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REVITALIZING LOST SPACE IN KADIKOY, ISTANBUL

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ABSTRACT

Urban space is used by citizens at different frequencies and contains various different functionalities. Therefore, it can be observed that some areas are internalized while others remain abandoned. Underused spaces are referred to as 'lost space' in literature, defined by Roger Trancik (1986). The work by Trancik has influenced other researchers into thinking and studying lost space in cities. Kadikoy is a historical settlement located in Istanbul. Starting from the 19th century, the area has gone through transformations under the chronological effects of industrialization, deindustrialization, modernization and lastly urban regeneration. Additionally, economic, political and social changes have led to lost spaces in various areas of Kadikoy. This research aims to identify these lost spaces, investigate the reasons of them becoming underused and propose solutions on how they can be regained into city-life. The investigation consists of three parts: literature review, physical area analysis and a questionnaire towards frequent users of Kadikoy. In the literature review, Roger Trancik's concept of lost space will be examined as well as other approaches towards underused spaces. Physical analysis such as figure-ground and linkage will be used in the determination of differentiated areas of Kadikoy in terms of urban fabric. The questionnaire will provide a sociological point of view, to understand the reasons behind the preferences of users towards the spaces of Kadikoy. The following questions have been of guidance throughout the research: How are lost spaces segregated from the rest of Kadikoy? What were the driven causes in the formation of lost spaces? What can be done to revitalize these spaces into city-life?

Keywords: lost space, underused space, Roger Trancik, Kadikoy, revitalization

1. INTRODUCTION

1.1 Historical Preview

Kadikoy is a historical settlement located in Istanbul. Starting from the 19th century, the area has gone through transformations under the chronological effects of industrialization, deindustrialization, modernization and lastly urban regeneration. Additionally, economic, political and social changes have led to lost spaces in various areas of Kadikoy.

1.2 Paper's Interest and Objectives

Urban space is used at different frequencies and these spaces contain various functions [1]. Therefore, it can be observed that some areas are internalized while others remain abandoned. Personal choices as well as characteristics of the built environment both effect user preference towards spaces. Kadikoy calls for an investigation of the used and underused spaces the area contains. The following questions have been of guidance throughout the research:

- How are lost spaces segregated from the rest of Kadikoy?
- What were the driven causes in the formation of lost spaces?
- What can be done to revitalize these spaces into city-life?

1.3 Paper's Scope and Limitations

Lost space can appear in built environments or open spaces at distinct measures ranging from building scale to urban scale [1]. However, this research adopts an integrative approach towards open

and built space at different scales. The focus of this paper will be on urban fabric differentiated from the rest of Kadikoy, which will enable detecting lost spaces. As can be predicted, the variations of lost space are plenty and in need of limitations. Single structures spread to wide areas, inactive industrial areas, continuous and linear highways, capacious parking lots will form these limits of lost space.

Physical examination of Kadikoy will consist of figure-ground and linkage analyses. Additionally, 'place' analysis holds a significant importance in terms of understanding the difference between what is predicted and what actually appears in urban space. User opinion is substantial when investigating lost space [2]. 'Place' analysis will consist of a survey towards regular users of Kadikoy.

2. LITERATURE REVIEW

Roger Trancik has put forward the concept of 'lost space' in his book *Finding Lost Space* published in 1986. Lost space is defined as dysfunctional areas found in modern cities [3]. How does lost space occur? What importance does it have in the functioning of a city?

2.1. Historical Background

Industrialization has led to mechanization in production, acceleration in automobile use, increase in population and lack of infrastructure. These changes have affected cities in a dramatic way. Architecture and planning struggling to keep up with the advances of industrialization, realized the necessity of change in cities. Therefore, CIAM under the leadership of Le Corbusier constructed the principles of Modern Movement. Although these advancements were beneficial in producing sanitary and planned spaces, these new principles overlooked humane factors: Avoidance of historical context, high-rise buildings and lack of community life in the built environment has created underused spaces [3].

2.2. Roger Trancik: Lost Spaces

Roger Trancik groups lost spaces into five categories to achieve a systematic approach. Automobile usage increased during the first half of the 20th century leading to an automobile dependent design of cities. Surrounding areas of highways became unusable due to air pollution and noise creating lost spaces [3]. Also, linear expansion of highways divides areas, preventing the crossing of humans and animals. Secondly, after the deindustrialization of cities, inactive industrial areas has become lost spaces. Other examples of inactive areas such as ex-military zones, unused railroads are also defined as lost spaces [3]. As mentioned above the re-shaping of cities by the principles of Modern Movement have been listed as the third reason. Zoning and privatization of public land have been mentioned as the last two reasons in the emergence of lost spaces [3].

2.3. Alternative Approaches Towards Lost Space

Lost space has been defined as areas that lack any contribution to the city and its users. The work by Trancik has influenced other researchers into thinking and studying lost space in cities. Loukaitou-Sideris, professor of Urban Planning at California University, has defined such spaces as 'cracks' in the city that has been left to decay. During the 2000s, different attitudes towards lost space can be observed. Frank and Stevens in 2006, re-defined lost space as loose space allowing an escape from the rules of city life where one can protest, celebrate and commerce [4]. Worpole and Knox, additionally marks loose spaces as gathering places for citizens [4].

3. CASE STUDY: KADIKOY

3.1. History of Kadikoy

Kadikoy is a district located in Istanbul, Turkey, consisting of 21 neighborhoods (Figure 1). Historical settlement area Yeldeğirmeni, was one of the early developing areas of Kadikoy during 1800s. Systematic street patterns and seasonally used buildings emerged towards the 1900s [5]. The construction of Haydarpasa Railroad Station in 1908 increased the accessibility of the area resulting in the spreading of settlements. Another advance in Istanbul affecting the area was the construction of the

first bosphorus bridge in 1970. D-100 highway passing closeby was a major axis in transportation, a connection road to the bridge.

Fig. 1. Map of Istanbul focusing on Kadikoy district, showing the boundaries of the study area.

The built environment underwent changes in transportation and architecture. Figure 2 shows a timeline of important advances that has occurred in the area. Starting from 2002, singular structures such as shopping malls emerged in the area, notably Nautilus. Metrobus (transit bus route), Marmaray (suburban train and subway crossing the Bosphorus underwater) and the subway specified their hubs as Kadikoy (Figure 3). It can be concluded that Kadikoy has become a part of daily life of citizens in Istanbul. All these advances considered; economic, political and social changes have led to lost spaces in various areas of Kadikoy.

3.2. Physical Analysis and Outcomes

Physical analysis such as figure-ground and linkage will be used in the determination of differentiated areas of Kadikoy in terms of urban fabric. Figure 4 shows the figure-ground analysis on a map of Kadikoy from the year 2016. Overall investigation of the analysis shows that Yeldegirmeni, Carsi and Moda areas are tightly packed while towards the coast, singular structures lack interrelation. Massive structures, Fenerbahce Stadium and Nautilus Shopping Mall dominate the area as clearly seen in the figure ground analysis. They have also left undefined areas in their surroundings. Haydarpasa train station near the seaside, has been inactive since 2013. To the north of Haydarpasa, again unused granaries invade coastal land causing lost spaces to occur. The scope of the research is unable to cover every detected lost space in Kadikoy, therefore areas containing particular examples have been chosen for further investigation. Available in Figure 4, these areas are: Ayrilik Cesmesi, Haydarpasa, Sogutlucesme and seaside of Moda.

The major earthquake in 1999 also led to serious changes in terms of government policies. Kadikoy was declared an urban transformation area partly because of damaged buildings but mostly due to profitable reasons [5].

Fig. 3. Map of the study area showing the locations of mentioned buildings and transportation hubs.

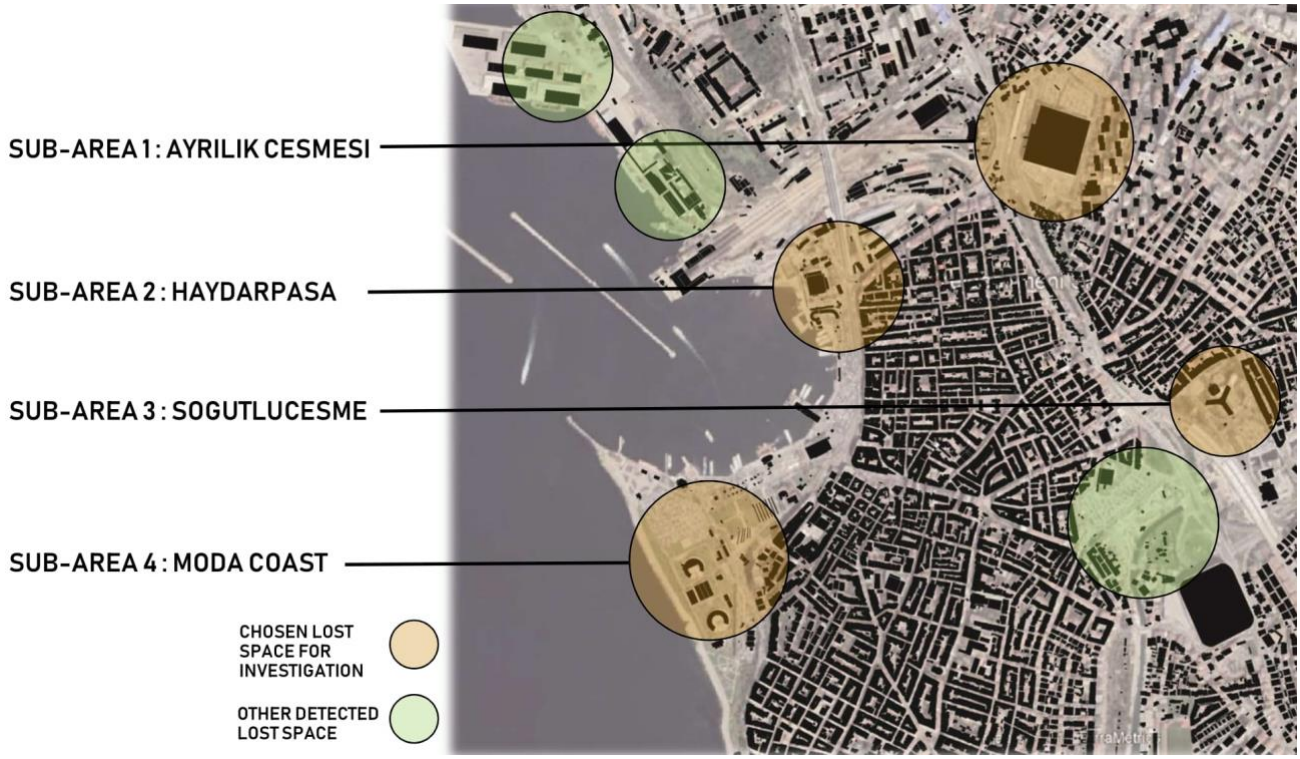

Fig. 4. Selected sub-areas containing lost space detected from the figure-ground analysis.

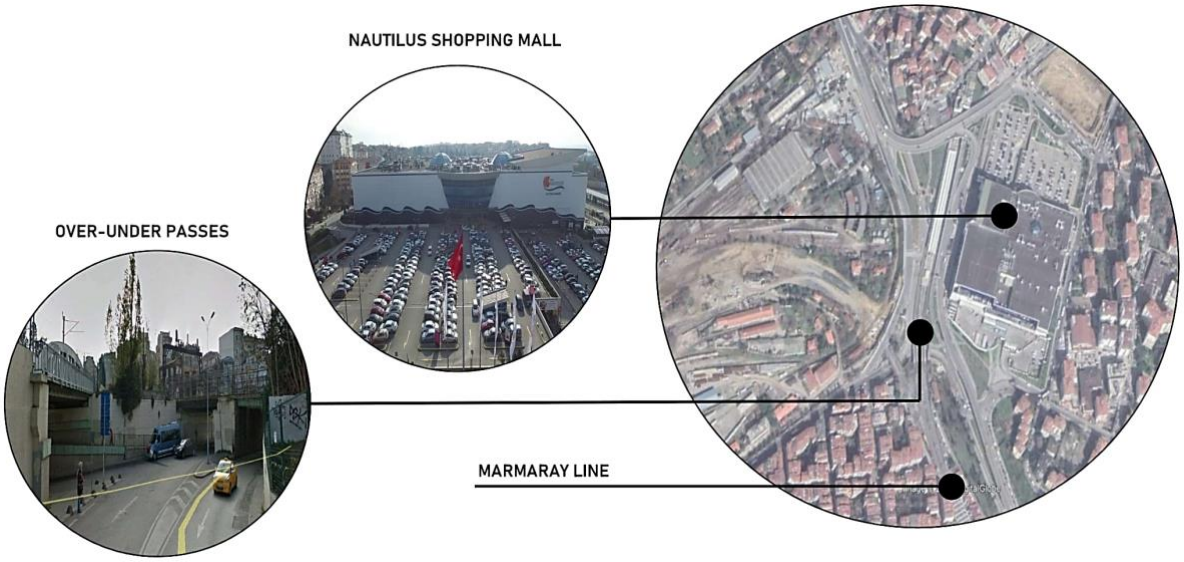

Fig.5. Sub-area 1: Ayrilik Cesmesi

3.2.1 Ayrilik Cesmesi

Ayrilik Cesmesi is located to the northeast of Yeldegirmeni and it is a hub of Marmaray. The history of the area dates back to the Ottoman Empire and as the name represents itself (ayrılık- separation, cesme- fountain), it used to be the leaving point of the city. Soldiers or groups departing away would say goodbye to their families here [6]. At the present time, the area serves as a similar function of being a hub. Network of roads surrounding Ayrilik Cesmesi led to the domination of over and underpasses for pedestrian circulation. The area used to accommodate workers during the construction of Haydarpasa station. Ayrilik Cesmesi Street is architecturally pleasing with two-storey multi-colored wooden buildings. Recently constructed high-rise structures contradict with the characteristics of the neighborhood. The railway divides the area into two, leaving the historical settlement on one side; Nautilus shopping mall and high-rises on the other. Nautilus dominates the area with its scale and the open car park area that is almost as big as the structure itself.

Zooming in to Ayrilik Cesmesi, Figure 5 enables detailed analysis of the area. As mentioned earlier, Nautilus can be marked as a lost space due to the undefined surrounding area and a massive car park. Network of highways encircle Nautilus, isolating the structure from the rest of the neighborhood. Back streets that lead to main avenues come across wide-open land, a dramatic change occurring in scale. Nautilus and surrounding high-rises in contradiction with historical Yeldegirmeni, is a good example showing negative effects of the principles of Modern Movement. Examining walkability, continuity of sidewalks is split by motorways. Over and underpasses result in the disappearance of street-life creating lost spaces.

3.2.2 Haydarpasa

Haydarpasa was the starting point of the suburban train operating between Haydarpasa-Izmit from 1874. The area had become an attraction point of industries because it was both located near the sea and the railroad, which eased the traffic of goods from both ways [7]. Additionally, the neo-classical station building completed in 1903 promoted the silhouette of Kadikoy. Today, abandoned structures are granaries, meat and fish institution and annexes to the train station. The coastal line was filled up in time and a major part of it was spared to Rihtim Avenue. Ferry ports and the bus station employ a wide area near the seaside of Kadikoy.

The compact urban fabric of Yeldegirmeni, transforms into broad open areas while approaching the shore. The figure-ground analysis of Haydarpasa clearly shows the dominating scale of Meat and Fish nstitution (Figure 6). The building while being unused is also surrounded by fences, thus preventing the citizens from reaching the seaside from that part. In addition, the architectural features and façade color

damages the silhouette. Linkage of Yeldegirmeni to the coastal areas is blocked by the wide Rihtim Avenue. The coastal area has major problems in terms of walkability: the narrow but overcrowded sidewalks, exhaust and noise pollution from cars and buses, the massive bus terminal all cause lost spaces to occur.

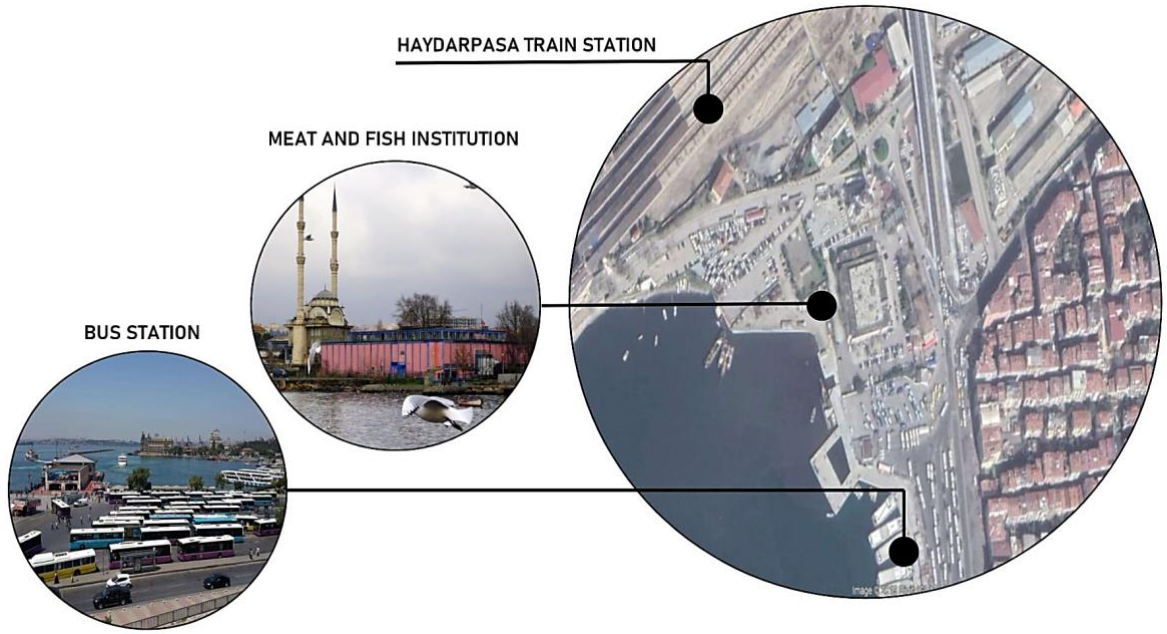

Fig.6. Sub-area 2: Haydarpasa

3.2.3 Sogutlucesme

The history of Sogutlucesme dates back to the Byzantium period. The area used to have generous water supplies (Kurbagalidere) and contained hammams [8]. Although, at present time the stream remediation continues, water has been irreversibly contaminated. Similar to Ayrilik Cesmesi, Sogutlucesme is a transportation hub also including the starting point of Metrobus. In 2019 the suburban train was added to Marmaray, expanding the line from east border of Istanbul to the west. Sogutlucesme station -a stop of Marmaray- built across the Metrobus increased the significance of the area. Presumably a major amount of Istanbul citizens uses the area in their daily routine. The surroundings consist of the Kadikoy Municipality building, apartments mostly used for commercial purposes and an open car park.

Examining the figure-ground analysis of Sogutlucesme, it can be noticed that the encircling built environment of commercial and dwelling units are tightly packed. The area left over for transportation however is undefined. The municipality building stands between the defined and undefined area, representing a transition from the commercial area to the transportation hub. The building disallows transition, thus one walks around it to pass to the other side. Another reason for the malfunctioning of the area is that the intended square facing the building is unused by citizens. Camillo Sitte indicates that squares are formed by defined areas between buildings. The scale of the square should be in harmony with the surrounding structures and the façades facing the square should also be considered [9]. On the contrary to Sitte's suggestions, the square is undefined, distant to surrounding buildings and incompatible with the environment. One other reason shaping lost space is the linearly continuous Marmaray and Metrobus lines that divide the area. The street connections for both sides have not been considered broadly (Figure 7).

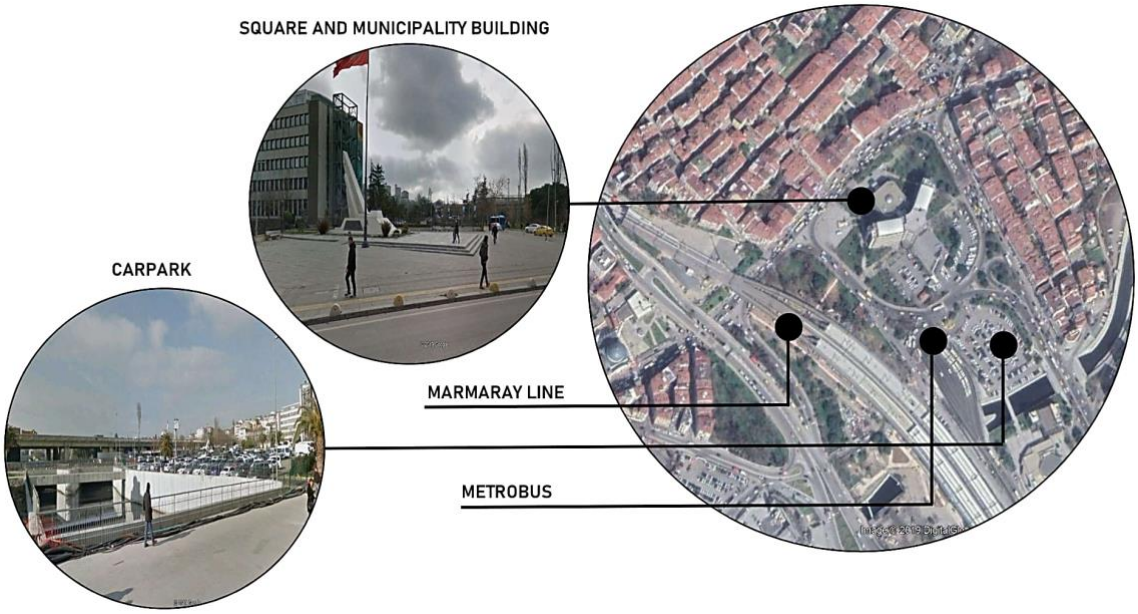

Fig.7. Sub-area 3: Sogutlucesme

3.2.4 Coast of Moda

As well as most areas of Kadikoy, Moda's historical roots extend back a long time. The zone was an important shipping trade port widely used by Phoenicians [8]. The coastline of Kadikoy starts from Haydarpasa passes from Moda and extends to Bostanci. As mentioned earlier, the shore is interrupted mostly between Haydarpasa and Moda but further to Bostanci, it is mainly continuous. Located at the starting point of the Moda coast, a massive open car park dominates the area. Another salient structure is Hilton Hotel situated towards the inner parts of the land. Initial to the construction of the hotel, experts from various fields objected to the 60-metered building that dominates the silhouette of the coast. Moving towards the inner land, multiple-floor apartments form a similar urban pattern seen in other residential and commercial areas of Kadikoy.

Figure-ground analysis of the area shows the change in urban fabric from dense inner parts to wide open spaces towards the coast (Figure 8). The dominant car park at the beginning of the coastal line indicates a lost space located at a precious spot. Furthermore, the boundary of the car park is hedged, lacking transition from the inner areas to the coast. Thus the open car park forms a dominant lost space that sets a negative example of linkage. Vertical expansion of Hilton Hotel, on the other hand, damages the silhouette of the city. Apartments at the inner blocks consist of an average of 5-6 floors while the hotel has 11-storeys. Although Moda coast is known as a widely used area by the youth, lost spaces limits the further development of the area.

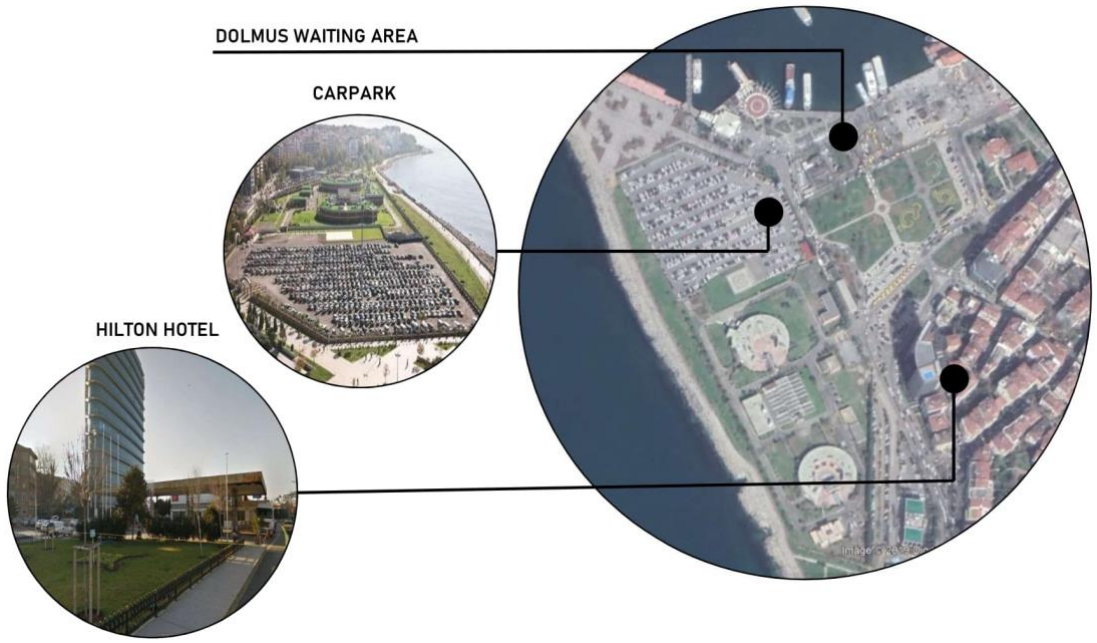

Fig.8. Sub-area 4: Moda Coast

3.3. Classification of Lost Spaces in Kadikoy

Lost space detected from the figure-ground analysis was systematically categorized according to four main topics derived from Roger Trancik's *Finding Lost Space*: abandoned industrial land, principles of Modern Movement, automobile dependent city design, privatization of land (Table 1).

Table. 1. Categorization of lost spaces detected in particular sub-areas.

	Abandoned Industrial Land	**Principles of Modern Movement**	**Automobile Dependent City Design**	**Privatization of Land**
AYRILIK CESMESI	-	Nautilus Shopping Mall	Road Network Shopping Mall Car Park	Nautilus Shopping Mall
HAYDARPASA	Meat and fish institution Annexes to the Haydarpasa Station	-	Rihtim Avenue	-
SOGUTLUCESME	-	The Municipality Building	Car park behind the Municipality Building	-
MODA SAHIL	-	Hilton Hotel	Open car park at the beginning of the coast	Hilton Hotel

4. PLACE ANALYSIS: USER EXPERIENCE

The physical analysis of figure-ground has enabled detecting differentiated areas in terms of urban fabric. Although it provided information on built up space and linkage, the investigation remains limited without 'place' analysis. The research gives importance to the regular users of Kadikoy and how they perceive the spaces. Empirical data was collected from a questionnaire and further one-to-one conversation.

4.1 Methodology

20 participants that use or pass through Kadikoy on a daily basis have been selected. Individuals from different professions and social backgrounds were preferred to comprehend various uses towards spaces. Photographer, architect, city planner, graphic designer and bartender were some of the professions of participants. Both night and day users of Kadikoy strengthened the investigation towards lost spaces perceived by citizens. Majority of participants were unfamiliar to the concept of lost space. Therefore, leading questions were asked towards the spaces they most internalized or externalized. Additionally, the questions were multiple-choice towards commonly known sub-areas of Kadikoy: Ayrilik Cesmesi, Boga, Carsi, Haydarpasa, Moda, Nautilus, Rihtim, Yeldegirmeni, Sogutlucesme. Participants were allowed to choose more than one sub-area and the answers were discussed one-to-one afterwards. 7 questions were as follows:

- How often do you use or pass through Kadikoy?
- Which areas of Kadikoy reflect its historical past?
- Have you noticed any outstanding structures in the silhouette of Kadikoy?
- Which areas are disturbing in terms of car traffic and noise pollution?
- Which areas pose danger?
- Where do you go in Kadikoy to get fresh air?
- Which areas give pleasure to hang out?

The first question aims to understand how frequent Kadikoy was used by participants. The second aims to identify areas that were able to reflect the history of Kadikoy. Following three questions intended to determine externalized, unused spaces. The last two questions, on the other hand served as positive examples to understand the areas internalized by users.

4.2 Survey Results

12 people out of 20 participants reported that they passed through Kadikoy during weekdays on their way to school or work. 6 of them used Metrobus, 3 used Marmaray and 3 used the ferry on a daily basis. They added that most weekends they socialized in the area. 2 of the remaining 8 participants worked in Kadikoy. 6 users lived and worked elsewhere but emphasized that they spent majority of their spare time in Kadikoy. The participants were asked about the activities they enjoyed doing in Kadikoy. Answers contained sitting on the grass near the shore in Moda, going to coffee shops, attending art activities and enjoying the night-life at pubs.

The question towards historical areas and shilouette was asked consecutively so that participants could identify the structures that contravened with the historical setting. Out of 9 sub-areas given, Yeldegirmeni, Moda and Haydarpasa was found to be most historical, while 2 people also thought Carsi was nostalgic. Yeldegirmeni and inner parts of Moda can be identified to reflect history but to further examine the choice of Haydarpasa, participants were asked about why they chose the place. All answers reflected Haydarpasa Train Station building. Regarding the associated question, participants noted that Nautilus (Ayrilik Cesmesi) and the surrounding high-rises were contradictory to the historical setting of Yeldegirmeni. During further conversation, participants were surprised to hear that especially Ayrilik Cesmesi had a past dated back to the Ottomans. Additionally, Sogutlucesme area was among answers related with characterless architecture. Although the vertical stretching Hilton Hotel was among the expected answers, only professions of photography, city planner and architects agreed on the corrupting effect of Hilton in the silhouette.

Areas with car traffic and noise pollution were easily identified by participants, most of them agreeing on Sogutlucesme Avenue and Rihtim Avenue. Sogutlucesme Avenue is commonly used by minibuses, dolmus (a kind of jitney) and busses causing noise and air pollution. Rihtim Avenue has a similar problem, and additionally the bus station increases the effects listed above.

Safety in public space is a widely discussed issue among researchers. Therefore, user perception towards dangerous areas of Kadikoy has been critical in identifying lost space. One participant working at a pub reported that he passes through Ayrilik Cesmesi on the way home and that the area is isolated at night, making him uncomfortable. 4 participants stated that they used the Metrobus on their way back after a night out in Kadikoy, adding that the area was not well-lit which posed risk.

Although the Asian side of Istanbul has plenty of parks compared to the European, investigated area in Kadikoy lacks green areas. User perception confirms this view. Among 12 sub-areas, only Moda was

marked as an answer. In further conversation, participants added Yogurtcu Park, which did not exist in the multiple-choice answers. Yogurtcu Park is located ahead of the shoreline, at the end part of Moda, thus may be counted a part of it.

The last question investigated a sub-area that users have internalized. Most respondents enjoyed spending time in Moda and Yeldegirmeni. The coast of Moda is reported to be an attraction area especially during summers. Upper spots of Moda consists of cafes and pubs which is also internalized by many that prefer Kadikoy. The liveliness of Carsi-Moda part has started to shift towards Yeldegirmeni in the past few years. Restaurants and cafes increased in time, attracting people towards the place. Carsi has also been listed among enjoyable spaces which is generally used for shopping activities. Table 2 demonstrates the frequency of survey responses towards the multiple choice sub-areas of Kadikoy.

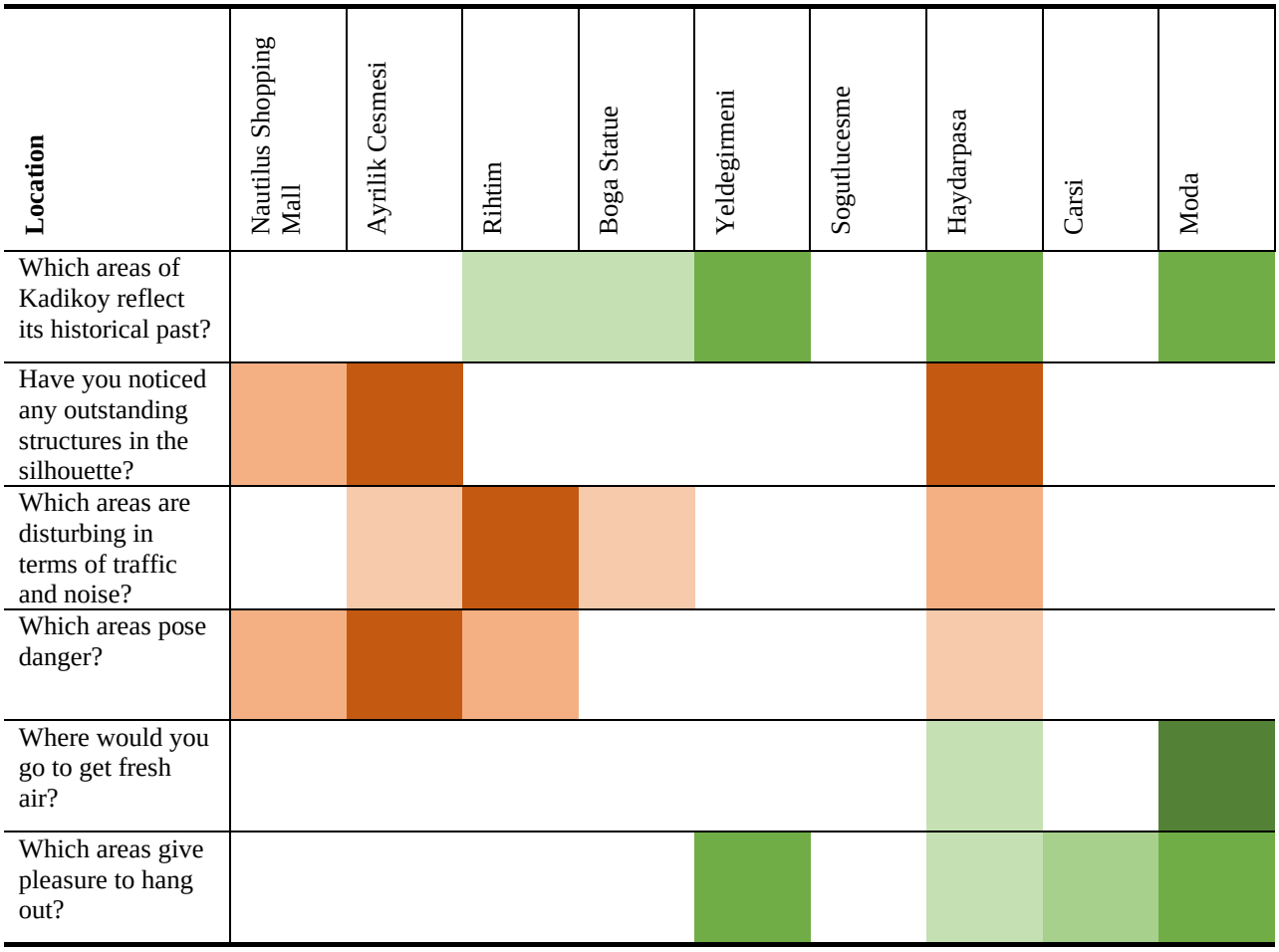

Table. 2. Table showing survey results: Frequency of 'sub-area' responses for survey questions (Darker color representing the frequency of the answer).

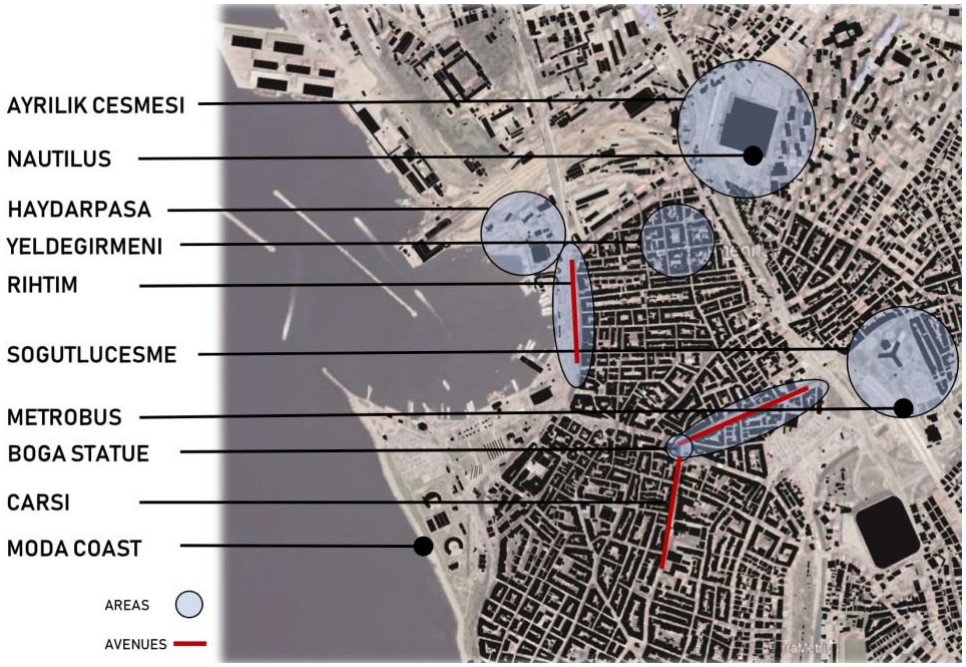

Fig.9. 'Sub-area' responses to survey questions showed on the figure-ground map.

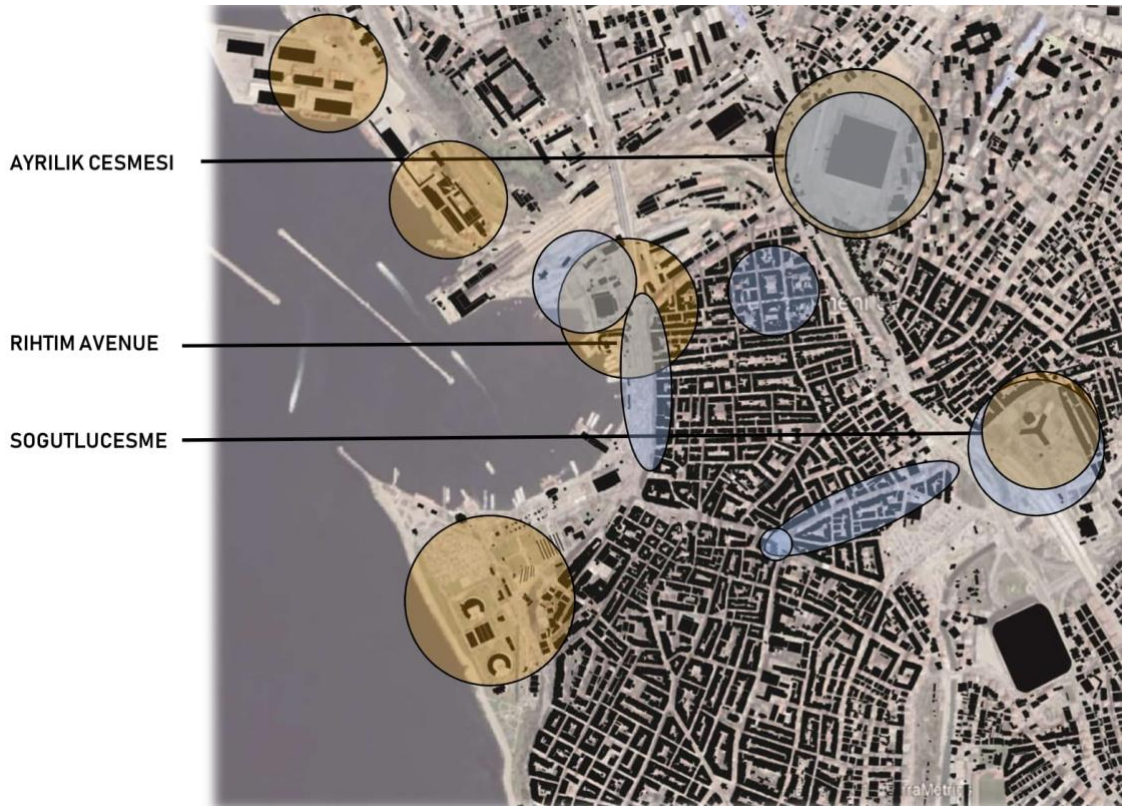

Fig.10. Superposed map showing common areas resulting from the physical figure-ground analysis and survey responses.

5. ASSESSMENT AND SUGGESTIONS

Physical differentiations in the urban pattern detected from the figure-ground analysis formed the first map (Figure 4). The second map shows lost space derived from user answers to the above questions (Figure 9). These two maps are superposed and common areas were selected for suggestions towards

their revitalization. The selected areas are: Ayrilik Cesmesi, Sogutlucesme and Rihtim Avenue (Figure 10).

Continuous linear roads and railways create problematic spaces in terms of pedestrian walkability, as mentioned earlier. Both these linear expansions are common in Ayrilik Cesmesi and Sogutlucesme causing lost space to occur. Theory put forward by Trancik links the causes to automobile-based design. In both areas, two divided land are connected via under and overpasses. Supported by user experience, these under and overpasses pose danger especially during night-time. Insufficient lighting may enable illegal activities to occur. Revitalizing lost space in Ayrilik Cesmesi and Sogutlucesme could be achieved by re-thinking the road network, possibly reuniting pedestrian and vehicular passes on a same plane. Another suggestion may be towards lighting and landscape elements.

Concordant information gained from physical analysis and user participation showed that Sogutlucesme, being the hub of transportation, holds an important spot in the daily routines of citizens. On the other hand, the area lacks linkage between nearby roads and pedestrian passes. Thus, citizens getting off the bus, need to take an obscured pass to reach to the Metrobus or Marmaray. This frequently used space should be re-considered in terms of connections between various public transports.

Sogutlucesme area also serves as a meeting/pick up spot. Although this is the case, the surrounding spaces lack in supporting these activities. One suggestion could be to re-arrange the square in front of the Municipality building. This unused, wide space may serve as a waiting point for citizens. The square is not internalized by users, simply because of the heavy traffic around it and a lack of shade –especially a problem during summers-. With the help of landscape elements such as seats and vegetation acting against the pollution and sun, the area could be revitalized for the usage of citizens.

A great majority of areas in Kadikoy including Sogutlucesme and Ayrilik Cesmesi rest upon a historical past. Although this is the case, study has shown that only a few sub-areas reflect its past. The second question investigating user perception towards historical areas of Kadikoy showed that Yeldegirmeni contained historical features and users internalized the area for this purpose. Therefore, conservation of historical characteristics may be another option for the revitalization of lost spaces.

Traffic and car dependence is one of the key problems of urbanized cities. The fourth question regarding this issue has shown that Kadikoy, especially Sogutlucesme and Rihtim terribly suffers from traffic, air and noise pollution. As appeared in the figure-ground analysis, the spread of Rihtim Avenue also has limited the connection between the coast and inner neighborhoods. Therefore, alternative road options towards decreasing the density of Rihtim Avenue should be accomplished. Additionally, an alternative location to the extensive bus station would allow citizens in using the coast more effectively.

6. CONCLUSION

Urban space consists of used and underused areas at various densities, depending on user preferences. Apart from personal reasons, user preferences are effected by certain factors. The attempt to identify these underused spaces has led Trancik to provide the concept ‘lost space’. Appearing at numerous forms, lost space was systematized under head pieces according to reasons of occurrence. Inactive industrial land, negative outcomes of Modern Movement, automobile dependent city design and lastly privatization of land. Trancik adopted two analysis techniques in the identification of lost spaces: figure-ground and linkage. Besides the physical analyses, place theory gives importance to the contextual meaning of spaces, an example being the human use over time. Although ‘place’ analysis have also been highlighted in the *Finding Lost Space*, it was achieved without user participation. However, this paper has adopted both physical and user-based analysis to understand lost spaces.

Historical briefing towards Kadikoy has shown that the area rests upon a deep past. Starting from the 19th century, the area has gone through economic, political and social transformations leading to diversified effects on urban space such as unused areas. Figure-ground analysis was applied to the chosen area in the first stage. The changes of urban pattern from close knit texture to wide undefined areas has revealed lost spaces. Lack of linkage of these spaces to the surroundings have strengthened the evaluations. Secondly, a survey was conducted towards frequent users of Kadikoy to discover the internalized/externalized spaces of citizens. Equivalent outcomes of physical analysis and user perception showed that areas such as Ayrilik Cesmesi, Sogutlucesme, and Rihtim can be identified as lost spaces.

Overview shows that the majority of lost space was caused by automobile dependent areas in Kadikoy. Continuous linear paths leading to under and over passes have raised security and walkability issues in both Sogutlucesme and Ayrilik Cesmesi. Additionally, disunited areas have created linkage problems of surroundings. Air pollution and noise are also observed in all three areas, especially in Rihtim, reversing the soothing effect of the coast. These facts represent an urgent re-arrangement need towards the road network. Construction according to the principles of Modern Movement, combined with the privatization of land has created singular structures such as Nautilus in Ayrilik Cesmesi. Alienated to its surroundings, Nautilus creates undefined land, similar to the Municipality building in Sogutlucesme. To achieve a connection between the structures and surroundings; lighting, landscape elements and vegetation could assist in the re-designing of the area.

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URBAN SPACE FOR PEOPLE: A CASE OF PARTIAL PEDESTRIANIZATION ON "MILLI KUVVETLER" STREET IN BALIKESIR CITY

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ABSTRACT

Streets have vital importance when the quality of life in urban areas is discussed. Although they have hosted every types of urban activities of pedestrians since the ancient times, streets nowadays are under the hegemony of motorised traffic. This transformation, which is initially emerged in other countries, is also affecting urban areas of Turkish cities strongly in recent years. Uncontrolled growth, increasing population and increasing number of motorized vehicles are causing various and different-scaled urban problems in Turkish cities. Thus, urban spaces, and especially, streets of Turkish cities are gradually becoming "uninhabitable places".
Today there is much interest to create pedestrian oriented urban places to revitalize existing urban centres. Main shopping streets in many European cities are palnned as pedestrian-priority areas. This paper intended to introduce Milli Kuvvetler Street Partial Pedestrianization Project in Balıkesir. This project is designed to transform the main retail street of the city into a shared space for both pedestrians and motor vehicles with extended pedestrian priority, and to improve the environmental image and visual quality of space. It will give priority back to the pedestrian. The principal idea of envisioning the street as a pedestrian-oriented and a human-scaled centre of urban life based on the assumption that pedestrianisation creates more livable environment, encourages people to spend more time on the street and establishes a platform for the economic revitalisation of the street.

Keywords: Pedestrianization, Balıkesir, Milli Kuvvetler Street, Urban Space, Streets.

1. INTRODUCTION

It is evident that streets have vital importance when the quality of life in urban areas is discussed. Streets have hosted various types of urban activitiy of pedestrians since the ancient times, but nowadays they are under the hegemony of motorised traffic. Car-dependent life style of the 20th century has caused emergence of auto-dominant developments in cities. In addition, suburban and out-of-city shopping centers caused to the detriment of the inner city pedestrianized precinct. Traditional commercial areas in central locations often declined after opening of the shopping centres [1]. Thus, it is seen that pedestrian based urban environments have transformed into spaces for car parking and motorised traffic [2], [3].

This transformation, which is initially emerged in urban areas of other countries, has also been affecting urban centers of Turkish cities strongly in recent years. Uncontrolled growth, increasing population and increasing number of motorized vehicles are causing various and different-scaled urban problems in Turkish cities. Thus, urban spaces, and especially, streets of Turkish cities are gradually becoming "uninhabitable places".

Vehicular traffic density dependent problems today are mostly seen in metropolitan cities of Turkey. However, they are also emerging in small and medium scaled cities such as Balikesir. Increasing vehicular traffic in the city is leading to deterioration of spaces planning for pedestrian use. In order to ease the vehicular traffic, roads are widening, pavements are narrowed and pedestrian sidewalks on some streets are used as car parking spaces. Urban space is limited to mechanical values

created by vehicular traffic, and in this case, pedestrian density and diversity of pedestrian activities which enrich urban life are ignored.

The effects of motor vehicles on urban streets on the issues of design, organization and use of urban spaces have begun to be questioned [4], [5], [6].

Today there is much interest to create pedestrian oriented urban places to revitalize existing urban centres. Main shopping streets in many European cities are planning as pedestrian-priority areas. Isaacs [7] stated that a major goal in contemporary urban planning is to encourage pedestrian activity. As Nooraddin points [8], the works of scholars such as Newman, Appleyard, Alexander and Gehl have raised new issues that influence street life such as user density, land-use mix, pedestrian-vehicle interaction and configuration. Their goal is basically to support social life in the street and create a safe community. Gehl [9] discussed in great detail how public spaces could be returned to the public and designed to not only attract people but to encourage them to stay and actively participate in city life. His view is that the city and its public spaces form a possible physical framework for increasing active participation in life. For example, the physical environment needs to provide better conditions for pedestrian and bicycle traffic, beter conditions for children and the elderly and better conditions for recreational and social community functions. Similarly, Montgomery [10] reveals that among the attributes of successful places –including urban streets and squares- 'we should expect to find plenty of opportunities for informal, casual meetings and gossip; friendly bars and pubs and a variety of settings in which to purchase and/or consume food; street markets; a variety of comfortable architectural element for peoples seating, wait and people-watch; a sense of ease with changing seasons; and, above all, a sense of belonging, affection, hospitality, vitality and historical and cultural continuity'.

Pedestrianisation trend means the proliferation of street refurbishment and pedestrianisation schemes in Western post industrial cities over recent decades [11]. Car-free settlements including sport areas, children play areas, urban furnitures and landscape elements that enrich the quality of urban life have been designed in many cities of different countries [3]. Thus, urban settlements are planned as places free from noise and other types of environmental pollution, they provide comfortable, safe and healthy places for pedestrians, and enrich social integration and quality of urban life [7], [1], [3].

Pedestrian-based urban revitalization efforts are also seen in some cities such as Ankara, Istanbul, and Izmir in Turkey. This studies are focused on the issues of movement, speed, change direction, walk and stop, communication with other users, perception of the environment or vice versa, sitting, recreation, and meeting [12] with Gehl's words, 'spaces for walking, staying, standing, sitting, seeing, hearing, talking, "a pleasant place in every respect" [9] in pedestrianised areas of cities. The exclusion of cars makes urban spaces ideal as places for a range of activities such as strolling, relaxing, sitting, and socializing [13].

This approach is defined as 'to design urban cores, sometimes along to a street, completely or partially closed to vehicular traffic; with the aim of improvement of shopping, recreation and leisure potentials of pedestrians, including the aim of historic preservation of the area' [14], [15]. There are alternative approaches for the revitalisation of Central Business Districts according to the technological, socio-economic and cultural characteristics of the societies [16], [17]. In particular, it is widely accepted that there are three different pedestrianization methods. First is full pedestrianization, elimination of vehicular traffic at all times and on all days; second is part-time pedestrianization, elimination of motor vehicle traffic for only certain hours of the day and/or certain days of the week, third is partial pedestrianization, which allows some motor vehicle traffic at low speeds or narrowing the width of vehicular area of street and widening of the adjoining sidewalk to gain more space for pedestrians [18]. Rather than more comprehensive methods, the third method suggests a less drastic pedestrianization scheme.

The main goal of the paper is to introduce Milli Kuvvetler Street Partial Pedestrianisation Project in Balıkesir. There are many existing empirical studies on inner-city revitalisation projects including street refurbishment and pedestrianisation devoted to developed countries, and metropolitan cities of Turkey such as İstanbul, Ankara or İzmir. It is expected that this paper closes a gap in the literature on similar studies related to small scaled Anatolian cities.

The organisation of the paper is as follows: Reasons, aims, methods, and conclusions of pedestrianization efforts are elucidated under the theoretical background title in the next section. The historical background, transformation and present situation of Milli Kuvvetler Street is given in the

third section. Milli Kuvvetler Street Partial Pedestrianisation Project in Balikesir is explained in the fourth section. The final section is devoted to a conclusion and suggestions for further research.

2. THE ORETICAL BACKGROUND

Streets and their sidewalks are its most vital parts and the main public place of a city [19]. While we are thinking a city, first its streets come to our mind. If the city's streets look interesting, lively, and secure, then the city looks interesting, lively, and secure. People will enjoy going there to see and to be seen, thus the street is not only a means of access but also an arena for social expression [4], [19].

Gehl [9] argues that the public realm in cities has traditionally performed three roles: as places to meet other people socially, as market-places to transact in, and as channels of movement. He argues that good public spaces are characterized by the presence of people staying or lingering when they have no pressing reason –or necessary activity- to keep them there. Gehl points that the success of urban public space can be judged by whether or not people are engaged in 'optional' and/or 'social' activities, such as having a conversation, sitting or simply watching others [20]. He implies the importance of stationary activities such as standing, sitting, and watching on the streets. From such a point of view, the street becomes 'the largest and the most used stage' in the city.

Pedestrianisation schemes which people have priority in the street have generally become more intensively used in cities around the world during the past three decades. Economic resurgence in the 1950s produced generalized car ownership in the 1960s in European cities. Cars quickly came to dominate public space with negative consequences on livability, environmental quality, and circulation. During the first half of the 1970s, a great number of pedestrian projects were undertaken simultaneously in West and East Germany, the Netherlands and the Scandinavian and Baltic countries [1].

Some studies reveal that in the reproduction of urban public space, some observations are expressed in terms of the links between cultural activity and economic vitality [21]. Indeed, pedestrianisation has long been a key strategy in promoting the city's economic and symbolic roles in the global/ national urban hierarchy. As Yang and Xu (2009) asserts, in discussions of pedestrianization and street refurbishment trend, there is a tendency to portray these efforts as 'to help cities find new niches in the global markets' [22], [23], [24]. However, Jayne [25] points out that commercialisation is actually both enabling and constraining in shaping public space and offering public use, which Miles [26] otherwise terms as the 'consuming paradox', as in reality many invented commercial environments, such as high streets and themed parks, act as the stage for individuals' pursuit of happiness and imagination. Gottdiener [27] concludes that the two different environments – those led and not led by consumerist culture – 'are both extensions of the human need for a material environment that signifies and has meaning'.

Today success of the urban centres is measured by numbers of pedestrians on its streets. Urban decay areas in many European cities especially historical city centres are transforming into lively places through pedestrianisation studies. These studies are undertaken as urban regeneration or gentrification efforts [15], surrounding buildings are being restored with new functions, and thus protection and sustainability of urban identities are provided. Pedestrianisation or refurbishment works of existing streets aim to make positive impacts to urban quality, urban identity, city's economy, sustainability and social welfare of city. These works facilitate easing of pedestrian's movements, creation of pedestrian areas for their various activities, strengthening social and physical image of the city, and they provide both preservation of historic city centre and development of retail trade [15].

In the first pedestrianisation schemes streets were fully closed to motorised traffic. They were designed to improve the pedestrianised street with new paving, trees, furnishings, night lighting and other amenities such as sculptures and fountains. This approach is called full pedestrianization and means that elimination of vehicular traffic from the street at all times and on all days. After that efforts, it was seen that such practices was not contribute to the development of retail trade at the expected level, finally, by the late 1980s, it became clear that most fully pedestrianised streets had turned out to be unsuccessful [28]. Since then, streets planning started to be as places which pedestrians and vehicular traffic in a balanced arrangement, regulating and improving the pedestrian environment instead of eliminating motor vehicles completely [29]. In these examples, the surfaces

allocated for the circulation of motor vehicles on the street were narrowed, pedestrian pavements were widened, and physical renovation works including changing the floor coverings and using various urban furniture and landscape elements were fitted in order to improve the quality of the space (Figure 1)

Fig.1. Main shopping street in Cannes, France. Source: Photography by author.

The pedestrianization of the streets was not only at the level of physical renewal, but also aimed to transform these places into living spaces of social interaction and activity. For this purpose, some buildings on the street have been re-functionalized with a focus on strengthening social interactions. In order to ensure the vitality of the social life on the street, the ground floors of some buildings have been converted into eating places and cafeterias requiring semi-open and open spaces, and these spaces have been allowed to use the sidewalk as a seating area. As Montgomery [30] points out, such spaces were places of social interaction and public social life. Promenading and people watching provide the dynamic quality of successful urban places. With the concern to `re-centre' cities and bring back their lost vitality, attention has been focused on the creation of cafe culture. As Oosterman [31] notes, many cities and towns across Western Europe have poured investment into improving and re-creating the urban public realm, in the redesign of plazas, streets and parks. These designs are intended to have a social impact by encouraging more active social life in urban public space. The entertaining force of the street is the main attraction of the sidewalk cafe.

In Turkey, the history of street pedestrianization projects is dating back to pedestrianization of Yüksel Street (Figure 2) [32] in 1989 in Turkey's capital city Ankara and pedestrianization of İstiklal Street (Figure 3) in 1990 in İstanbul. In the pedestrianization process of Istiklal Street, the shop owners opposed to pedestrianization on the grounds that it would be difficult for people to access there, but the increase in retail trade and the change in the social environment after the pedestrianization, it was seen that pedestrianization had positive effect on both physically and economically [33]. In recent years, it is seen that pedestrianization studies are also being implemented in some Turkish cities such as Eskişehir, Edirne, Trabzon and Bursa. As a result of these studies, pedestrian spaces isolated from the motor vehicle circulation at different scales both provide physical protection of the historical areas of cities and also mediate the creation of a lively social and commercial environment due to the intensity of pedestrian use in cities.

Fig. 2. Ankara Yüksel Street. [36]

Fig. 3. Istanbul İstiklal Street. [37]

3. HISTORICAL BACKGROUND OF MILLI KUVVETLER STREET

Balıkesir is a small western Anatolian town which is one of the significant Ottoman cities though not as much as metropolitan cities like İstanbul, İzmir, Bursa and Ankara in history. The function of commerce, particularly during 17th and 18th centuries, is obviously the most influential factor in the significance of Balıkesir. That the geographical position of city partially connects Anatolian provinces to those of Roumelia, and that city provides the possibilities for the transportation of row materials and products to Western Anatolia, Istanbul and then to abroad through her ports opening to both Aegean sea and Marmara, can be considered as the indicators of how developed the city was [34].

Milli Kuvvetler Street, which was named as İstasyon Street since it constituted the axis connecting Municipality Building into the Railway Station in Balıkesir, is an astonishing insertion of 1916 into the organic town fabric of Balıkesir (Figure 4). The street has become a new axis physically and functionally detached from the traditional core of city, and one with luxurious shops as well as the one with bank buildings –they represent modernising society- on its both sides particularly in 1940s and 1950s. Opening of the street and selling of imported goods on this new street were quite significant from the viewpoint that it was the generating point of the Westernisation and modernisation process in Balikesir (Figure 5). The newspaper advertisements of various retailers such as those who sell exquisite hats, elegant fur coats and fashionable watches are also typical manifestations of the quality of commercial life along Milli Kuvvetler Street around 1950s (Figure 6). They show that the street was the most favourite, distinguished, and popular shopping area of upper-middle class social groups or the early republican bourgeoisie in Balıkesir.

Later, the street started to deviate from an urban space representing a new social model of Turkish Republic in the early 1920s towards a mediocre and untidy streetscape appearance and configuration [35]. While the street was the most exquisite linear space of its time and the first upper-class commercial street of Balıkesir, it is observed that a significant alteration have gradually occurred in the physical layout of Milli Kuvvetler Street. It has been fragmented from the broader urban context with a series of misguided interventions since 1955. There are fifteen buildings which are accepted as “cultural heritage” by Cultural and Natural Heritage Protection Board on the street. Their architecturally significant building fronts contribute to the street’s physical presence and they create an attractive place for pedestrians. However, when the transformation of silhouettes on both sides of the street is analysed, one cannot fail to notice that the deformation in the proportion of width-to-height is so abrupt that the sense of “high-market street” is lost (Figure 7).

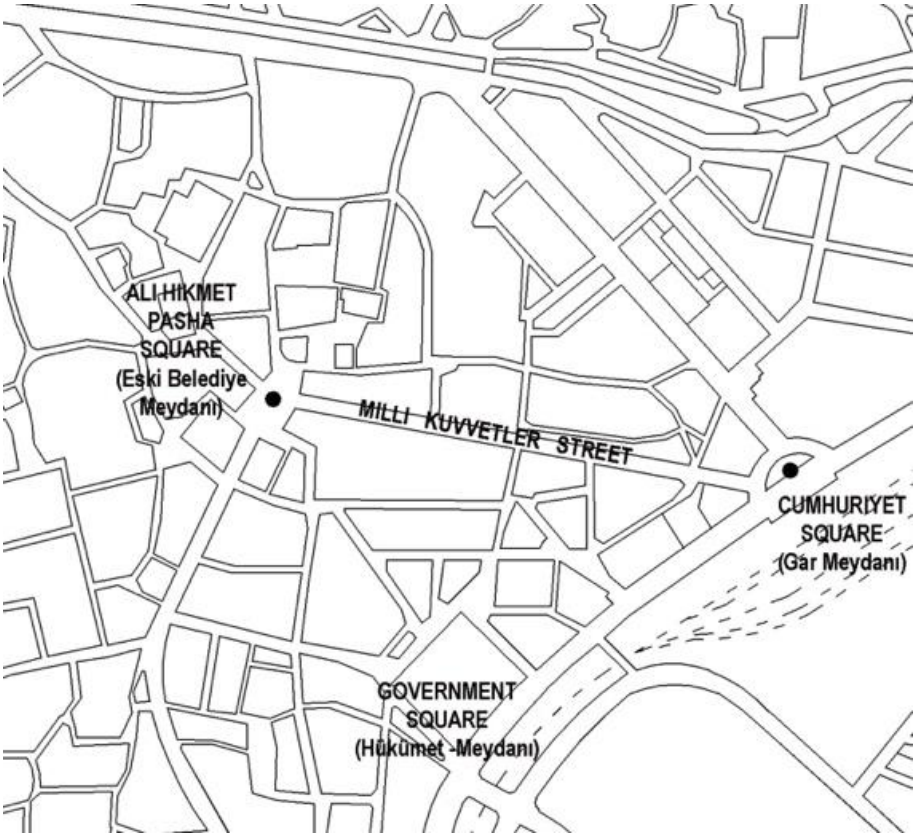

Fig. 4. Map of Central Business District of Balıkesir and Milli Kuvvetler Street. Source: Drawing by author.

Fig. 5. General view of Milli Kuvvetler (İstasyon) Street in 1930's. Source: Photographs were taken from author's archive.

Fig. 6. The newspaper advertisements show the quality of commercial life along Milli Kuvvetler Street around 1950s. Source: Local Türkdili Newspaper.

Moreover, the analysis of the transformation of plot widths also reveals that the regularity of the rhythm of pedestrians is impaired to a great extent via enlargement of shop windows [34]. On the other hand, overall economic change which formed in parallel to impacts of global economy, changing life styles, increase in the number of cars and enhancement of mobility have resulted in a considerably reduced demand in central city stores in Turkish cities. In particular, channelling of upper-middle income groups to shopping areas which set up in more peripheral areas of Balıkesir have caused the transformation of Milli Kuvvetler Street into a non-preffered shopping area. In other words, multi-centre development causing the decline of Central Business Districts as in other cities of Turkey [17] has ultimately experienced in Balıkesir by the mid-2000s.

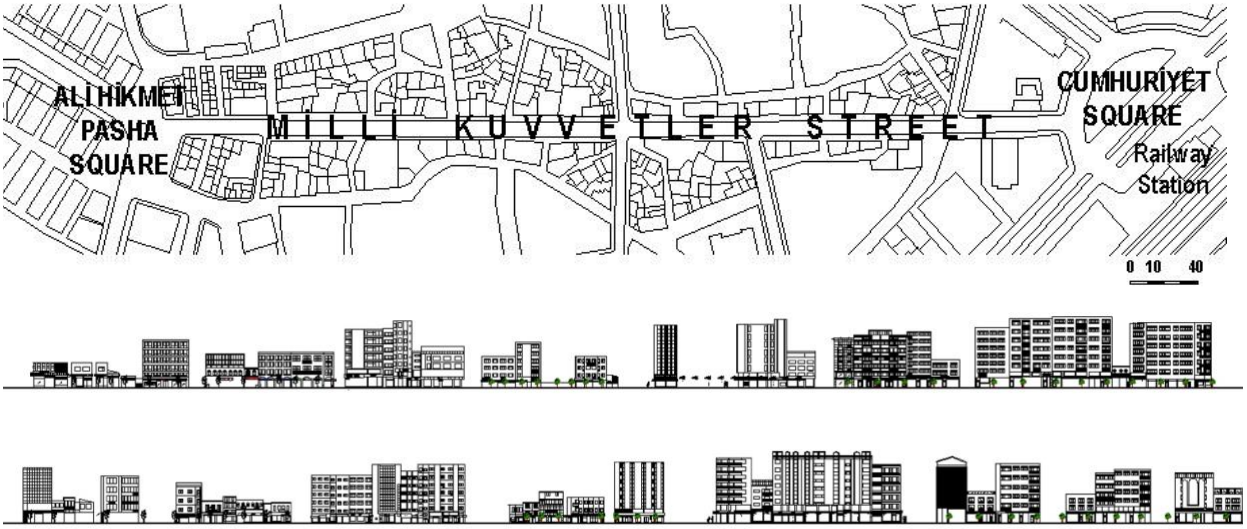

Fig. 7. Site Plan and silhouettes of Milli Kuvvetler Street. Source: Drawings by author.

Therefore, a series of urban-architectural interventions were needed for the rehabilitation of Balıkesir towards a better, unfragmented, sociable, participatory, and coherent city (Figure 8). Towards a better and vivid social life in the historic centre of the city of Balıkesir, Milli Kuvvetler Street was suggested as an urban generator to reactivate the social life in the city for a much more liveable Balıkesir. Milli Kuvvetler Street could easily be improved to a place which is accommodate public life, by reducing vehicular traffic, by removing two rows of parking spaces, by widening sidewalks, by creating places to sit, and planting new trees and other green elements. Thus, the street would also be the most vivid shopping street of Balıkesir again.

Fig. 8. Milli Kuvvetler Street before pedestrianization. Source: Photography by author

4. MILLI KUVVETLER STREET PARTIAL PEDESTRIANIZATION PROJECT

This project – planning to transform the main retail street of the city into a shared space for both pedestrians and motor vehicles with extended pedestrian priority, and to improve the environmental image and visual quality of space. It would give priority back to the pedestrian. The principal idea of envisioning the street as a pedestrian-oriented and a human-scaled centre of urban life based on the assumption that pedestrianisation creates more livable environment, encourages people to spend more time on the street and establishes a platform for the economic revitalisation of the street.

The preliminary project, which contains main decisions on pedestrianization, was designed by the author together with a group of student of Balıkesir University Department of Architecture in 2009. It was presented at Balıkesir City Council Environmental and Urban Planning Working Group (City Council is a voluntary and non-profit organization that provides urban dwellers to participate in decisions about urban development). Initially, a survey was conducted to understand public opinion about the pedestrianization of the street. Survey results (Table 1) showed that urban citizens were positive on the pedestrianization, but shop owners thought that pedestrianization may affect the use of street negatively. During a year, Balıkesir City Council Environmental and Urban Planning working group held almost 10 meetings to have input from citizens, shop owners, property owners and municipal management officers, and to make planning solutions with public participation. As Pojani asserts, without the owners' broad support, the city had limited ability to achieve any revitalization objectives [28]. Actually, these meetings were efforts to explain them that the pedestrianisation project provides much more liveable street physically, socially and economically. After the project had

announced in local newspapers and introduced to the public, Balıkesir Municipality was interested in the project and decided to implement it in 2011, and municipality commissioned a private company for the detailed project and implementation of the street rehabilitation project. Works were completed in 2014 and the street opened again.

Table 1. Survey results of Milli Kuvvetler Street

Questions	***Pedestrian***		***Shop owners***	
Contribution of vehicular traffic to the street life	unfavourable	86%	unfavourable	40%
	favorable	14%	favorable	60%
Efficiency of pavement widths of the street	efficient	26%	efficient	78%
	deficient	74%	deficient	22%
Presence of urban furniture on the street	there are urban furniture	24%	there are urban furniture	55%
	there are urban furniture, but they are not enough	-	there are urban furniture, but they are not enough	32%
	there are no urban furniture	76%	there are no urban furniture	13%
Walking time from the bus stop or parking places to the street	1-5 minutes	60%	1-5 minutes	40%
	5-10 minutes	26%	5-10 minutes	50%
	10-15 minutes	14%	10-15 minutes	10%

The positive aspects of pedestrianization of the street which were highlighted in the meetings as follows:

1. Partial pedestrianization would reduce vehicular traffic, increase pedestrian density on the street, and thus, increasing the number of pedestrian users on the street at different times of the day would transform the street into a social interaction place.
2. The increase in the number of pedestrian users on the street had positive effect on the retail trade of the stores.
3. Repaving of the ground with good and decorative materials, adding decorative street furniture, street lighting, and landscape elements on the pedestrian pavements would increase spatial quality of the street as important contributions to the identity and image of the city.
4. Clearing the building facades on both sides of the street from advertising signs that create visual pollution and setting a standard for the elements added to the facades would increase the spatial quality and character of the street.

At the beginning of the preliminary project, Milli Kuvvetler Street was analysed. The street was approximately 500 meters long and 15 meters wide. Vehicular circulation place width was 8 meters and pedestrian pavement widths were 3.50 meters on both sides (Figure 9). In the project, vehicular circulation place width was reduced from 8 meters to 3.50 meters, the pedestrian pavement widths were increased to 5.75 meters on both sides and the possibility of parking on the right side of the street was removed (Figure 10). Street widened at two strategic points for emergency situations.

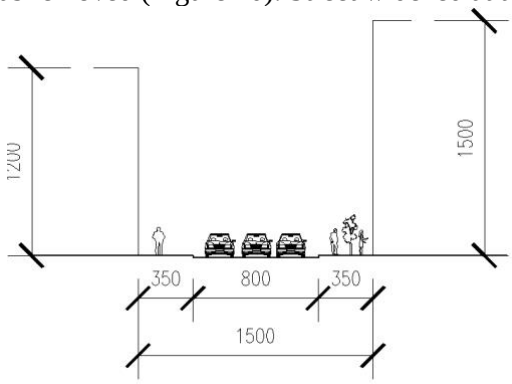

Fig. 9. Street section (before). Source: Drawing by author.

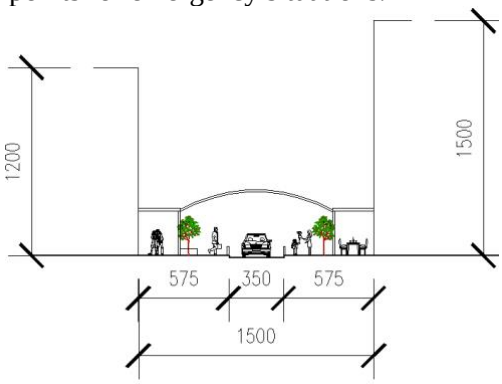

Fig. 10. Street section (proposed). Source: Drawing by author.

It was seen that changing heights of surrounding buildings caused physical deterioration on the street walls. On the other hand, there were no socialization spaces such as cafes, cinemas, concert halls, theatre, etc. around the street. It showed that the street was merely used as retail space that means there were not flexible uses. There was an overall lose of street life especially in night times. Other results of the street analysis were outlined as follows: Urban furnitures such as benches,

pergolas, seating elements, trash cans / bins of various sizes and functions, lighting elements, spatial arrangements for disabled people, street lighting were insufficient.

In the project, in order to increase social interaction on the street, it was proposed to add new functions such as cafes and restaurants on the street, and it was thought that the 2.50 meters wide section of the pedestrian pavements could be used as open or semi-open spaces of them (Figure 11, Figure 12).

Fig. 11. Source: Drawing by author.

Fig. 12. Source: Drawing by author.

In the project, a light steel structure was designed partly covering the half of the street so that the street was adapted to human scale and the continuity, rhythm and wholeness effect was created on the facades (Figure 13, Figure 14, Figure 15). This colonnaded arcade could create a more protected environment. The upper surface of the structure was partly covered to provide protection from rain, sun and wind. In addition, this structure was intended to bring spatial definition to the socialization areas to be created on the street. The steel structure could also be covered with photovoltaic panels as a mechanism that converts the solar energy into usable energy.

Fig. 13. Source: Drawing by author.

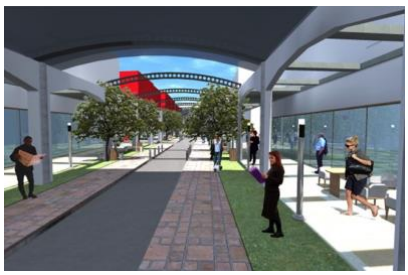

Fig. 14. Source: Drawing by author.

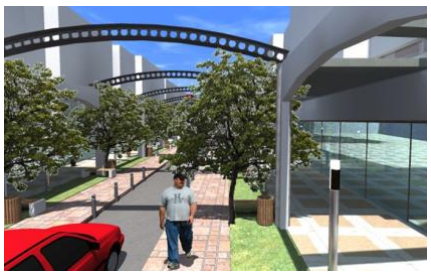

Fig. 15. Source: Drawing by author.

In addition, it was suggested that electrical and gas equipments on pedestrian pavements should be removed, urban furnitures such as benches, pergolas, seating elements, trash cans / bins of various sizes and functions, lighting elements, were placed to the right places. Besides, spatial necessities of disabled people were taken into consideration in the planning process.

In the implementation process of the project, there were some shortages. First, renovation of building façades was not recommended due to financial problems. The municipality did not have a budget and property owners were not willing to allocate resources for a façade renovation. Second, due to the private ownership conditions, functional changes of ground floors of the buildings on the street could not be proposed. Third, steel structure partially covering the street was not built. And the last, urban furnitures were not designed as unique equipments for the street. Quality and durable materials were not used in both floor coverings and urban furniture (Figure 16). A survey conducted in 2015 showed that despite the above-mentioned shortcomings, the implementation of the project was found favorable by the urban citizens.

Fig. 16. Current view of the street. Source: Photography by author.

5. CONCLUSION

It is completely accepted that street planning is an essential aspect in the success of public spaces. Gehl guides his planning philosophies is that people attract other people: 'If given the choice between walking on a deserted or a lively street, most people in most situations will choose the lively street. If the choice is between sitting in a private backyard or in a semiprivate front yard with a view of the street, people will often choose the front of the house where there is more to see' [9], [19]. Some studies show that pedestrianisation of a street or restoration of buildings around a street cause a serious increase on land prices and residential prices [17]. Increased levels of bicycling and walking in pedestrianized streets would result in significant benefits in terms of health and physical fitness, the environment, and transportation- related effects.

This paper tried to explain a preliminary partial pedestrianization project of a commercial street as a backbone of the historic quarter in a small western Anatolian town. The project has to be evaluated as a micro scaled urban revitalization or a kind of urban patch, instead of making ambitious and macro decisions on the future of the city. From the broader context, it is claimed in the study that a pedestrian oriented urban culture could possibly established through the partial pedestrianisation of Milli Kuvvetler Street of Balıkesir. It is expected that pedestrianization as an idea will speed up the revitalization of building facades and the same approach could be apply other main streets.

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MIGRATION AS A DEVELOPMENT VECTOR: IMPACT OF INTERNAL AND EXTERNAL MIGRATION ON THE URBANISATION OF RABAT CITY

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ABSTRACT

The present reflection aims to tackle the "African" migration issue, an intricate dialectic of different concepts and contrasting systems, both historical and social, as well as their repercussions for the territories. Thus, to establish a model of development including new migratory flows.
This migratory dynamic will engender profound urban metamorphoses which must be planned beforehand through urban solutions adapted to prepare the ground for a more organic migration. Especially that Morocco is committed to international conventions as well as the 2030 Agenda for sustainable development.
I have chosen to emphasize to study the case of Rabat city migration as a capital city it's focal role as hub Moroccan migratory path.
On the margins of this dynamic conurbation. Peri-urban centers have been developed, which benefit from their location on the road and coastal railway that joins Rabat Casablanca (economic city of the country).

Keywords: migration, urbanisation, Africa, development, sustainability, population, migratory dynamic

1. INTRODUCTION

General overview of migration phenomenon in Morocco

External migration - Morocco's special historico-cultural relationship with West Africa has existed for thousands of years and reflects the accessibility to moroccan territory by citizens of different African countries. Morocco is currently insisting on a strategic reassessment of its diplomatic, trade, political and security relations with the French-speaking states of West Africa. The deployment of various programs has helped to strengthen ties between these states and Morocco in the framework of bilateral and international cooperation, targeting.

This "diplomatic marketing", which was also aimed at consolidating Morocco's geostrategic position towards other regional competitors such as Algeria. In order to strengthen and increase bilateral cooperation between Morocco and West African states which enhances the current mobility between West African countries to their northern neighbor. [1]

While the Kingdom of Morocco emphasizes its "africanity" towards its southern neighbors and assumes the role of "big brother". On the contrary, it has become, the "guardian" of the European Union trough monitoring and regulating the arrival of African migrants and refugees.

If, for some foreigners, Morocco is actually regarded as a transit country in their journey to Europe, for others, it is also and above all a country of immigration. Similarly, we are witnessing a historical metamorphosis of Morocco's geographical role and its transformation from a transit country to a full host country.

In order to meet those unprecedented challenges in behalf of the arrival of these new populations, a renewed migration policy has been put in place, notably through the adoption of strategies aiming to regulate migratory flows and to manage the massive movements of migrants and refugees.

The urban agglomeration of Rabat, which barely exceeded 50,000 inhabitants at the beginning of the century, saw its population quadrupling in 1951 and reaching 203,000 inhabitants, according to the High Commission for Planning (HCP). [2]

Currently, the agglomeration tends towards 2 million people. The various Moroccan population census operations show an increase in the urbanisation phenomenon. Over time, the population of Morocco records two phenomena: urbanisation and coastalisation.

Internal mobility is characterized on the one hand by the depopulation of the countryside for the benefit of the capital city region, an Atlantic coast city at the expense of continental Morocco.

This double phenomenon is problematic on account of: The profile of urbanism in the coming years with a dilemma of a policy of new urban agglomerations creation or a policy of enlargement. An expansion of existing cities that put them at risk of becoming unmanageable metropolises. The third option would remain the development of rural areas to maintain/sustain its population and curb the exodus.

2. PROBLEMS

2. The historical background of the migratory process in Rabat

2.1. Internal migration:

The Rabat area, which covers an area of 118 km^2, represents a territory completely limited by physical structures that are difficult to cross, passing through the northern Bouregreg and Akkrach valleys and to the east, the Temara to the south and the coast to the west. These limits allow the capital to qualify the closed city where urban expansion has become almost impossible. The urban interventions are directed towards the punctual operations in situ: "to make the city in the city." Besides, the major urban operations of Rabat will be on its flanks. (Sale and Temara). [3]

Accelerated urbanisation on the "margins" of Rabat, territorial recompositions and functioning of the agglomeration. The urbanisation of "Greater Rabat" refers to the whole agglomeration of today including the cities of Rabat, Sale, Skhirat, and Temara and the surrounding rural communes. The latter occupies a special place allowing the attractiveness of the urban population of Rabat and Temara seeking housing opportunities, and "spillway" relocated by the state of the slums of Rabat and Temara.

For a very long time, the urbanisation of the Bouregreg River has been rapidly expanding throughout the colonial period, particularly on the left bank of the river, with the city of Rabat has become the administrative capital of the country.

With the Independence of the country, the extension of the urbanized area of Rabat extends further. This accelerated urbanisation movement, which is expanding along the coastline, but also more and more inland, on both sides of the river, led to the creation of a conurbation stretching along the coast and about fifteen kilometers inland. [4]

This nebula, compact in its central parts, becomes relatively looser towards the marginal extensions, with the emergence of some suburban satellite centers, more or less dynamic, as well as the recent creation of the new city, etc.

2.1.1. Protectorate period: Post medina urbanisation and emergence of the first Downtown Core: 'European' District Hassan

Circumscribed between the Atlantic Ocean on the north and the Bou Regreg river on the east. The city of Rabat can freely grow either towards the south or the southwest, along the coast. The Atlantic Ocean. This is the first direction that guided the first developments of the city in the Almohad period in the twelfth century. Later, from the eighteenth century, Rabat extended to the southwest, but away from the coast and the river. in the protectorate period and after the signing of the Treaty of Fez in 1912, Rabat became the capital city of Morocco. [5] The settlers then, proceeded to massive recruitment of workers from the rural world to build the new capital city.

In terms of management plans, the first master plan of Rabat was established in 1914 and was sketched by Henri Prost on 1/50 000 and 1/10 000 maps. [6] These scales were only allowed to represent the main features of the general urban fabric. (Figure 1.)

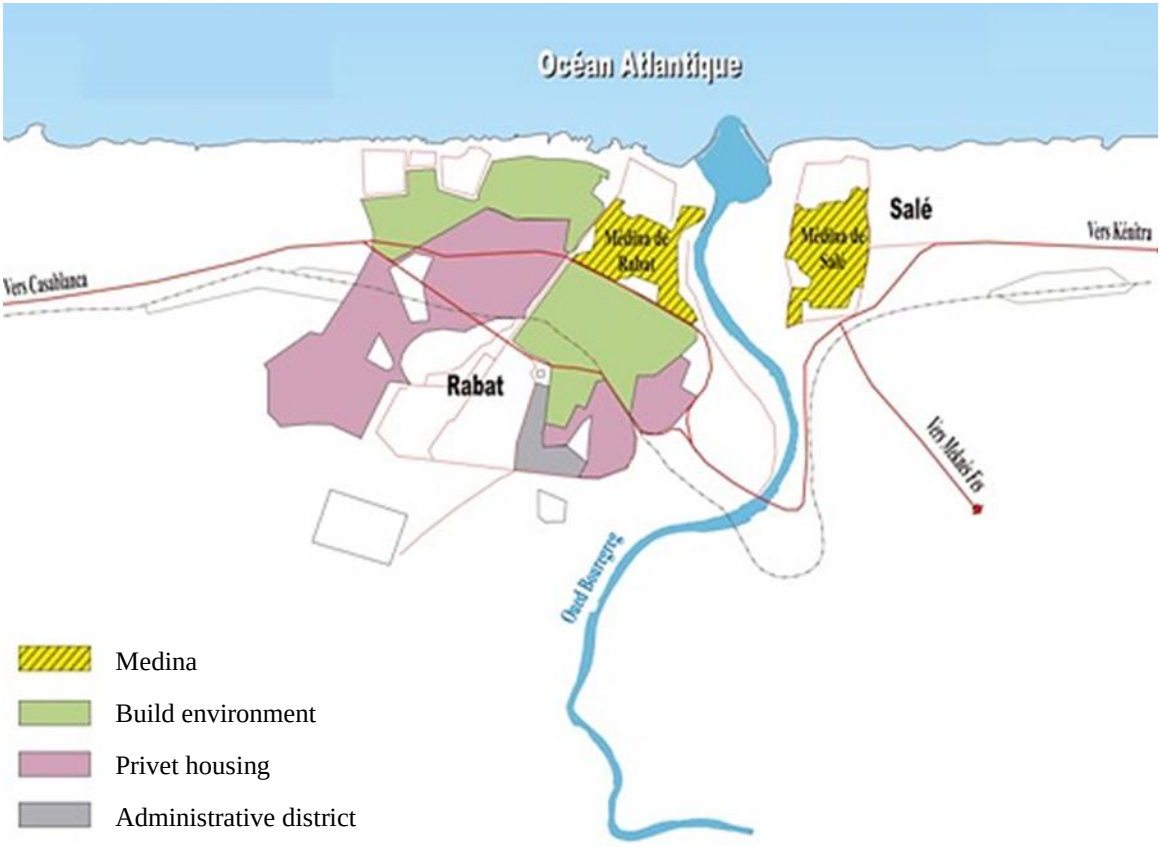

Fig. 1. Rabat-Sale development plan established in 1914 by Henri Prost , Source - Ministry of the Interior, Pinseau Michel, November 1991, Master Plan of urban development of Rabat-Sale, Report justifying, p. 94.

Later on, Michel Ecochard produced a new Master Plan of the city of Rabat between 1948 and 1955. (Figure 2.)

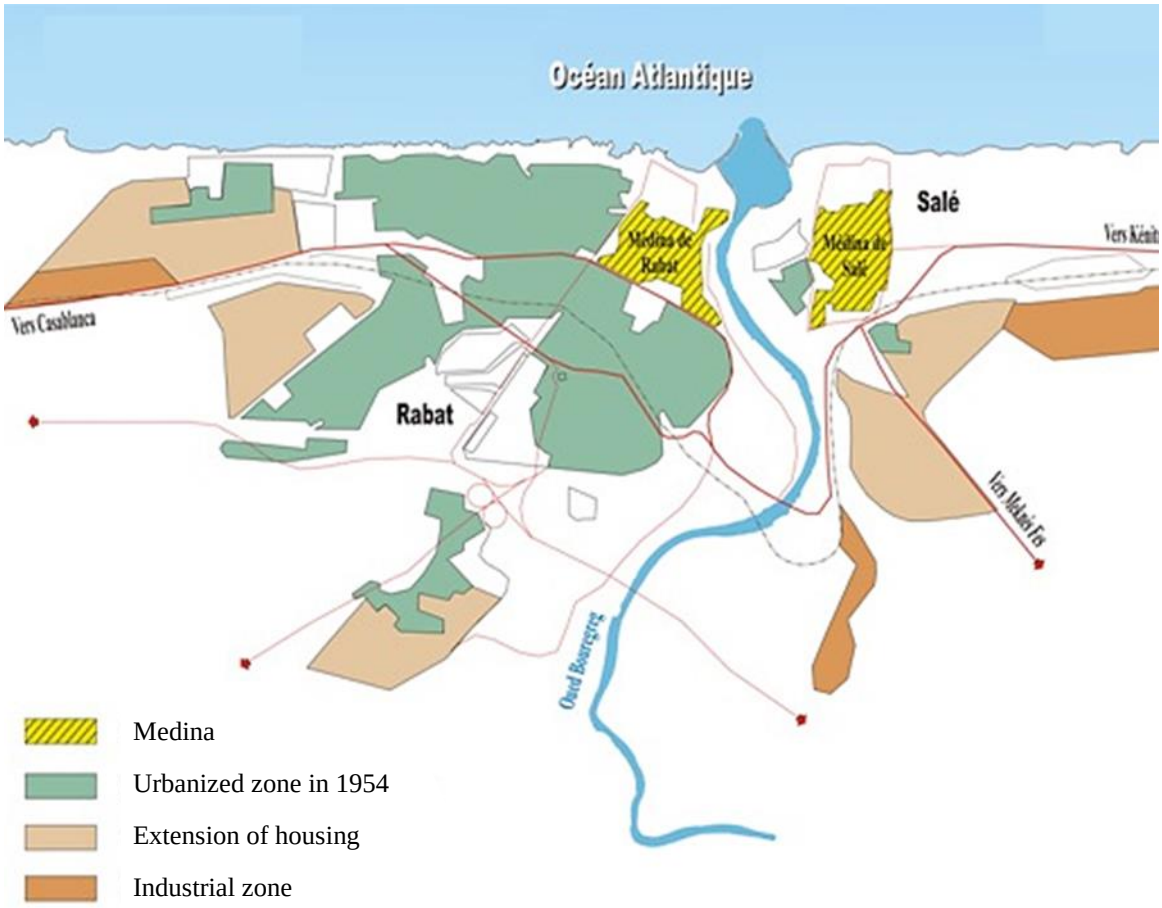

Fig. 2. Rabat-Sale Development Plan drew up in 1955 by Michel Ecochard, Source: Ministry of the Interior, Pinseau Michel, Rabat-Sale Urban Development Master Plan, Supporting Report, November 1991, p. 94.

In both master plans, no specific zoning has been provided for the city's coastal development because, at that time, the littoral area was considered as unsuitable for the urban extension of Rabat City. Therefore, it had been shelved from any development proposal. In addition to the Medinas (Rabat, Sale), these are the Avenue Mohammed V, which, the main axis of the European city, has located numerous headquarters of the Administration, the head offices of all types, banking institutions, all of them having a strong symbolic meaning and radiating far beyond the administrative boundaries of the capital; to these tertiary functions was added very early a great density of shops, many of quality, rare services, liberal professions, and various activities.[7] The conjunction of these functions in a limited space, thus making their concentration very visible, has given this boulevard the character of a major center of the capital and its agglomeration. To a large extent, this role has been maintained until today, even though it has been attenuated by developments that, after the independence of Morocco, have affected it.

2.1.2. The 80-90's Downtown Core: Agdal District

The urban development of the capital (within its administrative boundaries as a city) has historically been expanded from north to southwest, parallel to the Atlantic Ocean. This development makes it possible to highlight three large sets of habitats formed of the following neighborhoods:

The Agdal district, occupies a central position in the city; it is home to many tertiary activities (high-end businesses, private schools, etc.) as well as upper classes of the urban "middle class" residents. It was composed of medium-sized villas.[8] The main urban traffic lanes are intercalated (including the railroad), as well as the facilities and public spaces that occupy the central strip of the city from Hassan district in the north to the new city of Hay Ryad to the west, on the other hand. Conversely, the neighboring districts which are overlooking the Atlantic Ocean, housed popular residences and an intense commercial and craft activity.

Transition from rural to urban life implies behavior changes. 'Uprooted' outside the original communities for some, it is, it is likely seen as an opportunity for diversity and inclusion for others. The

arrival of migrants in the city of Rabat has led to defensive behavior and speculation. The legal and illegal use of land in areas bordering the city had let to the installation of overcrowded working-class shantytowns.

While the city continued its expansion due to urbanisation pressure, the shantytowns lands gained real-estate value. Consequently, the authorities decided to relocate populations in social housing in suburbs areas.

Changing these migration trends from the urban to the rural areas has to be more controlled by encouraging returns to the countryside, but also through adapting the development of the city to future migrations.

2.1.3. The 90's-... Downtown Core: Hay Riad District

The extension of the city of Rabat and the emergence of satellite cities the vaste agglomeration of Rabat-Sale-Temara. Several centralities other than the historical ones bloomed out of nowhere. Hay Ryad; the new "city"; was created on the southwest part of the city. (Table 1.)

From the beginning of the 2000s, there was a new transfer of headquarters and large corporations to Hay Ryad, thereby creating a new centrality in the heart of the new city. In addition to several ministries, such as the Supreme Court, the Bank of Morocco or the General Treasury of the Kingdom.[9] At this concentration of major public services, which now makes Hay Ryad a leading administrative center within the agglomeration, are added several large commercial areas and malls, draining varied clientele. Indeed, many commercial and service brands, often franchised, have accompanied this 'migration' of centrality. (Figure 3)

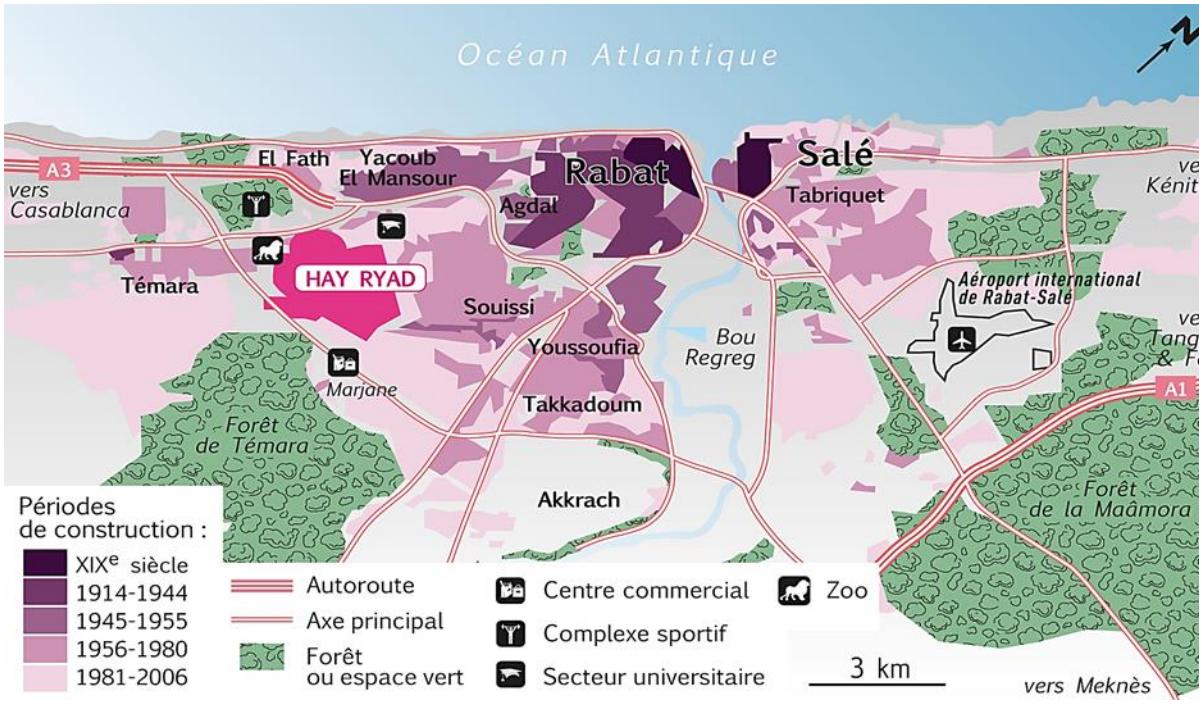

Fig 3. Evolution of urbanisation on the outskirts of Rabat agglomeration and location of the new center Hay Ryad, Sources: Rabat-Sale Urban Agency, 2005 & Ryad Development Company. Cartography: Fl. Troin • CITERES 2017

	1960	1971	1982	1994	2004	2012
Rabat's conurbation	303	523	876	1340	1623	1842
Satellite cities	0	0	16	55	97	107
Total	303	523	892	1395	1710	1949

Table 1. Population evolution of Rabat's conurbation and its satellite cities metropolitan area., Source: High Commission for Planning, Morocco - from 1960 to 2014

This spread over nearly 1,000 km2 has led to the bursting of the urbanized area. However, the bulk of the population remains concentrated in the three cities of Rabat, Sale and Temara, with just over 1,840,000 inhabitants in 2004, the date of the last census of the population.

The spatial distribution of the population of this conurbation has undergone a contrasting evolution, insofar as Rabat, which polarized 75% of the population in 1960 and still 70% in 1971, sheltered only 47% of it in 1994 and just 30% currently.

According to the Office of the High Commissioner for Planning, Rabat is home to nearly 15% of the Morocco's population. The urban population in Rabat increased from 4,023,217 in 2004 to 4,580,866 in 2014, with an average annual population growth rate of 1.31% over the last decade(1). The demographic growth and the rural exodus explained the increase in the urban population, which causes interregional disparities. [10]

Note of presentation of the first results of the General Census of the Population and Habitat 2014

The rural world, already in a deficit of population, continues to within the agglomeration of Rabat, depopulate in favor of the urban world, mainly to find better work opportunities. (Figure 4)

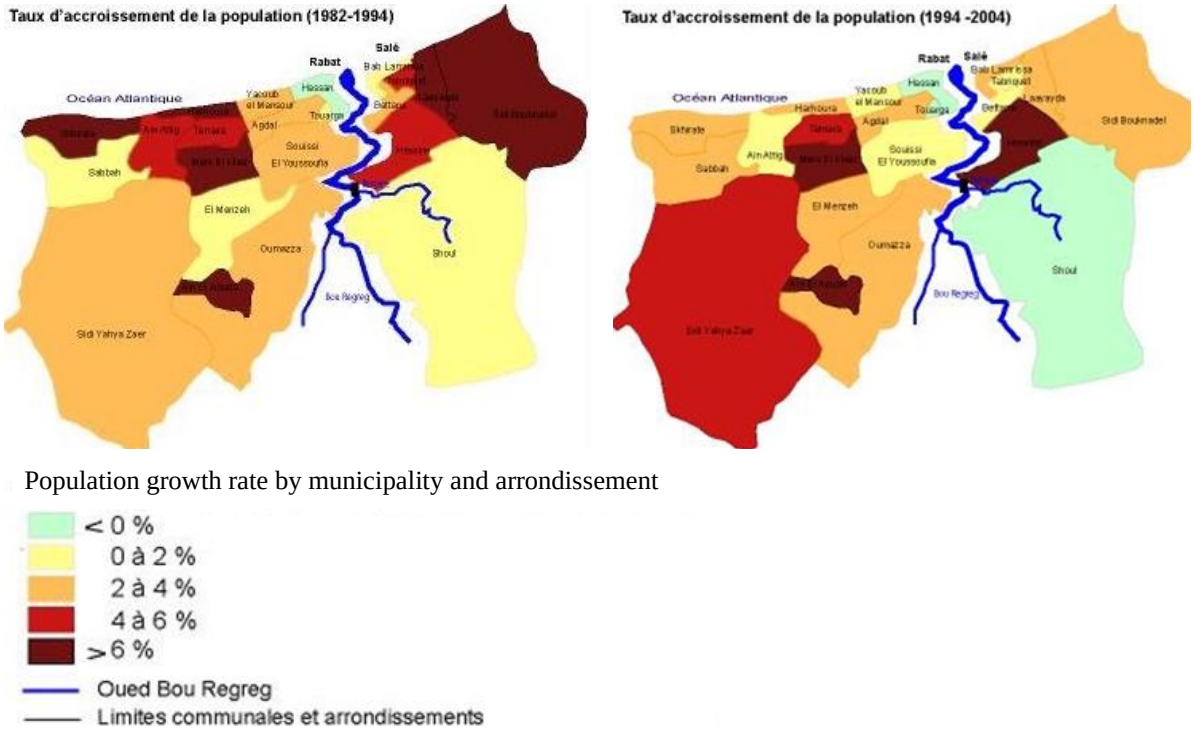

Fig. 4. Evolution of annual growth rate

2.2. External migration:

Nowadays, the spatial distribution of foreigners households has shrunk considerably. The analysis of the geographical location of households of foreigners reveals a concentration of households in the Rabat region which ranks second with 18.3% after the Grand Casablanca region. A region that seems to

attract more foreigners (especially European nationals) than the rest of the Kingdom. Their presence percentage is low. Consequently, it won't be studied in the present paper. [11]

However, the number of immigrants is growing exponentially, according to the 2004 General Population and Housing Census. It is estimated between 25,000 and 40,000 the number of sub-Saharan migrants in an illegal situation in Morocco. (The economic life, 2014: 4)

In addition to legal or illegal economic migration flows, recently, climate (natural disaster) refugees, had emerged dramatically.

Provided, Morocco has to face these new humanitarian challenges and provide political, economic and social responses to these new phenomena.

2.3. Migration itinerary

Migration scheme led us to study integration processes and to ask the question about the relationship between integration and access to housing as an indicator to address this presumed integration.

The collected field data allows us to draw a micro-sociological image of migratory routes and the process of access of sub-Saharan immigrants to housing in the city of We concluded that migration routes are multiple and complex; they differ according to the nationality and capacities of each migrant, according to the financial means available to him, in addition to the network of friends he has. In 2013, incidents of violence were a turning point in the process of locating immigrants on Moroccan territory. The authorities have dispersed them to avoid too much concentration in the regions Rabat, Casablanca, and Tangier. [12]

Who accept to rent to sub-Saharan immigrants, either through the intermediary of another immigrant who already has relations with Moroccans or some homeowners... Work is the most important thing: without work, one cannot access housing or to society in general.

3. Evolution of Rabat agglomeration urbanisation

3.1 Space framework: Moroccan cities as a migratory crossroads

Territorial reform in the form of advanced regionalization confers new powers on local authorities, and in particular regions. The latter, who now play a major role in local development, define their strategic orientations when developing their local planning documents.

This territorial reorganization represents a real opportunity to integrate migration in a cross-cutting way into local planning, thus optimizing the impact of migration on local development. Although local and regional authorities have already addressed this issue by implementing isolated initiatives, their political will on migration and development has so far been hampered by a lack of integrated vision and lack of tools. This promotion of life in common aims to institutionalize the "Migration and Development" dimension in regional territorial planning. The presence of migrants on a territory thus represents a real added value - through transfers of skills, remittances, investments, but also knowledge exchange and information flows - that the local authorities have every interest in. mobilize to foster development and anticipate the risks associated with these movements. Taking into account migration in the development of local authority development plans therefore contributes to fostering the local multidimensional development of territories and initiating a co-development dynamic.

In order to achieve this transition in an organic way, it will be necessary to develop more open and inclusive urban policies that protect and promote the rights of migrants for the benefit of the entire territory. The project is a practical laboratory that allows cities to share their experiences and share good practices promoting social cohesion. This voluntarist migration policy must imperatively create and maintain the political dialogue on the right to the city in order to exchange local experiences in the field of migration and the Political Council on the right to the city. [12]

The current discovery describes the agglomerations of sub-Saharan Africa as buffers or invisible spaces in which they are forced to move between peripheral areas, instead of creating spaces for meeting and exchange.

However, it is only recently that the presence of Sub-Saharan nationals is starting to become a new reality in many Moroccan cities. This presence is fueled by a dual form of immigration, initially irregular, which tends to regularize as and when, pushed by the opening of Morocco to sub-Saharan Africa and draining a growing influx of students, workers, etc. .

The growing presence of sub-Saharans in the public space is generally observed also in small street shops, in Mouqef (places where the workers who offer their services meet) or in the streets for those who seek charity. especially women with children who are more vulnerable and have difficulty accessing the labor market.

However, access to public spaces is not necessarily acquired. The filters are developed according to the status of the space in question, the availability of means of transport, police control and the stigmatization of sub-Saharan Africans. [13]

On social networks, Sub-Saharan migration is perceived as an "invasion", limited here to "forests and squatted spaces invaded by traders" and undermining the horma (integrity) of the country. The discomfort surrounding the issue of racism and daily discrimination against sub-Saharan migrants. This is mainly due to a lack of a comprehensive policies.

These debates also revealed fears and stereotypes about migration and the different categories of migrants, as well as the urgent need for clarify the multiple dimensions of these realities and broaden the issues that concern them for a more open and de-stigmatizing debate. Illegal immigration and the arrival of new refugees are increasingly felt as a threat to Morocco and consolidate the recurring amalgams. [14] Inter-Saharan nationals, who see it as a way of life as in the countryside, to flourish, to remain in solidarity. He expresses himself in closed and reserved spaces: places of worship, cafes, places of meeting and entertainment in the houses. So many meeting places and exchanges between sub-Saharan Africans who have fun and meet, in search of sociability between compatriots. We then witness the transition from a "closed" framework to a more or less "community" framework.

Religion as a factor of diversity really only appears in mosques, especially during Ramadan and holidays. Some forms of "religious mobility" represent an important dimension of trade and links with sub-Saharan Africa.

The religious and cultural relations that have brought Morocco closer to a large number of West African states for hundreds of years, mainly Senegal, are manifested by regular visits by pilgrims and "religious tourism" to Morocco in full growth. Beyond religious affiliation, the mastery of Darija becomes decisive, facilitating "integration". These social facts have direct or indirect repercussions on the spatial manifestations and articulations of spaces. [15] Migration policy must take into account these new phenomena of society, these forms of sociability and urban co-production in Morocco, with a view to integrating migration into local and regional planning by analyzing the routes, the traffic, the installation and the concentrations of African migrants in Morocco. While initiating dynamics of decentralized cooperation between the territories.

External immigration regulations of work and housing are challenging and generally, the areas deserted by the population are those where climatic and environmental problems have not been effectively tackled or areas that have not benefited from their share of the infrastructure.

This aspect of mobility also affects external migratory flows, which generally follow the same axes of displacement and settlement as national populations.

For instance, which urban development model can assimilate internal and external migratory flows?

SOLUTION

4. Applicability and transferability of future migratory policies

The rural world will have to be given special attention to the services which must be ensured daily. If several structures, high schools, hospitals hobbies... It cannot be made available to all rural settlements, the number of populations and the dispersion of dwellings isn't allowing it; this lack of proximity can be compensated.

Through liaison, communication, and transport that would allow these populations to join these structures. A compensation system can help these populations to maintain themselves in their places of origin. Such initiatives will complement the effort conducted in recent years in the field of electrification and drinking water supply.

Developing territorial intelligence both in terms of means to make available territories, then in the training of executives in the field of this intelligence. The regions which suffers from isolation could thus innovate in the creation of wealth and the optimum exploitation of potentialities.

5. Internal and Migration: which models of development?

Over the last thirty years, international migration has intensified and become more complex on a global scale. It coincides with the increasing mobility of goods, services, capital and information, not only at the regional level but also at the intercontinental level. Faced with the rise of global inequalities, the phenomenon of migration has become inseparable from issues related to the development of the countries of the South. [16]

CONCLUSION

Migration is potentially an engine of growth and development for all parties concerned - host countries, countries of origin and migrants themselves. In the country of destination, Morocco, in this case, migrants have enabled the economic viability of traditional sectors such as agriculture and services, the promotion of entrepreneurship, an exchange in terms of skills emanating from industries.

As regards the countries of origin of migrants, their positive contribution is facilitated by capital transfers, major transfers of technology and skills, as well as increased exports and international trade.

In this perspective, migrants support development and partnerships through their monetary, human and social contribution, the international financial and trade flows they generate, their engagement in social networks and their contribution to exchanges between different cultures.

However, it should be kept in mind that these migration policies for development are not new and have oscillated between the optimism of the theory of modernization in the 1950s and 1960s and the skepticism inspired by the theory of dependence in the 70s and even 80s. [17]

In the UN Secretary-General's report on international migration and development in the context of high-level dialogue, we read: "We are just beginning to learn to make migration a more coherent instrument of development. we have the puzzle, and so far, no one has an overview, it's time to finish this build. [18]

The contribution of migration to development depends on many factors - including the nature of migration, how it is changing, and how countries are succeeding in taking advantage of it and mitigating its negative effects. This means that the contribution of migration to development can be positive for developing countries; in other words, migration alone cannot create this momentum for development. The excessive immigration of workers and the loss of skills it represents, as well as the inability of the unemployed to emigrate, are all negative factors for the development of the country of origin concerned. But, in addition, the diaspora and so-called "circular" migrations through "transnational communities". and in the sense of returning to the country. So many solutions for a fair approach to migrant workers in a global economy.

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CASPIAN BASIN URBANIZATION AND ENVIRONMENTAL CHANGE: REGIONAL TERRITORIAL PEER NETWORK FOR GREATER RESILIENCE BUILDING

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ABSTRACT

The current trend of rapid population growth and urban development are being localized across the world with distinctive patterns. There is a general understanding that this latest process of urbanization without a global coherence or unity in form and boundaries as well as limited consideration for the natural environment is part of a new urban trend and sometimes event equated to a new phase of metropolization. These processes of urbanization bypass existing geographic and administrative scales as well as national boundaries, as in the case of some European trans-national metropolitan areas such as the Lake Geneva region, where urbanization takes place across national borders between Switzerland and France. Accordingly, many neologisms describe the phenomenon and its multiple ramifications as well as the consequences, but with little focus on the multiple yet similar impacts on the livelihood, well-being and security of millions of urban dwellers across bioregions. As in previous stages of metropolization, this new phase is not only an evolutionary phenomenon of large cities, it is also a process that connects a daily operating area up to a larger bioregion and territorial setting where the new dynamics of change impact the built and natural environments in different ways. As a result, the boundaries within urban areas on one side and between urban and rural areas on the other are increasingly becoming blurred and not representative of the multiple impacts of local and Global Change and adapted response mechanisms. More than in the past, regional territorial planning and urban planning are expected to integrate dynamics of change and related natural hazards at a scale more relevant to the ecosystems supporting the urban areas. This article aims to provoke a discussion on the regional patterns of urbanization in the Caspian Sea basin for integration of local adaptation strategies in the overall integrated approach of natural and built environments at the regional scale. In the case of the Caspian Sea- the regional and trans-national approach to urbanization aims to identify within a naturally defined space, the Caspian Sea basin, regional proximities and distinctions between urbanized areas on one side and the urbanized areas and their natural basin on the other, suggesting regionally informed strategies of territorialization and urban development. This is only possible if policy is informed by practice and if all development strategies, best and worst at the regional scale are brought to the attention of policy formulators and planners through a Peer Network of Cities and Urbanized Areas. Such platform can provide a potent tool and support for local urban policies and design in coherence with distinct yet connected other regional territorial policies and strategies.

Key words: Metropolization process, Caspian Sea Basin (CSB), Climate and Environmental Change, Regional Disaster Risk Reduction, Urban Resilience Peer Network.

1. CASPIAN SEA BASIN (CSB): FRAGMENTED AND HETEROGENEOUS TERRITORIAL DEVELOPMENT

The CSB has been through tidal political and economic shifts since the 19th century. The recent history of CSB's development has been marked by a period of unequal development in connection with oil exploration and WWII related military territorial projects and development of transport and energy infrastructures. The second part of 20th century was about the consolidation of centralized territorial planning independently from the political and economic regimes. On both sides of regional

political borders, the centralized planning system of the USSR and the capitalist Iran's centralized planning and policy making resulted in the reinforcement of centralized monitoring of various urbanization and environmental variables with little or no connection between involved Caspian littoral countries national institutions. The consequences of the Iranian revolution in1980s and the end of communism in1990s' heralded a new era of decentralized planning and policy evaluation processes. The breakup of soviet centralized planning and Iran's unsteady relation with its Caspian neighbors rather than bringing the Caspian neighbors closer through their urbanization processes, reinforced further segregated policy formulation, implementation and monitoring of urban and environmental planning across national boundaries. With the increasing general consciousness regarding Global Change, the integration of the Caspian littoral countries in the global economy and coordinated observation of cyclical environmental dynamics, in the CSB the situation has evolved. Several research institutions across the CSB have carried out observations, measurements and monitoring of local impacts of global change added to CSB intrinsic environmental cycles and variations. Nevertheless, their efforts are hampered due to the irregularity of the analysis and changing scales and scopes of measurements from one country to another providing a partial often dated picture of the situation in the CSB.

Towards establishing a more accurate picture of the situation and the complexity of the challenges, there is a need to capture the multiple sets of changes and interactions of sub-regional dynamics at the regional level. The blurring of rural-urban divide posits the integration of different elements of territorial development such as urban public spaces, infrastructure (e.g. transport) and ecosystems in proximity of cities, all strongly impacted by the urban palimpsest[1] . Indeed, the territorial development and urbanization of the CSB within the context of global dynamics of change were characterized by segmented and silo-based set of built and natural environment analysis in separation such as those related to specific ecosystem [5]. Further, the highly specialized set of studies such as the assessment of average wind speed [1], the assessment of changes of air temperature [14] as well the study on water resources [40] failed to address the intersection between demographic shifts, urbanization, environmental degradation and climate change in coherence with the Caspian Sea bio-region's becoming.

The need for latter research cannot be more current in times of uneven patterns of territorial development in the CSB. There are clear proximities in respect to rapid urbanization (mostly characterized by urban sprawl) with very limited consideration of the natural environment in Azerbaijan and Iran, the two main urbanized areas in CSB. Indeed, despite different administrative and planning systems, territorial development within Azerbaijan and Iran has been concentrated around urban areas and the connectivity between them. The roots of latter dynamic should be traced in demographic shifts, attractiveness and availability of resources mostly in urbanized spaces in Azerbaijan and Iran irrespective of environmental externalities and challenges mostly as a result of top down (national government), silo based and reactive decision-making processes.

The present study aims to expose how the lack of a bioregional approach to territorial planning in CSB has negatively impacted the identification of vulnerabilities and risks intrinsic to the CSB added to the impacts of current dynamics of Climate Change. To this end, the paper analyses urban evolution over the last 20 years in both countries' Caspian littoral areas. Moreover, the article's objective is to propose a new model of decision making in territorial development connected to the natural environment at the scale of the ecosystem basin where risk and hazards are produced and can be processed towards maximizing adaptation strategies and develop greater resilience.

Across national boundaries, local practices of urban development have been heavily impacted by speculation and strategies of beautification and iconic urbanism rather than driven by human and nature sensitive approach to planning. Consequently, territorial impact of economic development has been translated in betonization of the coastal areas as a symbol of progress and the current territorial development, have created distortions within this reterritorialization phase adding to the overall vulnerabilities of urban areas in the CSB region. To improve this situation caused by urbanization and

[1] In this context, urban palimpsest refers to the construction of space not only as an incremental accumulation of traces, but also as a series of processes: through the dimension of time, what has been added, what has been transformed, and what has been erased [11]. This model of analyze permit to redefine the territorial structure and evolution.

industrialization, there is a need to understand the complexity of urbanization processes, which have been reinforced by urbanization territorial planning choices of the CSB countries.

2. METROPOLIZATION PROCESS AND TERRITORIAL DEVELOPMENT IN THE CSB

A general analysis of urban development processes shows that the current patterns of territorial development, especially those in the coastal areas, have set the ground for greater vulnerability and exposure to disaster for the population and the infrastructure. Real Estate speculation, beautification and image building [21] as well as a little consideration of sustainable approach in urban projects [2] have been driving territorial projects ignoring the increasing sets of risks associated to natural environment. The outcome is greater vulnerability of urban areas and the population to the environmental risks as a result of Climate Change as well as Caspian Sea's own natural cycles such as the periodic elevation of the Sea level.

Historically the littoral cities of the CSB were built and expanded in recognition of ecosystemic particularities and geographical conditions [17]. Latter pattern contradicts with new successive trends of urbanization on the coastal areas of the Caspian Sea. Indeed, 20th and 21st century urbanization in the region have not been the exception to urbanization across the planet based on low density, decentralization and dispersion or what many experts such as Kaufman identified as the peri-urbanization trend [20]. Like in other world regions territorial development in the Caspian is a story of attractiveness of urban centers; it's about, availability of resources, concentration of services as well as educational and cultural opportunities. Here, mobility needs have transformed the territory more significantly and the daily practices resulted by mobility system have created major metropolitan areas across national boundaries. For instance, the processes of urbanization bypass existing geographic and administrative scales as well as national boundaries, as in the case of some European extended trans-national metropolitan areas such as the Lake Geneva region, where urbanization takes place across national borders between Switzerland and France.

In CSB region, like in many other locations, metropolization is not a simple phenomenon of urban growth, for it has become a process bringing cities and suburbs increasingly into the daily functionality area of agglomerations, which is generating new urban morphologies [6]. Further, what connects these metropolization experiences is their vicinity and immediate connection to the very sensitive ecosystem, the Caspian Sea. What makes Caspian Sea and the urbanization trend along its coasts is a special case for inquiry and analysis is the fact that the Caspian is a closed sea, in other words a lake. As such, issues related to coastal urbanization and territorial development are magnified in the CSB. Environmental hazards as much as vulnerabilities are accordingly more acute with greater consequences than elsewhere[2]. For example, today CSB level is expected to decline in the current long-term period, however, it was absolutely unexpected for scientific community that the CSB level continued to decrease from 1940s to late 1970s and rapid 2.5 increase over two decades after 1977 [10].

Added to the impacts of Climate Change the environmental risks and hazards can no more be dismissed within the territorial development futures of the CSB. The alternative would be exposing the population and the infrastructure to unforeseen and unequaled vulnerability and insecurity. When considering the above-mentioned environmental challenges and the demographic growth as well as those of capital, tangible and intangible goods [9], coherence in the political decision-making process as well as resilience should become the fundamental pillars of decision making. The authorities of the metropolitan area should have a regional vision across national boundaries, instead of focusing just on its administrative perimeter. When looking at regional resilience, urban investigations and analyses should consider the influence of time in urban evolution as part of the region's evolution, being subject to three categories of transformation: permanence, persistence and disappearance [24].

[2] Water elevation the Caspian Sea Basin means variation within 4 meters: rise up to 2.5 meters or drop off 1.5 meters [13].

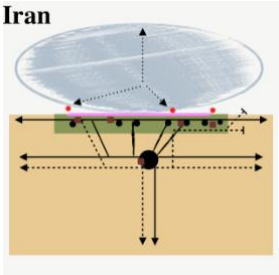
3. DIVERGENT PATHS OF URBAN DEVELOPMENT IN THE CSB

The CSB, as natural feature, has a huge potential to become a new attractive region in the middle of Asia and Europe. Up until today, this region was fragmented by the different countries that surround it. It has never been considered as one region and hence, there have been different development policies. Moreover, geopolitical disagreements about boundaries and the ownership of the CSB have inhibited planning being considered on a regional scale.

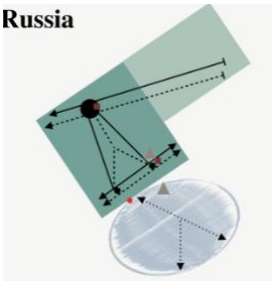
Instead, each CSB country has pursued national territory planning in relation to the sea. This means that the CSB has never been at the center of planning, being always considered just as a minor part of planning processes. For this reason, the CSB always treated by desires and wishes come from country strategy development. Hence, in order to understand the reality of the CSB territory, first, the significance of the sea for each bordering country needs to be established3. Figure 1 provides an overview on infrastructure of the CSB within the framework of urban and environmental situation of each CSB country.

As the figure 1 shows, the CSB does not have the same importance in the national development strategies of the littoral countries. There is general understanding that the several aspects such as the distance of political centers, the geographic size of the country, the country's population density among the other parameters may impact the decision-making system in respect to territorial development. Moreover, in the case of CSB, Azerbaijan and Iran distinguish themselves from other countries as they have larger population and urbanized areas, which implicates high density and concentration of infrastructure systems. Hence, urbanized areas are more vulnerable to natural and industrial hazards.

Iran generally has an arid climate, but the area between the Alborz mountains is humid areas, thus green and fertile. Hence, the CSB region is an important place in the agricultural and nutrition policies of the country. In fact, the Iranian coast of the CSB constitutes an exclusive landscape and climate in Middle Asia and the Middle East, which attracts tourism. Given the short distance to the capital Tehran and the good accessibility, mostly by car, but also by train and air, many Iranians view CSB as a vacation area. This accessibility and attractiveness have led to the creation of several urban development poles close to the CSB, which are connected by highways. The temperature in this area varies between 5 and 30 °C.

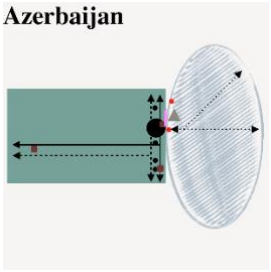


The distance of more than 1400 km between the capital Moscow and the CSB has impacted his attraction in national strategy development. However, its oil and gas resources have played a central role in the development of the Russian side of the CSB. The Volga delta environment cut the accessibility to the CSB. For that reason, the development pole is further located from the CSB. In addition, the linear accessibility behind the CSB is not privileged. The CSB is mostly presents the geopolitical value for the country.



[3] In 2018, after several discussions, a new approach to the governance of the CSB was approved. This depart can help to discuss about the planning can make integration in term of urbanization by using the master plan for CSB regional.

Baku is the political and economic capital of Azerbaijan, located on the CSB coast. This location makes it an important development pole, which is connected by road and rail. The industrial zone based on oil behind the Baku privileges the CSB. The CSB provides good conditions for the agriculture of Azerbaijan, which is located in the south.



The lack of accessibility of the CSB with the other side of the country, specifically the capital, has led to the creation of isolated and developed areas in the region. The country's political center does not have a strong connection to the CSB, behind having the cities such as Aktau and Atyrau. The oil and gas resources have resulted in an industrial landscape in the natural environment of the CSB.

The CSB region's natural landscape has been preserved, the reason being mainly because of its distance from urban areas, in particular, the capital, Ashgabat (580 km). Moreover, much of it is desert with harsh climate conditions. The oil industry and the transportation of goods are two important reasons for privileging this area for Turkmenistan. In addition, the sea attraction as the source of tourism activities has resulted in complex resort hotel development along the CSB coast.

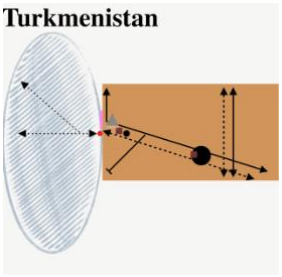


Fig. 1. Littoral Areas Attractivity in Caspian Countries, Produced by : Authors, 2019

In general, more than 17 million people are living on the coastline of CSB. Transport networks are the most important assets of CSB due to role in economic growth, wellbeing of the population and generally speaking development capacity of the region. Thus, influence on accessibility to cities, markets and goods as well as on land use. In this context, figure 2 indicates the current context of the CSB transportation network in 2019. It specifies the distinct patterns of network development across the CSB and on the coastal region.

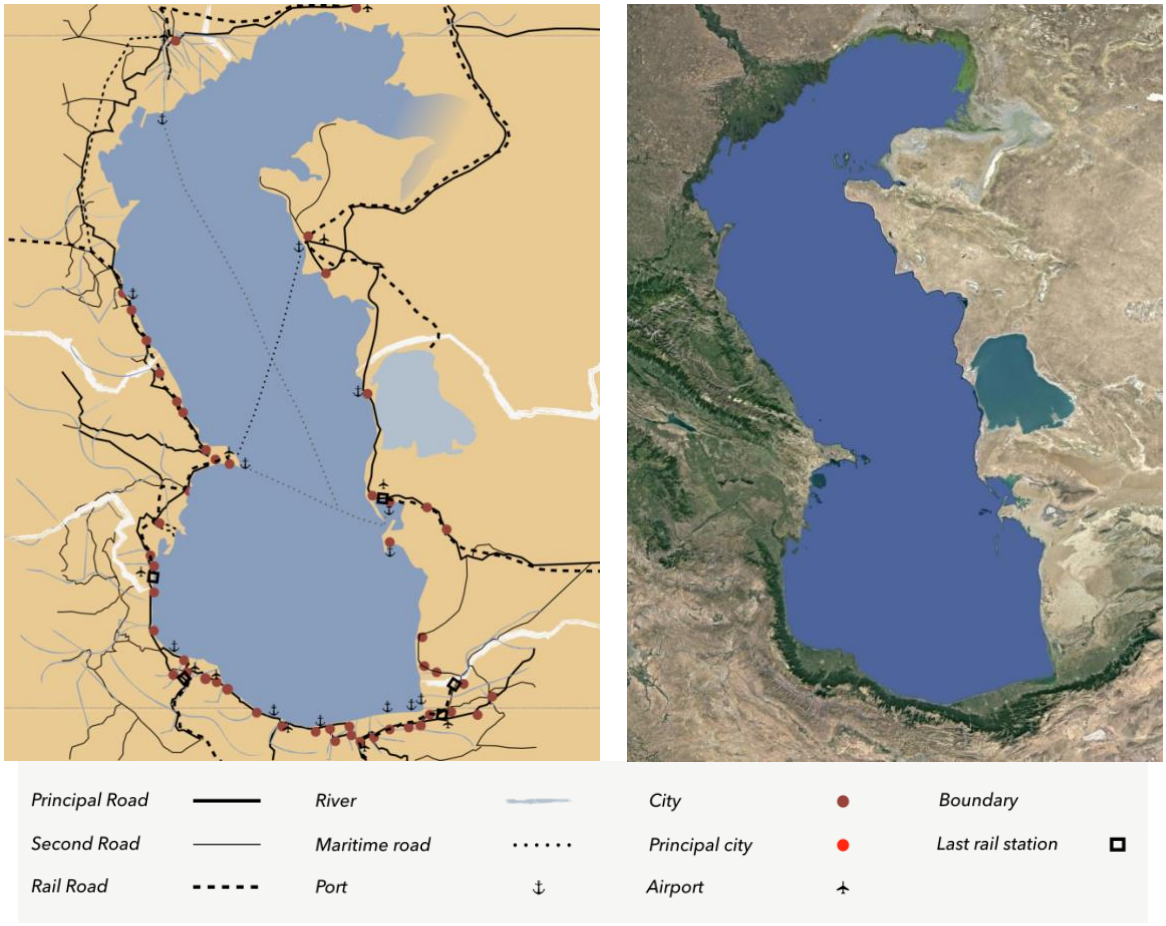


Fig. 2. Infrastructural context at the CSB, Source: Google, 2019 / Produced by: Authors

Here, a regionally polarized and differentiated network development is correlated with the urbanized areas distribution around the basin, being mostly concentrated in the west and south, with greater potential for expansion and urban growth. The road network around the CSB is the privileged infrastructure that connects facilities between different littoral countries. The rail connection at the regional scale is not complete. This system exists only between Azerbaijan, Russia and Kazakhstan and former Soviet republics. The rail connection is mostly used for the exchange of goods and passengers. Recognizing the importance of rail connection in the CSB led Iran to invest in connecting its rail transport system to Azerbaijan's city of Astara and with Turkmenistan at the Incheboron border.

At the same time, despite the existence of several airports in the region, the only existing air connections is between Astrakhan-Baku and Aktau-Baku. Iran has potential to develop air connection with four airports in the CSB that has yet to be developed.

Maritime connections are based on the exchange of goods. The maritime route between Turkmenistan and Azerbaijan is the principal one across the CSB with the use of a ferry service. In terms of the number of ports on the CSB, Iran has the highest number. Owing to it being under the sanctions of the United States, amongst other countries, Iran is investing in routes to Russia and Azerbaijan in order to capitalize on the CSB maritime corridor.

Taking into account the infrastructural system in the CSB, the three types of territorial development can be defined:

– **Type 1**: The relation between the cities and transport corridor is based on the linear accumulation of transport infrastructure. The main regional city forms the interface between the national and local systems. In this type of development, the second important city depends administratively on main city of the province, but in terms of functionality highly connected to the other principal cities of the urbanized corridor and its bioregion. This type of development encourages sprawl while reducing the relevance of the administrative scale. Type 1 of development can generally be seen in Iran's coastal area. Here, there 3 capitals of Caspian provinces are only connected by road network. The secondary provincial cities have been developed in line

with the main city. As figure 2 shows, rail and air transport systems exist, which guarantees good connections of this region with the capital of the country. In the absence of good air and maritime connection for the main cities between the Iranian side of Caspian and other CSB cities, the individual transport mode is the primary mode of communication and connection between cities. Hence, the centrality of the road network for the region's economy and livelihood of its population.

- **Type 2**: The main city functions separately but depends on the capital of the country. In this type, the main city is surrounded by small satellite cities and villages. This type of territorial development is related to Kazakhstan, Turkmenistan and Russia. The cities along the CSB do not have good connectivity and accessibility with each other. The long distance between urbanized areas has played an important role in the production of this type of territorialisation.
- **Type 3**: This is based on linear development along the CSB, yet the primarily is the main engine of activities and center of gravity of all networks. The focus here is on Azerbaijan with its urbanized areas driven by the weight of its capital city Baku. Alongside the CSB, the city has good accessibility by car and also by train. This high degree of accessibility by train is an opportunity to control urban sprawl, nevertheless because of its strategic importance for the region and the country, its vulnerability to environmental and industrial risks can jeopardize the regional and the national economy and well-being of the population. Indeed, in Azerbaijan rail and road systems are the main means of transport, maritime transport between cities being virtually nonexistent.

Based on this typology and the fact that national economies of littoral states witness the decline of agricultural sector in favor of industrial and service sectors within and vicinity of urbanized areas, these areas have become the Achilles' tendon of regional economy and livelihood of the population. Here, with witness and high level of proximity between Type 1 and Type 3 of territorial development. Cities and their population in both contexts are highly dependent on infrastructures, concentrated in primary cities and on their railroad network. Therefore, Type 1 and Type 3 of territorialisation share the same vulnerabilities, also considering their connection with the bioregion. The shared vulnerabilities between these two types of territorial development are also driven by the population distribution, within CSB as analyzed below.

4. REGULAR DISTRIBUTION OF THE POPULATION ACROSS THE CSB

Besides a regional dichotomy driven by models of territorial development, driven by infrastructure deployment, the CSB also presents strong disparities in relation to regional population distribution. The CSB region has been experiencing robust population growth, a trend that is expected to continue. The total CSB littoral region's population was more than 17 million by 2016 (National Statistical Data of the CSB countries, 2019). The western and southern coastlines of are significantly more populated compared to the northern and eastern ones. In the most populated areas - Iranian and Azerbaijani coastlines - the dominant type of settlement is densified areal; in contrast, dispersed and focal types of settlement are characteristic in the least populated areas - Turkmenistan and Kazakhstan sides (Ismayilov, 2002). Scientists have argued that the strong population distribution disparity between on one side - north and east of CSB and on the other side west and south is mainly driven by hostile climate conditions throughout the year in north and eastern part of CSB in respect to this coastal areas remoteness.

Moreover, as figure 2 shows, the northern and eastern areas, despite the importance and potential of oil fields and ecotourism, do not have good connectivity with the national capitals as well as other CSB urbanized areas. Figure 3 indicates the CSB's regional population growth between 1996 and 2016, which is important to study demographic growth in accordance with the urban development.

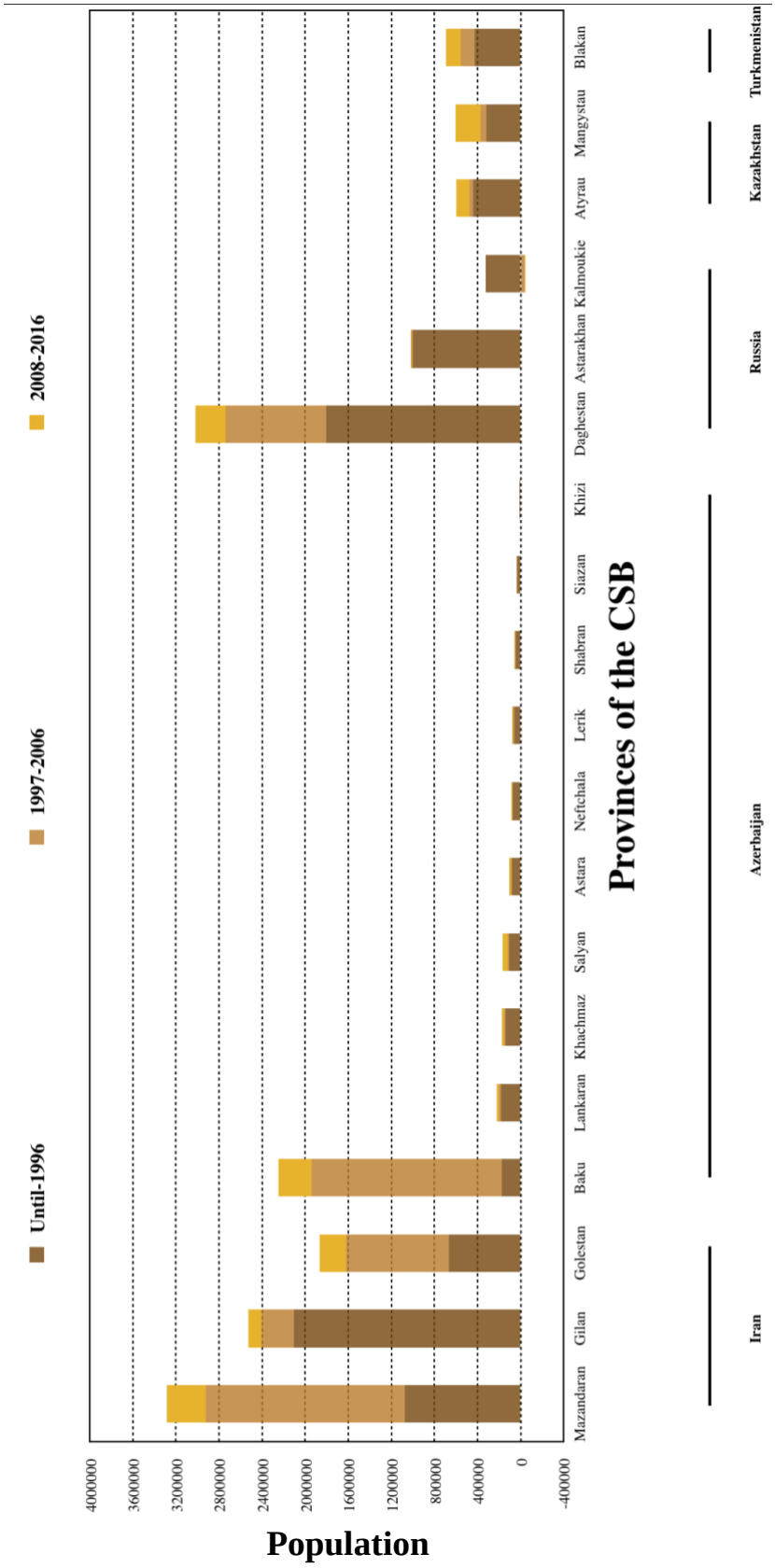


Fig. 3. Population of Administrative Provinces along the CSB region, Source: Compilation of the Data from the National Statistical Agencies of the CSB Countries, Produced by: Authors

Fig. 4. Map of Distribution of Population along the CSB, Source: UNEP, GRID, 2003/2004

In Iran, Gilan, Mazandaran and Golestan provinces are the three coastal regions and highly populated. In 2016, according to the National Statistic Service of Iran, more than 7.6 million people lived in these three coastal provinces, which is approximately 10% of the total population.

The Iranian side has diverse natural resources on which its economy is fully dependent. This dependence includes agricultural products, seafood and fisheries. Economic activity in the area is dependent of ports, logistic areas, primary resource extraction and another manufactured goods production. The economic and natural potential have resulted in the Iranian part of the CSB region to be magnet for the population making the Iranian side of the Caspian the most populated with over 7.5 million in 2016 [35].

The Mazandaran province has experienced very high rates of population growth, which is overtaking that in the Gilan province. Mazandaran has better connectivity and accessibility than Iran's other CSB provinces to the capital and it has profited from opportunities for economic development, thus4 becoming a host province for internal migration. The population is highly concentrated in the east of the province near to transport infrastructures. In fact, the population here represents more than 55% of the total population of the province, in a strip from Sari to Amol of less than 70 km. Moreover, the cities in the east of Mazandaran have absorbed more than 51% of the migration to the province (from 1996-2006) and have strong growth potential. The satellite image in figure 4 illustrates the vast urban sprawl in Mazandaran province. Population analysis in the Gilan province indicates migration from these areas to other ones of Iran, mostly to Tehran and Mazandaran. The Golestan province, until 1997, was considered a part of Mazandaran, but since has become a new province in the Iranian administration system. This change has influenced the economy of the province.

In addition, the natural attractiveness of the Iranian CSB coastline results in doubling of its initial population during summer due to national and international tourism [15]. This influx of people can be observed in the satellite images indicating the urban sprawl along the CSB beaches. The coastal urbanization can creates continuity of urban areas, where it is difficult to recognize city boundaries. The urban evolution has divided these coastal areas into three categories: the capital of the province as the place of administration, the settlement along the CSB as a place of tourism activities and the other cities and villages where there is agriculture production.

As indicated in figure 5, beyond the demographic growth from 1984 to 2016 unequal distribution within the three Iranian Caspian provinces is also accompanied by a shift of urbanization location. Indeed, urbanization in Gilan, Mazandaran, Golestan provinces indicate that from the original location of primary cities in 1984 away from the coast, they have developed towards the Caspian Sea.

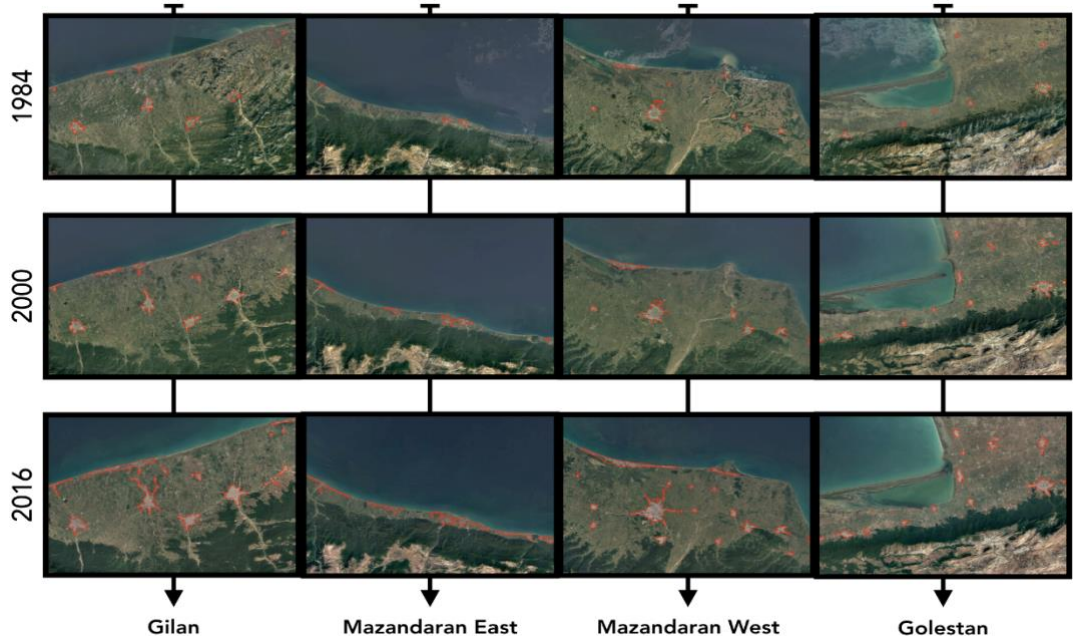


Fig. 5. Urbanization shift (in red) on the Iranian Side of the CSB - 1984-2016, Source: Google, 2019 / Produced by: Authors

[4] It has an area of about 24,000 km^2, including 17 cities, 52 towns and 115 villages.

Russia represents the second highest population along the CSB coastline, with more than 4 million people. Whilst the main city Astrakhan is the heart of the oil activities and development, its demographic growth has not followed the same trend. In this context, the Kalmykia province is the only one that is losing population. This loss could be explained by the impact of climate change and irregularity of precipitation to the detriment of agricultural activities; this has resulted of worsening of living conditions in the region.

In the case of Russia, the situation seems more complex than in Iran. As illustrated in figure 6, Astrakhan has been expanding across the river Volga, the cities of Makhachkala and Derbent experienced development and expansion along the coast. In both cases, the Russia's CSB urbanization illustrates a greater proximity of urbanized areas with the sensitive ecosystems (Volga River, Caspian Sea). This indicates greater negative externalities of urbanization on natural environment as well as greater vulnerability of cities to natural hazards.

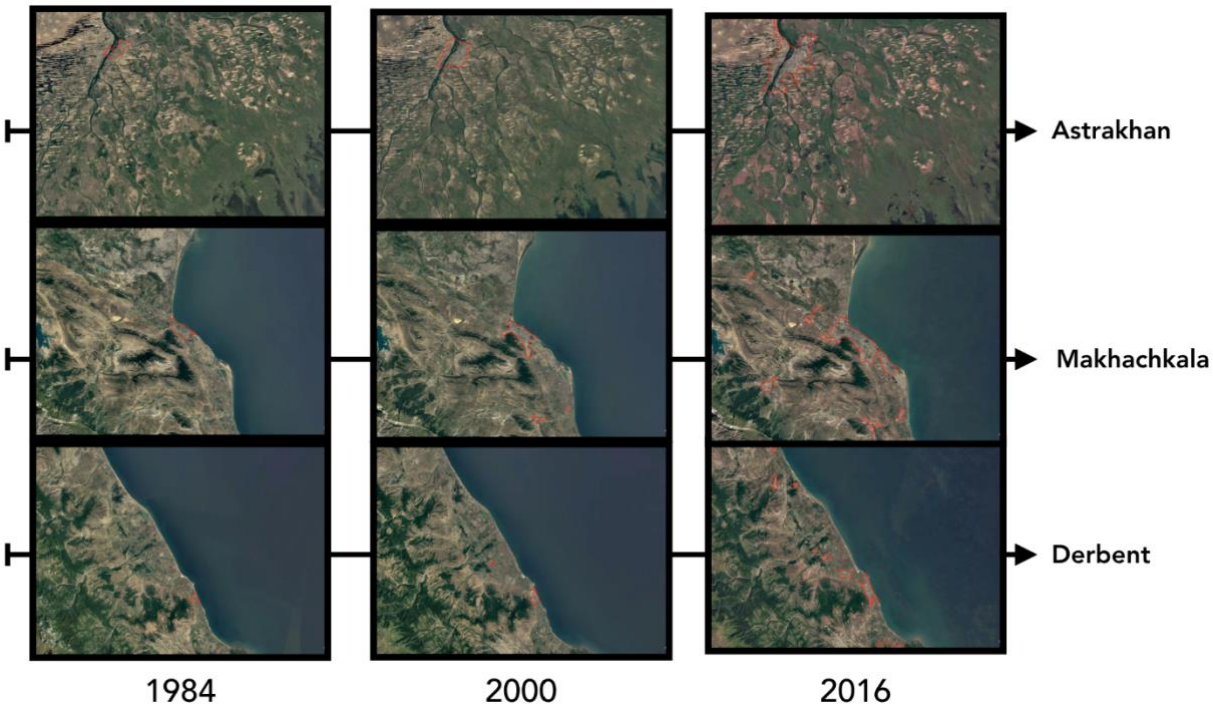


Fig. 6. Urbanization shift (in red) on the Russian Side of the CSB region - 1984-2016, Source: Google, 2019 / Produced by Authors

In Azerbaijan, 33% of the population lives in the coastal provinces of the CSB, which amounts more than 3 million inhabitants, according to the National Statistical Committee of Azerbaijan Republic (2016). Moreover, 26% of the country's populations live in 3.2 % of the territory of the Greater Baku Region, which includes the cities of Baku, Sumgait, Xirdalan and the urban settlement of the new port in Alat (Baku Design Institute, 2014). The Greater Baku Region is a center for the oil industry, which is the main source of the national economy and is a place of intensive migration. In fact, this region provides 98.3 % of the total income of the state budget, according to the Greater Baku Regional Development Plan (2011). In sum, the Baku area, as the political and economic capital, is the largest urbanized area, with the fastest growing population in the CSB, concentrating transportation, energy and urban infrastructures while having experienced growth of more than 1.5 million people between 1996 and 2006.

Further, as shown in figure 7, urbanization in Azerbaijan is also an illustration of irregular redistribution of the population as greater Baku has grown from 1984 to 2018 to cover most of the Absheron peninsula. In the meantime, the secondary cities Khachmaz, Shirvan and Lankaran have also witnessed a steady increase of the urbanized areas. In both cases of Baku and these secondary cities, urban growth has taken place in proximity of sensitive ecosystems. Indeed, while Shirvan has been developing along the Kura River, Baku, Khachmaz and Lankaran's are expanding along the Caspian coast.

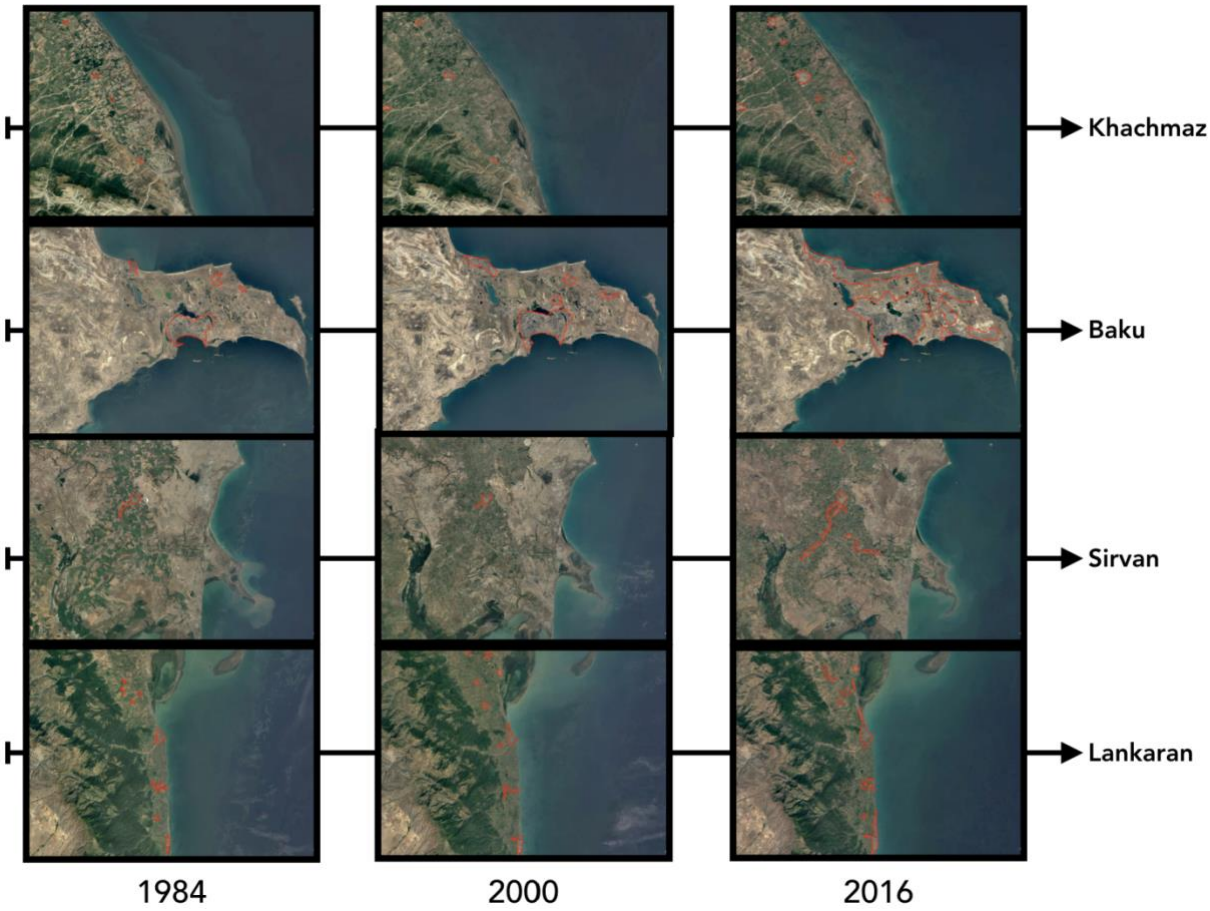


Fig. 7. Urbanization shift (in red) on the Azerbaijan Side of the CSB - 1984-20166 Source: Google, 2019 / Produced by: Author

Kazakhstan's two CSB coastal provinces, Atyrau and Mangystau, have the lowest population density around the Caspian. The provincial capitals of Aktau and Atyrau accommodate more than half of the total population of each province and both these cities have experienced growth in their population from 2006-2016. This demographic trend can be explained by the development of the oil industry and concentration of infrastructures and their economic attractiveness for the population, which has motivated successive migration waves to these Caspian provinces. Both provincial cities have experienced vast urban sprawl. As indicated in figure 8, urban development of both cities of Atyrau and Aktau has taken place with in proximity of ecosystems impacted by Climate change (Ural River, Caspian Sea).

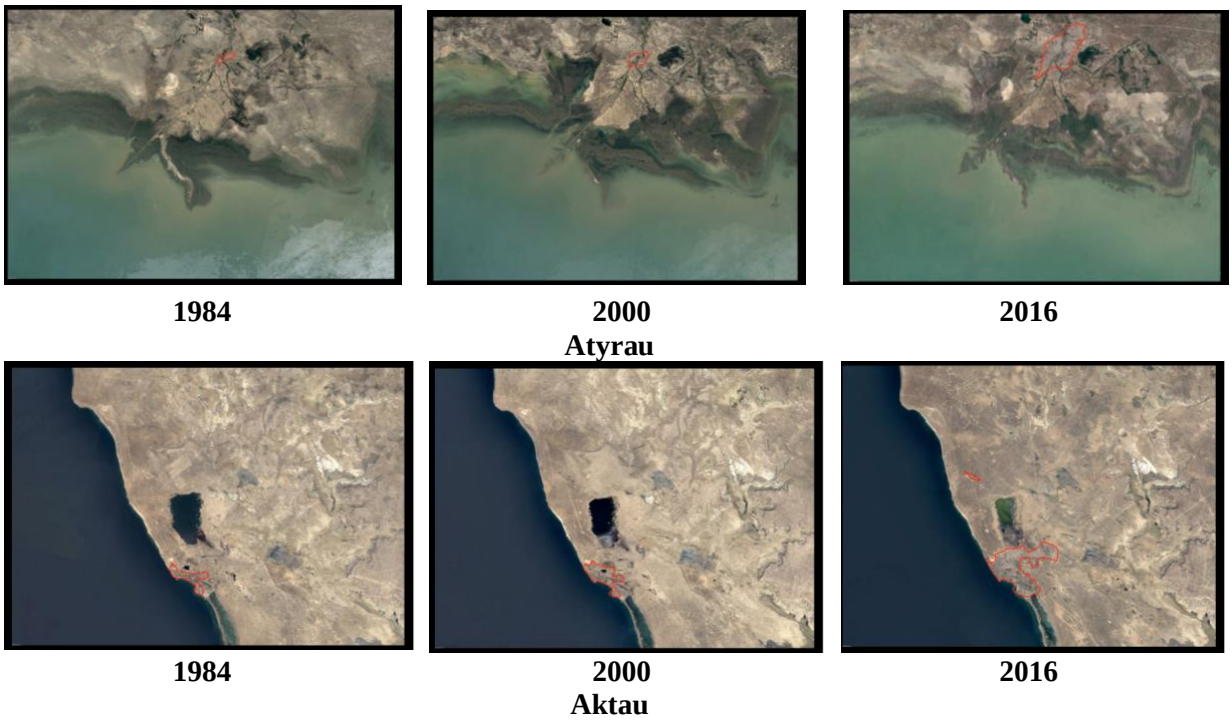


Fig. 8. Urbanization shift (in red) on the Kazakhstan Side of the CSB - 1984-2016, Source: Google, 2019 / Produced by Authors

The context of Turkmenistan's CSB coastal area is illustrated by smaller population pool (1 million people), despite its very sizeable surface area of 138.500 km2. The majority of the population is located in Turkmenbashi, the city concentrating oil industry while being a hub for maritime transportation. In 2002, the Avaza area in Turkmenbashi was chosen as a touristic area given its very attractive coast. As illustrated in figure 9, urbanization in the area between 1984 and 2016 indicates a dual development towards the Caspian Sea and the gulf of Turkmenbashi.

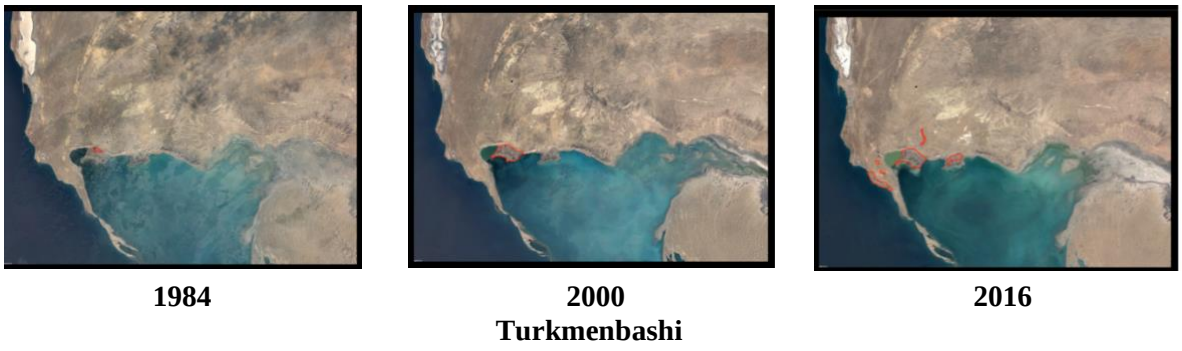


Fig. 9. Urbanization shift (in red) on the Turkmenistan Side of the CSB - 1984-2016, Source: Google, 2019 / Produced by: Authors

In conclusion, CSB demographic growth and distribution is disproportional around the region, nevertheless it indicates the same urbanization trend across all littoral countries. Here, urban growth has taken place in vicinity of fragile ecosystems (Caspian Sea watershed) impacted by climate change. The obvious environmental pressure on these ecosystems stems from lack of coordination between urbanization and environmental context.

In sum, the nexus between economic development and urbanization need also to integrate fragile ecosystems' becoming and their interaction with the new territorial development in the region.

5. LAND USE AND ENVIRONMENTAL NEXUS IN THE CSB

The CSB is the world's first large water body to be impacted by large-scale hydrocarbon exploitation. Since exploitation of oil in the coastal zone in late 19th century, million tons of crude oil has been dumped as the result of production and transportation operation with dramatic environmental impact on the marine ecosystem. Moreover, the rapid urbanization of the CSB has added equally important pressure on the natural environment of the region. In addition to the level fluctuations of the sea, the sea pollution and the degradation of ecosystems are at the heart of the challenges that CSB coastal areas are facing today.

The increasing concentrations of pollutants are observed near major river mouths (Volga, Sulak, Terek and Samur as well as Sefid-rud, Aras and Kura) [12]. With the increase in the economic potential of the Caspian countries due to hydrocarbon extraction, construction of new ports, upgrading of existing ones, revival of the merchant and tanker fleets, enhancement of the navy component, and construction of oil and gas pipelines, this environmental stress will continue to grow. The risk of negative externalities of oil and gas field development has been impacting the coastal regions of the CSB and its biodiversity [41]. This threat is especially significant in the shallow northern part of the CSB, which is extremely important for the development of the biological resources of the entire sea. This context has created a high set of risks for ecological disaster, made worse by the fact that the CSB is an enclosed sea.

In general, the CSB contains about 100,000 million barrels of oil and over 35,000 million cubic meters of fuel gas [18]. Daily extractions of crude oil and gas and transportation of them are the main pollution sources. The daily extraction of crude oil and gas and their transportation could be the biggest hazard in respect to CSB. The environmental change at the CSB scale negatively impacts the climate. The heaviest oil production pollution is observed in the areas near major cities, ports, and industrial regions, such as Makhachkala, Neftyanye Kamni, Baku, and Turkmenbashi. Intensive oil and gas development in the Caspian Region have resulted in extensive water, land and air pollution, wildlife and plant degradation, exhaustion of natural resources, ecosystem disturbance, and considerable losses in biological and landscape diversity [19].

For instance, in terms of territorial configuration on **Iranian** side, as explained previously, there is a continuity of urbanized areas along the CSB shores. This continuity is to the detriment of the natural landscape. In addition, the urbanized areas are developed across fragmented lines, cutting the connection between natural areas with the rest of CSB. Within the urban sprawl in Iranian side, as a primary mode of transportation, the road network is privileged by local inhabitants and tourists. In this context, the extension of urbanized areas takes place in the risk areas. For instance, the Port of Anzaly, the city is threatened by flooding being located under sea level (– 2m) and by the pollution coming from the urbanized areas. The waste water is transported through rivers and groundwater to the CSB [38].

The major challenge for the environment of the CSB on the **Russian** coastal side is in the northern part (Astrakhan region and Kalmykia), where there are industrial complexes. These relate to shipbuilding, pulp, paper production and the fish processing industry. The leading industries, such as a mechanical engineering, electric power, food industry and the fuel industry are primarily focused on the coastal lines. Astrakhan city also hosts a port on the right bank of the Volga River and the major transportation going through the CSB. Regarding the Dagestan economy, its main branches of production, such as agriculture, winemaking, fishing, folk crafts (including carpet weaving), oil production, natural gas production, chemical industries, engineering, power generation etc. are focused primarily on the CSB. The only non-freezing port of Russia at the CSB is the Makhachkala International Sea Trade Port, located in Makhachkala city.

The major source of pollution from the **Azerbaijan** side is pollution in connection with offshore oil production and transportation. The pollution also comes from domestic household waste and reservoir water generated during oil and gas production [4]. Some enterprises that contaminate the sea, whereas the wastewater produced by oil and gas production departments of several enterprises is well managed. Moreover, the urban facilities located in the coastal zones are also polluting the sea. Wastewater is discharged into the sewers of the surrounding areas and then, directly discharged into it. In fact, the biggest city on the CSB, namely Baku, does not have a proper system for sewage. In some cases, wastewater from the city is discharged directly to sea.

The oil and nuclear industries are the two main sources of pollution impacting the CSB in **Kazakhstan**, whereas **Turkmenistan**'s main pollution comes from the attraction of Avaza's tourist zone. In Turkmenistan, the Turkmenbashi and Avaza areas are low-lying lands and threatened by flooding. In the latter area, this has been exacerbated by water canal creation by resort developers, which guide more water during flooding surrounding the Avaza area. The oil industry and an important port for goods transportation impact the CSB in terms of pollution. Moreover, this area is more vulnerable to this than others because of its remoteness, which means that its pollution is being overlooked.

All these sources of pollution impact negatively the environment of the CSB. In addition to the environmental risks (cyclic changing of water level, seasonal surges etc.), climate change (irregularities of precipitation, drought and flooding, extreme weather events, cyclic changing of water levels, etc.) is also influencing the coastal areas [3]. In sum, today, the coastal cities of the CSB are faced with cyclic environmental risks, which are compounded by the increasing impacts of climate change, seismic risk[5] and related tsunamis

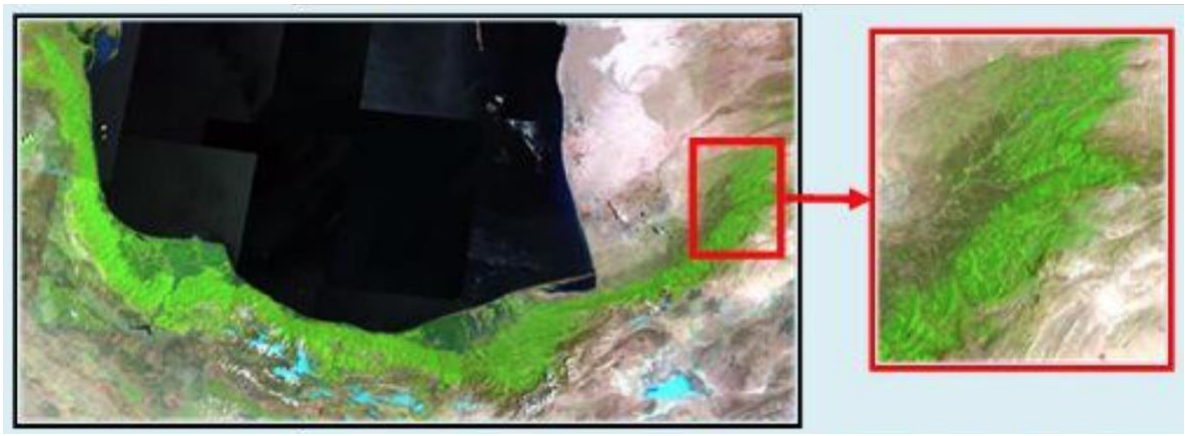
6. RISKS ASSOCIATED TO THE CSB AND THE PRIMACY OF CONTINUOUS RISK PROCESSING

The risk related to the coastal areas has been addressed in the UN's proposed New Urban Agenda [28], which shows clearly the global recognition of the severity of the problem in terms of the severe risk of climate change and rising sea levels in urban areas. Adopted at Habitat III in Quito, Ecuador, the Agenda highlights the importance of measures, mentioning that "*vulnerable as part of the impacts of climate change, sea level rise particularly affecting coastal areas"* [28].

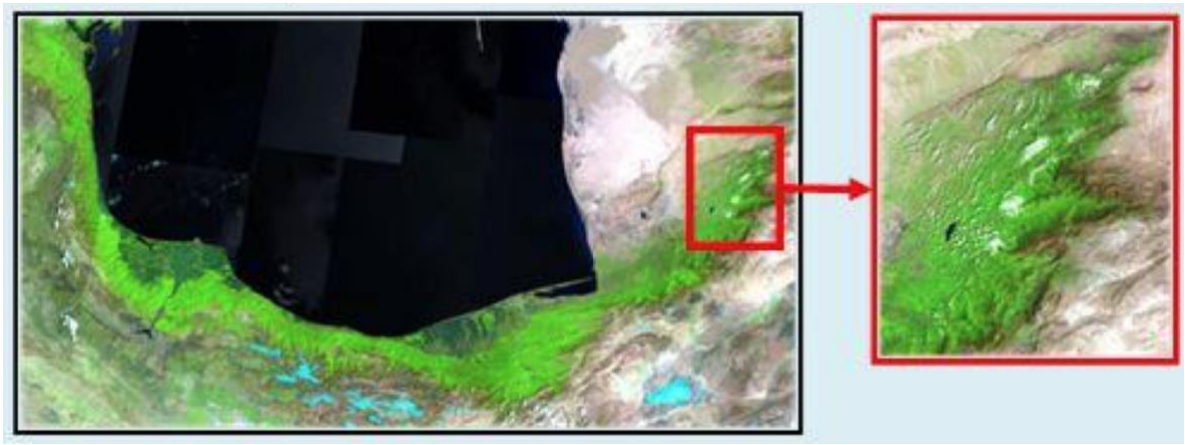
Besides, the CSB presents unique ecosystem and biodiversity. As Saatchi, Hedjazi & al. [34] have emphasized, CSB has several particularities such as sub latitudinal borders of natural zones of steppe, deserts, and subtropics of the temperate zone, being the region with a large diversity of typical (zonalsubzonal) and ecotone (transitional) types of habitats both offshore and onshore [34]. In addition, CSB is a largest landlocked body of water on earth, with the drainage basin of approximately 3.5 million km2 (world's largest watershed and annual runoff) and 130 rivers flowing into the sea with Volga, which contributes 80% of runoff. Saatchi, Hedjazi & al. [34] also highlight that, the hydrological and biogeochemical processes are intimately linked at the CSB because of its closed system (water, energy, resources) and any changes in land impacts the hydrology and ecosystem & vice versa.

As indicates the figure 10, the deforestation represents another major risk for the CSB region. According to Saatchi, Hedjazi & al. [34], the total forest loss in the Caspian forest from 1990 to 2000 was 1718.67 km^2, which changed the sparse forest into bare land (554.43 km^2), agricultural area (551.94 km^2), open woodland (464.3 km^2), and orchards (349.6 km^2); whereas agricultural area (363.39 km^2), open woodland (336.29 km^2), and orchards (257.17 km^2) consumed a large part of dense forest.

[5] The last two earthquakes were: 1) 21 April 2019, Offshore Turkmenistan, 4.0 magnitudes; 2) 21 March 2019, CSB, 4.5 magnitudes.



Caspian Sea forest belt in 1990s



Caspian Sea forest belt in 2000s

Fig. 10. Deforestation at the southern part of CSB, Source: Saatchi, Hedjazi & al., 2013 (p. 15)

Considering the above-mentioned risks associated to the CSB, the different methods of urban planning have their role to play in reducing and managing the range of hazards and uncertainties. The concept of resilience, which has been defined as being an "umbrella concept", in the context of strong uncertainties in the CSB, appears as a necessary condition of sustainability with its transdisciplinary and holistic when it comes to its implementation [23].

In the context of urbanization and climate change, the literature emphasizes on the importance of resilience capacity. The resilience capacity has been defined as "*[...] the ability to fall back on one's feet, to stay on course, to ensure the sustainability of an organization or society, to maintain certain permanence in a turbulent environment*" [32].

Among the CSB countries, existing set of mechanisms have shown their capacity to address challenges and proposes innovative solutions. The best illustration of latter is the Caspian Environment Program (CEP) and Tehran convention. CEP was established with the aim to halt the deterioration of environmental conditions of the Caspian Sea and to promote sustainable development in the area. CEP facilitated to negotiate and finalize the Framework Convention for the Protection of the Marine Environment of the Caspian Sea, also known as the "Tehran Convention" in 2003.

The objectives of Tehran Convention "*environmental preservation, restoration, protection a monitoring, the littoral States are required to take all appropriate measures to achieve these objectives individually or jointly and to cooperate with international organizations to that end*" [16]. Since 2004, four ancillary Protocols have been developed to give substance to the Tehran Framework Convention covering the four priority areas of concern 1) Pollution from Land based Sources and Activities, 2) Oil Pollution Incidents, 3) Biological Diversity, and 4) Environmental Impact Assessment in a Trans-Boundary Context.

Taking example of CEP and the Tehran convention, the CSB can tremendously benefit from the exchange of information, practices and policies across the region's urbanized areas and cities. Acknowledging environmental risks to build or upgrade the environmental resilience within the urban context at this subnational level will enable urban areas decision-makers and stakeholders to increase the capacity of communities and institutions to coordinate, strategize, and implement risk-reduction plans and disaster responses [39].

Here, urban resilience can be defined as the ability to absorb the shock, function during disturbances and learn from the negative experience in an urban context. The resilience framework requires that urban spaces contribute to mitigate risk and promote nature-based solutions, secure continuous operations within urban areas and ensure well-being of the population. Its actions are supposed to improve the quality of the ecosystem, give life to the city and play an important role in environmental and human security. "A successful city" is one that pursues a sustainable development policy, being committed to protecting the environment and one that considers the negative effects of climate change [33].

Considering the scientific consensus on the implementation of the resilience program following elements can assist addressing the vulnerability in cities and urbanized areas by:

- Anticipating environmental and industrial risks and disturbances;
- Identifying vulnerable communities and areas;
- Developing environmental adaptation and mitigating strategies.

In addition to the risks associated to the coastal cities (irregularities of precipitation, cyclic changing of water level), the CSB has its particular ones relating to the patterns of urban development and industrial development (e.g., oil exploration) in the sea. Indeed, patterns of urban development, industrial development (Offshore), seismic and related tsunami risks [22] as well as ongoing fluctuations in sea water level can be identified as specific hazards for the coastal areas of the region.

For instance, a tsunami that happened in Krasnovodsk (Turmanbachy) in 1895 shows clearly the possibility of future seismic and related tsunami events in the CSB. The rapid rise of its water level (about 2.25 meters since 1978) has also caused much concern to all five littoral countries, primarily because flooding has destroyed or damaged buildings as well as other engineering structures, roads, beaches and farm lands in the coastal zone [31].

Today, it is estimated that the Caspian Sea water level (attitude -27.5) could possibly rise to a maximum of -25/-26 level (if continuous humid years occur), which means it would rise up to 2.5 meters or drop off 1.5 meters within the natural variation cycle (EIA report, Baku Shipyard Project, 2011). However, as it was already mentioned, it was absolutely unexpected for scientific community that the CSB level continued to decrease from 1940s to late 1970s and rapid 2.5 increase over two decades after 1977 [10].

The perennial fluctuations in sea levels are due to changes in its water balance elements under the influence of climate change and use of water resources in the catchment area of the sea [25]. Moreover, the assessment of the dynamics of tides has shown that, the Caspian Sea has another particularity for having the predominance of semidiurnal tides, which is probably a resonant nature [26]. Tides produce regular periodic oscillations of the sea level and currents, and influence the general motions in the basin.

The water level fluctuations can impact negatively the built environment and human security. In the case of an increase in water level, this can cause social and economic disruption, environmental degradation, chemical pollution of the waterfront areas related to the oil industry, erosion, landslides etc. Whereas in case of a decrease, it can cause dust and sand storms, salinization of the land, as well as impacts agriculture negatively. In other words, both outcomes can impact human security. The occurrence of natural disasters, which impact human security and cities' infrastructure, have shown the importance of disaster risk reduction (DRR) and climate adaptation programs for urban areas. The measures of the programs shouldn't be only construction project as an "afterthought" [8]; it should be seen as a continuous process, with resilience being methodically built into the design, construction and operation processes (DCOP).

7. CONCLUSION REMARKS: URBAN REGIONAL PEER NETWORK FOR COLLECTIVE PROBLEM SOLVING

Today, the urbanization and regionalization processes are the bounding reality of the Caspian Sea Basin. As a result of concentration of infrastructures and population cities and urbanized areas of the region are all being affected by climate change as well as other dynamics of global change. Consequently, CSB cities and urbanized areas are exposed to the same risks (water pollution, availability and fluctuation geological and seismic activities, biodiversity loss etc.) and their associated impacts which require agile governance.

For instance, the south (Iranian part) of the CSB region is often confronted with the problem of flooding, whilst the north is not. Further, the south of the CSB presents linear coastal development, whereas the western part of the region (around the city of Baku) has densified areal form. Indeed, the regional approach to urbanization aims to identify proximities and distinctions between major poles of urbanization in the Caspian Basin and suggests a holistic approach to urban development of hard and soft interventions, such as nature-based solutions (NBS). This is only possible if experiences and strategies are shared among regional decision makers and city officials through the **Urban Resilience Peer Network**, which will provide a potent platform towards decision making on urban development. The Peer network also aims for to build collective and localized urban resilience knowledge across national boundaries. This entails sharing practices between urban areas of similar context, scale and level of connection with their immediate natural ecosystems (river, coastline). At the same time, the Peer network will be the mean of exchanging data, best practices towards identifying risks (sea level fluctuations, water and soil pollution, deforestation and biodiversity loss etc.). The Urban Resilience Peer Network can also assist in developing practices informed response mechanisms within distinct and diverse urban experiences in which nature could play a central role through adoption of Nature Based solutions.

Finally, the Urban Resilience Peer Network will assist CSB cities and urbanized areas to develop a portfolio of adaptive measures. At the regional level, cities could pass on information in relation to identifying the risks, the development context as well as the vulnerable areas and communities through the establishment of a collective resilience network. This should constitute a potent platform towards decision making on urban development, creating networks of urban resilience to share the best and worst practices by identifying also the resilience officers in each city of the region while insuring prompt exchange of information upgrading local response mechanisms.

In sum, the **Urban Resilience Peer Network** should promote collaboration between the cities, mitigate risks and promote the sustainable urban practices within the CSB region. The true power of the proposed network lies in collective problem solving to advance creativity and develop a new framework towards agile urban governance.

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IMPACT OF SOCIAL FACTOR: REVITALISATION OF LIVABLE ENVIRONMENT OF THE RESIDENTIAL HOUSING IN BAKU CITY

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ABSTRACT

Most people can agree that cities are places where large numbers of people live and work; they are hubs of administration, commerce and housing. By 2030, a projected 27 per cent of people worldwide will be concentrated in cities with at least 1 million inhabitants. Because of geopolitical options, Baku as capital and one of the post-soviet city went through many challenges in term of economic platform, public mentality, and build environment. Baku's demographic dominance means that the city contains the largest group of poor (one quarter of the total). [1]

Actual processing of housing transformation inside of the city is segregation by economic status. From 2017, the new districts for very rich peoples are emerging, generally with the territory fenced by high wall. Thereafter evidently, there is a growing process of dissatisfaction around middle and creative class.

Livability refers to the subset of sustainability impacts that directly affect people in a community, such as economic development, affordability, public health, social equity and pollution exposure.

Azerbaijan has also endorsed "Transforming our World: The 2030 Agenda for Sustainable Development" (2030 Agenda), which entails 17 Sustainable Development Goals (SDGs) and 169 associated targets, that were formally approved by the Member States on 25-27 September 2015 at the United Nations Summit on Sustainable Development and entered into force in January 2016. This paper tackles the problem of misbalanced environment in livable area in Baku City

Keywords: livable environment, urban, social impact, people, urban area, revitalisation, housing

1. INTRODUCTION

Today, 55% of the world's population lives in urban areas, a proportion that is expected to increase to 68% by 2050. Projections show that urbanization, the gradual shift in residence of the human population from rural to urban areas, combined with the overall growth of the world's population could add another 2.5 billion people to urban areas by 2050, with close to 90% of this increase taking place in Asia and Africa, according to a new United Nations data set launched today.

Compounding the difficulties are about 750,000 people (i.e., more than 10% of the total current population) displaced by the conflict with Armenia. Internally displaced persons (IDPs) are known to be significantly poorer on average than the rest of the population. In environmental terms, this has added to the pressure on the hosting areas, both rural and urban, demanding more attention to things such as pastureland management and provision of basic urban environmental services. The majority of refugee are habitants of Baku area in different types and stage of housing. [1]

In the world, agenda of urban development there are significance sense come to the reconstruction of urban centers, to the concerning certain zones of neighborhood of completely planning area. The meaning of reconstruction as action behind the city become more practical in frame of urban solution. According to many famous specialist and scientists, the epoch of "urban planning" is coming to the end.

Generally, the problems of urban density could be resolved by interior source of the city, drifting opportunity of urban life that hided in build environment.

In result, the concept of secondary urban development turn to effective. In such conditions, reconstruction becomes a leading trend in architecture and urban planning and is a tactic of urban development. It has been argued, that the housing problem is in second place after the food in a number of countries.

In common with other newly independent states, Azerbaijan is an urbanized society (urban population around 55% of the total). Baku alone accounts for about one third of the country's population. [1]

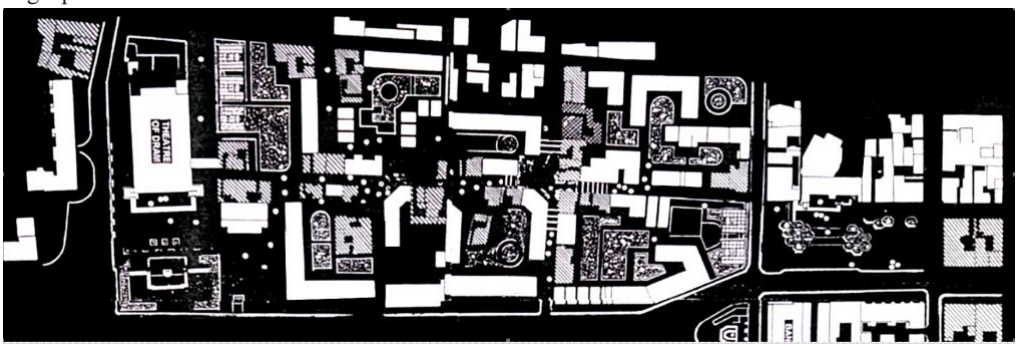
Housing reconstruction takes on greater importance, especially since the contemporary housing is considered in view of "livable environment" which represents not only living cell, house but also involve the supplementary areas having the activity of various groups of the settlement. Today we may say that whole life of a citizen was concentrated in apartments. The concept of housing shrunk down to the size of several rooms; even it is not a house. Finally, globally, in today tendency there are aggravating between human and environment.

In modern practice, reconstruction is not limited only to constructive measures, but the goal is to eliminate contradictions in the system of "human - environment". [2]

2. CURRENT STAGE AND OPPORTUNITY

It is estimated that in 2013, there were about 1.99 million private households in Azerbaijan. [1] Although dated, information from 2009 indicates that at that time, the total housing stock was about 109.4 million m3, of which about 62% was classified as urban. The nation's housing stock is generally classified into two broad groups: existing housing and new housing estates. Regarding the post-soviet districts of Baku, most of whose residential fund are typical plans of modular buildings of industrial series, it is possible to say the following: the policy of the authorities - "Help youself by your own when you gonna get drowned" and the public, due to disunity, separation, unconscious - inactive. The contemporary housing groups particularly are not different; they have same structure about public services may be even less. Their majority has 16 story building behind the soviet one 9, by top view they remain the "U type well", some time with small courtyard or without. For example the area of "Zarganpalan urban district" which represent the typical collection of urban issue of post soviet city. (Figure 1)

Area of "Zarganpalan urban district" – BEFORE



Area of "Zarganpalan urban district" - AFTER

Fig. 1. Particular types of housing (source of international design competition "Integrated communities: a Society for all ages"), author's project

Their majority has 16 story building behind the soviet one 9, by top view they remain the “U type well”, some time with small courtyard or without. The planning arrangement of contemporary housing reflect only to benefits of developers who want include maximum square meters with no comfort of living or livable environment. In Baku agglomeration, the temperature variable from 30.6-2°C and city has hot climate. [3] Particularly in that case the housing plans have to provide the apartments with two sides of the ventilation system to allow the benefits from the natural air stream. It has been argued that, by the formation towards livable environment able to meet the needs of human but simultaneously lead the public behavior.

Obviously, the architecture control the impact to human behavior, according with transformed social environment and by programming the infinite variety of its emotional states. [4]

2.1. Assessment model of livability environment

Most people would agree that car accidents and oil spills do not increase the livability of an area, but like other traditional measures, GDP disregards the links among social, environmental, and economic aspects of livability in that it measures economic increases at the expense of society and the environment. [5]

The determination of the stage of livable environment can be arranged by analysis model. These few comprehensive variables are able be as common factors, generally reflected on the livability environment. As shown in analyses the majority of parameters of livability interact across a social impact. The initial selection results of the indicators in this paper are as follows: (Figure 2)

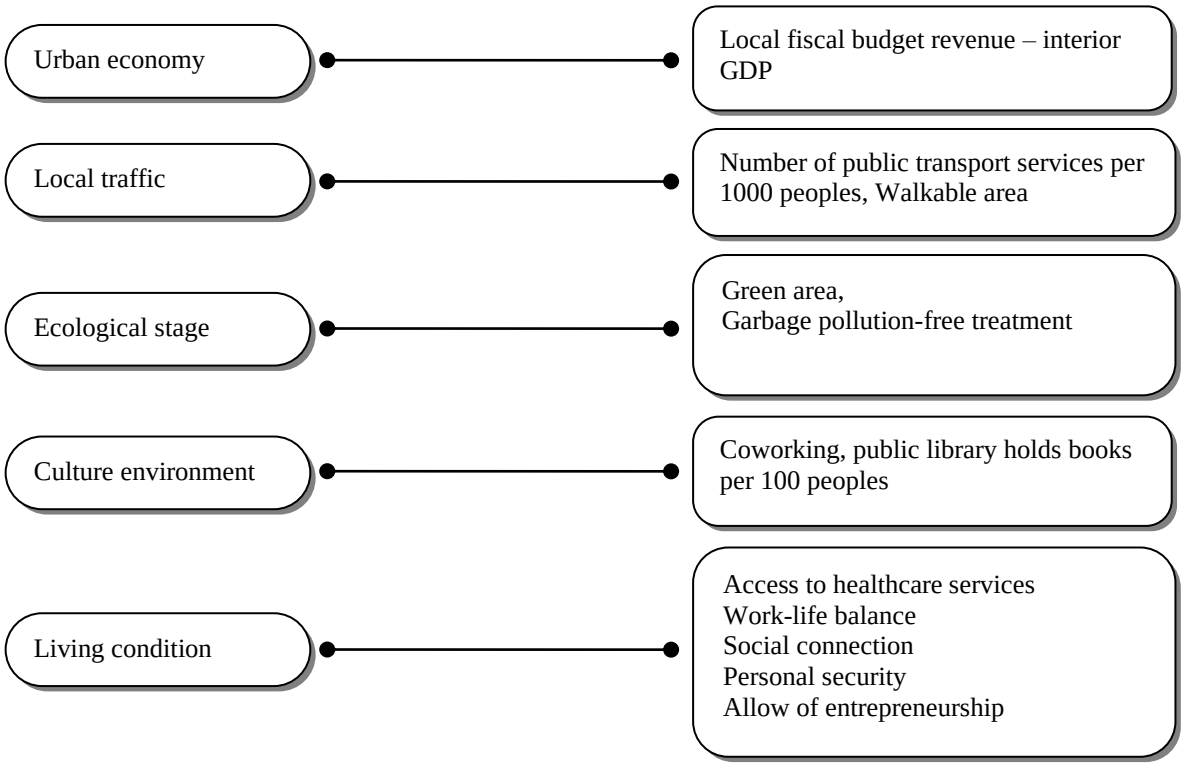


Fig. 2. Initial selection of indicators determining livable environment

4. METHODOLOGY

Many authors dealt with livable environment in a theoretical term which considered social factor consequences and impacts, positive and negative ones (especially changes the environment and no social segregation). Livable environment is considered to be a new field of urban sustainability for research and study, and there is a lot to be explored and examined. Even some academics may refer to livable environment from the mid of the XI century, others relate it with the social equality. While few

authors struggled the typological views, and identify affordable housing by areal possession of livable environment. By reviewing and evaluating social impact, the researcher determined that the cultural and mental issues are very significant.

The European urban centers are the most suitable for the case study, due to the absence of a comprehensive approach of the case studies used and the subject that assures the research point of view: what can be applied from example in European experience, must not by default be applied to other countries due to social and cultural differences.

The methodology used for examining the revitalization of livable environment; is to overlap and join the typology of the case study where the social impact in order to achieve the main objective of the paper. As, the main objective of this paper is to understand how social impact has influence in revitalization of livable environment in case of Baku's affordable housing and to expect the requirements in order to consider the possible to deal with social impact in a good manner and avoid negative consequences of development of disconnection with livable environment in affordable housing, using its positive to upgrade and develop the neighborhoods. This methodology was based on a bilingual analyzing of current practice and published literature on exist affordable housing of the Baku City with comparing of worldwide cases. Farther the paper forward the project represented in competition "Integrated society for all ages" which used as example of architectural and urban solution of district composed from affordable housing.

3. OVERVIEW OF REVITALITY AND LIVABLE ENVIRONMENT

3.1 Revitality

The famous urban planner like Jan Gehl and Jane Jacobs considered that revitalisation of livable environment of the urban area is based on the people and theirs activity in an area.

Jacobs noted that good urban revitalisation requires a dense population. [6]

Revitalisation of urban area depend from urban public safety, socioeconomic, resident health, walkable space. Kevin Lynch represented the volume of build environment by following components: revitalisation, feeling, suitability, accessibility, and management. The definition of revitalisation is the level of support for life and requirements for ecology and human beings. [7]

Attoe & Logan maintain the idea that people activity depend from each day living proceed in city behaviors associated with daily life in cities are the foundation. Then many theoretical ideas guide basic theory to led the researches on urban revitalisation. [8]

Assessment of revitalisation in the traditional statistics source is often initially based on qualitative comparison, or on observation area and application. For instance, mentioned that measuring of revitalisation have to be based on diversity of providing the healthful lifestyles, consisting of privateness, relaxation, and contemplation.

The survey for the consideration of revitalisation can be processed through the telephone calls, observing the each day walking sports of City residents, in addition revealing the relationship among the residential environments and on foot activity. Urban revitalisation can also be featured from the increment of employers, economic, star up level, and public coworking. Urban life activate the peoples come to the district, the diversity build environment and proposed activities generate the revitalisation potential. Farther, the rapid development of information and communication technology has enabled the acquisition of daily activity data for a large number of residents. Many researches actually used the collection of information on the spatial movement of residents through GPS tracking data or electronically payment and social network comments. Then mapping the people location used for analyze the timing change of revitalisation. Yue et al. noted that neighborhood vibrancy can be assessed by the number of active people in the neighborhood, extracted from mobile phone location data. [9]

To summarize, in certain time of measurement the changes in urban people activity and revitalisation show that quantitative evaluation has the precautions in that field.

3.2 Livable Environment

Current the problems of livable environment has taken into consideration as urban scientific research field in 2002 by the Society of Urbanist of Azerbaijan (SUA). At this time, many developers

resource were bind stimulating of new types of housing orientated to european luxury live. And affordable housing has stayed as not interest area, which generally was represented only by typical post-soviet modular housing (generally 5 and 9 story buildings). Beginning from 2015 the problems of livable environment has come as one of the focus of the affordable housing program of Azerbaijan government and urban residents. Building a livable city has become an important goal of Azerbaijan's urban development at this stage. Table 1 highlight the inclusion of social impact factors in governmental program.

The focus of the Strategic Roadmap of Azerbaijan will be at two levels: a national economy perspective on the diversification of the national economy and a sector perspective for the accelerated development of eight key sectors, which will deliver diversification, and guide public and attract private investment. The following sectors identified in the roadmap correspond closely with the National Urban Assessment's analysis of opportunity sectors with competitive advantages for diversified urban development:
– oil and gas processing, including chemicals;
– agriculture and agricultural products;
– small and medium-sized enterprise manufacturing of consumer goods;
– heavy and mechanical engineering;
– tourism and leisure;
– logistics and trade;
– affordable housing;
– human resource development and training

Table 1. Urban Vision and Strategic Prioritization [10]

It is great opportunity to improve the quality of life of residents of urban area. Meantime the functionality and efficiency operation could be improved in post-soviet housing area.

SUA research group has summarized many positive and negative cases with local approach and international practice in the process of urbanization by drawing a advises from the multidisciplinary ways of more than half a century of urban construction in Baku and absorbing many research data about the urbanization problems from the international society in recent years. They came to the conclusion that livable cities emphasize on enhancing sustainable development opportunities from the urban district, which leads the generally post-soviet cities and urban neighborhood to begin of changes of mental transformation in frame of industrial city including tendency of division between the peoples of affluent life and social housing. Based on the case analysis, we believe that livable environment is a settlement place with excellent condition of quality of people life, strong impact of social factor, improvement of public space, natural environment consideration, and clean efficient energy use. The living environment, being the object of design and does not represent the final product, but is considered as constantly evolving.

Many studies show social interactions between residents and the environment can contribute to happiness in the organization, but according to Yufi (2012) social support does not show significant results of the level of happiness of an individual. However, Murti (2013) expresses social support as one of the needs in employee satisfaction as well as individual personal characteristics, family relationships and pleasant feelings with the jobs they have. Besides, social support formed in social environments varies according to individual needs and this eventually affects individual perceptions of the definitions of happiness. [11]

The social contradictions in residential development can only be solved by support of residents, as it is evidenced by the foreign experience of the so-called "participation" *(from Late Latin participationem (nominative participatio) "partaking,") which* means planning with the direct participation of future consumers. As one of the performance, there are the conception of the rehabilitation of livable environment. It is consisting in the design of the circular and self-regulating system for living of whole neighborhood on the base of activating of socio-economic capacity of residents, supporting by architecture tools. [12]

The general principles of conception are:

- people participation
- conducting the reconstruction of missing features in living environment (list is determined by the residents)
- upgrade of apartment given the social and demographical, provisional, everyday family needs

- improvement of housing conditions due to the resettlement in frame of micro-neighbourhood and growth of housing fund
- ensuring aesthetic and environmental quality housing development, improvement and travel outside the territory with the participation of residents
- maintaining of aesthetic and environmental impacts of build, arrangement and spaces managing with local peoples

In 1970-1980's the neighborhoods of American and European cities that were previously sentenced by the experts to demolition came to life. The life, repair and reconstruction, the modest but real economic development of these districts and areas were grown by the efforts of the residents themselves. Actually, independent experts from outside maintained this process. Moreover, even if repaving area was in medium scale, the city authorities supported these residents.

Therefore, in this respect, may to highlight the main points that contribute to the successful reconstruction and development of the residential environment (reduce the conflict between a human and environment)

- involvement of the population in the process of forming a living environment
- detailed development of programmes for the rehabilitation and residential environment
- orientation towards long-term cooperation of three levels: resident - power - architect

From East to West such practice in reconstruction of the livable environment show the viability and prospects of the approach outlined above. At the same time, we should count in consideration the circular process, when the space planning of the livable environment affects the behavior of the land use, the public activity of the settlement, its psychological stage and the way of life [2]

For half a century, in our region, the typical living environment (TLE) has been "educate" the peoples. In fact, the result of TLE is low self-activity of the community or public and difficult in renovation process of livable environment. It is very important to understand that until residents realize themselves as owners of their housing, not limited by the walls of their apartment, and the authorities do not consider the goal to assist people in the restoration and development of their own housing, it will be difficult to do anything.

5. SUSTAINABILITY OF LIVABLE ENVIRONMENT IN BAKU

On the basic of the analysis social impact, we made proposal to reconstruction of livable environment public community (social special rehabilitation). The structure of the proposed approach consists from two phases and represent following phases.

First stage - revitalization of the social and functional status of the elements of the livable environment (pedestrian and public area, courtyard, housing adjacent area, entrance, staircase), that does not affect residential cell.

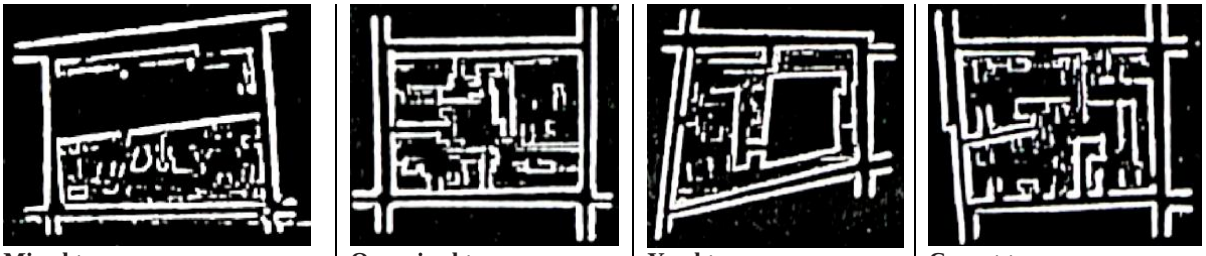
The vitalization livable environment of housing begins by interior life of community - courtyard and it is not casual. Because the courtyard it is common area residents where middle commerce, public services and working area are intersected. Finally, it should be unite channel of elements: courtyard – housing cell. The goal of first stage is design the background of personalization of livable environment as well as to stimulate the privet activity of residents by architectural way.

Second stage - reconstruction of housing as a process of development of the livable environment. Proceeding from properties of territory there are proposed the appropriate reconstruction directed to improve housing condition quality of life. On that stage the cooperation between authority and public community is certainly significative. Accordingly, the gradual rehabilitation of the livable environment, as well as the long-term cooperation between the people, authorities and architects, make its possible the continuous development and deformation.

Another issue of reconstruction could be mentioned the inconsistency of housing structure and its location. This problem is particularly acute in the urban center, which build by the ancient building with heritage value and by just old residential houses (two, tree floor).

"Zarganpalan urban district" aims at identifying and promoting solutions that respond to these constraints, verifying that sustainability can be achieved in affordable area as effectively as in high standard buildings. Sustainable social housing units allow to provide significant environmental, social

and economic grows to population with middle economic stage and to reduce the discontent of the society as a whole. The types of local urban fabric are collected in (Figure 3)



Mixed type | **Organized type** | **Yard type** | **Carpet type**

Fig. 3. Particular types of housing (source of international design competition "Integrated communities: a Society for all ages"

To resolve the inconsistencies the housing structure and its location, there were proposed the conceptual proposal - restructure of the residential area, located in historical center of the Baku City (conceptual project proposed by author "Zarganpalan urban district"). [13]

The essential idea of the proposed approach is expressed in the following sequence:

- determination of regularities of the plan structure of the housing next to the local urban central and deeper inside of the residential area.
- plan structure as tripartite conception of differentiated as: base – interlayer – crown
- determination of the pattern according to the intensities of urban use of are behind the housing (buffering).

6. CONCLUSION

The research results shown above are able be considered as requirements but proposed approaches of design solution for reconstruction of livable environment might be considered by authority of the city and could play positive role for benefits of urban community.

At what scale should livability be measured? Can or should it be considered at the individual, household, or population group scale or only with reference to places? We can improve livability for people, for example, by augmenting their disposable income and thereby allowing them to leave a deteriorating neighborhood. [14]

Reconstruction works in Baku City, accordingly to social impact, have not carried out yet because of various reasons, including the mentioned in this paper. In that reason, our city is as "open space'. In addition, the case of positive issue is that we able to observe whole of the experience of past construction and consider its best implementation. From other hand, it is possible to exclude the recurrence of the bad practice, which already made. Zargarpalan district (40°23'12.38"C - 49°50'18.99"B Google map coordinates) is one of typical area of urban 400X180 meters in center of Baku. This site proposed as simple of difficult disproportion between city new housing (luxury) and vernacular housing build by local people accordingly with architecture tradition of middle class of Baku city. The area block between roads and 12-16 story new residential buildings (bordered space) which aren't providing the social neighborhood. There are many sites like this one situated in the center and Baku's agglomeration. Population of selected area 14000 (2700 families, 520 elderly) populated by peoples with low budged and in real need of appropriate shelter and healthy environment. The project proposal is directed to provision the residents by livable environment where the peoples of different ages could better life, have local public services and offer theirs personal service. Strategy of revitalisation appoint the forming of prerequisite for changing "mahalla" community's life with theirs people participation. A mahallah, mahalla, mahallya, mahalle, mohalla, mehalla, or mehalle (Arabic: محلة maḥalla; Bengali: Hindustani: मोहल्ला; محلہ mōhallā; Persian: محله mahalleh; Azerbaijani: Məhəllə; Albanian: mahallë or mahalla, or mëhallë or mëhalla, Bulgarian: махала), is a country subdivision or neighbourhood in parts of the Arab world, Balkans, Western Asia and Indian subcontinent and nearby nations. [15] Participation people's aspirations is the best way to form an integrated society. The design solution is based on arrangement of the results of community surveys, sociological questionnaire application of residents and analytic study.

Analysis showed that the social impact includes: a) research of cultural needs and wellbeing of the

urban community; b) creation of intercourse and leisure centers in a dwelling space; c) street excitement by changing some dwelling houses functions for creation additional places of crafts, commerce and service; d) include more of green areas, a comfortable traditional habitation; e) recovery of a block – "mahalla" cultural values, restoration of heritage buildings etc.

Ecological aspect supposes: a) involving of people participated in design desision in the process of revitalisation of livable environment; b) a maximum consideration of traditional background of dwelling space; c) creation of a shady pedestrian street, blocking it for passageways, saving from the sun radiation and wind; d) reconstruction of greenery and water in local public area, shady ground and people intercourse etc.

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FEATURES OF DEVELOPMENT OF THE NEW CITIES IN THE REPUBLIC OF AZERBAIJAN

N.Y. MAMMADOV

ABSTRACT

The article deals with the growth of the population of new cities and in this regard the peculiarities of their territorial development.
The analysis of changes of architectural and planning structure of the new cities in Azerbaijan due to growth and change of their territories is given in the article.
Population growth in cities is studied in detail every decade on an average and is shown in exact figures based on statistics. Construction of cities in the post-war period. The population growth in these cities is studied during the periods of construction of large hydro-technical facilities and industrial enterprises.
The necessity of the developing of new projects and the solution of the issues arising from this need have been investigated taking into account the expansion of the city's territory,
Issues of formation of new urban centers in Sumgayit, Shirvan and Mingachevir. Due to the growth of the cities in question, the increase in traffic intensity and consequently overloading issues of the streets and avenues are the subject of extensive research.
New districts are created in different directions from the first core of the city and these districts gradually form a new compact city. Such development is typical for the city of Mingachevir in Azerbaijan.
More difficulties in urban development, problems arising during the development of construction and industrial zones in the opposite direction and ways of solving these problems are widely investigated.
The division of city development into three types according to the structural ratio, and the pros and cons of each type are analysed separately.
The article analyzes changes occurring in architectural planning structure according to the growth and change of new cities in Azerbaijan.

Key words: new cities, growth rate, population growth, city development, functional zones, new district, number of floors in buildings, transport intensity, development structure, territorial expansion, construction, residential zone.

1. INTRODUCTION

When the new city is expanded, the amount of directions of growth is not so important, as the character of the development of functional zones relative to each other. The features of the development imply the following:
a) in separate directions or combined
b) in one or several directions

Similar difficulties arise during semi-separated development. At first, functional zones develop together and then divide in different directions

The development of the city can be divided into three types according to structural ratio:

1. sustainable development of each zone
2. intermittent (discrete) development through the growth of complex structural units (industrial and residential regions)
3. adapted development

The study of the general characteristics of the development of new cities in Azerbaijan shows that they have high growth indicators. For example, in the first 30 years of its development in new cities such as Sumgayit, Mingachevir and Shirvan, the population was 50-60 thousand or more, while in

Sumgayit the population is currently 300 thousand people. The population growth in these cities averaged about 20-30 thousand people every decade.

Currently, a higher growth rate is observed during the construction of the largest hydro-technical facilities and industrial enterprises in new cities, which arose after the war. During the period of construction, the annual population growth in these cities was 5-10 thousand people. This applies especially to new cities with favorable economic and geographical and natural-urbanization condition. The general plans, which took into account rapid population growth in intensively developing Sumgayit, Mingachevir and other new cities, were repeatedly revised.

In many new cities, where the projected population has been achieved in a planned manner over the estimated period (20-25 years), it is now necessary to develop new projects taking into account the future growth of the population and the territorial expansion of the city.

2. ANALYSIS

The analysis of numerous examples shows that the successful solution of this important project issue is largely predetermined by how rational the conditions such as unimpeded expansion and urban development are taken into account in the first effective projects.

In a number of post-war urban development projects, the conditions for the development of the city were not fully taken into account, which led to known contradictions.

For example, in Sumgayit, the areas necessary for the development of the city in the future were occupied by low-cost, extensible residential and industrial buildings due to the initial project. The project did not envisage the development of highways and the creation of winding (surrounding) roads, as a result, due to the growth of the city and the intensification of transport, the district and residential streets were loaded with the function of tense citywide roads. The center of the city remained on the construction periphery with the development of the residential zone, although the population of the city did not reach 100 thousand people in the 70s of the 20th century, the issue of the formation of a new city center arose. A similar situation is typical for Mingachevir and Shirvan.

The creation of objective conditions in which new cities can freely develop is the most important criterion for the rationality of the city planning structure.

The development of the city, accompanied by an increase in population, is due to the expansion of the territory, the density of buildings and the increase in the number of floors, the increase in the capacity and number of highways and transport nodes, engineering networks and main buildings, the development of the public center, the complexity of the architectural and planning composition of the city. Under certain circumstances, the development of the new city as a single planning derivative moves to a higher and more complex stage of development in the form of a new group system of cities. The territorial growth of new cities is very diverse, and for their planning structure, the issue how to expand the territory of the city is an important factor: due to the internal resources or the surrounding empty lands; on one, two or more directions; with a continuous or territorial gap (breakage).

In new cities, growth in one or two directions is more efficient, as it allows the concentration of construction and the formation of larger structural parts of the city (industrial districts, residential areas, public centers, parks) in a short time. Conducting civil construction simultaneously in several directions and in sites in new cities, which are not as large as bigger ones particularly inadequate from an economic perspective and planning issues.

However, due to local conditions, the development of the city is characterized by the fact that new districts are emerging from the first core of the city in different directions, gradually forming a new compact city. Such development is typical for the city of Mingachevir in Azerbaijan. Reconstruction of the previously extensively emerged region in the neutral part of the city will play a reserve role in one of the future stages of its development. During the development process of the new city, the growth in the density and the number of floors is more typical for new districts in the direction of the expansion of the city (the city of Sumgayit). When the new city is expanded, the amount of directions of growth is not so important, as the character of the development of functional zones relative to each other: either individually or jointly, on one or on several directions.

While the construction and industrial zone emerge in opposite directions much more difficulties

arise in the development of the city.

In such cases, separate development for space is largely inevitable and requires a solution to complex urban issues, e.g. the creation of fast longitudinal links, and construction of land dams for speed connections, non-street transport types, etc. Similar difficulties arise during the semi-detached development: first functional zones develop together, then they are divided in different directions. The joint spatial development of industrial, residential and green areas of the city, for example, parallel development in one or several directions, is more rational. The development of the city can be divided into three types in structural proportions: continuous development of each zone, intermittent (discrete) development through the growth of complex structural units (industrial and residential regions), adapted development. The sustainable development of all functional zones is characteristic for the city of Shirvan. The development of the city is due to the gradual development of machine-building production and equal development of settlements. Both zones develop continuously without territorial separation.

The advantages of urban development of such a sustainable development scheme are that the development of industrial zones and settlements at a given period has its own characteristics. For example, the development of production is expressed in some cases by an increase in the number of employees, without expanding industrial sites, in this case, the residential zone expands territorially, while the industrial zone remains in its previous dimensions. With the automation of production, the use of labor force is reduced, which may be more necessary in another sphere, resulting in the industrial zone grows without a significant increase in the number of personnel, while the residential zone remains relatively stable. It is very important that despite the indicated features of the development of individual zones in the scheme of sustainable development, there are conditions for the regulation of the city and its harmonious development.

Another advantage of sustainable development is that each zone has the ability to develop through the addition of structural units that best express internal functional organizational regularities. For a residential zone, a residential district, for an industrial zone, an enterprise or an entire industrial district serves as such a unit. At all stages of development, these structural units do not change their rational organization.

Thus, the sustainable development of new cities responds better to the dynamics of the formation of a part of the city, than to the formation of complex districts. For example, when the development direction of functional zones is changed or moved to new areas, there is a need to create new production sites and residential areas. To prevent unsystematic placement, it is possible to integrate industrial and residential areas into the city's complex planning areas. It is expedient to protect the land resources to expand the residential and industrial areas in order to be able to meet the changing conditions of settlement in the production process, science and other fields in each of the districts. The difficulty of creating such territorial resources in the discrete (intermittent) development of the city is not a prerequisite for rational development. Another problem is the complexity and extension of labour relations during the fragmented growth of the city as a whole, even if it is possible to reduce Interurban Labor Relations to a relatively small percentage of all displacements.

Therefore, the main part of the city is constantly developing, and in parallel, if a complex planning district of the city is formed, or if one of the zones of the same type is continuously developing, and the other is discrete, the combined (combined, adapted) forms of development are expedient here.

The growth of the new city and its development character are largely determined by the development features of the production base. The latter, in most cases, develops on the following stages: the construction of the main enterprise, the creation of a production complex on its basis, the organization of new enterprises and complexes not connected with the first, as in the city of Mingachevir. As a result, the growth of the city does not occur equally in many cases, it changes with leaps and bounds depending on the location and time.

Initially, the city of Mingachevir was developed on the basis of a hydropower station with a population of 50 thousand people, and the development of urban zones was of parallel sustainable nature. Then the construction of the largest textile complex, 3 km from the first industrial district and residential area of 10,000 people, separated from the first by the Kur River was started. The development of the city continued with a prolonged parallel scheme but in a new direction. Thus, a structure consisting of two parts of the city, interacting with each other, was formed.

The construction of new large manufacturing enterprises often leads to the construction of new

squares and the formation of the new city structure. The emergence of a new system of group settlement, which is one of the complex steps of the development of the new city, is associated with this activity.

New cities should be created, mainly by designing (forecasting) the planning structure of future settlement groups, in the settlement system or by designing a separate city, provided that they are not isolated. In these conditions, the choice of a particular structure of a separate new city is not the only task that ensures its unobstructed growth. In this case, it is important to establish the correct phase of transition from the development stage of the city to the creation of a settlement system, where each city forms part of the entire framework.

Thus, the formation of the urban group system is the most complex and promising type of development of the planning structure of the new city. Such development sets certain requirements for the construction of external (in connection with this) high-speed communication lines on the planning structure of the initial urban formation and the formation of a system of recreation areas and community centers with future elements of agglomeration

3. METHODOLOGY

One of the main problems of the growth of a new city is the possibility of developing a system of highways and transport. The growth of the city is accompanied by the extension and expansion of the transverse profile of the initially built highways, the construction of new highways in the formed cities (on the reserve lines in construction), the creation of high-speed roads and new winding roads, the creation of off-road types of transport etc.

The analysis shows that the closed networks of the main streets, the absence of reserve lines in the construction and transverse profile of the highways, as well as the closure of any types of construction preventing the promising directions of the road-street network have caused even greater difficulties in the development of new cities.

For new cities with significant development prospects (with sustainable or other schemes), it is necessary to develop open transport systems that allow increasing the numerical composition, density and complexity of the highway.

The analysis of the existing transport network of cities allows us to claim that the necessary directions and lines for highways are kept on track; for high-speed transport types – on the transverse profile of highways and at the crossroads of intersections between them is considered positive.

Closed (circular, semicircular and others) highway systems can be applied to new cities that are not large, provided that their convenient connection to high-speed city roads will be ensured.

One of the most complex problems of the development of the planning structure of the new city is the development of the center. Practice shows that when the general plans of Sumgayit, Mingachevir, Shirvan cities are prepared or adjusted, the location of the enters and their planning solutions are radically changed, and because of the mistakes made in the initial general plans, it is not always possible to achieve a harmonious solution of the center in the general structure of the city.

The development problem of the citywide center, first of all, reaches to the growth (or change) of the territory and the increase in the level of services for inhabitants of the city and the growth of urban population, and secondly, when the urban area grows, to ensure the favorable connection of the center with new districts. Finally, the growth of the city center should take into account the complexity of the composition structure of the new city and the formation of architectural appearance.

The growth of the city and the development of the center have three main directions:

1) continuous spatial development of the center – monocentric and linear;

2) development of the previous center and creation of additional urban centers in remote residential areas - polycentric system;

3) establishment of a city center in one of the newly built residential areas by transforming the previous one into the center of one of the residential areas.

The monocentric development of the center is characteristic for cities expanding equally in many directions. The concentration of public buildings in a single complex of the city center and the protection of the territory for its sustainable development can improve the quality and effectiveness of public services, as well as create a unified architectural ensemble of the city. Along with other

advantages, it requires the availability of reserve areas that have not been used for a long time around such development centers, and if it is revealed that their number is insufficient, then there is a need for reorganization of the districts for the development of the center. In both cases, additional costs are required for the temporary improvement of the reserve areas and subsequent reconstruction. During the one-sided development of the city, the monocentric development is irrational, so with the growth of the city, the center remains in the periphery. Therefore, when the city grows in one direction, the center usually develops in the same way.

It is more expedient to gradually develop the center in a linear or other direction, where the first phase of its formation is carried out in the form of the first completed urban ensemble.

The polycentric system is advantageous in the development of the city in several directions when there is a need to create several public centers with urban values in new planning districts. The less compact the residential zone of the new city is formed, the more scattered (incoherent) the system of centers.

In the unregulated development of urban settlements, there is usually a practice of changing the location of the city center to a new and larger residential area of the city. In this case, the primary city center, intended for a smaller number of residents, should be a secondary district center.

In fact, such a displacement is a long-term and difficult process, because the city already has operating buildings of public institutions (administrative, cultural and household services, culture), the construction of the new center is always delayed. The inconvenient site of city center remains unchanged until there are additional ways to develop the city.

Therefore, instead of the idea of "displacement" of the main urban center, which is consciously accepted in many projects of new cities, spatial development in the form of a linear continuous or intermittent strip of important public complexes should be proposed.

As a rule, in the construction of a new city (5-10 years), it may be more justified to start with the formation of parts of the city center or individual elements of the system of urban centers (in large cities).

Therefore, it is not recommended to attach importance to the city center, for example, to one of the centers of residential districts "temporarily", because the service functions that are not inherent in it for a long time (with the construction of administrative buildings) are attached to it. As a result, general facilities, as a rule, occupy an unfavorable place in construction, and the possibilities for the future center of the city are reduced. If the problem of planning the formation of the city center is not laid at the first stage, then the city objects are placed in random places.

To ensure the conditions for the development of the new city center, its relationship with urban elements and territories with certain development opportunities is very important. These include urban highways, open spaces and greenery intended for urban use.

4. SOLUTION

In the design of the green space system, the general plan of the new city solves the following main tasks placement of mass recreation places of citywide importance and green spaces of general use taking into account the requirements of convenient accessibility for the population and improvement of sanitary and micro-climatic conditions in all zones of the city; providing the unity of the structural and planning organization of the city and the expressiveness of its architectural appearance with the help of landscaping system.

Facilities for everyday leisure are located mainly in the structural elements of the residential area; devices for short-term rest - mainly near the city (in the forest belt and suburban area). Often park and forest areas are part of the overall structure of the new city.

Determination of the territory of suburban areas of short-term rest is made either based on the approximate norm of 500-600 m^2 per 1 vacationer, taking into account the departure to the recreation areas at the same time up to 10-15% of the population of the new city, or based on the prospective indicative norm of 50-70 m^2 per 1 resident of the new city (only for areas of short-term rest. In areas that do not have great opportunities for the facilities of suburban recreation areas, these calculated data can be reduced by half. The total area of public green spaces is rounded up to 20-25% of the residential area of the city.

The system of recreational green places, considered as a whole, combines all the functional areas of the city and its immediate environs. Therefore, the existing green areas should be included as an integral part of the city structure.

The location of the main parts of the landscaping system is influenced by the position of existing forests and groves or the availability and configuration of areas suitable for planting. Built taking into account these natural factors, the terrain and water spaces, their diverse combination with each other and with future architectural structures, the system of green spaces should receive an individual planning solution. [7] It definitely appears on the composition of the residential zone and the public center of the city, on the layout and construction of residential areas and neighborhoods, as well as, ultimately, on the landscape architectural and planning composition of the green facilities themselves.

The concept of a citywide system of green spaces includes: the entire composition of urban green facilities, the conditions for their placement in the city, the requirements for the organization of functional and architectural and planning relationship with each other and green spaces of the suburban area.

The landscaping system is an organic part of the architectural and planning structure of the city and includes all the necessary facilities associated with the three main areas: housing, labor, recreation. The system of green spaces forms green facilities in residential areas (city park, gardens of residential areas connecting their alleys and boulevards), landscaping of the industrial area, the sanitary protection zones and areas of recreation. The continuous system of green spaces provides convenient landscaped pedestrian connections of residential complexes with public centers of the city and places of recreation in the countryside.

5. CONCLUSIONS

Analysis of the practice of planning new cities reveals two approaches to the organization of the system of green spaces:

when it acts as a consequence of the division of the city in the main structural elements or outlines of the system of highways;

when it acts as a structural forming system of the city.

In the first case, the system of green spaces does not have a decisive influence on the planning of the city and in the composition of the city plays a subordinate role to a certain extent. The second reveals the importance of the structural value of green areas.

In new cities characterized by calm and windy weather, large solid areas of green space can lead to stagnation of air. To preserve the mobility of the air, it is recommended to build a wedge-shaped system of green spaces along the direction of the winds, in which the wind flow enters the depth of the built-up areas and thereby activates the ventilation of the city. Rational alternation of green and open spaces in the city plan can cause desirable local breezes in these conditions.

When solving the greening system in the city's master plan, it is necessary to map out the structure of its large elements (areas or zones of suburban recreation, urban parks, gardens of residential areas).

The country recreation areas of the population may consist of country parks and forest parks of various purposes, meadow parks, green and landscaped areas of reservoirs, as well as green hiking roads connecting green areas with each other and with cities. The main structural unit of the recreation area is a complex of public recreation facilities (holiday homes, boarding houses, tourist bases, pioneer camps, etc.).

Planning zoning of the territories of the recreation area should be made depending on the differences in the nature of their use, forms and organization of recreation, transport and pedestrian accessibility and attendance, highlighting: a) a zone of mass attendance; b) a walking area (more rarely visited by individual tourists or their groups). Each of these zones is distinguished by the nature of use, the techniques of architectural and planning decisions of the territory and the degree of improvement.

Areas of mass attendance are located in the places of transport accessibility (for public transport), at the beaches on the banks of water bodies and water channels, in the most picturesque and attractive places of the landscape, for example, in the cities of Sumgait and Mingachevir. The area of mass attendance, depending on its radius, can range from 3-5 to 60-75 hectares, and the radius should be set on a case-by-case basis based on the number of vacationers. However, it is not recommended to take

the size of this area over 60-75 hectares in all cases (which corresponds to the radius of the zone of about 500 m), since the remaining area over this size, as experience shows, will practically remain underutilized (in the absence of public transport). In each of these zones, local compositional centers can be established. Compositional centers are created in places with the most interesting elements of the landscape: in open areas and elevated terrain elements. Extensive water surfaces are also the compositional centers of architectural and planning organization of the forest park.

Urban parks provide a recreation of the population in a healthy, well-maintained, landscape and aesthetically designed natural environment. They are the main largest arrays of plantations in the system of inner-city resting places. According to the Regulations, the area of urban parks in the city as a whole should be: 80-100 hectares in big cities, 20-40 hectares in medium-sized cities, 35 hectares in small towns.

One of the criteria for determining the optimal size of the park area is the pedestrian accessibility of the entire park area. The limit can be considered parks with an area of up to 300 hectares, having a rational planning scheme. If under local conditions the park is allocated an area that exceeds the possibility of developing it as a city for the rest of residents, in such a recreation area should be allocated areas of the highest density of visitation, improve them well and create garden-park compositions. The rest of the zone is left completely or almost completely untouched as a reserve for the organization of the forest park.

Violation of the task of zoning the park for functional purposes affects besides natural conditions, the location of the territory in the city plan in relation to residential development and the configuration of the site. Thus, in the park area of the city, located peripherally in relation to the building, the territory of the most mass visits tend to the public centers of citywide importance and transport hubs, the recreation zones is an alternation of territories with a dense network of institutions and forest parks of a tranquil regime.

Water reservoirs are a necessary landscape element of the urban and district park. In the absence of natural reservoirs, it is necessary to look for the possibility of creating artificial reservoirs and basins.

It is very important to provide convenient transport links to residential areas with the city park. A good connection of housing places with a recreation area is achieved by placing the city park in parallel with the settlement and at the central position of the city park in the residential zone.

Parks of residential areas are the most important elements in the system of places of recreation of the city. They are intended for recreation of residents of the whole area during the week and on non-working days, as well as for everyday recreation living in a radius of up to 500 m. This determines the large number of visitors to the park and the need to have sufficient territory for their reception, which according to the estimated standards should be 24-30 hectares. In the planning of the district parks system, it is important to organize green paths of pedestrian traffic from residential development to the park. These paths should be decided as part of the common system of urban and suburban pedestrian roads and serve to unite individual facilities of greening the city.

In order to make the most rational and full use of the natural landscape already at the stage of the feasibility study of the general plan, it is necessary to develop a project of landscape zoning of the city and suburban areas.

Sites of residential and suburban areas, to be greened or preserved on them natural landscape (existing plantations, relief, reservoir, etc.), are established on the basis of consideration of the natural conditions of the area, a comprehensive assessment of its natural conditions, a comprehensive assessment of its landscape advantages and determining the most appropriate functional zoning of the territory, including areas of short and long-term recreation countryside.

In order to choose the territory for urban and district parks, as well as recreation areas at the general plan stage, appropriate maps of the entire planned city and suburban area are required.

Based on the initial data, it should be given a comprehensive geek of the territory with the allocation of sites, especially favorable for the accommodation of recreational areas of the population, and a scheme of landscape zoning should be drawn up.

Depending on the nature of the landscape is determined by the degree of suitability of individual sites for recreation, in accordance with which the following areas are allocated in the city: 1) protected areas with a picturesque landscape, intended for recreation; 2) protected areas with the potential for the formation of a picturesque landscape, followed by use for recreation (the presence of vegetation, rugged terrain, water sources); 3) unsuitable for the construction of the territory. The latter include sit-

es that can be converted for recreational purposes (high groundwater standing, flooded, waterlogged, with a surface slope of more than 20%), or requiring the restoration of a disturbed structure surfaces (ravines, waste rock dumps, quarries of inert production).

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CONCEPT OF PRESERVING ARCHITECTURAL HERITAGE OF BAKU, BUILD AT THE END OF 19TH AND BEGINNING OF THE 20TH CENTURIES

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ABSTRACT

The architectural heritage of Baku in the period under study is in dire need of protection today. Urgent study of the supporting structures of the monuments for their preservation, strengthening, replacement, etc. is necessary. At the present stage there is an urgent need for the conservation of individual monuments of architecture, creation of conditions for their correct use and exposure, measures for the regeneration of the historic environment.

The aim of this study is to develop the concept of preservation of the architectural heritage of Baku, relating to the late 19th – early 20th century on the basis of identifying their condition. The research methodology is based on a systematic approach, which includes the analysis of literary and archive materials, full-scale studies of architectural monuments and surrounding buildings, typological classification of architectural heritage by type, chronology of construction and development of the concept of the historical heritage preservation of Baku of the period under study.

The study of the general condition of the buildings considered in this work allows us to conclude that they are in a relatively satisfactory condition. Some of them have recently been restored. İt is necessary to carry out restoration and rehabilitation works in others. The considered buildings are the most striking architectural monuments of the capitalist period of Baku. Their rehabilitation requires a correct approach, taking into account all aspects of the modern preservation of historical buildings. For the first time, the main directions of the concept of preserving the architectural heritage of Baku of the period under study have been developed. The main concept proposed by R.Mustafayeva is based on the preservation of their historical authenticity, without changing the original idea of the authors of the project. The main proposals and conclusions presented in this paper can be successfully applied in the projects of rehabilitation of historical buildings in Baku. In this article sections 1,2,3,4 were made by Z.Mammadova. Sections 6.7, 8.9 were elaborated by R.Mustafayeva. Section 5 was developed jointly by both authors.

Keywords: Old Baku, architecture of Baku, principle of regulated management, zone of special regime of building, preservation of old planning, concept of preservation of architectural heritage of Baku

1. INTRODUCTION

1.1. During the XIX and early XX centuries, the city began to grow rapidly, going beyond the walls of the fortress walls of Icheri Sheher, within which it existed and developed over many centuries. The demand for buildings of different functional significance served as the basis for the rapid development of the construction of buildings and structures with a new architectural and artistic composition, a different volumetric solution. This led to the need to shape the city in the shortest possible time, erecting new residential buildings and residences of oil magnates, public buildings, markets, passageways, theaters and cinematographs. Due to a certain one-tameness in building up the central quarters and streets of Baku, the appearance of the city was thoughtful and completed [1].

It should be particularly noted that not only new types of public and industrial buildings were built in Baku during this period, related to the development of industry and the new status of Baku. All types of buildings existing there before also developed. There were new mosques, baths, caravanserais and other buildings that had been built here for a long time.

1.2. The graduated Azerbaijani architects and craftsmen such as Z.b.Akhmedbekov, K.Hajibababekov, M.G.Hajinski, Haji-bay Akhundov, I.Kh.Kasumov and many others worked in Baku. A special role belongs to the formation and development of the architecture of Baku of that period in those years to the work of architects and civil engineers - Europeans who received education in Russia or Europe: I.Goslavsky, I.Ploshko, Fon Der Nonne, K.Skurevich, E.Skibinsky, N.Baev, D.Buinov, F.Lemkul, L.Polyakov, I.Edel, A.V.Eyhler and others. [2].

By the beginning of the studied period, the local architecture had a rather high level of development, it consisted of many centuries of traditional construction of buildings from local material and taking into account local natural and climatic conditions. Due to the fact that the invited architects and engineers treated local traditions with special tact and understanding and skillfully used them in their work, as a result, traditional architecture not only did not suffer from foreign influences, but also revealed, deepened, developed in new beauty. As a result of this, it was formed a specific, so-called eclectic architecture of the city of the end of the XIX-beginning of the XX centuries, known as “Baku romanticism”.

2. LITERATURE REVIEW

Among the works dedicated to the history of architecture of Baku in the investigated period, it is firstly necessary to note the fundamental works of academician Sh.Fatullayev. One of his first significant works is the book "Urban planning and architecture of Baku in the XIX - early XX centuries" (1978) [1]. In this work for the first time the stages of development of General plans of the city, architectural and decorative features of the main types of buildings of Baku were investigated, as well as the role of local and foreign architects and engineers in all the above - mentioned processes that influenced the formation of the present Baku. The main positions of this book are reflected in the later monograph "Urban planning and architecture of Azerbaijan of XIX - early XX centuries" (1986) [3], where other historical cities of Azerbaijan were explored in addition to Baku. In the next work of Sh.Fatullayev "Architectural encyclopedia of Baku" (1998) [2], the main buildings built in the investigated period on the historic streets of the city were systematically and methodically studied. Very relevant is another fundamental work of Sh.Fatullayev "The Architecture of Absheron" [4], which reveals in bright colors the way of formation a unique architecture, where all studies, measurements, photographs of peculiar and unique architecture of Baku villages were collected and demonstrated. And, finally, several books of Sh.Fatullayev published in the last few years are devoted to the study of creativity of architects I.Goslavski, I.Ploshko, which vibrant works are landmarks of the city today[5,7]. It is also necessary to emphasize the recently published five-volume book of "History of architecture of Azerbaijan" (2013) [7], where one of the volumes of this fundamental modern research (R.Abdulragimov, N.Abdullayeva) devoted to the study of architecture of the early capitalist period (XIX – early XX centuries). This work reflects the aspects of development and formation of architecture of Azerbaijan and Baku in XIX - early XX centuries which were collected earlier, revised and supplemented with new modern research.

However, despite the large number of multilateral studies, which mainly cover the architectural and urban aspects of the above period, it have not been studied issues of today's correct use, both individual monuments and the historical environment as a whole; issues of heritage conservation, the necessary measures for the regeneration of the environment, the creation of protected areas, the correct exposure of monuments. However, it is obvious, that the study of these aspects, the study and classification of different types of buildings and structures, the study of similar monuments, and the development of recommendations for their adaptation and modern use, will reveal previously unexplored aspects and will serve to preserve the architectural heritage of Baku.

The current state of the studied monuments highlights the need for speed repair and restoration work on many of them. In this regard, the study of the constructive and decorative features of structures, the regularities governing the construction of parts of a building, their proportionality and mutual subordination becomes especially relevant. In order to carry out a competent restoration, while preserving the authenticity of the building, it is necessary to properly study the characteristic features of various structural elements, the most common methods and methods of their construction.

1.1 Having studied in detail the problems related to the preservation of the architectural monuments of Baku, built in the late XIX – early XX years, we can try to develop a concept of further protection of monuments, as well as their protection from the harmful effects of human factors and natural aging. In the era of globalization, architectural heritage is known to undergo even deeper and inevitable changes. However, adapting monuments to modern, incredibly fast changing requirements and trends, it is necessary to remember that architectural monuments — in general, it is our history, our heritage, which we are obliged to pass on to the next generations.

1.2 The architectural heritage of the late XIX - early XX years is a special historical and architectural layer, indicating a very important historical stage in the life of the country and the city of Baku, in particular. This is not only an object of tourism, but also a reason for self-esteem and gratitude to those who built and preserved a heritage for the people. The loss of architectural objects is irreplaceable. Not a single super modern building constructed according to the latest methods and technologies can replace an architectural monument that has grown old for many years of operation. The destruction of even the smallest object of architectural and historical heritage will inevitably lead to the loss of a certain historical period in the life of the country and the people [8].

1.3 The image of today's Baku creates not only its location as an amphitheater in the colorful by of the Caspian Sea and modern buildings and structures. Baku is first of all a historical center, and not only Icheri Sheher, but also all the many historical architectural buildings that have survived to the present day. In this regard, in the first place it goes the maximum preservation of the authenticity of these buildings, timely research, as well as their use in modern conditions in order to prolong their life.

The situation with monuments is worsening every day, and often the situation is aggravated, primarily, with improper operation and defective repair, as well as the violent destruction of monuments due to the incompetence of those responsible for making such decisions. On the other hand, the development of a proper and comprehensive planning strategy for the protection and research of monuments, the creation of mechanisms for regulating controversial moments when it is necessary to resolve the issue of demolition, or repair, restoration or conservation of a monument, can not only prolong its life. As indicated in a similar heritage conservation strategy developed in St. Petersburg: The strategy is designed to provide semantic, legal and procedural aspects of transforming and improving the urban landscape, the essence of which is defined by the formula “conservation through development, development through conservation” [9].

3. MATERIALS AND METHODS

The following scientific approaches were used in this study:

1. The systems approach – studying the impact of new construction and urban development of Baku on the state of Baku architectural monuments.

2. The space-and-time approach – characterizing the transformation of architectural heritage in the course of time.

4. METHODOLOGY

The study used general scientific methods (theoretical analysis and synthesis, systematization and typification) and special methods that are typical for studies in the field of history on architecture, in particular, field and desktop methods (analysis of library and archive historical, cartographical, and literary material on the history of formation of the historical heritage of Baku).

5. RESEARCH OUTLINES AND APPROACH

5.1. In this study, authors have made an attempt to develop a concept for the sustainable development of the architectural monuments of Baku during the study period. The authors believe that consider it necessary in this concept to pay attention to:

- disclosure of the role and importance of buildings build during the study period;
- determine their current state and current use;

- depending on the preservation of the architectural heritage, conducting a typological classification of buildings
- objects of architectural heritage by type, chronology of construction;
- identification of negative examples of modern use of monuments;
- an attempt to develop recommendations to solve problems arising in connection with the protection and use of the architectural heritage of Baku. To this end, develop a concept of preserving the architectural heritage on the example of buildings in Baku built in the late XIX-early XX centuries;
- development of recommendations on the creation of buffer zones of historical parts and the definition of their borders;
- development of project proposals for the preservation and use of some of the monuments of the city of Baku through their modern reconstruction and restoration.
- creation of mechanisms for regulated impact on the preservation of monuments. Preservation of monuments should be carried out by the competent authorities [10]. Not only must a legal basis be developed for making timely decisions about certain measures for the protection of the monument, but there must also be sufficient opportunity for the practical implementation of all the necessary measures [11].
- development of basic measures for the study, protection and further use of monuments of the period. Despite the long-term and repeated studies of the monuments of the period studied by many scientists of Azerbaijan, there are still some aspects that need to be addressed. In addition, the strong deterioration and old age of many monuments require a more thorough and periodic study of monuments with a view to their protection. Here, an important role is also played by the polarization of monuments, their correct use, the adaptation of monuments with possible changes to the original functions, etc. All these issues should also be strictly regulated. Decisions on them should also be made by competent professionals. For example, the situation with many residential buildings requires urgent intervention, in which, after alterations and division of apartments into smaller ones, an unhealthy and inconvenient environment has emerged for many years. Residents make attempts to independently equip housing, which leads to even more disastrous results in terms of the preservation of the monument. For this purpose, the authors of the article conducted a study of the historical street of S.Tagizade which is dominated by the monuments of the study period and allocated the buildings according to chronology, purpose and function. (Figure 1) They also made project proposals for conservation, regeneration and further use of these buildings. (Figure 2)

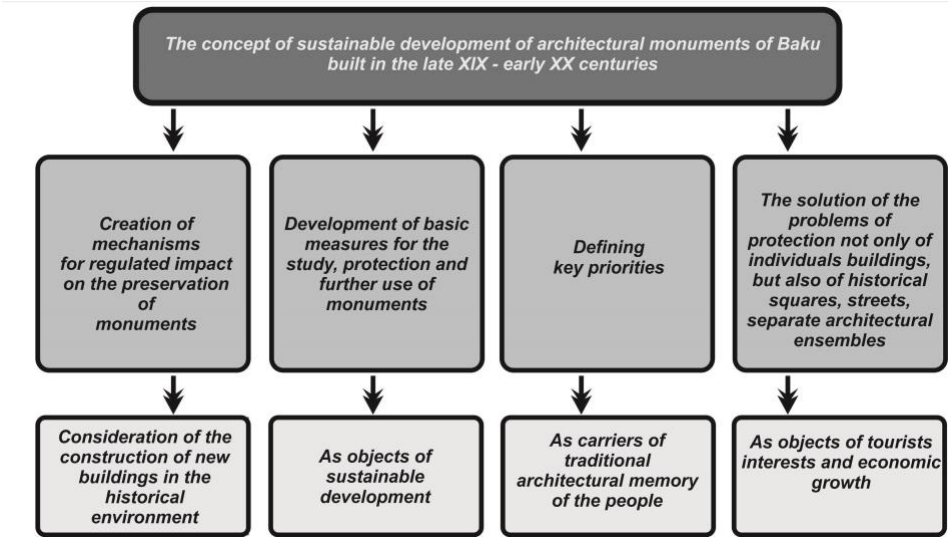

Fig 1. Main requirement of sustainable development for reconstruction architectural monuments

5.2. One of the important concepts of the sustainable development of monuments of architecture of Baku of the studied period is the study and solution of the problems of protecting not only individual buildings of this period, but also historical squares, streets, separate architectural ensembles. Here it is necessary to note once again the fact that the majority of the investigated buildings are located on the historical streets and squares of the city. These buildings, in fact, formed squares and streets. Very

often they were created at the same time, and even if not, special attention was paid to the construction of each new building to the issues of interconnection of the building with the existing environment. Of course, the age-old history of their existence and use modified somewhere their appearance, negatively or positively. Today it is especially important to reduce the negative factor and try to return the original historical environment as far as possible. The question of the subordination of buildings to the scale of the surrounding buildings is very important here, as well as the ability to perceive buildings in a historical environment without parked cars that interfere with the view. This applies to all narrow historical streets, such as S.Tagizade, M.Subhi, A. B.Guliyev and others.

– Consideration of the construction of new buildings in the historical environment. In this regard, the development of new security and buffer zones is of particular importance. As it was already noted, at present the mechanisms for regulating protection and buffer zones work, unfortunately, very poorly. In the historical environment, new buildings are built, with their own style, scale, and proportions that destroy the integrity of the historical image of buildings built during the periods under study. A striking negative example is the new building in the immediate vicinity of the mansion of A.B.Guliyev, the building of the Rothschild office and the prospective mansion of M.Mukhtarov.

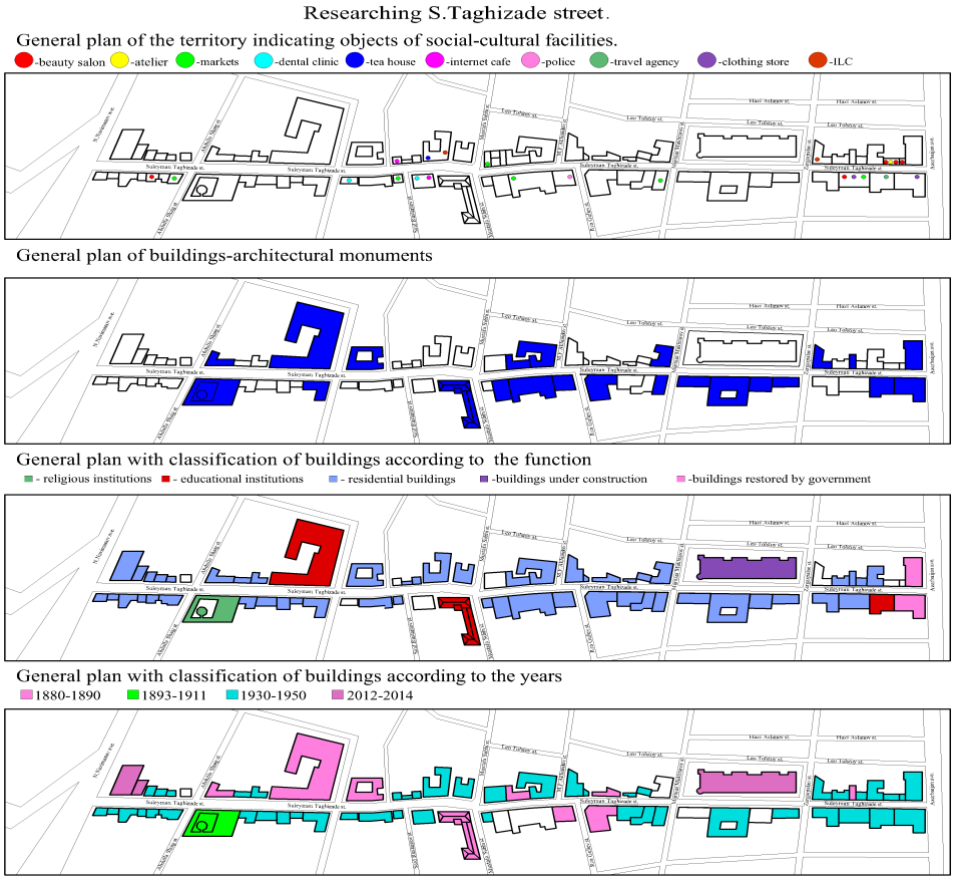

Fig. 2. Project proposal of preservation of architectural heritage

– When creating the concept of architectural monuments of the study period, it is necessary to consider:
– As objects of sustainable development, since the objects of this traditional culture are the memory of society, this is evidence of the adaptation of people living here for centuries to the environment, the result of using local climatic conditions and building materials to create a specific architecture characteristic of this region.
– As carriers of the traditional architectural memory of the people, since the architectural monuments of the period under study characterize the history of the city and country, the mentality of the local people, the tolerance of the people, the continuity of traditional values.
– As objects of tourist interest and, accordingly, economic growth, since these buildings attract tourists along with modern architectural achievements. Perhaps tourist interest of this kind is not

accompanied by immediate economic benefits, however, it is this “contrast” of the city, where, along with modern ones, there are a large number of buildings from different historical eras, and it attracts people [12].

Fig. 3. Mansion of M. Mukhtarov

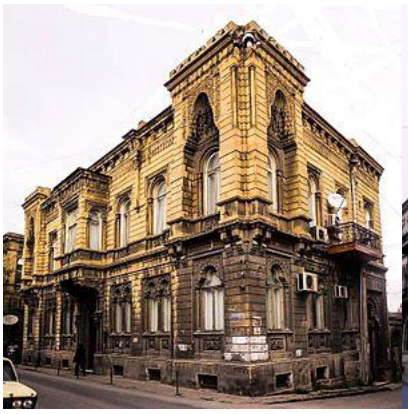

Fig. 4. Mansion of A.B. Guliyev

Fig. 5. Office of Rothschild

6. STUDY AREA

Taking into account the number of monuments to be protected, as well as a wide range of various problems related to their preservation, it is necessary to develop the sequence of events held on the monuments for their protection. A positive example is the restoration and adaptation of large public and residential buildings of M.Mukhtarov’s mansions (Figure .3,4,5) and G.Z.Tagiyev, Fon der Nonne’s houses, passages, etc. [13]. Further, it would be worthwhile to draw up a plan of measures, determining the degree of priority of conservation measures being carried out. For example, it seems to us that, first, it is necessary to carry out the restoration of buildings located on the ring road around Icheri Sheher, where many buildings have been restored, and some facades have been renovated. However, here we are talking about the targeted regeneration of the street with the complete restoration of buildings and the strengthening of their carrying capacity. The same should be done with all historical streets. This will prevent the buildings from being separately snatched from the context of the historical environment. After this, it is necessary to refer to the buildings located in the depth of development.

7. PROBLEM

These problems have been touched upon in some studies, where the development of the security zone around Icheri Sheher, it was stated that "...in the case of Icheri Sheher, the problem of the correct definition of the area of the zone, as well as its proper functioning is complicated due to the fact that the objects included in the zone are themselves architectural monuments. That is, each of the monuments included in the protected area should also be in turn protected. In addition, the view of the fortress walls of Icheri Sheher opens not only from the ring road around it, but also from perpendicular streets, such as Azerbaijan Avenue, M.Mukhtarov and B.Sardarov streets. According to the requirements for maintaining the scale, height, structure and layout of these streets are increased, since any introduction, distortion can lead to disruption of visual connections" [14]. First of all, of course, the buffer zone should include areas directly adjacent to the monument, preserving the building, creating a favorable environment for its perception. Then, by comparing the data obtained with the current situation, it is possible to determine which elements of the surrounding buildings, which visual connections of the monument with the environment correspond to the previously existing aesthetically valuable qualities of the urban situation and therefore they should be preserved. In addition, it is necessary to establish that in modern buildings it prevents the perception of the heritage, which is required to be abolished during reconstruction. The resulting support plan shows those sections of the area around the current protection zone, which should also be included, since they affect the perception of Icheri Sheher from the side of the ray-diverging streets. In accordance with the proposed

project, in addition to the buildings directly adjacent to the fortress wall, or replacing it (i.e. the existing security zone of Icheri Sheher), the new buffer zone also includes monuments located on the other side of Istiglaliyet, Niyazi, A.Aliev, ordinary (background) buildings behind them, as well as, Azerbaijan Avenue, M.Mukhtarov, M.Rasulzade streets, national Park – Boulevard, fountain square. I would like to note that such a buffer zone meets the standards of world practice. A building control zone is created around the security zone. It covers, as a rule, quite large areas. In the zones of regulation, there are areas called the zone of strict regulation (sometimes - the zone of special development regime). During construction, it is necessary to preserve a large number of various historical compositional regularities on them: the preservation of the old layout, low-rise buildings, the old principles of silhouette formation, etc. The most important of these areas are recognized as protected. In such territories, when addressing the relationship between the old and the new buildings, the proportional, large-scale ratios of old and new buildings should be taken into account. Below are the main directions of the concept of preserving the architectural heritage of Baku, built at the end of the XIX-beginning of the XX centuries. (Figure.6)

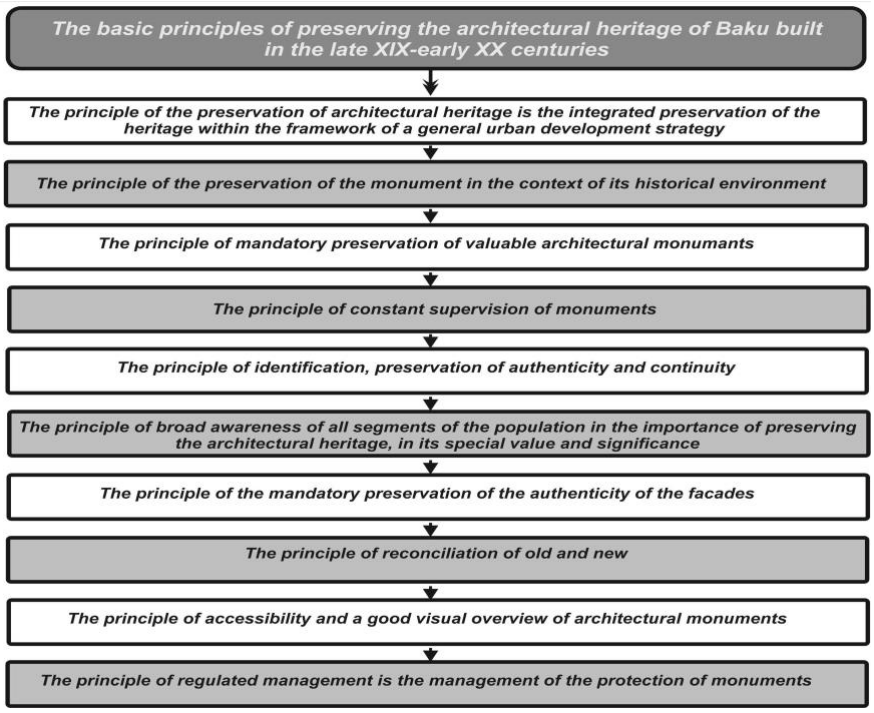

Fig. 6. Main directions of the concept of preserving the architectural heritage of Baku

1. The main principle of the conservation of the architectural heritage - integrated conservation of heritage within the overall city development strategy.

Monuments cannot be legally preserved separately from the country's policy on the development of the city of Baku. A common strategy must be developed. Historical architectural monuments should act in this regard from the point of view of all the above-mentioned characteristics. Preservation of architectural monuments should become the main object of the urban renewal strategy. Thus, the preservation of monuments should be studied not only by the relevant structures, such as the Ministry of Culture and Tourism, the newly created structure for the protection of monuments or the Scientific - Research and Project Institute "Azerberpa". All structures involved in issues of urban planning and architecture, economy and industrial development, transport, landscaping, legal services, etc. should feel responsible and solve their problems taking into account the preservation of monuments.

In the world practice of preserving monuments of architectural heritage, it is proposed to replace priorities in the protection of monuments from “saves from …” to “save for ...” [9]. This is due to the fact that in the first case there is a system of prohibitions, when the population is not motivated to save, the second approach, on the contrary, implies joint participation of all members of society in the protection of monuments and should lead to the recognition of common responsibility for the preservation of heritage.

2. ***The principle of preservation of the monument in the context of its historical environment.*** The specificity of Baku lies in the fact that individual historical objects formed quarters, streets, squares (as discussed in Chapter 2 of this study), and where changing each building invariably leads to a change in the historical town-planning structure of the whole block, street or square. In this regard, it is very important to review and approve the buffer zones of objects. In world practice, when creating buffer zones of monuments, complexes or areas, in addition to the well-known radius calculation, depending on the height of the protected object, the principle of "view ability" is applied - even outside the calculated distance, it is necessary to preserve the historical building, the monument's view ability. That is, the points of view, the composite connections of the monument with the surrounding objects, altitude and scale should be taken into account. Protected areas are a very important method in preserving heritage. They set a regime prohibiting new construction (with the exception of measures aimed at regenerating the historical environment and adapting architectural monuments); a ban on changing the historical planning structure of streets and neighborhoods; strict restrictions on the reconstruction of objects of historical and cultural value (buildings, facades, squares, etc.).

3. ***The principle of the mandatory preservation of valuable architectural monument***. Even in the case of a severe deterioration the architectural monuments of this period should not be destroyed, they should be preserved at least in their present form. The best example in this regard is the house of Hajinsky, who was badly damaged after the earthquake, but was completely strengthened while preserving the facade. It is also necessary to note here the flagrant fact of the destruction of a large number of architectural monuments in the area of the former Sovetskaya street called emergency and not having architectural significance.

4. The principle of constant supervision of monuments to be able to carry out the correct restoration, conservation, repair, etc. In this regard, it is necessary to note the general measures to slow down the processes of natural aging of monuments and under the influence of natural and climatic factors:

- Reduction of pollution by cleaning the facades with special modern methods harmless to the building and their subsequent coating with an encaustic solution in the form of a film protecting the surface from contamination for many years. This will also entail a reduction in damage to buildings, penetration of vegetation, microorganisms; (there is foreign experience). This method is used in the cleaning of monuments in the historical part of Vienna, in some Italian and Russian cities [15, 16].
- Reduction of vibration sources from transport. To limit vibrations from the metro, it is proposed to use special devices for load distribution on the foundation. It is also necessary to limit the impact of conventional auto transport, to close the traffic on the most valuable streets and squares, to exclude arbitrary parking, etc. for example, it should be noted the negative impact of the last two years of Formula 1 competitions. Exposed to many times higher than normal vibration rates from transport, loads, monuments lose their stability [17, 18].
- Correct and effective use of monuments. Even in the case of changes in the original function, the building should be used so that, firstly, to minimize the introduction of its structure, associated with the necessary alterations, and secondly, not to contradict the safety of the building and worthy of it [19].
- Use in the repair, restoration and conservation of architectural monuments, only proven high - quality materials corresponding by physical and chemical characteristics of the materials of the building. Any new implementation should be strictly controlled and regulated.
- Strict regulation of various implementation in the building surface such as: wires and cables, cords, cameras, antennas, air conditioners, communication pipes, plates, etc.
- Timely elimination of minor problems-strengthening of doors, windows, etc.
- Systematic fire-prevention supervision.

5. ***The principle of identification, preservation of authenticity and continuity*** is based on the understanding and constant study of the main characteristics of traditional features of architectural heritage with their subsequent use in new construction. The basis of this principle is the understanding of the importance of preserving the original appearance of the building without changing, understanding the principles and methods of its construction in order not only to preserve the monument, but also to be able to repeat it as a model of a traditional building. In this regard, it is

especially necessary to dwell on the need to create a special school of restoration, workshops, where it would be possible to conduct research on the design and decorative features of individual monuments, repeat them in new buildings, but also to carry out the restoration of individual sites, etc. The initial example of such workshops takes place in Icheri Sheher. The workshop for the study of objects of art was created by the Icheri Sheher Administration and successfully operates to promote the art of Azerbaijan, creating souvenirs and crafts. It would be desirable that the similar workshop on production of architectural details also took place. In addition, it is necessary to create a restoration school to create professional staff in the field of practical restoration (artisan workshops). It is possible to create master classes of local and foreign experts. You can create tourist routes on the monuments of the study period. It is necessary to create a map of the location of all the monuments of the 19th and early 20th centuries, avenues, brochures that will allow them to be promoted not only among the guests of the city, but also among its permanent residents.

6. ***The principle of wide awareness of all segments of the population in the importance of preserving the architectural heritage, its special value and significance.*** This is a very important aspect, because very often the issues of heritage protection in fact concern only those who are on duty doing it. Ordinary people, even those who live and work in architectural monuments, do not understand the value of monuments, and as a result, do not monitor the safety and they are subject to destruction. In this regard, it is necessary to raise the issue of bringing to justice those who clearly or not damage the monuments.

7. ***The principle of the mandatory preservation of the authenticity of the facades***. This principle follows from the previous one and is connected with the lack of understanding of the importance of preserving the authenticity of buildings. However, the problem here is much wider. Very often, residential buildings, as well as office premises, are modified by homeowners, the first floor of buildings and public buildings acquire advertisements, extensions, etc. All this, of course, negatively affects the integrity of the building's appearance, modifies its original appearance. It is unacceptable. However, to solve the problem today due to its wide scale, to eliminate the results of this so-called "remake" can now only be made with the involvement of administrative structures, holistically [11].

8. ***The principle of reconciliation of old and new.*** Since Baku is a large, constantly developing city, it is impossible to stop the process of its expansion and the construction of new buildings even in historic buildings. The city cannot be conserved and should not turn into an open-air museum where all development and life in general will be stopped. However, this process must be regulated and strictly scheduled. As mentioned above, conservation areas and regulated development areas should be defined. Each new building should be skillfully integrated into the existing historical building by means of harmonious inclusion "from complete dissolution" of new architectural volumes, materials and colors in the environment to the methods of "counterpoint", all kinds of stylizations and recreations by means of new construction, new technologies and materials" [9]. New construction should in no case threaten the physical condition of the neighboring historical buildings either visually (aggressive, inconsistent scale, styles, etc.) or technically (excessive pressure on the foundation and base, etc.).

9. The principle of accessibility and good visual overview of architectural monuments. Since most of the monuments of architecture of the period under study are located on the narrow historical streets, their review is now very difficult. Very often these streets are a parking place. It is very important to review the transport grid of the city for the unloading of some streets with particularly valuable monuments of architecture, to regulate or completely prohibit traffic and parking. In addition, if possible, it is necessary to create open spaces-squares, etc. in order to open an overview on some monuments. This can be done by demolishing dilapidated low-value buildings. In this case, a special threat is the desire to build a large multi-storey building on any open space, which not only closes the historical building from people, "presses" on it with its inappropriate scale and proportions, but also creates a threat to the foundations, communications, etc.

10. The principle of regulated management-management of monuments protection. Once all recommendations have been developed, a mechanism for their proper functioning and implementation should be established. This mechanism includes both legal measures-punishments, impacts, etc., and real measures to implement the principles of safety. An example of such a management plan was drawn up in the early 2000s in the Administration of the State historical and architectural reserve

Icheri Sheher with the involvement of foreign experts. Drawing up the management plan was one of the conditions for the inclusion of Icheri Sheher in the UNESCO World Heritage list in 2001[20].

8. OUTCOMES AND REMARKS

Thus, the following measures for research, analysis and preservation of monuments of the architectural heritage built at the end of the 19th – beginning of the 20th centuries are particularly relevant today: analysis of the list of monuments, correction and subsequent inventory; constant supervision of destruction processes; studying the causes of destruction and ways to eliminate them; formation of a unified database of historical and cultural heritage with a constant update based on the results of photo fixation of the current state; the creation of a legal and administrative framework for the regulation of all the above processes for the preservation of monuments.

In addition, it is necessary to develop special events and routes to familiarize the local population and tourists with the rich architectural heritage of the study period. The rich experience of such events and tourist routes is widely used and promoted in the world practice of tourism [12]. We also have certain experience in Icheri Sheher. Various holiday celebrations, exhibitions and tourist routes can be used to promote the monuments in various historical streets, squares, various authors, etc.

Neither in domestic nor in world practice there are eternal methods of conservation. The main task is to suspend the processes of natural aging and wear, to minimize the factors of their acceleration. The processes of natural aging are determined by the life cycles of buildings and building materials, the limits of safety of operation of structures. The lack of proper protection of buildings and structures from natural and climatic conditions, techno-genes load on soils and structures, gas pollution and acid rain, the release of such pollutants as sulfur oxide and nitrogen oxide create a cumulative effect. The processes of corrosion of metals and carbonization of plastering layers are intensified, the “wild” loose patina corrodes bronze and copper surfaces, the abrasive effect destroys gilding, stone and marble are reborn, groundwater destroys foundations, biological damage spreads to wooden structures [21].

Today there are two main trends in the preservation and regeneration of historic streets in Baku. One of the trends can be seen in the demolition of all low-value buildings and the construction in their place of buildings in the style of pseudo-classical, which was so popular, and we love customers mansions in the late XIX-early XX centuries. The second trend is facing all the uninteresting facades of buildings built in the Soviet period with local limestone, widely used in construction and that period. In addition, the pitched roofs with domes are often attached to these buildings, although most of the historical buildings of this period had flat roofs in favor of local climatic conditions. However, it is not difficult to notice that some buildings also had pitched roofs, for example, in the building of the Tiflis bank, etc. It should also be noted that some buildings reached the revolution unfinished, without roofs. In this regard, I would like to note that such an update of the facades by “faking” historical facades is at odds with the requirements of modern restoration, designed to preserve, but not update or conjecture the original intent of the restorer. Of course, in the conditions of historical Baku, where the buildings were built in different styles (as it was already investigated in this work), it is not difficult to fit the new building in any of the styles into the surrounding historical buildings. However, it is unacceptable any attempt to present a new building as a historical, original tendency to “age” a modern building, to fake its original appearance.

A few words must be said about the courtyard interior facades of the buildings considered in this study, especially residential buildings. Very often, only street facades undergo renewal, restoration and other measures to preserve facades, while internal facades are in a completely unsatisfactory condition. It is necessary to dismantle the balconies and other outbuildings attached to the buildings during the long years of life, and return the buildings to their original appearance whenever possible. Yards should be made green and landscaped, and also it is necessary to plant greenery and flat roofs of buildings.

In recent years, work has been carried out to preserve the architectural heritage. Among them there are successful and unsuccessful examples. One example of the successful preservation and adaptation of the historic building in Baku is the restoration of the Lalaev`s passage. The building has two floors, there is also a basement. For many years, the building was used as a Gastronome number 1. And only

the fifth part of the building, consisting of a large number of premises, was used as objects of trade and public catering. The second floor was half filled with residential apartments and a hotel with 20 rooms. If at the time of the research, prior to the restoration and adaptation of the building, the first floor and basement were in relatively satisfactory condition, the territory of the second was in disrepair. After the fire in 2008, the roof and the entire ceiling were completely destroyed. Thus, for several years the premises of the second floor were under the open sky, which adversely affected the condition of the supporting structures. Auxiliary premises of the building were used without taking into account the norms for the use of a historic building, sewage wastes were merged into the basement. The building was saved from total destruction only by the cross-vaulted ceiling structure.

In this area there was a high level of groundwater. As a result of the constant presence in case of high humidity conditions the arches, columns were damaged, they were covered with small and deep cracks of varying degrees of danger. Stucco and other interior decorations were in a threatening state. In this regard, particularly valuable for the monument of architecture was the fact that during the last restoration measures were taken to protect the building from further flooding by groundwater, including drainage and covering the walls of the basement with thermal insulation and waterproofing.

Among the major projects for the restoration and adaptation of architectural monuments built during the period studied in this work there are: the art museum, where a new building was added between the two buildings of the museum (*Fig.5*), the History Museum - the house of H.Z.Tagiev (Figure 6), Wedding Palace- M.Mukhtarov's mansion, etc.

Currently, work is underway on the reconstruction of the Opera and Ballet building, involving the extension of a separate building and the refurbishment of the building itself. Judging by the design drawings, in our opinion, the reconstruction may damage the original appearance of the building.

Fig. 5. Museum of Art (attached new building between the two buildings of the museum).

Fig. 6. House of H.Z.Tagiev

Another example is the movement of a residential building on Fizuli Street closer to the new red line of the street. The movement of the house was carried out by BRESSER (Figure.7).

Fig. 7. Moving the Hajinsky House on Fizuli Street

9. DISCUSSION

This study revealed that the end of the 19th-beginning of 20th centuries is a unique period in the development of Baku architecture and includes mainly of buildings and structures for public and civil purposes. In Baku, and in particular in Icheri Sheher, a great deal of work has been done to preserve and conserve monuments of cultural heritage of world importance. However, the modern approach to the protection of monuments of the investigation period requires an overestimated interest in them, with the use of extended research in many areas.

After comparing the results of this study with other results (St. Petersburg heritage preservation strategy.https:/ / www.gov.spb.ru /gov/ otrasl/c govcontrol/ peterburgskaya-strategy-sohraneniya-kulturnogo-naslediya/; Starchuk M.L. Konsepsiya soxraneniya architecturnikh pamyatnikov v istoricheskoy srede q.Baku (na primere kvartalov mejdu ulisami Y.Mamadaliyeva i M.Rasulsade. dissertasiya na soiskaniye uchenoy stepeni magistra arcitecturi. Biblioteka AzASU – Baku, 2014) the recommendations on the basic principles of preservation of the architectural heritage of Baku built in the late XIX-early XX centuries, which focuses on the integrated preservation of heritage within the overall strategy of urban development, preservation of the monument in the context of historical environment, the identification and preservation of authenticity and continuity, constant supervision of monuments, the relationship of historical and modern buildings, accessibility and good visual overview of architectural monuments, as well as regulated management - management of monument protection are worked out [9, 22].

The validity of the results is confirmed by the processing of a large number of scientific sources and archive materials on the research topic.

The main theoretical and methodological conclusions and recommendations of the presented concept has a scientific and practical value and can be used in the protection, regeneration and further use, as well as for the development of the master plan of the historical part.

10. CONCLUSION

The process of regeneration of the existing historical buildings is complicated. There are several sequentially performed steps. Moreover, each stage is an independent project. At the same time, the bases for the implementation of each subsequent stage are the design developments of the previous one, which are used as starting materials.

First of all, a master plan for the regeneration of the territory (that is, general recommendations for the zone regeneration) should be implemented, the decision of which depends on a number of factors: the historical planning of the territory, the modern use of facilities located on it, the condition of each

individual building, the trends of use and modern functions. This stage also includes the study of the general condition of the territory, problems and destruction. The second stage of design is the project of preserving and adapting individual objects. At this stage, it is developed recommendations on the nature of the work on regeneration. The third stage of designing consists in the improvement of the territories, the choice of the method of further correct use and functioning of the territory as a whole, and of its individual objects in particular.

First of all, it is necessary to establish the strictest security regime for historical monuments. The protection of a historically multi-layered, complex and diverse, internally inconsistent architectural and spatial environment with the preservation of all its components remains a general task. In assessing this environment, not only aesthetic categories, but also criteria for the historical content of the building, which embodied the course of history in its forms, come to the fore. The renovation of buildings, carried out depending on the obsolescence of houses, is carried out by the method of town-planning regeneration, without violating the specifics of the historical environment and the specific situation of the objects of reconstruction.

It is necessary to develop a system of restrictions for regulating background buildings on the basis of its silhouette and connection with the structure of the natural relief, as well as the regeneration of the system of historical dominants and the sign systems of the ancient city, taking into account their continuity when transferring landmarks from the center to the periphery, on the changed system of functional planning foci in the historical part of Baku.

To create a comprehensive program for the regeneration of the historical environment, it needs to master the basics of restoration work and rules, know the essence of modern town planning tasks and be able to find the main links in solving the problem of the urban life of the ancient city.

The problem of using valuable historical and architectural monuments should be the focus of attention in the reconstruction of historically developed cities. Significant progress in this area has been achieved by foreign experts. In this sense, the experience of Italian architects, who do not separate the problem of protection of historical monuments from the problem of their creative use, is remarkable: on the other hand, the problem of protection of a single monument is associated with the problem of the urban environment as a whole [23].

Speaking about the protection of individual objects of the XIX-early XX centuries, we should first of all focus on modern methods for cleaning surfaces (many of the buildings were cleaned, however, with the climate of Baku, after a while, the situation will repeat and re-cleaning will be necessary). Another problem is the redevelopment of the first floors of buildings, which in most cases are occupied by cafes, restaurants, shops, banks. Performed unauthorized, without taking into account the requirements for buildings, architectural monuments, sometimes with violation of standards, has a negative impact on the building as a whole, such redevelopment, if inevitable, should be strictly regulated. In addition, all structures of buildings must be inspected, because for more than a century of existence and most importantly, multiple modifications and adaptations, many of them have worn out.

To preserve structures of historical significance, it is necessary to carry out a set of measures for cleaning, disinfecting and strengthening the stone. In modern conditions, special colorless solutions have been developed that can be applied to the cleaned surface, and which, having a lacquer us dense consistency, protect the surface of the stone from penetration of moisture, plant seeds, microorganisms, etc. (for example, products of the Italian company HUMIDBLOCK, the Austrian company REMMERS, etc.)

Redevelopment of the first floor is possible after a comprehensive assessment of the quality of the reconstructed floor and the social tasks of the reconstruction of the urban area where the building is located, determine the function of the first floor after reconstruction - permanent or temporary housing, an integrated institution. In principle, the way the first floors of the buildings under study are currently used can be considered satisfactory in accordance with the standards, but in each specific case it is necessary to check the objects placed in the first floors for proper adaptation, preserve the old building grid, correct use of existing communications, temperature and humidity conditions, etc. In this regard, it is necessary to note the state of even the brightest monuments used for many years, but not subjected to a thorough restoration. This applies to Melikov's house on I.Safarli, the "Fantasia" bathhouse and others, where, according to the results of our research, there is an urgent need to replace or reinforce structures and carry out waterproofing measures.

The overall goal of all work related to the strengthening of structures - increasing the capital of the building. Therefore, in carrying out work to strengthen the structures of buildings, it is necessary a complete inspection of buildings for endurance of foundations, walls, ceilings, and stairs. Specific activities are assigned depending on the state of the existing structures. The physical wear, the possibility of their enhancement or replacement were defined. Structures are left as they were if their characteristics meet the requirements of strength, stability, durability, moisture, frost and corrosion resistance, thermal, moisture and sound insulation. If in the existing form they do not satisfy the listed requirements and, secondly, when in the course of reconstruction some weakening occurs, the existing structures are enhanced. The reinforcement of structures can be produced: by changing the structural elements themselves, by introducing reinforcing elements into them; the introduction of new designs (additional and parallel) often in a more durable material. In this case, the design system and the scheme often change. Changing the design scheme is possible without additional constructions, if the loads are moved to more durable, for example, self-supporting parts of the building. New constructions replacing worn-out old ones in the reconstructed building can be divided into: made in the same materials, in the same dimensions and forms; made in other materials - traditional or new, in the same or, more often, in other dimensions and forms.

Any new constructions should organically fit into the general concept of the reconstruction of this object in this place and at this time, which means not only does not contradict the architectural and constructive idea of this structure, but also organically develop it. With a significant increase in load in the case of weighting of structures of the house when they are updated or loading superstructure produce reinforcement of soils and foundations.

In the process of adaptation of buildings, the works of various sizes and complexity for strengthening and renovating walls are necessarily included. Before repairing the walls to be preserved, the causes of their damage should be eliminated: water logging (due to poor blind area, damaged waterproofing, faulty drainage from the roof, etc.); inconsistency of bearing capacity of masonry, physically perceived by it loads; uneven settlement of parts of buildings (due to the presence of weak soil or solid inclusion under the middle part of the building or at the end of the building, or when the ground was unacceptably close). The overlap is strengthened by increasing the cross section of the load-bearing elements by unloading with the device for additional support, reducing the span or changing the design scheme.

The reinforcement can be local (parts of the structural element or parts of the whole floor), as well as solid (along the entire element length or floor area in the same room or on the floor). New elements (linings, beams, decks, etc.) are usually introduced for reinforcement. Floor is usually replaced.

All the buildings under consideration are monuments of architecture, and therefore, if they are strengthened, no superstructure is possible, even if it is dictated by the considerations of urban planning and economy. In addition, special measures should be taken to strengthen the foundations that would dampen the impact of vibration on buildings associated with the operation of the metro line in close proximity to the zone.

It seems to us that the landscaping of monuments is very important. The purpose of the improvement of its territory is to create a comfortable living environment. It is achieved on the basis of a complex of measures, taking into account all social processes occurring in a given territory, and the characteristics of the territory itself. Assessment of the level of improvement of the territory can be made on the basis of functional saturation, comfort in use, artistic merit and sanitary and hygienic requirements. Landscaping includes engineering landscaping, consisting of engineering training and engineering equipment; external improvement, consisting of landscaping, organization of traffic and pedestrians, equipping the territory with small architectural forms; lighting; environmental improvement, consisting of the improvement of sanitary and hygienic conditions, measures to combat noise and gas pollution and greening of the urban environment.

Correct measures in this direction will create not only more comfortable conditions for living and living activities of the population, but will also allow a better display of the monument, create conditions for its better visibility and protection. In general, we offer the following measures for landscaping:

Gardening (individual plants in vases and pots before arranging lawns, planting shrubs and trees), depending on the size of the site, exposure to sunlight and specific reconstruction tasks can be arranged on a larger or smaller area, in simple or complex forms. In the areas of historical buildings,

due to the small area under green spaces, it is appropriate to use vertical and container gardening, arrange gardening of roofs, terraces, balconies.

Improvement and landscaping of the area must be carried out taking into account the following rules and regulations (and taking into account the nature of the territory): the width of the pedestrian paths must be a multiple of 0.75 m; the main -2.25-3.0 m; minor ones - 0.75-1.5 m; sidewalks must be at least 1.5 m wide; the main tracks (with a traffic intensity of 100-150 people / h) must have a hard coating (asphalt or tiles), and minor ones - 0.75-1.5 m.

There are also project proposals for the regeneration of the environment of historical monuments. For example, in the study of M. Starchuk, the concept of preserving the architectural heritage was proposed by the example of a historical site, where such architectural monuments as the Northern Bank Building, the Palace of G.Z. Passage and Theater of G.Z.Tagiyev, the building of the Tiflis bank, the residential building of the Adamov`s, the building of the Olgin`s rows, the Lalaev`s passage. In the work of the building it was investigated in terms of the number of floors of buildings, technical deterioration of buildings in percent, periodization of buildings, as well as historical and architectural analysis [22].

The author R.Mustafayeva also proposed conceptual projects of restoration and adaptation of the house of A.B.Guliyev – now the Union of Architects of Azerbaijan (Figure. 3) and restoration of the "Fantasy" bath. In project of adaptation of A.B.Guliyev house it was proposed to retain the current function of the building as the Union of Architects, but there is some expansion of the use for the needs of architects and to use the basement under the creative workshops and master class rooms. [24]. In the project of "Fantasy" bath it is also not offered to conduct global changes and changes in functions. We offer only a thorough study of all facades and especially the interiors of the building, the strengthening of structures and creating the most comfortable conditions for use.

Undoubtedly, the development of tourism is a stimulating factor in the preservation of architectural monuments and it also serves as a financial source for their restoration and preservation. In our country there is a state program to address the issues of tourism. In this regard, it is necessary to approach with particular care to the issue of identifying architectural monuments that can be used in a complex – as a modern organized base of tourism and recreation, and as museums.

In conclusion, it should be taken into account that in this study the basic principles of preservation of the architectural heritage of Baku in the late 19-early 20 centuries were complied, as well as, the modern concept for their rehabilitation based on international experience were developed for the first time.

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BUILDING HOMOGENEITY WITH CLIMATIC FACTORS TO ACHIEVE SUSTAINABLE DESIGN

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ABSTRACT

With the advent of modern architecture and the ever-increasing use of mechanical facilities, the importance of climate in architectural design was underestimated. However, due to reduction of the oil reservoirs and pollutions in cities and the irreparable damage of fossil fuels to the environment, attention to the climate and climate design was restarted since the 1950s. One of the major principles of the sustainable architecture is to consider how to optimally use the climate in architectural design. In other words, the sustainable architecture describes the architectural design with an awareness on the environment. Observing climatic conditions in the architecture will lead to energy saving. Sustainable architecture or, in other words, the same architectural architecture compatible with climate minimizes consumption and allows continued use of natural resources. Today's human beings can have a brighter future by relying on the nature with the unlimited energy. What has been considered in this article is architectural design with respect to the climate and its applicability in the design and construction of buildings considering the latest science and technology to achieve sustainable design.

Keywords: sustainable architecture, climate design, energy use

1. INTRODUCTION

From the very beginning, human being has always been innovating in organizing the environment to meet primary needs His aim was to create an environment to live and meet the physical and emotional needs. In this regard, the Iranian traditional architecture is one of the best examples of climatological architecture that is more desirable to achieve a sustainable human environment and optimal use of natural energies. Due to locating in a good geographic location, Iran has numerous renewable energies. Based on the land divisions, there are 4 sub-districts including mild and humid, cold and mountainous, hot and arid and hot and humid climates. Nowadays, with the use of new materials and scientific and technological resources that are costly and environmentally polluting, it is observed that in some cases, there is no comfort which it is tried to solve this problem by application of sustainable architecture. In general, sustainable design is a kind of interference in the environment that is trying to invent a solution with ambitious, social and economic goals. At a glance, the goal is to achieve balance to provide the quality of their products for present generation and a proper heritage for future.

According to the present century approach and emphasis on the energy preservation and inactive systems for having a clean environment and reinvestigation of the climatic design and principles governing the Iranian traditional architecture is felt in this period. On the one hand, traditional architecture was responding to the needs of the inhabitants and the fact is that it cannot be adapted to the circumstances of time in an appropriate way. Hence finding the rules governing the past architecture and offering a pattern with scientific knowledge on the new materials and with regard to the climatic conditions and the functions that are in the process of technological advancement, it can be said that traditional architecture could be used in new buildings. In this regard, the external form of the architecture can be considered as a new according to the climatic, static, physical, and cultural

conditions which are based on the region traditional architecture. It is a useful and necessary principle in the present era.

Modern pattern designs → new condition effect → analysis → vernacular patterns research

2. IRAN NORTH AREAS AND CASPIAN SEA REGIONS BORDERS

2.1. Climatic condition

This area has high precipitation and it is a green region in Iran climate and it has a lot of rainfall all seasons. In spite of having relatively low width, this border consists of two relatively separated areas. One is a plain area that is in the form of a narrow strip along the sea and the surrounding area, including broad fields and also big cities. The second region is the mountainous area of Alborz Mountains which is covered with woodland.

Weather conditions of this area: High rainfall throughout the year, especially in the fall and winter season, relatively high humidity in the coastal area during the year, temperature difference in day and night- vegetation.

The form of the traditional monuments: due to the high humidity, the buildings have a completely extroverted form. The walls and the fences of the courtyards are short to let the flow of the air. Because of high humidity, no part of the building is located in the basement, because the height of surface water is high and ventilation of the basement space is relatively impossible. The floor of the buildings is separated from the ground and the floor space of the building is up to a level of one to three meters. In this condition, in addition that the floor is cooled by air flow under the flow, the building floor is also cooled and the building is located at a higher elevation and more air flows into inner space. Due to the high rainfall, the roofs are sloped and the wide and indoor balconies are built around the rooms to protect the rain. According to the regional conditions, openings are provided in all directions of the building so that natural ventilation can reach the maximum.

The urban texture: the urban texture of the city is quite open and wide so that the conditions for ventilation are provided and for the creation of open fabrics, the buildings are completely the urban areas are relatively wide, the enclosures are with narrow walls and the alleys are relatively broad.

Building materials: The building materials used in the walls of the body of the building are with low thermal capacity and low thickness. The materials should be selected in such a way that, in addition to being resistant to the high moisture, do not prevent air flow inside the buildings.

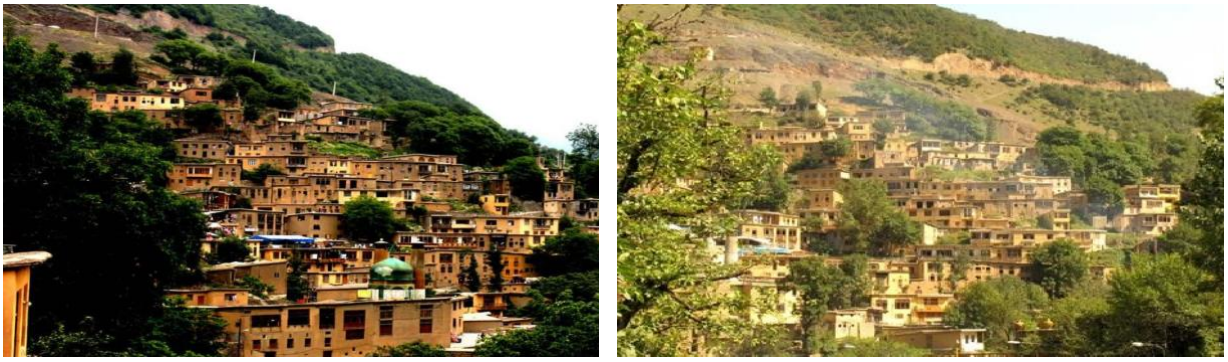

Fig. 1. Urban fabrics of Gilan and Mazandaran. Iran (temperate and humid climate)

2.2. Design proposals for temperate and humid climate consistent with sustainable design

- Building locating and form: the east-west direction of the building- perpendicular on the north-south direction of the lands (according to the daily wind blowing that is mostly in north-south direction)
- Plan proportions elongation line and one layer spaces (locating spaces as a line beside each other) and avoiding nesting and multilayer design of the spaces
- House plans design as one floor or duplex (preferably height expansion)

- Building direction: the studies have shown that the best direction in this region related to irradiation for a building is an open front of south to southeast with 30 degrees inclination from the south with two open fronts of north and south. The wind blows in hot seasons from northeast, north and northwest. The east front and the west and northwest fronts are better to use for services spaces due to being improper in most seasons.

  Building main spaces (setting and main porch) → south to southwest

  Spaces used in the hot season (summer siting and main porch) → north preferably in upper floor

In designing buildings in this area, air flow inside the building should be considered to provide comfort for the residents:

The height of building from the ground is one of the determinant factors of the wind pressure on the building and as result the wind is used for natural ventilation.

The building is placed on the pilot in this region (there is no humidity under the building). Proper direction of the building based on the optimal wind blowing causes to air flow in the space. The building design should provide the possibility of air flow in all rooms, if there is no possibility of creating air flow, large windows play an important role in cooling the air inside the building in the afternoon (creating effective canopy is important for these windows) even using small windows placed in a proper location according to wind blowing can create air flow inside the building. By creating contortion in the façade in front of wind flow, it can create pressure and suction regions and improve the inside air movement. Generally, the effective factors in natural ventilation and air flow inside the building are a) windows location on the façade, b) windows openings, c) canopies situation and shapes, d) windows accessories (curtain, shutter, and etc.).

Better air flow and visual connection with the nature in the yard:

- Vertical sliding windows or double-sided openings in the houses without porches, relatively light windows with lower window height, use of multi-pane doors across the porch to connect to the front of the living room in hot seasons.
- The glazing and open walls in this area should be in the shade on the one side and stream in the air on the other side. The openings should be large with wide canopies.
- Windows to the south and southeast → horizontal sunshade (depth=1.3 of the windows height)
- Windows of the north face → with the canopy near the window
- Windows of the west and east directions → vertical and horizontal sunshades in front of the windows (depth=1.2 of the window height)
- It is recommended that all sunshades or canopies should be horizontal with holes so that the heat accumulated below to expose less in the buildings and the air flows well.
- The openings must be protected in the cold seasons, especially on the west and north fronts where the cold wind is blown.
- Porch element in modern architecture:
- Northern porch: 1- cool in the hot seasons. 2- flowing cold air under the porch into the house.
- South porch (in front of the sun): 1- proper for cold and hot seasons. 2- in the summer, prevent direct irradiation into the house and causes cold air flow inside the home. 3- in winter, the space is usable and according to the inclined sun shine, prevents penetration of the sunrays into the house.

3. MOUNTAINOUS REGIONS AND HIGHLANDS

3.1. Climatic conditions

The Alborz and Zagros Mountains separate the central regions of Iran from the shores of the Caspian Sea in north and the Mesopotamia plain in the west. The weather is cold in this region.

The climatic characteristics of the areas are extreme cold in the winter, mild in the summer, heavy snow in the north and northwest, low humidity, high temperatures difference in the day and night.

Considering coldness in most parts of this region, the maximum use of sunshine, daily temperature fluctuations, and preservation of temperature and prevention of the winter wind in residential areas seems essential.

The form of the traditional buildings: the building form is designed and used in the same way as the urban fabric, based on the climate of the region and to deal with extreme cold.

Buildings with a central courtyard and introverted- relative to the building external level with low volume building-low rooms height, the roofs are mostly flat without slops in order to remove snow easily and increase absorption of sunrays. The buildings form is cubic and rectangular with eastern and western elongation. By construction of some parts of the house in the basement, it helps adjustment of the space air. Due to high thermal capacity of the underground soil, the basement is warmer in the winter and cooler in the summer.

Urban and rural fabric: in contrary to the southern borders that the residential environment is susceptible to the heat and air, here cold weather is the determinant of urban and rural texture. In these regions, the urban and rural areas are small and closed and the fabric is dense and connected and the sunshine direction and the land determine the manner of establishment, extension and general appearance of the city and village, alleys and hills parallel to low altitude and very low temperatures with cold weather in the area. The urban spaces are enclosed and small enough to lessen the flow of cold winds. In addition, the heat on the surfaces of the walls causes to balancing cold weather in the urban spaces and smallness of the urban spaces is considered as an advantage.

Building materials: in the cold climate, especially in mountainous areas, the body and walls were often constructed from the stones. Due to the stone heat transfer, it is not very reasonable. In most buildings, the walls have a high thermal capacity and utilization of stone in the foot of the adobe walls is a proper solution and these traditional buildings are weak against earthquakes.

Fig. 2. Urban fabric in cold and dried climate

3.2. Suggestions for designing for cold climate consistent with sustainable design

In order to use the energy of the sun in a cold weather, it is necessary to have elongation of the main part of the building in the eastern and western direction. In less cases, the building rotation toward southeast is better that it causes that the building uses the morning sunshine more than afternoon sunrays and the building absorb the heat early. The building rotation toward the southwest causes that the morning cold air is to be preserved more and the afternoon heat until sunset. Thus, the best solution in this climate is south and southeast direction. It is better to place the walls and main windows in the south direction (Inactive use of sunlight).

- Cubic plan of a two-floor building is optimal since by sharing the ceilings and floors of the buildings in the external surface reduce the energy waste. It should be pointed that the low significant spaces should be placed in the side that the wind blows in the winter. The doors and windows should be located in the side that the air pressure is minimum. The building basement meets most climatic needs such as thermal control and preservation against wind.
- Construction of buildings with several floors with limited plan that is better than one-floor and wide building. In this case, the facades in front of wind should be controlled by wind catcher.
- More extrusion on the facades acts as wind catcher and prevents air monotonous flow and cause disturbance in wind flow. Thus, a flat and uniform façade is better.
- Construction of a greenhouse connected to the building in the facades in south direction is recommended besides thermal insulation on the windows at night.
- Open and transparent walls in this region should be exposed to sunrays on one hand, and they should be protected from cold winds on the other hand, the openings should constructed in low amount in eastern, western and northern fronts in order to be protected by insulation and the south and southwest windows should have horizontal sunshades.

– Increase of the window area to the wall plays an important role in energy consumption according to orientation of the windows (thermal resistance of the double glazed windows is twofold more than other windows).

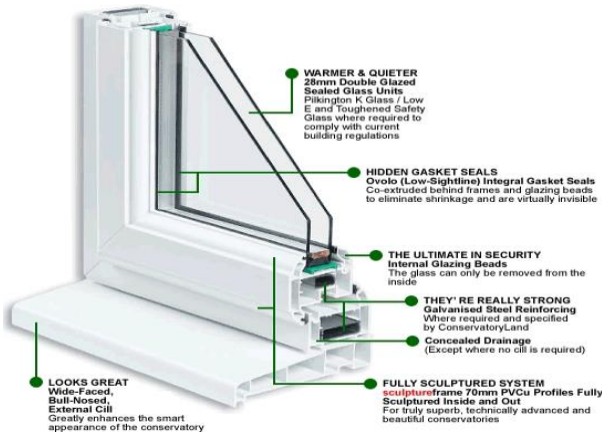

Fig. 3. Double glazed windows details

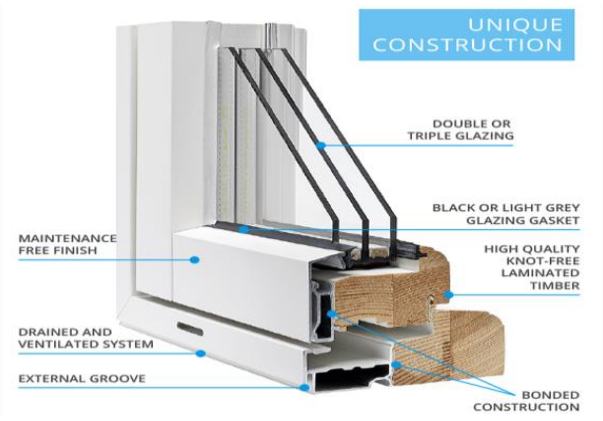

Fig. 4. Triple glazed windows details

– Materials of the building external part should have the highest thermal resistance such as light concrete (insulating concrete, gas concrete, and fine-grained concrete).
– Since the building external façade should be insulated against thermal conduction in the cold climate. Thus, sunrays absorption by the non-transparent surfaces is not correct. The best solution is using the solar windows and collectors.
– Due to the cold weather, the building wall must reduce the thermal conduction, the spaces should have capacitance walls with high thermal delay or have thermal insulators in the external facades. The walls ought to be constructed with high thickness materials u<1 and for the ceilings, u=1. Using the materials with high thermal capacity in the floor and walls in front of sun is recommended.
– All external surfaces should be covered by dark materials with soft texture, unless the inside and outside thermal exchange to be stopped by thermal insulator.
– In the design of the enclosure and the surfaces adjacent to the windows, reflective materials are used to increase the reflection of the sunrays and the reflective the surfaces should be used in the floors leading to sunshades, porch and greenhouse connected to vacant space.
– The static solar shades and passive systems can be used in designing of the building such as:
– Solar windows that are located in the south facades and the sunrays enter directly into the inner space and it is a space for absorbing energy.

The vented well collects and save the heat energy indirectly. The solar energy enters to the materials between the inner space and energy resource and then absorbed and then transferred into the inner space (in vented type, 20 and 50 valves are used in up and bottom).

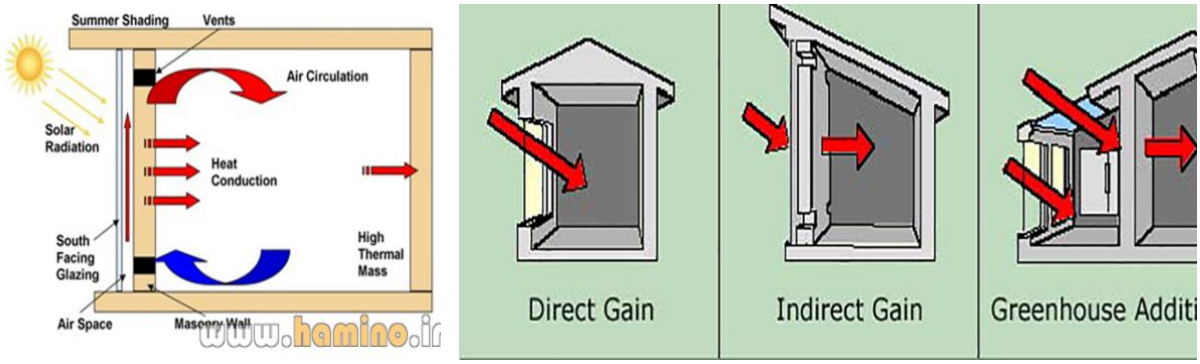

Fig 4. Vented wall detail (appropriate in the cold weather)

The hydraulic wall and roof: water is used as the thermal mass and this wall by displacement and the masonry wall is displaced as thermal conviction. The water bags are used on the roof and the heat is preserved and dissipated.

Greenhouse (using photovoltaic plates): it is a glass space that acts separately and it is located in the south wall with east-west direction.

Thermosiphon conducts absorption and disposal of energy and there is stone mass instead of shading space and liquid tank that absorbs the energy and it is usually located under the interior main spaces and connects to the inner space by channels.

4. PLATEAU PLAINS

4.1. Climatic conditions

Plateau plains, considered as the main part of Iran, are located in the central and eastern parts with hot and arid climate.

The general climate characteristics are as follows: hot and arid weather in the summer, cold and arid in the winter, very low precipitation, very low humidity, very low vegetation, high temperature difference day and night, winds with dust in the desert areas, high day and night temperature difference.

Due to the above climatic problems, the traditional architecture with thousands years' experience has provided rational solutions for pleasing life in these areas.

Buildings traditional forms: the general form of the building is completely introverted and enclosed, all the buildings have a central courtyard (except bath) and they have a basement, a porch and a wind catcher, the floor of the building, especially the courtyard is lower than the passageways. The height of the rooms is relatively high and the dome and walls are large. Creating a central courtyard in the middle of building and placing a basin water and construction of garden have increased the moisture content of living environment. By placing all openings in the yard and blocking the external walls (except at the entrance), the connection between the inner space and external space has been interrupted and a small climate for human beings has been established in the hot and arid climate. Using four seasons' houses in this region is meant that in the winter, the rooms in south and in the summer, the rooms in north are used and the living place is adjusted to the climate. Using the garden hole by increase of the yard wall height and as result, increase of the shadow height is done for preserving the cool air in the yard during day.

Urban fabric: urban and rural fabric is dense and the urban spaces are enclosed and the alleys are narrow and regular sometimes covered by vaults, the buildings are connected and the biological complexes are based on the sunrays and wind blow directions. It should be said that in this region, the buildings are connected to each other. The alleys are narrow with high walls located in the broken line that there is no enclosed space.

Materials: the materials used in the walls are mainly mud and adobe (due to soil high thermal conductivity) and the domed and arched ceilings are common with vernacular materials. In addition to creating shade on the domes, these materials casus shadow around the dome and more sunrays reflection and reduction of thermal absorption.

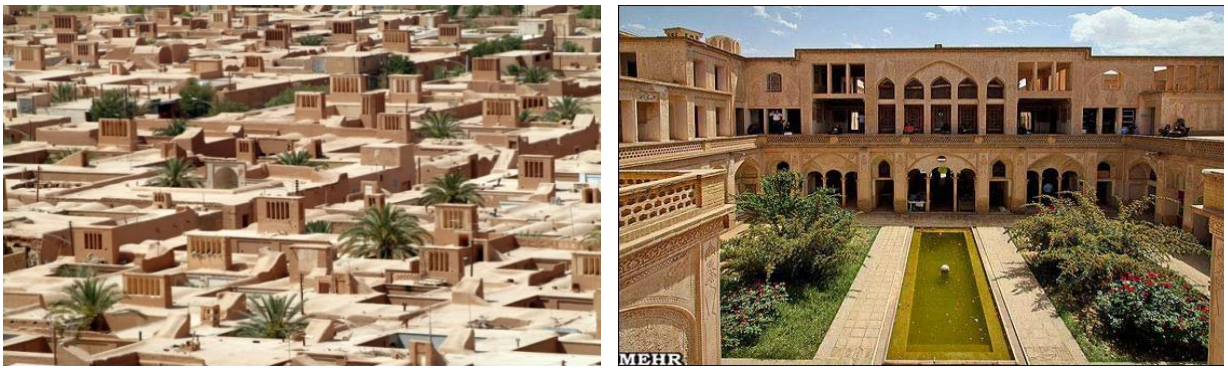

Fig. 5. Yazd urban fabric (hot and arid)

4. 2. Propositions for designing in the hot and arid climate compatible to sustainable design

- The best direction for locating the buildings is east-west. Since, the south wall absorbs more energy in the winter and this wall can be protected by shade in the summer. The ester-west walls that absorb more energy in the summer should have low surface. Thus, the building direction must be a little toward east to receive less sunrays in the western section. The advantage of this design is that a south part of the building receives sunrays. However, in this case, some part of north front absorbs sunrays that the vertical shading can be used in north front and horizontal canopies can be employed in the eastern front.
- Using central yard in this climate protects the spaces before summer hot and winter cold and the building is protected against wind, sunrays, heavy dusts and etc.

Fig. 6. Using central yard in hot and arid climate

- Using the garden hole due to lower level of the yard and shading on the walls that causes to preservation of cold air in the garden hole during day.
- Prediction of shades using the diagram of sun situation relative to latitude is simple and appropriate. Regarding the openings near shades, it should use the materials with low thermal capacity to be effective until rapid cooling in the evening. One of the most effective ways methods is to use false ceiling under the ceiling with isolating under the false ceiling.
- Utilization of the vegetation as garden in the roof and green walls

Fig. 7. Green roof in the hot and arid climate

- For prevention of heat penetration into the building, using double glazed windows is rational.
- Planting ever-green trees such as pine and cedar in the west pat and dense trees in the west. Using green space in this climate reduces the direct sunshine and its reflection, makes shadow on the ceiling, walls, windows and space, decrease dust, wind velocity and increases humidity and reduces temperature around the building.
- Other method without energy to cool the interiors of the building is using patio and creating cold air at night.
- The color of the ceiling and walls without shading should be close to white and the interior walls and exterior spaces should be pained in dark to prevent heat and light reflection. The walls with shade should be painted with light colors. The ceilings interior spaces must be white to dissipate

maximum light from the window to the rooms equally and in the walls, it is recommended to use light colors with combination of gray.

- Using evaporative cooling by basin on the roof
- Using wind catcher as a functional element for benefiting from desired wind in the main rooms. The wind catcher can be placed far from the building and create a green space over it that the air inside the wind catcher becomes cool by irrigation of the green space and the cool air is transferred into the space.

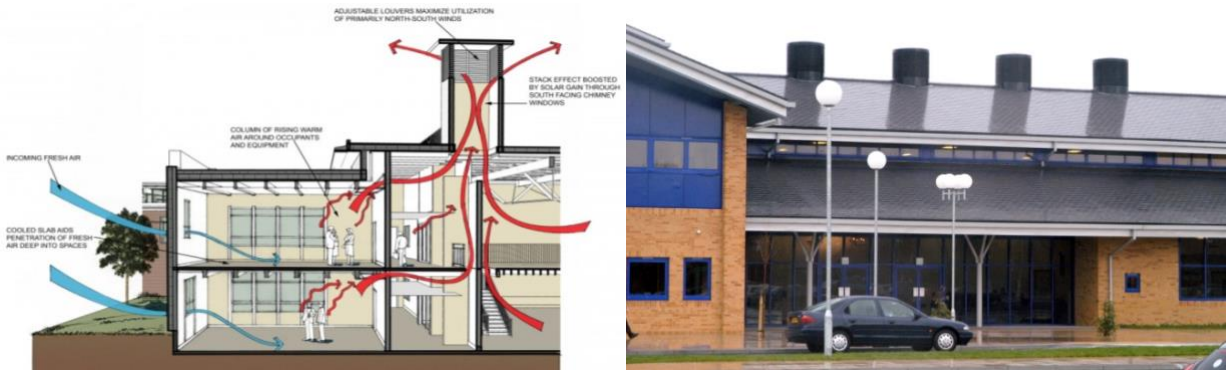

Fig. 8. Using wind catcher in the hot and arid climate

5. PERSIAN GULF AND OMAN SEA NORTH BORDER

5. 1. Climatic conditions

This climatic regions is located on a narrow and relatively long coastal border with more than 2000 kilometers in length. It begins from Arvand Roud in the southwest of Khuzestan Province and ends to the Gwadar Bay in southeast of Sistan and Baluchestan province.

This border climatic features include: very low annual precipitation, most raining in the fall, especially in the winter (due to loamy soil and lack of vegetation, the raining is accompanied by flooding), high humidity in all seasons (due to closeness to sea), very hot and humid weather in the summer and mild in the winter (in climatic terms, these coasts are considered as hot and arid and humid. The summer is relatively long and the winter is cold only in January and February), low temperature difference in day and night, salinity of underground water in most regions, very low vegetation (due to low precipitation).

Buildings traditional form: In these areas, the buildings are designed as central yard and semi-introverted, maximum use of shading and air flow, high rooms and windows, wide porches and lack of basement.

The major difference of these buildings with central yard with similar buildings in the Iran central plateau is that although they are introverted, their connection with the external space is not closed and there are high and wide windows and wide porches toward the alley space or square in the second and third floors of the buildings. This reason is to use air bilateral ventilation inside the room and reduce hot with opening the windows toward the yard and alley. The porches are big and they are very important space in the building. Mostly, there are tall and wide porches around the central yard and in one or two sides of the building.

Fig. 9. Sample of hot and humid traditional houses structure (Hormozgan, Iran)

The height of the rooms in this region is higher than other areas in Iran and the height of the rooms sometimes is fourfold or more due to this fact that the hot air moves upward inside the room and the air in lower part is cold. The hot air moves by under ceiling windows. In this region, most basements are used for services and kitchen and warehouse are located in this floor and the first and second floors have a residential usage.

Urban fabric: Creating shades and using air flow are two important elements in urban fabric and the building form for human comfort. Generally, in this area, the urban fabric is semi-dense and the rural fabric is relatively open, the urban space is semi-closed and the cities and villages have been expanded along the coast. The coastal cities and villages fabric varies between open space in the Caspian Sea coasts and closed fabric of the Iran central regions. So that, there is possibility of air flow in the cities or villages. The urban spaces adjacent buildings shade and plants shades are used for reduction of hot.

Materials: The used materials have low thermal mass and do not preserve hot such as wood (due to low thermal capacity). Because of shortage of woods, most buildings are constructed by adobe and clay and masonry materials with high thermal capacity.

5. 2. Propositions for designing in hot and humid climate compatible to sustainable design

- Lack of air flow increases temperature and humidity and the hot and humidity level is increased inside the building. Hence, considering the direction and manner of construction of building plays an important role in this climate. In designing of these areas, the buildings should be expanded in east and west direction and the facades are mostly end to north and south. Construction of the ceiled porch and balcony is the best way and by shading, the direct sunrays penetration is prevented.
- The open plans and wide spaces between buildings are effective in cooling, it is better to place the building on the pilot that causes better ventilation and air flow.
- One of the elements that is important is wind catchers that directs the wind to inside space and the hot air is moved outside and the cool air enters the space.
- The openings should be designed so that to use maximum wind flow. It is better to place a shade over the windows and their glass surface should be minimized and use dark colors in painting of frames to absorb the sunrays. The proper size for opening varies between 25 to 40 % of the north or south wall surface.
- For creating effective air flow, it is necessary that all rooms to have openings or windows in the pressure or suction area and the rooms that have window in the back should have large openings to rooms that are inverse the pressure area.
- Using large doors and windows is useful for protection against sunrays. These openings increase natural ventilation and reduce internal space temperature in the afternoon and at night.
- Roof should be soft and accessible and the slope should be design so that to be discharged easily against high speed winds. By expansion pf the roof surface more than the area surface, it can protect the windows and walls against sunshine and heavy raining. The ceilings should be light and insulated thermally.
- It is recommended to avoid iron in building because of corrosion and use specific steels resistant against climatic conditions. The materials used in the lateral walls should have high thermal

conduction and the interior and exterior walls materials must be so that pass the heat more than eight hours.

- Using the false ceilings for creating shading and air flow in the space between two ceilings is another solution for reduction of the external hot air inside the building.
- Using smart curtains in external part of the openings to control the light and heat entrance.
- For reduction of the solar heat from the ground to the building, adjacent areas are covered with green space and small gardens. These elements are not heated by solar radiation and as a result the heat is not transferred into the interiors. Planting trees in the west and southwest is useful in reducing heat transfer into the buildings.

6. CONCLUSION

By examining the effective climatic factors on the buildings physical structure in various climates in Iranian traditional architecture, it was tried to refer to some points for progress of the sustainable architecture goals in contemporary architecture of these regions. These hints include elements in biological sustainable design besides the new solutions for obtaining sustainable architecture. Thus, in designing in different climates, it is essential to consider the followings:

1. In temperate and humid climate, it is recommended to employ general principles of vernacular architecture such as semi-open and semi-closed elements, air flow, expansion in the height, space orientation, openings forms and etc. As a result, elongation of the building perpendicular on the ground, 30 degree inclination from south for receiving solar energy, using proper wind flow, air flow in the interiors, wide openings with proper shadings and porch elements cane be appropriate climatic solutions for residents comfort.

2. For designing in cold and arid climate, it is tried to use the vernacular principles for maximum use of sunrays, temperature daily shifts, preservation of heat and prevention of winter cold wind. As a result, east-west orientation with rotation of 15 degree toward southeast, designing spaces in underground, construction of multi-floors houses with soft and uniform façade, using high thermal conduction materials, with light concrete, using horizontal shades in south and southwest windows, using static solar and inactive systems such as solar windows, walls, water walls and roofs, greenhouse and etc. are recommended.

3. In the hot and arid climate, the east-west direction of the building, using vertical solar systems in north front and horizontal shades in east front, using vernacular elements such central yard, garden hole, using false ceilings under the roof, vegetation as garden on the roof, double glazed windows, patio and basin on the roof are recommended.

4. In the hot and humid climate, the east-west direction with facades toward north and south, open plans and wide spaces between buildings, using materials with high thermal capacity, using interior and exterior thick walls and false ceilings are recommended for achieving sustainable design.

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LOST ARCHITECTURE MONUMENTS: THE CASE OF BERLIN RETHINKING HISTORY

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ABSTRACT

Specialists often face various social and ethical challenges when reconstructing an architectural monument, historical building, or iconic artifact. Berlin is a city with a complex past, therefore for many years a number of historical objects have been constantly disputed over their value and need for protection. The Berlin projects in the last decades are largely illustrative examples of different approaches to their equivocal heritage, due to large-scale reconstruction activities carried out with the involvement of world-class architects.
The following works are considered: Nikolaiviertel (Nicholas' Quarter), Reichstag building, Kaiser Wilhelm Memorial Church (Gedächtniskirche), Berlin Wall and Chapel of Reconciliation.
The purpose of this paper is to review general trends that are true for a number of projects in the city, diverse in their use of reconstruction methods, but combined with the complexity of historical and ethical factors. The result of this review is the conclusion about the emotional impact felt by the viewer in the modern context as the primary goal of the reconstruction of such objects. The role of public opinion in making design decisions is emphasized.

Keywords: reconstruction, architectural heritage, Berlin, architectural monuments, German architecture, GDR architecture

1. INTRODUCTION

1.1 Historical Preview

United in 1989, Berlin became a modern metropolis. It attracts hundreds of thousands of tourists annually with its modern urban infrastructure, quality public spaces and landscaping. Besides improving the quality of the environment, the city is actively working to preserve its history. .

Through the 20th century Berlin experienced a series of challenging events, which left a powerful imprint on its modern architectural appearance: the First World War, the post-war economic crisis, the Jewish pogroms, the totalitarian dictatorship, the numerous bombing raids, the occupation of the city by the allied forces, the domestic policies of the German Democratic Republic and West Berlin, the construction of the Berlin Wall. All of the above resulted in the loss of many historic buildings and a violation of the planning structure, as well as new urban changes, which themselves became part of the history of the city, country and the whole world.

1.2 Paper's Interest and Objectives

This article proposes to consider a number of modern projects for the reconstruction of monuments, partially or completely lost due to various events. Since these events also have special historical significance, the reconstruction process becomes complex and ambiguous. The choice of a solution (Full reconstruction, partial reconstruction, creation of a new volume, etc) depends on a combination of various factors, including symbolic ones.

2. RESEARCH

2.1 The Nikolaiviertel

The Nikolaiviertel ("Nicholas' Quarter") is a historical quarter in the very center of Berlin, in the Mitte district (see Fig. 1). It got its name from the Church of St. Nicholas (Nikolaikirche), located nearby Nikolaikirche was built in the 13th century in the late Romanesque style and is the oldest church in Berlin and the highest of the area. During the Second World War, the Nikolaiviertel was almost completely destroyed. After the war, the area became part of the GDR. In the 1980s, large-scale work was carried out to restore the area what became a rare example of measures to preserve the historical heritage in this socialist republic.

The result of the reconstruction turned out to be contradictory primarily because of the lack of full restoration practice in the republic and the limited exchange of international experience, as well as the presence of a command and administrative economy and the inability to attract investments. An important factor is the presence of political ideology, which denies the importance of turning to the historical past, preserving religious buildings. The project can be characterized by the following key points:

A) *Full restoration concerned only those objects that had a relatively high degree of preservation.* Only Nikolaikirche itself (from which only the outer walls remained) and several other best-preserved buildings were completely restored.
B) *The integrity of the composition of the quarter was achieved by creating a common architectural and artistic style*. For the new development, a common color and texture solution was chosen: ocher-yellow stucco on the first floor and corrugated concrete panels on the subsequent floors. The restored historical buildings re-acquired their former polychrome, which allows them to stand out against the backdrop of a new environmental development. Small architectural forms, elements of landscaping and visual communication tools were also solved in a kind of "historical style" [1].
C) *The inconsistency of the 1968 Venice Charter in terms of ensuring the contrast of the "old" and "new".* Despite the widespread use of modern materials for new construction, the common style of the quarter visually blurs the boundaries between new and historical buildings.

It can be concluded that the reconstruction project of Nikolaiviertel was not aimed at restoring the area lost during the war years. The objective was the creation of a compositionally pooled district in a historical style [1].

Fig. 1. The Nikolaiviertel Quarter in Berlin (author photos), part 1

Fig. 1. The Nikolaiviertel Quarter in Berlin (author photos), part 2

2.2 The Reichstag building.

In the 1990s, after the reunification of Germany, a process started under the leadership of H. Stimmann, referred to in various sources as "critical reconstruction". The idea of this large-scale project was the district-wide restoration of the historical center based on the plan of Berlin in the 1930s, taking into account the needs of a modern rapidly developing city. This process is still ongoing [2].

One of the most important projects of the "critical reconstruction" was the creation of a new government quarter (the so-called concept of the "Ribbon of the Federation" – an urban symbol of the city's unification) [2]. The central part of the complex is the building of the Federal Parliament - the Reichstag. Built in 1884-1894, it experienced the key moments of German history: it burned in 1933, later it was used as a bomb shelter, at the end of the war it was declared the main symbol of Nazism. In May 1945, as a result of the assault, the Soviet flag was risen over the building. It was unambiguously decided to keep the Reichstag as a symbol of the inviolability of German statehood. During the period of divided Germany, work on the reconstruction of the building happened with varying success. The competition for modern reconstruction was won by architect Norman Foster. The following ideas were incorporated into the Reichstag reconstruction project:

A) *The idea of "openness" and "transparency", which applies to all structures of the government quarter.* The grandiose glass dome was created with the expectation of a constant big number of tourists visiting it and serves as a viewing platform, for which two spiral ramps were installed to climb to the top and descend from it. Glass partitions dominate in the interior. The Bundestag meeting room is located directly opposite the public entrance, and is also much visually open to the viewer as possible.

B) *Ultramodern, technological filling while maintaining the appearance of the building of the late XIX century.* The new Norman Foster's dome (see Fig. 2) also serves as a lighting controller and ventilation source for the plenary room (the reverse mirror cone reflects sunlight; ventilation occurs naturally through the gaps of the dome) [3]. When designing, the requirements for energy efficiency were taken into account: solar panels and thermal sources are used.

C) Preservation of the memory of the difficult past of the building. Even at the initial stages of reconstruction, such important artifacts as graffiti of Soviet soldiers were hidden under the finishing panels and therefore were saved. Some of these inscriptions are still available to the viewer.

Fig. 2. The Reichstag dome designed by N. Foster, 1999 (author photos).

2.3 Kaiser Wilhelm Memorial Church (Gedächtniskirche)

Kaiser Wilhelm Memorial Church (Gedächtniskirche) was built in memory of the first Kaiser of the united Germany Wilhelm the First in 1891-1895. In 1943 it was destroyed during the bombing of Berlin by the Allied forces. After the war, the ruins of the church were supposed to be demolished, but this decision got really sharp resistance from the Berlin public, as a result of which the ruins were conserved on a special platform. Egon Eiermann, the architect designed new volumes of the church - the prayer hall and the separate bell tower (see Fig. 3) .

The project has great symbolic significance for the city. The ruins of Gedächtniskirche are a kind of "warning monument": the protest of the inhabitants of Berlin regarding the demolition of the church was connected with preserving the memory of not only Kaiser Wilhelm and the German Empire but the outcome of Nazism and retribution for its crimes. The new volumes strongly contrast with the ruins of the church in the form and solution of the facades. They are combined with into a common ensemble only by spatial attribute. The surviving nave with the restored mosaic dedicated to William I is also contrasted with the interior of the prayer hall, in which the cellular structure of the stained-glass windows creates a futuristic blue glow. There is also a lot of symbolism in this decision: it is necessary to take into account the mistakes of the past and strive for the future.

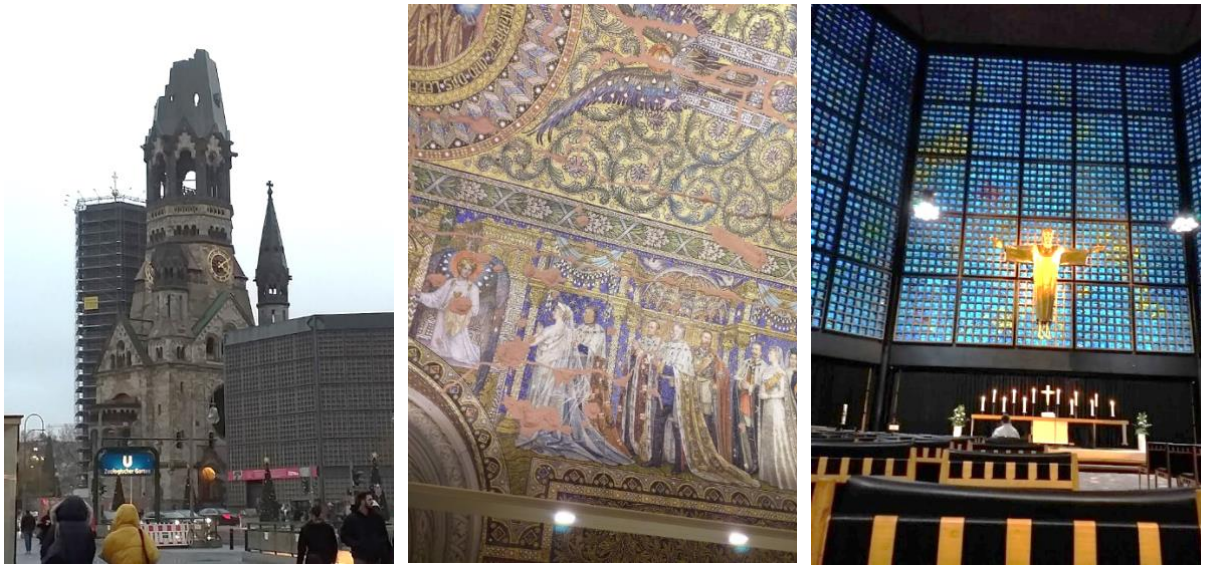

Fig. 3. Reconstruction of the Kaiser Wilhelm Memorial Church. General view of the ensemble, a fragment of the mosaic in the interior of the preserved part of the church, , a fragment of the interior of the new church (author photos)

2.4 The Berlin Wall

One of the main symbols of 20th century Berlin is the Berlin Wall, an engineering-equipped interstate border dividing East Berlin, the capital of the German Democratic Republic, and West Berlin, the Federal Republic of Germany enclave. It was passing through the entire city, including the historical center, destroying urban integrity, leaving a lifeless wasteland - an exclusion zone - next to it (especially from the side of thr German Democratic Republic).

The fall of the wall was immediately followed by the unification of Germany - evidence of the sharply negative significance of the wall in the history of the country. The city is now still divided into "West" and "East" but only nominally. in terms of architecture, thanks to the "critical reconstruction", the boundaries between the development of two different political systems are blurred. However, the wall line is still a striking element of the urban environment, continuing to carry on the function of a historical monument (see Fig. 4). The concept of turning the Berlin Wall into an artifact in a modern city can be characterized by the following key points:

A) *Restoration of a holistic urban structure, broken ties, "overcoming political topography"* [3]. Almost the entire perimeter of the wall was destroyed (many concrete blocks of the fence turned into art objects scattered throughout the city). Huge empty territories of the exclusion zone are actively built up with new urban ensembles.

B) *The new life of the Berlin Wall: as an art object that only complements the full historical picture of the place.* In each area adjacent to the wall, on the site of the physical boundary of the GDR, you can find a narrow paving strip deliberately different from the environment. This line runs already in other urban planning reality: in some places - along the sidewalk, in others - along the roadway, sometimes interrupted by development. Walking routes “along the Berlin Wall” that lead to iconic places associated with the wall are possible: Checkpoint Charley, East-Side Gallery (a preserved section of the wall, away from the historical center, turned into a gallery of world famous graffiti), as well as a completely reconstructed section walls (subject to transverse zoning, the presence of an observation tower etc.).

C) *The transformation of the meaning of the wall from the symbol of "separation" into the symbol of "reunion".* The designation of the wall is not an obstacle. Some buildings lost during its construction are also indicated by paving along the perimeter. One of the notable examples of the reconstruction of one of these monuments is the Chapel of Reconciliation.

Fig. 4. From left to right: Fragment of paving with the inscription "Berlin Wall 1961-1989"; open air museum of the Berlin Wall (author photos)

2.4 The Chapel of Reconciliation

On the site of the modern chapel was the neo-Gothic church of Reconciliation, built at the end of the 19th century. The peculiarity of its location on the city map was that the Berlin Wall, built in 1961, passed just a few meters from the church, and it itself was on the «Death line», a border territory from the German Democratic Republic, free access to which was strictly prohibited and was punishable by execution by shooting down. For some time, the bell tower of the church was used as a shooting tower, and in 1985 it was blown up.

The fall of the Berlin Wall provoked a discussion of the issue of reconstructing the church and the surrounding area, which was resolved again with the active participation of citizens: they decided not to begin to rebuild the church, but only preserved the remains of its foundation. The Chapel of Reconciliation now stands on its place - a kind of monument to all the victims of the Berlin Wall. The design of the chapel is interesting both with its own architectural solution, and with the approach to the lost heritage and the organization of the surrounding landscape:

A) *Every detail of the new chapel and the surrounding space is a symbol open to interpretation.* The bearing walls of the prayer hall are made of clay rammed by volunteers from 14 countries (man-made reconciliation, the importance of uniting everyone for a common goal). The open space, formerly the “Death Line”, is now a field sown with rye every year.

B) *Special attention is paid to the history of the place.* The chapel itself did not replace the blown up church but became a kind of fence around what is left. This impression is strengthened by the by wooden plank cladding design of the external walls, which transmits sunlight [4]. The foundations of the church can be seen through special holes in the floor of the chapel, as well as in the recesses on the sidewalk. A fragment of the altar discovered during excavations found a place in the interior. The bells and one of the crosses are now represented on the site as sculptural compositions.

The “imprint line” of the Berlin Wall runs here, but is complemented by the same imprint of the exterior walls of the Church of Reconciliation and other buildings that existed on the Bernauer Straße before the partition. Graffiti on the facades of houses, numerous sculptural objects - all this is part of one big story about one of the sad pages in the history of Berlin.

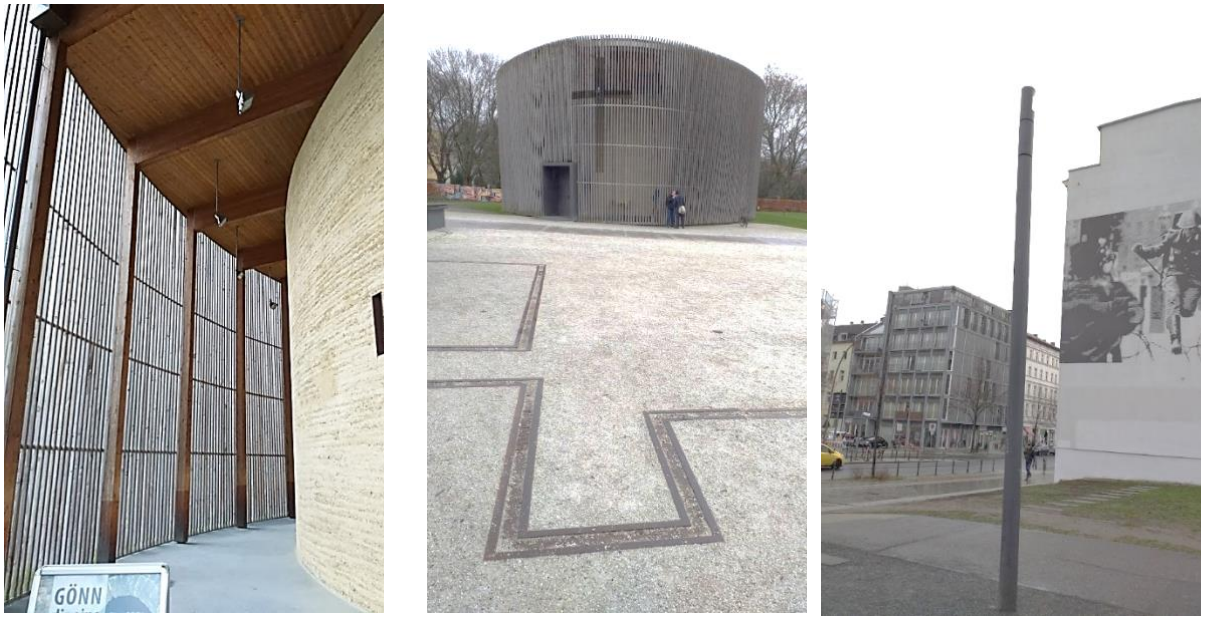

Fig. 4. From left to right: Interior of the Chapel of Reconciliation; the appearance of the Chapel with the outlined walls of the Church of Reconciliation; graffiti illustrating one of the successful shoots through the wall (indicating the path of the fugitive on the ground) (author photos)

3. CONCLUSION

The example of Berlin shows that the issue of preserving heritage in complex historical and political realities requires a wide public discussion. When an object is not only a valuable architectural monument but also a political symbol, any transformation of it can be perceived as a symbolic statement.

One can note the peculiar approach of Berliners (namely, Berliners: public opinion is one of the key factors taken into account by architects) to a historical place: a comfortable modern urban environment in which there are elements that refer us to the past, no matter how inconvenient it may be.

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INTERCHANGES OF PUBLIC SPACE AND TRANSPORT IN PLANNING OF THE URBAN UNDERGROUND OF BAKU

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ABSTRACT

The article is devoted to presenting the forms of underground spaces of the city, providing unloading a number of areas of Baku, and the organization of the regulated processes on the surface of urban fragments. Separation of functions in urban areas at the level of squares of Baku will give an opportunity to resolve the use of both ground and underground space. In this respect may be the transport area of Baku, social and communication spaces multi functional areas that are active both underground and open the top-level area, tunnels of different categories, as well as the subway station. So that a harmonious relationship of surface and underground spaces Baku always opens more new horizons for the development of the architectural environment of the city.

Key words: transport, pedestrian, communications, underground space, architecture.

1. INTRODUCTION

Modern road transport in cities is developing at a rapid pace. The street-road network of the city in these conditions has very limited conditions for its development: the expansion of existing highways and the laying of new transport directions. All this leads to the fact that the cities should actively consider the prospects for the development of transport routes with the active use of the underground space of the city.

The city in all respects is a multifaceted organism, perceived in stages, as fragmentary panoramas unfold. So, in a comprehensive assessment of its territorial and spatial capabilities, it is always necessary to take into account the day and night life of the city, keep in mind the profitability (rationality) of land use, that is, inner-city open spaces and underground reserves, often excluded from the stock volume.

In modern conditions, with the development of various methods for assessing urban lands, the factor of saving the city territory can be one of the main factors in the most intensive development of the city's underground space.

In the first half of the 20th century, original proposals for the active use of the underground space and the multi-level organization of traffic in cities were put forward in France (Le Corbusier, E.Henard), Italy (A. St.Elia), USA (L. Hilbersimer, B. Gropius), Great Britain and other countries. [1] And already in the second half of the 20th century, radical and sometimes fantastic proposals are being developed. For example, the idea of creating an underground multi-tiered city in which there are almost no buildings on the surface of the earth is put forward (a project of the American architect Max Abramovich for Pittsburgh). (Figure 1)

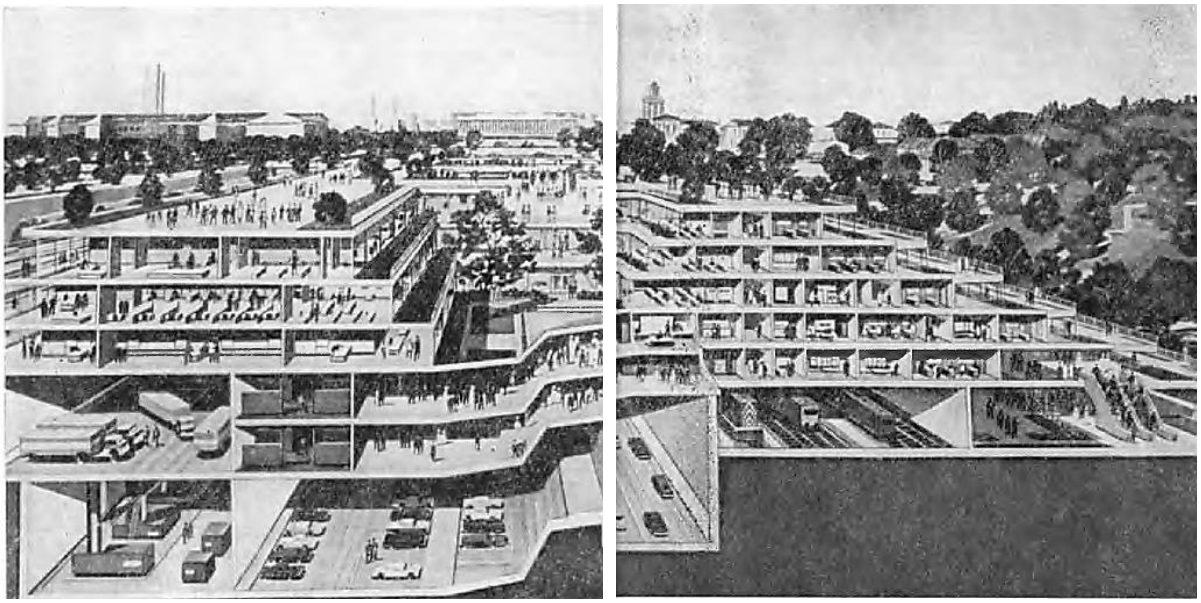

Fig. 1. A detailed multi-story city project for Pittsburgh. Achitect M. Abramovich, USA.

2. CURRENT ISSUES AND IDENTIFICATION OF UNDERGROUND SPACES

Let us try to identify exceptional specific forms of land use in underground spaces by choosing urban areas, passages, tunnels, metro stations and semi-underground structures on reliefs for them. Here it will be appropriate to refer to the trends in the organization of underground urbanism in the cities of developed countries, where underground spaces are as active urban areas as land. Their multi functionality once again proves the demand for such spaces in meeting the needs of the population.

It should be noted that the rationality of using such spaces is more inherent in historically developed cities with dense buildings, as well as those with large relief differences in the terrain.

The underground urban planning of Baku can be represented in several forms. Firstly, if we take its local capabilities and conditions as a basis, then this is a network of underground metro stations created in the first half of the 20th century, [2] which are rather entire complexes (metro lines, station design, apron halls, a network of service and office premises, entrance pavilions with escalators etc.). The architectural and artistic design of the metro stations is in many ways superior to the metro system of many countries. Each of them according to structural data and decorative processing can be equated with works of art. (Figure 2)

Fig. 2. Interior of the Nizami metro station in Baku.

The second type of underground facilities Baku last few years can be considered as transport and pedestrian tunnels. The first of them satisfied at the intersection for the passage of transport in the different levels. They increase the road capacity and radically solve the problems of traffic safety. A similar role is carried out by its unique architecture arranged Baku underground passages under highways, unleashing the movement of vehicles and pedestrians, and linking the city streets and neighborhoods, buildings occupied by the fundamental. (Figure 3)

Fig. 3. Entrance to the underpass at Azneft Square, Baku

The most common form of land use of underpasses is the presence of a widely ramified network of objects of trade and consumer services. Such areas can be found both within the historical part of Baku - near the railway station, the Park Boulevard, and in the western part of the city - at the beginning of the Tbilisi highway, near the new bus station.

The third type of structures in the underground (spaces) of a number of layers of Baku city areas can be considered volumetric small but functionally significant space fleet, organized in the underground floors of high-rise buildings (hotels, business centers, residential and public buildings). These environmental objects, together with many household objects constitute the basis for underground transport urban planning of Baku. In this regard, the semi-underground territories of the capital used for parking and car repair are very important. (Figure 4)

Fig. 4. Underground parking of shopping centers in Baku.

3. PROBLEMS AND SOLUTION

Studying the relief of the western and eastern parts of the Baku amphitheater, great opportunities are revealed for using the differences of these slopes. They are acceptable both functionally and visually aesthetically. [3]

On the other hand, the relief and spatial capabilities of many areas of the city indicate the acceptability of using their underground spaces multi functionally. These are the squares in front of the Government House, at the seaport, at the Koroghly metro station, in front of the Ajami metro station and Moscow department store, as well as in the area of the cycle track and fair, at Shamakhinka, at the intersection of the 9th and 8th micro districts of the North-East etc.

For example, in the area of the Bus Station, the area occupied by the parking of large-sized buses is very inconsistent with respect to daily traffic passes to different regions of the country. Whereas movement of the parking places under the earth largely frees the upper levels of the complex. There are no places for parking of individual vehicles, which exacerbates the comfortable and fast service departing and arriving passengers. (Figure 5)

Fig. 5. Baku International Bus Station

In the area of the fair on the square near the metro station on January 20 also has a great possibility of organizing parking routing machines in the underground space. Whereas today, three functions are combined here: intercity parking, city buses and the location of a large shopping center of the city. This creates not only confusion in the settlement movement a different level of service, but also impairs the conditions of service coming to the trade fair. (Figure 6)

Fig. 6. 20 January square, Baku. Entrance to the trade fair

Due to the versatility of this area (hospital, welfare institutions, shopping center, restaurant, coach parking and individual machines, etc.) of its transport function relegated to the background, while it is possible to fully transfer to the underground space transport service system of this fragment cities occupied by engineering equipment.

As part of comprehensive measures to ensure continuous traffic in Baku, [4] a comfortable and safe passage of streets for the peoples, a long elevated pedestrian crossing at the intersection of Moscow Avenue with 20 January street, in the territory called Shamakhinka, is already under construction in Baku. In addition, entrances and exits will be built in each direction of the road.

The total length of the transition will be 134 meters; it will not be supported, and will be held at the special hangers (ropes). This overpass will be the first suspended pedestrian crossing in Baku. Its height above the surface of the earth will be 6 meters, and the width of the pedestrian gallery will be 3.5 meters. Works are scheduled to be completed in 2020. (Figure 7)

Fig. 7. Elevated pedestrian crossing at the area of intersection of Moscow, part 1

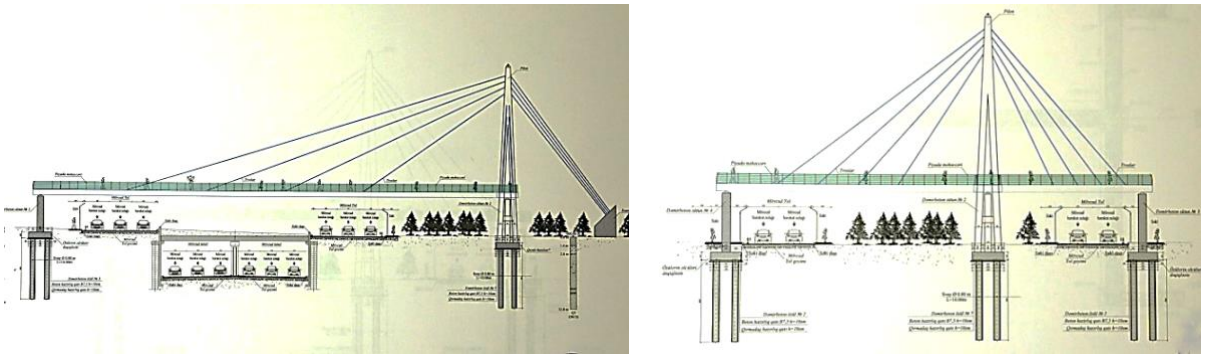

Fig. 7. Elevated pedestrian crossing at the area of intersection of Moscow, part 2 (sections by street)

On the territory of the forecourt, it is acceptable to use the underground space under the trade service enterprise. At the same time cost-effective to link these objects and trade pavilions with newly built and located close to the area of a large shopping center 28 mall. (Figure 8)

Fig. 8. Baku Railway Station Square and the underground passage below it

In the area of Azneft Square, it is also possible to change the land use of its open space. It is convenient here not to separate, but to combine the upper and lower levels due to the creation of a recreational and entertainment complex over the area. [5] For example, the use of a mobile tent covering in the central part of the square will be able to assemble diverse pavilions and service facilities on the same territory. In this position, in the underground space of this area, you can build a bypass belt path for traffic, and the central sections for the placement of various attractions for children. Thus, the unification of the children's leisure town with Azneft's areal facilities will be able to present an interesting arena of united communication spaces for organizing pedestrian traffic and leisure places. (Figure 9)

In parallel with the analysis of the possibility of using the underground spaces of Baku city for different types of transport interchanges tied to the public service system, it would be useful to get acquainted with the positive results of using the territories in the underground urbanism of foreign countries. The relevance of this problem can be justified by the fact that in large and largest cities, the need to save scarce urban areas, in conditions of high communication speeds and an increase in the degree of danger of urban traffic, is especially acute, especially during the reconstruction of historically developed areas of the city.

Fig. 9. Azneft Square, Baku

At the same time, one should not forget about improving the environment in the central areas of the city, where mainly pedestrian traffic puts forward its requirements for the artistic and aesthetic quality of development.

It is no coincidence that in recent years this area of urban planning has been paid special attention as one of the integral spatial elements of the city, which are used mainly for the construction of transport facilities, from crossings and tunnels to large stations and interchange stations.

The above-mentioned positive examples of formation of underground spaces are largely due to the local conditions of the relief, the prevailing character of the land development, operation of the vehicle.

Obviously, that in urban planning practice, the transport system has always been directly related to the public service system. For this reason, its underground spaces, like other spaces of the city, also remain associated with transport. These include the underground urban planning of cities such as Paris, New York, Munich, Helsinki, Frankfurt am Main, Vienna, Tokyo, Osaka, Moscow, Warsaw, Copenhagen and others. (Figure 10)

Currently, the construction of underground garages and parking lots with a capacity of 600 to 2,000 places has become widespread. With the increase in the number of vehicles in large cities, the problem of a lack of parking spaces appeared. Open temporary parking lots occupy large areas that can be used for buildings or structures. Most often, this situation develops in large shopping centers, offices or residential complexes. In order to more compact accommodation, including increasing pedestrian, walking areas and recreation areas, parking spaces are designed in the form of underground parking. (Figure 11)

Fig. 10. Metro and underpass in Helsinki.

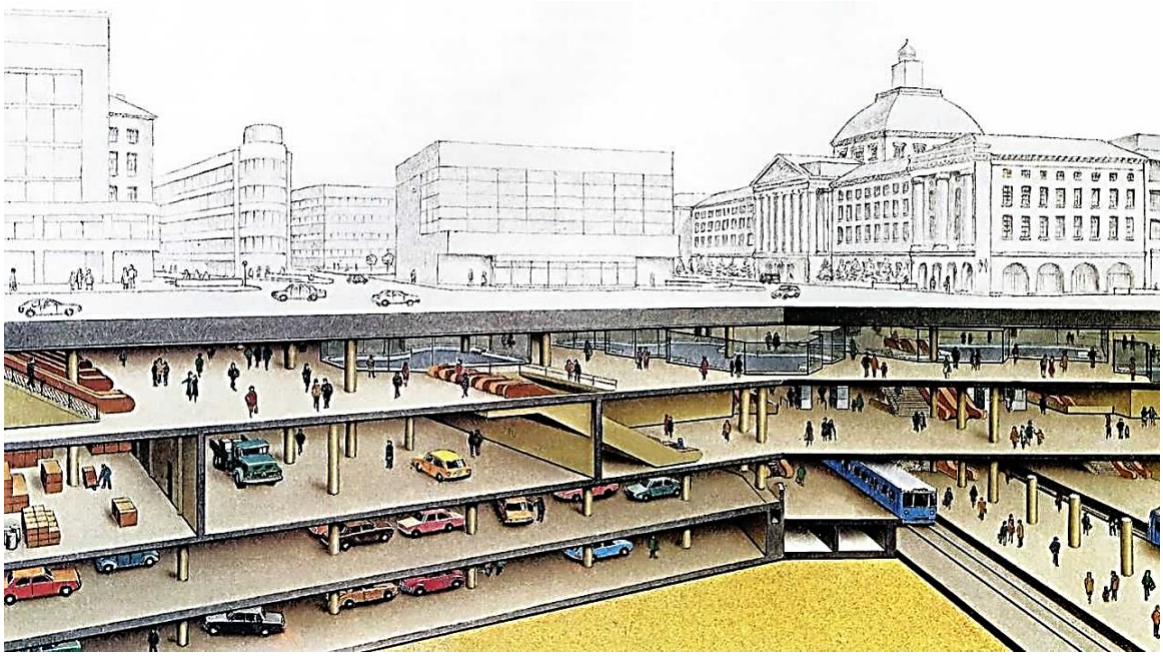

Fig. 11. The complex of underground structures at Karlsplatz, Munich, FRG

More active development of the city underground space vehicles (and other) purposes will significantly reduce the consumption of the urban area, to provide more compact construction, which in turn increases both transport and pedestrian mobility. [6]

In a number of countries (Austria, England, France, Sweden, Canada, Japan) special editions (Underground World, Coordination of Underground Urban Planning) are already issued, devoted to urban planning and engineering problems of underground urban planning and highlighting many important issues in this area.

4. CONCLUSION

Today, in many countries of the world with the increasing development of urban traffic and transport, not a single city is deprived of the active use of the underground space in order to decompress historical buildings, due to the lack of free urban land suitable for new buildings and the fear of losing the best fragments of the natural environment.[7] At the same time, the scale of this phenomenon over the past 30 years is largely due to the lack of places for above-ground construction. These include Moscow and Rome airports, the airport in Brasilia, the railway station and station in Kiev, Tbilisi and Riga.

It should be noted that the latter act as a combined buildings, including transport and service elements. Helsinki Airport is an engineering structure with several floors, where the hotel is located in the underground.

In other cases, the combination of the transport functions of the aerial parts of specific structures is in good harmony with the use of their underground spaces for entertainment and exhibition complexes.[8] For example, the public transport complex on the collective farm in Moscow, the Bull Ring shopping center in Birmingham (England), the Stachus trade and transport complex in Munich, built in the 80s of the twentieth century, the well-known complex of underground and semi-underground structures of UNESCO in Paris. [9]

Thus, we can say that the above examples of the use of underground spaces in the existing conditions of development of large cities, are witnesses of how to provide optimal conditions for the movement of the population, while maintaining the aesthetically pleasing environment of the city, and that can be attributed to the conditions of urban nodal areas of Baku city.

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