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BROWNFIELD REGENERATION AS AN URBAN APPROACH RESISTING ECONOMIC RECESSION

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BROWNFIELD REGENERATION AS AN URBAN APPROACH RESISTING ECONOMIC RECESSION

Abstract

Brownfield is a land that was used before for different purposes, then was polluted, and abandoned, this type of land is called brownfield. Brownfield regeneration consists of three main sustainable fields: economical, environmental, and social. Brownfield regeneration is a main key in sustainable urban development. Thus, suffering from an economic crisis that affected all the veins of the country and left people in a bad situation. That shortage made the citizens feel miserable, unproductive, less efficient, and unpleased. This research aims to examine the validity of using the brownfield areas to be proper lands as a tool for resisting economic recession. To achieve the main aim, this paper will apply desk research, literature review, defining brownfield and its types in addition to field work and questionnaires. Through these studies, the paper will conclude with some recommendations and suggestions to regenerate some brownfields and its impact on the economy.

Keywords

Brownfield, Regeneration, Economic, Sustainable, Urban Development

1. INTRODUCTION

Brownfield, a word or a term that is very used and important now in the urban planning or policy in the whole world. But the term of reuse the brownfield land or the revive it was different meanings for now, this difference in the meaning can lead us to a better understanding of the terminology and how the world is going to deal with it.

Usually, brownfields areas or land are affected by their previous use. These lands if regenerated, it can help reduce the human, environmental and economic crisis and of course it will help the environment to heal. Brownfield regeneration has a concept of relocate a land used before in its economical urban place. The brownfields regeneration has the full potential to offers or the help achieving a sustainable urban development. Brownfields are sites that has been affected before by their former use with the land surrounding it, underused sites, and derelict, have or could have pollution problems and issues, mainly located in a developed area and required major human intervention to let it revive in the urban sustainable development. (Oliver et al, 2005)

Brownfields should be seen as a place or potential for future urban development opportunity, rather than being seen as an urban problem that have to be solved. The use of brownfields in the next development should be in a strategic way, it can be divided into three main stages the first one called “policy maturity” in this step understanding the problems surrounding this brownfield is the main key. The second step is to see and explore the potential of this brownfield and how can it be transformed to another useful area and the third step is making the private sector to get engaged in this process. (Grimisky, 2002)

In other way brownfields can be compared between each other to see which one should be regenerated first and the criteria of selection are socio-economy index, the majority, smart growth index and environmental index. These criteria of selection help the decision makers to prioritize brownfield lands for reviving. By giving the decision maker these information’s and data, he can make his move to revive the proper brownfield that can be adapted for use in different context. (Brown, 2012)

Green field sites and reviving brownfields are not competitive if the private sector doesn’t intervention in this process. Sometimes the wrong location and infrastructure make the regeneration of the brownfield high coasted. (Doetsch, 1999)

Stating three main groups of brownfields sites are viable sites this type of sites are found in an economy area where private sector regenerates it without the help of the public sector. The marginally non-viable sites that require the intervention of the public sector, where the site is very polluted or coast a lot of infrastructure. The non-viable site is the site where its location is far from every life and it is hard the regenerate it so the public sector will revive it, mainly all of these types of lands are used for constructing parks or making green areas. (Thornton, 2005)

Sustainability can be defined in many different ways; it can be explained as a permanency and strength.

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

(World Commission on Environment and Development 1987)

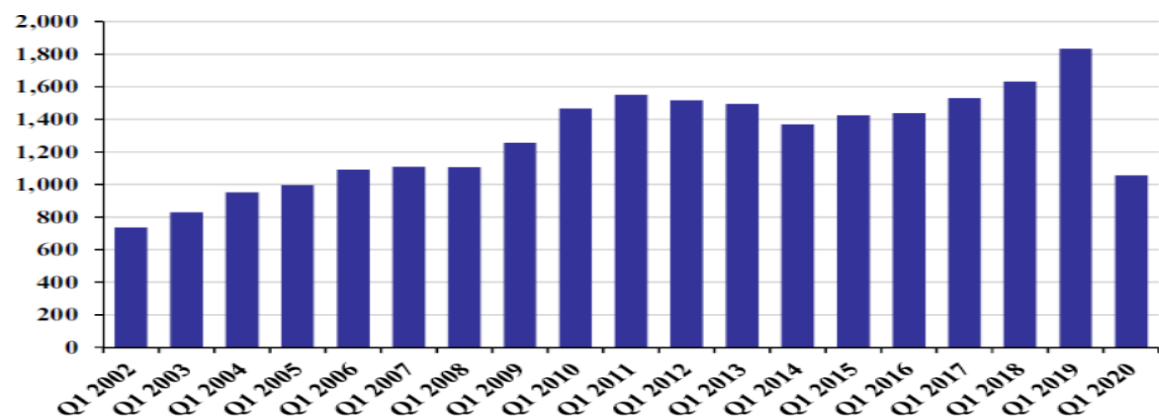
As a leading model urban regeneration became a concept that is applied in different ways and countries. The regeneration of a place should always have a good impact on the social, economic and environmental titles.

18 months from now, Lebanon has been suffering from an economic and financial crisis, followed by Covid -19 restriction that have destroyed the economy and lastly Beirut explosion in 4th of August. Meanwhile the huge lockdown done by the ministry of health and government to prevent the spread of the virus has affected negatively the tourism section in Lebanon specially that the Lebanese economy depend on it. And the shortage of infrastructure such as fuel, electricity and water lead to this decrease in the tourists coming to Lebanon. The number of tourists in Lebanon reached its lowest level on record. Also, tourist receipt reached its lowest level in this year. (Joseph Eid, 2020)



Source: Beirut International Airport

Fig.1: number of passengers at Beirut International airport, source: Beirut international airport official



Source: Lebanon's Central Bank

Fig.2: tourism receipts in US \$, source: Lebanon central bank

This research aims to examine the validity of using the brownfield areas to be proper lands as attraction for tourism and as a tool for resisting economic recession through culture and tourism.

This research hypothesise that we can benefit from brownfields and reusing it or reviving it in order to benefit from it in the urban approach to resist the economic restriction through different ways specially in the tourism sector.

To achieve this aim, the paper will rely on the qualitative analysis of scientific methodology, based on literature reviews about the brownfields, investigating ideas about regenerating brownfields and how can

This process resist economic recession. Through these studies, the paper will conclude with some recommendations and suggestions to regenerate some brownfields and its impact on the economy.



Fig.3: A brownfield site in USA, source: irmi.com



Fig.4: A brownfield site in USA transformed into a park, source: irmi.com

2. LITERATURE REVIEW

Based on reviewing the literature, a theoretical base was detected for relating the brownfields to urban regeneration as collaborative research. In order to understand this sensitive relation, the study begin with highlighting precise definitions, values, and characteristics of brownfields as follows

2.1 Definition of Brownfields

In architectural field, brownfields are projects that have a lot of regulations or constrains that are related to the current type or state of the land. That's mean that the site could be polluted or damaged or even have constructed ruins. The architect should intervene in this way to change the status of the land to move on with the project.

Brownfields are relinquishment lands, underutilized or filthy. Redeveloping these types of land will reduce the destroyed green areas, bring more taxes and then boos the economy and improve the social state of the area surrounding this land. (Brebba, 2002)

2.2 Roots of Brownfields Problem (Historical Background)

Critics across the globe indicates the law and the politics than brownfields are victims of environmental politics and laws. So owning a polluted site or a contaminated site under these laws is a main cause that the owner of this land will leave it to be transformed into brownfield. The problem is with the coast of a polluted site and the laws of reusing it is also a cause that lead to a brownfield.

Of course the environmental law let owner leave his land to become a brownfield, so mainly brownfields have started to show from the beginning of human creating laws for environmental issues. After the industrial revolution, a lot of factories are made and a lot of lands become polluted after the factories closed and after the site became abandonment and polluted it became a brownfield. (Rossi, 2004)

2.3 Criteria of Brownfields regeneration

Mainly to achieve the full potential of transforming or reviving a brownfield in the urban approach, there are parameters should be followed that influence on the degree or level of sustainability is this land. Many questions should be asked to know what's suit for this type of brownfield. Some of the questions are:

What is the suitable process the regain this brownfield?

What are the requirement so the brownfield regeneration became sustainable?

All the decision makers should answer these questions before. But to answer for these questions a clear definition should for brownfield sustainable regeneration should be prepared. Donatti explain the sustainable brownfield regeneration as:

“Sustainable Brownfield Regeneration is the management, rehabilitation and return to beneficial use of brownfield land in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations in environmentally sensitive, economically viable, institutionally robust and socially acceptable ways within the particular regional context.”

(Donatti, 2004)

This definition still very general so a new study came to improve and support this definition by requiring chief arena of effort in the brownfield.

- Management of contamination and the reuse of soil and debris;
- Management of existing buildings and infrastructures;
- Land use and urban design on brownfield sites;
- Planning processes and methods for citizen participation; and the
- Management of brownfield projects.

2.4 Optimal Lifecycle of a Brownfield

When evaluating the environmental component of sustainability of a brownfield redevelopment, it is paramount to consider the environmental impacts of the Site in terms of its life-cycle assessment.

Step 1 – establish a vision

Step 2 – consult on the vision

Step 3 – develop necessary infrastructure and public realm standards

Step 4 – prepare site development brief

Step 5 – training and employment access principal

Step 6 – developer-partner selection and agreement

Step 7 – implementation

Step 8 – training and employment linkage activated

Step 9 – aftercare (Parkinson, 1998)

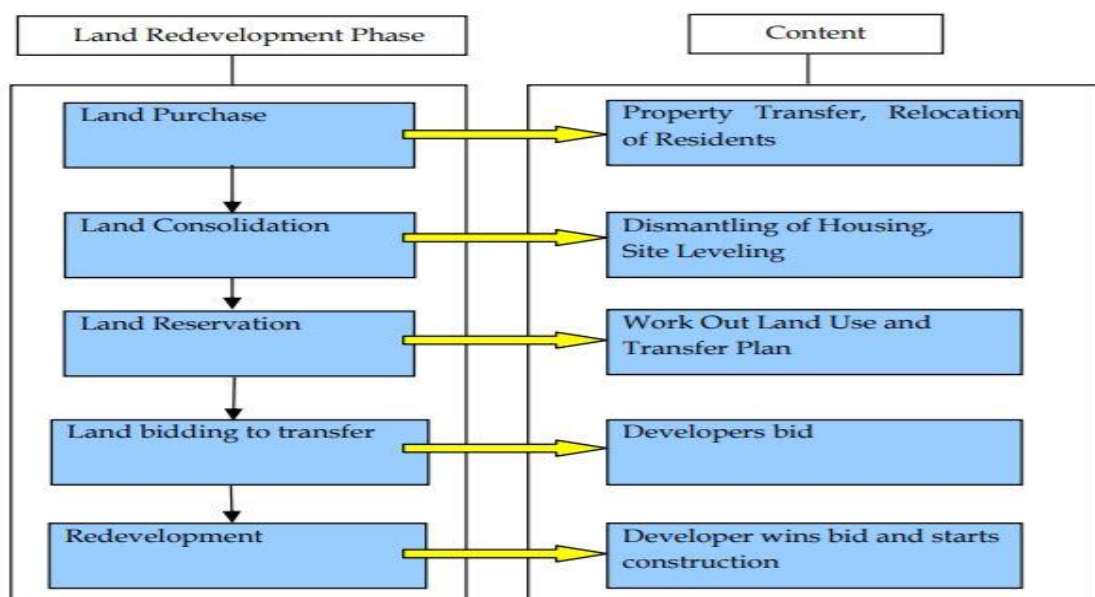


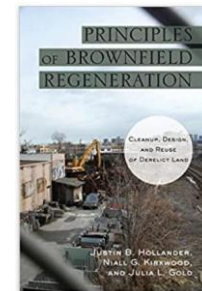
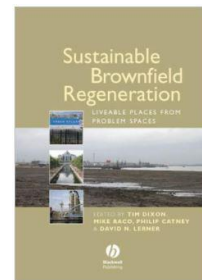
Fig.5: Land redevelopment, source: World Bank document, September 2010

2.5 Previous Readings

The next section contains a list of recommended literature relevant to the research topic. The readings illuminated several issues raised by many architects with differing perspectives on a same theme, low-income housing.

Brownfield regeneration is now the most purpose of major developed countries, researches said that there is more than 64,000 hectares of brownfield lands in England, the authorities use different way to regenerate it as an urban approach to become a way to power the economy. Bringing this land back to life is the new policymaker process.

This book represents the most effective ways to regenerate brownfields in the twenty-first century, the author takes the reader and let him discover all the way used from A to Z how brownfields can be solved and the best ways to regenerate it, by identifying the potential of regenerating it with analysing of some case studies.



2.6 Analysing Similar Examples

2.6.1 Brownfield redevelopment in Norrköping



Fig.6: image showing the new proposed project in the brownfield in Sweden, source: Urban Baltic lab



Fig.7: image showing the new proposed project in the brownfield in Sweden, source: Urban Baltic lab

This project is being constructing from 2017 till now in Norrköping in Sweden, the project is funded by Baltic urban lab. The city of Norrköping faces a great challenge when transforming the harbour to be part of the city with parks, homes and canals. Also, the land used to build is the most polluted in the country and it cost 450 million SEK to rehabilitate it. The main purpose is to let the stakeholders, the school kids and the citizen to know more about this city and its history. T know why this land is destroyed and polluted, how this place will be transformed into a liveable space in the future. (Bajars, 2017)

6



Fig.9: image showing the new proposed project in the brownfield in Skoone, source: Urban Baltic lab

The main objective was to redesign the area called Skoone

2.7 Parameters of Analysis

Table 1: Parameters of analysis- Properties of brownfields regeneration on urban approach.

Characteristic of Brownfields		
Contaminated land	Derelict land	Vacant land
Bits	Bits	Bits
Leftover	Leftover	Leftover
Unfinished megaprojects	Unfinished megaprojects	
Mining sites	Mining sites	
Prohibited sites	Prohibited sites	
Challenging typography		
Key benefits associated with brownfields		
Environmental	Culture	Infrastructure
Economic	Recreational	Community and health

These parameters should be used when trying to identify how to regenerate a brownfield as urban approach to resist economy recession.

3. METHODOLOGY

The paper uses types of research methodology. These can be summarized as four types, first the inductive method is used through gathering data around the chosen case study, Sour heritage area in Lebanon, recognizing its different changes along history. Second the field method, the author visited certain sites in Sour, taking live photographs, sketching and undertaking interviews with a sample of people living in old city of Sour. Beside the interview, a written questionnaire was distributed at this sample to recognize their point of view on the brownfields existing problems and the possible way to developed it. Third the analytical method, the paper analyses results of interviews and questionnaires. Finally, the deductive method, the paper deducts a strategy of certain solution to revive the recessed economy by reviving Brownfields. The four-research methodology are presented through the research as follow.

3.1 Introducing the Case Study of A Brownfield Zone In Old Sour City, Lebanon By Selecting A Brownfield Area To Be Changed Into A Source Of Economic Revitalization

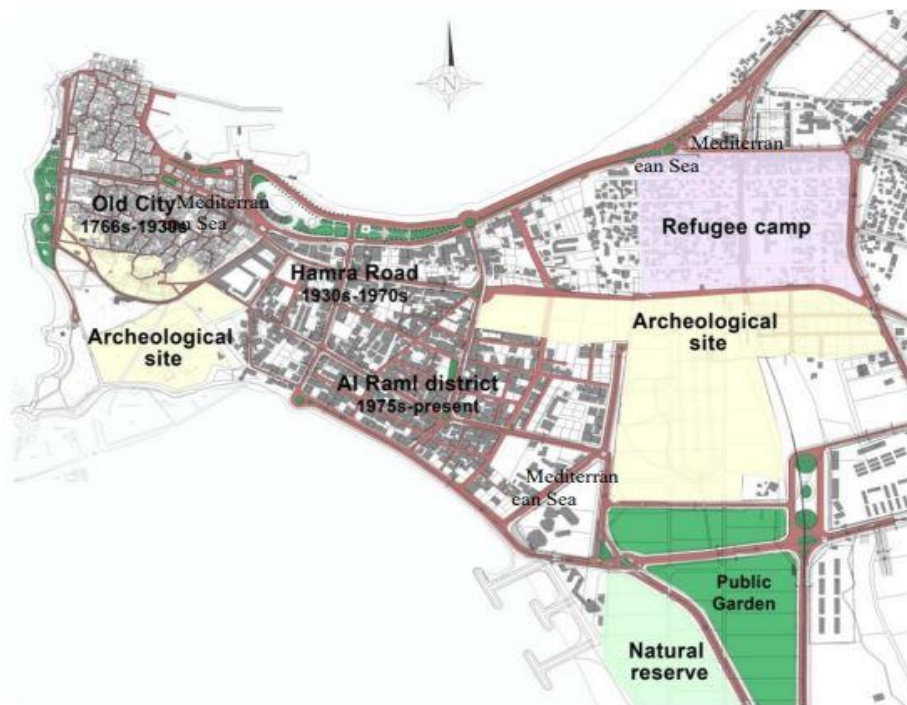


Fig.10: Current plan of Tyre city, showing the morphological study of the urban tissue of Tyre (Researcher, based on the Council of Development and Reconstruction (CDR) cad drawing 2012)

Sour, one of the oldest cities of Lebanon, it was constructed on an island that is not connected with the Lebanese lands, and then attacked by Alexander of Macedonia in 332 how has fill the gap between the Iceland and the Lebanese land so that it is connected now. Sour was first a Greek city, then Roman, Christian and then when the Ottoman Empire conquer all the region the city became Muslim. Al-Mamluk where the last people how destroyed the old city of Tyre, from the ruins of the destroyed city, Sheikh Abbas decided to rebuild the old city. "One can call Tyre a city of ruins built out of ruins" (Jidejian, 1996)

3.2 Urban analysis of Old city of Tyre



Fig 11 and 12: Figures showing Sour city from the sky source: Sour municipality 2014

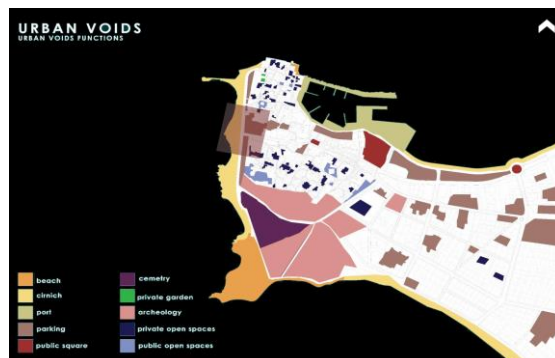


Fig.13: map showing Voids in the city. Source: author

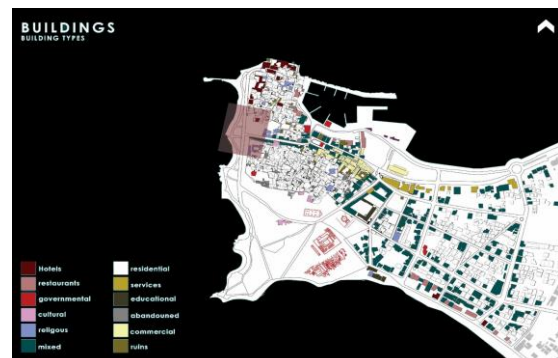


Fig 15: map showing building types in the city. Source: author

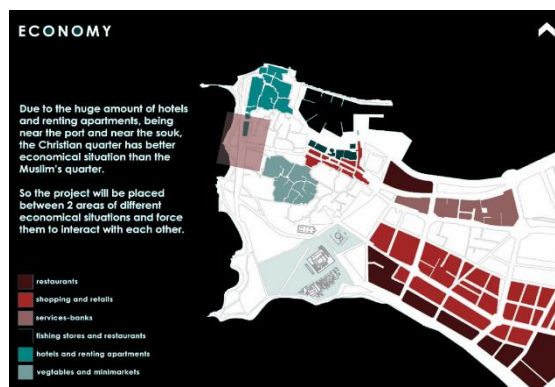


Fig.14: map showing economy in the city. Source: author, 2021



Fig.16: map showing site selected. Source: author, 2021

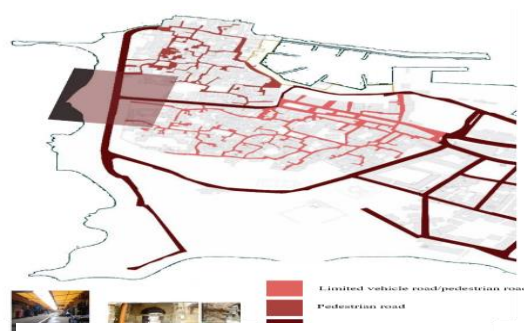


Fig.17: map showing road connection Source: author

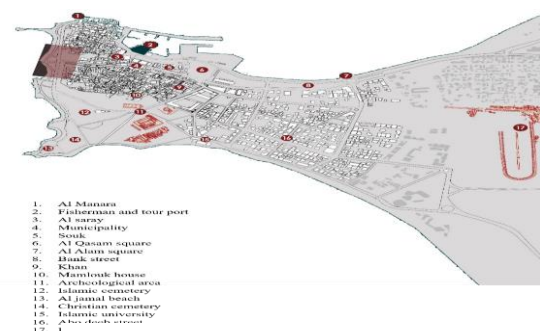


Fig.18: map showing Landmarks in the city Source: author

As a result, for its urban analysis and land use, the old city of Tyre is composed of many zones, the first zone is the old souk, the second one is the port, the third one is the Christian quarter, the fourth is the Muslim quarter, the fifth is the water front, and the sixth is the archaeological sites.

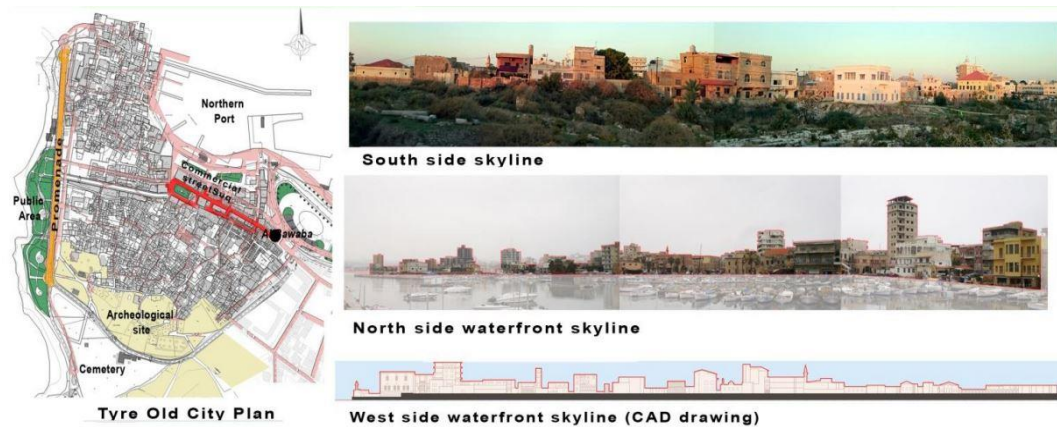


Fig.19: Current plan of old city of Tyre, showing the main zones and skylines from each side (Researcher, based on the Council of Development and Reconstruction (CDR) cad drawing 2012)

3.2.1 Zone 1: the old souk

The old souk of Tyre is one of the most famous souks across Lebanon, known for its diversity, the buildings in the souks are being renovated and the souk attract a lot of people across the country and tourist from all over the world. The routes in it are 6m wide and some places are shaded. There are some places in the souk that are leftover or destroyed and not renovated like the old khan that has been destroyed in the war and never renovated yet. (Jidejian, 1996)



Fig.20: showing the old souk of Tyre (taken by the author 12/9/2021)



Fig.21: showing the old Khan of Tyre (taken by the author 12/9/2021)

3.2.2 Tyre port

The location of the old city of Tyre on the coast line of Lebanon made it an ideal shipping city and trading port. The city was the greatest city of old Phoenicia, a trading and navigating city. The port of tyre is a small harbour, the port control operates during the daytime only. The port connects the old souks with the Christian quarter that is very famous for its boutiques and hotels.



Fig.22: showing the old port of Tyre (taken by the author 8/10/2021)



Fig.23: showing the old port of Tyre (taken by the author 12/9/2021)

3.2.3 The Christian and Muslim quarters

The old city mainly is divided into 2 mains quarters, known as the Muslim and Christian quarters separated visually by a road with 8m wide, full of commercial shops and a cinema. The Christian quarter is more known and famous for its bright colours the buildings are painted with and it is economically stronger than the Muslim one, the Christian quarter has a lot of boutique hotels and restaurants by the sea and it is near the port, a large landscape connects also the two quarters, it is called the water front. The Muslim quarter economically weak and the poverty in it is more rampant. (El-Khoury et al., 2002)



Fig.24: showing the Christian quarter (taken by the author 12/9/2021)



Fig.25: showing the Muslim quarter (taken by the author 8/10/2021)

3.2.4 The archaeological sites in old Tyre

Tyre is a city very rich in its archaeological sites specially that its special location made it very vulnerable to be invaded by many civilizations. The old city is considered as a heritage site by the UNESCO. The city is covered by ruins from different civilizations from the Phoenicians to Greeks and romans. There are very large ruins that still exists till today like Hippodrome the second largest Roman chariot racing arena discovered and the Crusader cathedral where the king of Jerusalem has been were crowned. (El-Khoury et al., 2002)



Fig.26: showing the Hippodrome (taken by the author 12/9/2021)



Fig.27: showing the Crusader cathedral ruins (taken by the author 8/10/ 2021)

3.3 Identifying Problems of Old Tyre

Unfortunately, Lebanon is suffering from an economic crisis two years from now that is considered the biggest ever seen in it. This shortage affected all the sectors of life for the Lebanese people, especially that tourism is a powerful sector of Lebanese GDP. Tyre is an old city that lays on tourism specially that it has a lot of heritage and touristic areas. Most of the people living in Tyre are mainly depending on touristic people nationally and internationally to boost their economy.

The city has different lands that are even destroyed from the war and never renovated or lands contaminated because the municipality is throwing human rubbish in it.

“For Tyre, studies have recurrently stated the need for developing tourism and agriculture as the sectors with most potential but that remain under-exploited.” (UN habitat, theme 4, economy and services 2017)

Tyre city economy is mainly based on tourism, agriculture and trade. Tourism activities Development is mainly sensitive to security.

3.4 Selection of a Specific Area in Old Tyre

To concentrate the study the research selects a specific area of the old city. It is located near the sea, between the two quarters, the Muslim and Christian one.



Fig.28: showing the Brownfield (taken by the author 12/9/2021)



Fig.29: showing the Brownfield (taken by the author 12/9/2021)



Fig.30: showing the surrounding of the site chosen (taken by the author 12/9/2021)



Fig.31: showing the map and location of the site chosen (by the author 12/9/2021)

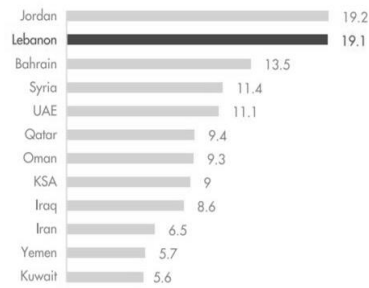


Fig.32: graph showing tourist arrival in Tyre (Banq du Liban, 2021)

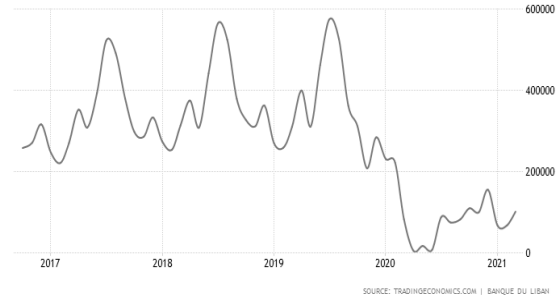


Fig.33: graph showing tourism contribution to GDP (UN habitat, 2017)

3.5 Different Perspectives of Public in Old Tyre

To let the research be more creditable and making more interaction with the people how are living surrounding the site chosen. To recognize the people point of view, visions, needs and memories, the research follows to simple field's methods; interviews and distributing questionnaire forms.

3.5.1 Holding interviews

The interviews were made face to face with eight elderly people living in old city of Tyre from 30 October to 7 November. A lot of memories, emotions and visions represented by people living there and their connection to the city. During interview three questions were asked:

- How do you consider yourself belonging to old city of Tyre?
- How is the relation between the tourists and the local residents and how much the economic crisis and Covid-19 restrictions affected the economy?
- How does the security affect the tourism in the city and how can we boost the tourism section?

Answers sometimes were touching specially when speaking to old people who lived their whole life in the city and go through all the ups and downs.

Samir Karouni (80 years old)

Resident of old city of Tyre are the most generous and lovely persons of Lebanon, they love other people and they love each other. The city is full of joy and life. Tourist is the main economy power used in the city. The resident of the city wait the tourists each year as way to make money. Tourists love to come her because Tyre is a beautiful city.

Sara El Assal (73 years old)

Tyre is my life, I love this city more than my family. I grew up here and I still here and I want to die here. The narrow roads, we used to play every day hide and seek in the narrow roads. My grandpa was a fisherman, he used to take me with him on the boat when the weather is good. I don't know if you saw it, there is an old city drowned under the water, it is called Yarmuta city, and u can see it from the Promenade in the water front.

Abbas Fares (75 years old)

I inherited this shop from my grandmother, she owned it also by inherited it by her mother, we were always having this shop in the old souks of Tyre, the souk attracts a lot of people and tourist specially that they are a lot of people how used to live here are gone after Israel occupation of Lebanon now they return to the city each summer and they buy everything they need from here. There are many beautiful crafts in here. U can't come to the souk and not to try Mahfouz sandwich, the most delicious sandwich in the life go try it and then come and tell me what do you think about it.

People when they were talking, a lot of smiles and daydreaming.

3.5.2 Questionnaire

A closed questionnaire was designed and distribute in 12/9/2021 on 100 educated people of engineers, architects, judges, doctors, business people and non-educated people in the group age between 22 and 60 years old. This questionnaire was submitted equally in three different zones of old city of Tyre (Christian quarter, Muslim quarter and the souk) in order to gain results for each sector. Questions mentioned in this form were directed, simple and specific as follows:

- What is your opinion on the existing projects to boost economy?
- What is your opinion on the brownfields existing in the city?
- What is the project that on your opinion can boost the tourism sector?
- Do you see that there is a potential if some projects are made in the city to boost economy?

After achieving the field methodology, the paper analyses results and finding answers.

4. FINDINGS

Through using an analytical methodology, results of answers can be presented in form of sketches and charts.

4.1 Analysis of Interview Results

Answers of the interview were given to a young Lebanese architect she reformulated answers through visionary sketches according to her feelings and creativity.

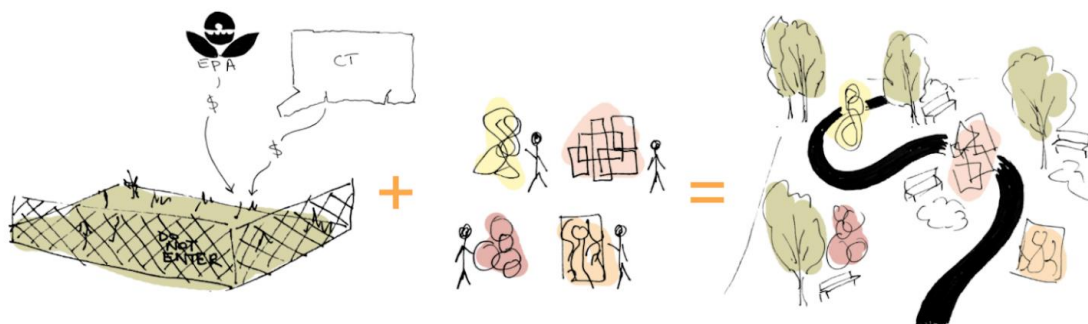


Fig.34: sketches of Lebanese architect Sally Zouia 10/9/2021

As showing in Fig 34, the architect sketched a vision on how regenerating brownfields can boost the economy and the life of humans living surrounding it or near it.

4.2 Analysis of Questionnaire Results

Results of answers are formulated through statistical charts that are based on specific cultural, social background, and economic level. The findings are depicted in the statistics in Figures 25, 26, 27 and 28. Analysing the results show us that the citizen of the city have a great love for the city and they always try to improve the city. They look forward to have projects that can boost the tourism sectors as it is the second economy income for the city, and for the brownfields regeneration they want to revive it also to help the different sectors of the city. They all want old Tyre to become the most touristic city in Lebanon.

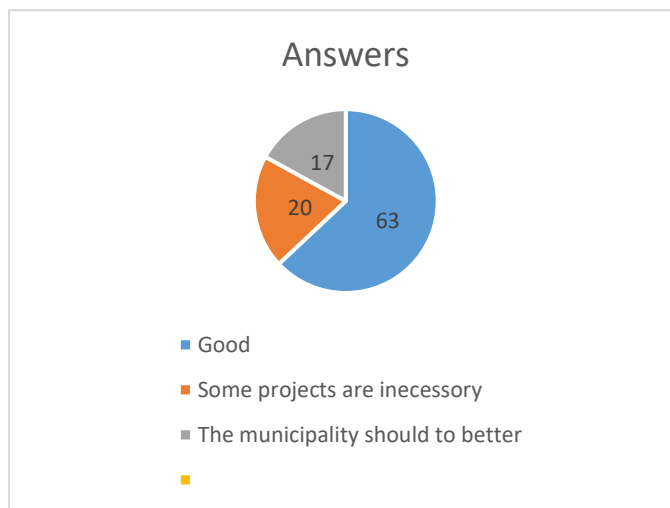


Fig.36: pie chart showing the answers for the first question: “What is your opinion on the existing projects to boost economy?” (Source: author)

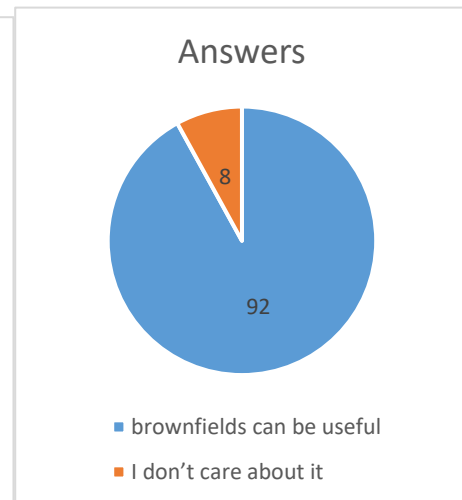


Fig.37: pie chart showing the answers for the second question: “What is your opinion on the brownfields existing in the city?” (Source: author)

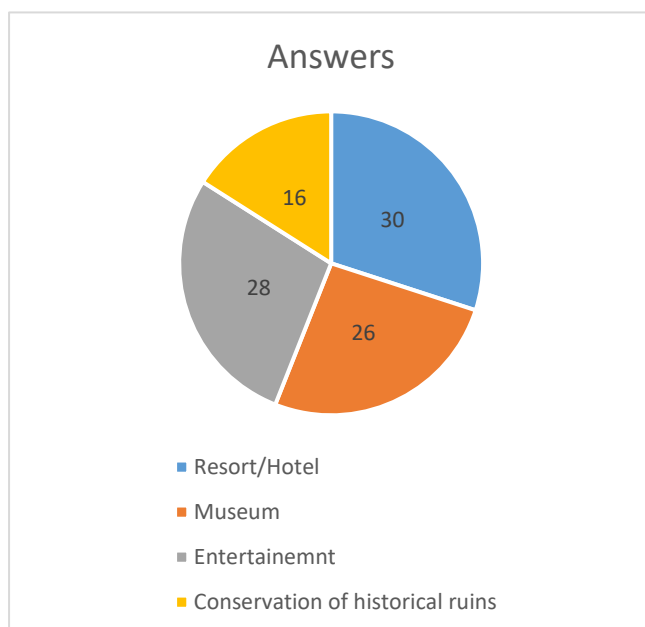


Fig.38: pie chart showing the answers for the second question: “What is the project that on your opinion can boost the tourism sector?” (Source: author)

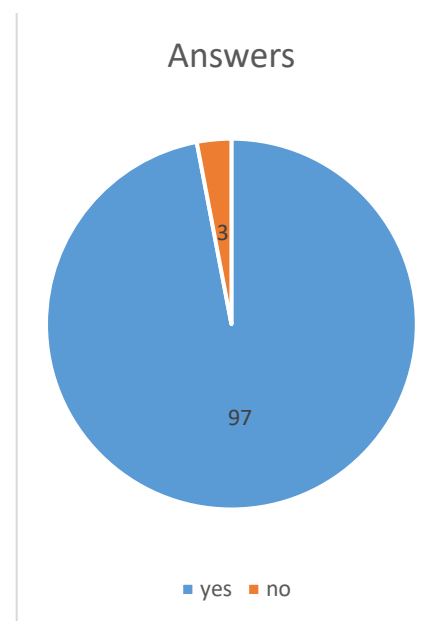


Fig.39: pie chart showing the answers for the second question: “Do you see that there is a potential if some projects are made in the city to boost economy?” (Source: author)

5. DISCUSSION

The study suggested guidelines for regenerating brownfields in order to boost the economy of the area.

The first guideline is the economic value, brownfields have a great potential to boost economic value when it regenerates. Economy is the most sensitive field that can tackle human, because if the economy is not good, food security is not good, education, health, life style... so boosting the economy can solve a lot of problems if not all of it. In another way there are a lot of ways to boost the economy and to help stop the resist of it, one of the ways is by reviving brownfields existing. If the brownfield is located in a heritage site an extra sensitive place, the renovation of this brownfield should not affect negatively the heritage site. The second guideline is the social equity for example reviving a brownfield tackle the social life and the social surrounding. The revival should make a social equity. The third one is ecological system and the public health, by reviving a brownfield that is a polluted or contaminated land the public health should increase because this polluted site is transformed into something useful for the surrounding.

Table 2: The index system of Brownfields redevelopment projects

Main criteria	Sub-criteria
Environmental and health benefits Criteria B_1	1) Improvement of the quality of underground water B_{11} 2) Improvement of soil quality B_{12} 3) Improvement of air quality B_{13} 4) Lowering the health risks of local residents B_{14} 5) Increase of green cover percentage B_{15} 6) Improvement of remediation technologies B_{16}
Financial criteria B_2	1) Payback period B_{21} 2) Return on investment B_{22} 3) Total cost of brownfield redevelopment B_{23} 4) Ratio of remediation cost to total cost B_{24} 5) Net present value B_{25}
Brownfield site criteria B_3	1) Location of brownfield B_{31} 2) Status of infrastructure facilities of area B_{32} 3) Transportation convenience of brownfield area B_{33} 4) Size of brownfield B_{34}
Societal stability criteria B_4	1) Increase local tax base B_{41} 2) Increase local employment rate B_{42} 3) Improvement of local security status B_{43}
Policy and technical criteria B_5	1) Protecting and recycling the land/soil resource B_{51} 2) Influence from other contamination hazards nearby B_{52} 3) Difficulty and cycle of remediation B_{53}
Performance criteria B_6	1) Matchup with city planning B_{61} 2) Increase land value of neighborhood B_{62} 3) Improvement of image of local community and government B_{63}

The evaluation criteria on how the brownfield will boost the economy of the area, the brownfield can validate this aim if it can achieve that main and sub- criterion's existing in the table above and the number that the brownfield collect it can be validated or not.

6. CONCLUSION

Overall, this paper concludes that:

- Brownfields are relinquishment lands, underutilized or filthy. Redeveloping these types of land will reduce the destroyed green areas, bring more taxes and then boos the economy and improve the social state of the area surrounding this land.
- Steps of regenerating a brownfields: establish a vision/consult on the vision/develop necessary/infrastructure and public realm standards/prepare site development brief/training and employment access principal/developer-partner selection and agreement/implementation /training and employment linkage activated/aftercare
- Many questions should be asked to know what's suit for this type of brownfield. Some of the questions are: What is the suitable process the regain this brownfield? What is the requirement so the brownfield regeneration became sustainable?
- The revival of a brownfield will defiantly help in boosting the economy, help in progressing public health and help to improve social equality

- e. According to the questionnaire and interviews the city have a great potential to become the most powerful touristic city of Lebanon, specially that the economy of the city lay on three main sectors, agriculture, business and tourism.
- f. This paper should make a huge push to the municipality of Tyre to make investments in the touristic sector to boost it specially that the French and Italy government have interest in funding this type of projects especially in Tyre the most heritage city of all Lebanon.
- g. The brownfield redevelopment can be validated based on points it can get by achieving some main and sub- criteria's.
- h. Reconsider the regulatory framework in Tyre, to establish a clear character to the urban development of the city.

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