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Urban architecture for sustaining local identity of cultural landscapes: A study of water front development in Khartoum, Sudan

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Abstract

Landscape is an indicator of common heritage as a combination of natural and cultural heritage. The of Landscape Architecture profession hosts several levels of intervention, starting from the planning level, the designing level, land suitability and water resources. This is done by applying scientific methods such as, ecological, economical, and social processes. Landscape is important as it provides the setting for our everyday lives. It is not only defined as a place of special interest nor does it refer solely to the countryside. It is the result of how people have interacted with the natural, social and cultural components of their environment and how they then perceive these. In recent years the land uses within the cities have been changing rapidly due to the various development pressures, and the tendency towards replacing all open spaces, public activities, and recreation areas to commercial and industrial uses has been enormous. The main objective of this research is to introduce an urban landscape design approach in dealing with cities waterfronts as a tool to enhance the overall sustainable the cultural landscape local identity within the urban structure of the city, taking the city of Khartoum, Sudan as a case study.

Keywords: Landscape design; Local identity; Sustainability; Waterfront development; Khartoum; Sudan

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1. Introduction and definitions

According to Burgi (2004), the landscape is the canvas upon which we live our lives, join together as communities and build our cities. Natural and cultural forces are the main pillars in shaping the dynamics of the landscape. Therefore, change is a part of the ongoing process of the landscape. It may occur as a result of not only planned forecasted actions, but also, as a result of unplanned processes. Cultural landscape theory provides a way to bring the tangible and the intangible qualities of a shared environment into focus, to highlight possibilities for understanding both history and identity, and to develop management plans. Different and often detailed definitions of cultural landscapes are used by theorists and land managers around the world as listed in (Table 1) (Jacques, 1995).

Table 1. The various definitions of the term Cultural landscapes

U.S. Definition (U.S. Cultural Resource Management Guidelines) 1992	In the broadest sense, a <i>cultural landscape</i> is an expression of human adaptation and use of natural resources and is often reflected in the division and organization of a property, the systems of circulation that allow movement through a landscape, the types of structures we build, the types of use that influence texture and colour in a landscape, and the purposeful planting of trees and shrubs.
"Cultural Landscapes," draft working document, Architectural History Branch, National Historic Sites Directorate, Canadian Parks Service, November 1991.	Geographical terrains which exhibit characteristics of or which represent the values of a society as a result of human interaction with the environment.
Parks Canada, Guiding Principles and Operational Policies (1994)	Any geographical area that has been modified, influenced, or given special cultural meaning by people.
Austrian Ministry for Science, Research and Art, <i>Research Initiative Cultural Landscapes</i> (1995)	A spatial system of activity that is perceived by human beings as a unit and results from man's interaction with what is to be found in his natural environment.
U.S. Secretary of the Interior, Guidelines for the Treatment of Cultural Landscapes. 1993	A geographic area (including both cultural and natural resources and the wildlife or domestic animals therein), associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values.
Institute for Cultural Landscape Studies, Harvard University 1992.	Any landscape that people have created, used, modified or protected - from historic gardens and urban parks to conservation reserves, from neighborhood streetscapes to working farms and forests. We use "cultural landscape" to mean a way of seeing landscapes that emphasizes the interaction between human beings and nature over time.
Canadian Parks Service (Proposed Canadian Definition, 1993)	Geographical terrains which exhibit characteristics of or which represent the values of a society as a result of human interaction with the environment.
UNESCO/ICOMOS definition (Report of the Expert Group on Cultural Landscapes, October 1992)	Cultural landscapes represent the "combined works of nature and of man" designated in Article 1 of the Convention. They are illustrative of the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment

	and of successive social, economic and cultural forces, both external and internal. They should be selected on the basis both of their outstanding universal value and of their representatively in terms of a clearly defined geo-cultural region and also for their capacity to illustrate the essential and distinct elements of such regions.
"Cultural Landscapes," draft working document, Architectural History Branch, National Historic Sites Directorate, Canadian Parks Service, November 1991.	Cultural landscapes emphasize the interactive nature of human activity with the environment in the creation of cultural landscapes.
UNESCO/ICOMOS World Heritage Committee, Guidelines for the Implementation of the World Heritage Convention	Represent the "combined works of nature and of man"

Source: the author after, Wilson, Chris and Groth, eds (2003)

Cultural landscapes term is emerging since of the recent inclusion of cultural landscapes as a category on the World Heritage List. The responsible agency, UNESCO, the United Nations Educational Scientific and Cultural Organization, has developed a set of definitions that appears to be relatively inclusive and broadly applicable (Robertson and Richards, 2003). The World Heritage List divided places into ‘natural’ or ‘cultural’ sites. Earlier that was before the development of the idea of ‘cultural landscapes’. Cultural landscapes can be both. They have an ecological dimension that includes both natural and human ecology. They are not limited to places of scenic beauty or to places with distinct physical patterns created by human activities over time (Rossler, 2006). Cultural landscapes includes political, spiritual and ideological dimensions that reflect how people think about landscapes and how landscapes are connected to personal and social identities. Taylour (2003) referred to cultural landscapes as the link between the intangible and tangible qualities of landscape embraces the idea shared by many indigenous people is that it is the relationship between people and place is conceived fundamentally in spiritual terms, rather than primarily in material terms. Landscapes are part of the cultural heritage of humankind and heritage is considered as a sort of intellectual capital. Although no economic production is considered here, sustainable preservation of these landscapes is often based upon developing new functions that have economical significance. The protection of heritage values (both cultural and natural) of landscapes focuses upon the sustainability of existing values and is confronted with urbanization and tourist and recreational pressure (Antrop, 2005). Urban waterfronts are an inseparable part of the development of human settlement. Watercourses together with their accompanying edges hold a special position within the urban structure. Together with the streets, squares, parks and other public spaces they participate in forming a complex inner structure of the city organism. Unlike other public places, urban waterfronts are unique as a point where urban land and the landscape meet (Desfor, 2011). They form the border between two worlds and at the same time they are their linkage and thus they influence the mutual relations between the city and the surrounding landscape. Interaction between nature and a society can be greatly beneficial for human physical and mental well-being. Successfully incorporating theories of connecting human and natural systems together in an urban community depends on regenerative design strategies. Regenerative design goes beyond restorative and sustainable environmental design; it is a co-evolution between humans and nature. The goal of regenerative design is explained as harmonizing nature

with humanity. Two main objectives are to reduce adverse effects of modern design and development on natural systems and human health and to promote positive contact between people and nature in the built environment (Deming, and Simon, 2011).

1.1. The rise of cultural landscapes

There was a remarkable flowering of interest in, and understanding of, cultural landscapes in the 1990s. According to Hunt (1992, p.12),

"The emergence of the cultural landscape movement informed the notion that places or landscapes reflecting everyday ways of life, the ideologies that compel people to create places, and the sequence or rhythm of life over time are significant. They tell the story of people, events and places through time, offering a sense of continuity, a sense of the stream of time. They also offer a cultural context setting for cultural heritage."

Taylor, and Altenburg, 2006. Franz Boas argued that it was important to understand cultural traits of societies, their behaviors, beliefs, symbols and the necessity of examining them in their local context (Wrede et al., 1991). The presentation of appropriate interpretative material to cultural landscapes Visitors can enhance their sense of participation. In 1992, the UNESCO recognized three categories of cultural landscapes of outstanding universal value for world heritage listing (Waldheim, 2006) which may be summarized as:

- Designed cultural landscapes

Designed cultural landscapes are well defined places designed and created intentionally by an individual or group, usually at a particular moment in time. These landscapes display well-articulated design intentions and a considerable degree of continuity in their design moves (i.e. the plan) and language (i.e. the details). Where these landscapes survive, it is often because of perceived cultural significance and because there has been a cultural will to enhance and achieve the reading of the most dominant and important layer, i.e. the design. Designed cultural landscapes are particularly vulnerable to physical changes. These may disrupt the logic of earlier design intentions and result in a gradual loss of awareness and appreciation (Akagawa and Sirisirak, 2008).

- Evolved cultural landscapes

Evolved cultural landscapes result from a more general idea, not necessarily specific to a particular individual, group or time period, that evolves over time, in some cases over many centuries, integrating changes introduced by new ways of seeing and using space (Fowler, 2003). These ideas are usually related to assumptions fundamental to social and economic life, such as agricultural or mercantile practices and their evolution over time. The cultural assumptions that support these ideas are widely shared and allow a cultural landscape to evolve through multiple contributions. Rural vernacular landscapes fit within this category, reflecting the way particular cultural groups have adapted to a particular place, transplanting land use and social patterns inherited from their homeland and adapted to their new environment. The threat to these landscapes occurs when there is a change in cultural perceptions. This over time can create discord unless the new values are successfully overlaid on the existing values (Robertson and Richards, 2003).

- Associative cultural landscapes

Associative cultural landscapes are places where the cultural ideas that structure the place are not physically obvious. They are difficult to characterize as designed or evolved because the relationships with the place are less tangible, they are often more evident through patterns of use or other indicators of association. Because of the need to understand these landscapes through the lens of cultural practice, these landscapes documentation requires more than the usual physical tools of analysis, GIS mappings, for example (Swaffield, 2004). These are part of the physical record, but not a clear indicator of underlying structure or value. In some cases, associative cultural landscapes overlay all or part of designed or evolved cultural landscapes that may have value for other cultural groups. The documentation of associative cultural landscapes requires a wider range of documentary evidence, which relate to the associative dimension of landscapes as expressed through literary work, landscape painting, mental maps, etc. (Corner, 1999). Associative cultural landscapes are open to change, but the patterns of cultural experience and understanding must be part of the management process to avoid the loss of their significance.

2. The city of Khartoum landscape

2.1. An overview of Sudan

Sudan is the largest country in Africa, having an area of 2506000 km². The heart of the country, in terms of population lies at the confluence of the Blue and White Nile where the three largest cities in the country (Khartoum, Khartoum North and Omdurman) are located. The three cities form the capital region and contain about 20% of the country population. The total population of Sudan was estimated as 30 million in 1999, with an urban population estimated at 33%. Nearly 2.2 millions are still entirely nomadic (Figure 1).

2.2. Physical structure of Khartoum

According to Martin and Mosel (2011), the metropolitan

Khartoum consists of three cities, Khartoum, Omdurman, and Khartoum Bahri. Each of these cities has its own character, function, and feature. The city is an amalgamation of wealth and poverty, demographic



Figure1. Geographical map of Sudan (Source: MEFIT 2009)

density and sprawl and robust atrophied infrastructure. It is, in short, a symbol of the contradictions that mark Sudan as whole. The metropolitan is divided into: Khartoum city on the southern part of the Blue Nile, which is the administrative and commercial hub, Omdurman to the west of the White Nile is the historical and traditional part of the city since Mahdist set their capital in at 1886, and Khartoum Bahri on the north part of the Blue Nile which is the industrial center. De Geoffroy (2005) referred to the contrast in the landscape features functions of each city , which is an important factor that should be considered in any future Khartoum plan to keeps its unity (Figure 2).



Figure 2. The city of Khartoum hosted by the Nile and showing the subdivision of its three cities (Source: MEFIT, 2009)

2.3. Urban landscape features of Khartoum

The living experience in the city of Khartoum is very much linked to nature and to the riversides. Lots of elements are combined together to shape the quality of place in Khartoum, the strong quality of place is very dominant. The powerful environment of Khartoum depends on the vast expanse of the barren desert and the slow movement of the Nile. The Nile as a main landscape feature, the confluence of the two rivers, the narrow, fast Blue Nile and the slow, wide White Nile, the interesting natural landscape, the decreasing, yet, magnificent urban agriculture, the natural forest of Al-Sunnut and the vast desert (Figure 3). Khartoum is sometimes described as a donut with a hollow centre. The presence of the low density *Tuti Island*, *the rural eye*, in the middle, surrounded by wide three rivers and their flood plains, segregate the centre of Greater Khartoum into actually three separate centres in Omdurman, Khartoum North and Khartoum. This is further enforced by the fact that this middle circle accommodates government buildings, extensive cemeteries and spacious military sites together with rural type agricultural lands. Some plans attempted consolidating

development and shifting the centres towards each other. Connectivity has somewhat improved in fact, but the overall goal proved difficult to attain due to natural as well as political reasons (Bannaga, 2010).



Figure 3. Urban landscape fabric of the city of Khartoum (Source: after, Abd Elmoneim, 2010)

Kitchener's plan planned the city with grid iron planning pattern. It was, applied articulately with diagonal intersecting roads and some parts elaborated as garden cities in the airport neighborhood and the confluence area named *Mugran*. The grid iron in its crude form was adopted for natives housing, for ease of application and servicing and for security reasons too, since roads at the beginning were wider than plots. Later on, this checker board pattern was perpetuated indiscriminately over every new extension. Coupled with low heights and small plot coverage, the city sprawled tremendously and lost character (Bannaga, 2010). During the rainy seasons (June -October) Khartoum suffers from frequent floods. There are some zones which act as flood control zones that absorbs and delay flood water progress such as the vast urban agriculture areas boarding the riverside which are located at Al-Sunnut forest 5, Tuti Island and University of Khartoum riverfront. The city of Khartoum itself accommodates about 4,000,000 inhabitants (Abdel Ati, 2009). The city periphery is the most populated area in the whole city, the city downtown is generally empty a part from the business hours. This phenomenon was reflected directly to the pattern of activities along the CBD riverside. Khartoum has been suffering from an exertion on urban environment as a result to the rapid growth. According to El Sammani et al. (1989), 60% of existing housing are in a poor status in comparison with the international measurements for housing conditions.

2.4. The evolution of the Khartoum city landscape planning process

There were four plans for developing Khartoum made after Independence. the first was the twenty year plan 1960-1980 by Doxiadis, the second was the fifteen years regional plan for Khartoum and a master plan for the three towns by Mefit 1975-1990, and then the ten year Khartoum structure plan by Doxiadis and A. Mustafa 1990-2000. But, none of the three previous plans had its full implemented target because of a fragile economy, ineffective government institution, and environment problems. Before laying down the fourth structure plan for Khartoum, the government's urban planning strategy has three main component; re-planning of squatter areas, preparing site for communities affected by re-planning process, and relocation of communities. (Pantuliano et al., 2008) Due to city expansion these strategies created many problems in the process of solving Khartoum's squatter settlement problems and offering accommodation for displaced people (Figure 4 a, b).

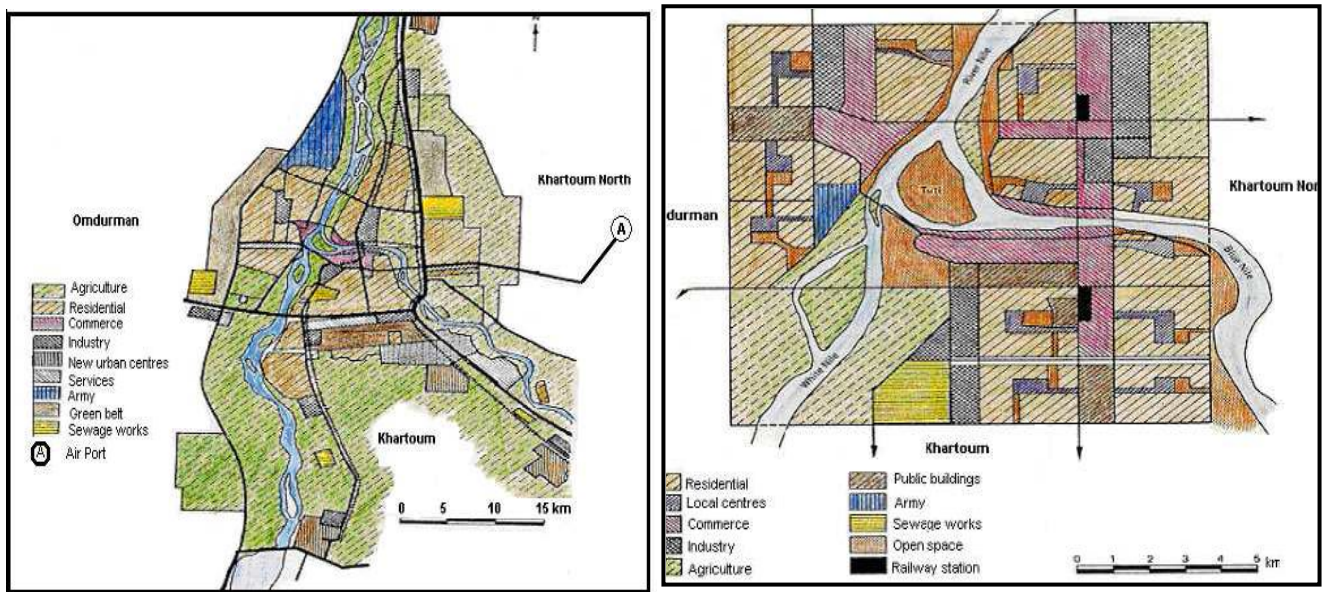


Figure 4(a). Twenty year plan 1960-1980 by Doxiadis and the fifteen years regional plan for Khartoum and a master plan for the three towns by Mefit 1975-1990 (Source: Malaz, 2012)



Figure 4 (b). Ten year Khartoum structure plan by Doxiadis and A. Mustafa 1990-2000 (Source: Malaz, 2012)

2.5. The role of the Nile on the Khartoum waterfront cultural landscape

Over the years urbanization has had a major impact on cultural changes. But still, the Nile river water front played an important role in the cultural landscape of the Khartoum city residence. Because of the desert nature of Khartoum, developments tend to cling to the Nile which is running due north. The city therefore took an elongated shape and grew extensively long (De Wit, 2008). From the most northerly tip in *Geili* to the furthest south end in *Jebel Awlia* the distance is a hundred kilometers. The majority of busy commercial roads, therefore, run north-south. This entails that most buildings, which are normally insistently designed to face the main road, open east or west or both, thus getting exposed to intensive solar radiation in the morning or evening or both. Remembering that nowadays buildings get dressed in large glazed panes, the impact of the greenhouse effect on the interior, as well as the exterior climate at the end, cannot be underestimated. Long uninterrupted roads normally contribute to another ecological problem too (El Sayed , 2005) (Figure 5).

Due to roads extensive lengths winds tend to build up momentum and get tunneled. In the case of Khartoum wind speeds are not high and buildings are generally low. The tunneling effect, therefore, is not that great. The problem, however, is that many of these are earth roads. A layer of fine dust hovers over the city, obviously noticeable in the evenings, and when sand storms blow they speed up without obstruction (De Waal, 2007). The linear pattern of roads encouraged a linear pattern of development, whereby shops and businesses are attracted to the main road. Whenever a road is asphalted, boundary walls are replaced by shops and lucrative plots are developed into commercial buildings. This created a situation of congestion where all shops, schools, health centres and even hospitals and colleges open immediately to the main road (Martin and Mosel, 2011). The former neighborhood centres in the middle lost their role and remained empty spacious vacancies and inner roads away from the asphalt are mostly desolate dirt roads with obstructed surface drainage though unattended to, central open spaces became very attractive for developments because of escalating cost and scarcity of land. It is worth mentioning that every grid iron cluster of blocks will allow for a service block in the centre to provide for schools, shops, a police station, a

mosque, a water yard, etc, together with open spaces and playgrounds (De Wit, 2008). If undeveloped, as the case in many instances is, these open spaces become heat islands and garbage dumping areas turning into filthy muddy swamps in the rainy season. Lately local administrations learned to subdivide these open spaces and sell them as investments, resulting in distorting the urban fabric, worsening surface drainage and generating poor aesthetical and social environments. In addition to that, levels of pollution are high, especially from the one cylinder rickshaws which are normally overloaded beyond design limits and not promptly serviced and overhauled (El Sayed, 2005) (Figure 6).



Figure 5. The Khartoum city urban status today, busy and crowded roads. (Source: after, Abd Elmoneim 2010)



Figure 6. The linear pattern of the Khartoum city urban landscape and the impacts of the floods on its urban spaces (Source: after, Abd Elmoneim, 2010)

It, therefore, becomes extremely strenuous to drive long distances between the three towns and ambulances and emergency services find it difficult to negotiate these roads. Vast areas in the peripheral belt

around the three towns of the capital exemplify vernacular non-structured layouts with narrow winding earth roads. These villages and shanty towns have largely remained with little or no services and a poor infrastructure in general (Jacobsen, 2008). The ruralization of the capital is evident in the way people use public spaces and amenities and the way people use roads, whether pedestrians or drivers. This, in fact, is an issue by itself that requires deep analysis of cultural tendencies and attitudes. To say it in a nut shell, Khartoum is aging and becoming a nightmare of a city, and there is a deep need for creating a new green network for the city depending on the Nile water front as its main component. Though modern buildings have often been planted here and there, several show cases of landscaped zones and attempted beautification adorn its central parts, new luxurious housing estates emerging, sometimes in complete disresemblance to their context, roads widened and in some cases palm trees planted, problems of the city as a whole are intensifying and are calling for serious immediate attention. The cultural scene is worth mentioning (El Sayed, 2005).



Figure 7. The Nile water fronts of the city of Khartoum a socio-cultural hub as well as a recreational heart for the people of Khartoum. (Source: after, Abd Elmoneim, 2010)

Khartoum lacks cultural facilities. There are only two functioning theatres, movie cinema becoming deserted places, and there are no proper art galleries all around. There are only a few sports centres and swimming pools, no jogging or cycling lanes. Recreation of the masses is mere picnicking in un-facilitated locations leading to their deterioration and pollution. The value of the River Nile Corridor lies in its association with the history of the city, its choice as a capital, the cultural expression of the city, a positive organization principle in the urban fabric of the city. As well as being a monitored ecosystem and a sustainable resource for enjoyment and recreation. All these previously mentioned aspects led the Nile water front of the city of Khartoum to be the green recreational as well as cultural lung of the city. It is the social and cultural hub of the city, by day it is where they sell their goods and work as a commercial artery, by night, it is their cultural recreational artery where they gather, socialize and enjoy the night breeze in the harsh environmental conditions previously mentioned (Figure 7 and 8).



Figure 8. The Nile water fronts of the city of Khartoum night socio-cultural atmosphere plays an important role in the people of Khartoum cultural life (Source: after, Abd Elmoneim, 2010)

2.6. The Khartoum city urban landscape new vision

In Sudan, the economic growth of the country has been exponential reaching a high of 9% in 2006. However, since 1999, the emergence of this oil wealth has not effectively realigned the developmental disparities within the different regions of the country which have prevailed since independence the tentative oil production levels of August 1999 have seen a significant increase and today the country prides itself on the production of 500 000 barrels of crude oil per day. (Murillo and Mustafa, 2008). A wind of change has been blowing through Khartoum since their integration into the petro-countries circle. This has generated a two-tier process: this capital city has become new *eldorados* for foreigner investors, and they follow the path of Emirates' development (Pantuliano et al., 2008).

In Khartoum, new office towers, stores, malls, lush golf courses and gated communities are rapidly sprouting on the banks of the Nile as well as within the wealthy districts. The image of downtown Khartoum is one of a vast construction site. The suburban areas are no less untouched by the construction of luxurious compounds. The airport, currently located at the heart of Khartoum, is due to be relocated from the downtown area towards the south-western fringe of the city. All of these physical transformations inscribed on the face of the city epitomize the new economic wealth of Sudan. Heralded by the discovery of crude oil, the growth is one of the fastest of the world in the last decade (Murillo and Mustafa, 2008). On the contrary they have reinforced the dominance of the capital city as the economic stronghold of the Sudanese State and furthermore contributed to a mass migration towards it in search of better economic sustenance (De Wit, 2008). The increasing interest of the State in land tenure creates novel forms of public-private partnerships. In 2004, the Governorate of Khartoum and the Ministry of Physical Planning and the National Social Insurance Fund signed a partnership agreement with Dal Property Development, one of the most powerful Sudanese private companies. The aim of the agreement was to establish the Alsunut Development Company. This public-private partnership was convened to reactivate an "area of business prosperity" in the Al-Mogran zone the confluence of the Blue and White Nile Rivers (Jacobsen, 2008). This \$4 billion development project consists of two main phases: the first comprising the construction of a Central Business District (CBD) and the second a residential estate portion. Completion is expected by 2014 with 630 hectares of office space, 1 100 villas, 6 700 apartments affording living space for 40 000 residents and visitors, a marina and a golf course. The site is expected to generate jobs for 50 000 employees (Martin and Mosel, 2011).

On the opposite bank of the Nile within the Abu Se'id area, another waterfront project "*Medinat al-Noor*" is under construction. The zoo and the golf course equally feature in the Alsunut project mentioned above. The magnitude of "*Medinat al-Noor*" is such that an industrial zone has been envisaged as part of the project (El Sayed, 2005). Land destined for sale is most often situated on the banks of the Nile and animated with its history. This is land that has been appropriated by those who have occupied it over a long duration of time and furthermore bears the marks of their identities and social biographies. Over the years farmers had cultivated the greatest expanse of this area only to find that their agricultural land was now being transformed into land reserved for construction. This is evident at the confluence of the Blue and White Niles where investors are intending to transform the face of Tuti Island, a rural haven of peace (Murillo and

Mustafa, 2008) (Figure 9 and 10). A well defined problem of the loss of cultural landscape local identity is on the fringe of breaking out as a result of all these urbanization booming projects in the city of Khartoum.



Figure 9. The New waterfront development projects of Tutti Island, city of Khartoum reshaping and affecting the city's cultural landscape. (Source: Murillo and Mustafa, 2008)

2.7. The Khartoum city urban landscape new vision impacts on the cultural landscape of the city waterfront local identity

Besides current landscape changes are characterized by the loss of diversity, coherence and identity of the existing landscapes. This has been well noticed in Khartoum lately (Antrop, 2005). To understand the problem we have to define identity, it is often used to describe the “uniqueness” of a person or a thing, it is always coined with another descriptive word, such as personal identity, political identity, ethnic identity, social identity and place identity (Ozdemir et al., 2010). As a result of his interaction with the place, it was stated that an emotional bond with a place is formed between the user and the place as a result to the meaning given to a place by the individual (Najafi, 2010). According to Hague (2005) place attachment may be primarily associated with meanings and experiences which often involve relationship with other people. Sense of belonging and place attachment plays an important role in the social and cultural life of urban areas. Thus, identity of a place is more than just the physical appearance, but also involves a “meaning” for the individual and the community (Jenkins, 2005).



Figure 10. The New waterfront development projects of the city of Khartoum transforming the city's cultural landscape (Source: Murillo and Mustafa 2008)

It is assumed that people, who develop emotions and positive meanings to a place, tend to protect and care for that particular place. Lynch referred to identity as a part of the image of a city (Halpenny, 2010). Although the image of a city is not necessarily the same as its identity, it is the physical and most instant perceived reflection of its identity. On the other hand according to Seamon et al. (2008), identity of a place is strongly linked to the existence of authentic sense of place. Sense of place depends on two main aspects, the first is the experience and the second is a subjective dimension. These results in affecting the sense of place perceived and interpreted by people due to the characteristics and composition of physical components of the built environment. This led to the existence of three variables that might affect the sense of place; legibility, preference for and perception of the visual environment and the compatibility of the activities with human purposes (Stobbelaar and Pedrolí, 2011). As for the people of the city of Khartoum all these projected development projects will lead to a total loss of their cultural landscape values, a loss of all circulation systems, including recreational paths, streets and bridges, which they are familiar with, within the waterfront boundaries that help organize the city urban fabric and increase public awareness of the scenic and natural value of the Nile River. The demolition of the views from each side of the river to the other, which helps to reinforce the river's complex history in the relationship between communities on sides of the Nile River and

the middle islands. The waterway itself, as a natural feature and as part of transportation network will be missed. Views to the river from the bridges and from the shores will lose its value.

3. Landscape design methodology for sustaining the cultural landscapes local identity

3.1. Key Aspects that Contribute to landscape cultural local Identity

When studying landscape cultural identity on a local and regional level, Amundsen (2001) identified four elements that gives the landscape its value: Spatial qualities that distinguish the place from others e.g. location, but also infrastructure, communication and architecture; characteristics or qualities of the inhabitants that distinguish them from inhabitants of other places e.g. values, customs, physical appearance; social conditions and social relations between the inhabitants; culture and/or history, seen as a unifying element that again connects the inhabitants to tradition and again distinguishes them from 'the other'(Jenkins, 2005). These four elements give some indication of the specific content of local identity. The first two elements, summarized as 'the place' and 'local people', are tangible and reflect social relations and culture and/or history. It is important to understand that local people are a typical element of local identity. An absence of local people will lead to a loss of a sense of local identity (Hague, 2005).

3.2. Landscape design criteria that foster the sense of the landscape cultural local identity

According to Huirong (2013), the 'urban waterfront manifesto' was issued by the Canadian Center of waterfront development in 1999, setting out basic principles of waterfront development. This manifesto incorporates many of the values that urban landscape designers should bring to planning and designing waterfronts. It focused on the importance of understanding that ecological and economical benefits go hand-in-hand when developing a successful waterfront. As well as, focusing on defining a river's beauty is its natural appeal and healthy aquatic ecosystem supported by rich diversity. The choice of the right type of development that brings people to the waterfront. In addition, to connecting people to the river. Many urban riverfronts are challenged with physical, political, social, and economic tasks, but if successfully done, they can increase public enjoyment and create strong connections to communities (Otto et al., 2004). Allowing the community to experience a river up-close promotes lively and diverse places while encouraging a connection to communities and an appreciation for nature. In order to achieve these objectives, a methodology that consists of four main pillars for cultural landscape process should be followed (Smith et al., 2012).

3.2.1. Functionality

The functionality of the waterfront refers to land uses or activities provided by the site. International experience and literature pointed out that mixed-use is a key in the success of urban waterfront development (Dovey, 2005). A mix of retail, recreational and cultural activities will attract people of different backgrounds,

incomes, and ages. This helps to create places of universal appeal (Brown et al., 2009). Cities create various themes for their waterfronts, associated with their vision and strategy for urban developments. This is always shown as an emphasis on one or two priority land uses. However, the local community usually desires recreation opportunities. Huirong (2013) suggests that water edges are natural magnets for people, they also can be considered as a vital open-space opportunity because they host a vast area of land within the urban fabric. Urban waterfronts can provide various land-based and water-based activities for waterfront inhabitants and citizens throughout the year. The functions of urban waterfronts should also be considered at the bigger scale, creating functional connectivity to the rest of the city. A linkage to the city core is an emphasis in many waterfront reclamations. Attracting people to the urban core can be a huge boon to downtown service industries (Otto, 2004). Thus, waterfronts can obtain the character of being a lively connection between the city and the water.

3.2.2. Accessibility

Water is an innately attractive medium, both aesthetically and as the location for a variety of recreational activities (Shaw, 2001). People should be able to touch and interact with the water in appropriate locations, whether through wading, fishing, launching a boat, or sitting on the riverbank. Physically, easy access to the waterfront is essential. Expanded and well-designed public transit brings people to the waterfront from every stratum of the city, especially for waterfront development that adds regionally-valuable amenities (Brown et al., 2009). Treib (2009) suggests that the spatial and social disconnections in waterfronts contribute to fragmented interests and a lack of identity. Improving accessibility is an imperative to return waterfronts to local people. Pedestrian promenades along the water edge can be seen in many successful waterfront developments. Ideally, the promenade should connect to local and regional trail systems with facilities such as washrooms, seating areas and parking lots. Nodes, such as welcoming areas or small plazas, should be provided at reasonable intervals along the promenade, where opportunities for various forms of public access are provided (Otto, 2004). This connectivity with the city core ensures smooth movement of pedestrians to all amenities, thus attracting local communities to use the waterfront more frequently. Visual access is also an important concept in waterfront development. Preserving and providing additional view corridors allows for visual permeability from the waterfront into the inner areas. The visual links create opportunities for people in the inner city to enjoy waterfront views (Isil, 2013).

3.2.3. Culture and history

Culture and history provide unique definition to the place and its communities. Preserving the architectural art with the introduction of new uses is a widely-used strategy in urban development including waterfronts (Hague, 2005). These buildings can again serve the surrounding communities when incorporating uses such as live theatres, galleries, retails, cafes/restaurants and the like. Cultural buildings and public arts can greatly enhance the ambience that celebrates a city's special character. Large cultural buildings, whether it is theatres, museums or art galleries, not only enrich the citizens' spiritual life, but also develop cultural identity for the city. Using local materials, incorporating treasured signs or other memorabilia help to

capture the unique qualities of a place (Ozdemir et al., 2010). Waterfronts are also rich in natural history. Educating the public about the river and its natural history will generate a sense of stewardship and a connection to the river's history (Sepe, 2010). Ecological education is especially meaningful along waterfronts in ultra-urban environments, in which people seem to have lost links with nature. The water body can be a powerful tool for science and nature education. Interpretive boards, way findings and other sign systems explain the river's unique characteristics and the region's natural assets. Furthermore, Local people can participate in riverfront interpretation and activities, learning about their river by seeing, smelling and touching the water (Najafi, 2010).

3.2.4. Ecological environment

Otto et al. (2004) pointed out that preservation is the best way to ensure the health of an urban waterway. However, it is a reality that the ecological environments of urban waterfronts have being traded off for economic growth in cities. To reduce and to restore are probably the most practical ways to protect natural environments in waterfront development. A city's river is a place that grants the region its identity (Van Slobbe et al., 2013). Clear and dynamic rivers are appealing and attractive to residents and businesses. An engaged public that enjoys riverfront features and activities also cares about the river's long-term health. The habitat functions in the waterfront, being a small green buffer area on land or constructed a small island on water, benefits the river ecosystem. This can mean giving up some traditional notions of what is 'attractive'. Trimmed lawns, formal landscape features, and pruned shrubs are replaced by passively managed native plants providing food and shelter to fowl and small animals (Steiner, 2011). This kind of natural area has proved not to be a conflict for the commercial atmosphere of downtown. Rather, it provides an escape experience for people living and working in the area. Bioengineering uses plants to stabilize watershed slopes. But it needs to be applied carefully in ultra-urban settings where some structural components such as stone or rock may be necessary due to current velocities, channel alterations for navigation, and adjacent infrastructure, such as bridges. Landscape features that infused ecological and educational functions will get local communities involved broadly. They allow people to see and interact with water, providing them knowledge, fun and experience, which leads to an intimate attachment between the site and the community (Huirong, 2013). Native plants interpret the local natural history and create a strong sense of the place. Native plants that thrived on site before the industrial development are an important part of the local landscape, differentiating a place from others. In many cultures, plants also carry particular cultural meanings. The biotic properties of these plants, including fragrance, shape/form and the ornamental characteristics, bring not only physical but spiritual joy to local people (Isil, 2013). From all what was mentioned above, in table 2, we may come up and conclude some preliminary landscape design aspects that forms the pillars of the methodology for sustaining the cultural landscapes local identity.

Table 2. Preliminary landscape design aspects for sustaining the cultural landscapes local identity (Source: the author after, Huirong, 2013)

Design Attributes	Key Aspect
Mixed land uses and various amenities to attract a variety of people	Functionality
Affordable housing for low-income people to promote social equality	
Diverse retail and services within walking distance to support a self-sufficient community	
Emphasis on recreational function on the water edge with sufficient supporting facilities	
Design solution that balance the privacy of the waterfront inhabitation and street-level activities for tourists	
Employment opportunities targeted to low-income and inner-city residents	
A well-design public transit system connection to city core and other regional area	Accessibility
Good connectivity to the surrounding area with minimum physical barrier	
Establishing waterborne transport	
Pedestrian and biking roads connect to local trails	
Reasonable intervals along pedestrian path, providing various forms for public access	
Sufficient way-finding system	
Opportunities for people accessing the water	Culture and History
View corridors form inner city to waterfront	
Public spaces that highlight the culture and history of the site such as plaza, parks and etc.	
Heritage architectures Incorporating new uses for local communities	
Culture amenities, such as theatre, museum or library to enrich the spiritual life of local communities	
Public art by local artists that depict local history and personalities of the site	
Providing gathering place for community cultural programming and events	Ecological Environment
Play elements that reflect the character and the main theme of the site	
Protecting and restoring natural features in the waterfront	
Protecting or creating habitat for wildlife	
Softened banks and hardscape with bioengineering approaches	
Managing storm water on site with features such as permeable pavement, bio-swale, constructed wetlands and etc.	
Urban agriculture as an important strategy for a sustainable community	
Landscape features that are infused ecological, educational and creative play functions	
Using the water body as a tool for science and nature education	
Using green roof for various of advantages such as aesthetic value, energy efficiency, storm water management and etc.	
Native plants and plants with cultural meaning	

4. Applying the cultural landscape design methodology on Khartoum waterfront

4.1. Khartoum water front case study

This project is considered as one part out of the six water front projects in greater Khartoum. The area of the project estimates about 379.500 sqm. located along the western bank of Blue Nile at Khartoum starts from al Mogran family park to the area facing the presidential villa complex, bordered with Blue Nile bark and the Nile avenue. The study area was divided into four sectors, according to their urban landscape features (Figure11).

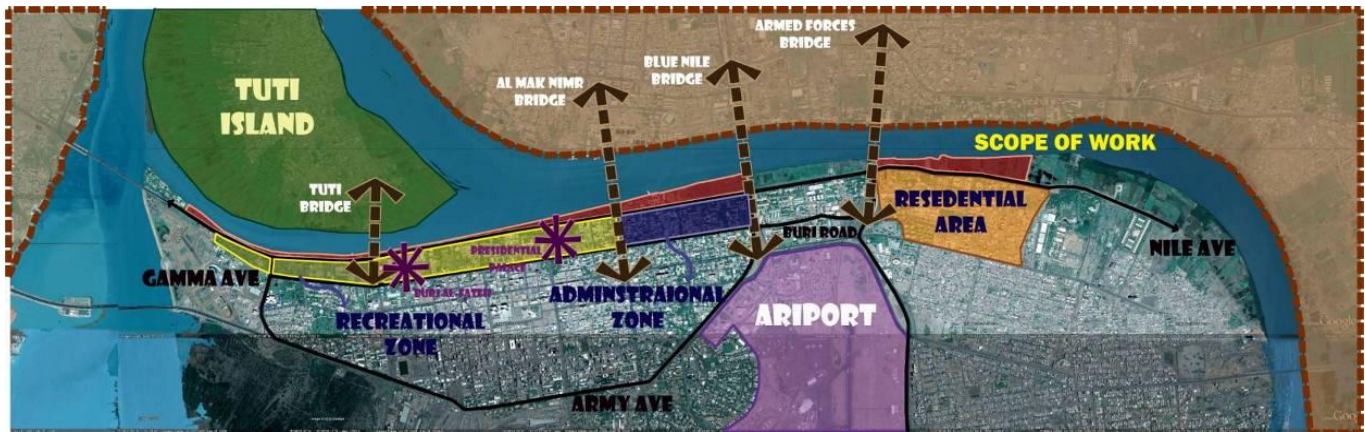


Figure 11. The subdivision of the water front sectors before applying the landscape design methodology. (Source: by the author)

A study of the existing conditions was carried out including, studying the Public Transportation routes and stops on the Nile Avenue Street. Surveying the existing constraints (Pump stations, Transition station, Tension lines...). Analyzing the panoramic views of the Nile coast line and waterfront. Carrying an existing vegetation inventory. Specifying which trees are considered “Heritage & Historical Plants”. Hydrological study of average existing Nile water level, and minimum ground level proposed for working, as well the protection walls existing position and proposed ones. Specifying which existing land uses, are going to be reserved, removed or renovated. The main strategic objectives were to enhance the River Nile environmental, recreational and cultural values. Considering the Nile as a main source of tourism. Maintaining the Distinct Value of the Nile. River Nile is a recreational environmental tourism greenway not a traffic axis. Opening a visual Axis to the main Landmarks Open Green Areas, and rich vegetation. The study covered the following aspects:

- The accessibility aspects to cover the; the open views along the waterfront calculating the minimum distance to and from the coast, number of obstructions in the field of vision and the creation of an open horizon. The public accessibility to the coast was also considered through calculating the number of obstacles in the circulation route, public nodes on the waterfront, collective seating areas and connectivity with the city greenway network.
- Flexibility of designs to allow future development, takes into consideration the human scale of design, and match with the city master plan.

- Efficiency of Urban Spaces as part of the city network.
- Heritage preservation of local character through sticking to the existing theme and style of structures.
- Verification of Urban context by considering the homogeneity of buildings with surrounding as well as the existing and proposed skyline.
- Classification of all walkways according to their types and designing convenient pedestrian walkways that meet the circulation and desire lines.
- Providing Recreational activities linked with the Nile.
- Suggesting a variety of activities to suit the coastal areas.
- Achieving balance between public and private uses.
- Encouraging factors that could revive the place.
- Reducing traffic on the waterfront, and easing of pedestrian movement between the spaces of the project.
- Encourage public use of the space, by providing availability of means of public transportation, the availability of basic services, availability of parking lots and using no walls & gates in public parks to allow maximum public access.
- Enhancing designs that implement and integrate with the natural & cultural beauty, while preserving the ecological and historical nature of the Nile water front.
- Taking into account the behaviors & needs of the users and creating a friendly environment for the public.
- Creation of an overall atmosphere which is safe and comfortable for humans.

4.2. Khartoum water front landscape design concept

As sector B is mainly streetscape concept we shall focus on the e rest three, sectors A, C and D to highlight their design concept which led to two conceptual designs for each sector.

Sector A:

The main concept included, providing a major parking lot that acts as a vehicular terminal and also considered as a service lot to any proposed cafes or restaurants. Main sector entrance with a vast hardscape plaza to accommodate the pedestrian flow and welcomes visitors to the waterfront with a main water feature. Main node is an area with high pedestrian flow from the street and pedestrian outlets from the bridge in addition to two major landmarks overlooking it, two alternatives were made but following the same main design decisions (Figure 12 and 13).

Sector C:

This sector is the water front of the Khartoum University; the main concept depended on redeveloping of the existing local harbors into proper main marinas, to act as stops along the Nile Cruise. Redevelopment of the Historical Ship, and transferring the site into a main tourism destination. Respecting the local culture of the political debates at the university, a huge Hide-Park like concept was adopted in the recreational zone. Two alternatives were made, different in concept but following the same main design decisions (Figure 14 and 15).

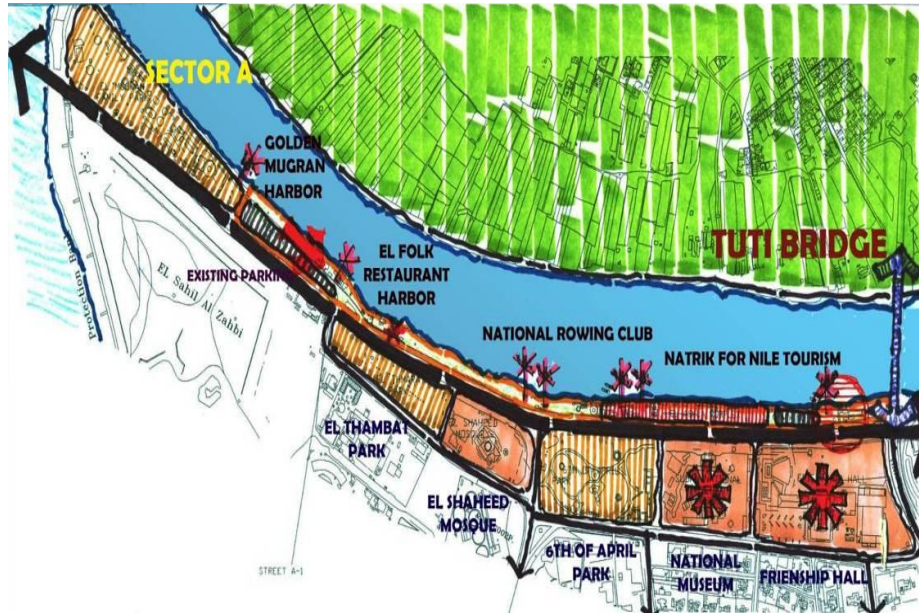
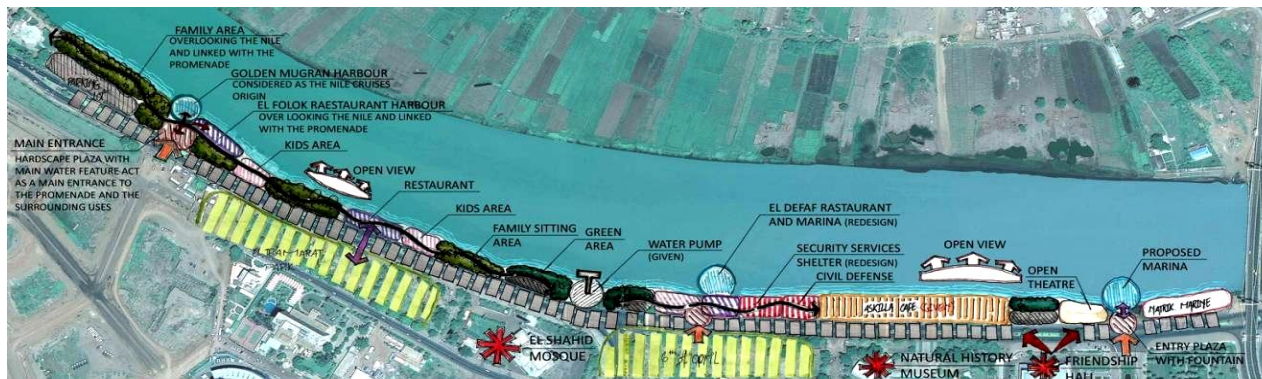


Figure 12. The landscape design concept of Sector A. (Source: by the author)



ALTERNATIVE A



ALTERNATIVE B

Figure 13. The Landscape design concepts alternatives of sector A. (Source: by the author)

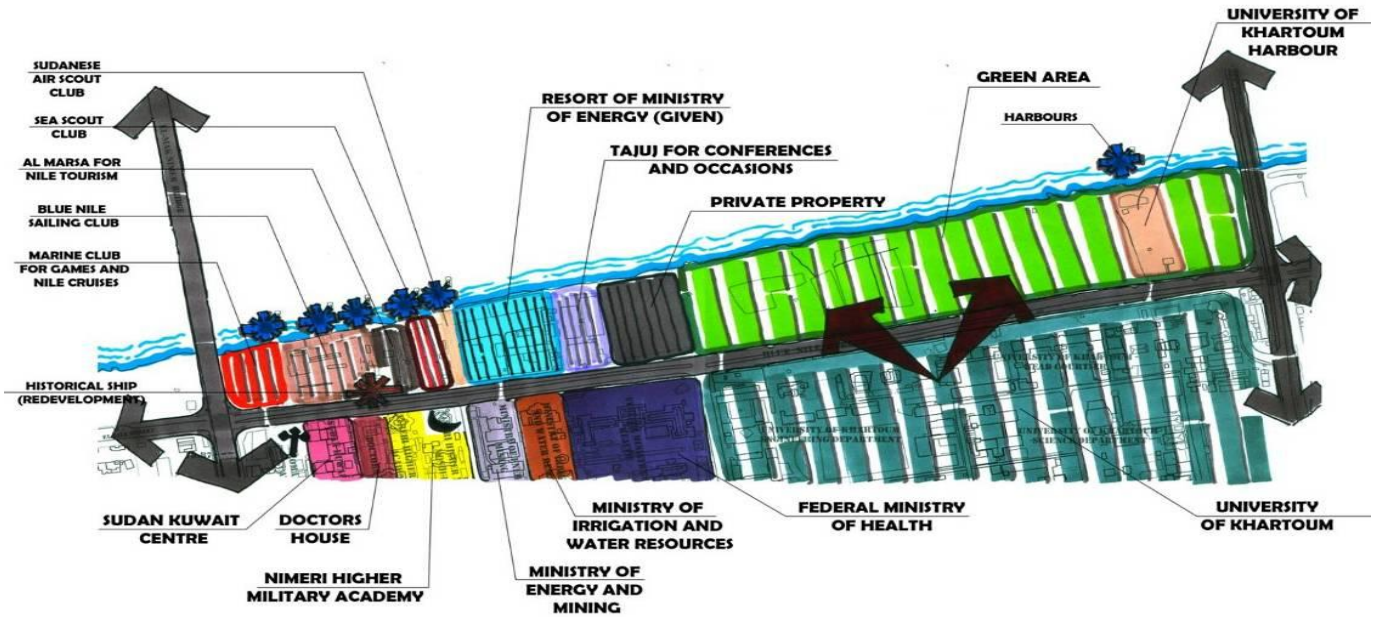


Figure 14. The landscape design concept of Sector C. (Source: by the author)



ALTERNATIVE A



ALTERNATIVE B

Figure 15. The Landscape design concepts alternatives of sector C. (Source: by the author)

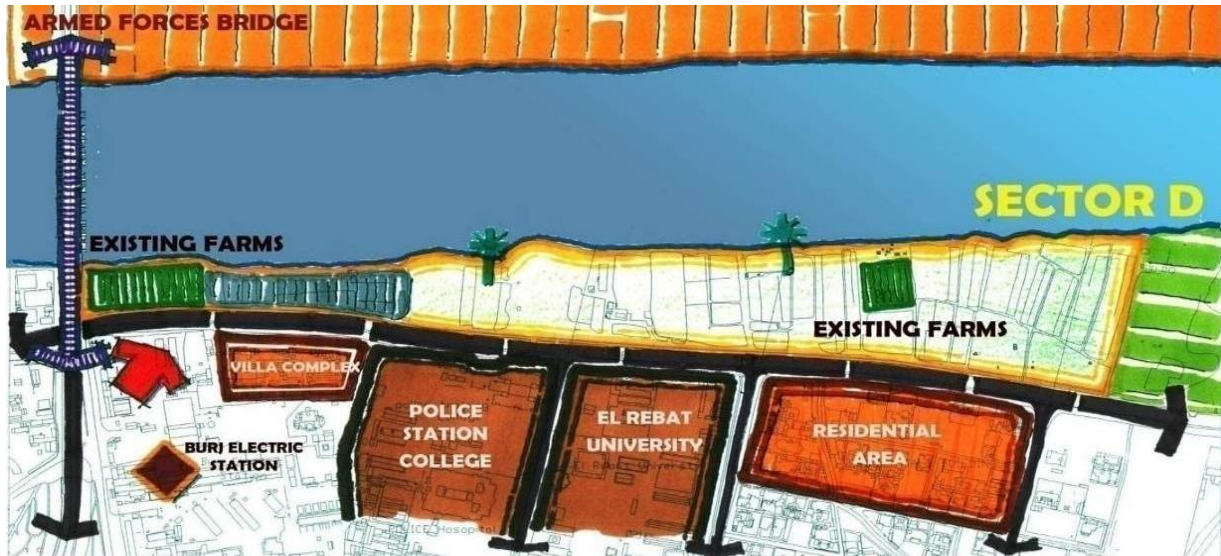
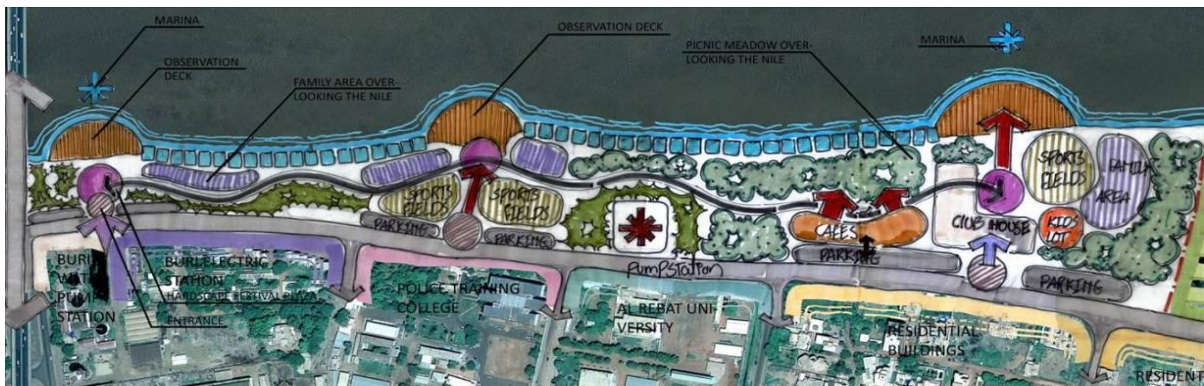
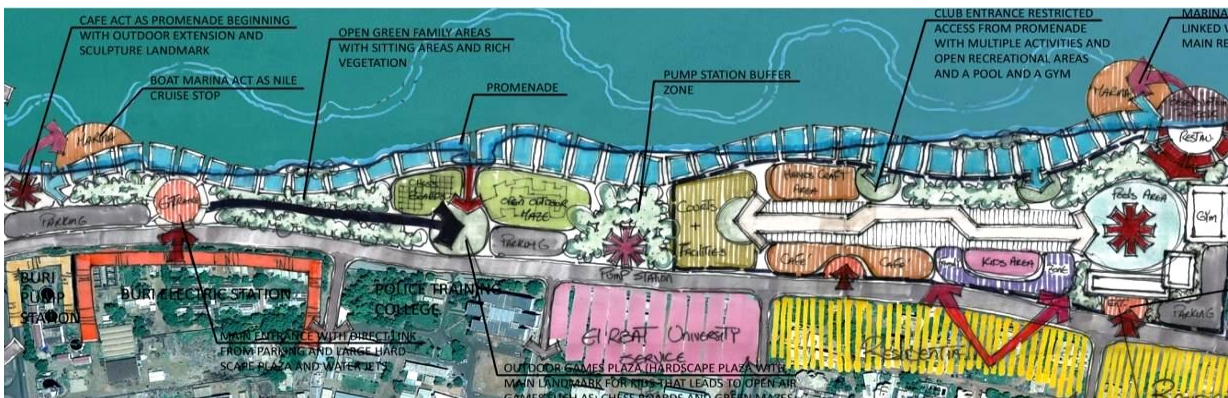


Figure 16. The landscape design concept of Sector D. (Source: by the author)



ALTERNATIVE A



ALTERNATIVE B

Figure 17. The Landscape design concepts alternatives of sector D. (Source: by the author)

Sector D:

This sector is the main beach area of the water front, that's why it was used as the main public recreation hub to the city citizens. A private club was also designed as an investment project to provide funds for maintaining the public area. Two alternatives were made, different in concept but following the same main design decisions (Figure 16 and 17).

4.3. Applying the landscape design criteria that foster the sense of the landscape cultural local identity on the Khartoum water front design concept

When applying the previously mentioned landscape design criteria that foster the landscape cultural local identity on each alternative for every sector of the water front. Using the relative weights technique and the expert system in giving the weights, the following was detected:

Sector A: Table 3 shows the evaluation of applying the previously mentioned landscape design criteria that foster the landscape cultural local identity on each alternative for sector A of the water front (Figure 18).

Sector C: Table 4 shows the evaluation of applying the previously mentioned landscape design criteria that foster the landscape cultural local identity on each alternative for sector A of the water front (Figure 19).

Table 3. shows the evaluation of applying the landscape design criteria that foster the landscape cultural local identity and the chosen alternative. (Source: by author)

Points of Evaluation		Alt. 1	Alt.2
Access	Open View along the Waterfront	80	80
	Transportation on the Coast	80	70
Culture and History (Urban & Architectural)	Master Plan & Design	90	70
	Network of Spaces	70	75
	Preserving the heritage and local resources	30	30
	Large open public spaces on the coastal line	90	85
	Pedestrian Walkways& nodes.	80	70
Functionality (Land Uses & Activities)	Recreational Activities	80	75
	Diversity of compatible land uses & activities	80	90
	Minimum Traffic on the Coast	75	75
	Enjoyment of coastal areas	90	80
Environment & Ecological	Preserving of ecol & environment of the coast	85	80
	Protection of the coast line from erosion	30	20
Public Safety	Friendly environment for the public	85	85
	Safe & comfortable environment For humans.	90	80
AVERAGE		75.67	71

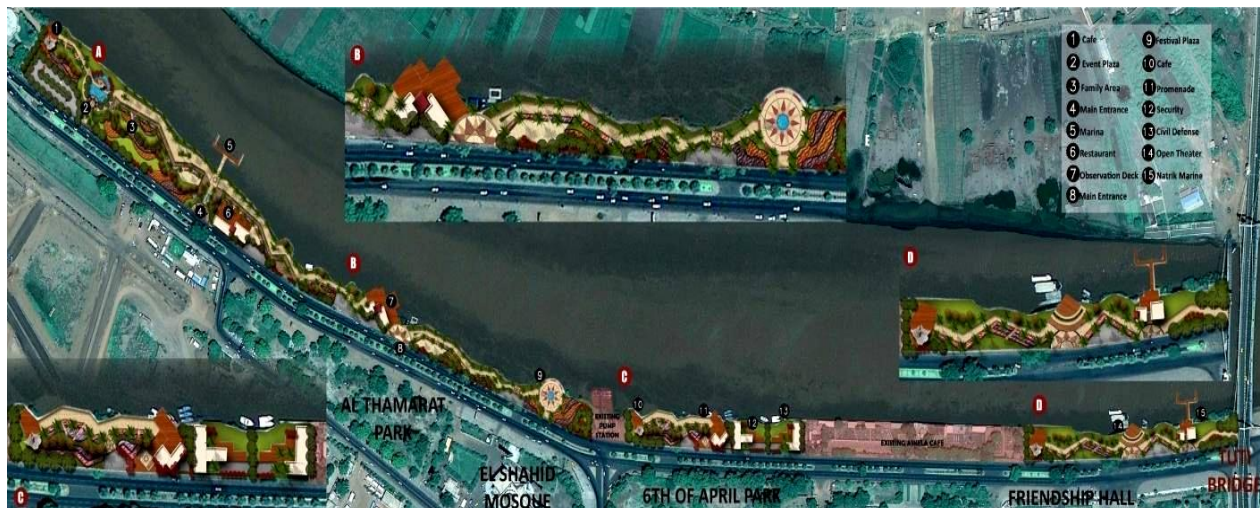


Figure 18. The Landscape design selected alternative of sector A. (Source: by the author)

Table 4. shows the evaluation of applying the landscape design criteria that foster the landscape cultural local identity and the chosen alternative. (Source: by author)

Points of Evaluation		Alt. 1	Alt.2
Access	Open View along the Waterfront	90	90
	Transportation on the Coast	0	0
Culture and History (Urban & Architectural)	Master Plan & Design	85	80
	Network of Spaces	20	20
	Preserving the heritage and local resources	30	50
	Large open public spaces on the coastal line	70	70
Functionality (Land Uses & Activities)	Pedestrian Walkways & nodes	45	50
	Recreational Activities	60	75
	Diversity of compatible land uses & activities	65	65
	Minimum Traffic on the Coast	75	75
Environment & Ecological	Enjoyment of coastal areas	70	70
	Preserving of ecol & environment of the coast	90	95
Public Safety	Protection of the coast line from erosion	85	85
	Friendly environment for the public	90	90
	Safe & comfortable environment For humans	95	95
AVERAGE		65	67.67



Figure 19. The Landscape design selected alternative of sector C. (Source: by the author)

Table 5. shows the evaluation of applying the landscape design criteria that foster the landscape cultural local identity and the chosen alternative. (Source: by author)

Points of Evaluation		Alt. 1	Alt.2
Access	Open View along the Waterfront	90	95
	Transportation on the Coast	70	75
Culture and History (Urban & Architectural)	Master Plan & Design	65	70
	Network of Spaces	70	60
	Preserving the heritage and local resources	0	0
	Large open public spaces on the coastal line	80	85
	Pedestrian Walkways & nodes	70	75
Functionality (Land Uses & Activities)	Recreational Activities	75	70
	Diversity of compatible land uses & activities	80	90
	Minimum Traffic on the Coast	50	70
	Enjoyment of coastal areas	70	80
Environmental. & Ecological	Preserving of ecol & environment of the coast	60	80
	Protection of the coast line from erosion	70	70
Public Safety	Friendly environment for the public	75	70
	Safe & comfortable environment For humans	80	80
AVERAGE		67	71.33

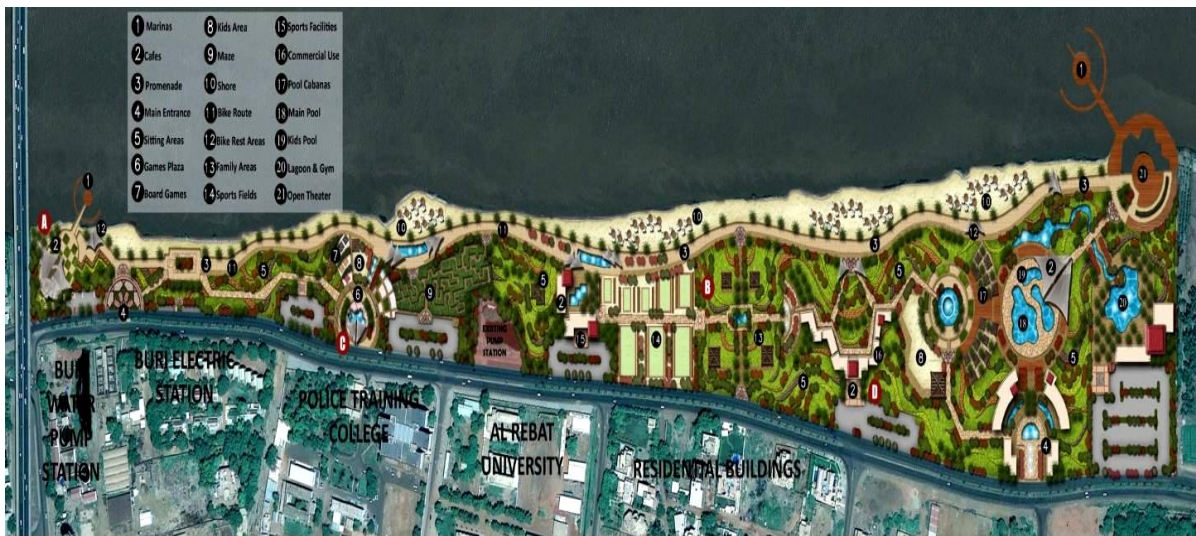


Figure 20. The Landscape design selected alternative of sector D. (Source: by the author)

5. Conclusion

The interaction between human and his environment plays an important role in the Urban landscape dynamic process. The process takes into account the social dimension, cultural dimension and the economic dimension in order to be sustainable. Human activities influence the form and shape of urban landscapes. Therefore, they inherit community's values, beliefs, symbolic meanings which occur and change throughout the time, forming the local cultural identity. The change in world economy leads to a communities change, lifestyles change, and as a result an overall change in the Cultural landscape. Thus, the urban landscape is the physical reflection of urban identity. The waterfront plays an important role in documenting the evolution of cities and territories. In addition this may be very helpful in understanding the transformations and help with the making up of future scenarios. Cities urban landscapes are not only physical constructs, but also involve social structures. The people are the main life spine in any city cultural urban landscape; they keep it vivid and ongoing. There is a mutual relationship between a city's cultural landscape characteristics and its citizens. While the local urban landscape dimension of a city (buildings, open and green spaces, streets etc) is formed and shaped under its citizens' influence, it also shapes its citizens' social identity and life-styles throughout the time. Cities are thus cultural heritages. In addition, the mutual relationship between people and their environments should be well understood and interpreted in order to create and maintain livable places. Sadly, human actions and interventions lead to loss of coherence, diversity and local identity, and sometimes it is too late when we become conscious with what we have lost. While we put all the blame on globalization and urbanization processes, we should also acknowledge that we need to develop strategies, plans, designs and policies that would restore and preserve the landscape cultural local identity of the city.

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