Lake, located in the centre of the basin with an area of 3574 km². The waters of Van Lake heat up and cool down more slowly than inland areas, thus moderating the continental climate and providing warmer winters and relatively cooler summers at coastal areas (Allaeddinoğlu 2006).

According to the temperature statistics indicating monthly average values for the period 1926–2016, the highest temperatures have been recorded in July and the lowest ones in January, with the highest temperature of 37.5°C recorded on July 27, 1966 and the lowest one of -28.7°C on January 19, 1964. While April is the month with the highest level of rainfall, the lowest level in this sense has been recorded in August (Url-1) (Figure 15-2). The prevailing winds in the main town of the province of Van blow from the east (AL M.T.).

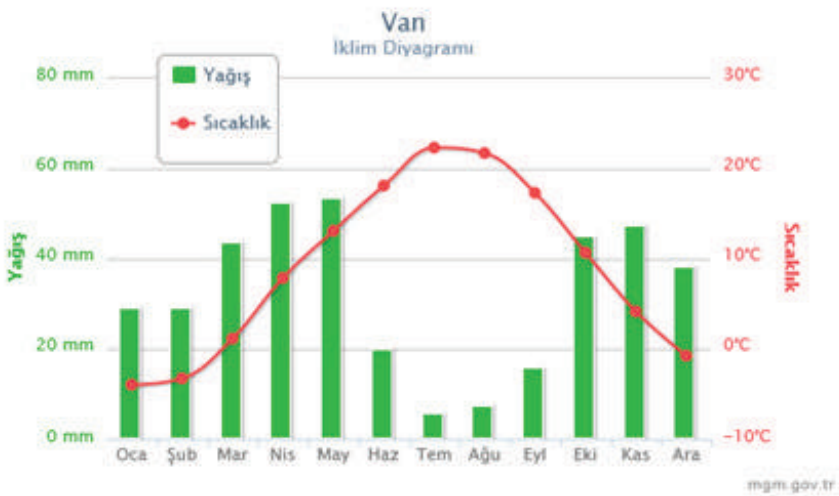

Fig. 13-2. Monthly average values of temperature and precipitation in the province of Van (URL-1).

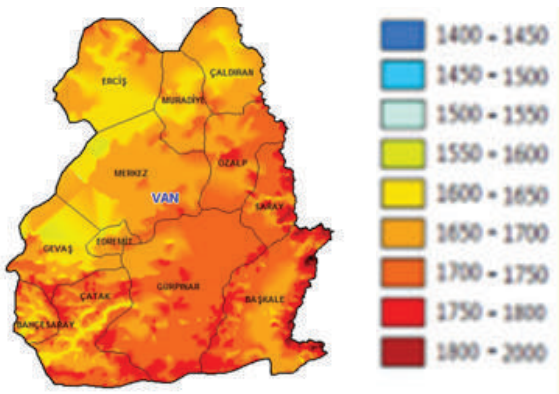

Fig. 13-3. Global solar radiation distribution values for the province of Van (kWh/m²-year) (URL-2).

The areas in light and dark red colour in Figure 15-3 represent the solar radiation values. In dark red areas the solar radiation values are high. Higher solar radiation values are observed in the southern parts of the province compared with the values obtained in the northern areas.

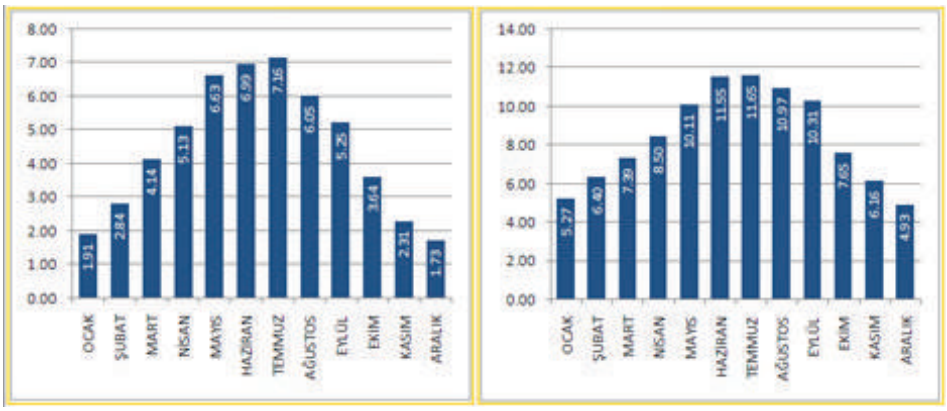

Fig. 13-4. a) Monthly average solar radiation in Van (kWh/m²-day)

b) Monthly average sunshine duration (hour).

Figure 15-4a shows the global radiation values in the province of Van on monthly basis. The global radiation value reaches its peak in July. The average daily radiation intensity calculated on monthly basis in the province of Van is 4,48 kWh/m2-day; the annual average global radiation value, on the other hand, amounts to 1635,81 kWh/m²-day (4,48x365).

Figure 15-4b shows the sunshine duration in the province of Van as calculated in hours on monthly basis. The sunshine duration reaches its peak in July. While the daily sunshine duration calculated on monthly basis amounts to 8,41 hour/day, the annual average sunshine duration in total is 3.068,64 hour/year (8,41 x 365) (Sinan 2009).

4. Topographic Characteristics

The province of Van is located in a mountainous region in Eastern Anatolia, with mountain massifs that are close together, becoming more rugged towards east. The Van Lake covering an area of 3764 km² is the biggest closed basin in Turkey (Figure 15-5). Most of the mountains surrounding it are of volcanic origin. There are about 20 mountains with altitudes ranging between 2560 m and 3668 m. Two mountains located in the north, Aladağ (3351 m) and Tendürek (3542 m) constitute the boundary between the provinces of Van and Ağrı. Other summits worthy of mention are the Mount of Süphan (4434 m), Mount of Nemrut (3050 m), Mount of Erek (3250 m), Mount of Kuh (2850 m), Mount of Kazan (2890 m) and Mount of Irgat (2750 m).

The basins of Erçek, Hoşap, Van, Başkale, Havasor, Erciş, Muradiye and Özalp in high lands that spread towards the coasts of Van Lake are lowlands that provide proper conditions for purposes of settlement and agriculture. The Lowland of Van is the largest one among the lowlands on the coastline (Uluçam 2000). These lowlands that have great economic value are also the locations with the highest settlement and population density.

Fig. 13-5. Physical Map of the Province of Van (Alaeddinoğlu 2006).

The district of Çaldıran investigated in the study was established in 1987 on the lowland with the same name. It has an area of 413 m2 and is located at an altitude of 2050 m over sea level. It is 113 km from the main town of the province. There are 96 rural settlement units under the district, 64 of which have village status, 27 are hamlets and 5 quarters. Cattle breeding and trade are widespread in the district (Annual Book of Van 1999:381). The district of Özalp, lying 60 km from the main town of the province, was established in 1948 at a location at an altitude of 2008 m over sea level. It has an area of 1558 m2. Governed by the district administration are 54 villages, 4 quarters and 20 hamlets (Annual Book of Van 1999:389).

5. Role of Climate on Local Architectural Identity

Climate is one of the most important factors that influence the formation of architectural identity at local level. In the province of Van, whilst winters are rainy, long and harsh, summers are short and arid. Long and harsh winters have forced the local people to develop architectural solutions that can address challenges which harsh weather conditions in wintertime pose. Plans thus developed in line with the needs of the region led to a local architectural design specific to the region.

Fig. 13-6. Map of the area investigated.

The study has investigated three villages, namely Salahane, Alikelle and Yavuzlar, rural settlements under the districts of Çaldıran and Özalp, with structures that reflect the architectural identity of the region, focusing on dwellings built with local materials (Figure 15-6). To this end, the study examines the role of climatic factors in the formation of architectural identity in dwellings in rural areas on the basis of materials used, planning and architectural components.

5.1. Aspects of Plans Designed for Local Dwellings

Location

The topographic condition of the location where a structure is to be built is of great importance in respect of exposure to solar radiation, use of daylight and ensuring natural draught. The effect of climatic factors on structures may vary depending on the topographic features of the locations where dwellings are to be built.

The grade and direction of the inclination of the related piece of land affects the angle of incidence of sun rays reaching the earth. The quantity of solar radiation affecting a surface varies depending on the inclination and direction of that surface due to its direct component. Soil temperatures do also vary depending on the inclination degree and direction. As the south-facing slopes of mountains get more sun and are, in turn, less affected from cold north winds, the slopes that face the south are warmer than the ones facing the north. The temperatures at the slopes at the west, on the other hand, are rather lukewarm, which is mainly due to warmer average temperatures and effect of sun radiation throughout afternoon.

In cold regions, people prefer to maximize the use of sun radiation as a reinforcing effect for heating the dwellings. It is also essential, due to the effects of wind in respect of increasing heat loss, that dwellings are protected from wind as well. Building a dwelling at the lower part of a slope is, therefore, much more convenient with respect to an architectural consideration taking due account of climatic conditions.

The villages of Alikelle and Yavuzlar, the locations investigated in the researched area, are located on a slope facing the south. On the other hand, the village of Salahane, the other one investigated, is located in a lowland area with an arrangement mainly facing the south, west and east.

Building Forms

Dwellings are the dominant constituents of rural architecture. The design and form of a dwelling reflects the colours of social and cultural life. Differences in cultural life and life style from place to place do also influence the constructional plans, one with or one without differing or similar aspects. Social and cultural structures especially put their stamp on the form and development of a dwelling. In the course of time, the dwelling can be reformed in line with the growing size and needs of the family. In planning and improving the dwellings, we observe that the probable effects of climatic conditions are also duly taken into consideration besides the cultural and social concerns.

The simplest type of the dwellings in the area researched is the type of dwelling that comprises two units, namely an anteroom and a room (Figure 15-7). In the course of time new spaces were added to dwellings in order to create new room in line with newly emerging needs. With the room added to the basic dwelling type to meet the need for a second space, a plan consisting of room-anteroom-room was introduced. Plan types with external anteroom and one in central position are generally implemented in dwellings (Figures 15-8, 15-9). In expanding the structures, the basic type is duplicated either in horizontal or vertical axis. While, in some structures, the expansion is performed in one direction by arranging the spaces side-by-side, some other dwellings are expanded by combining the spaces back-to-back in two directions (Figures 15-10, 15-11). The expansion of the basic type in one direction tends to develop around the boundaries of the plot. Complementing the expansion at horizontal level, a garden or a yard is arranged with units such as tandoori house (unit with a floor furnace), a stable, a fold and a poultry-house, all constituents of a dwelling satisfying the needs other than the one of shelter.

The repetition of the basic type in two directions is the planning style with a single integrated structure where anteroom-room arrangement is combined back-to-back, which is a more compact planning. This type of planning decreases the surface area of external walls, thus contributing to reduce the temperature in cold weather conditions. It is seen in some dwellings that a mixed plan is implemented depending on the size of the plot (Figure 15-12). While, in some parts of these dwellings, spaces are arrayed side-by-side, compact planning is implemented in some other parts.

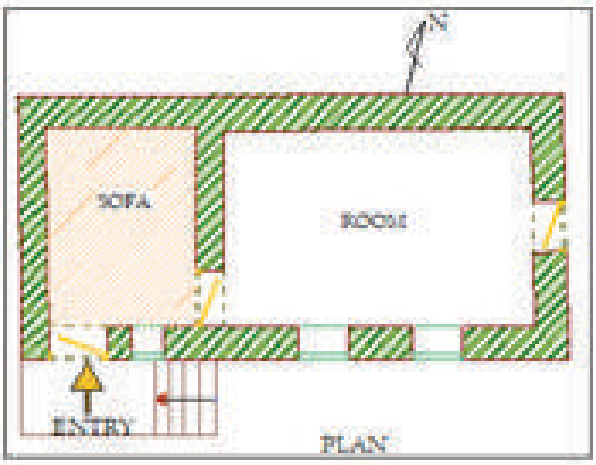

Fig. 13-7. Basic type.

Fig. 13-8. Plan types with external anteroom implemented in the region.

Fig. 13-9. Plan types implemented in the region with an anteroom in the middle.

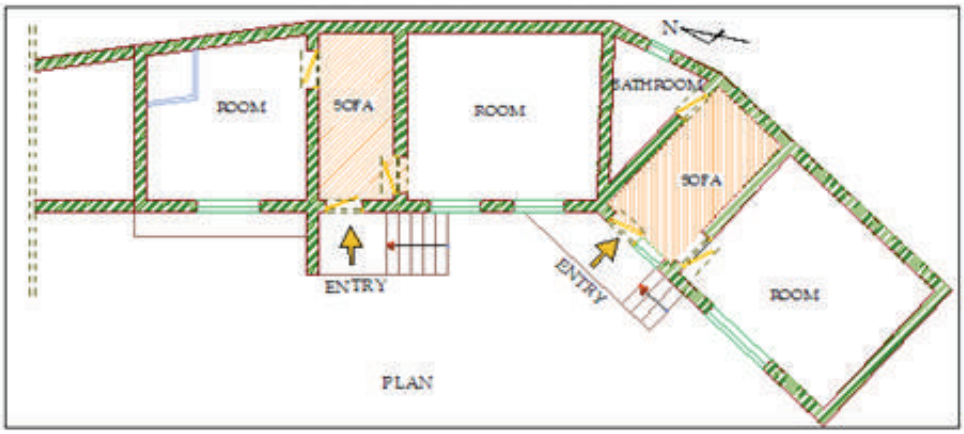

Fig. 13-10. Plan type developed in one direction.

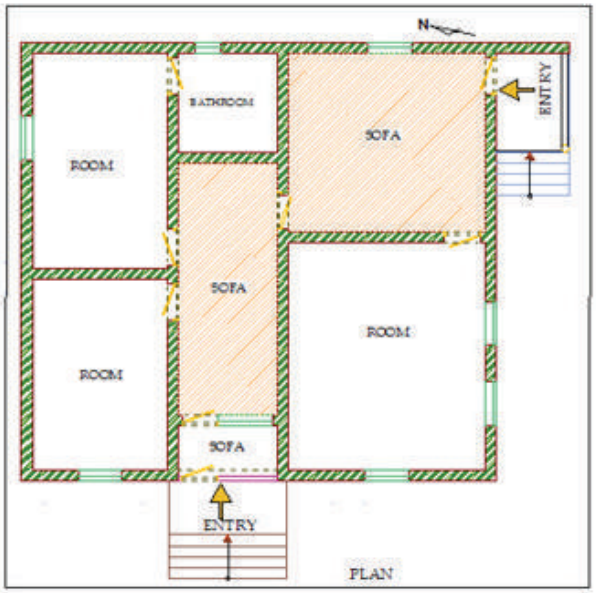

Fig. 13-11. Plan type developed in two directions.

Fig. 13-12. Mixed plan type.

Fig. 13-13. Open area formed for bathing in a room.

Volume Arrangement in Structures

Rooms are the most important units of a dwelling. One and the same room is used as sitting and dining room as well as for sleeping and resting. The anteroom connects the room with the external environment. In some dwellings, the kitchen is built outside; in some, it is integrated into the unit called the "tandoori house". There is no separate unit to be used as a bathroom; an area is formed in the rooms for this purpose (Figure 15-13). WC is built in the garden.

A specifically designed closed unit called "tandoori house", literally "house with a floor furnace", is used for dining and cooking. It is a unit with architectural design specific to the region, which has an important place in the cultural life of local people. Although called as a house, the tandoori house is comprised of a single space in the size of a room built on a square plan with walls made of stone or adobe brick. Its roof is completely made of wood, which is built with wooden girders placed one over the other, heightening it in vertical axis in square or hexagon form. The roof, thus heightened in vertical axis and covered with soil, looks like a vault when looked at from the outside. Centrally located at this roof system, there is an opening which has the function of a manhole and allows the light to enter into the dwelling (Figures 15-14, 15-15). The furnace is usually placed just underneath this opening. Every dwelling has its own tandoori house. Long and harsh weather conditions in winter have forced people to plan such a unit. When the weather is warm, the furnace or the hearthstone in the yard is used for cooking.

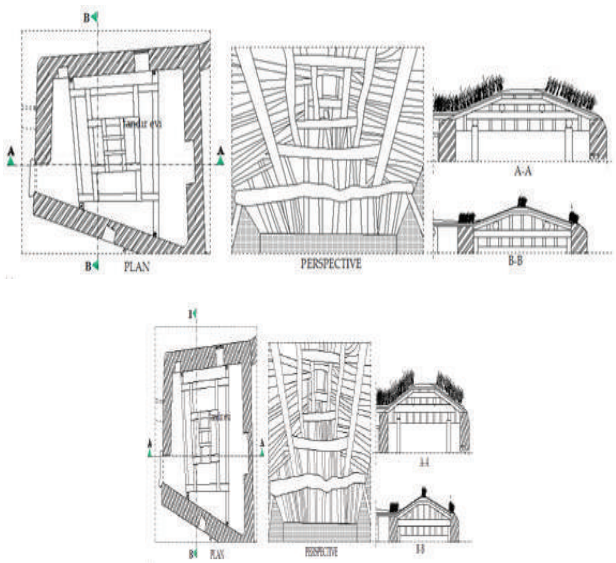

Fig. 13-14. Plan and sectional drawings of tandoori house.

Fig. 13-15. The interior view of a tandoori house.

The tandoori house, reflecting a culture specific to the region, is integrated as an important unit into the construction plans. They are built as a separate unit, so that the smoke that forms during the cooking does not penetrate into the dwelling. It has a separate entry, but also has a door that connects its anteroom with the anteroom or with a room of the dwelling (Figures 15-16, 15-17). Its design plan which foresees a unit attached to other spaces allows people to directly access to this unit from the inside, a real comfort in harsh winter weather. Besides such a function of providing a convenient access in wintertime, it also provides heat gain to the attached space.

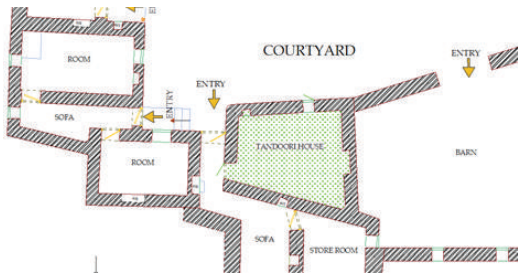

Fig. 13-16. Tandoori house connected with the anteroom.

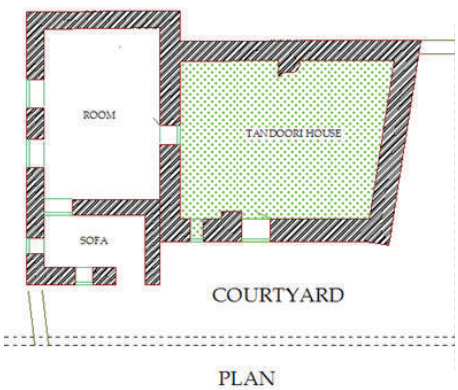

Fig. 13-17. Tandoori house connected with the room.

The spaces forming the dwelling are in essential in direct relationship with the need of shelter and sources of income of people. Add-on rooms built later in line with the needs of the household or the units built as part of the house in connection with production surround a courtyard or a garden depending on the correlation of the house with the courtyard or the plot (Figure 15-18).

Fig. 13-18. The courtyard surrounded by the units.

As in the villages investigated, the majority of people earn their livelihood by cattle breeding, it has been necessary to integrate units such as stables, folds and mangers in the related plans, which are usually projected as attached spaces or units in the close proximity due to concerns and requirements arising from security, maintenance and production. The design of the structure group, projected as an attached unit, also makes a contribution to prevent heat loss because it reduces the external wall surface of the house.

Orientation

The quantity of the sun radiation affecting the surfaces of structures vary depending on the geographical features of the region such as latitude, inclination, direction and seasonal effects, thus affecting the average radiation temperature. Consequently, the quantity of temperature that penetrates through the building envelope has an effect on the internal surface of the envelope, and also affects, in consequence, the temperature of the internal space. For these reasons, the direction of a structure has a direct effect on other structural girts with respect to meeting the climatic comfort in the internal spaces with the least energy consumption.

The use of openings at the façade of the structures in the region of Van with frosty weather conditions are designed taking due account of the local climatic conditions. These openings often face the south to allow more sun to penetrate into the dwelling in order to

increase, in this way, the internal temperature. The windows used at the façades facing the south are wider in sizes. The entries of houses are also generally arranged at the façade towards the south. In cases where the houses cannot be directed to the south due to the location of the plot, to position the houses towards east and west is preferred. No openings are arranged at the northern facades to avoid the effects of frosty and harsh weather conditions in winter time (Figures 15-19, 15-20). The windows, built of wood in straight form, are few in number. A small window is placed just beside the entrance door to illuminate the anteroom.

Fig. 13-19. Design of windows.

Fig. 13-20. Entrance area of a dwelling.

Dwellings are the primary type of structure in the residential areas in the region, and the primary characteristic element in these is the usage of local material and local utilization techniques. Materials of local origin are the most prominent components, determining the formation of the rural architectural identity. The most important reason why local materials are given preference is that they are available in abundant quantities in the vicinity of communities (Ergin 2015).

Stone and adobe available in the nearby environment are used as construction materials in rural dwellings in the region. The majority of the dwellings are comprised of one story, very few structures have two stories. Besides cost-effectivity, climatic factors do also play a role that people prefer one-story structures, so that they can heat the dwelling in shorter time and in a cost-effective way in cold winter months (Figure 15-21).

Fig. 13-21. Structures in the residential area.

In construction designs in rural regions, masonry construction method is implemented, in which walls are the main bearing elements. The walls that fulfil the bearing function in the buildings in the rural areas in the region are made of stone and adobe. Stone and adobe used to build walls have the capacity to retain and store heat during the day and release it in evening hours when the heat is needed. Reducing the thermal load of the space, they avoid, owing to their delay capacity, that the temperature in the space abruptly falls down. In this way, such materials reduce the amplitude of the outer temperature in cold weather conditions and let the cold air penetrate into inner spaces in a longer time span. The thermal capacity of the materials is in direct proportion to their specific heat and mass quantity. For this reason, the thickness of a material with high thermal capacity reinforces the effect of the thermal mass in the envelope. The walls seen in the region are usually of 50-60 cm thick, but walls in 70-80 cm thickness can also be seen. Such large thickness of walls built

of stone and adobe with high thermal capacity plays an important role in increasing the thermal mass effect in the structures built in the province of Van where harsh weather conditions predominate.

The bearing walls are built on the fundament laid in a depth of 50-60 cm. The walls of adobe are built on the stone walls that are built at least 70 cm in height above ground level. The floor level of houses is high in consequence of excessive rain and snowfall in the region. In residential areas on hillsides, the low level is heightened to form an even ground. While one of the facades facing one another at the dip direction is as high as the subbasement level from the ground level, the other facade is at a higher level (Figure 15-22).

Fig. 13-22. Structures in the residential area.

Earth roofing is used for top flooring. Wooden posts are put and arranged in order on the wall in the shorter direction of the space. After covering it with materials such as wood and brushwood, the top flooring of the house is formed in 40-50 cm thickness with earthen materials mixed with salt (Figure 15-23). The earthen materials used in the top flooring that is a part of the structure envelope reduce the thermal load of the space and avoid, owing to their delay capacity, that the temperature in the space abruptly falls down, reducing, in this way, the amplitude of the outer temperature in cold weather conditions and letting the cold air penetrate into inner spaces in a longer time span. The earth in the middle of the roof with higher thermal performance is laid higher and inclined towards edges. The inclined design allows discharging the precipitation water in an easy way.

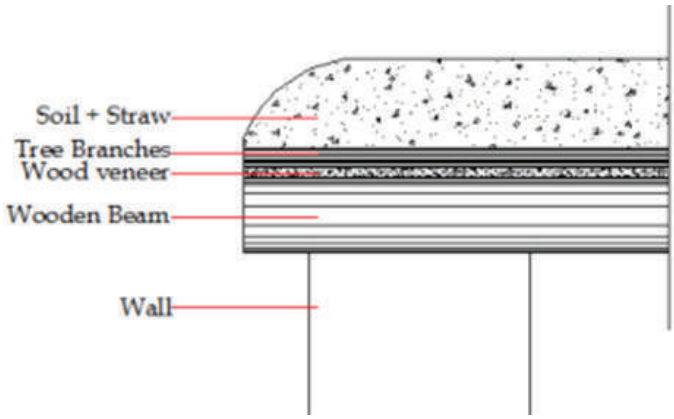

Fig. 13-23. Top floor detail.

Fig. 13-24. Top flooring implementation.

It is observed, especially in recent years, that a wooden roof is built on the earthen flooring. The obliquity of the earthen roof can sometimes be insufficient due to excessive precipitation in the region. The wooden roof implemented in many buildings serves to increase the roof obliquity. Corrugated aluminum plates are placed on the wooden roof in order to form a covering and provide lubricity (Figures 15-25, 15-26).

Fig. 13-25. Wooden roof implementation.

Fig. 13-26. Inclined roof.

It is observed that the layout of the entrance area is realized in line with the considerations regarding climatic conditions. Built in a region characterized with heavy snowfalls, the entrances of dwellings are laid out at a height of at least 60-70 cm from the ground level. A cornice is built over the entrance area to protect it from precipitation (Figure 15-27). In some dwellings, however, the entrance is not built on the façade, but arranged a little bit inside the façade axis formed by the spaces on both sides. It is observed that wooden material in even forms is used at entrance doors (Fig. 15-28).

Fig. 13-27. Entrance area of a dwelling.

Fig. 13-28. Example of an entrance area.

6. Conclusion

Rural residential areas can have original examples of structures designed and built on the basis of solutions developed against the natural and environmental effects guided by a long-standing experience. Climate has always been the most determinant factor in the formation of rural residential areas in the province of Van. Frosty and harsh climatic conditions that prevail in the region have forced people to develop solutions which aim to tackle the challenges arising from the climatic conditions in the cold season. In dwellings in the region, the plan types, considerations in respect of directions, mass positioning, usage and functioning of spaces, usage of structure elements and materials have always been planned and elaborated on the basis of concerns arising from local climatic parameters. The planning in compliance with climatic conditions greatly contribute to achieving climatic comfort conditions in the structures.

Methods applied in the region to build dwellings in harmony with the local climate can form a basis for new housing projects in the region in respect of a planning taking due account of local climatic conditions. Besides, local architectural examples in the region have created, through improved plans, an architectural identity unique to the region.

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