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EXPLORING POTENTIALS OF LEFTOVER SPACES USING URBAN METAMORPHOSIS

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EXPLORING POTENTIALS OF LEFTOVER SPACES USING URBAN METAMORPHOSIS

Abstract

In a dynamic world, the challenge behind reaching utopia is a result of the continuity of change and the metamorphosis. Metamorphosis, from the Greek *meta* signifying the change and *morphe* referring to the form, is a change and adaptation of the form or nature of something into a different one through time. However, when it comes to urban metamorphosis, it is a tension between the traditional living and the raise of technology through history, and this adaptation is affecting cities, buildings, identity, and environment. Urban metamorphosis of undeveloped non-organized cities had created urban and social fragmentation; unorganized cities are broken urban fabrics disconnected by bare lands. Therefore, this research aims to establish guidelines to metamorphic the leftover lands to create utopian spaces in the cities. To achieve this aim the study starts with a literature review including previous opinion in the field of study, and the case study analysis of the neighborhood of Bachoura in Beirut city; a disconnected neighborhood from Beirut central city. The urban fabric of this neighborhood needs to reconsider preserving the identity which goes back to 1960s, and to reconsidering the use of the urban leftover spaces in revitalizing the district. A holistic approach of urban integration among built and natural environment, changes the way people occupy a place and get attached to it.

Keywords

Architecture, Urban Metamorphosis, Leftover Spaces, Environment, Social Interaction, Identity

1. INTRODUCTION

The continuity of change in cities and urban expansion, especially the unorganized ones, is the main cause behind leaving some spaces unused. These changes are an example of the urban metamorphosis, which causes a lot of problems to occur. The leftover spaces are one of these problems that was always studied and analyzed. Throughout history, many theorists identified leftover spaces based on the usage quality such as being unproductive spaces, abandoned spaces without defined boundaries, uncertain and blurred spaces, unexposed spaces, and indeterminate ones.

Urban metamorphosis had created urban and social fragmentation; unorganized cities are broken urban fabrics disconnected by bare lands. The leftover spaces in an urban fabric are considered threatening areas used for illegal practices and non-ethical practices, or kept empty which would annoy the neighborhood. The reasons behind leaving these spaces unused may be a gap in urban design laws and regulations. Finally, the need to revitalize a neighborhood through the leftovers spaces is poorly understood, authorities and responsible parties do not pay attention to these spaces.

The table below shows the number of leftover spaces in three zones in Beirut city, and the percentage of non-constructible spaces among them:

Table 1: leftover including non-constructible spaces in three zones in Beirut city
Source: "Non-constructible parcels within the boundaries of Municipal Beirut: The case study of Saifi, Bachoura and Zokak El-Blat" (Aouad, 2014)

	Saifi	Bachoura	Zokak El-Blat
Leftover Spaces	42	809	559
Non-constructible Spaces	77 (18%)	118 (14.5%)	151 (27%)

The main aim of this research is:

"This research aims to establish guidelines to metamorphic the leftover lands to create utopian spaces in the cities."

To achieve this aim, the research will try to reach the following objectives:

- To identify the types of leftover spaces, the areas and proportions, and the relationship of these spaces to each other.
- To understand the needs of the people and their utopian vision of their place.
- To propose possible interventions that could be done in these lands to create an interaction platform or environmental friendly space.
- To introduce metamorphic design solution as a new approach of intervention.

This research assumes that the revitalization of leftover spaces to create open public spaces for social interaction and environmental solutions in a metamorphic manner is a great step toward creating utopian cities.

2. LITERATURE REVIEW

A wide range of researches are progressively published about Architecture Metamorphosis as it is based on the changing of circumstances. Metamorphosis is a biological term which describes the transformation in animals and plants life cycle. However, metamorphosis term has been used in architecture, it is a process of adaptation to the changing circumstances by moving from a static to a dynamic manner. Since 1985, proceeding of seminar eight in the series of Architecture Transformation in the Islamic World, the Aga Khan Awards published a book under the title "*Development and Urban Metamorphosis*" in which volume II analyzes the examination the effect of social changes and economic development on the traditions of buildings in the Yemen republic. As mentioned in this book,

Architecture is the most accurate mirror that reflects the continuity of traditions as well as organic or radical changes in any society

The socio-economic changes are the main aspect behind the evolution of architecture style in the cities of Yemen republic, because of continues transformation new functions emerges in a cities, and as a result, new buildings are designed to satisfy these needs.

2.1. Historical Background of Leftover Spaces Metamorphosis

Since World War II, Aldo Eyck and Pancho Guedes were the first designers to rethink architecture metamorphosis process insuring creativity, elasticity and endurance in order to accomplish utopian living environment. Then, leftover spaces were defined by many theorists based on the usage, design qualities, forms and functions, as shown below:

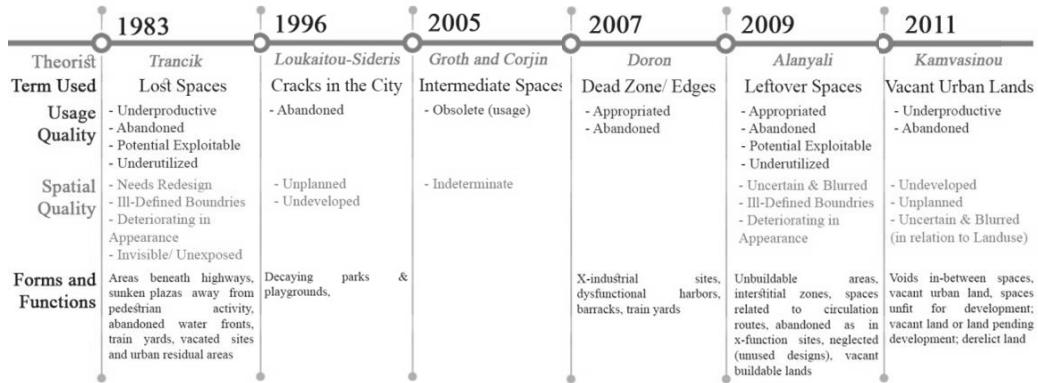


Fig. 1: Historical Background of Defining Leftover Spaces Since 1983

Source: D. Eissa and M. Khalil (2013). Reclaiming Leftover Spaces for the Public: A Case Study From the City of Cairo, International Conference on 'Cities, People and Places', SriLanka

2.2. Metamorphosis: Definitions and Aspects

Metamorphosis is an adaptation process to the changing circumstances. Therefore, continuity is essential, and adaptation is important to preserve the identity and heritage when moving forward to follow the continuity of change. Metamorphosis could be studied on four different but yet related levels which are cities, buildings, identity, and environment. In a city, the challenge is in adaptation to the growing technologies and digital revolution, in addition to increasing environmental awareness and the worldwide mobility and migration. However, on a building level, restoration as a technique to adapt to new arising functions, different users and new lifestyles, and late environmental and safety ideals such as energy efficiency, materials, and health and wellbeing. For the identity, keeping culture and traditions, social norms, and the way of living and interacting are essentials in order to preserve the identity if people in a changing geographic places. Finally, on the environment level, sustainability and resilience against the natural and human made environmental changes the world is facing today are the trend which should be followed in the arising architecture designs.

2.3. Leftover Spaces Metamorphosis

Leftover spaces are defined based on the reasons of its appearance throughout urban metamorphosis as mentioned in this part.

2.3.1. Reasons behind the appearance of leftover spaces

Generally speaking, lost spaces are the undesirable urban areas that are in need of redesign- anti spaces, making no positive contribution to the surrounding or users. They ill-defined, without measurable boundaries, and fail to connect elements in a coherent way

There are four main categories of leftover spaces specified upon the reasons of formation as follows:

- Planned leftover spaces are those created due to the lack of understanding spatial needs of the urban environment. These may be as a result of unsuccessful policies applied by the governments regarding urban design zoning and land use which divides the city and creates the planned leftover spaces. These spaces are prominently visible in an urban area.
- Functional neglected leftover spaces are those governmental properties in the form of built masses that are no longer functioning; spaces lost beneficial usage in a city.
- Geographical leftover spaces which are mainly due to geographical features such as difficult to build terrains and river sides.
- Residual leftover spaces which are the result of unorganized urban metamorphosis in the form of small areas that could be private or public properties.

Finally, moving fast into the technology which is invading the world without considering a studied and planned process of metamorphosis creates urban problems.

2.3.2. Residual leftover spaces: forms and patterns

Residual is one of the terms used when tackling the urban expansion in cities cutting out lands and keeping non-constructible leftovers behind as a result of certain policies and regulations (Petruskeviciute, 2014).

Leftover spaces forms and negative uses are listed in the figure below:

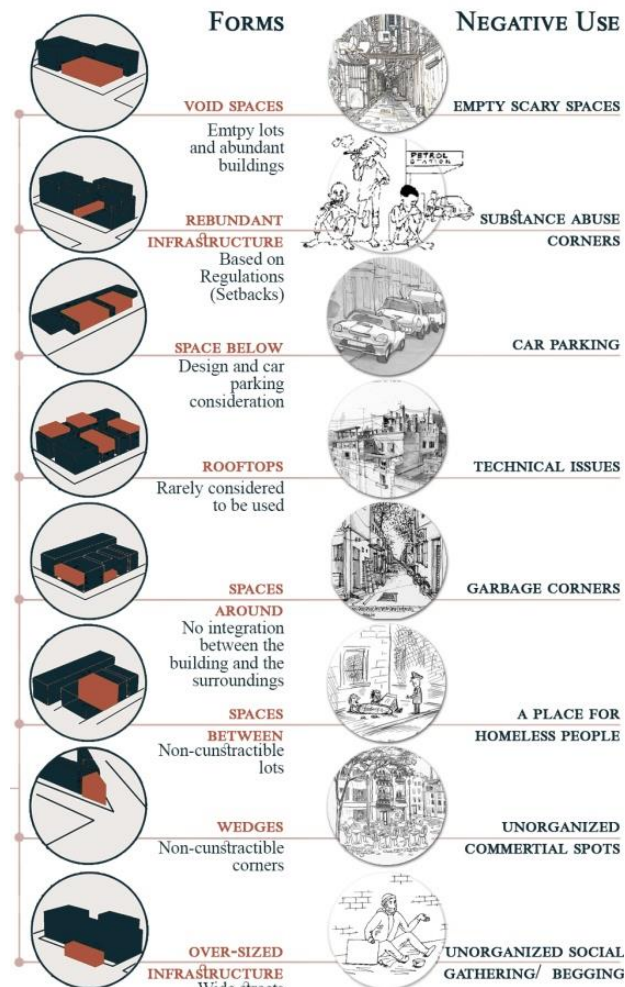


Fig. 2: Different Forms of Leftover Spaces

Source: L. Petruskeviciute, (2014). Up- Cycling Spaces, Thesis dissertation published on issuu.com/ Date: 9th Dec, 2020

2.3.3. Leftover spaces potentials

As described before, leftover spaces are of different forms and types, which create a variety of potential usage quality. The possibility of metamorphosing these spaces is applicable by adopting a new purpose and social identity, but preserving the cultural value. A neglected space that is kept unused, or used negatively, could be an opportunity for the community to get benefit by reusing it for creating useful facilities. Today, Metamorphosis of leftover spaces could be presented by several features including a dynamic perception of a space and sense of movement, adaptability, and a relationship between space and time. The movement in architecture is based on two features: dynamic human perception by focusing on visual perception such as light, shade and shadow, and architectural forms of constantly changing visual environment. On the other hand and when it comes to vitality, a relationship between the user, function, and time of a space should be managed.

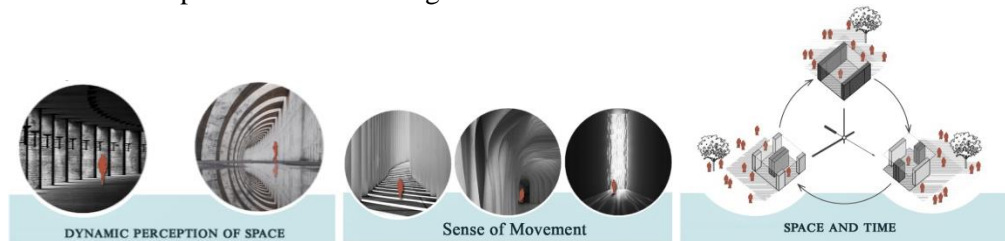


Fig. 3: Metamorphosis Design Features

Source: K. Dewidar, and H. El Daly, (2007) “Metamorphosis of Spaces: A New Language for a Futuristic Architecture”, Architecture Department, Faculty of Engineering Ain Shams University, Cairo, Egypt

The potentials of leftover spaces could be best summarized in achieving self- sufficiency, creating sufficient facilities and equipment, providing social facilities, vitalizing neighborhoods, improving visual qualities, personalizing spaces, enhancing the need for belonging to a group, providing security privacy and comfort, enhancing diversity, and providing permeability.

2.4. Similar Examples of Leftover Spaces Metamorphosis

The followings are similar examples of metamorphosis of form and function of a leftover space into a more livable one.

2.4.1. Zeitz MOCCA Hotel by Heatherwick Studio, South Africa, 2013

Since 1921, this structure was built in Sub-Saharan Africa, and it was used to store maize form all over Africa. Unfortunately, the building stopped to function in 2001 after several years of plundering, and it became then severely damaged structure due to



Fig. 4: The Grain Silo Before and After

Source: DesignBoom.com Date: 11th Oct, 2020

floods for too many years. Then, it was planned to make use of the abandoned area by demolishing the structure, however, the CEO of the V&A Waterfront Duke Green refused to get rid of the structure and assigned Thomas Heatherwick to repurpose the abandoned structure in 2004. At that time, it has been 7 years

ago when John Zeitz, former CEO of Puma started collecting African Art pieces, and it was planned to create the contemporary art museum of Africa's by changing the function of the grain silo keeping the cultural identity. The exterior, the original concrete heavy structure was preserved, however the addition of the geometric glazing glows the building.

The building stands long ago as the tallest building in that region, today, the elevator tower serves as the hotel and the grain silos became a contemporary art museum opened in 2017. The following is a detailed wall section showing the two main parts of the restored structure and the services and amenities distribution.

2.4.2. Superkilen Park by BIG (Bjarke Ingels Group), Topotek1, and Superflex, Copenhagen, Denmark, 2012

The challenging neighborhood Nørrebro is an old part of the city Copenhagen, known for its inhabitant's diversity. Designed by the BIG, Superkilen is represents around sixty different cultures and countries in a vital area of different nationalities using a unique 750 meter squares of public space designed between the buildings of Nørrebro neighborhood. Before this intervention, the area was an empty area between the buildings in which kids and parents meet in a bare land without finding any place to sit or playgrounds for kids to enjoy the space. Due to the social and ethnic variety, this area was subjected to arguments and frictions among the users of various traditions, norms, and social behavior. A competition was launched by the city of Copenhagen and the Realdania foundation to create urban spaces which adapts to this diversity as they planned for reorganizing the city.

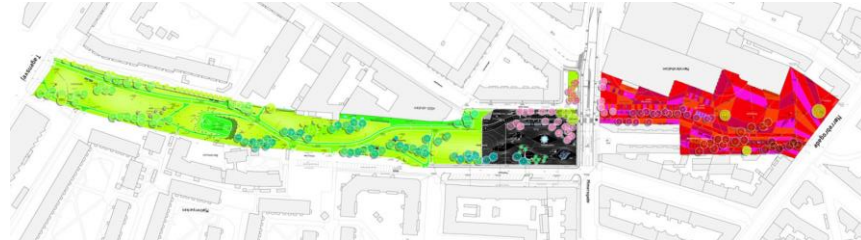


Fig. 5: Superkilen Master Plan

Source: A. AlShehri, (2017). Superkilen: Case study of the public urban space in Copenhagen, Denmark

The dynamic zoning theme of Superkilen is of three different colors: green, black and red. The green part is the integration with nature through a plantation and vegetation along the rectilinear landscape. The red part of the landscape aims to create a platform for social interaction and gathering, as well as physical activities and games. The black part is the center of the park, where the different cultures can be clearly seen through elements. Superkilen was an added value to the neighborhood for people to live and interact (Akšamija, 2016).

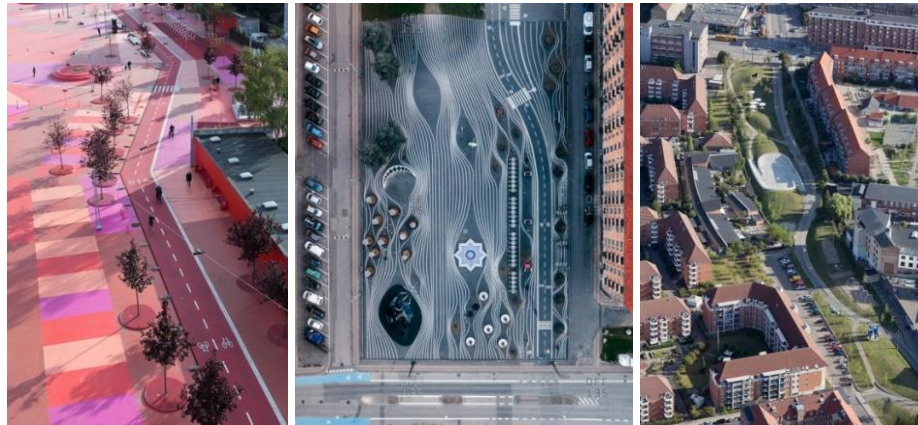


Fig. 6: Superkilen Three Zones

Source: Dezeen.com, photograph is by Torben Eskerod, Date: 9th Dec, 2020

2.4.3. High Line, New York by James Corner, Diller Scofidio, and Piet Oudolf, USA, 2014

The High Line was originally constructed to be used for passenger's transportation and goods from and to New York City through the west side of Manhattan. Due to demolishing some parts of the High Line by the 60's all the traffic to stop; the last train passed on the High Line rail was in 1980s. Since that time many people were calling for reusing the ugly eyesore as a recreational space and landscape for the public to use. In 2003, 720 ideas for reusing the High Line were created as a competition was done for this purpose. Then, James Corner Field Operations, a landscape architecture firm and Piet Oudolf, planting designer, were selected as the team to transform the High Line.

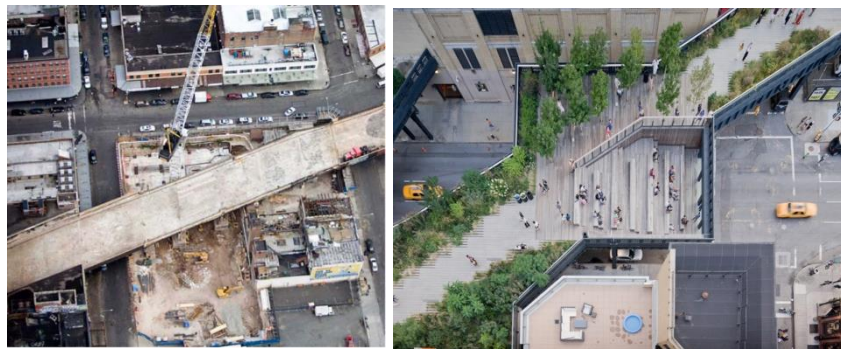


Fig. 7: High Line before and After Restoration

Source: Highline.org, Date: 9th Dec, 2020

In 2009, a restoration of the neglected rail way started, in which an iconic landscape, when it became the one of the first public spaces on the world in the 20th century. The High Line magnificent landscape has created a healing space in the middle of a city for everyday use, in which the elevated structure created an experience which separates the user from the mood of the city and brings the nature to the middle of crowdies. The High Line is unique for its architectural landscape design and cultural reflection, as well as the artistic image. The concept of reusing an urban neglected and restricted structure since too many years and changing it into a pedestrian zone in the middle of the city was a successful choice. (Rosa and Lindner, 2018)

2.5. Parameters of Analysis

Based on analyzing and understanding metamorphosis and the capability of metamorphosing leftover spaces through the three previous similar examples, it is concluded that the social and cultural interaction as well as on going activities in a city are the key element for creating a near, affordable, and healing public spaces for users to interact and practice certain activities. This enhances creativity and productivity of people benefitting from these spaces. In order to categorize the different approach to achieve this goal, it could be possible to revitalize these spaces based on three different aspects: utilities, activity, and productivity (Petruskeviciute, 2014). The followings are the parameters that characterize a successful metamorphic leftover space:

Table 2: Parameters of Analysis

Source: Author				
Time	Site Location	Identity	Target Audience	Environment
Change and Continuity	Context and Surrounding Potentials	Social and Cultural Value	Activity and Productivity	Climatic changes and Environmental Goals

3. RESEARCH METHODOLOGY

Several research methods and reasoning approaches are used to conduct this paper, and these are mainly categorized into two research methods and two reasoning approaches. The field method, in which the author visited the specified location to collect data in order to conduct urban studies including land use, building heights, building conditions, road network and others, either by sketches or by taking photos. Besides, interviewing people who live in Bachoura district concerning their point of view about the metamorphosis of leftover spaces. The analytical method is used to analyze the results of the field survey and questionnaire.

On the other hand, the inductive reasoning is used to collect the required data and information regarding the specified case study; urban fabric “leftover spaces” in Bachoura district, the potentials of reusing these unused parcels. Finally, the deductive method, after all the studies that were performed, a new approach to reusing leftover spaces in the urban fabric will be established. The case study of Bachoura district targets the leftover spaces which are in the form of non-constructible parcels, urban corridors, abandoned sites, and roofs. The leftovers which fragment the urban fabric could be an opportunity to create a social interaction platform.

3.1. Introducing the Case Study of “Bachoura Leftover Spaces Metamorphosis”

Bachoura is located in the oldest settled part of the walled city of Beirut; it is a dense area including the oldest built structures. This area has developed in an unorganized manner, with no planning strategies for designing neighborhoods. Many historical forgotten buildings in Bachoura, which reflect the lebanese culture and traditional architecture are leftovers in the area of Bachoura district. This district includes several types of leftovers such as abandoned buildings, non-constructible parcels, and urban corridors. The community living in this district are low-income community lacking the basic facilities for entertainment. Since 2006, the only site which may have been considered a public playground was bought from one of the native families of Bachoura to a private company. At 2006, the excavation work of the site started and a new project was planned to be

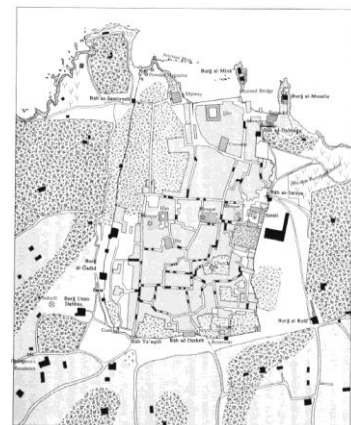


Fig. 8: Beirut 1841
Source: M. Davie, “Maps and the Historical Topography of Beirut”, almashriq.hiof.no
Date: 26/11/2020

constructed, however, a surprising archeological site was discovered which stopped the project. Since then, the abandoned site is an inaccessible site for the public. In the middle of the built environment, and in a crowded city, people live with no leisure amenities to escape. In a fragmented urban fabric such as Bachoura district, these leftover sites are the only way to integrate the built environment with a network of facilities and social interaction platforms.

3.2. Urban Analysis of Bachoura

Bachoura district is located in the heart of the capital Beirut. The district is surrounded by Solidaire from the North, Basta from the South, Patriarcats from the West, and Furn Al Hayek from the East. The Northern part of Bachoura is completely demolished, and it belongs to Solidaire, and the North Eastern part belongs to Beirut Digital district which is also invading Bachoura. Bachoura is in danger, historical buildings are being demolished to build new and modern project neglecting the importance of the historical background and creating a gap between the old Bachoura and the new one.

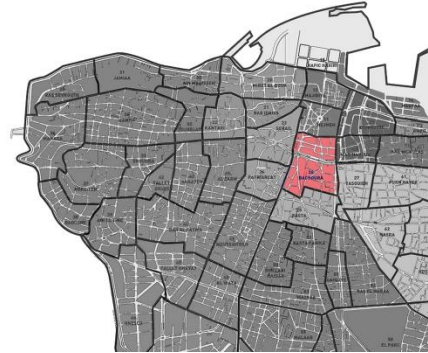


Fig. 9: Locating Bachoura in Beirut
Source: Author

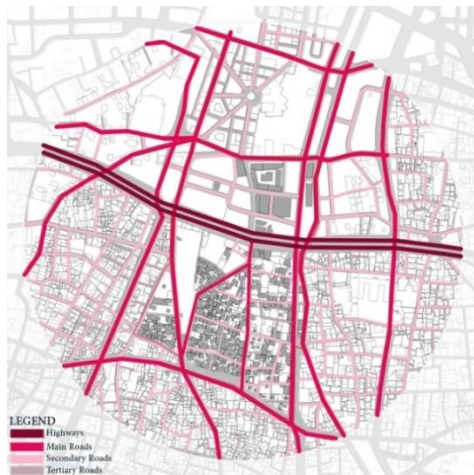


Fig. 10: Mapping the Road Network of Bachoura
Source: Author

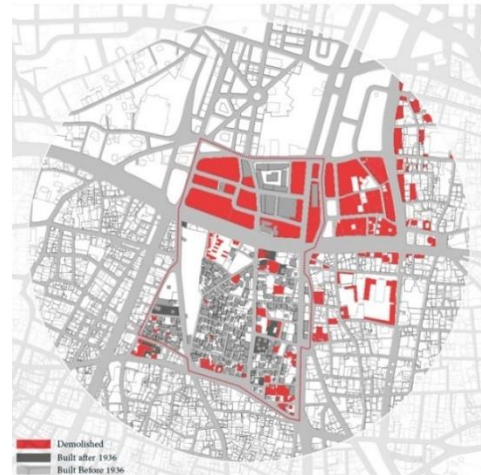


Fig. 11: Building Conditions of Bachoura
Source: Author

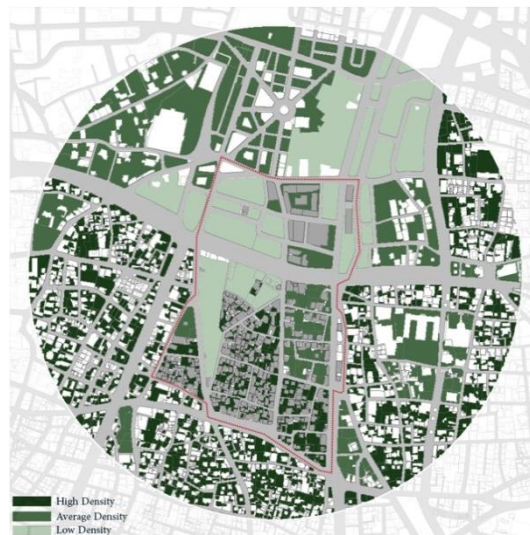


Fig. 12: Mapping the Population of Bachoura
Source: Author

The Independence Road divides Bachoura from East to West. The main street in Bachoura district are considered in a good condition, however, car parking parallel on both sides of the street creates crowd. Sidewalks and lighting features are available only in the main streets; however, the secondary and tertiary streets are dark at night. Since Bachoura is a very old district, most of the buildings in this site are built before 1936, and these are being demolished progressively. Awareness is required to stop eliminating the identity, and instead, restorations of the existing abandoned sites are required. The empty sites in the district are those were historical buildings were demolished. And the green spots in Bachoura are almost left with garbage.

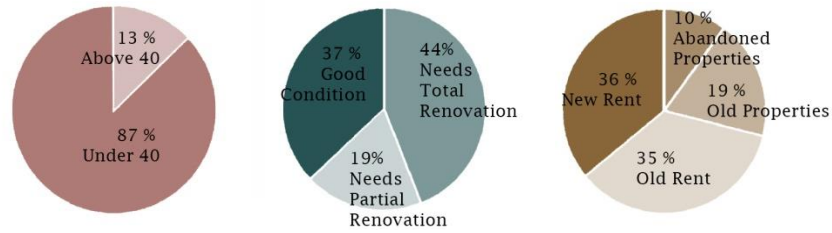


Fig. (13)

(a) Population Ages (b) Building Conditions (c) Properties and Rents
Source: Author

3.3. The Problem of Leftover Spaces in Bachoura

Since Bachoura wasn't design according to urban rules and regulations, neighborhood in Bachoura does not follow in any way or another the regular form of a neighborhood, there is no facilities and they lack the minimum requirements.

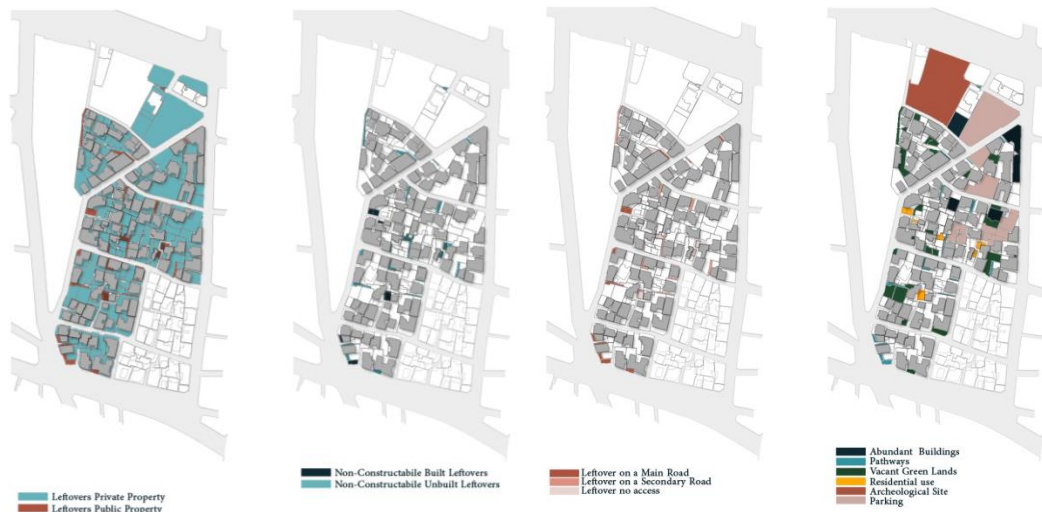


Fig. 14-A: Analyzing the Leftover Spaces Conditions

(a) Properties (b) NonConstructable Parcels (c) Approximity to Roads (d) Landuse

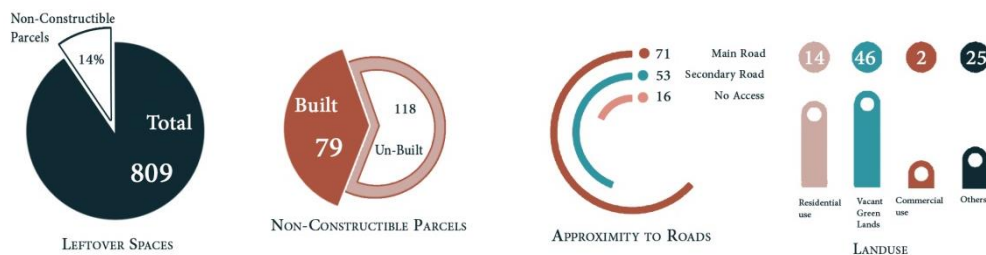


Fig. 14-B: Analyzing the Leftover Spaces Conditions

(a) Leftover Spaces (b) NonConstructable Parcels (c) Approximity to Roads (d) Landuse

Source: D. Aouad, (2014), "Non-constructible parcels within the boundaries of Municipal Beirut: The case study of Saifi, Bachoura and Zokak El-Blat", Thesis submitted in partial fulfillment of the requirements for the degree of: Masters in Urban Planning.

Throughout the development of the area in a vernacular old form, leftover spaces were created in the form of corridors between buildings, and small area lands in between the houses. Besides, the kept abandoned houses which are widely spread in the area are also considered leftover spaces, and these are concrete old structures that are unoccupied, and some of them lack some parts such as the roof or façade, as well as some facades that are standing alone. Figure 14 shows the non-constructible lands that are of two types, some are built although it is not allowed, and others are kept unused as leftovers.



Fig. 15: Different forms of Leftover Spaces in Bachoura

Source: Author

3.4. Selection of a Specific Area in Bachoura

Bachoura district was selected in order to test the potentials of metamorphosing leftover spaces for several reasons. First, the district is on the Southern side on downtown Beirut, and it is affected by the flow of people and traffic to the city center, it is a strategic important location in Beirut. Second, the area is one of the oldest parts of Beirut and it includes too many forgotten structures, as well as a historical neglected site, and many small area parcels. Third, Bachoura community is neglected by the government and they aren't getting their essential amenities as humans. The project aims to revitalize Bachoura district and create a relationship among the district and the neighboring sites through a promenade connecting it to the downtown city center.

3.5. Different Opinions Concerning the Potentials of Leftover Spaces in Bachoura

In order to achieve credibility and to involve people in designing their neighborhood, the research required meeting people living in this district.

3.5.1. Holding interview

Interview were held at the 9th of December 2020 in order to ask the people about who live and belong to this place about their way of living, and what they like and dislike about their neighborhood. The following questions were asked to these people:

- a. What cognitive memory can you draw about this place?
- b. What cultural and social behavior does the community practice in Bachoura?
- c. What do you think about all the abandoned buildings in Bachoura? Do you prefer demolishing or repairing?

Below are some of the answers to these questions as said by the people:

- *Placing memorial elements to save the memories of certain events that took place in the area.*
- *Any changes in the selected area should be focusing on the resident's needs, to make their daily life better and not transforming it into a high class area for specific type of people*

- *Strongly agrees about the idea of demolishing old, leftover and abandoned buildings, but also its unfair for a company to take the whole project rather than taking over the project for individual architects or engineers.*

These opinions are taken into consideration by analyzing and interpreting the results and taking the recommendations into actions.

3.5.2. Questionnaire

An online questionnaire form was established targeting mainly the educated people living in the district of Bachoura or nearby, and these were 50 people of different ages and economic classes, the questionnaire includes the following questions:

- a. On a scale from 0 to 5, how likely do you feel safe and comfortable crossing the paths between the buildings in Beirut?
- b. How likely do you feel comfortable living in a neighborhood adjacent to a cemetery?
- c. Due to the urban expansion of Beirut, these vacant spaces are left between the buildings, do you agree upon considering these spaces as lost area? Leftover Spaces in Bachoura, Beirut?
- d. How likely do you agree upon transforming these leftover spaces into a useful space for the community? Bachoura, Beirut
- e. For what purpose could these spaces be used?
- f. How likely do you agree upon transforming secondary streets of the old neighborhood of Beirut into only pedestrian pathways and bicycles tracks?
- g. To what extent do you agree or disagree upon demolishing abandoned buildings in the old districts of Beirut?
- h. "Bachoura, a new Solidere in the making?" Do you agree upon the expansion of solidere to the neighborhood district such as Bachoura?

After visiting the site and completing the field methodology, the paper analyzes results and findings of answers.

3.6. Findings

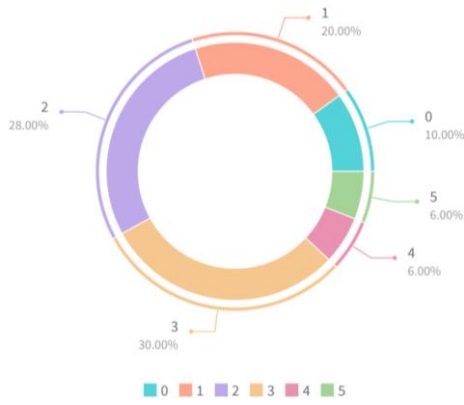
Below the results of the interviews and questionnaire are described and analyzed

3.6.1. Analyzing interviews and results

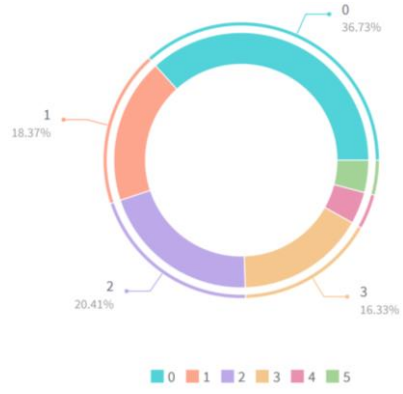
The sense of belonging to Bachoura and the need to keep the place identity implies asking for memorial spots for the good and heartbreaking moments in order to keep these memories. Moreover, the area lacks all the amenities needed for social and cultural interaction. And they are losing their place and areas progressively, that's why they ask for amenities that are beneficial for the district. Besides, most of the residents feel afraid of the expansion of real estates into this district, knowing that most of them are living there long ago. This appears upon refusing the demolishing of old buildings to expand the real estate in this district. The fear is due to the negative side effects of the real estate expansion including the economic and social gap between the two areas. This affects the existence of low-income community living in Bachoura district.

3.6.2. Analyzing the questionnaire results

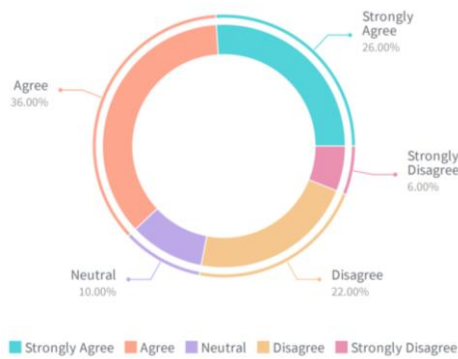
The results of the questionnaire are viewed below in the form of a pie chart describing the percentage of answers of each question as follows:



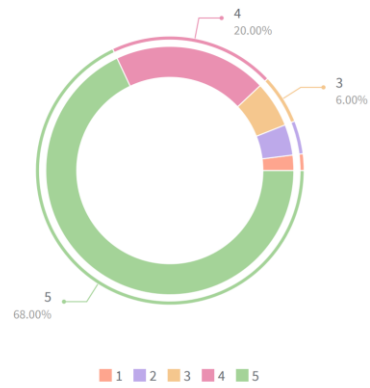
(a) Fearing the Passages between the Buildings in Beirut
Source: Author



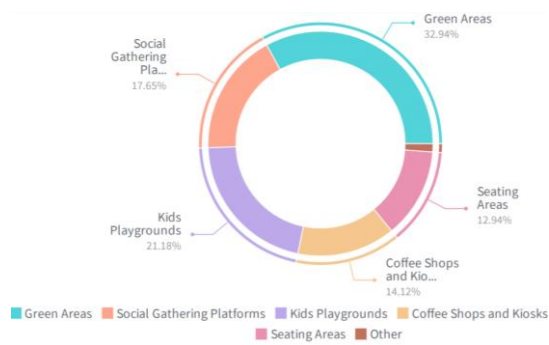
(b) Fearing Living near a Cemetery
Source: Author



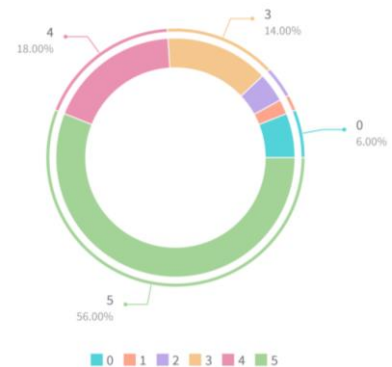
(c) Classifying the Leftovers as Lost Spaces
Source: Author



(d) Encouraging Transforming the Leftover Spaces
Source: Author



(e) Functions and Uses in Leftover Spaces Restoration
Source: Author



(f) Accepting Secondary Streets to become only Pedestrians and Bikes
Source: Author

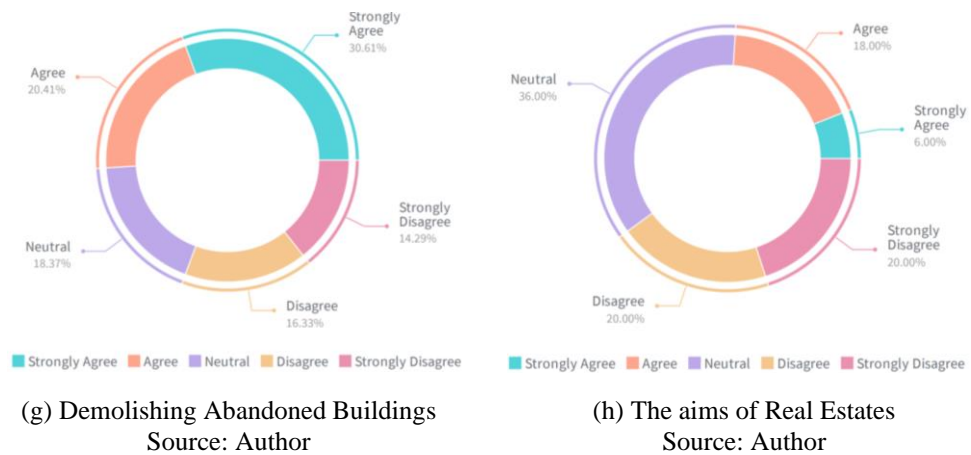


Fig. 16: the result of the Questionnaire

In Figure (16):

- Shows that 58% people are afraid of passing between the buildings in Bachoura. This is due to the absence of lighting which makes the paths dangerous.
- Shows that 54% of the people don't fear living near to the cemetery. This is because it is in the middle of the crowded city Beirut.
- Shows that the majority agree upon classifying the unused spaces as leftover spaces. This is due to lacking a lot of amenities which leads to questioning: why don't we use these spaces to introduce essential amenities for the district?
- Shows that 68% of the people encourage the transformation of leftover spaces. This implies that people really need to change their way of living.
- Shows that all the recreational facilities mentioned in this question are needed in this neighborhood. People lack social and cultural interaction platforms.
- Shows that 73% of the residents agreed upon transforming the secondary streets into pedestrian pathways. This means that car accessibility isn't needed and it is applicable to park few meters far away and encourage physical activity.
- Shows that people agree upon demolishing abandoned buildings. For them, these building are leftover masses that could be removed. However, if these buildings are reused, these building won't be considered problems anymore.
- Shows that people don't agree upon the expansion of the real estate into the district, and 36% are neutral. Some people aren't aware about the historical and cultural value of the district.

3.7. Discussion

Based on the analysis of the interviews and questionnaire results, and referring to the analysis of the district built and natural environment, a new approach to reusing the leftover spaces is established. The followings are the decisions concluded to restore leftover spaces:

- The intervention in leftover spaces shall be of two types: temporary and permanent. As described in figure 14, leftover spaces are of two types: public and private properties. It is possible to build permanent structure in public properties since the recreational amenities are provided by the governments.
- Leftover Spaces are agreed to be lost with no function based on the questionnaire, therefore the function of leftovers will be reconsidered and all the vacant lands will become public spaces. The questionnaire aimed to define the typology that is needed in this area and it is mainly recreational facilities.
- Transforming the corridors between the buildings into appropriate paths by transforming pavement and installing lights.
- The identity of a place shall be preserved through leftovers by enriching the culture and social value of the district through public spaces.

- Abandoned buildings which are in good condition shall be renovated and restored.
- The use of leftovers will be dualistic; two functions in different time could be performed in one space based upon the needs of the community.

By applying these decisions, it is possible to say that these people belong to these spaces, and they are provided with the minimum amenities that need for a healthier life physically and mentally.

4. CONCLUSIONS

This research paper defined the problem of leftover spaces which are the result of unorganized urban expansion. Similar examples were analyzed to define the parameters of analysis of the main case study. The case study of Bachoura district in Beirut analyzed the urban fabric and the existing conditions and interpreted the results to come out with certain conclusions as follows:

- A. Leftover spaces are considered a problem with a range of potential solution for developing and improving the quality of live in a neighborhood.
- B. For the users, leftovers are spaces used for keeping garbage, unplanned bare lands, abandoned masses, setbacks, and the unused spaces around the buildings.
- C. Despite the fact that the abandoned buildings are historically and architecturally valuable of the, they are considered leftovers that aren't needed by the native people in the district, unless restoring them.
- D. In a crowded city, people of all ages need to find recreational spaces for social interaction. Meanwhile, it is necessary to consider using the potential leftovers in order to create a social and cultural interaction platform.
- E. Leftover spaces could be used to provide utilities, revitalize the district through enhancing activities, and create a sufficient environment to boost the productivity of the occupants.
- F. In an undeveloped neighborhood, children's playground is the car parking areas. However, separating the kids playgrounds and car parking is one of the principles if urban design.
- G. People are in need for recreational spaces and social platform for interaction, and that's what makes these spaces leftovers.
- H. Today, metamorphosis of leftover spaces shall be an adaptation process to the parameters defined in this paper including: time, site location, identity, target audience, environment. It is the change in form and function of these vacant lands in order to enhance the aesthetics of the area and the mental and physical health of the users.

REFERENCES

- Tostoes, Ana, and Koselj, Natasa, (2018). “Metamorphosis: The Continuity of Change”, Lisboa, Docomomo International, Ljubljana, Docomomo Slovenia
- “Development and Urban Metamorphosis”, Aga Khan Awards Publication, 1985
- Angel, S., Parent, J., & Civco, D. L. (2012). The fragmentation of urban landscapes: global evidence of a key attribute of the spatial structure of cities, 1990–2000. *Environment and Urbanization*, 24(1), 249-283.
- Maturano, R. G. Gómez R.(2014). New Concepts or New Stories: the Urban Fragmentation. *Anuario de Investigación del Posgrado de Urbanismo*, 0, 253-265.
- Faleh, M. (2013). Urban metamorphosis and Islamic Architecture in the time of globalization: Utopian realities and challenges. *A/Z ITU Journal of the Faculty of Architecture*, 10(1), 128-137.
- Azhar, J., Gjerde, M., & Vale, B. (2018). Re-imagining Urban Leftover Spaces.
- Dewidar, K. and El Daly, H. (2007) “Metamorphosis of Spaces: A New Language for a Futuristic Architecture”, Architecture Department, Faculty of Engineering Ain Shams University, Cairo, Egypt
- Aouad, D. (2014). *Non-constructible parcels within the boundaries of Municipal Beirut: The case study of Saifi, Bachoura and Zokak El-Blat* (Doctoral dissertation, Masters' Thesis, Académie Libanaise des Beaux-Arts (ALBA), Balamand University, Balamand, Lebanon).

- Withagen, R., & Caljouw, S. R. (2017). Aldo van Eyck's playgrounds: Aesthetics, affordances, and creativity. *Frontiers in psychology*, 8, 1130.
- Petruskeviciute, L. 2014. "Up- Cycling Spaces. Design Recommendations for Reactivation of Residual Urban Spaces", Department of Architecture, University of Strathclyde
- Akšamija, A. (2016). Superkilen On-site Review Report. *Aga Khan Award for Architecture (Geneva: Aga Khan Award for Architecture, 2016)*, 8.
- David, J. (2002). Reclaiming the Highline A Project of the Design Trust for Public Space, With Friends of the High Line. *Edited by Karen Hock. Accessed August, 15, 2011.*
- Rosa, B., & Lindner, C. (2017). From elevated railway to urban park. *Christoph Lindner/Brian Rosa (Hg.), Deconstructing the High Line. Postindustrial urbanism and the rise of the elevated park. New Brunswick ua: Rutgers University Press, 1, 20.*
- Raeisi, I., Nezhad, A. K., & Hafezifar, M. (2010). Architectural Design Principles of Public Spaces Based on Social Sustainability Approach: A Case Study in Ardabil, Iran. *Design Principles & Practice: An International Journal*, 4(5).
- Desportes, B. and Pugajeva, O. 2015. "Space Metamorphosis", Msc04 ARC, Department of Architecture, Design and Media Technology, AAU
- Güneri, G. D. (2014). *A New Conceptual Framework for Architectural Utopia (Nism) S* (Doctoral Dissertation, Middle East Technical University).
- Petruskeviciute, L. (2014). Up- Cycling Spaces, Thesis dissertation published on issuu.com Date: 9th Dec, 2020