ISBN 978-93-84422-62-2
Proceedings of 2016 2nd International Conference on Architecture, Structure and Civil Engineering (ICASCE'16)
London (UK), March 26-27, 2016

Change Is of the Essence, Regenerating of Brown Fields (Landscape Revitalization of Tehran's Brick Kilns)

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***Abstract*:** *Tehran, capital city of Iran, has witnessed extensive industrial development since the last century. Due to the changes in production mode, many of these industrial sites have changed to abandoned zones. Although these sites once have been outside the city's boundary, now most of them are surrounded by commercial and residential buildings and are laid inside the urban context. Today, these neglected sites are known as "industrial brown-fields". The brick kilns of Tehran which have a great potential for increasing the green open spaces in the city. The regeneration strategies for these kilns are treated from the landscape architecture point of view. In this approach the main body of the site which has a rich collective memory for the local residents is kept without any transformation because of its visual values. The interventions are based on the physical and psychological environment. Development of this site has emerged as a core feature in strategies to regenerate urban areas. Bringing it back into use tends to be primarily a "good thing" that will have broader economic, environmental and social benefits. In order to achieve a sustainable development, natural, social and economic aspects should be appraised with the same care spent on aesthetic assessment.*

This Paper tries to provide an insight towards the main principles of brown-fields regeneration. A site of brick kilns is chosen as a case study so that the resulting principles could be replicated. More specifically the goals are:
- Restore urban open spaces by regenerating urban potential of brown-fields on green spaces in particular, and brown-fields sustainable redevelopment in general;
-Recovering neglected spaces, such as brick kilns for achieving sustainable landscape and better quality of life;
-Improve social and environmental qualities in the urban landscape by identifying a functional role for the site; and
-Correlate functions and activities within the site for reusing previously developed plots of land.

Keywords: *sustainable urban conservation, landscape regeneration, green-space, brown-fields, brick kilns*

1. Introduction

Since the late 1980s, most countries have reformed their legislative and regulatory language and developed programs to encourage the redevelopment of Brownfield properties. As a result of these and other reforms, Brownfield's redevelopment has greatly expanded over the last ten years (Wernstedt, 2004).

Tehran, the capital city of Iran, has been surprisingly experiencing all of the development and evolution stages less than a century and now it is one of the world's twenty metropolises. During the course of this fast and disharmonious evolution and changes in the production mode, many of industrial sites have changed to abandoned zones. Although these sites once have been outside the city's boundary, now most of them are surrounded by commercial and residential buildings and they are laid inside the urban context. Today, these neglected sites are known as "industrial brown-fields" and have turned into one of the main challenges for Tehran's urban management.

The brick kilns of Tehran are an example of brown fields that have a great potential for increasing the green open spaces in the city. The revitalization strategies for these kilns are treated from the landscape architecture point of view. In this approach the main body of the site which has a rich collective memory for the local residents is kept without any transformation because of its visual values. The interventions are based on the aspects of the environment.

In this article the main goals are:

- Restore urban open spaces and recover neglected spaces
- Improve social and environmental qualities in the urban landscape
- Correlate functions and activities within the site and enhance visual aspect

2. Approach

The study presented here aims for creating green open spaces in the urban brown fields in Tehran. In this process the first step would be a quick review of Tehran Urban development in the last decades. In the next step Tehran Brownfield are considered and brick kilns of Tehran municipally district no.19 is chosen as the case study. And at last the major principles and strategies of revitalization of brick kilns sites would be mentioned with regard to the literature on cultural and historical landscape for brown-fields.

3. Tehran & Urban Development

Tehran is situated in the north-central part of Iran, on the slope of the Alborz Mountain covering an area of 600 sq. km (1500 sq. km with its suburbs). The urban area is bounded by mountains to the north and east with the ground sloping southward falling 800 m over the 25 km from the northern suburbs to Shahr-e-Rey in the south. As the national capital, it is the most populated city in Iran. Nearly 10 Million (14 Million with its suburbs) people live in Tehran in contrast to two hundred thousand in 1920. Today, it's beneficial to have a new urban landscape approach towards these brown-fields. Bringing these back into use.

4. Brownfields Law & Tehran

The Small Business and Liability Relief and Brownfield Revitalization Act (Public Law 107-118, H.R. 2869, P.6), passed in 2002, defines 'brown fields' as 'real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant'.
The number of brown fields in the Tehran is not known with certainty, because no single registry of such sites has ever been considered.

5. General Features of District No.19 Of Tehran

District 19 of Tehran is one of the southern marginalized areas in Tehran's downtown and based on statistics carried out in year 2005 the population reached up to 244,000 people.

In terms of legal and administrative identity, this region is incredibly young with an urban management of 20 years old. Despite the paucity management, settlement of population in the region has been predominantly affected by physical factors in the development of Tehran.

Now, we are witnessing the creating of a region in southern urban areas of Tehran, which, owns defining physical characteristic of compaction, instability and intense atmosphere blend between residential and those incompatible pollutants activities.

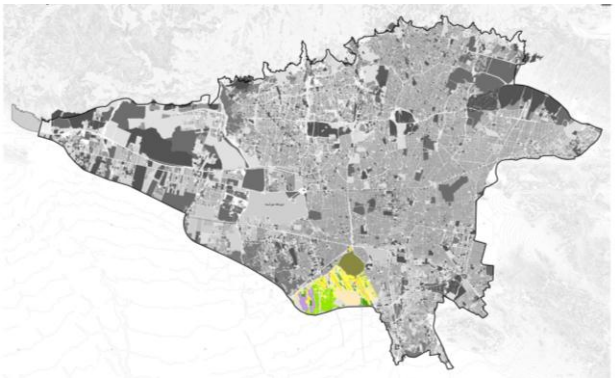

Fig. 1: The location of District no. 19 in Tehran

6. The Brick Kilns of Tehran Municipality District No.19

These brick kilns are located at the foot hills of Alborz Mountains, south west of Tehran. The main reasons for locating the kilns in this place are: (1) fertile soil in the karaj and Jajrud river banks; (2) new methods in brick production; and (3) financial justification.

Today, these neglected sites are surrounded by commercial and residential buildings and are laid inside the urban context. The question is what are the main principles that could help to convert the brown fields to Green spaces?

Fig. 2: Image of Brick Kilns (District 19)

7. Transformation of Brown Fields to Green Spaces

The most appropriate model for revitalization has been put forward by Bourne (1991), who argues that the pattern of de-industrialization is part of a cycle; whereby after a mass exodus, many abandoned urban neighbourhoods start to experience a sense of renewal and rebirth, leading to their rehabilitation. Furthermore, both the redevelopment of brown fields and the revitalization of urban environment are key tools in this rehabilitation process (Bourne, 1991). Another approach is that Sustainable development can be attained without compromising the environment, suggesting ways in which a balance and interconnectedness can be maintained among the environment, social and economic requirements of human societies (Houghton & Hunter, 1994).

So the most important principles in this field are:

- Proper management of city's urban form and the preservation and revitalization of its built and natural environment;
- Breaking the destructive pattern of urban sprawl, which had led to a serious under-utilization of city lands, buildings and infrastructure

- Constitutes one way to stimulate the re-utilization of the city's built environment while, at the same time, remediating contaminants, transforming socially and economically neglected neighbourhoods and taking up less space

Although, brown fields enhancements do not necessarily translate to widespread public support for green space conversion, but there is some evidence that conversion benefits can be attractive in a range of settings.
Scientific researches that have been conducted on the conversion of brown fields to green spaces are focusing on design and planning aspects. So, most highly desirable of all potential land-uses for brown fields (in order of frequency) are: the provision of new open spaces; economic benefits; aesthetic improvements; habitat restoration; the connection of green space to the city; the creation of new trails; access to water; flood control; infrastructure improvement; socialization among neighbourhood residents; historical restoration; and models for future greening efforts (De Sousa, 2004).

8. Landscape Planning for the Brick Kilns

Due to its irreplaceable historic remains, brick kiln sites in district 19 of Tehran can contribute modern society in obtaining an integral and comprehensive knowledge of cultural values and their past .Presence of buildings, spaces and urban facilities and equipment in this site, makes it a strong potential in order to strengthen the role of Tehran city and its historical identity.
Our survey in brick kilns with regard to three kind of exhaustion of the site:

8.1. Structural exhaustion

The kiln sites suffer quality drop due to ageing, climate effects, tectonic earth movements, vibrations caused by car traffic and inappropriate undesirable maintenance, resulting in this type of exhaustion.

8.2. Functional exhaustion

This type of site exhaustion is caused by internal and external factors. With Improvement of technology and industry and innovation in manufacturing methods, the structure of building is no more suitable for primary designed function, as this method of brick fabricating is not in compliance with nowadays standards.

8.3. Exhaustion in mind image

As time goes by, with evolution in social, economical and natural environment of Tehran, the structure of site has experienced no change and thereby lost its proportion to demands of modern life.

9. Intervention Methods to Improve the Quality of Brick Kilns

Regarding to the different approaches in dealing with such sites, the method of intervention in brick kiln site requires a systematic approach, i.e. planning for that requires a kind of multilateral approach in different areas of population, economic, culture and environment. Mutual affects of these areas on each other and interactions and two-way relationships between the system and the larger system (Tehran) is an important matter that requires particular attention. Considering various structural and functional exhaustions of this site, respectively, renovation and revitalization methods for intervention are recommended.

9.1. Revitalization

In this approach the effort is to minimize the intervention with the structure and the emphasis is on application change to eliminate the functional exhaustion. The main purpose is to keep the main structure of old structure and framework unchanged while introducing positive social and economical functions to it.

TABLE I: Activity Scope of Revitalization of Brick Kilns

	Activity Scope of Revitalization of Brick Kilns							*Process Outcome*		
	Support	Maintenance	Protection	Conservation	Unification	Revitalization	Repair	Promotion	Restrictions and defects reduction	Emphasis on and use of potential and available facilities
Revitalization Objective	-Attract attention and participation to maintain site conditions or its internal elements	-Regular inspection to maintain status of site or its elements in the natural and primary form	-Protection against damages caused by natural and manmade erosions	-Prevent the physical destruction of the site, or elements within it from the potential dangers to increase Safety , security and strength of site's elements	-Unification in the site, or elements within it	-Restore the original and primary state	Compensation for suffered damages.	Strengthen the positive aspects, weaken the negative aspects and social, economic, financial, technical, administrative, executive, and physical space strengthen		
Content of intervention	- Make governmental laws - Receive governmental/Non governmental supports	-Permanent Inspection of site and its internal elements on regular basis in means of keeping its efficiency and desirability of natural and primary form	-Study the types of variations and changes due to erosions and compensation them	-Study of the destructions caused by potential natural disasters	- Create integrity in morphology of the Structure - Strengthening the internal elements to survive	-Repair the created damages based on previous documents and consideration of qualities	-Repair of destruction and damages to the site and its internal elements			

9.2. Renovation

Renovation emphasizes on permanent activity of space. Modernizing framework with modification in structure results and providing appropriate urban spaces. In this approach the emphasis is on structural repair and also economical and social revitalization.

TABLE II: Activity Scope of Renovation of Brick Kilns

	Activity Scope of Renovation of Brick kilns			*Process Outcome*		
	Revitalization	Rehabilitation	Compliance	Re creation	Re definition of ancient values while being in accord with contemporary requirements	Modification in site with no harm to inheritance values and overall shape
Objective	-Revitalization of site and it elements, -Restore life and sustaining living in contemporary conditions	- Strengthen and expand the positive aspects - Eliminating negative aspects of living in site and its internal elements	- Establish relative changes, - Homogenise site and its internal elements to comply with new requirements and contemporary situations	in order to improve the quality of space, visual function, increase efficiency and productivity and to restore urban life		
Content of intervention	- Selecting of new activity	- Some nature modification in site and its elements	- Establish Compliance between structure, space and activities of site and its internal elements in accordance with modern requirements			
Level of remaining loyal to past	Low intervention	Low intervention	Partial alteration with no major change			

TABLE III: Development of Brick Kilns in Short Term, Mid Term & Long Term Period of Time

	Short term	*Mid Term*	*Long Term*
Main Objectives Of Project	- Support - Maintenance - Protection - Conservation	- Unification in the site - Revitalization the original state	- Restore life and sustaining living in contemporary conditions
Structural, Economic & Social Policies & Strategies	-Improve the quality of space, visual & function	- Social, economic, financial, technical, administrative, executive, and physical space strengthen	- Selecting of new activity in contemporary conditions
Policies & Strategies For Urban Facilities	- Strengthen the positive aspects - weaken the negative aspects	- Use of potential and available facilities	-Increase efficiency and productivity and to restore urban life
Planning Methods	- Make governmental laws , Receive governmental / Nongovernmental supports & Determine areas for site protection - compensation of the variations and changes due to erosions - compensation of the destructions caused by potential natural disasters	- Create integrity in morphology and the Structure - Strengthening the internal elements to survive - Doing some nature modification in site and its elements	- Injection of new activity - Establish Compliance between structure, space and activities of site in accordance with modern requirements
Approach Methods	Revitalization & Renovation	Renovation	Revitalization
Type Of Intervention	Structure	Structure & Function	Function

10. Conclusion

Today, Tehran has to adopt the industrial-brown fields as a strategy for the regeneration of public spaces and for the environmental improvement of the city. The traditional perception of brown fields as obstacles, empty spaces or even factors of risk should morph into an idea that they are open and green spaces that structure the urban ecological zones.

At the moment, Kiln furnaces of district 19 of Tehran; has to deal with critical challenges of physical disorders, social and cultural systems, poverty of service and incompatible applications. The strategies for Landscape planning of Brick Kilns classifies into two sections; 1) Revitalization & 2) Renovation. This site finds to have golden opportunity for growth and development, based on which, strategies have been made. The mentioned objectives can be headed for as there are opportunities in converting the lands and establishing appropriate use of available land facilities.

Therefore, objectives, strategies and the sites mentioned in this article are provided as documents supporting development model. The development model of site is in accordance with environmental, geographical, social and cultural considerations.

Strategies and the consideration for structural and functional improvement of lands and buildings in this site can be generalized as a model to other similar sites in Tehran.

11. Acknowledgement

Author would like to thank Dr. Farzin Fardanesh, Prof of Landscape Architecture, Shahid Beheshti University.

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