

Research 5

THE ROLE OF SUSTAINABLE MAINTENANCE TO ENSURE SUSTAINABILITY OF THE URBAN SPACES HERITAGE



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Research 5

The Role of Sustainable Maintenance to Ensure Sustainability of the Urban Spaces Heritage.

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بحث فردى

THE ROLE OF SUSTAINABLE MAINTENANCE TO ENSURE SUSTAINABILITY OF THE URBAN SPACES HERITAGE

ABSTRACT

This research focuses on the problems faced by urban upgrading projects for buildings and areas (heritage), which negatively affect the physical or visual level or both, and may ultimately lead to the destruction and loss of upgrading processes. Therefore it was necessary to identify these problems, and their reasons as solutions to maintain the process of upgrading these problems include the cultural heritage of the human factor, the lack of periodic maintenance, the weakness of the structural link between the architectural character of the heritage buildings and the urban structures. The different concepts and importance of the heritage buildings will be reviewed and the importance of achieving sustainability for the building's heritage through the identification of different types of maintenance and how to use them in dealing with all types of buildings. The development of Al-Moez Street was chosen as a case study because of the importance of its heritage. To identify the negatives that occurred after the process of upgrading through the main axes of the process of sustainability (economic, social and environmental). Through the analytical study, the results and recommendations for the proposed solutions were reached to ensure the sustainability of the urban upgrading processes.

KEYWORDS: Human Impact, Cultural heritage, Sustainable maintenance, kind of Maintenance, Urban upgrading.

استدامه الفراغات العمرانية ذات المورث الثقافي من خلال تأثير دور الصيانة المستدامة والعامل البشري

يركز البحث على تحديد المشكلات التي تتعرض لها مشروعات الإرتقاء العمراني للمباني والمناطق (التراثية) والتي تؤثر سلباً علي المستوي المادي أو المستوي البصري أو كلاهما وقد تؤدي في النهاية إلي تدمير وضياع عمليات الإرتقاء. ولذلك وجد من الضروري تحديد هذه المشكلات واسبابها كطول للحفاظ علي عملية الإرتقاء ومن هذه المشكلات تأثير الموروث الثقافي للعامل البشري، غياب الصيانة الدورية، ضعف الربط التشكيلي بين الطابع المعماري للمباني التراثية والمنشآت العمرانية. وسوف يتم إستعراض المفاهيم المختلفه للمباني التراثية واهميتها، والتأكيد علي اهمية تحقيق الاستدامه للمباني التراثية من خلال تحديد انواع الصيانه المختلفه وكيفيه استخدامها في التعامل مع جميع انواع المباني. لقد تم اختيار مشروع تطوير شارع المعز كدراسه حاله لما له من اهمية تراثيه وتم عمل دراسه تحليليه للشارع للوقوف علي السلبيات (بيان التعديات والتشوهات علي المباني الاثريه) التي حدثت له بعد عمليه الارتقاء من خلال المحاور الاساسية لعمليه الاستدامه (الاقتصادي والاجتماعي والبيئي). ومن خلال الدراسة التحليليه تم استخلاص النتائج والتوصيات حول الحلول المقترحة لضمان عمليه استدامه عمليات الارتقاء العمراني

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ABSTRACT

This research focuses on the problems faced by urban upgrading projects for buildings and areas (heritage), which negatively affect the physical or visual level or both, and may ultimately lead to the destruction and loss of upgrading processes. Therefore it was necessary to identify these problems, and their reasons as solutions to maintain the process of upgrading these problems include the cultural heritage of the human factor, the lack of periodic maintenance, the weakness of the structural link between the architectural character of the heritage buildings and the urban structures. The different concepts and importance of the heritage buildings will be reviewed and the importance of achieving sustainability for the building's heritage through the identification of different types of maintenance and how to use them in dealing with all types of buildings. The development of Al-Moez Street was chosen as a case study because of the importance of its heritage. To identify the negatives that occurred after the process of upgrading through the main axes of the process of sustainability (economic, social and environmental). Through the analytical study, the results and recommendations for the proposed solutions were reached to ensure the sustainability of the urban upgrading processes.

KEYWORDS: Human Impact, Cultural heritage, Sustainable maintenance, kind of Maintenance, Urban upgrading.

1. INTRODUCTION

The upgrading and coordination are the most important means of improvement and treatment to be a major input to activating the role of tourism activities. This involves upgrading the corridors, squares, and intersections, either through visual studies of the directions of movement or the method of coordination of the site [1], as well as lifting and

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removing slums and added infringements without coordination with the heritage or historical surrounding.

Despite the existence of working institutions with an entity that is responsible for maintenance and upgrading processes of the urban environments that can achieve the desired objectives.

Buildings upgrading process ensures serving the local community as it becomes part of sustainable development processes such as using traditional methods of processing without taking into consideration the human factor and its cultural heritage and financial needs. This could negatively affect the status of the monument and deteriorate it threatening its survival and the probability of losing its heritage value .

Therefore, it was necessary to develop a plan for sustainable maintenance to maintain the upgrading of historical areas with historical features distinguished by urban and architectural.

2. HERITAGE BUILDINGS AND ITS IMPORTANCE:

2.1. Definition of Heritage Building [with distinctive architectural style]:

It is a building or facility that is distinguished historically, symbolically, artistic architecture, structural or social Table 1. [2]. It is agreed that heritage buildings and facilities or with distinctive architectural style should be featured by the following:

- Community acceptance, which means to have the positive acceptance and interaction by the community allowing it to survive.
- Cultural or social phenomenon: to be expressing physical, moral or intellectual phenomena of certain period.
- Stability and continuity mean that its status allows the continuity of its presence and ability to deal with it.

Table 1. Basic values and standards that distinguish heritage buildings [2].

Value	Basic Standards
Historical Value	- A building with links to national historical aspects. - Residence for important personality locally or internationally. - Has symbolic value

	- Buildings age.
Artistic architectural value	<ul style="list-style-type: none"> - Building with unique architectural style. - Outstanding architectural design and unique artistic creativity. - Production of famous artist or architect locally or internationally. - Represent rare and unique scientific value or constructional technique.
Urban value	<ul style="list-style-type: none"> - The building has value because of being part of urban heritage group with integrated distinctive urban planning. - The building has heritage garden of environmental and historical importance or garden assortment within the plan that shows a phase or age of the community's history. - Integrated heritage buildings regarding form and style of construction.
Moral social value	<ul style="list-style-type: none"> - Relation through time to important social functions within the region. - The building represents a reflection of social ideas, doctrine or traditions in general.
Traditional local value	<ul style="list-style-type: none"> - The building is part of urban, rural or desert architecture with an integrated nature characterized by its history and harmonious architecture. - The building is part of an architectural group with the usage of distinctive building materials that reflect the nature of the place and adapted to climatic conditions. - The traditional building reflects accumulated experiences through ages of traditional design, construction, and crafts.

2.2. Standards and Specifications of Heritage Buildings Referred to in law no. 144 for 2006:

All studies agreed when putting standards and specifications of heritage buildings to consider it comprehensively in the frame of the following two levels:

First: comprehensive spatial environment as urban gathering, city, group of buildings or estates and corridors whether inhabited uninhabited that are far from urbanization or close to it.

Second: specific single building whether big or small influence complete or incomplete. The architectural heritage treasure protects by the state issued law 144 for 2006 to regulate the demolition of non-falling buildings and facilities and maintaining the urban heritage. The second article of this law included the banning of licensing to demolish or adding to buildings and facilities of distinctive architectural style that is related to national history, historical character, represents a historical era or considered as a tourist attraction. The previous is the definitions provided.

We see when comparing between standards put under the law and the previous definition that law did not address the values of heritage buildings but only architecture style related to the historical or national aspect only.

3. SUSTAINABILITY FROM CULTURAL HERITAGE PERSPECTIVE:

3.1. The Concept of Sustainability:

Sustainability is considered one of the modern specialties that try to bridging and blocking the gap between social sciences, civil engineering, environmental sciences and merging it with technology in the future. When mentioning sustainability, we think of renewable energy resources, reducing carbon emissions, environment protection and maintaining its balance on earth. Briefly, sustainability aims to protect our natural environment and human health meanwhile creating innovations that do not affect our way of living and environment [3-4].

Sustainability is defined as studying how natural systems work, variation and producing what the natural environment needs to maintain its balance. Also, sustainability considers that human civilization provides sources for sustainability of our contemporary way of living. There are many examples through human history for it where civilizations worked to destroy its environment and seriously affected surviving opportunities. Sustainability takes

into consideration how to live in harmony with the natural world and protecting it from destruction and demolish [5].

Sustainability and sustainable development focus on the balance between calculating the needs, our need to use technology economically and the need to protect the environments we live in. Sustainability does not relate to the environment only; but it relates to communities health and ensuring that people do not suffer because of environmental legislation with the necessity to test the long-term impacts of the acts performed by humanity, also, to ask questions about: how to improve the situation [3-6].

Human development report 2011 of the United Nations Development program states that sustainability is inextricably related to fundamental equity issues; which means equality and social justice and increasing the opportunities of having a better quality of life. The reports call to take urgent measures to slow down the climate change, preventing the occurrence of more deterioration and limiting disparities. This is because environmental degradation threatens to decline the recent progress in the human development of the world's poorest people [3].

3.2. Elements of Sustainability:

In 2005, the international summit for social development specified three major fields that contribute in philosophy and sociology of sustainable development. These elements, according to a lot of national standards and accreditation plans, constitute the cornerstone for overcoming the three areas that face the world nowadays. (Brundtland) Committee recommended that it is the development we need now without any reduction of the next generation's ability to meet their needs. Accordingly, we should look to the future when making decisions concerning the present. The committee also found that human factor and cultural heritage have a significant effect. Overlapping with sustainability fields, as deterioration of the urban status of ranges surrounding the effects and valuable areas to reflect negatively on the monument leading to the emergence of some negatives on the monument as a result of external influences resulting from the surrounding urban environment. A community cannot flourish without culture and development cannot be reached in the lack of culture; as culture includes responses for many challenges that face the communities in the meantime. Also, the perception of the relation between culture and development confirms the decisive importance of non-physical cultural heritage such as live

cultural practices, forms of cultural expression and knowledge systems that give meaning to various societies, interpret and form the world [7].

From the above comes the effect of cultural heritage because of the decline of the cultural, educational and civilizational level in addition to insufficiency and lack of their awareness of the heritage, historical and aesthetic importance of the buildings. We also find the cultural dimension created by the previous civilizations on the buildings became customs and traditions that have the impact of forming the personality of the place and inhabitants in addition to its impact on the behaviors and dealing method. It also affects the character of the place, and we notice that in the shape and the nature of the place in ancient Cairo as the character of the building come from the impact of Islamic architecture with its characteristics and privacy. The infringements added on its facades of oriels and internal windows and this was done to the interior but by developing some negative behaviors that are done by the human factor by developing groups of factors, which led to the distortion of heritage buildings that are exposed to:

- Using modern building materials resulted from its use of getting away from the dominant traditional style in the city.
- The function harms the uses of some ancient buildings for non-relevant to the current era such as some baths, schools, monasteries, and others.
- Integration of non-physical cultural heritage in what is happening now from dialogue, policies, programs, and strategies concerning the sustainable development represent urgent matter. In this regard, the main report presented by the team of United Nations concerned with the development plan of United Nations after 2015 that came under the title of "The future that we all want". This report was presented to the general secretary of UN and provided a structure that is used for discussions and future activities that is characterized by specific dimensions that are:
 - a. Collective social development.
 - b. Collective economic development.
 - c. Environmental sustainability [7].

3.2.1. Economic development:

Economic development is considered evidence of the major problems that is controversial among people regarding political thought and its essence and not from an

economic perspective only and how could this affect trade, companies, jobs and providing job opportunities. This could relate to motivating by companies and other institutions to abstain from sustainability instructions, what violates legislations and laws. Also, we shall encourage, reinforce and increase the motivations for individuals when performing their duties, achieve these goals, reduce negative impacts of human acts, what affects humans and the environment [3].

The trend towards vertical recently, whether in architectural education or the practical reality, related to several matters; perhaps the most important is the economic factor that is related to high land prices as because of its limitations in a place such as Gaza strip and Oman. On the other hand, it related to sustainability concepts, which has grown in the modern times with increased interest of it in architectural education. Multistory buildings were used in a limited way in Islamic architecture such as agencies, but also it had several functional uses between accommodation and trade, and this is what we see today in multistory buildings [8].

In addition to that, supply and demand in the market is consumption in its nature as contemporary life requires a lot of resources. This led to the existence of infringements that are represented in filling parts of some buildings like shops, also using pavements by street vendors especially in front of shops for selling goods or movables that distort the visual image of heritage buildings to increase the economic income. For environment preservation, it is necessary to control what we consume. Economic development is related to giving the people what they want without affecting the quality of life, especially in the developing states with the necessity to reduce the financial burdens when performing the right things [3].

3.2.2. Social development:

The social dimension is one of the dimensions of sustainable development (social, environmental and economic) especially as a new dimension to measure the level of development through focusing on increasing the size of production. This could be reached through ensuring the increase of energies from generation to another and the most important is to achieve the basic needs of man. While the environmental dimension is represented in the continuity of human's behavior could lead to changes that could reflect on humanity threatening his survival [9].

There are a lot of elements that relate to this part majorly the awareness of legislation that aims to maintain health, preventing pollution and other harmful activities that are performed by companies, institutions, and factories. In North America, Europe, and other developed countries, some strong inspections and programs are performed to ensure compliance with legislation and to ensure the public health, good living and maintaining these earnings. This also could relate to ensuring providing the basic resources without affecting the quality of life. The current biggest challenge is represented in the sustainability of providing houses for the people and how to build these houses of sustainable materials. While the last element is education and encouraging people to participate in environmental sustainability. Then getting them aware of the effects of preserving and protecting the environment in addition to warning of the risks if we could not achieve these goals. The human factor is considered the main reason of the presence of negative human and social manifestations that could be a direct result for the increase of population in the ancient city in particular and Cairo in general in addition to the resultant occupancy of some heritage buildings by some families [10]. This led to the damage and distortion of these buildings, so expelling these people out of heritage buildings became a very difficult issue under economic circumstances that do not help to solve this problem. This factor is a result of the non-existence of archaeological consciousness among citizens and lack of understanding of the historical and artistic value of this monument; especially if it has no tangible benefit on the people of this area. The previous does not encourage the people to preserve and care for it.

3.2.3. Environment protection

It is noted in the recent period that there is increasing international attention towards the need for sustainable development to reach sustainable future. This came after the world was heading towards a group of probable human and environmental disasters. Problems such as global warming, environmental degradation, increase of population and poverty growth, lack of biodiversity, wide range of desertification and other environmental problems. Are inseparable from the problems of human well-being or the process of economic development in general; as many current forms of development are limited to environmental resources on which the world depends. The close relation between environment and development led to the emergence of sustainable development concept [9].

We realize what we need to do towards environment protection whether through recycling, reducing energy consumption or through taking short trips instead of riding the bus. Companies work to prevent pollution and reducing the level of carbon emissions; there are also incentives for concentrating on renewable energy resources in our homes and companies. The element of environment protection is considered the third element and a place of interest for the future of humanity as it defines how we should study and protect the natural ecological system, air quality and providing resources that focus on preserving the environment. The issue of environment protection is concerned with the technology that will improve our future life and avoid the risks of using technology. When dealing with heritage areas, we find to use the undesirable activities within the city [environment polluting activities]. Such as blacksmiths, foundries, tannery, car workshops and others, in addition to the negative use of living needs that distorts the monument such as electrical wires, telephones, electrical devices aeriels and putting air-conditioning on the facades [3]. Neglect in some facilities within the ancient city aroused because of non-use of some facilities that are not suitable in the current time such as some houses, baths, schools, monasteries and other places. There are several factors and effects such as natural factors [mechanical], surrounding environmental factors, biological factors and human factors that could adversely affect these buildings and locations [11]. For instance, on this neglect, there is the shortage of periodic maintenance that should be performed for many buildings such as cleaning facades and different maintenance works, which their neglect leads to increased danger. Also, there is, irresponsible, processing to make changes within the buildings by adding, removal of archaeological elements or infringements by adding modern elements that cover the existing heritage elements.

4. MAINTENANCE:

4.1. Definition of Maintenance:

There are several definitions of maintenance, but we mention part of it as a try to give it comprehensive definition:

- Maintenance is preserving the invested capital in the form of machines, equipment, devices, facilities and buildings that are allowed for use on specific performance level and economical method to achieve production goals [12].

- A function the works to maintain or reestablish the operational status of the equipment and its continuous availability [13].
- Maintenance is fixing the damage caused by use and prevention from this damage to avoid its occurrence in addition to maintain the capacity to perform the work economically [13-14].

4.2. Types of Maintenance

4.2.1. Planned maintenance

Means maintenance which regulates its work and executed according to prior study and strict control in addition to recording in the specialized records for this aiming to achieve high levels of buildings maintenance and higher economic efficiency [15]. Planned maintenance is divided into Fig.1.

4.2.1.1. Preventive Maintenance:

The basis for preventive maintenance is prior thinking and being ready for emergency cases. Before its occurrence; which means it is based on right planning to prevent the occurrence of the problem through putting specific program periodically to clean and serve all parts and elements of the building in addition to its examination, inspection and replacing the damaged parts by other new parts [16]. Preventive maintenance is divided into:

a. Periodic Preventive Maintenance:

The type that aims to prevent from rapid injury to parts of the building or its corrosion through periodical cleaning and this field of preventive maintenance continued to expand. This type of maintenance depends on expiry of a certain period to perform the examination, change of some parts of the building or reconstruction of the building. Prevention programs are often found in many institutions, but an artificial process that is not taken seriously and the most of its elements may not be executed or executed in other dates and in an unprofessional way. Comprehensive productive maintenance pays attention to prepare these programs and updating it well then performing periodic maintenance accurately on specific dates.

Periods of periodic maintenance depends on the mentioned in the operating manual and maintenance of the equipment about any factory instructions in addition to workers

experience and the date of equipment maintenance. Periodic maintenance aims to replace the parts before collapsing. So the periodic timeframe of replacing depends on the usual or expected lifespan of this part [17].

b. Conditional Maintenance:

Group of operations that aims to predict the validity of all parts and elements of the building consequently knowing all symptoms that appear and trying to fix it. So it is a technical predicting tool for faults and distortions that could affect the parts and elements of the building.

4.2.1.2. Therapeutic Maintenance:

The type of maintenance concerned by performing the needed repairs for parts and elements of the building in case of its damage such as broken or corrosion of one or some parts. No matter what preventive maintenance is accurate and organized, there must be fault or damage to some parts and elements of the building sooner or later [18]. Therefore, the necessary resources shall be provided to fix the fault or damage in the part or element of the building while it happens so that other parts and elements of the building shall not be affected by this damage.

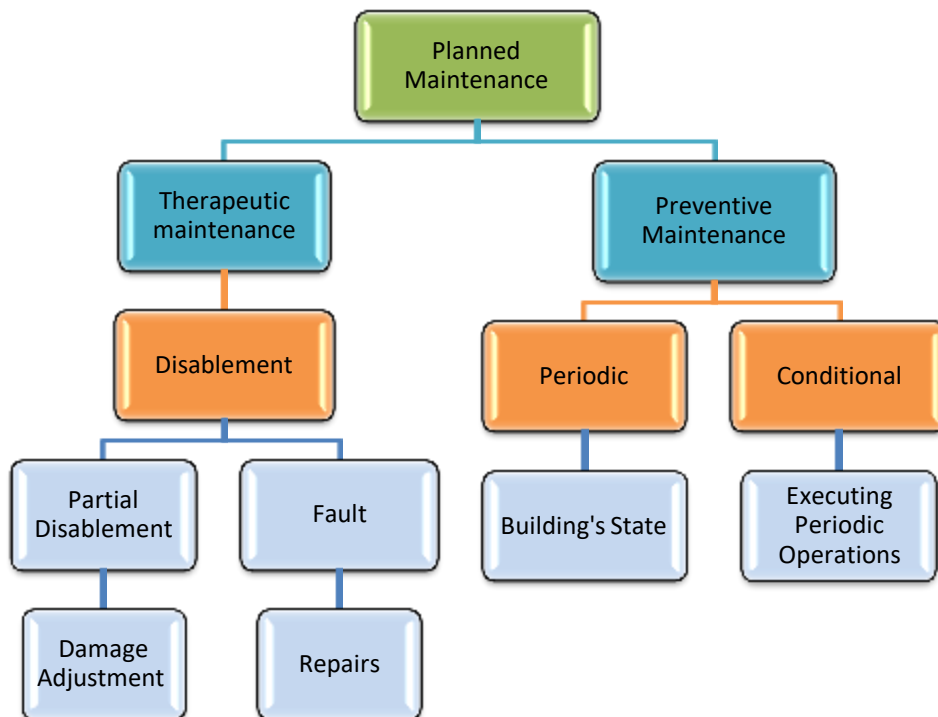


Fig .1. Types of Planned Maintenance. Author

4.2.2. Unplanned maintenance

This type includes emergency maintenance that is allocated part of time based on experience and structure of emergency work during a period and includes the following activities [15].

- Emergency and urgent works that require being done according to needs and emergencies.
- The sudden increase of unplanned maintenance shall be processed through contracting with outsourcing maintenance contractor and organization.

The concept of maintenance is restricted to buildings to some persons in some basic items such as bleach, painting, electricity, air-conditioning, renewal or renovation and repairing networks and sanitary fittings works. When maintenance is related to buildings with heritage value, the basic principle is not to distort the original appearance of the building and its historical features that should be highlighted, confirmed and not disturbed. Although maintenance process is neglected for after operation of upgrading processes.

The concept of maintenance always related to restoration as (maintenance and restoration) could be defined as [19]. The processing operation of damage or defect within the building that already occurred or predicted to occur and this operation is done by the follower means. It aims to improve the appearance of the building, and it is periodic work that shall be performed continuously to preserve the building. While restoration is returning the building to its original state through rebuilding what is destroyed or repairing it as required by its state. The restoration process is performed through stages that start by performing comprehensive survey and architectural survey then analyzing the threatening factors for building's safety and gathering its historical documents. Restoration could be for single or group of buildings together. The definition of sustainable maintenance emerged as a tool to reach the sustainability of upgrading heritage areas.

5. SUSTAINABLE MAINTENANCE

Sustainable maintenance is considered a tool for maintaining and preserving heritage buildings. With the evolution of concepts and its relation to the concept of preserving the gradual transformation of this concept. The concept of sustainable preserving to include the retention process and maintenance of origin along with perceiving the values

related to it and its relation with its urbanization and characteristics of society it belongs and relates to [20].

Sustainable maintenance could be defined as the comprehensive process of the urban built environment that usually include. In addition to preserving historical buildings, other aspects such as preserving a group of distinctive traditional buildings, urban heritage, particular architectural style or pattern of heritage alley or street and urban relations between constructions and adjacent external spaces then performing continuous maintenance processes after performing upgrading or development processes.

We will clarify the factors leading to the emergence of negative effects on historical areas in an analytical review of El-Moez Street in Cairo.

6. CASE STUDY OF EL-MOEZ STREET IN CAIRO

6.1. Location Definition

El-Moez Ladin Allah Street is a place that always formatted the sentiment of Egyptian people where great incidents occurred through thousand years and more as it is the oldest street in the world.. It is considered the linear city where all activities related to the daily life of the population was focused on main linear axis [north-south] which is Cairo rod, Fig. 2. Where all economic and commercial activities were gathered such as agencies, markets, hotels and social activities such as baths, schools and religious such as mosques, so the street became the center gathering of Cairo and huge commercial mall [21].

1. The main linear axis was connected to the entrances and exits of the city in addition to roads leading to it and connecting it with other provinces.
2. The main axis consisted of sub-roads leading to residential areas in addition to the presence of main road surrounding it between the city and its walls.
3. There were spreading public squares and yards as open areas established for social, economic, entertainment or religious purpose. The size of these yards varies according to the purpose it was established for.
4. Movement roads and routes were marked by Lack of straightness refraction of the path for the treatment of climate, privacy, and prevention of pedestrian boredom.



Fig.2. Al-Moez Ladin Allah Al-Fatimi Street [22]

6.2. Analysis of El-Moez Street:

The following will analyze a set of basic factors for sustainability process (economic, social and environmental). that through it the reasons of the emergence of negative effects of breaches and changes that occurred in the historical heritage area, which led to its infringement and non-continuity or preserving it and it could be clarified as followed: (Table 2., Table 3., Table 4.)

Table 2. Analysis of the basic factors of sustainability process (Economic factor) with the suggestion of what should be done. [Author]

What has become	the cause of change	What should be done?
Economic factor		
	<p>The majority of shops overlooking the major axis of ancient Egypt turned into retail stores not for selling Khan El- Khalili's productions of oriental and historical handicrafts and products.</p>	
	<p>Extending the appearance of shop signs outside to change the shape and activities of the facade.</p>	











	<p>Lack of maintenance for sanitary works that led to distorting the aesthetic view of the area.</p>	
	<p>Using lighting units that is not proportional to the architectural style of the area</p>	
	<p>Allowing the existence of inappropriate violations to the nature of the area and putting chairs and tables.</p>	
	<p>Using inappropriate advertising signs with the urban heritage.</p>	

Table 3. Analysis of the basic factors of sustainability process(Social factors)with the suggestion of what should be done. [Author]

What has become	the cause of change	What should be done?
Social factors		
	<p>Changing the shape, color and the formation of the residential unit, turning the balcony into a room or other changes.</p>	



Changing the style of residential units because of adding or increasing the size of residential units because of the numerical increase in family numbers.



Adding technological innovations such as A/C units that could be hidden under wooden covers that cope with the surroundings.



Use of advertisements and similar with no regard for the aesthetic of the building and distortion associated with cracking the walls.



Allowing direct connection between the heritage area and the surrounding area in a heterogeneous manner.



Changing the shape of original design; desiring to be distinguished than the other shops. Competition between these shops spread that its facades became exaggerated by the use of aluminum and marble.









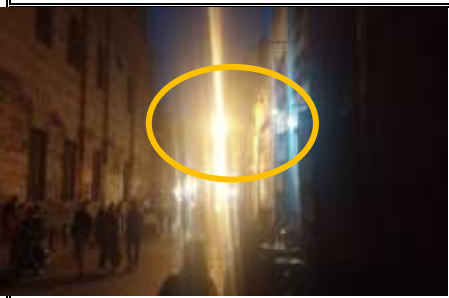

	<p>The decline in social activities, service and entertainment buildings led to the increase of presence of individuals with behaviors hostile to the nature of the residential area, especially at night.</p>	
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Table 4. Analysis of the basic factors of sustainability process(Environmental factor) with the suggestion of what should be done. [Author]

What has become	the cause of change	What should be done?
	<p>The use of colors is disproportionate to heritage buildings with the placement of products on heritage buildings leading to their degradation.</p>	
	<p>Lack of interest in open areas and places of sitting</p>	
	<p>Using different lighting that is not proportional to the heritage area to attract attention in a way that leads to architectural deformation</p>	

Through the analysis of Al-Moez Street in Cairo, it became necessary to take into consideration some of the factors that influenced the sustainability of the upgrading process.

The following are some suggestions for improving the performance of Al-Moez Street and its continuity.

1. Do not allow the change in the activity of shops overlooking the main axes in historic Cairo
2. The necessity for periodic maintenance and follow-up to reduce the extension of the banners outside the commercial shops.
3. The use of lighting units Appropriates with The architectural character of the area.
4. Take corrective actions when an inappropriate encroachment occurs to the nature of the region or the urban heritage.
5. The necessity to install the style of residential units and external Building facades.
6. Use architectural treatments to hide technological innovations such as air conditioning units under the binding of wood in keeping with the surrounding buildings and Taking into account the architectural character of the area.
7. Harmoniously connect the heritage buildings with the surrounding area.
8. Provide places for social activities and service buildings and entertainment with attention to open areas and places to sit.
9. Use colors in proportion to heritage buildings.
10. Use lighting that is proportional to the heritage area to attract attention in a way that does not lead to architectural deformation.

7. CONCLUSIONS AND RECOMMENDATIONS

The research concludes that some factors have had a significant impact on maintaining the processes of upgrading. These factors were represented in the economic, social and environmental factors to achieve sustainable development processes with a focus on the importance of activating sustainable maintenance and taking into account the importance of the human factor and the impact of cultural heritage on it.

To maintain the processes of upgrading it is recommended that:

1. Put Work through an integrated approach to maintain and maintain the existence of forms of traditional crafts and industries. that represent the historical heritage of the region and develop them to ensure continuity of production and improve the quality and increase their competitiveness in the local and global markets for sustainable economic/social development capable of improving the living conditions of the population

2. Identify the types of overlap clearly regarding reference of the parties involved in the project where there are and the presence of many of the parties dealing with the region such as Awqaf, antiquities, conservation, neighborhood, facilities, civilizational coordination, and others. In addition to dealing with each crisis to the project on my own without a comprehensive view. There must be mechanisms for management and maintenance through an institutional framework and an integrated vision.
3. Increase the security intensification on the borders of the region regarding the work of electronic gates on the border of the street, and the short use of specific activities, and remove street vendors stalls and other aspects that ignore the urban aspect of the area and the daily life of its inhabitants.
4. The necessity of continuous commitment to perform follow-up and maintenance operations with the interest of activating the role of the bodies towards the preservation of heritage areas.
5. Interacting with the population before starting any project until the response and urging the population to cooperate rather than imposing an opinion that may be misplaced will affect the repetition of the attempt.
6. Raising awareness and interest in the protection and development of the cultural and urban heritage in the promotion of heritage domains. The preservation of their urban and historical content requires a comprehensive study of all factors affecting the heritage domain without neglecting the impact of the human factor and ensuring the strategy of the maintenance process after completion of the upgrading process.
7. Create a character for the buildings that surround the monuments so that they are in line with the spirit of the area.
8. Improving the architectural form of buildings and degraded parts.
9. The heritage buildings should be subject to strict supervision to prevent repeated attempts by the residents to continuously modify them, leading to numerous infringements, mutilation and destruction, and spreading ugliness at the level of buildings and the area.
10. No internal or external modifications or changes in the type and colors of paints shall be made unless the necessary license is obtained to ensure that these amendments do not adversely affect the heritage value of the building.

11. The necessity of taking into account the importance of the human element and the social dimension in the conservation projects, especially those close to urban areas or populated areas, while not forgetting the movement of visitors and tourists.
- 12.. Exploitation of tourism income as one of the main sources to cover the cost of maintenance, where tourism is an important influence of the human element on conservation projects as well as the impact of social dimension on these projects.

REFERENCES

1. Delarue, F. etal, “ French Urban Strategies”, Editions Du Monsieur, Paris, France,2002.
2. The National Authority for Civilization Coordination, “The Foundations and Criteria for the Civilizational Coordination of Buildings and Heritage Areas”, National Organization for Civilization Coordination, Cairo, Egypt, 2009. Al-Khawaja, S.S., “What is Sustainability?” An article in the Journal of Environment and Development, No. 84, Amman, 2016.
3. Haddad, R., “The Theory of Sustainable Development“, Research Support Program at the Lebanese University, Beirut, Lebanon, 2006.
4. Al Hassan, A. R., “The Government's Strategy to Eliminate Unemployment and Achieve Sustainable Development“, Research Paper, Workshop, University of Massila, Sudan, 2011.
5. Aoyanan, A., “The Analysis of the Economic Impacts of Environmental Problems in Sustainable Development“ Case Study of Algeria, SC, Faculty of Economic Sciences and Management Sciences, Saad Dahlab University, Algeria, 2008.
6. <http://www.unesco.org/new/ar/media-services/in-focus-articles/intangible-cultural-heritage-for-sustainable-development.accessed> 29/3/2018.
7. Amro, D., Ammar, S., “The rile of academic education in directing the architect towards maintaining the sustainability of cultural urbanization“ [Comparison study], Research Paper unpublsh,2016.
8. Abo gouda, E., “Sustainable development and their social, economic and environmental dimensions“, National Defense Journal, vol.78, January, Lebanon, 2011.
9. Attieh, A.A., El Barmby, H.E., “Simple Environmental Remedies for the Conservation of Buildings and Heritage Areas“, Research Paper, First International Conference, Architectural Conservation between Theory and Practice, Dubai Municipality, United Arab Emirates, 2004.
10. Ramadan, S., “The Architectural Restoration of Islamic Historical Buildings in Egypt - Towards an Integrated Framework - An Empirical Study on the Malek Hall of Sufism“, Ph.D. thesis - Faculty of Engineering, Cairo University, Cairo, Egypt,2005.
11. Tawfik, A., “Management Maintenance and Operation Facilities“, 3rd Edition, PMEC-Professional Management Expertise Center, 2003.
12. Waheba, B., “The Role of Maintenance Management in Reducing Production Costs“, M.S.c thesis - Faculty of Science management, Skikda University, 2007.
13. Tartar, A., “Economic Rationalization of Productive Capacities in the Institution“, the Bureau of University Publications, Algeria, 2001.

14. El Bakry, S.M., "Production Planning and Monitoring", Dar El Gamaia for Publishing and Distribution Alexandria, 2000.
15. El-Shenawy, S., "Production Management", Alexandria Book Center, Alexandria, Egypt, 2000.
16. Qantajy, S.M., "Rationalization of Maintenance Process of Quantitative Methods", Dr. Samy Mazhar Qantaggi Development Center, Syria, 2003.
17. Ali, R.S., Al-Musawi, S.K., "The Functions of the Contemporary Institution", Al-Warraaq Publishing and Distribution Foundation, First Edition, Amman, Jordan, 2001.
18. Salafi, G., Al-Bass, A., "Maintenance and Restoration as a Means to Preserving the Urban Heritage Saudi Experience", 10th Interbuild International Conference for Construction and Construction, 23 July, Cairo, Egypt, 2003.
19. Al-Sherbini, E., "Urban Environment Improvement As Key Approach To Conserve Fortunate Heritage With Special Reference To El Gamalia, Historic Cairo", Research Paper, Assiut University Fifth International Conference "Urbanization and Environment", Egypt, 2003.
20. El-Essawy, M.A., "Enhancing Heritage Domains of Value, a Comparative Study of the Policies of Preservation of Urban Heritage", Research Paper, 3rd International Urban Conservation Conference and Exhibition, Dubai, UAE, 2012.
21. Salam, F.A., Wagdy Abbas, W., El-Mari, T., "Historic Cairo. El Moez Street, the Great Street", Al-Moez Street Development Project, Supreme Council of Antiquities, 2010.

استدامه الفراغات العمرانية ذات المورث الثقافي من خلال تأثير دور الصيانة المستدامة والعامل البشرى

يركز البحث على تحديد المشكلات التي تتعرض لها مشروعات الإرتقاء العمراني للمباني والمناطق (التراثية) والتي تؤثر سلباً على المستوي المادي أو المستوي البصري أو كلاهما وقد تؤدي في النهاية إلى تدمير وضياع عمليات الإرتقاء. ولذلك وجد من الضروري تحديد هذه المشكلات واسبابها كطول للحفاظ على عملية الإرتقاء ومن هذه المشكلات تأثير المورث الثقافي للعامل البشري، غياب الصيانة الدورية، ضعف الربط التشكيلي بين الطابع المعماري للمباني التراثية والمنشآت العمرانية. وسوف يتم إستعراض المفاهيم المختلفة للمباني التراثية وأهميتها، والتأكيد على اهمية تحقيق الاستدامه للمباني التراثية من خلال تحديد انواع الصيانه المختلفه وكيفية استخدامها في التعامل مع جميع انواع المباني. لقد تم اختيار مشروع تطوير شارع المعز كدراسه حاله لما له من اهمية تراثيه وتم عمل دراسه تحليليه للشارع للوقوف على السلبيات (بيان التعديات والتشوهات على المباني الاثريه) التي حدثت له بعد عمليه الارتقاء من خلال المحاور الاساسية لعمليه الاستدامه (الاقتصادي والاجتماعي والبيئي).

ومن خلال الدراسة التحليلية تم استخلاص النتائج والتوصيات حول الحلول المقترحة لضمان عمليه استدامه عمليات الإرتقاء العمراني