International Journal of Development and Sustainability
ISSN: 2168-8662 – www.isdsnet.com/ijds
Volume 3 Number 1 (2014): Pages 108-134
ISDS Article ID: IJDS13113001

A Manual for sustainable historical and cultural landscapes design: A case study in the Cairo Citadel of Salah al-Dien

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Abstract

Egypt is a country with a vast history. It is considered one of the world's biggest countries in hosting a large number of various historical sites within its urban context. Cairo, in particular, hosts several historic sites within its urban fabric. These sites, by reason of their special historic, scientific, or aesthetical qualities are of highly scenic value just like World Heritage Sites. It is not surprising; therefore, that many sites are favourite tourist attractions, generating revenue and drawing world attention to their importance. The status of these sites today is considered a serious threat towards their existence. This research provokes the ability of using elements of historical via cultural landscapes as a tool for preserving and restoring the value and image of these sites for the present and future generations. It investigates the practical ability of promoting historical and cultural landscapes in historical sites. The paper, based on theoretical, practical, and comparative analysis, provides a manual for historical landscape rehabilitation projects.

Keywords: Historical and cultural landscape; Historical landscapes manual; Historical Landscape Rejuvenation process

Cite this article as: El-Barmelgy, H.M. and Refaat, M.H. (2014), "A Manual for sustainable historical and cultural landscapes design: A case study in the Cairo Citadel of Salah al-Dien", *International Journal of Development and Sustainability*, Vol. 3 No. 1, pp. 108-134.

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1. Introduction

> *"A landscape that contains both past and present the remains of many past activities, ideas, and eras in combination with the contemporary can offer its residents a multifaceted experience and layers of interpretation which a landscape containing only the present cannot" (Yahner and Nadenicek, 1997:142).*

Egypt holds today only seven properties inscribed on the main World Heritage List and thirty-two properties submitted on the tentative list, which is a very limited number of properties regarding the fact that Egypt holds more than 40% of the world's total monuments and 70% of the world's undiscovered monuments. Not only that, but six of these sites are under direct threat by the UNESCO to be permanently removed from the list due to the lack of any actions, plans, or projects from the government to manage, conserve or preserve these sites. These sites are undergoing an intensive degree of deterioration (UNESCO, 2013). Heritage sites, including cultural and historical landscape sites, are extremely important to a country's tourism industry as they attract many visitors locally, as well as internationally. 'Intangible cultural heritage' is built up of customs and practices, values and traditions, artistic expression, language and other aspects of human activity as well as aesthetic and spiritual beliefs. Therefore, it is more difficult to preserve intangible cultural heritage sites than other physical sites. These sites, by reason of their special historic, scientific, or aesthetic qualities, have universal value. It is not surprising; therefore, that many sites are favourite tourist attractions (Yahner, and Nadenicek, 1997).

Cairo is a city of enormous historic consequence, whose buildings, sculptural monuments, open spaces and streetscapes are as rich as they are varied. The city boasts a townscape of immense subtlety and site qualities that are recognized and designated on the WHS as a series of conservation areas. Appreciated by local communities and visitors alike, this unique townscape contributes much to Cairo's outstanding universal value External factors have greatly increased over the past century causing massive changes, and adding pressure to cultural and historical landscapes. Factors such as rapid population growth, urbanization, local migration, and globalization all add economic as well as physical pressure on historical landscapes. Globalization increases tourism, which could overall benefit the country; however, that largely depends on how these factors are managed and what initiatives are taken to preserve these historical sites. It is widely agreed that each historical area should have its own conditions and specific responses, as each case is different, therefore a common set of principles and patterns should be set out.

The research methodology was based on theoretical analysis reviewing the status on which most of the urban historical sites are in, emphasising the crucial need for a rehabilitation manual for historical sites and buildings. Accordingly, an appraisal for the notion and principles of historical landscape as a tool for sustainable development has been carried out. The findings correlate a blue print for a check list that will aid in promoting cultural and historical landscapes (Benson and Roe, 2007; Morse et al., 2011). The paper concluded by presenting a Historical Landscape Rehabilitation Manuel (HLRM), as a proactive sustainable landscape tool. The tool aims to allow current generations to acquire their economic benefits from these sites

while conserving their scenic value as assets for the future generations. The manual was practically tested on the rehabilitation project of the Cairo Citadel of 'Salah El Din' as a case study.

2. Historical and cultural landscapes in Egypt; their use and abuse

The confrontation between urbanization, tourism and recreational pressures with the protection of cultural and natural heritage values limits the sustainability aspect of these values (Antrop, 2006). The main problem of the decline and deterioration of immovable property is similar in many countries of the world. Most of these countries have sites within a city's landscape or on a regional landscape level that are deteriorating or have deteriorated. Some might argue that a plan which defines certain areas that were suitable for development as habitat preserves will have a negative impact on that landowner's economic potential. Although, the general idea of negative financial impact-of having to pay-is conceptually reasonable; if society holds conservation and the belief that biodiversity is valuable. What is unreasonable is that a few individuals should pay for a benefit which accrues to society as a whole. The plan should identify ways in which this potential inequity can be resolved. Contemporary communities that carefully connect new development to the existing historical cultural landscape will also develop their own unique character that distinguishes them from other places (Yahner and Nadenicek 1997).

According to the Urban Regeneration Project for Historic Cairo (UNESCO, First report of activities**,** 2012**)** stated that: "The overall assessment of the situation in Cairo shows that the morphological and spatial relationships between monuments and their surroundings, which justified the inscription of the site on the World Heritage list, has been affected in several parts of Historic Cairo" (UNESCO, 2012: 56). The report demonstrated how, in some areas of al-Gamaleya, al-Darb al-Ahmar or al-Muski, monuments have lost their visibility and role in the cultural landscape setting as landmarks; instead, they appear as isolated spots in a distorted urban landscape. It also highlighted the fact that, even when monuments in Historic Cairo are protected by law or restored, some are still in danger or at risk of collapse. Due to the lack of a strategy for possible re-use, prevented by the existing legislation, restored monuments are sometimes closed or devoted to sporadic tourist visits, making their integration into a changing urban fabric difficult and resulting in progressive physical decay. Some efforts were done by several international organizations to restore and conserve as well as preserve the cultural landscape of historic old Cairo sites. However, they have had only a limited impact on the surrounding environment.

The Historic Urban Landscapes General Conference's report adopted by UNESCO, November 2011, summarized a combination of factors that has led to a loss of heritage values in Historic Cairo and the dilapidation of its urban fabric. From this report we may conclude that lack of management systems and tools necessary for the preservation of the site is one of the important causes of the deterioration of cultural and historical landscape sites (UNESCO, 2012). A radically different approach is required to address the many, diverse issues of a forward-looking conservation of cultural and historical landscape sites policy, with the involvement of all relevant administrations vital to set up and enforce appropriate planning and management tools, in line with current international standards.

3. Notions and principles of historical landscape rehabilitation process

The UNESCO in 1972 initiated the idea of having a World Heritage List, which formed the core of the World Heritage Convention project. The project was designated by 175 nations, where Egypt was one of the delegated countries participating in the project. The convention aims to compose a platform for preserving the culture and biodiversity of the world by preserving buildings and sites of outstanding universal values (Stephenson, 2008; Cullota and Barbera, 2011). The UNESCO (2013) defined a cultural World Heritage Site (WHS) as a monument, a building or group of buildings forming a historical site of outstanding aesthetics, archaeological, scientific, and cultural values. Since the mid 1960s, the threat to the historic and cultural landscapes, created by tourism and modern urban planning developments, has been of concern to the conservation community. Ever since then, conservation practitioners started heavily working and creating concepts of urban heritage conservation, rehabilitation and regeneration (Dramstad and Fjellstad, 2011). The last decade has witnessed rapid urbanization and population growth resulting in the transformation of cities worldwide; these changes increased the pressure and challenge of preserving heritage sites. Preservation of these sites is currently one of the most universally urgent issues challenging culture heritage conservation. Cultural landscapes are living heritages that conserve a nation's traditions and norms into the current modern lifetimes, in a dynamic that forms the culture identity of an indigenous living community. They present landscapes that are signifiers for cultural values (symbolic, religious, artistic and aesthetic) or witness of important achievements. Also natural landscapes may have an additional cultural value, which enhances the heritage value (Antrop, 2006). Drost (1996) stated that: "Cultural sites should represent a unique artistic achievement, have exerted great influence, bear a unique or exceptional testimony to a civilization which has disappeared, be an outstanding example of a type of building ensemble which illustrates a significant stage in history, or be tangibly associated with events, ideas, or beliefs of universal significance" (Drost, 1996: 483).

In the last two decades, it was mentioned that cultural landscape resources are increasingly recognized for their interpretive and recreational values (Tempesta, 2010). The concern about the vanishing traditional cultural landscapes and new emerging landscapes has become a recurring topic in most of the recent international scientific conferences and workshops from the perspective of the study of traditional landscapes. The actual changes are considered as a threat because the current changes are characterized by the loss of diversity, coherence and identity of existing landscapes; which are considered as heritage values. The preservation of landscape fits in the frame work of the protection of cultural and natural heritage. Safeguarding this heritage is a serious concern worldwide thus; several organizations have been established to work on preserving these cultural and natural heritage sites. The most famous examples include, World Conservation Union (IUCN), UNESCO World Heritage Centre, International Council of Monuments and Sites, Council of Europe (European Landscape Convention) and International Federation of Landscape Architects and International Association of Landscape Ecology. These organizations help to establish identities, which can be interpreted by communities and nations, attract visitors to the heritage sites, as well as protecting, managing and conserving them (Palang et al., 2011). Several international attempts for framing the relationship between protection and development were established under the UNESCO's Man and the Biosphere Programme (MAB). Biospheres are protected areas where an ideal relationship exists between a

local development and conservation of biodiversity. Materials are well balanced and areas co-exist in harmony. The idea of sustainability incorporated in biospheres could be seen as a means for creating a sustainable landscape (Kusova et al., 2008). A very important dimension should be taken into consideration while implementing the various design ideas on the cultural and historical landscape sites. Cultural resources material (tangible) and non-material (intangible) are remains of societies' past activities on the environment, which comprise archaeological remains, monuments and sites, cultural landscapes superimposed on the natural environment, local indigenous knowledge systems and traditional practices and rituals attached to the biophysical environment (Antrop, 2005). According to Antrop (2005) a range of cultural drawbacks may be identified during working on the cultural historical landscape sites, including: impacts on the communities such as culture stripping/exploitation, attitude changes, creation of social differences and impacts on the sites themselves like stolen/broken artefacts, destruction of sites by uncovering them, damages to sites simply by miss-use. Negative impacts on the environment may be in the form of increased traffic, litter, altering landscapes, erosion/soil degradation, and providing access to remote places (Antrop, 2005).

We may conclude by stating that designed cultural landscapes are defined in a broad context of interaction between nature, landscape and cultural history, and people. The originality and scenic quality are considered important characteristics. 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. Historical and cultural landscapes, with their different types and forms, create a common heritage that should be appreciated, valued and administered uniquely to emphasise the importance of past events that led to the creation of these landscapes. The paper presented the notion of HLRM as an innovative proactive approach for conservation of historical and cultural sites.

4. HLRM: A blueprint for conserving historical and cultural sites

Within this broad context, the profession of landscape has been and will continue to be a design discipline, combining art and science, whose primary focus is the sensitive joining of people and their outdoor activities with the land (Connellan, 2013; Bahamon, 2006). Landscape architects will also maintain their traditional expertise in the imaginative creation of out-door environments that sensitively deal with the ecological, social, economic, and aesthetic issues of the site and client while also being visually and emotionally appealing. Ultimately, it is the task of the landscape professional to give birth to outdoor experiences that are profitable, stimulating, and enjoyable over days, months, and years (Sauter, 2011). Conservation of urban landscapes and historic towns should be a critically important part of the urban and regional planning, as well as the policies of social and economic development at all levels. These strategies all focus upon adapted use and functionality of the landscape based upon knowledge of its historical development and past functioning. The protection of heritage values, cultural and natural, of landscapes focus upon the sustainability of existing values and are confronted with urbanization and tourist and recreational pressure (Malpass, 2011). The goal of rehabilitation is to retain the historic character of a property, but this treatment allows for alterations and additions that are necessary for contemporary landscapes. Rehabilitation is a

process through which improvements and rejuvenation of historical sites are introduced. It aims to allow efficient reuse of historical sites and buildings while preserving the historical and cultural context of the site (Sauter, 2011; Malpass, 2011). In order to merge the changing demands on the land use, natural resources and landscape conservation it is vital that the socio-cultural, economic and ecological values of the landscape to be fully administered into the planning and decision making processes (Malpass, 2011). An important bridge to build is the link between ecology and economics. Since most landscape planning decisions are based on economic data, better information on the economic and monetary importance of natural and semi-natural ecosystems and landscapes is crucial in order to achieve more sustainable use of our landscapes and conserve our natural capital (Malpass, 2011; Groot, 2006).

More and accurate information on economic benefits of the services of multi-functional landscapes is necessary to: demonstrate the contribution of these systems to the local and national (and even global) economies. This information may be used to convince (potential) donors that the benefit of conservation and sustainable use of ecosystems and landscapes outweigh the costs, thus, attracting investments. It also identifies the users/beneficiaries of the landscape-services to secure financial streams for the maintenance of these services; adjust economic incentives to stimulate the conservation and sustainable use of natural and semi-natural ecosystems and landscapes (Groot, 2006).

4.1. Defining HLRM for historic sites?

There are two levels of involvement for the landscape profession in historic sites:

- The first is the site planning or site historical mapping where studies of the natural potentials of the site, the cultural and visual character of the surrounding urban fabric are combined with the design programme to produce a site plan.
- The second level is the level of the landscape design, starting to use and co-ordinate the various elements together to form a pleasant outdoor environment which fits with the historical and cultural urban character of the site; either by maintaining its original design or forming a new one with the same design criteria.

The HLRM formulate the master plan for all the elements on the site, including plants and hard surfaces. It creates the landscape character by selecting plant materials, manipulating landforms, and adding different activities to create useful and enjoyable outdoor spaces while maintaining the site history and cultural character. Their tasks include designing roadways, walkways, outdoor lighting, outdoor seating, water features, railings, signs, grates, retaining walls, steps, ramps, play areas, public parks and sports areas (Connellan, 2013). In addition when dealing with historic sites, a full awareness of the site history and culture should well considered (Sauter, 2011; Malpass, 2011).

4.2. The historical landscape rehabilitation process

The landscape professional working on cultural or historical sites must fully understand and come to terms with the fact that understanding the potentials of the project settings (historic and cultural environment) is

the point of start for any design project. Whatever these conditions are, limitations, however severe, to establish landscapes appropriate to the image he wants to create the designer decides either to maintain the old or original image of the site or create a modified design version, in addition to maintaining sustainability. Sustainability is defined as the capacity to create, test and maintain adaptive capability (Opdam et al., 2006).

In addition, the sites must meet criteria of authenticity and integrity. Authenticity relates to design and materials and whether there has been reconstruction and the extent of it. Integrity relates more to natural sites and requires that they be of sufficient size and constitutes self-perpetuating ecosystems (Malpass, 2011). In order to reach an understanding of the surrounding environment the landscape professional should investigate the past and present conditions of the landscape, while projecting it into the future. Also, determining what is to be attempted and accomplished, in addition to programming the actions to be taken. This process may also be called historic landscape rehabilitation process. This is the mental process of attaching or allocating value to different landscapes, or different elements of the landscape. This value is a perception of importance related to physical or conceptual entity. It is a characteristic of that entity which an individual or society considers worth acquiring, protecting, keeping or preserving (Hough, 1990). Historic landscape rehabilitation process need not to be expressed in real terms or universal measures but may be expressed in relative domestic terms. The landscape professionals search for several types of data in order to read the natural landscape. This information should be about the plant sciences, wild life management, soils, landforms, climatology, hydrology and geology as well as the systems ecology of the site (Smith, 1997). In addition to the natural and physical factors, in dealing with historic sites the historic landscape rehabilitation process may also include socioeconomic and cultural values.

The level of detail required in the landscape assessment depends on its purpose. If the study is of a broad nature, dealing with capability and suitability of land for different uses, then a comprehensive assessment of natural, socioeconomic and cultural factors is required (Booth, 1991). An important factor which should be considered while working in historic sites is that sustainable designs, driven by conservation interests, often ignore the needs for an adaptive form of landscape development that is compatible with the landscape flexibility required by economic enterprise (Opdam et al., 2006).

4.3. Elements of HLRM and its application on historic sites

The landscape design of historic sites is the search for the forms that satisfy the projects program and maintain its cultural and historical character. It deals with three elements: the pattern of outdoor activities, the pattern of outdoor circulation, and the sensible forms that support both the activities and the circulation. A good landscape design is a product of intimate understanding of the project history and character, creativity, and showing in an innovated way the outdoor activities, hard surface areas, circulation systems, ground forms, and general planting design scheme (Hopper, 2010; Booth, 1991; Connellan, 2013).

4.3.1. Hardscape or paved areas in historic sites

Pavement is any hard natural or artificial surface material consciously placed on the ground plane of an outdoor space to establish a durable surface while also satisfying design objectives (Booth, 1991). Examples

of pavement types in historic sites include gravel, brick, tile, stone, concrete, and asphalt and, in some cases, wood decking. Pavement in historic sites has several characteristics that set it apart from other ground surface materials. First, as has been pointed out, a pavement is a hard, comparatively non-pliable surface material. As such, it is relatively fixed and non-changing. Plant material and water, on the other hand, are quite variable over time. Because of pavement's rather permanent quality, it is a good structural material to support intense uses on the ground plane and establish fixed ground areas over time (Hopper, 2010; Davitt, 2006). Besides its permanence, pavement may be used to define exact edges of shapes and forms on the ground plane while lawn and ground cover edges must be constantly trimmed or contained with another material to achieve similar results in historical spaces (TDA, 2004).

A number of design guidelines should be considered when using pavement in the landscape of historic sites. This should be weighed with the overall objectives of a design and utilised accordingly.

- First of all the original material used in the historic site should be first priority in using, if it is not feasible then materials used at the same historical period is recommended. As with any other design element, the number of materials used in a given area of a design should be simplified to help insure visual unity and not visual disorder. Too much variation in a pavement material and or pattern can easily create visual chaos and disorder (Strom et al., 2013).
- The selection of pavement material and the design of the pavement pattern in historic sites should be undertaken simultaneously with the selection and organization of the other elements of a design to help insure that the pavement is visually and functionally integrated into the entire scheme. It is not a desirable procedure to select and design the pavement as an after-thought late in the development of a design solution (Hopper, 2010).

In conclusion, hard surface areas fulfil both utilitarian and aesthetic functions in landscape design of the historic sites. It is important to understand the different types and characteristics of the pavement materials so that the right one is selected for the intended use and appearance. Whatever pavement materials are used, it must be coordinated with all other elements of the site (Hopper, 2010; Booth, 1991).

4.3.2. Planting or softscape element

The common thread that links us, as landscape professionals, to the environments we create is plant materials. Our repertoire of trees, shrubs, ground covers and grasses provides an extensive and complex base for selecting the ingredients that manipulate the spaces around us. We improve living conditions, protect the balance of wildlife, and prevent the deterioration of environment with proper placement of plants (Clare and Bunce, 2006; Birdwell, 2003). In historic sites, plants are among the most important and complex landscape design elements. The very different cultural and climatic conditions have a profound effect on planting design and it is necessary for landscape professionals to adjust their thinking and acquire new insights into the way people and plants behave in the various conditions within the historic sites. Using plants in historic sites play an important role in improving climatic conditions of the outdoor environment as well as, improving the scenic value of the surrounding landscapes (Chen, 2011). As we have mentioned earlier in the Hardscape design of historic sites, the first step to be done in planting historical sites is to maintain its original character

or similar atmosphere so a study of the existing plant typology is a must in order to enhance the existing types. The fundamental principle running through all planting design in historic sites is the adequate creation of a more favourable outdoor environment for people: adequate shade, cooler temperatures, light breezes, protection from glare and wind blown sand. In temperatures where handling cars left in the sun, like in Egypt, can cause first degree burns, the adoption of the principle that all usable outdoor space should have at least some shade (Birdwell, 2003).

Plants are an architecture element, which play an extremely important role in the design process. They can be used to screen undesirable elements such as parking lots or electrical transformers, which ruin the overall historical and cultural visual atmosphere, to reveal a view progressively for historical elements, or to define the ruins of a historical space, by using them singularly or in-groups; they form walls, canopies, or floors of varying heights and densities. The success of a landscape scheme depends not only on careful implementation, but on adequate maintenance. Also using plants which need low water content in historical sites is favourable, due to the bad effect of water leakage on the sites which need very high maintenance (Chen, 2011; Birdwell, 2003).

4.3.3. Site structures

Steps, ramp, walls, fences, and seating are elements that enhance the spatial quality and liveability of the outdoor environment of the historic sites, as they form the visual backbone of the historic landscape character. In the context of larger, more dominant elements such as landform, plant materials, and buildings, site structures can be thought of as smaller-scale detail elements that reinforce and complement the more substantial aspects of the outdoor environment. Steps and ramps facilitate movement from one ground elevation to another, walls and fences subdivide space and provide structural detail, and seating makes outdoor spaces seem more human by furnishing places to rest and observe (Strom et al., 2013). The sensitive use of site structures makes the landscape more inhabitable and responsive to human needs. Steps may be used to separate outdoor spaces and create transitional points. In addition it may be used as focal points at the end of path walks. Retaining walls can be used to visually link groups of plant materials. Walls and fences may be used as shade providers, and most of all in creating privacy. Also, they may be used in screening the site from climatic factors, such as winds, sandstorms or flooding (Layall, 1997). People with special needs must also be considered in the design scheme, a whole plan for their circulation system and ramps is a must. All slopes and ramps must fulfil the international standard requirements, as well as all the design details.

4.3.4. Water as a dominant element in landscape design

Water is a very dominant feature in most of the historic sites. It is an extremely varied element whose visual character and appearance depend on several external factors. To design with water in a historic site, one must first study the landscape character as well as the architecture theme of the existing site (Strom et al., 2013). Designing water elements should take into account, the shape, size, height, and bottom slope of the containing element. Even then, uncontrollable elements such as sun, wind, and temperature can influence the visual quality of a body of water. Visually, water may be used in the outdoor environment as a flat, reflective

element to suggest tranquillity and contemplation, as a moving, flowing element to provide activity and sound, as free fall water to express the forces of gravity, or as vertical fountain jets as accents and exclamation points. Used in any of these capacities, water is a specialty element that adds meaning and a sense of life to outdoor spaces (Layall, 1997; Strom et al., 2013). To conclude water in historic and cultural sites is yet another physical design element used by landscape professionals in the design and management of the exterior environment. Water is a highly varied design element and may take on such diverse forms as flat, quiet pools, falling water, and jets of water. It also may be used in the historical sites landscape as a purely aesthetic element or it may be employed for such utilitarian functions as cooling the air, buffering sound, irrigating the soil, or providing a means of recreation.

4.3.5. The functional uses of water (Irrigation systems)

There is no ideal form of irrigation for every installation in historic sites. The method of irrigation used on any installation will be decided by several investigations, such as, plant requirements, soil types, and water quality and quantity (Steiner, 1995). The most efficient form of landscape irrigation in historic sites is drip irrigation, followed closely by nighttimes sprinkler irrigation. Flood techniques use far greater quantities of water than both of these do, which has a very negative impact on the historic sites due to the water damage effect on historic elements. All forms of irrigation systems in historic sites require careful installation, though the requirements are different. With flood techniques, great care must be taken to ensure that land grading is accurate to avoid erosion of historic elements (Smith, 1997). Drip irrigation requires careful cleaning of the mains and feed lines. Sprinkler irrigation is perhaps the easiest to install. All types of irrigation systems for historic sites require careful maintenance; though the requirements of flood irrigation and the more technological techniques are at different ends of the scale. On the other hand, drip and sprinkler irrigation installations are usually automated and will require the services of a technical man, or men on very large installations, with a degree of manual labour back up. So the choice lies between a larger number of skilled manual workers or a single, qualified technical man. In either case, installation contractor should be enforced through his contract to provide the required training for running and maintaining the system (Layall, 1997).

4.3.6. Signs and parking

Planning and designing signage systems should not be treated lightly or in a piecemeal approach, while dealing with historic sites. The landscape designer should aim at clarifying, regulating and amplifying the flow of information conveyed throughout the site, while maintaining the sites cultural and historic identity. It is a matter of great concern for the image and quality of the entire landscape design project, the safety and enjoyment of all visitors, and the integrity of its architecture and site design (Malpass, 2011). Parking of cars in historic sites is a major site-planning problem, as it should be selected in a non-visible place so that it does not ruin the historic and cultural landscape image of the site. Parking may be provided in various ways such as, on the street, in small parking bays along the road, in large parking lots away from site, underground below main buildings and in multi-story garages. Each type has its advantages and disadvantages; however, large parking lots are the most economical. Many techniques may be used to improve the landscape quality

of the parking lots, such as, reducing their visual impact by dividing them into several clusters. Also we may improve their microclimate by integrating different kinds of plant materials. In addition of using berms, evergreen hedges, or a combination of both to screen large scale parking lots (Booth, 1991).

4.3.7. Outdoor lighting

Outdoor lighting represents a resource that is rarely used effectively in historic sites. A sensitive artistic scheme of artificial lights can add a remarkable dimension to the user's visual experience especially in sites with unique visual character like any historical site. Landscape lighting is not just a beautiful exterior decoration; it is an essential element in the design concept as the scene changes completely by sunset. What we visualize by daylight is totally different by sunset. We may summarize the important functions of outdoor lighting in landscape design of historical sites as follows (adapted from Karlen and Benya, 2004):

- Providing security.
- Allowance of longer nighttime's use of the outdoor landscape.
- Providing a safe guidance for people through the deigned circulation system.
- Focusing on significant landscape design elements to enhance its visual character.

In order to fulfil such deign objectives while dealing with historic sites, some considerations must be thought of. These may be, ensuring adequate functional light, for security and safety purposes, as some of these sites gain its visual charm at night more than morning. Allocating the correct amount of light, by providing brighter illumination for dark surface and using less intensity for lighter surfaces is a must, so that it doesn't disturb the visual effect of the historic site features. Placing the source of light either above or below eye level, to avoid direct lights on people's eyes, as this will lead to a total visual loss of the scenic value of the historic designed landscape. Installation of the light elements within the historical context of the monuments itself should be totally avoided (Strom et al., 2013).

4.4. The Historical Landscape Rehabilitation Manual (HLRM)

Based on the profound analysis, reviewing and discussing of several landscape design references and projects, Table 1, came up with a concluded check-list/blueprint listing all the landscape elements and their characteristics which should be considered while working on a historical cultural landscape site.

5. Applying the HLRM on a practical case study

The paper aiming to test the achieved HLRM conducted a practical analytical study on one of the recent Historical and Cultural rehabilitation projects. The project that targets the historical site of the Cairo Citadel was carried out by a group of experts from the Department of Preservation of Culture and Historical Sites and Buildings, at the National Organisation for Urban Harmony (NOUH), on behalf of the Egyptian Ministry of Culture.

Table 1. Elements of HLRM

Landscape Element	Socio-culture Values (Design Criteria)	Natural-Environmental Values	Economic Benefits	Management /Implementation
Hardscape	1-The number of materials used in a given area of a design is simplified to help insure unity. Too much variation in a pavement material and or pattern can easily create visual chaos and disorder. 2-The selection of pavement material and the design of the pavement pattern is in harmony with the selection and organization of the other elements of a design to help insure that the pavement is visually and functionally integrated into the entire scheme. 3- The pavement selected for a particular space is suitable for the type of intended use, anticipated intensity of use, and desired character.	1-Using local domestic materials found in site. 2-Using rough texture material to reduce the effect of glare and heat reflection.	1-Right selection of Hardscape durable sustainable materials. 2- Low cost pavement elements selected. 3- Number and quantity of elements selected is adequate to design purposes and not over used.	1- The use of low maintenance Hardscape materials. 2- The existing of a damage replacement plan of Hardscape materials. 3-Impelimnetation techniques and how it is effective.
Planting	1- Using Plants to define spaces. 2- The use of Plants to provide unity and harmony. 3- Using the right color scheme of plants to provide a continuous visual interest all year round.	1- Improving climatic conditions of the outdoor environment. 2- Providing adequate shade. 3-Rigt location of plants in sunny areas will lead to providing cooler temperatures. 4- Right orientation of plants lead to adding some light breezes. 5- Protection from glare and wind blown sand.	1-Using the right selection of plants which needs low maintenance. 2- Number and quantity of plants selected is adequate to design purposes and not over used. 3- Using low cost plants while maintaining a good visual character.	1- Using plants which needs low water content in historical sites is favorable, due to the bad effect of water leakage on the sites which needs very high maintenance. 2- The existing of a damage replacement plan of plant materials. 3- The existence of an on site plant nursery. 4-Impelimnetation techniques and how it is effective on plant health.
Water Element	1- Choosing the right design style of the water element. That integrates with the surrounding landscape historic and	1- The use of water element as for utilitarian functions as cooling the air and	1-Right selection of durable materials. 2- Low cost elements selection. 3- Number of	1- All types of irrigation require careful maintenance. 2- Amount of maintenance required for

Landscape Element	Socio-culture Values (Design Criteria)	Natural-Environmental Values	Economic Benefits	Management /Implementation
	culture character. 2- Selection of the shape, size, height, and bottom slope of the containing element. For visual and functional purposes. As uncontrollable elements such as sun, wind, and temperature can influence the visual quality of a body of water.	buffering sound.	elements selected is adequate to design purposes and not over used.	water quality control. 3- The existing of a water irrigation system damage replacement plan, as well as care for water features. 4-Impelimnetation techniques and how it is effective
Outdoor lighting	1-Provision of security. 2-Allowance of longer nighttime use of the outdoor landscape. 3-Providing a safe guidance for people through the deigned circulation system. 4- Focusing on significant landscape design elements to enhance its visual character. 5-Placing the source of light either above or below eye level, to avoid direct lights on people's eyes.	1-Using Led light 2-Using solar sources of light. 3-Reducing the amount of heat effect by selecting the right light Lux.	1-Right selection of durable materials. 2- Low cost elements selection. 3- Number of elements and quantities selected are adequate to design purposes and not over used.	1- The use of low maintenance lighting materials. 2- The existing of a damage replacement plan of light fixtures and cables. 3-Impelimnetation techniques and how it is effective.
Site structure	1-Steps and ramp facilitate movement from one ground elevation to an-other. 2-walls and fences subdivide space and provide structural detail. 3- Seating makes outdoor spaces seem more human by furnishing places to rest and observe, making the landscape more inhabitable and responsive to human needs. 4- Steps e used to separate outdoor spaces & create transitional points. 5- Steps used as focal points at the end of path walks. 6-Retaining walls used to visually link groups of plant materials.	1- The use of Walls & fences as shade providers. 2-The use of site structures in screening the site for climatic factors, such as winds, sandstorms or flooding.	1-Right selection of durable materials. 2- Low cost elements selection 3- Number of elements and quantities selected are adequate to design purposes and not over used.	1- The use of low maintenance site structure fixtures materials. 2- The existing of a damage replacement plan of all site structures and features. 3-Impelimnetation techniques and how it is effective.
Signage & Parking	1-Signage design is clear and simple.	1-Using local materials in	1-Right selection of durable materials.	1- The use of low maintenance materials.

Landscape Element	Socio-culture Values (Design Criteria)	Natural-Environmental Values	Economic Benefits	Management /Implementation
	2- Signage design regulates and amplifies the flow of information conveyed throughout the site. 3- Signage design maintains the sites cultural and historic identity. 4-Right location of parking sites from a visual perspective in order to disturb the historic scenery of the site.	designing the signage. 2-Using environmentally friendly paving materials for parking sites such as basalt, natural stone.	2- Low cost elements selection. 3- Number of elements and quantities selected are adequate to design purposes and not over used. 4-Choosing the right type of parking lot which fits in with the project budget.	2- The existing of a damage replacement plan of the signage fixtures. 3-Impelimnetation techniques and how it is effective.

(Source: after Connellan, 2013; Strom et al., 2013; Hitchmough, 2011; Davitt, 2006; Booth, 1991; Karlen and Benya, 2004; Layall, 1997; Hopper, 2010; and Clare and Bunce, 2006)

5.1. Project description and methodology

The project was conducted over a period of two and half years. It comprises four consecutive phases. The first phase was the inventory stage, where the current situation of the historical site where carefully studied, a SWAT analysis was conducted and the findings where documented. The second phase of the project carried out a detailed historical documentation for the various components of the site (buildings, spaces, paths, walls, gates and towers). The third phase composed a 'Visitor Management Plan' (VMP) for the historical site. The VMP aimed to maximise the benefits of the site as a world wide tourism destination, while maintaining the possible precautions that would eliminate any possible existing or future threat to the site and its components. The fourth phase includes an attempt to promote a historical landscape design for the spaces of the sites. The landscape aimed to enhance and protect the historical context of the site and its monuments.

5.2. Selection of the case studies

In order to be able to select the most applicable case studies a brief simplification for the history of the citadel and its current situation is required. In 1171 Salah al-Din embarked the construction of the citadel as an urban citadel, among a grand and ambitious defence project (Al-Sayyad, 2011). It was planned to serve as a royal residence, a capital for ruling and a billet for the army. The elevated location of the citadel reflects his military upbringing and visual function establishing the image of his ruling era. The main defence plan included the citadel as stronghold within a fortified defensive wall that was said to surround the famous cities of that time 'al-Fustat' and 'al-Qahira'. Archaeologists define the historical and cultural context of the citadel as an outcome of a series of plans all produced in around 150 years of construction time (Rabbat, 1995). With an outstanding history of over 850 years the citadel is standing as a unique historical and cultural site (Behrens, 1992; Rabbat, 1995), famously referred to as 'Qalat al Jabal', 'Qalat Salah al-Din, 'Qalat Muhammad Ali or just Cairo Citadel (O'Kane, 2009). Most of the existing structure is dated to the era of

Muhammad Ali, where the Citadel was radically reconfigured. Nowadays the site complex comprises three semi independent parts (Williams, 2002). The Northern enclosure established since the initiative stages of the citadel radically changed, known as the 'Qalat al Jabal'. Mainly, it was used to host military troops and in some eras it conceived a complete community. The existing condition of that enclosure was completely changed and demolished. The lower enclosure established during the Mamluk era as a residence for the local recruited service people. Also, radically change during Muhammad Ali era, to comprise his military factories and the main royal horse stables, beside local houses and living areas. Fortunately this area preserved most intact and referred to the period of Muhammad Ali. The final and the most important enclosure is known as the south enclosure, famous as 'al-Qala al-Sultania', royal enclosure with residences and palaces. Most of its existing monuments is built on raised foundations or accumulated debris. It was completely innovated and changed during Muhammad Ali, rebuilt most of its walls, changing its interior construction, adding his monumental mosque, a number of palaces, a hall of justice and a huge terrace. Also, that enclosure witness the famous massacre of Muhammad Ali, where he slaughtered all his opponents to conceive the rule of Egypt and reclaim himself as the official ruler, know as 'Sahet al-Alam' (Raymond, 2000; O'Kane, 1995).

Based on the former analysis the research targets the spaces of the Southern enclosure. Its noticeable historical and cultural values and the challenge of its fragile condition being mostly founded on elevated derbies are among the main reasons to test the efficiency of the proposed HLRM to deal with the variables of the historical landscape rehabilitation plan prepared by the NOUH. The research intends to apply the tool on three selected spaces as follows: CS1: The area between the 'Mosque of Muhammed Ali' and 'Shahat al-Alam'; CS2: The Royal Terrace between the 'Mosque of Muhammad Ali' and 'al-Gowhara Palace'; and CS3: The Royal space in front of 'Sraya al-Adl' and 'dar suk al-Oumla'.

5.3. Running the HLRM on the selected case studies.

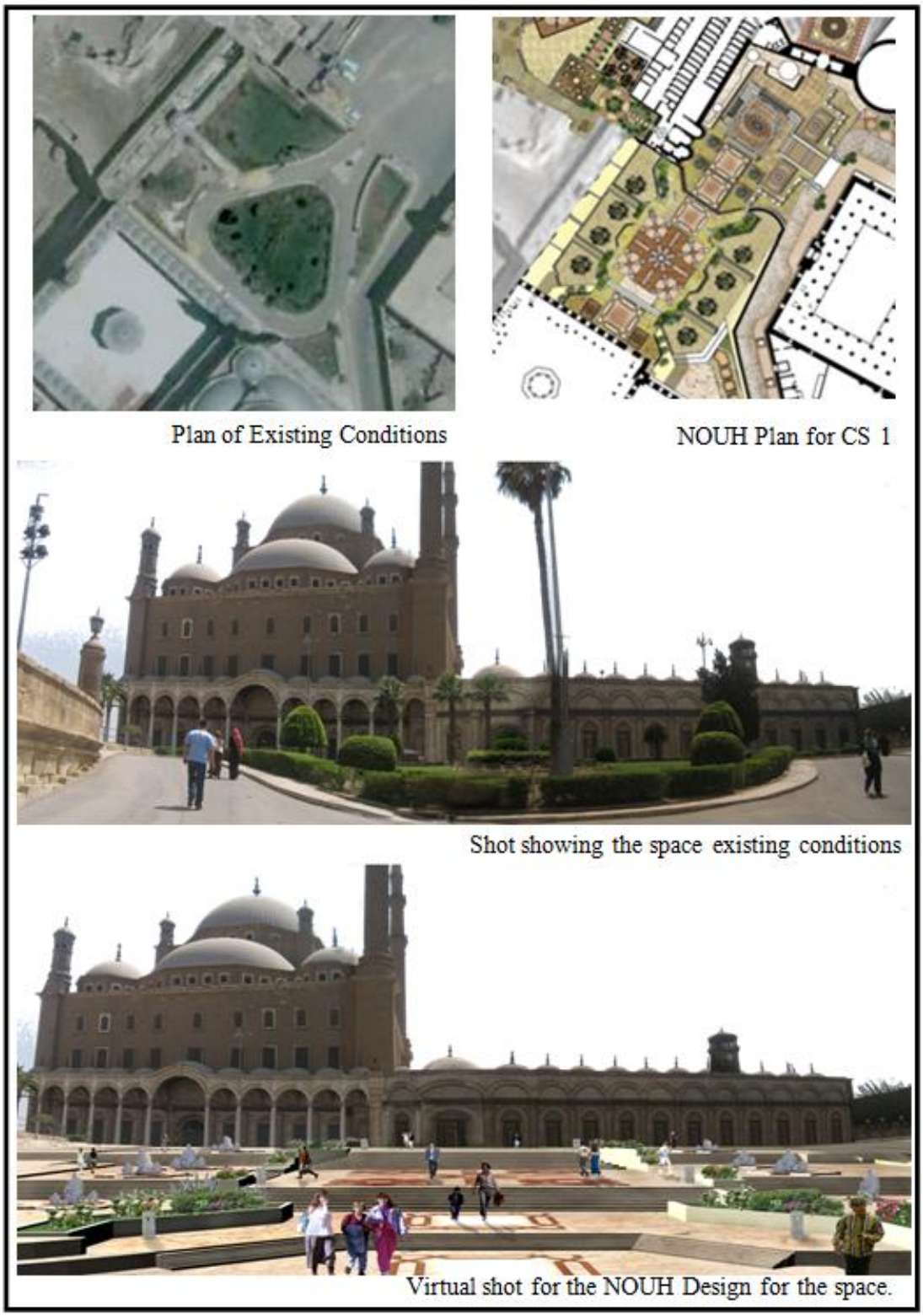
5.3.1. CS1: The area between the 'Mosque of Muhammed Ali' and 'Shahat al-Alam'

5.3.1.1. Historical means

This space used to be a part of the great space in front of the 'Qula Gate'. It was mainly used as a festival area where the king comes out to meat the public or his military troops. It is also known as 'Sahat al Alam', the Flag space, where Muhammad Ali slaughtered his opponents in his way to rule Egypt. During the era of Muhammad Ali, the study area was articulated from the main space. It was elevated and since then is used as an introductory space to the main entrance of the mosque.

5.3.1.2. Current conditions

The space existing conditions are beyond the historical context of one of the most famous Islamic monuments, mosque of Muhammad Ali, imposing negative impact on the integrity and the context of the monument. The endurable, unsuitable and unsustainable selections of softscape types, hardscape elements and irrigation methods are clear (Plate 1). Design-wise there are completely functional and visual disorder all over the space, regarding the paths, visual axes, vistas and space sensations.



Platte 1. CS 1 Historical context after and before the NOUH project (Sources: photos by the authors and illustration by NOUH project)

5.3.1.3. NOUH project design aims

As presented in Plate 1, the proposed historical landscape design for the space aims to re-establish the historical link between the space and the wider context of the Flag space. Redesign the space as a monumental space to enhance the function and empower the historical context of the mosque. Utilise the appropriate softscape and hardscape elements that reinforce the visual and functional integrity of the space. Accentuate the axial visual entrance of the mosque in a way that suits the high appreciated value of the mosque, as one of the most unique Egyptian Islamic monuments.

5.3.1.4. Implementing the HLRM on CS1

Completing the HLRM was based on a number of sites visits, inspections and meetings with the managerial team of the citadel and the profound analysis of the detailed information of the NOUH rehabilitation project. The authors examined the HLRM on the citadel's existing conditions and the on the NOUH proposed projects. The examination was performed on the pre-selected citadel case studies, CS 1: reported on by Table 2, a simplification of the items in the HLRM table (Table1) was done to facilitate the understanding of its components. An evaluation system was carried on to evaluate the items. A grading system was made to evaluate the items according to the following criteria:

- *High Efficiency grade*: this grade is given when the item integrates with the surrounding historical and cultural landscape setting as well as fulfilling the design visual and functional aspects.
- *Medium Efficiency Grade:* this grade is given when the items does not fit well with the surrounding historical and cultural landscape setting as well as not fulfilling all the design visual and functional aspects.
- *Low Efficiency Grade:* this grade is given when the items have negative impact on the surrounding historical and cultural landscape setting, and also when it does not fulfil any design visual or functional aspects.

From Table 2, site structures were enhanced to fulfil design visual and functional, environmental and economic objectives. The rest of the items achieved only a moderate satisfactory improvement.

5.3.2. CS2: The royal space in front of 'Sraya al-Adl' and 'dar suk al-Oumla'

5.3.2.1. Historical means

The space is known as the 'Haoush al Sultani', which means the Royal Garden. At earlier stages of the citadel 'al Nasier Qalawoun' implemented this area as a botanical garden. It was so famous that time harvesting a collection of plants and animals. Also, it acts as a natural water pool in the way of supplying the citadel with the required water supply. During the Mamluk era (Sultan al Ghouri), the royal throne was established there, where the ruler used to meet the public to discuss their needs and claims. Muhammad Ali, affirmed the royal prestige and function of the space turning it into one of most the famous prestige's royal spaces of that time, where he used to meet royal guests. Overlooking the space are the famous royal palaces of 'al Gowhra' 'Saraya al Adl' and the official currency mint house 'dar Suk al Omla'.

Table 2. Applying HLRM on CS1: The area between the 'Mosque of Muhammed Ali' and 'Shahat al-Alam'

Landscape Element	Socio-culture Values (Design Criteria)	Before	After	Natural- Environmental Values	Before	After	Economic Benefits	Before	After	Management /Implementation	Before	After
Hardscape	1- Simple Variation of Materials.			1-Using local materials.			1-selection of durable sustainable materials.			1- Low maintenance materials.		
	2- Pavement and design harmony.			2-Using rough texture material.			2- Low cost pavement elements selected.			2- damage replacement plan.		
	3-- Pavement compatibility.						3- Suitability to design elements.			3-Impelimnetation techniques.		
Planting	1- Plants defining spaces.			1- Positive climatic impacts.			1-Plants selection & maintenance.			1- Plants and irrigation.		
	2- Plants providing unity and harmony.			2- Providing adequate shade.			2- Plants selected and design purposes.			2- damage replacement plan.		
	3- Plants and Visual Functions.			3-Rigt orientation of plants.			3- Using functional low cost plants.			3- On site plant nursery.		
				4- Protection functionality.								
Water Element	1- Right design style of the water element.			1- Cooling the air and sound buffering.			1-Right selection of durable materials.			1- Careful irrigation maintenance.		
	2- Right Selection of the water element shape, size, height, and bottom slope.						2- Low cost elements selection.			2- Maintenance required for water quality.		
							3- Adequate selection of elements for design purposes.			3- The existing irrigation system damage replacement plan.		
										4-Impelimnetation techniques		
Outdoor lighting	1-Provision of security.			1-Using Led light			1-Right selection of durable materials.			1- Low maintenance lighting poles.		
	2-Longer nighttime use of the outdoor landscape.			2-Using solar sources of light.			2- Low cost elements selection.			2- Damage replacement plan of light fixtures and cables.		
	3-Providing a safe guidance for user.			3-Reducing the amount of heat effect			3- Adequate selection of elements for design purposes.			3-Impelimnetation techniques effectiveness		
	4- Focusing on significant landscape design element											
	5-Right placing of the light source.											
Site structure	1-Facilitation of movement from one ground elevation to an-other.			1- Providing shade.			1-Right selection of durable materials.			1- Low maintenance site structure fixtures materials.		
	2- Subdivision of space.			2- Screening the site for climatic factors.			2- Low cost elements selection.			2- The existing of a damage replacement plan of the fixtures.		
	3-Making the landscape more inhabitable to human needs.						3- Adequate selection of elements for design purposes			3-Impelimnetation techniques effectiveness.		
	4- Separation of outdoor spaces & creates transitional points.											
	5- Steps used as focal points at the end of path walks.											
	6- Visually linking groups of plant materials.											
Signage & Parking	1-Signage design is clear and simple.			1-Using local materials.			1-Right selection of durable materials.			1- The use of low maintenance materials.		
	2- Amplifying the flow of information conveyed throughout the site.			2-Using environmentally friendly paving material.			2- Low cost elements selection.			2- The existing of a damage replacement plan of the fixtures.		
	3- Maintaining the sites cultural and historic identity.						.3- Adequate selection of elements for design purposes.			3-Impelimnetation techniques effectiveness.		
	4-Right visual location of parking sites.						4-Choosing the right type of parking lot which fits in with the project budget.					

Low Efficiency **Medium Efficiency** **High Efficiency** **No Available Data** **Inapplicable**

5.3.2.2. Current conditions

The current condition of the space as shown in Plate 2, is a totally different picture than that of the expected famous royal space. There is a miss use of functions, the integrity of the monument and the monument itself is totally ruined. A monumental renovation projects is highly required for the palaces of 'al Gowhra' 'Saraya al Adl'. The space is mainly used by the tourist to take pictures with the mosque as a background, and sometimes as a storage area for the police and military equipments. The integrity and intact of the landscape has been completely altered.

5.3.2.3. Design aims

The main design aim and challenge of the project was to revitalize the royal image of the space. Empower the paths the visual aspects related to the royal monuments of the space and that of the Mosuqe of Muhammed Ali appearing as the background of the space. The design (Plate 2) utilises elements of water and hard, polished high reflection materials to empower the monumental image of the space. The colours where simplified as much as possible to minimise any distortion impacts to the integrity of the monument and to achieve maximum possible harmony and integration.

5.3.2.4. Implementing the HLRM on CS2

Completing the HLRM was based on a number of sites visits, inspection and meetings with the managerial team of the citadel and the profound analysis of the detailed information of the NOUH rehabilitation project. The authors examined the HLRM on the citadel existing conditions and the on the NOUH proposed projects. The examination was performed on the pre-selected citadel case studies, CS 2: reported on by Table 3. The same grading system used in CS1 was used in CS2 and CS3. From Table 3, Hardscape and Planting design were enhanced to fulfil design visual and functional, environmental and economic objectives. The rest of the items achieved only a moderate satisfactory improvement.

5.3.3. CS3: The royal terrace between the 'Mosque of Muhammad Ali' and 'al-Gowhra Palace'

5.3.3.1. Historical means

Unlike most of the elements of the citadel the history of this space is only related to Muhammad Ali. In his radical renovation of the citadel he constructed this space as a highly elevated terrace (pleasure space) enclosed between al-Gowhara Palace and his mosque. The terrace offered delightful view of the city, the Nile valley and the Pyramids. The path toward the mosque was a pleasure trip through a unique garden, with the silhouettes of the mosque and the minarets that, "invite the soul to sour through the sky", (Raymond, 2000: 304).

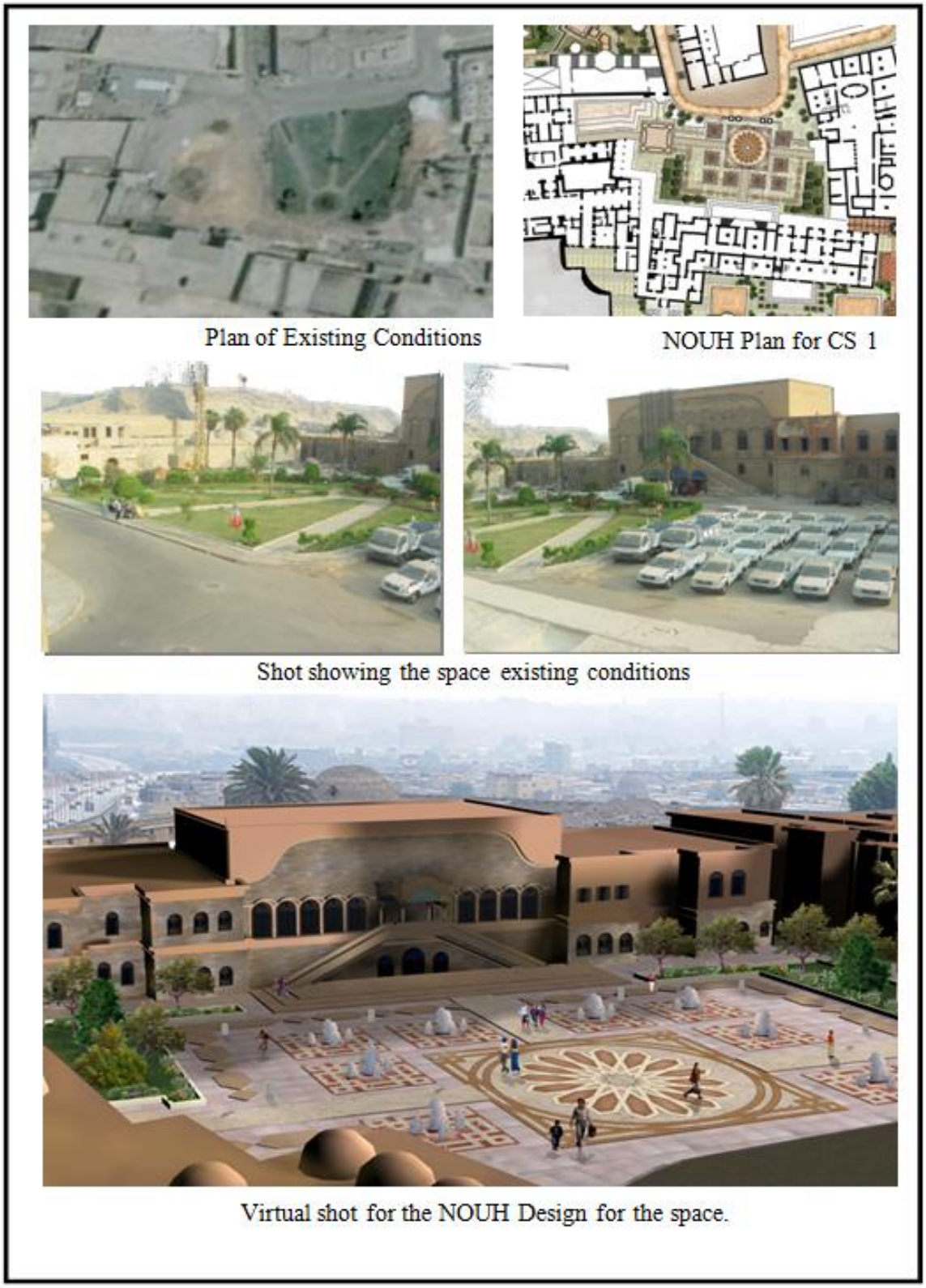
5.3.3.2. Current conditions

The current condition of the space as shown in Plate 3, is a complete different picture. The pleasure path does not exist any more nor does the garden. The landscape elements of the space are in very bad conditions. The movement in the space is a total chaos that neglects the presence of the mosque and the palace. The feeling and existence of the palace is totally lost. Still the view from the terrace is spectacular, where you can grasp a picture of the historical city and the modern Cairo.

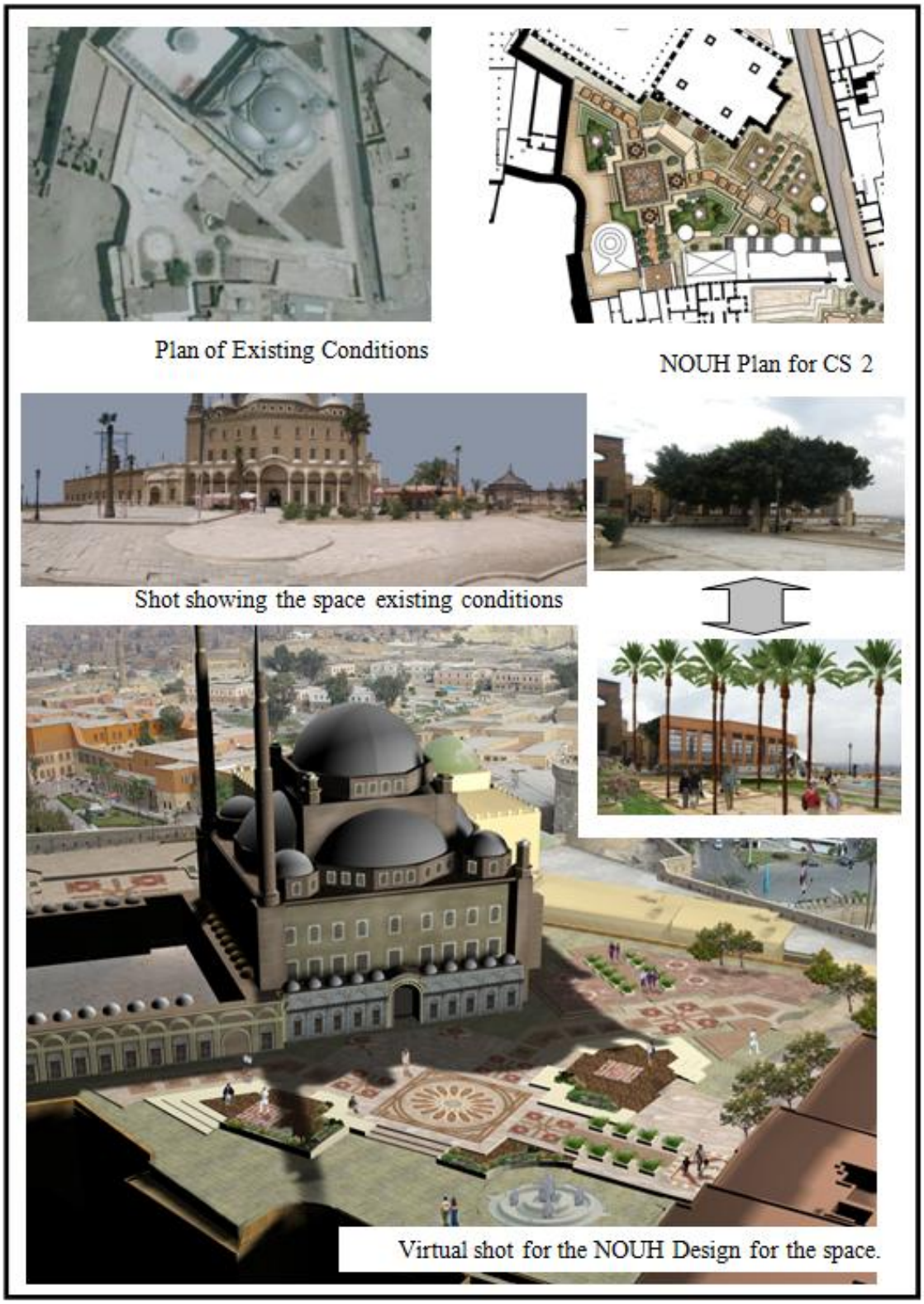
Table 3. Applying HLRM on CS2: The Royal space in front of 'Sraya al-Adl' and 'dar suk al-Oumla

Landscape Element	Socio-culture Values (Design Criteria)	Before	After	Natural- Environmental Values	Before	After	Economic Benefits	Before	After	Management /Implementation	Before	After
Hardscape	3- Simple Variation of Materials.			1-Using local materials.			1-selection of durable sustainable materials.			1- Low maintenance materials.		
	4- Pavement and design harmony.			2-Using rough texture material.			2- Low cost pavement elements selected.			2- damage replacement plan.		
	3-- Pavement compatibility.						3- Suitability to design elements.			3-Impelimnetation techniques.		
Planting	1- Plants defining spaces.			1- Positive climatic impacts.			1-Plants selection & maintenance.			1- Plants and irrigation.		
	2- Plants providing unity and harmony.			2- Providing adequate shade.			2- Plants selected and design purposes.			2- damage replacement plan.		
	3- Plants and Visual Functions.			3-Rigt orientation of plants.			3- Using functional low cost plants.			3- On site plant nursery.		
				4- Protection functionality.								
Water Element	1- Right design style of the water element.			1- Cooling the air and sound buffering.			1-Right selection of durable materials.			1- Careful irrigation maintenance.		
	2- Right Selection of the water element shape, size, height, and bottom slope.						2- Low cost elements selection.			2- Maintenance required for water quality.		
							3- Adequate selection of elements for design purposes.			3- The existing irrigation system damage replacement plan.		
										4-Impelimnetation techniques		
Outdoor lighting	1-Provision of security.			1-Using Led light			1-Right selection of durable materials.			1- Low maintenance lighting poles.		
	2-Longer nighttime use of the outdoor landscape.			2-Using solar sources of light.			2- Low cost elements selection.			2- Damage replacement plan of light fixtures and cables.		
	3-Providing a safe guidance for user.			3-Reducing the amount of heat effect			3- Adequate selection of elements for design purposes.			3-Impelimnetation techniques effectiveness		
	4- Focusing on significant landscape design element											
	5-Right placing of the light source.											
Site structure	1-Facilitation of movement from one ground elevation to an-other.			1- Providing shade.			1-Right selection of durable materials.			1- Low maintenance site structure fixtures materials.		
	2- Subdivision of space.			2- Screening the site for climatic factors.			2- Low cost elements selection.			2- The existing of a damage replacement plan of the fixtures.		
	3-Making the landscape more inhabitable to human needs.						3- Adequate selection of elements for design purposes			3-Impelimnetation techniques effectiveness.		
	4- Separation of outdoor spaces & creates transitional points.											
	5- Steps used as focal points at the end of path walks.											
	6- Visually linking groups of plant materials.											
Signage & Parking	1-Signage design is clear and simple.			1-Using local materials.			1-Right selection of durable materials.			1- The use of low maintenance materials.		
	2- Amplifying the flow of information conveyed throughout the site.			2-Using environmentally friendly paving material.			2- Low cost elements selection.			2- The existing of a damage replacement plan of the fixtures.		
	3- Maintaining the sites cultural and historic identity.						.3- Adequate selection of elements for design purposes.			3-Impelimnetation techniques effectiveness.		
	4-Right visual location of parking sites.						4-Choosing the right type of parking lot which fits in with the project budget.					

Low Efficiency **Medium Efficiency** **High Efficiency** **No Available Data** **Inapplicable**



Platte 2: CS2 Historical context after and before the NOUH project (Sources: photos by the authors and illustration by NOUH project)



Platte 3: CS 3 Historical context after and before the NOUH project (Sources: photos by the authors and illustration by NOUH project)

Nevertheless, the view of the Nile and the Pyramids are possible partly distorted by the chaos of the city skyline. The famous pergola of Muhammad Ali still exists in a moderate condition standing alone in the space.

5.3.3.3. Design aims

The design aims to revitalise the main pleasure path between the palace and the mosque. Articulate the space to an intimate space including the pergola of Muhammad Ali as its focal point. It will accomplish this by: creating a relief sensation by using potted botanical plants to recreate the sense of the royal garden while considering the fragile construction conditions of the citadel, by accentuating the vistas of the mosque and the palace through restoring the visual contact between the palace and the space and the visual design of the path (Plate 3), by adding the appropriate source of lightning in order to extend the using hours of the space to include night visiting programs, that can enjoys the views of the city from the terrace at night, and by utilising the most suitable and durable landscape elements.

5.3.3.4. Implementing the HLRM on CS3

Completing the HLRM was based on a number of sites visits, inspection and meetings with the managerial team of the citadel and the profound analysis of the detailed information of the NOUH rehabilitation project. The authors examined the HLRM on the citadel existing conditions and the on the NOUH proposed projects. The examination was performed on the pre-selected citadel case studies, CS 3, reported on by Table 4. A simplification of the items in the HLRM table (Table1) was done to facilitate the understanding of its components. An evaluation system was carried on to evaluate the items. The same grading system used in CS1 was used in CS2 and CS3.

From Table 4, Water elements and Outdoor lighting were enhanced to fulfil design visual and functional, environmental and economic objectives. The rest of the items achieved only a moderate satisfactory improvement.

5.4. Findings of the practical study

After reviewing the three case studies, the following findings were deduced concerning the existing condition. In all the previous landscape settings not much care and concern was given to the selection of matters, design harmony or compatibility in hardscape. The use of local low cost sustainable durable materials was also not considered. Minimum functional and visual uses for plants in the spaces, right selection of low cost and low water budget was not taken into consideration. Water elements design was not well integrated with the surrounding historical and cultural setting. Outdoor lighting used traditional fixtures no led light or solar system was included. Site structures did not provide much facilitation to the circulation system within the landscape setting. Signage design was not given much attention to fit with the surrounding cultural and historical setting. Parking was not located in proper visual location. For all landscape items, they were not adequate to fulfil design purposes; also, there were no damage replacement plans or effective implementation techniques.

Table 4. Applying HLRM on CS3: The Royal Terrace between the 'Mosque of Muhammad Ali' and 'al-Gowhra Palace'

Landscape Element	Socio-culture Values (Design Criteria)	Before	After	Natural- Environmental Values	Before	After	Economic Benefits	Before	After	Management /Implementation	Before	After
Hardscape	5- Simple Variation of Materials.			1-Using local materials.			1-selection of durable sustainable materials.			1- Low maintenance materials.		
	6- Pavement and design harmony.			2-Using rough texture material.			2- Low cost pavement elements selected.			2- damage replacement plan.		
	3-- Pavement compatibility.						3- Suitability to design elements.			3-Impelimnetation techniques.		
Planting	1- Plants defining spaces.			1- Positive climatic impacts.			1-Plants selection & maintenance.			1- Plants and irrigation.		
	2- Plants providing unity and harmony.			2- Providing adequate shade.			2- Plants selected and design purposes.			2- damage replacement plan.		
	3- Plants and Visual Functions.			3-Rigt orientation of plants.			3- Using functional low cost plants.			3- On site plant nursery.		
				4- Protection functionality.								
Water Element	1- Right design style of the water element.			1- Cooling the air and sound buffering.			1-Right selection of durable materials.			1- Careful irrigation maintenance.		
	2- Right Selection of the water element shape, size, height, and bottom slope.						2- Low cost elements selection.			2- Maintenance required for water quality.		
							3- Adequate selection of elements for design purposes.			3- The existing irrigation system damage replacement plan.		
										4-Impelimnetation techniques		
Outdoor lighting	1-Provision of security.			1-Using Led light			1-Right selection of durable materials.			1- Low maintenance lighting poles.		
	2-Longer nighttime use of the outdoor landscape.			2-Using solar sources of light.			2- Low cost elements selection.			2- Damage replacement plan of light fixtures and cables.		
	3-Providing a safe guidance for user.			3-Reducing the amount of heat effect			3- Adequate selection of elements for design purposes.			3-Impelimnetation techniques effectiveness		
	4- Focusing on significant landscape design element											
	5-Right placing of the light source.											
Site structure	1-Facilitation of movement from one ground elevation to an-other.			1- Providing shade.			1-Right selection of durable materials.			1- Low maintenance site structure fixtures materials.		
	2- Subdivision of space.			2- Screening the site for climatic factors.			2- Low cost elements selection.			2- The existing of a damage replacement plan of the fixtures.		
	3-Making the landscape more inhabitable to human needs.						3- Adequate selection of elements for design purposes			3-Impelimnetation techniques effectiveness.		
	4- Separation of outdoor spaces & creates transitional points.											
	5- Steps used as focal points at the end of path walks.											
	6- Visually linking groups of plant materials.											
Signage & Parking	1-Signage design is clear and simple.			1-Using local materials.			1-Right selection of durable materials.			1- The use of low maintenance materials.		
	2- Amplifying the flow of information conveyed throughout the site.			2-Using environmentally friendly paving material.			2- Low cost elements selection.			2- The existing of a damage replacement plan of the fixtures.		
	3- Maintaining the sites cultural and historic identity.						.3- Adequate selection of elements for design purposes.			3-Impelimnetation techniques effectiveness.		
	4-Right visual location of parking sites.						4-Choosing the right type of parking lot which fits in with the project budget.					

Low Efficiency **Medium Efficiency** **High Efficiency** **No Available Data** **Inapplicable**

While in the NOUH rehabilitation project, hardscape was enhanced showing a variety of low cost durable materials. Plants were oriented in the right location to provide maximum visual function as well as assisting to enhance climatic conditions. Water elements were correctly selected, adequate for fitting with in the surrounding cultural and historical setting. Environmentally friendly light fixtures were used in the right places to enhance the visual image as well as extending the time use of the historic and cultural site. Some of the items were not looked after in a way which may help to enhance the overall landscape setting of the cultural and historical sites, such as, site structures material selection were not durable, sustainable or low cost. Signage were not properly designed to integrate with the surrounding landscape setting. Parking lots were not studied to be put in the proper location from a visual or a functional perspective. No maintenance or damage replacement plans were considered, in addition to efficiency in the implementation techniques.

6. Conclusion

Working on historical site is not an easy task to be achieved. These sites are unique in every detail and they form the historical and cultural assets of the world. Any attempt to modify these contexts would negatively affect such issue of authenticity and diversification. However, many of the World Heritage Sites have been suffering lately under great deals of impacts, to such extents that threaten their existence. Interfering in these sites, although it is not preferable, has become an urgent matter in many cases; especially in developing countries. The paper conducted a practical and theoretical research that aims to draw and compose a manual. The proposed manual utilised landscape as a sustainable approach for preserving the authenticity and the integrity of the historical site. The manual was defined by the paper as Historical Landscape Rehabilitation Manual (HLRM). It was tested on a recent landscape rehabilitation project conducted on the Citadel of 'Salah al-Dien' at Cairo. Based on the findings of the case studies and the analysis of the paper, we may conclude by emphasizing that the proposed HLRM is an effective tool for promoting sustainable landscape in historical areas. The manual presents a valid step (blueprint) along the path to achieve the goal of conservation of historical sites, a step that can be utilised and further developed in future studies. In addition, the paper concludes that there is a need for greater landscape understanding and the ability to promote sustainable forms of landscapes.

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