

THE INNOVATIVE REUSE OF POST-INDUSTRIAL HERITAGE IN MINET EL BASSAL DISTRICT AS A STRATEGY FOR PRESERVATION

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Keywords: Industrial heritage, Adaptive reuse, Sustainable heritage Adaptation, and social development.

Abstract. *Industrial properties, comparing with historic district, are unlikely to possess the privilege to attract communities in which they are situated and always left to be demolished by neglect. In this perspective the recycling of derelict industrial areas is essential for sustainable city development. In Egypt, and precisely in the metropolitan city of Alexandria, Minet El-Bassal district was once a famous Alexandrian industrial district. It was built around 1810 overlooking the only seaport in Egypt and was the international marketing center for Egyptian cotton. By the early 90s, with the new policy of liberalization, an industry, which had sustained large communities of people, became redundant. Accordingly this research main objective is investigating the role of sustainable adaption of such buildings within their communities to formulate a new place not to re-create the old version. The research will explore some of the environmental, social and economic benefits of sustainable industrial heritage reuse through evaluating three design strategies that might be used to reclaim derelict sites in urban areas transforming them for the society and the environment. Each is strategy related to different characters: environmental, socio-cultural and socio-economical characters. The objective of the present work is to analyze those design strategies used in the reclamation of derelict industrial areas using three representative different case studies: London Docklands, Natural Capital Center and Rotterdam Dry dock Company. The transformation of derelict industrial sites into public spaces enhances the quality of life and marks a new commitment to the transformation of once-industrial sites to new cultural and environmental uses. In addition, the research presents a set of design principles that could be applied to post-industrial buildings describing how they can be best reclaimed and reused, with reference to the specific study case of Minet El-Bassal district.*

1. INTRODUCTION

In the past few years the redevelopment of abandoned industrial areas has received a lot of attention and has become a major landscape related problem. In many countries industrial sites are located within dense urban areas. The transformation of these sites to accommodate new urban realities has become a major challenge for authorities. Many old industrial spaces were considered liabilities for their surroundings, but, with imaginative programming, some of them have been transformed into assets that support a healthy urban life. Also, while older industrial facilities are being reconfigured to accommodate new functions, new construction techniques and materials have given architects additional tools to design industrial facilities at scales that some decades ago were not possible (Workplaces: The Transformation of Places of Production) [1]. In the past, industry was often abandoned without performing the appropriate retrieval work. Today, with the increased ability of perturbation that affects many former industrial districts, there is a deep public concern that industry should not be abandoned without performing any reclamation work. New design strategies to reclaim derelict industrial sites have been devised in recent years, focusing on the sustainability, quality and multi-functionality of the space, with attention to historic, socioeconomic and cultural aspects [2].

The studied case of Minet El-Bassal district represents a famous Alexandrian Industrial district acting as the international marketing center for "Egyptian cotton". Brokers came from all over the world to this area; cotton was a major agriculture crop, totally for export under the British occupation in Egypt (1882-1956) [3]. The district was and still is supported by a well de-signed transportation network either for people or goods; this network helped connecting the district with all vital spots of local production and marketing in Egypt. Minet El-Bassal, this underdeveloped urban area, close to the Central Business District of Alexandria city, became over time un-inhabitable. This made its industrial buildings venerable to demolition. The concern is how to preserve buildings and areas which are no more capable of securing their future, due to the decline of their need, and which resulted in creating an abandoned unsafe environment, that encouraged the appearance and breeding of unhealthy communities. Also, widespread crisis of numerous industrial sectors will contribute to the appearance of neglected industrial areas to become one of the city's cement residential blocks, so the past and history of such areas will be forgotten and extinct.

2. TRANSFORMATION OF INDUSTRIAL HERITAGE

During the second half of the twentieth century a widespread crisis of numerous industrial sectors contributed to the appearance of derelict industrial areas. In this perspective the recycling of derelict industrial areas is indispensable for sustainable city development in the optic of recovery and conservation of the industrial heritage. It is important to know how to preserve buildings and areas which are no more capable of securing their future, due to the decline of their need, and which resulted in creating an abandoned unsafe environment, that encouraged the appearance and breeding of unhealthy communities [4]. Loures & Panagopoulos state that the transformation of abandoned industrial sites into public spaces represents a significant enhancement to the quality of life and land use, and at the same time marks a new commitment to the transformation of once-industrial sites to new cultural and environmental uses [2]. According to Justine Clark industrial heritage can tell of economic, architectural and technical achievements, of infra-structure, of processes and procedures and the transformation of materials [5]. The last 30 years have brought increased awareness of the importance of industrial history in understanding heritage [1].

3. ADAPTIVE REUSE DESIGN APPROACHES

Adaptive reuse deals with the issues of conservation and heritage policies [6], according to Smallwood the phrase adaptive reuse could be defined as using a building for a new purpose [7]. However, the architectural reuse should be understood as an evolutionary process occurring over time [8]. Moreover, the most successful built heritage adaptive reuse projects are those that best respect and retain the building's heritage significance and add a contemporary layer that provides value for the future [9]. Adaptive reuse of buildings has a major role to play in the sustainable development of communities; the benefits of reuse extend far beyond the conservation of our cultural legacy [10]. Loures & Panagopoulos state that any attempt to define principles for good design must embody the principles of sustainable development. Defining good design principles must represent the principles of sustainable development. The industrial building adaptive reuse design ideologies should integrate similar five fundamental principles: perform well the functions for which they are redesigned; being adaptable to new uses; respond well to their context; have a visual coherence and create 'delight' for users and passers-by; be sustainable and have a minimal environmental impact, easily accessible [2]. Adaptive reuse of derelict industrial areas can play a very important role in regeneration in raising the quality of the local environment, preserving local distinctiveness, and attracting visitors and new business, and it is very popular with local communities [1].

4. THE STUDY AREA: MINET EL BASSAL DISTRICT IN ALEXANDRIA

Choosing Minet El-Bassal district as a case study resulted of many environmental, historical, governmental, locality, market and financial aspects. Creating awareness of the heritage value of its historic industrial buildings is important before being ruined by neglecting and become new city blocks. Minet El-Bassal district, figure 1, was considered as one of the famous Alexandrian Industrial districts. It was built (around 1810) located near the end of the Mahmoudia Canal in front of the Western Harbor gate at Alexandria Port "The Western Harbor" [3]. The District history begins when the Ottoman ruler Mohammed Ali Pasha predicted the significance of the Industrial revolution happening in Europe. He worked to industrialize Egypt and the Egyptian military [11]. The city controlled virtually the whole of the cotton industry of Egypt. By 1870, Alexandria was the fourth leading Mediterranean port after Istanbul, Marseilles, and Genoa [11]. Minet El Bassal buildings were prosperous when European companies, especially British, were benefiting from cotton cultivation in Egypt by exporting all the production to be processed in British mills. After the 1952 revolution in Egypt, many of these buildings were out of work, as for the new national regime focused on the local manufacturing of cotton, which took place mainly in the Delta, right beside agriculture land [12]. By time, market liberalization led to the neglecting of cotton cultivation and farmers went on to grow fruits and vegetables to meet the needs of the local market. Now, these industrial heritage buildings are owned by the Egyptian company for pressing cotton [13]. Due to the company's need for funds to cover the deficit resulting from the reduction of cotton cultivation for exporting some of Minet El Bassal buildings were sold to national banks. Buildings and machinery, which were suffering from neglect because of lack of investment, became almost completely redundant. Minet El-Bassal was registered as a heritage area under code 6040 "Warehouse". Furthermore, the International Market exchange of Minia El-Bassal (1871) in Alexandria, known as the Cotton Exchange included in the same district in the list of heritage buildings of Alexandria under the code no. 535 as "Distinguished Building" [14].



Figure 1 Left: Minet-El-Basal map 1947. Right up: Minet-El-Basal district 2014. Source: researcher

5. MINET EL BASSAL'S ADAPTIVE REUSE DESIGN STRATEGY

The scope of the paper is studying the different adaptive reuse design approaches of industrial heritage and implementing them on Minet El Bassal. First part of the strategy was to accomplish site visits to take an overview of the buildings status and to collect data needed to pursue decision makers and investors to re-use and revitalize this neglected area. Second part focused on analyzing similar cases to extract the guidelines to be implemented in the district.

5.1 Site visit and data collection

Most of the buildings, owned by Egyptian Company for Pressing Cotton, can be described as massive industrial buildings composed of two to three -story blocks in concrete-frame construction, with visible columns and girders articulating the façade as a grid filled with red-brick walls. Small transverse rectangular windows are distinguished in the lower floors and upright oblong windows on the upper floor. Most of the buildings contain internal courts and bridges connecting their different parts [3]. Spaces are separated by iron doors with special designs and techniques to isolate spaces in case of fire. Chimney and steel water tanks and steel gates with vertical steel tracks for loading cotton are also main features in these buildings design. Most of the buildings are abundant and their old equipments are left for decay and rust. Some of these building's parts are rented for import and export companies working at the harbor to be used as storage spaces such as “Makbas El-Tareekh, Makbas El-Nile, and Makbas Misr”, figure 2. Others were destroyed over time except for a remarkable neo-Renaissance elements façade such as makbas 45.



Figure 2 Left: Makbas El Tareekh. Middle: Makbas El Nile. Right: Makbas Misr. Source: researcher

The Bourse of Cotton, shown in figure 3, is one of the oldest, most active stock exchange houses for cotton in the world. It was built in 1872 in neo classical style and it specialized in the trade of cotton and agricultural grains and remained prosperous until the revolution of

1952. It is the only listed building as previously mentioned and is in good state according to structure and construction status.



Figure 3 Left: Makbas 45. Right up: Bourse of cotton. Source: researcher

The reuse of vacant and neglected industrial buildings is a desirable form of development as municipalities face the pressure of continuous growth [3]. The district's development assets and constraints are summarized in the following table:

Table 1: Advantages and disadvantages of Minet El Bassal district. Source: researcher

Advantages/Assets	Disadvantages/Barriers
<ul style="list-style-type: none"> • Long industrialization history. • Unique location of its industrial buildings, just in front of the western harbor and next to the center of the city. • Minet El Bassal was, and still supported by a well-designed transportation network either for people or goods. • Maintaining the quality and setting of this central industrial area and at the same time insure profitable revenue, capable of sustaining its future. • Access to existing infrastructure. • Industrial buildings are large-span buildings highly suitable for conversion to other functions. • Buildings are in a state where they could be renovated. • Most of the buildings are owned by the Egyptian Company for Pressing Cotton, so they can be easily convinced with the needed modification. 	<ul style="list-style-type: none"> • The abandoned unsafe environment created due to the decline of these industrial buildings need. • The district hosts an old well known market to the Alexandrians' selling used goods called "Souk El-Gomaa" popular market for selling used goods. Recently, these street vendors occupied the area all week long, and became a threat to local workers at the harbor and warehouses. • Poorly coordinated economic development strategies within municipalities. • Unemployment is a major problem.

5.2 Adaptive reuse design approaches: case studies

In the adaptive reuse of abandoned industrial areas it is essential to define the different approaches that were followed in successful projects. In the adaptive reuse of abandoned industrial areas it is essential to define the different approaches that was followed in successful projects, once different approaches to these components, may give different ways to reuse such important heritage, allowing the use of different design strategies. To specify the different design strategies of adaptive reuse of derelict industrial areas three case studies will

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5.2.1 Socio-cultural character: The case of London Docklands

According to GeoBytesGCSE (2010) in 1981 the London's Docklands Development Corporation (LDDC) was set up to improve the economic, social and environmental problems that had developed in the area that was once one of the world's busiest ports. The area had been in decline since the 1950's, as shown in figure 4. This is because larger ships could no longer access the port. Unemployment soared, the back to back terraced housing fell into disrepair and there was a lack of transport and leisure facilities. The area became on the first Enterprise Zones in 1981 [15].



Figure 4 Left: Shadwell Basin 1985. Right: Shadwell Basin 1998. Source: [15]

The land was made rate free for ten years. Between 1981- 1998 many changes occurred within the Docklands. For example [5]:

- **Employment:** Low rents attracted a number of hi-tech and financial firms. This includes The Lime house ITV studios and The Guardian and Daily Telegraph newspapers.
- **Housing:** Many of the former warehouses have been transformed into luxury flats. This is an example of gentrification. Low cost housing has also been built along with the renovation of older council owned properties.
- **Leisure:** A large shopping area was constructed close to Canary Warf. A number of parks have been created where buildings once stood. More recently the Millennium Dome was built in this area.

Table 2: Arguments for and against adaptive reuse of London Docklands buildings. Based on: [15]

Advantages/Assets	Disadvantages/Barriers
<ul style="list-style-type: none"> • Existing buildings represent social and cultural capital. • Wider appreciation and more enlightened attitude towards heritage value. • As time passes social conventions also change and as a result some buildings will lose their original use value. • The impact of social changes with respect to some buildings • Adaptive re-use enables revitalization of 	<ul style="list-style-type: none"> • The standards required of new building cannot be achieved within older buildings • New building design is seen as creative whereas adaptive reuse is not • Some building stock is simply too ugly. • The social objectives of the London Docklands failed to provide the affordable housing for local residents. Other projects in Swansea, Cardiff Bay and Bristol also failed to provide a social

neighborhoods and controls urban sprawl.

- Adaptive reuse brings an ‘urban renaissance’ into the city centers.
- If the built environment ceases to have social sustainability they become derelict and crime and vandalism pervade.
- Older buildings provide a sight of the past and lend character to a place.
- Inter-generational argument that by saving buildings future generations are able to enjoy them.

mix in the regenerated areas

- Some of the social goals may not be realized in practice.

5.2.2 Environmental character: The case of Natural Capital Center

In the late 1990s, Ecotrust (conservation organization based in Portland) bought Jean Vollum an 1895 warehouse, reclaimed many of its original materials, and transformed it into The Natural Capital Center. Jean Vollum has been a hub for the goods of the industrial economy for a century; after reclamation it has become a focal point for a new economy in which “Natural Capital”. The Natural Capital Center is an evolving expression to the long-term wellbeing of people and nature [16].



Figure 5 Left: Left: Natural Capital Center in 1895. Right: Natural Capital Center 2003. Source: [16]

John McCracken, a wholesale building supplies distributor, built the warehouse as shipping was gaining significance for the growing city of Portland. The late 1800s saw the completion of the Transcontinental Railroad and increasing investments in the Port of Portland. The building stands a testament to the craftsmanship of the workers and the quality of the materials they used. It’s an example of Classic Richardsonian Romanesque style, which flourished between 1885 and 1990. These massive, heavy-looking buildings feature flat roofs and parapets, recessed round-arched entries, arched window openings, and stucco and brick facing [17]. Jean Vollum lies in a central site very near downtown that was easily accessible by bike and public transport. The building's derelict neighborhood which is now known as The Pearl District was rapidly changing into a lively, mixed-use urban neighborhood with kid-friendly parks [16]. The rebuilding project was uncharted territory. The main goal of building adaptive reuse was to couple historic restoration with environmental innovation. Ecotrust took stock of the materials already within the structure and were able to recycle 98 percent of Jean Vollum construction debris from the recycled paint to the old tires that became rubber flooring to the benches on the street made from old granite curbs. The contractors created an entire wood shop within the walls. Almost all of the doors were custom build from the salvaged native Doug Fir within the building [16]. Re-opened to the public in

2001, the building was named the Natural Capital Center to reflect the ideas in ecological economics that nature's services are basic to human existence and that natural capital is, along with financial and other forms of capital, a fundamental means of production. As the first LEED gold-certified building in the Pacific Northwest, the building has become an icon of Portland, Oregon's leadership in the field of sustainability [17].

Table 3: Advantages and disadvantages of Natural Capital Center adaptive reuse. Based on: [18]

Advantages/Assets	Disadvantages/Barriers
<ul style="list-style-type: none"> • Natural Capital Center is located in the heart of an urban concentration, utilizing already developed land. This decision to reuse a building is a large move towards sustainability, yet it also has its limitations. • Sustainable practices included water and energy conservation, recycling of materials, and foremost the reuse of an existing structure. • The focus of the adaptive reuse project was on four areas of the sustainable design portion: social equity, water, light, and air. A large atrium and other public spaces are open to the public. 	<ul style="list-style-type: none"> • The high cost of seismic and structural system to accomplish the new building's design with an exposed interior.

5.2.3 Economic character: The case of Rotterdam Dry Dock Company

The RDM site was constructed in the past for the Rotterdam Dry Dock Company. The ports and piers are located around the village of Heijplaat, which was built in the 1920s for the wharf employees. From 1983 to 2002 there were still some ongoing technical/industrial activities at the wharf and the area was used for port activities such as container transport. After 2002, the wharf increasingly became an avoided area. In 2004 after the RDM sites were purchased, the redevelopment of the RDM area began. This site is developed into an area where education, knowledge-intensive activities, conventional port activities, recreation and the neighboring residential functions all merged together in one site, shown in figure 6 [19].

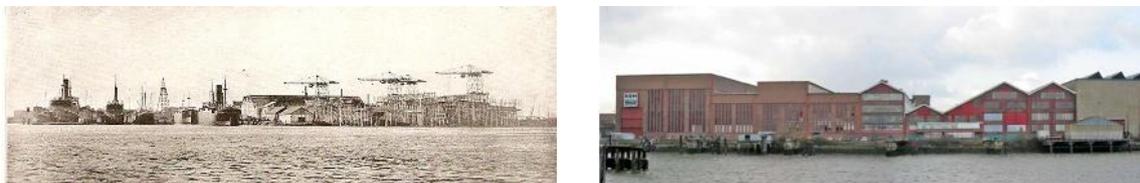


Figure 6 Left: Rotterdam Dry dock Company 1918. Right: Former Dry dock Company 2009. Source: [19]

The most important part is the RDM Campus which includes technical education, research centers and companies collaborate on sustainable innovations needed for the Rotterdam economy. RDM Campus is collaboration between the Albeda College, Rotterdam University (of Applied Sciences) and the Port of Rotterdam Authority. Their ambition is to make RDM Campus the innovation Centre for the manufacturing industry of Rotterdam [20]. RDM Campus consists of [20]:

- A location for education: intermediate and higher vocational education under the same roof, with plenty of space for experiment and for practical research.
- A location for research: two research centers of Rotterdam University focus on sustainability and main port issues.
- A location for business: accommodation for the innovative and creative manufacturing industry.
- A location for events: accommodation for meetings and conferences.

Table 4: Advantages and disadvantages of Rotterdam Drydock adaptive reuse. Based on: [19]

Advantages/Assets	Disadvantages/Barriers
<ul style="list-style-type: none"> • Strengthen the current (sea) port-related activity in Dordrecht Seaport. • Shift non-port-related activity to the immediate vicinity, if possible. • Increase productivity at the terminals; make optimum use of the space. • Improve the visual quality of Dordrecht Seaport and strengthen its relations with its environment. • Make optimum use of public space, public parks and gardens. • The mutual interest of different partners is to improve the regional economy, by education of highly qualified technical employees for the main port of Rotterdam, and by stimulating innovation and entrepreneurship. 	<ul style="list-style-type: none"> • The incompatibility between the rapidly changing needs of business parties, and the time it takes RDM School to adjust its programs to what these businesses are looking for.

6. IMPLEMENTATION OF ADAPTIVE REUSE DESIGN APPROACHES ON MINET EL BASSAL DISTRICT

As it was mentioned before this research follows three steps to reach to the adaptive design approach of Minet El Bassal district. First site visits were held to investigate the present situation of the buildings there, second precedents analysis to identify different adaptive reuse design approaches, and finally extracting the design guidelines out of these precedents and implementing them on Minet El Bassal industrial heritage in addition to the description of constrain facing such adaptive reuse there. One of the main objectives of Minet El Bassal regeneration is the establishment of a project that integrates social, economic, and environmental issues in the development of an important former industrial site to be a viable entertainment and commercial area. Developing the architectural approach, particular emphasis should be given to innovation in design and environmental sustainability, together with wider regeneration benefits, linking convincingly the terms city, landscape and architecture. Public participation plays a crucial role in the success of the regeneration project.

6.1 Design guidelines adaptive reuse of Minet El Bassal industrial heritage

According to the analysis of the previous three design approach precedents adaptive reuse design guidelines could be driven in Minet El Bassal as following:

Social Character:

- Due to a the situation of Minet El Bassal near by the city's downtown, this area can present enormous amounts of commercial and entertainment activities and add to the city's attraction.
- There is much healing potential, where the vacant landscape exists as an empty canvas, waiting to be re-established as a common space that can be a catalyst for creating a new identity for the community.
- The warehouses can then accommodate: Hotels, restaurants and services that would serve this development.

Environmental Character

- These warehouses are located along the Mahmoudia Canal which once was used for industrial transportation with industrial facilities occupying its banks. This Canal embraced in the middle of the buildings to reach the harbor, is an asset that can enhance the district's environment quality and revitalize the city's waterfront.
- Lowering the material usage in the project is considered as an important environmental benefits of adaptive reuse
- Furthermore, lowering overall embodied energy even when economic costs are high, the environmental (and social) benefits may sway the decision in favor of adaptive reuse.

Economic Character

- Souk El-Gomaa "Friday Market", the most popular and oldest markets in Alexandria, could be developed to be important commercial center.
- Part of the proposed government plan is to revive tourism in Alexandria by developing the Alexandria Harbor as it is considered one of Alexandria's main accesses for tourists.
- In Minet El-Bassal district, almost all of the warehouses were owned by one owner (the Egyptian cotton pressing company) so it's easy to convince this owner with the adaptive reuse projects.
- The adaptive reuse of vacant industrial buildings could present part of Minet El Bassal infill development and affordable housing strategies.
- The revival of the Central Business District and the vital role which it plays in the lives of the city's inhabitanace.
- Adaptive reuse is cheaper than demolition and rebuilding.
- Making the residents partners in the investments as the case of Solidaire Lebanon can encourage them to enhance the district as they will be working in their own property [21].

6.2 Constraints facing adaptive reuse of Minet El Bassal industrial heritage

Various challenges need to be managed sensitively to ensure reusing of industrial heritage without compromising its integrity, but guarantees its livability as follows:

- There is a lack of political motivation which reflects on the commitment of funding to develop educational and training programs in industrial heritage conservation and to conduct regular maintenance and repair.
- Developers do not consider industrial heritage part of the mainstream property market and can be put off by a site's scale, possible contamination, conversion costs or, if the building is listed, an exaggerated notion of the restrictions this could impose.
- The absence of public awareness towards the significance of cultural heritage in general and traditional cores in particular is a serious problem.
- Most inhabitants in Minet El Bassal are poor people living in poor conditions who have no interest in conserving their buildings.

7. CONCLUSIONS

Industrial heritage sites play important roles in the lives of communities. They may have provided the livelihood of a substantial section of the community. Throughout this research successful adaptive reuse projects of abandoned industrial areas were analyzed according to different design principles that promote socio-cultural values, sustainability, reduce negative environmental impacts, and provoke economic prosperity and a better quality of life. So it can be concluded that the protection of industrial buildings is an important cultural objective and is inherently sustainable in that it encourages the positive reuse of redundant buildings that are part of our industrial and commercial heritage. Furthermore, adaptive reuse can play an important role in raising the quality of the local environment, preserving local distinctiveness, and attracting visitors and new business. Even derelict industrial areas can be filled with a new spirit and can be made worth living by keeping visible the spirit of existing site, by applying design strategies that contribute to economic prosperity, social cohesion and environmental quality. Adaptive reuse of buildings has a major role to play in the sustainable development. Sustainable city makes use of new forms of resident contribution, implements sustainable transport and mobility concepts, promotes environmentally sound building measures, has an ecological energy supply and minimizes energy consumption, designs socially oriented living spaces on Minet El Bassal, and at the same time allows for accessibility for different social groups. There are several financial savings and returns produced from adaptive reuse of industrial historic buildings. Embodied energy savings from not demolishing a building will only increase with the predicted rise of energy costs in the future. The adaptive reuse of Minet El Bassal industrial sites creates a valuable opportunity for bringing benefits such as improving the place quality and thus; habitat regeneration and economic revitalization of neighborhoods. By reflecting the precedents' analysis on Minet El Bassal district in Alexandria; various design strategies should be used in adaption of derelict industrial areas according to their potential, but independently from the design strategy that may be used; the spirit of the place should be seen as the essential theoretical base for such important industrial heritage sites regeneration allowing to strengthen the landscape most important aspects and to accomplish sustainable development. Certain project innovations should be suggested to regenerate such important derelict industrial heritage, minimizing the intervention costs, by creating socio-cultural conditions that not only favor those spaces, but also reinforce their sustainability.

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