

RE-ARCHITECTURE OF EXISTING BUILDING STOCK WITH SUSTAINABLE APPROACH: THE ANALYSIS OF THE CITY OF IZMIR

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Abstract. Sustainability can be defined as providing the best life conditions for living creatures in modern city environments for maintaining continuity in the natural environment by protecting the historical and the cultural elements. It is important to design the structures under the scope of ‘sustainability’ which can have positive contributions to the environment and redounded to the city with the help of some definitions like re-functioning, re-use, decontamination and others within the enhancement of existing building stock. Re-consideration and re-evaluation of the existing buildings are important as constructing new buildings within the scope of this comprehension. In this research, the distribution of the existing building stock in the city of Izmir that should be reconsidered and enhanced in terms of ‘socio-spatial improvements’; functions of these existing building stocks and their potential for re-functioning were detected. Local governments applications on this issue were examined on their sites, the news related to the urban transformation and recruitment that took place in the media was analysed. Also, by putting emphasis on the important examples on sustainability and ecological approaches in the world, criteria were set which were needed to be considered while retrieving the existing building stock both in Izmir and our country.

Keywords: re-architecture, sustainability, adaptation, green building, existing building stock.

AIMS AND BACKGROUND

As designers and architects, we all design for our built environment from upper scale to lower scale. All the final products of our designs are in interaction with its immediate surrounding or environment in a specific way. While being at the design process, we all think that two way interaction. However, which is very critical and hazardous is that we pass over the natural or living environment and focus on the built or non-living environment. Throughout the years which passed by ignoring the nature, the natural resources started to finish and the damages that we give to the nature started to increase. Especially in the last 400 years, it is tried to overcome the negative effects which are under the scope of the ecological crisis¹. For the recruitment of the problem which was again come up because of

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us, we proposed the term ‘sustainability’ in design. Sustainability in design can be defined as ‘eliminate negative environmental impact completely through skillful, sensitive design’². The issue of sustainable architecture can also be defined as the design of sustainable buildings. Sustainable architecture attempts to reduce the collective environmental impacts during the production of building components, during the construction process, as well as during the lifecycle of the building (heating, electricity use, carpet cleaning, etc.)³. As it is obvious, the main common concern of the term sustainability in design and architecture is trying to provide the best life conditions of the users of that environment or the living creatures by also considering and looking out for the maintenance of the healthy progression of natural environment.

Generally sustainable approach in architecture is started to be applied to the new buildings starting from their design decision-making process by trying to implement 4 basic concepts like environmental, economic, social and cultural⁴. Their exterior forms, spatial design, material usages, facade applications, energy consumption (water, electricity, heat) methods are done accordingly. However, re-thinking of the existing buildings with a sustainable approach has some importance with constructing new buildings with a sustainable approach. Re-architecting of the existing buildings from the scope of sustainability can be a step for green cities and green architecture. Under the issue of re-architecting the buildings, there are 2 main categories listed⁵:

- (1) Restoration – restitution – reconstruction – renovation;
- (2) Re-functioning – re-use – rehabilitation – regeneration – revalorisation – conversion – re-adaptation – re-cycling.

From the start of the 21st century, ecological issues started to gain importance again with regarding these above key terms. Before hands, the buildings which complete their lives (which are measured by if the building serves for its very first function) were demolished, but after the 21st century, architecture is started to be handled in ‘re-architecture’⁶. As it was also mentioned by Ungureanu and Georgescu⁷, referring to their conducted case study, it is more sustainable to re-architect an existing building than demolishing it and constructing a new one.

Referring to all these above issues, this study aims to answer the ways of re-architecting the existing building stock in Izmir. The ways of providing socio-spatial improvements for the existing buildings which are in collapse zones will be also analysed with a sustainable approach. In addition to those, the previous applications in Izmir for re-architecture and possible applications are tried to be detected. At the end, it is aimed to prepare a guide for Izmir like cities for re-architecting the existing building stock where needed.

Although the term ‘sustainability’ seems physical, it is much related to some other various issues like culture, function, society, economics and ecology. The sustainable approach in architecture will be a contributor for the cities which started

to be demolished by overpopulation, economic conditions, social unconsciousness, wrong place choices and supply-demand dispositions⁸.

When it is looked to the three main stages of ecological design, these are conservation of the existing structure as much as possible, re-architecting of the existing building and management at last. For obtaining better cities with the application of green process regarding these 3 stages, ecologic design can be a holistic approach because ecologically designed buildings pay attention to environment at first and then resource issues. In ecology friendly buildings, the main concern is wasting the least energy. In addition to these concerns, especially eco-friendly buildings have 3 main categories: environmental response, efficiency of sources and social sensibility.

When all those above are thought at the building stage from the designing stage to the construction, there are 7 main stages with subtitles underneath: programming stage – position design stage – preliminary design stage – design development stage – construction stage – operation – transformation⁹. Although these above 7 stages are valid for new buildings, some of these can be applied to existing buildings too. When the issue of re-architecture of existing building stock is analysed deeply, it is seen that this issue should be analysed after dividing into some sub-titles for obtaining a better result at the end. First one is conservation of the built heritage which means that all buildings have a historical value and they linger the past to the future which makes them important. Referring to this, it should be thought again and again while demolishing an existing structure totally rather than choosing re-architecture. Second one is adaptation of buildings for climate changes which is an important issue in today's 'global warming' world. It is important for buildings to be sustainable in all aspects like being mutable to various climate conditions. Third one is the enabling flexibility in design of the building. The flexible design choices can be helpful for being adapted for various changing conditions which make them sustainable for spatial terms. Forth one is making nature visible which creates natural consciousness in the user of buildings. Fifth one is changing slow city into slow homes which supports the idea of buildings in efficient size and way with least energy consumption.

Also, there are some certification systems for re-architecting the existing building stocks like Leadership in Energy and Environmental Design – Existing Buildings (LEED-EB). Under this certification system, Environmental Building Evaluation Rating categories were developed: sustainable space/optimising space, conserving water and using it economically, conservation of material and resources, optimising energy use, enhancing interior environmental quality, optimisation of operation and maintenance applications.

When all these re-architecting of existing building with sustainable approach stages, steps and criteria were analysed, some important worldwide international and national examples draw attention:

- From Municipal Asphalt Plant, NY, USA, asphalt factory (1944–1980) to sport and culture centre (1986) (Ref. 10);
- From New Mills, Wotton-under-edge, UK, watermill (1760–1980) to office building (1983) (Ref. 10);
- London Dok Park (industrial transformation – from harbour legend to trade centre), Sekapark, Izmir, Turkey¹¹;
- From Terkos pumping station to Istanbul Water Civilisation Museum, Istanbul, Turkey¹²;
- From Bankside Power Station to art gallery, London, UK.

EXPERIMENTAL

Izmir as being the 3rd biggest city of Turkey is one of the best developed industrial cities with İstanbul, Kocaeli and Ankara. When it is looked to employment division of 2006, service sector takes the first place whereas industry sector takes the second place¹³. As being one of the most important trade cities, Izmir still maintains this characteristic.

The followed politics which caused changes in city economics after 1980's also changed the spatial structures¹⁴. With the enlargement of service sector and increasing of productive services, there were some other centres raised up in conjunction with the housing zones besides Kemeralti like Karsiyaka-Mavisehir and Cigli at north, Bornova at west, Balçova and Narlıdere at south. As traditional centres, Konak, Çankaya, Basmane and Alsancak were all affected from this process and it continued in 1990's. As a result, Konak and Kemeralti were transliterated into places where wholesale and retail trading were rolled up. However, there was no big difference in the trading and entertainment traditions of Alsancak but the profile of inhabitants here was changed with a great impact. In addition to the decrease in the young population, in some areas, some marginal groups started to live in which resulted with security problems in some streets at nights.

When it is looked to the existing building stock of Izmir from the perspective of re-architecture, a classification can be made as: 're-architecture' in areas where industry left, re-functioning of the historical buildings at city centre, adaptive reuse of structures that can be classified as modern architecture heritage constructed after the Republic, adaptive reuse of civil architecture examples and monumental structures and revitalisation of the structures and lands to city back which belongs to state and private firms and located in inner-city.

Within the scope of above classification, the applied/in the process of application/planned to be applied/proposed projects are listed below which are under the subtitle of re-architecture of historical and cultural heritage of Izmir.

'RE-ARCHITECTURE' IN AREAS WHERE INDUSTRY LEFT

- 'Water gas Factory', Alsancak (1850's), to 'Culture Centre' (2005) (Ref. 15);
 - From 'Dewilux Dye Factory and Bisan Bicycles' (1950, 1960), Bornova, to 'Yasar University Campus' (2008);
 - From 'Old Flour Factory and Storage' (1895), Alsancak, to 'News Ege' (1980's–2000), Yasar University (2002–2013), (Project is still continuing for turning it into museum);
 - From 'Soap Factory' (1941), Kemeralti, to 'Konak Municipality Hamdi Dalan Soap Museum' (2014) (Revitalisation applications still continue).

RE-FUNCTIONING OF THE HISTORICAL BUILDINGS AT CITY CENTRE

- From 'Konak-Goztepe Trolley Line Administration Building' (1880), Karatas-Konak, to 'Izmir Municipality Counter Atelier' (1930–2000), to 'Music and Performance Arts Centre' (2000);
 - From 'Customs Building' (1867–1950), Konak, to 'Fish Market' (1960–2000), to 'Konak Pier Shopping Mall' (2004) (Ref. 16);
 - From 'Ayavukla Church' (1877), Basmane, to 'Culture Centre', 'Publication Museum', 'Mukhtar', 'Children Library' (2010) (Ref. 17);
 - From 'Izmir Old Tekel Tobacco Storage' (1930's), Alsancak, to 'Izmir Architecture Centre' (2014) (Refs 18 and 19).

ADAPTIVE REUSE OF STRUCTURES THAT CAN BE CLASSIFIED AS MODERN ARCHITECTURE HERITAGE CONSTRUCTED AFTER THE REPUBLIC

- From 'Sark Coffee' (1954–1980s), Varyant-Konak, to 'Sato Restaurant' (1980's–2005), to 'Guest House' (2009) (Ref. 20);
 - From 'Izmir Fire Station' (1932–1990s), Cankaya, to 'Ahmet Piristina City Archive and Museum (Apikam)' (2003);
 - From 'Central Bank' (1950), Gumruk-Konak, to 'Key Hotel' (2011) (Ref. 21);
 - From 'Tekel Tobacco Storage' (1930), Basmane, to 'City Police Department' (2013) (Ref. 22).

ADAPTIVE REUSE OF CIVIL ARCHITECTURE EXAMPLES AND MONUMENTAL STRUCTURES

- From 'Belhomme (Wolf) Pavilion' (1880), Bornova, to 'Ataturk Library' (1997);
 - From 'Pasquali Pavilion (Barry Pavilion)' (1835–1840), Bornova, to 'Bornova Agriculture School' (1941), to 'Ege University Club' (1990s);
 - From 'Davut Fargoh Pavilion' (19th century), Buca, to Buca Municipality Service Building (1925–2000), to 'Buca Municipality Culture Art Centre and Library' (2000);

- From ‘De Jongh Mansion’ (19th century), Buca, to Tennis Club (beginning of the 20th century), to Sanatorium (20th century), to ‘Sifa Hospital’ (2000s).

‘Izmir History’ Project: With the project of ‘Project of Recruitment of Izmir Relation with History ‘Izmir History’, it was aimed to make the revitalisation of Agora-Kemeralti-Kadifekale axis which is nearly 300 ha, by adding new functions and becoming attraction centre again with the projects participator group composed of historians, architects and urban planners, craftsman, business man and academicians. It was also aimed to rehabilitate the architectural examples by their immediate surroundings whereas the historical pattern was also protected. In the scope of this project, it was planned to create some attention points with different functions like boutique hotels, design streets, innovation centres and Mediterranean Cuisine street.

The studies about the revitalisation and the restoration of the historical buildings in Kemeralti still continue. Kemeralti and its surrounding were announced as ‘Recreation Area’ (210 ha) and as 1., 2., 3. Degree archeological site with 1480 registered structures inside. It is expected to have positive improvements in the revitalization of the city centre with protecting the rich historical and natural heritage of the city while rising, functionalising, making it live and transferring it to the future. In this content, a ‘culture and history axis’ of Izmir will be composed which nearly 270 ha area is including Agora starting from Kemeralti Bazaar till Kadifekale²³.

- From Ahmet Aga Mansion (the first half of the 19th century), Konak, to ‘Museum and Culture Centre’ (2012);

- From ‘Guzel Izmir Hotel’ (1876), Konak, to ‘Guzel Izmir Inn’ (1950’s–2000’s), to ‘Clothing Shop’ (2013) (Ref. 24);

- From ‘Buca Kasaplar Square Buildings’ (19th century), Buca, to ‘District Centre’ (restoration of buildings still continue);

- From ‘Emir Sultan Tomb’ (14th century), Namazgah, to ‘Museum, Library and Exhibition Saloon’ (2013) (Ref. 25).

REVITALISATION OF THE STRUCTURES AND LANDS TO CITY BACK WHICH BELONGS TO STATE AND PRIVATE FIRMS AND LOCATED IN INNER-CITY

There are so many structures which were left in the city centre which belong to public establishments in Izmir. There are still no adaptive reuse-revitalisation projects about these structures. In the immediate future, with the reasons of privatisation of these facilities, moving out to the city, expiring of their function, the necessity of the existing structures evaluation for adaptive reuse will rise by emptying the areas where they exist.

RESULTS AND DISCUSSION

The visible effects of the structural transformation in cities economies over historical housing spaces and other historical structures which started with globalisation are also valid for the city of Izmir. It is required to make a deep analysis on how the desolated and registered historical structures can be recovered. The protection and the revitalisation of the buildings that especially became dense in Kemeralti, Basmane, Tilkilik, Agora, Halil Rifat Admiral, Goztepe has become a growing problem. In this respect, 3674 registered structures and 100 of constitutive monumental structures of those registered ones in Konak should be taken into consideration under the title of public heritage and restored for being functional and be different in the urban pattern.

Because that Kemeralti does not harbour the rising sectors of changing city economy, it seems impossible to meet the needs of middle class and be a part of transformation process in close future. However, it still attracts tourists through keeping traditional bazaar function. The acceleration of the transformation process with the tourism sector, many historical buildings around the area of Hisar Mosque and Kizlaragasi Inn were restored and turned into restaurants, cafes and souvenir shops. However, by going far from this region, the effect of this transformation lose its influence like in Kestelli Street, Havra Street, Salepcioglu Mosque, multi-floored car park, Beyler Streets and Kemeralti Mosque. Some places like Meserret Hotel, Yeni Sukran Hotel, Ankara Palace Hotel and Os-ka Passage which are important touchstones of Kemeralti are unfortunately doomed. The examples which should be protected and revitalised can be given as Tevfik Admiral (Akseki) Hotel in Basmane and Emniyet (Cihan Palace) Hotel.

Another part of the historical building stock in Kemeralti is also composed of some religious structures like synagogues and mosques. In Kemeralti, there are 9 synagogues and a house which belong to Jewish community. The mosques in Kemeralti can be listed as Konak-Yali, Kemeralti, Salepcioglu, Hisar, Basdurak, Sadirvanalti, Kestanepazari, Hacı Mahmud, Fettah, Faik Pasa, Hatuniye, Aliaga, Corakkapi, Abdullah Efendi, Han Bey and Ikicesmelik²⁶. It can be a positive step for the transformation if some public places are conducted next to these religious structures which turn them into more visible focal points in the city and make them live in integration with Izmir.

The situation of the inns in Kemeralti which had importance in the economic history in Izmir is not much different than the above mentioned structures which are doomed. It can be an effective starting point for the transformation of this whole area if an adaptive re-use process will be started from Cakaloglu Inn to other inns like Mirkelamoglu, Karaosmanoglu, Selvili, Buyuk and Kucukdemir, Yesildirek, etc. However, the most important matter which should be paid attention is standing apart from the defective revitalisation studies caused by information insufficiencies

about these structures and working with expert teams who internalised the modern protection theories and science restoration.

CONCLUSIONS

All the re-architecting and enlivenment studies that were carried out and works in progress should be sustainable in both physical and social aspects. Referring to this, composing a re-architecting program comes into prominence in terms of social sustainability covering the issues of culture, function, society, economics and ecology.

Re-architecting program which starts from the urban scale to building scale can be handled through with specific way to Izmir city. The areas which especially should be taken into consideration are Kemeralti, Agora-Kadifekale-Ikicesmelik and Alsancak. Primarily, the buildings that can be re-architected in those areas are needed to be detected with a detailed inventory. This inventory can continue in the other areas of Izmir afterwards within the scope of a staging program. Another issue that needed to be searched with this inventory study is the decision making of 'creative industries' that stimulates the economic improvement of Izmir.

It is proposed to compose the below criteria for handling the issue of sustainability in re-architecting studies in addition to the city scaled inventory study and the definition of 'creative industries':

- The function-space optimisation (defining the minimum space for the specific function) can be provided.

- An informing can be done with an electronic labelling system in re-architect-ed buildings which shows the consumed energy (water, electricity, natural gas).

- A control mechanism can be proposed which is related to usage of energy. With the help of this mechanism, the waste energy optimisation can be calculated referring to different criteria (person number-waste energy, m^2/m^3 -waste energy, etc.).

- At the stage of the function decision for a specific building, the term 'flexibility' can be prioritised. For example, one single building can serve for different functions and purposes in different times which can be called also as 'efficient space usage'.

- The relation between the environment and the building can be fictionalised in such a way to strengthen the relation between the human being and the nature.

In addition to the above proposals, some activities like workshops, exhibitions, fairs, painting competitions, workshops for children, film screenings related to city history and photography competitions can be conducted for increasing the awareness level of nature and ecological sensitivity within the city centre.

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