

Multifunctional clusters in Post-industrial Landscapes: rising from what's left

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Abstract: Development in the post-industrial landscape is one of many contexts that designer's will be forced to participate in as contributors to a sustainable future. The rapid expansion and globalization of industry over the past century has had a profound impact on industrial areas all over the world. A changing global economic and energy paradigm from industry to technology has and will continue to produce a vast landscape of obsolete industrial facilities. These facilities and their surrounding service industries are often strategically located near waterways, cities, and great centers of population, while simultaneously being segmented from the very people and communities that support their existence. The question then, for today's designer, is how to plan for the future of these post-industrial landscapes facing the new growth management paradigm. The re-use of post-industrial sites in order to develop multifunctional landscapes, as opposed to the consumption of previously undeveloped land is seen as a great possibility to the achievement of the new growth management paradigm – the accommodation of economic development and population growth while sustaining the spirit of community and the physical environment. To demonstrate the relevance of the reclamation of these sites, and a design approach that considers environmental, social, and economic aspects, this paper presents and analyzes two post-industrial reclamation studies. One located in Cleveland, Ohio, United States of America, (West 3rd Street Peninsula) and the other in Lagoa, Portugal (left margin to the Arade River), both presenting a vast potential for redevelopment. The main objective of this article is to show the post-industrial landscape as a complex resource, which can be recovered, re-used, and reintegrated into the surrounding community as a multifunctional landscape; a diverse environment that provides economic, social, and environmental benefits for the community and the land- investigating the benefits that may arise from the reclamation of urban post-industrial environments using a multifunctional cluster approach -. Additionally, the theory of the overall design strategy is discussed in detail in a manner such that it can be used as a resource for other designer's for non site-specific challenges.

Keywords: post-industrial landscape, urban re-development, multifunctionality, heritage, clusters.

1. Introduction

Throughout the past centuries several waterfronts were transformed from sparsely populated wilderness into industrial and trading areas, becoming essential elements to economic life [37].

The globalization of industry has had a profound effect on industrial areas all over the world [19], contributing to the appearance of many derelict and

underused post-industrial landscapes [2] that contribute to the reduction of development potential and quality of life [17]. Furthermore, during the last few decades, abandonment, sale or demolition of industrial facilities were fairly common approaches of dealing with amenities that were designated as 'surplus' no longer serving their original production functions [14].

This scenario, coupled with urban growth (urban population in the world was approximately 2.4 billion in 1995, a number that is expected to duplicate at about the year 2025) and with the population concentration in urban areas [3, 47], confront Landscape Architects and other planning specialists with a great challenge: How to plan the future of those post-industrial landscapes facing the “new” growth management paradigm? – Communities, cities and regions must accommodate economic development and population growth while sustaining and enhancing the spirit of the community, the sense of place, and the physical environment – the answer to this question is far from being simple, but the reuse of post-industrial sites, in order to develop multifunctional landscapes, instead of consuming new ones is seen as a great possibility to help achieving those goals [26].

The fact that these urban areas became economically disadvantaged, environmentally degraded and socially distressed through industrial contamination [11] made clear that reclamation projects should enable the redefinition of these landscapes through community-based, interdisciplinary action that integrates multifunctional longer-term solutions based on social, economic and ecological objectives.

2. Post-industrial waterfronts as redevelopment sites

Post-industrial landscapes, when reintegrated into the urban context, represent a valuable resource to society [27], however, to achieve this objective, new approaches and methodologies are needed. The aim of this study was to investigate the benefits that may arise from the reclamation of the post-industrial areas using a multifunctional cluster approach, in a period when post-industrial reclamation has been stressed as a proficient tool to contribute to sustainable development [21, 24].

According to Rafferty and Holst (2004) there are several facts that may contribute to waterfront redevelopment:

- Available Land – depressed prices serve several times as stimulus for investors looking for a business opportunity;
- Cleaner Water and Land – deindustrialization and environmental legislation may contribute to increase the development potential of these areas;
- Historic Preservation – the historic preservation movement initiated during the sixties, promote the recognition of aesthetic and heritage qualities in

previously ignored post-industrial and commercial buildings [22];

- Citizen Activism and Leadership – citizen activism and participation play a relevant role in the redevelopment of post-industrial landscapes [24].

- Urban Revitalization – the rebirth of the cities occurred in the eighties and nineties functioned as a catalyst for water front redevelopment;

- The Return of Certain Water Uses – land use changes have contributed to introduce new functions and activities in several underused waterfronts.

3. Methodology

The methodology was developed both for the design of the West 3rd Street Peninsula and of the left margin to the Arade River. Figure 1 shows the methodological scheme that is based in the holistic concept of landscape as a resource [16, 39, 40, 44] applied to a multifunctional cluster approach.

First, current best practice examples of post-industrial redevelopment were analyzed at three different levels: community, townscape and green-space design.

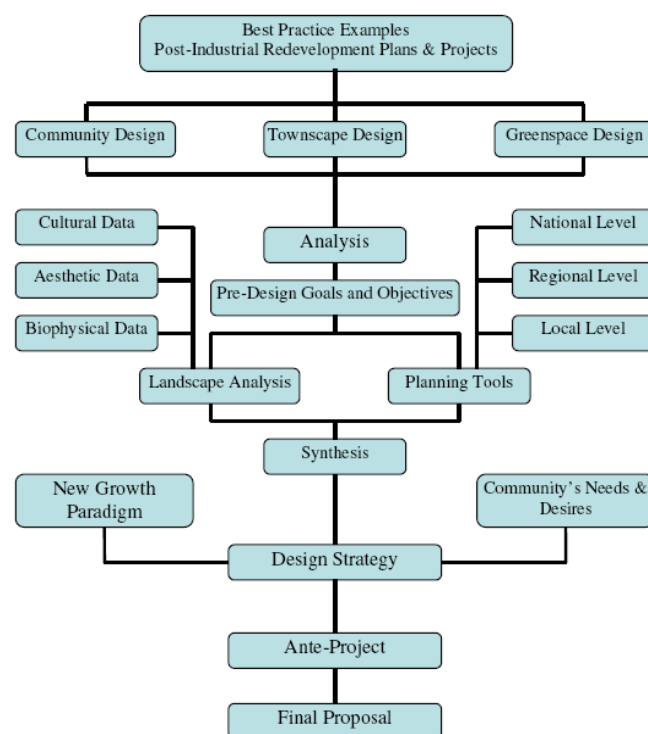


Figure 1- Methodological scheme

After the analysis of the best practice examples, the design team developed several brainstorming meetings in order to define the pre-design goals and objectives that would inform and support the design

strategy. The next phase focused on the collection and analysis of information about the different components of the landscape. Then the existing territory constraints and development priorities at different levels were taken into consideration.

Afterwards, a synthesis of the above information, together with the new growth management paradigm and the community's needs and desires were used to define the design strategy. According to the defined design strategy (a multifunctional cluster approach) the design team created the ante-projects for the West 3rd Street Peninsula and of the left margin to the Arade River.

4. Case studies

The case study approach can be a proficient tool to present and analyse specific projects [46, 48], as it is the case of the ones approached in this paper.

Both study areas are post-industrial waterfronts that may become the focal points of several activities in their regions and central to the social and intellectual life of cities [37].

4.1. The West 3rd Street Peninsula, Cleveland

Cleveland is located in north central Ohio on the shores of Lake Erie. It is Ohio's second largest city with a combined city/suburban population of over 490,000. Cleveland is the largest municipality in Cuyahoga County. There is extensive industrial and commercial development throughout the city, reason why its history and its future are tied to the way in which Cleveland chooses to use the Cuyahoga River corridor.

4.1.1. Brief historic development

The West 3rd Street Peninsula is located alongside the course of the U-shaped Cuyahoga River, a result of the twists and loops in the riverbed that created two other peninsulas in close proximity to the confluence of the mouth of the river and Lake Erie (Figure 2).

The peninsulas are in the "Flats" which became a strategic site for commerce and industry to flourish in Cleveland from the mid nineteenth century to the mid twentieth [12, 20]. The "Flats" became the place where raw natural resources, agricultural products, and goods and services, came together for storage and shipping to the eastern seaports and the Gulf of Mexico.

Despite the advantage of a location at the confluence of the river and lake, the new port of Cleveland did not begin to flourish until the

Cuyahoga River was linked to the Ohio and Erie Canal in 1832. That event opened domestic markets both east and west, which had a great economic impact that lasted for over twenty-five years (until shipping was supplanted by the railroads) [42].



Figure 2- Location map – adapted from Google Earth.

The peninsula was a site of railheads, warehouses, factories and other commercial facilities.

When the city lost its pre-eminence as an industrial and shipping powerhouse though, the businesses that thrived in the area began to decline or move away. Although a large part of the former activities are gone, West 3rd Street Peninsula's future is today open to a variety of uses and opportunities.

The redevelopment potentials of these locales alongside the Cuyahoga Flats and their reconnection to the city and the region have been recognized as of significant meaning to the future and image of this area.

One should notice that, now more than ever, it is increasingly recognized that a place is built on its past, that history has a high profile in people's lives. For this reason, new approaches should be aware of the opportunities that could be opened up for a more cultural use of post-industrial landscapes.

4.2. The post-industrial area of the left margin to the Arade River

The estuarine post-industrial landscape of the left margin to the Arade (Figure 3) is located in the municipality of Lagoa, Algarve, which is characterized from a Mediterranean climate and landscape. Algarve is the southern region of Portugal characterized by a decreasing and scattered population distribution in the mountainous areas which becomes increasingly more concentrated in

costal zones. Tourism is the main activity and the farming population is continuously aging.



Figure 3- Location map – adapted from Algarve Digital <http://geo.algarvedigital.pt/>

4.2.1. Brief historic development

The post-industrial landscape of the left margin to the Arade River describes more than one hundred years of local and regional history, constituting a testimony of industrial, cultural and social conception and evolution which documents and interprets considerable values for the Algarve's industrial heritage.

Even if, it was only in the beginning of the twentieth century that the implantation of an industrial centre in the river margins promoted some development of the area, the importance of the river Arade and its surroundings in the local, regional and national context is much older than that. Its relevance can be attested by several archaeological tracks that have been found submerged and around it from different civilization, as it is the case with the Phoenicians and the Romans. The circumstance of the First World War had a great importance to this landscape once it enabled the development of several industrial buildings, creating an attractive location to labour force. At that time, almost two thirds of the population worked in an industry [29]. Even so, after the economic breakdown of the 1970's the industrial activity collapsed and numerous industrial structures were left abandoned.

The destiny of this whole industrial landscape is still unknown, although during the last decade, some of the interventions that have been accomplished contributed to the disappearance of buildings with significant cultural meaning.

The post-industrial landscape of the left margin to the Arade River is a legacy of an industrial past that should be protected and remembered. Furthermore,

Portugal has a very good example –Park 'Tejo-Trancão' - EXPO 98, [23, 32] (Figure 4), which shows that the reclamation and redevelopment of a post-industrial landscape can constitute a remarkable way of increasing landscape's social, economic and environmental value [6, 26].

The analysis and recovery of this landscape constitutes an opportunity that tends to be lost in time, considering the growing urban pressure that has led to the disappearance of various industrial infrastructures, some with heritage value and significant relevance at local, regional and national levels.



Figure 4- Past, present and future (from top to bottom, respectively) aspect of the post-industrial landscape where the Park 'Tejo-Trancão' – EXPO 98 – is located. The design proposal was developed in association by PROAP (João Nunes) and Hargreaves Associated. Adapted from Google Earth. Used by permission of Luis Loures © 2007, all rights reserved.

4.3. Pre-design Goals and Objectives

Today's landscape architect is expected to find environmentally responsible solutions to complex

challenges; to ask questions that have answers beyond the aesthetic; to build community and bring about change using both the blank canvas and the soiled site. To that end, the design of the modern post-industrial site cannot be based simply on an artistic theory; it must also propose a new path. "Art may be content only to comment on unstable, unsustainable, or consumptive conditions: responsible design should remedy them. This dimension of healing, the deliberate manifestation of a normative, corrective process in the landscape, is the obvious 'end' of the revelatory process. Why diagnose if not to cure? Why reveal if not ultimately to heal?" [41]. This quotation exemplifies, in its essence, the philosophy applied in the design proposals presented in this paper.

The definition, *a priori*, of several design goals and objectives enabled the development of a research oriented to the pre-established aims, once the design team knew from the beginning the purpose and the intentions behind the redevelopment plan.

The following strategy was used on the Third Street Peninsula and The Arade River Estuarine Area to return the environmentally impaired post-industrial landscapes there to more productive landscapes that are integrated with the surrounding community.

Pre-design Goals and Objectives:

1. Apply a set of land ethics to the revitalization of these spaces that can be a catalyst for a new generation of change within the regional landscape.
2. Create a relationship between the landscape and user that can provide a framework for the regional land ethics transformation.
3. Propose a redevelopment scheme that recognizes the importance of diversity on site.
4. Use a multifunctional approach creating a diversity of ecological systems, cultural patterns, historical landmarks, housing clusters, retail outlets, transportation options and spaces and infrastructure that allow for the evolution of programs and uses over time.
5. Use the revitalization of these spaces to create a positive economic impact on the surrounding area, attracting not only local but also foreign investment.
6. Thoughtfully construct design visions toward generating the greatest possible economic opportunity on site.
7. Use tested principles of classic walkable community designs during the master

planning process in order to create a comfortable and safe pedestrian experience.

8. Use the lessons learned from the post-industrial landscape to design spaces where urban land stewardship is both practiced and taught.
9. Use sustainable approaches to construction, storm-water management systems, and urban design.
10. Preserve industrial heritage and encourage the positive re-use of redundant buildings that are part of the industrial and commercial heritage.

5. The design strategy

In the reclamation of derelict industrial areas it is essential to define the contributions of the landscape components, once different approaches to these components, may give different ways to reclaim landscape, allowing the use of different design strategies [28].

The reclamation of post-industrial landscapes should result essentially from the new activities projected for the space, in order to valorise landscape in a multifunctional perspective and protect the industrial heritage. As such, the reclamation landscape, unlike explanations that tend to become dominant, is not just a type of insurance against forgetfulness [25]. It is an instrument of social legitimation [9, 10] and a strategy to valorise and redevelop underused sites in order to turn it into a multifunctional landscape [4, 13, 33].

The emergence of the concept of multifunctionality started after the post-war period, when growing land pressure and environmental problems transformed spatial segregation of functions into a considerable problem [15, 36, 43, 45]. Even if multifunctionality has been proven to be a good design approach [7, 8, 30] in landscape redevelopment, the analysis of the application of different sustainable design solutions suggests that no "one size fits all": a variety of problems face different landscape in diverse ways. It is only fitting then, that the most meaningful solutions for particular landscapes, towns and cities are achieved through a range of plans, methods and technologies [18].

Currently, high demands on landscape show that in the future, landscapes will have to serve several functions simultaneously: environmental, economic, socio-cultural, historical, and aesthetic [8], in order to enable the type of growth proposed by the famed concept of sustainability.

With this purpose in mind, the design team opted to develop a multifunctional cluster¹ approach. Clusters can provide a way of planning and organizing landscapes that goes beyond the common needs of the entire society, helping to focus priorities and guide policies. Furthermore a cluster approach can help the development and implementation of a positive long-term multifunctional program that mobilizes government, business, institutions and citizens.

A multifunctional cluster approach will also emphasise the uniqueness of the place, which according to several authors [1, 31, 38] continues to be a significant factor in site planning redevelopment.

Thus, the preservation of the industrial heritage was an important cultural objective, not only because it enlarges the sense of community [5], but also because it constitutes a sustainable approach, once it encourages the positive re-use of redundant buildings that are part of our industrial and commercial heritage.

In a broader manner, the adopted design strategy represents the desire to preserve a legacy for future generations – industrial heritage – developing at the same time an environmentally, socially and economically successful and responsible landscape, that, as one may see in figures 5 and 6 may be applied at different scales.

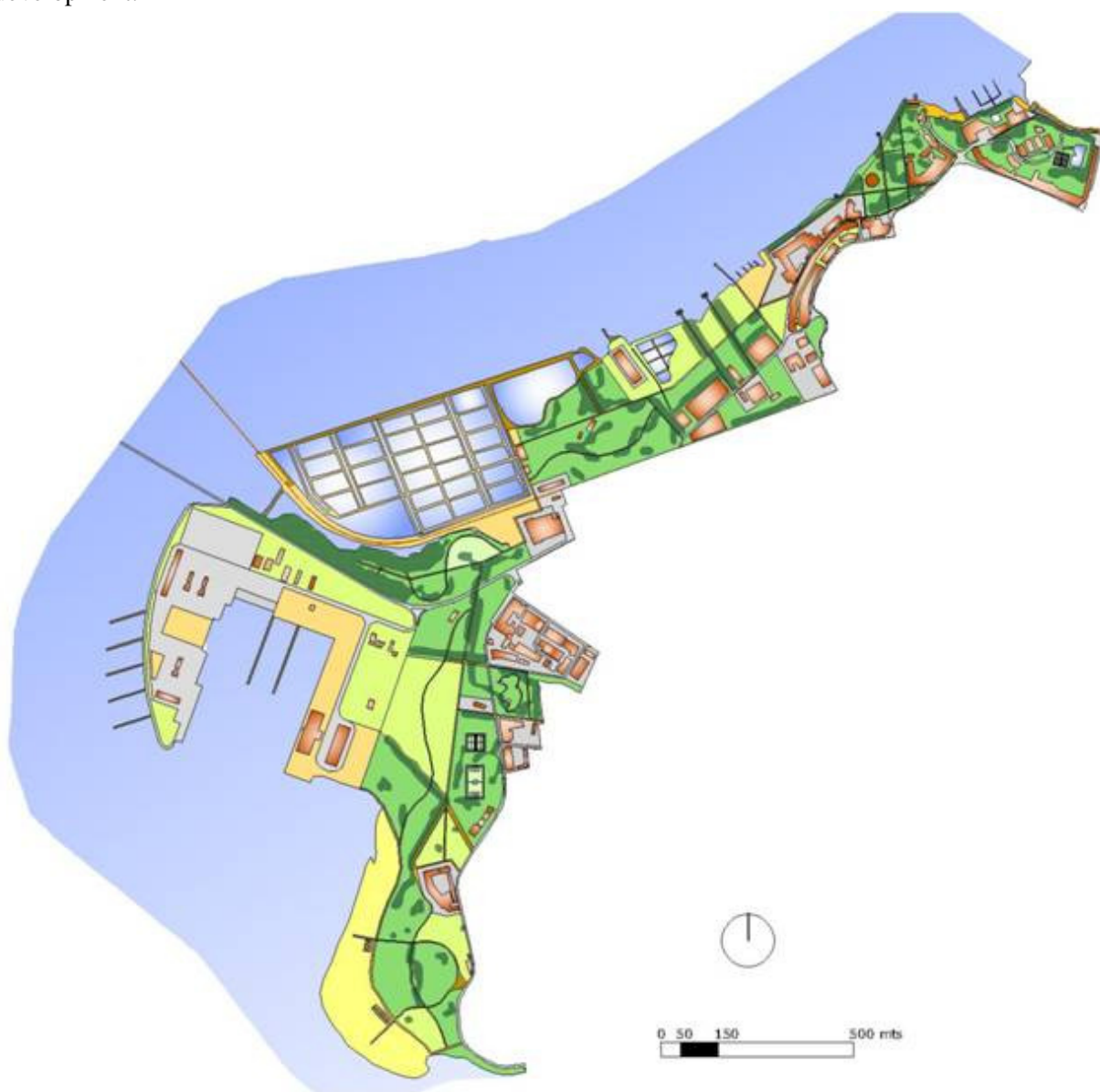


Figure 5 - Ante-Project to the left margin to the Arade River – waterfront redevelopment.

¹ A cluster is a geographically proximate group of interconnected activities, functions, and associated institutions (e.g., universities, service providers, associations, public spaces, etc.), linked by commonalities and complementarities [29, 30]. Thus, a cluster is a system of interconnected facilities and services whose whole is more than the sum of its parts.



Figure 6 - Ante-Project to the West 3rd Peninsula – neighbourhood redevelopment.

These figures represent respectively the developed ante-projects to the left margin to the Arade River and to the West 3rd Street Peninsula, which in a second phase will inform and serve as a base to the development of the final proposal.

6. Concluding remarks

As it has been shown in the presented case studies it is possible to redevelop post-industrial landscapes - giving them new uses and functions - through careful site planning and urban design. However, long term strategies must be applied in order to achieve the proposed objectives.

Post-industrial landscapes were always a space of innovative technology and processes. Thus, they could possibly be a place of innovation again, only this time as a place to teach and practice and develop new processes that celebrate the successes and remediate the damage left by the previous era.

To achieve this objective, the reclamation projects of derelict industrial areas should follow

design principles that promote sustainability, reduce negative environmental impacts, and foment economic prosperity, social inclusion, multifunctionality, and a better quality of life. For this reason reclamation projects should reinforce landscape character taking into consideration the spirit of the place and integrating the pre-industrial existence in the new landscape.

Furthermore, it is possible to conclude that even if the post-industrial landscape is commonly experienced negatively as fragmented and incoherent because it is difficult to conceive as a legible whole, the design process proposed here seeks to alleviate that experience. The projects presented enable a sense of spatial enlargement, with high degree of complexity, richness in discontinuities and with diverse ecological and social benefits.

As stated in the pre-design goals and objectives for both projects, the land ethics applied to a multifunctional cluster approach can be the catalyst for a new generation of development and change. The relationship created between landscape and user can provide the framework for a great land ethics transformation within the analysed landscapes. To that end, the design proposals recognize the importance of heritage and diversity on site. A diversity of ecological systems, cultural patterns, historical landmarks, commercial facilities, housing clusters, and transportation options will be the hallmark of both revitalization proposals.

Upon closer inspection of the goals and objectives, we imagine a couple of questions that some readers may have: “Why is industrial heritage so important? How does a multifunctional approach influence design?”

Throughout numerous pre-design brainstorming sessions, one thing became clear to us. As a design team, we recognized a general lack of ‘vision’ in today’s communities, townscapes, and green spaces as a whole. With that being said, the revitalization of these post-industrial landscapes must be approached with the necessities of the future generations in mind.

In conscious opposition to the lack of community visioning that we’ve recognized; the design solutions presented here seek to satisfy a time, which is not so far off, where the type of solutions we have proposed will become a necessity in the urban landscape.

Secondly, these designs place the use of alternative energies and recycling programs at the heart of the re-designed landscapes. The design we’ve proposed allows for the seamless integration of realistic human and community needs with a

changing global energy picture. Coupled with a highly pedestrian environment, including bicycle paths and canals, this scheme will allow for the transformation of these sites into a comfortable, attractive, and sustainable landscape.

Finally, this design proposal holds as its highest objective the goal of morphing an increasingly frustrating, underused and polluted urban landscape into a space that meets the needs of users from all walks of life. From the production of fresh local food to the “freecycling” of materials and possessions, the proposed designs will encourage artists, farmers, business owners, industrialists, open space advocates, and urban revelers alike to all walk together toward a more sustainable future for these sites.

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