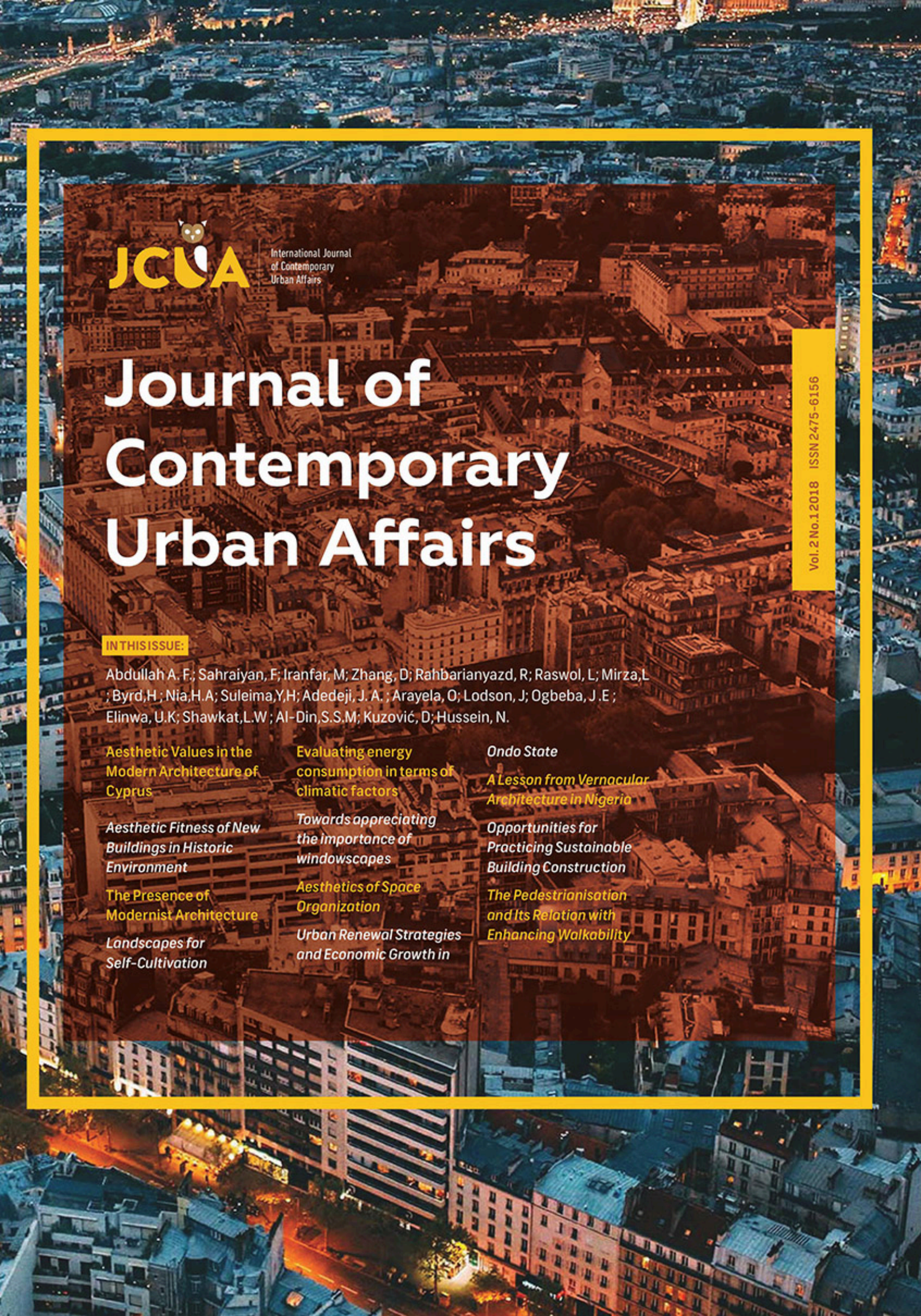

JCUA
International Journal of Contemporary Urban Affairs

Journal of Contemporary Urban Affairs

Vol. 2 No. 1 2018 ISSN 2475-6156

IN THIS ISSUE:

ISSN 2475-6156 (print)
ISSN 2475-6164 (online)

Journal of Contemporary Urban Affairs

Volume 2, Issue 1, June 2018

www.ijcua.com

IMPRESSUM

Journal of Contemporary Urban Affairs
Volume 2, Issue 1, June 2018

ISSN 2475-6156 (print) ISSN 2475-6164 (online)
URL: www.ijcua.com
Email: editor@ijcua.com
Publisher: Anglo-American Publications LLC
Address:
- No 13, Subat Sokak, Orkoz 1 Apartment, Flat 3, KKTC, Via Mersin 99302, Turkey.
- Girne American University, Karmi Campus, Mersin 10 Via, KKTC, Turkey.
Phone: +90 506 189 99 66
Circulation: 100 copies

Indexed & Abstracted:

Crossref, CNKI , BASE (Bielefeld Academic Search Engine) , Findplus , Scilit, Garba Rujukan Digital (GARUDA), ISSN International Centre, Dimensions, Powered by Digital Science, DRJI (Directory of Research Journals Indexing), TIB, IPI (Indonesian Publication Index), Polish Scholarly Bibliography (PBN), Osmikon Search , EZB, Index Copernicus, Genamics JournalSeek, SSRN, MAFIADOC, KUDOS, WorldCat, CiteFactote, UBL (Universitas Bibliotek Leipzig), SCIPIO, Elektronische Zeitschriften, TurkEgitiminDeksi, ResearchBib, SIS Index, Scientific world index, IIJIF, COSMOS, ESJI (Eurasian Scientific Journal Index), IP Indexing, JOURNAL FACTOR, IP Online Journal, Root Society for Indexing and Impact Factor, General Impact factor, I2OR, Saif Scholars Impact, Slideshare, Science Index , SPARC Indexing, Biojournal, Internation Scientific Indexing (ISI), sjifactor, International Citation Index (ICI), Calameo, LIVIVO - The Search Portal for Life Sciences, ZB MED – Informationszentrum Lebenswissenschaften, Opacplus, Beluga – Catalogue of Hamburg Libraries, Tpbin, ResearchGate

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Journal Of Contemporary Urban Affairs

2018, Volume 2, Number 1, pages 1– 12

The Influence of Le Corbusier On the emergence of the Aesthetic Values in the Modern Architecture of Cyprus

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ARTICLEINFO:

Article history:

Received 02 July 2017

Accepted 21 July 2017

Available online 21 July 2017

Keywords:

Le Corbusier;
Modernity;
Aesthetic Values;
Cypriot architecture.

ABSTRACT

Modernity has significantly influenced the branches of human knowledge; architecture has a substantial share in this effect. Modern architecture, in turn, was not a negative recipient to impact, but it was a positive catalyst for decades. Moreover, it did not limit to certain geographic boundaries, but it has spread all over the world and Cyprus was not an exception. Due to most of the Cypriot pioneer architects were studied in Europe; Cyprus was the incubator that has many architectural distinctive pieces of evidence of modern architecture. Perhaps the expert reader of the modern architectural discourse of Cyprus could distinguish numerous aesthetic features in Cyprus Buildings especially the private residences and their appearance is credited back to one of the pioneers of modern architecture; Le Corbusier. The research paper is an attempt to determine the influence of the principles that Le Corbusier claimed as keystones of modern architecture in early twenty century and how impressed on the emergence of aesthetic values of the modern architecture of Cyprus as well. The paper takes two works of Neoptolemos Michaelides, as case study (Neoptolemos Michaelides is considered the father of Cyprus modern architecture). The first case study is his and wife private residence, which considers the icon of the modern residential architecture of Cyprus and the other is the first residential project designed by him Theotodos Kanthos residence.

JOURNAL OF CONTEMPORARY URBAN AFFAIRS (2018) **2**(1), 1-12.

https://doi.org/10.25034/ijcua.2017.3651

www.ijcua.com

1. Introduction

Modernity as a lifestyle has started to construct its features through enlightenment era and had manifested as a fundamental issue where the age of machine was begun. The phenomenon of Modernity embodied in a broad spectrum of knowledge and behaviors socially, culturally and economic. Architecture Might consider the most physical appearance of human being, for that, it influenced highly by the new trends. The crystal palace, which constructed in 1851, represents the first Avant-grade example of using new construction material such as concrete, glass and steel and chronically, it was the first embody of modern

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architecture. In the early years of twenty century, many architects Fed up with the decorative Art Nouveau architecture and the limited horizon of the regional architecture that prevailed in that period.

As they were carrying avant-garde ideas, those architectural approaches were no longer able to accommodate future of vision toward global modernity. Le Corbusier was the forefront of those architects wherein 1923; he declared his five principles (the *pilotis*, the free plan, the free façade, the horizontal ribbon windows and the roof garden) which were the keystones of the Avant-garde language.

Rationality and functionality were the most obvious characters of modern architecture. These features have many aesthetic values, which distinguish the Avant – grade architectural discourse such as abstraction, purism, and Simplicity.

Le Corbusier was not just the forefront and pioneer modernist architect; he is also the most influential figure on successive generations of architects. Whereas Modern architecture did not limit to certain geographic boundaries, but it has spread all over the world and Cyprus was not an exception. Due to most of the Cypriot pioneer architects were studied in Europe; Cyprus was the incubator that has many architectural distinctive pieces of evidence of modern architecture. The works and principles of Le Corbusier have affected those architects on many levels, functionally, formally, aesthetically and technically.

This influence is the core of this research paper to detecting how it contributed in highlighting the aesthetic values of modern dwelling architecture in Cyprus. And more deeply, the study focuses on two cases study as distinguishable examples of privet residences.

1.1. The modernity, modernism and modern architecture

The enlightenment age highlighted the social attitude to adopt new thoughts and lifestyle, and unfolded a desire for change and looking for a modern way of living. Whereas "Modernity is what gives the present the specific quality that makes it different from the past and points the way toward the future. Modernity is also described as being a break with tradition, and as typifying everything that rejects the inheritance of the past."(Heynen, 1999, p.9) famously Walter Benjamin defined modernity as 'the world dominated by its phantasmagorias'. (Frisby, 2004, p.13) This avant-garde and conflict viewpoint with tradition had developed and spread increasingly at the machine age which inspires the artists and architects as such as the economists and politicians. The modernity movement progressed and theorized to be a philosophical doctrine; (modernism) which "refers to an international tendency that came to expression in western literature, theatre, music, visual arts and architecture in the latter half of the nineteenth century, and continued to dominate twentieth century art" (Frisby, 2004, p.23)

With The crystal palace, which constructed in 1851(figure 1) that recognized as the ancestor of Modern architecture evidence, a new generation of construction manners and concepts, meanings and technology was begun.

Richard Lucae, published an article at 1869, titled "On the Meaning and Power of Space in Architecture." He described the crystal palace as "a "piece of sculpted atmosphere" in which light fills the whole space with a "beautiful naturalness," a "magically poetic form of light."." (Mallgrave, 2005, p.197)

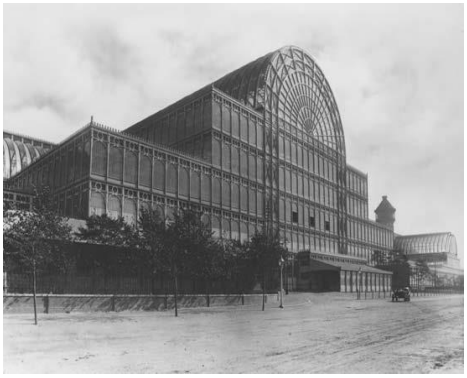

Figure 1. The crystal palace 1851.

The machine age features after the industrial revaluation have supported new aesthetic values portray the functional attitude of the modern architecture. "At a deeper level still, industrialization transformed the very patterns of life and led to the proliferation of new building problems - railway stations, suburban houses, skyscrapers for which there was no precedent." (Curtis, 1982, p.14)

In 1896, Otto Wagner published in Vienna what is probably the first modernist architectural manifesto – his Modern Architecture. Despite its theoretical weaknesses, his contemporaries read it as a rejection of the historicism of the recent past and a plea to create an architecture appropriate to modern life. (Frisby, 2004, p.3)In the manifesto, he also suggested qualities of simplicity, realistic expression of the means of construction and a respect for modern techniques and materials.

> In the early years of twenty – century, many architects reacted and Fed up with the decorative Art Nouveau architecture. The reaction against Art Nouveau, which acquired increasing momentum in the first decade, was fed in part by the Arts and Crafts ideals of simplicity and integrity: by an abstract conception of Classicism as something less to do with the use of the Orders, than with a feeling for the 'essential' Classical values of symmetry and clarity of proportion: and by a sense that the architect must strive to give expression to the values of the modern world through frank and straightforward solutions to architectural problems in which disciplines of function and structure must play an increasing, and attached ornament a decreasing role. (Curtis, 1982, p.33)

Modern architecture became more strong and acceptable in the twenty-century when had supported by numerous art schools, movement and organizations such as the futurism (1909-1944), the De Stijl (1917-1931), the Bauhaus (1919-1933), the constructivism (1920-1932) and CIAM (1928-1959). The members of those avant-garde took upon themselves to adopt and disseminate the principles of modern architecture and constructed new architectural aesthetics when it Celebrated and glorified the new technology and materials. The Bauhaus building in Dessau (1926) itself considered an impressive evidence about how the modern product should be (figure 2). "Within its irregular plan, glass curtain walls and steel and reinforced concrete frame beat an interdisciplinary heart so that all the departments – furniture, theater, architecture, textiles, and so on – collaborated." (Sadler, 2004, p.36)

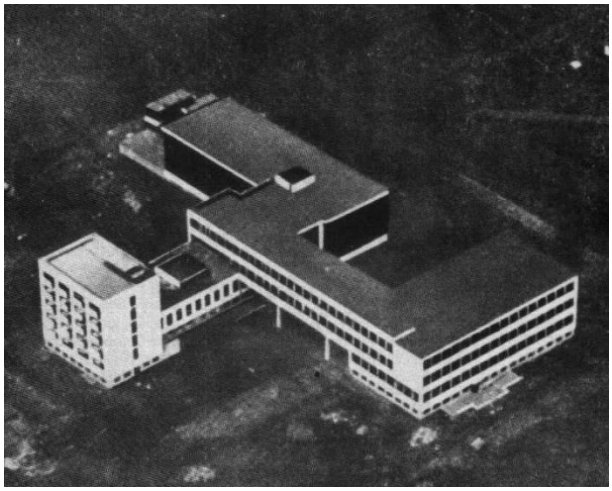

Figure 2. Bauhaus in Dessau 1921.

After World War II many architects, members of Bauhaus, and CIAM emigrated from Europe to the United States and other countries that helped to spread the principles of modern architecture around the world. In the fifteenth from the last century, the modern architecture had viciously attacked from the angry young architects that felt the pioneers had let them down and they were becoming graying establishment figures. "Only Le Corbusier remained truly inspirational to young architectural "rebels." He had no qualms about revising his principles until they were unrecognizable. He now offered what would become known as a "New Brutalism" of raw, shuttered concrete, exposed brickwork, and primitive, handcrafted-looking building techniques." (Sadler, 2004, p.40) Those

architects tried to regain their confidence in the architecture of modernity and re-arranging the papers to draw lessons. "Under the youthful leadership of figures such as Alison and Peter Smithson from England and Aldo van Eyck from Holland, their discussion group Team 10 and practices like France's ATBAT, the supposed founding principles of Modernism were revisited in a "Brutalist" manner and new attention was paid to local rather than universal constraints. Put another way, it was possible to be in some way "avant-garde" again." (Sadler, 2004, p.40) Especially that many opponents have found a chance to ruins on the concepts and principles of modernism after criticism suffered by the modern city on the urban and social level.

1.1.1 . Characteristics of modern architecture

The first generation of modernists was contributed in constructing a theoretical framework of their attitude to enrich the architectural knowledge and encourage the young architects to adopt the Avant-garde movement. In their contribution, they portrayed the features and characters of modern architecture. The functionality of Luis Sullivan (form follows function), the simplicity and economic of Ludwig Mies Van Der Roch (less is more) and the openness, formality and abstraction of Le Corbusier (mass and surface are the elements by which architecture manifests itself. Mass and surface are determined by the plan. Plan is the generator. So much the worse for those who lack imagination) (Le Corbusier, 1927) all were constructed a common understanding of the purpose of the modern architecture.

The modern architect believes in simplicity in form, clarity in plan and functionality in design. The modern architectural product is characteristically free of decoration and unnecessary elements. The goals of the project are clarified at the start, and only the features that are required are included in the design. The focus will be on the space itself, rather than on any decor or details not relevant to the overall design. Also the Emphasis on the honesty of materials, there is nothing to hide, the true nature of the Materials especially the concrete, are shown in the ordinary form. Inner workings of the building tend to be visible: beams and other structural elements are exposed to the spectator. Moreover, the linear elements, rectangular forms and bold horizontal and vertical features especially the windows, staircases, rooflines, and other structural elements all contribution the architect in creating a linear-inspired open plan. Modern architecture is also characterized by an emphasis on Layout and location, which are the keys to modernist design. Building such as Chapel de Ronchamp (1955) by Le Corbusier and the falling water house by Frank Lloyd Wright are marvelous evidence on the correlation between the building and site.

1.1.2 Le Corbusier and his principles

It is impossible to research the architecture of the twentieth century and of our own time without first coming to terms with Le Corbusier (1887–1965). His buildings can be found from Paris to Algeria to the Punjab and his influence has extended over numerous generations worldwide. Famous building such as the Villa Savoye at Poissy 1931, the Chapel of Notre-Dame-du-Haut at Ronchamp 1955, Unité d'habitation, Marseille, France, 1945 and the Parliament Building in Chandigarh 1955 stand assessment with the works of any age. As well as an architect, Le Corbusier was also a painter, sculptor, urbanist, and author. *Charles-Edouard Jeanneret* who best known as Le Corbusier is one of the most influential architects on generations of architects after. Le Corbusier born at sixth of October 1887 in, *La Chaux-de-Fonds*, Switzerland. Son of *Georges Edouard Jeanneret*, watch engraver and enameller, and of Marie Charlotte *Amélie Jeanneret-Perret*, music teacher. He Studied watch engraving at the Art School, under *Charles L'Eplattenier* the director of the Advanced Decorative Arts Course (based at the Art School) whereas Le Corbusier joined to it at 1904, *Charles L'Eplattenier* was the person who interests Le

Corbusier in architecture. [1] In his early year, Le Corbusier designed a few villas regarding the regional style that was common in *La Chaux-de-Fonds* also he worked as watchcase designer. The trips to Germany, France, and meditation countries that he made when he was young changed his vision about architecture and design. He worked one year for *Auguste* and *Gustave Perret* as draughtsman, half time at 1908 And another year in 1910 for Peter Behrens's architectural practice in Berlin. Then from 1912, he started his independent career. In 1914, Le Corbusier designed a skeletal structure for his Domino houses, as a technical solution to the lack of residences according to the destruction of world war I. with the aim of liberating space from the limitation of load bears. This type of thought and tendency in design was a beginning for a new vision toward construction methods (figure 3).

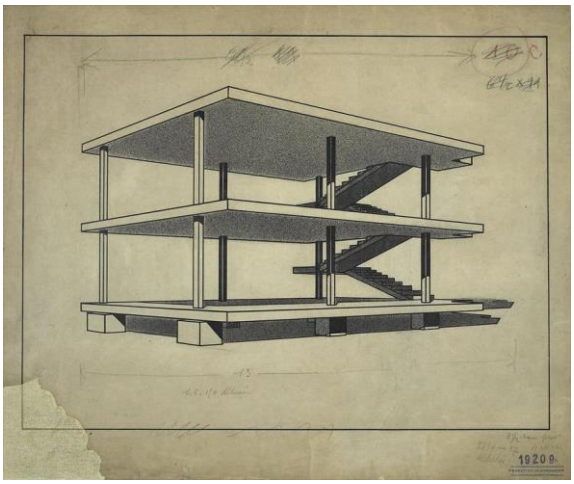

Figure 3. Domino house by Le Corbusier 1914.

At the same time, he started to document his concepts and principles about modern architecture in written way. In 1926, he published, *"Les 5 points d'une architecture nouvelle"* (Five points of a new architecture), which affirmed his architectural type-features: *pilotis* (columns), free plan, free facade, horizontal sliding windows, and roof garden. (Mallgrave, 2005, p.259) after that manifesto, his reputation as Avant-grader architect started to shine

One year late, he Published *Vers Une Architecture* (based on articles published in *L'Esprit Nouveau*), published in English in 1927 as Towards a New Architecture. In 1928, he was a Founder member of CIAM (*Congrés Internationaux d'architecture moderne*) at the castle of *La Sarraz*, in Switzerland. CIAM and Bauhaus had a crucial role in constructing the principles of modern architecture (Amen, 2017). In 1930, he gained the French nationality. Le Corbusier was almost thought about the social sense of architecture and human scale, in 1945, he awarded Honorary Doctorate in philosophy and mathematics of the University of Zurich regarding years of researching on the modular, which is a represented standard for construction depending on human scale. In the rest of his life, Le Corbusier designed about 500 projects, involved, architecture and urban planning. A few of them were built and about 75 buildings reflected his vision and philosophy. Through his fruitful life, he received many Honorary Doctorates and titles and lectured at famous architectural schools. On 27 August 1965, Le Corbusier dies by a heart attack while swimming at Cap-Martin.

In Towards New Architecture Le Corbusier posed the question 'from what is emotion born?': 'From a certain harmony with the things that make up the site. From a plastic system, that spreads its effects over every part of the composition. From a unity of idea that reaches from the unity of the materials used to the unity of the general contour'. (Le Corbusier, 1927)

This 'unity of idea' is central to Le Corbusier's work – a desperate attempt to create order in what he perceived to be a fragmented and chaotic world. (Samuel, 2007, p.1) Corbusian principles might distingue in his whole projects in different level especially in Villa Savoye (1928-1931) (figure 4), where the *pilotis* are fully brought into play and are teamed with the staircases and ramps; it is a masterful creation, if

[1] For more information about le Corbusier biography, visit: http://www.fondationlecorbusier.fr/corbuweb/morpheus.aspx?sysId=11&sysLanguage=fr-fr&sysParentId=11&sysParentName=home&clearQuery=1

only for its minimalist, purist language. The free plan that allows connecting spaces together with no visual obstacles then arising upstairs by attracting ramp from inner semi-court to the roof garden, seeing the outdoor landscape through the horizontal windows, a lived experience journey presented to the viewer.

Figure 4. Villa savoye 1928-1931.

1.2. Aesthetics of Modern Architecture

Aesthetics as "the study of the nature of beauty, especially in arts such as painting and architecture." [2] has a significant attention of many theorists and philosophers, from Socrates through Aristotle and Plato, then Kant, Nietzsche, Hegel and Heidegger to recent days. Albeit "Aesthetics is a late-emerging sub-discipline within philosophy and during the last three centuries has been for the most part considered inferior to logic and epistemology, as well as to ontology and ethics." (*Sepp and Embree, 2010, p.15)*

Historically, the first formal classification of aesthetics as a branch of philosophy appeared in 1735 when Alexander Baumgarten published his *Meditationes philosophicae de nonullis ad poema pertinentibus* - (Philosophical meditations on some requirements of the poem) and in which he identified a theory of sensibility labeled aesthetics as a desideratum. Due to Baumgarten, we find for the first time in the history of philosophy the notion of aesthetics as an in- dependent philosophical discipline (Nia and Atun, 2016). Regarding modern architecture, Aesthetics of the machine was the essential tendency of the new epoch; rationality and simplicity are the clearest features of the aesthetic values. Sadler sees "The embrace of the expressive aesthetics of modern life, whether of machinery or popular culture, that motivated Modern architects quite as much as rationality." (Sadler, 2004, p.37))The new aesthetics of modernity also involves the formal principles such as (planar surfaces and clean lines). (Mallgrave, 2005, p.232) the British historian Reyner Banham reduced this juxtaposition to twin categories, the "Academic" and the "Mechanistic." In the first of these he placed the "Three Reminders to Architects" (mass, surface, plan) as well as the chapter on "Regulating Lines," both of which derive from Le Corbusier's purist aesthetics and revolve around his definition of architecture as "the masterly, correct and magnificent play of masses brought together in light. (Mallgrave, 2005, p.256)

2. Le Corbusier influence on the modern architecture in Cyprus

Cyprus is the third largest island in the Mediterranean, it locates at the southeastern edge of the Mediterranean, at the crossroads of Europe, Asia, and Africa, Cyprus has had many different cultures constructed on the island throughout history where many people passed through. In Cyprus, the past lives side-by-side with the present in a unique fabric. The classical architecture of Cyprus has the same variety, which originated to the cascade civilizations had passed there. Although Cyprus did not affect by industrial revolution so much, regarding its location, which reflected negatively on the development of the infrastructure in every Cypriot city. Nevertheless, modern architecture began to be made known

[2] Retrieved from: http://www.macmillandictionary.com/dictionary/british/aesthetic_2#aesthetic_2__2

to Cyprus in the 1930s, when professional European- educated architects started to establish theirs applies on the island. In the period from the end of World War II until 1960, modern architecture has been a distinctive presence in Cyprus. Those architects were influenced by avant-garde movement in the first half of twenty-century and the works of the pioneers of modern architecture Especially Le Corbusier.

Although Unfortunately, Le Corbusier did not realize any project in Cyprus, However, more or less obvious traces of Le Corbusier can be encountered in Cyprus from the 1930s onwards. (Kiessel, M., 2014)[3]

This paper will discuss the influence of Le Corbusier from different viewpoints related all with the aesthetic values of Le Corbusier's architectural discourse. First, the formal aesthetics, second the free plan organization, third, the structural aesthetics, fourth, the technical solutions and finally, the details scale. Focusing on two residential cases study designed by Neoptolemos Michaelides.

2.1. Neoptolemos Michaelides dwelling projects:

Neoptolemos Michaelides (1920-1993) is an important representative of the modern movement in Cyprus, with a strong personal style. He studied in Milan at the beginning of the 40's, under great architects like Gio Ponti and Bruno Zevi. He returned to Cyprus after the end of World War II that standing excuse to interrupt briefly his studies and turns in Cyprus until 1947. He then returned to Milan to complete his studies, turning in Cyprus in 1952 with the title of Doctor of architecture. In 1979, he founded the Cyprus Architectural Heritage Organization, of which it becomes the President, managing to pass on to the architects of the 80s the love of folk architecture, thus saving several important buildings in both urban and rural areas. His own private house in Nicosia is considered a masterpiece, which exemplifies the peak of his creative career.

Through his work, the architect achieved the harmonious coexistence of an environmentally sensitive and climatically correct design, while at the same time his architectural creations are of a high aesthetic level. (Michael, 2006)

2.2 The Case Study

The research paper focuses on two cases study as distinguishable examples of privet residences the first one is the Neoptolemos and Maria residence, the second is Theotodos Kanthos residence. The two examples were designed by the modernist Cypriot architect Neoptolemos Michaelides at the middle of last century, both of them are clear examples of the applying the principles and aesthetic values of modern architecture.

2.2.1 Aesthetic values of Neoptolemos and Maria residence

The family house, which Michaelides built for himself and his wife Maria during the mid-1960s, located in south part of Nicosia. It was designed to be used, except for housing, and as a working space for himself and his artist wife. It also features a gallery space, where it would be exposed paintings and other collections. The importance attributed to the architect is evident in matters relating to natural light, as well as to the proper location and orientation of the building. (Figure 5)

Figure 5. Neoptolemos and Maria residence- top view.

[3] Direct and indirect influences of Le Corbusier on the architecture of Cyprus; a paper presented by Marko Kiessel through A Swiss in the Mediterranean, International Le Corbusier Seminar, organized by Cyprus International University – Nicosia. 2014

The house stills in its original state and closed to the public since the couple passed away, the building is now under state control and the Maria and Neoptolemos Michaelides Foundation. The brutalist appearance of the house remains a strong evidence of its time. "The modernist treasure composed of concrete overhanging slabs, a vaulted roof, expanding terraces, sculptural staircases and glass surfaces are untouched and tell the story of this highly creative couple. The interior of the house highlights pure and simple volumes, graphical concrete surfaces and wooden features such as railings reminding the old prehistoric elements." [4]

"It is worth noting the variety at play across the villa's three stories. The parking spaces and quests living areas at ground level contrast a far more reserved second floor, the piano nobile, comprising living quarters for the owners. The third floor, an isolated den for study, is crowned by a beautifully articulated at the top slab parabolic vault." [5]

In this house seemingly, N., Michaelides had influenced by Le Corbusier on efferent levels; on the principles level, we could notice that he applied three of them: the *pilotis*, the open plan, and the free façade. On the formal level also we could notice another Corbusian feature is used; the vault slab which it appears Cleary in many building designed by Le Corbusier such as Maison Jaoule and Villa Sarabhai before(figures 6, 7, 8,9).

Figure 6. Neoptolemos and Maria residence.

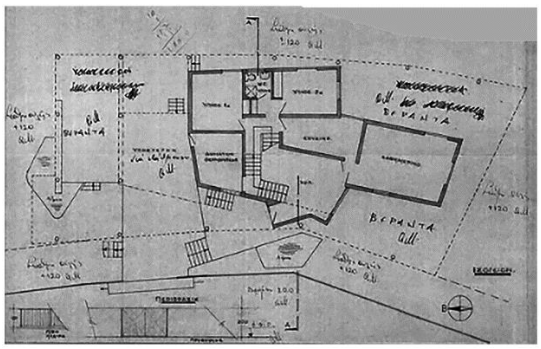

Figure 7. Ground floor plan / Neoptolemos and Maria residence[6]

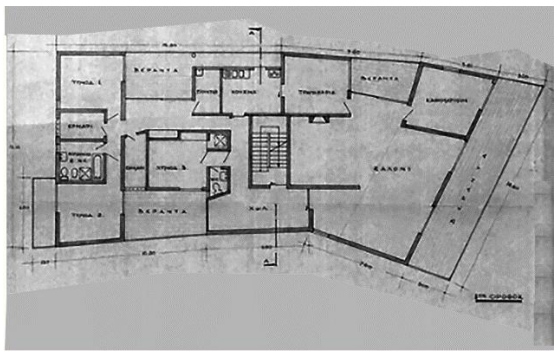

Figure 8. First-floor plan.

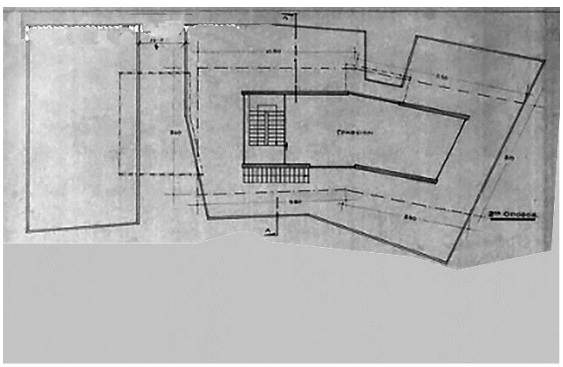

Figure 9. second-floor plan.

[4] Retrieved from http://www.coolhunting.com/design/helene-binet-neoptolemos-michaelides

[5] Retrieved from http://www.cy-arch.com/neoptolemos-michaelides-house-in-nicosia-hadjivassiliou/

[6] Retrieved from https://www.flickr.com/photos/petrosphokaides/

Figure 10. Maison Jaoule-exterior.

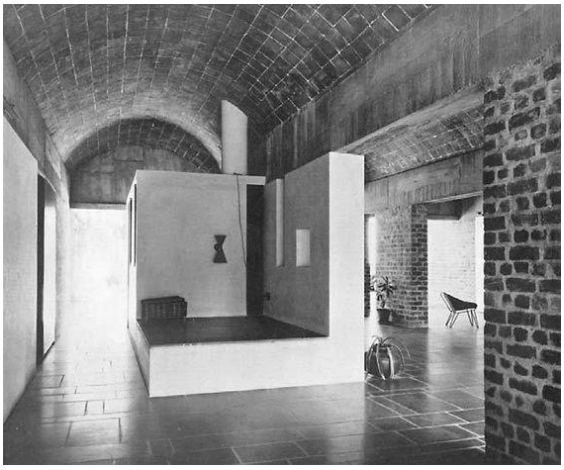

Figure 11. Villa Sarabahi – interior.

On the materials and details level, he used the big glasses with upper ribbon windows that Le Corbusier used in Villa Savoye 1928-1931. Regarding the materials, he had used the traditional material such as wood with modern ones such as concrete, steel, and class insofar Le Corbusier tactic especially in Villa Sarabhai, Ahmedabad 1951. The elegant sensitivity of merge these materials together reflects the aesthetic adapting of the construction resources (Figures 10, 11).

Figure 12. Neoptolemos and Maria residence 1964.

Figure 13. Villa Sarabhai, Ahmedabad 1951.

In addition, he used the concrete without plastering as Le Corbusier did in his brutalist period after WWII; moreover, obviously, he supervised and practiced his construction staff in a professional way from the level of productivity and precise working comparing with a critical time of the years of construction. Study the lighting and reflection which remind by Le Corbusier words" the elements of architecture are light and shade, walls and space" (Le Corbusier, 1927)

He dealt with those elements in an attractive way (figures 12, 13). moreover, N., Michaelides did not hide his influence by Le Corbusier, the elements was clear to viewers, the concrete gutter for draining rain water was used in an abstract and aesthetic way as Le Corbusier had done before in many building such as in Villa Shodhan, Ahmedabad 1951(figures 14, 15)

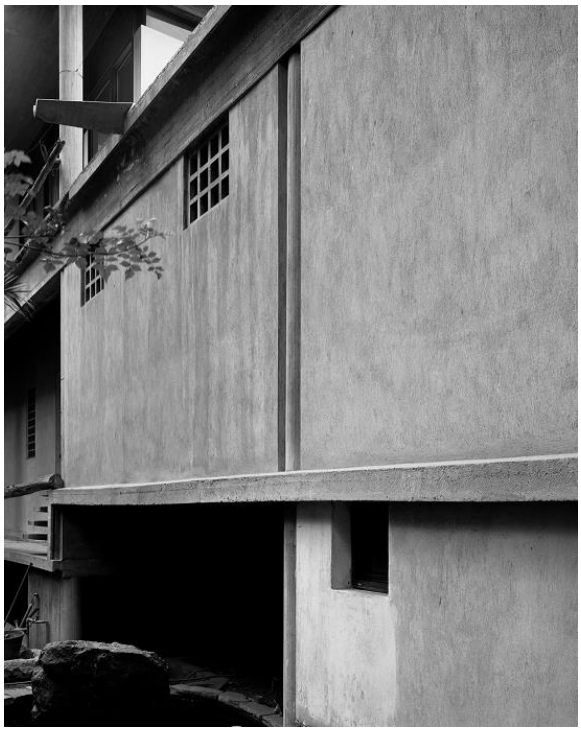

Figure 14. Neoptolemos and Maria residence, details.

Figure 15. Villa Shodhan, Ahmedabad 1951.

In addition, the nautical large balconies, the steel handrail, and light staircase could be differentiated as aesthetic features recognize in N., Michaelides residence was used by Le Corbusier before in many building such as his nautical metaphors in Unité d'habitation, Marseille, France, 1945 (figure 16)

Figure 16. Kindergarten on roof in Unité d'habitation, Marseille, France, 1945.

2.2.2 Aesthetic values of Theotodos Kanthos residence

This project is the home of the painter and close friend Theodotos Kanthos; perhaps it was the first architectural example in Cyprus that embraces so overall the principles of modern architecture. The House Designed in 1949 and its construction was completed in 1952. This is a three-bedroom house, further comprising painting atelier (Figures 17, 18).

N., Michaelides, despite his young age, in this house, he applied so impressively all novel elements of the modern movement. Apart from the residential spaces, it contains a painting studio. The usage spaces are clearly divided into two levels. The common spaces are on the ground floor, the private ones on the first floor. The passage into the interior of the building contains three stages: The covered foreground, the glassed entrance space with the vertical circulation and the closed interior space. The differentiation of the building volumes over the height determines concrete visual connections and allows for a high level of natural lighting of the spaces. During the summer period, the activities of the closed living room are transferred into the outer covered space that is defined by the structural grid, the water pond, and the curved wall, encasing the painting studio (Michael and Phocas, 2010).

In the design, special attention was given to functional separation and transition from open to close. Moreover, the relation between outdoor and indoor, neoplastic and free view of the composition both plan view and in section where it was distinguished from its simple forms, In addition, we could notice that The architect focused on the rational use of materials, the dialectic resolving conflicts in and out, up and down, open-closed, covered-uncovered, are the tools used by the architect. He fully elevated the building on *Corbusian pilotis* although there were rare use *piloites* even to elevate a part of the building in Cyprus before the 1960s.

Figure 17. Theotodos Kanthos residence (1949-1952).

Figure 18. Theotodos Kanthos residence (1949-1952).

3. Conclusions

The research paper aimed to highlight on the modern architecture of Cyprus through a historical review about the appearance of modernity, and how it was affected the whole lifestyle in the 20th century. The paper found many pieces of evidence on the emergence of aesthetic value in modern dwelling architecture of Cyprus regarding the influence of Le Corbusier principles and applying them in the modern architectural discourse by discussing two examples of private residences designed by N., Michaelides. The *pilotis* (columns), free plan, free facade, horizontal sliding windows, and roof garden are the most important architectural type features were used. Moreover, the simplicity, functionality, the brutalist features, the nautical elements are distinguished the modern architecture discourse of Cyprus.

Acknowledgments

This research did not receive any specific grant from funding agencies in the public, commercial, or non-for-profit sectors.

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Journal Of Contemporary Urban Affairs

2018, Volume 2, Number 1, pages 22– 32

The Presence of Modernist Architecture in **Government's educational Buildings at Lefkoşa**

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ARTICLEINFO:

Article history:

Received 20 February 2017

Accepted 23 July 2017

Available online 23 July 2017

Keywords:

Modern architecture;
Elements of modernist architecture;
Modernism philosophy;
Government's educational buildings;
Lefkoşa.

ABSTRACT

Modernist architecture movement of the buildings in any city reflects the modernity of that city. Lefkoşa as a modern city faced many conflicts in the last century. The governmental buildings illustrate how modernism in architecture was defined and reflected in the buildings of the city. The aim of this paper is to explore the modernism movement in architecture influence on educational governmental buildings in Lefkoşa for first half in 20th century. The paper focuses on the ideas and experiences of modernist architects in first half of 20th century to apply modernism elements, and relationship between architecture form and functionalism in governmental buildings. Methodology frame work elucidated to conduct the subject. Two School buildings have been selected from the first half of twentieth century in Lefkoşa as case studies for modernist architecture. 'Lefkoşa türk lisesi' designed by 'Ahmet vural Bahaedden', which was the one of famous modernist architects in Cyprus and 'Şehit Ertuğrul Ilkokulu'. The buildings architectural elements analyzed in both schools to demonstrate relation between site, interior space, functionality and environmental response, based on using their modern material and character. The paper concluded that the educational buildings hold strong elements of the modernist architecture in Lefkoşa and demonstrate how the elements of modernism were involved functionally in the design. The findings contribute useful evidence about the existence of modernism philosophy in architecture in Lefkoşa in the first half of twentieth century.

JOURNAL OF CONTEMPORARY URBAN AFFAIRS (2018) **2**(1), 22-32.

https://doi.org/10.25034/ijcua.2018.3653

www.ijcua.com

1. Introduction

Lefkoşa is considered as a modern city because it was affected with European architecture in first of 20th century. Many modern buildings are built in Lefkoşa in that time. Over time modernist architecture replace with other styles in architecture and modernist elements changed or became meaningless because of another adding elements. Governmental buildings were less affected with these deformations and the

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modernist architecture appears more than another buildings.

Schools are crucial buildings of a society and indicator of its development. Schools as a building with special character were always one of the most momentous projects for architectural thinking because of their multi functions and elements. The aim of this paper is to explore the modernism movement influence on Educational governmental buildings. The paper tries to evaluate the effects of the modern elements for school buildings design on first half of 20th century. Functionality will be second factor to evaluate the effects of modernism. Many buildings represent modernism in Lefkoşa but over time they lost their character as a modern building or they change with another style. The research assigned few questions to be answered. How much Modernist Architecture elements presence in Modernist feature of Educational Buildings in Lefkoşa? How much Modernist Elements are functional today? The paper hypothesizes that if the educational buildings from beginning of twentieth century until today have the elements of modern architecture, then that shows the presence of modernism philosophy in architecture in the city since that period.

2. Literature Review

2.1. Modern Architecture History

The term 'Modern' demonstrates combination of functionalism and aesthetic through movements in twentieth century which deny traditional and historical ruling on that period (Robinson, 2003). In the first half of 19th century while, modernism applied in the art and literature, start to refuse religion and history in Enlightenment period. In Europe, one of the most important perspectives of modern movement was criticism of the tradition and religion. In fact, the idea of modernism finds out in renaissance, but become more popular in Enlightenment era. Scientific look forward for future instead of past to improve the society and their life, as a result churches lost their place in society (Zabihi, 2010). The modern movement had begun in the early twentieth century by political, social, aesthetical and technological revolution in design and creates artistic and architectural movement to look ahead to future without participate historical background. The modern design focuses on functionality and interior space of the building more than decoration. In the beginning of 20th century, modern architecture continued by technical revolution which was the product of modern movement. Development of engineering field, using the materials and construction techniques, open a new way for architects in the world. New material such as steel, reinforced concrete, glass and aluminum enter to the new era of design (Evans and Jeffery, 2005).

2.1.1 The Pioneer Architects of Modern Movement in the world

Modernism is the most important movement of the 20th century, in architecture related to function of building and using new materials. It has been called as international modern after Philip Johnson's modernist architecture exhibition in 1932 in America. The modernism is determining by; building always introduced by cubic or cylinder shapes with flat roofs, using reinforced concrete in the facade with white or cream color without any ornamentation, as well as steel and glass sheet are used in the building with horizontal large windows and open interior plans. The two pioneer of modern movement in architecture design were Walter Gropius in 1883-1969 and Le Corbusier in1887-1965. (Savio, 2006). Le Corbusier was one of the Pioneers of the modern movement in 1920's and one of the most famous architects in the history of modern movement. His effects on the architecture as well as on the art continues until today in the world. Chandigarh is one of the remarkable experiences of urban planning in 20th century. It is only the one in whole urban design of le Corbusier which had been built; also it is the place of many of his significant architectural design. The city of Chandigarh was blooming the

modernism architectural movement in all over the India. It became famous for its modern architecture and landscaping. Most of the buildings were designed with cubical form; respect the proportion of human body with building scale and details. The city was combined with several sectors; the area of each sector was 800by 1200 meter (Tungare, 2001). He designed many buildings in Chandigarh with different categories. Colleges and Schools were important part of his design in the city. The Chandigarh College of Architecture located in sector 12 is one of the educational building built by le Corbusier and was established in 1959 (Ali, 2017; Dalrymple, 2009).

Figure 1. In the left shows northern façade of Chandigarh College of Architecture and in the right shows the interior space with opening for natural lighting. Retrieved from http://corbusier.totalarch.com/chandigarhcollege

Walter Gropius is another pioneer of modern movement and founder of Bauhaus school of architecture (Amen, 2017). Impington Village College (1938-1939) is the most remarkable work by Walter Gropius during his short period while he came to England with his assistant, Maxwell Fry to participate an architectural partnership. Simultaneously, educationalist Henry Morris was deciding to build three village colleges in Cambridge shire. In autumn 1934 Gropius introduced with Henry Morris and they decide to build a college in 'Impington'. Gropius and Maxwell Fry worked together to design 'Impington' College in summer 1936. Gropius's modern design of school leads the community pay attention to the build environment. Professor Sir Nikolaus Pevsner eulogize the 'Impington' village college as '*one of the best buildings of its date in England, if not the best'*. The importance of 'Impington' Village College became the only public building designed with Gropius in England (Campbell, n.d).

Figure 2. The outdoor view of the 'impington' Village College designed by Gropius in 1936(A plan conceived in the mind. Impington Village College, 2011).

The crossing wall built by bricks, with steel roof trusses and steel frame conference hall. The envelope covered by rough-texture yellow bricks with dark brown brick used in plinths, chimney stacks ant bridge trusses bearing the girders which span the hall roof.

The timber roofs covered with furring and asphalt. In the classrooms, steel roof trusses carried by internal walls therefore the external walls are not bearing wall and could be design with large windows. The building designed with one and two stories and simple. The plan is designed around central landscape which, normally used as the dining space. The accessibility to the building is direct from main entrance and also from side entrance from Playground. The Conference hall is located in the right of main entrance. The classrooms designed by two stories with two staircases and later extended lift. Behind the landscape located the main classrooms with central laboratory, and corridor relating the classrooms. The accommodation buildings such as staff rooms, common rooms, lecturer rooms, committee room, and library are located in the left of entrance. The building is presence the simplicity in architectural design (Walter Gropius-master of Modern architecture, 2011). After World War II, Richmond High School for Girls designed by Denis Clarke-Hall & Scorer in 1940.it

was another modern architecture school in England which designed in the form of Gropius and Fry's 'impington' Village College (Hille, 2011).

2.1.2. Elements of Modernism in Architecture

The modern movement elements are: absence of ornament, decorative molding strongly simplified and buildings introduced by simplicity in design. The convergence of touching surfaces between vertical and horizontal are sharp and clear, horizontal and vertical lines create rectangular form for the plans, flat roofs, most of the plans have meandering one story. Introducing new and modern material and systems such as steel column was using directly as an obvious elements to show the simplicity and functionality, concrete block is used for finishing material, truces with long span steel provide open spaces free from columns, direct solar heating system provide comfortably for occupant. Also traditional materials such as wood, brick and stone are used in building in a simple way to demonstrate the simplicity in modern aesthetic. All the material is stayed with natural character to reflects the honestly of materials. The interrelation between indoor and outdoor explained the transparency of large windows allows visual connection between site with natural landscape and building. The more important element is open plan that provide a big interior space in the building. Shading elements also applied in the building to increase human comfort. The modern building designed efficient (Jones, 2011).

2.2. History of Modern School Design in modern movement period

During 1930's to1940's, many schools were built with the same criteria and methods of design from the last periods, however the interest for the newer models of education were increasing. As much as the tendency was growing, the new model of schools was more appearance. Through guidance of several people such as Maria Montessori in Italy and John Dewey in the U.S by support the educational development theories which cause form the basis of many current educational until today. In addition to this educational Progressivism, several architects start to support these new ideas of schools. Many significant schools were built by innovative architects of that time such as Alvar Aalto's Tehtaanmaki School (1937), Richard Neutra were built many modern school buildings during the 1930's and Impington Village College (1939) by Walter Gropius. These schools were known as the 'open air school' movement, because of the importance of design were in indoor air quality, natural light, strong connection between inside and outside and proper circulation inside the school building. The best sample of this architectural movement could be the adult learning center (Impington Village College) built by Walter Gropius which the windows is the connection between ceiling and floors. This school building still in use and is the best school building in England. This model of design could easily apply in the classroom design of today (Baker, 2012).

2.3. Modern Architecture in Cyprus in the period of 1900-1965

The modern architectural movement in Cyprus starts with colonization in the island. When the ottoman rent the island to Britannia in 1878, British start to have full population documentation with hoping to control island. When they reach to control the tension between two communities of Greeks and Turks in the island, they decide to keep them separate. But the situation changed after 1914, the colony status in 1925 and increasing the population and hard economic situation in 1931 British rulers applied several new law projects and infrastructures and begins a processes for modernization and urbanization. Hence, the island had introduced to the new idea of modern architecture in 1930's, when the number of architect who educated abroad increased to start their practices in island. The architects started to reflect rational aesthetic which sometimes followed by vernacular priorities. After finishing the World War II, the

urbanization became more strong and it tend to aesthetic of "Corporate modernism" mostly revealed in the landscape by using concrete in the apartment buildings and office blocks which cause to be separate from walled city. In 1960 which Cyprus released from British colonial, modern architecture became as a tools for decolonization and modernization. They start to build new schools, markets, factories, hotels with modernism thinking and using new materials and techniques. There are several samples of modern schools building in Cyprus such as Lykavytos elementary school in Nicosia;

After the World War II, when the urbanization process came across with modernization and intensified, the needs for school building appeared. The Demetris Thymopoulos's elementary school in Lykavytos is one of the first modernist school buildings in Nicosia which had built between1955-1957.The architect follows the Louis Sullivan ideas which is "Form follows function" and use local material such as sandstone in the building. School for Girls in Nicosia (1962) also were designed in a same architectural style where founded a new building style, which were built clearly after the island independence from British colonial (Pyla and Phokaides, 2009).

Figure 3. D. Thymopoulos, Lykavytos Elementary School, Nicosia, 1955- 57 (Pyla,Phokaides, 2009).

2.3.1 North Cyprus, Lefkoşa

Nicosia or Lefkoşa (TRNC) is the largest city and capital of Turkish Republic of North Cyprus. From the geographical condition is the economic, political and cultural center of the Cyprus. The population of the city is about 84900 people by 2006 census. The majority of people are local Cypriot and Turkish people consider of people who migrates from Greece part after1974.lefcosa is the only divided capital city in the world nowadays, which south of the island occupied with Greece people and in the north by Turkish people (Nicosia - North Cyprus capital city,2007). TRNC area is 3,355 square kilometers, with the Mediterranean climate which is long dry summers and short rainy winters *(The Turkish republic of Northern Cyprus,* 2014).

Figure 4. Nicosia city. Retrieved from http://www.lefkosa.com/.

2.3.2. Ahmet Vural Bahaedden (1927-1993)

During Industrialization and blooming of Modernist movement in the world, local architecture in island also has been affected by this architectural movement. Hence, there are many good samples of modernist architecture in Cyprus which were designed by Cypriot architects of that period. Unfortunately, this condition had left as it was without any research from that period until today in north Cyprus. Ahmet Vural Behaeddin (1923-1993) was one of the pioneers of modern movement in north Cyprus which bring about special attention with his works (Celik and Erturk, 2007). He designed many modern buildings in north Cyprus which most of them is residential buildings, also he has school building (Lefkoşa türk lisesi built in 1962), which today used as high school. The author tried to investigate this building but couldn't find

any information source about the school, therefore, the author decides to visit the building in order to analyze the building and draw its plans.

3. Methodology

Through literature review author illustrate some information about Modernism Movement and its characteristics, then tried to shows some sample of educational modern design by pioneer of modern architecture in the world. The qualitative method applied in this paper through analyzing two educational Buildings design examples in the 1960's period case studies in Lefkoşa, North Cyprus. The Analysis criticized several elements regarding modern architecture characteristics. The author studied the form and function of the school's architectural elements and demonstrates their success; Envelope, materials, surface, structural elements, and spaces. The author analyzed the existing elements for the educational buildings in Lefkoşa and compared them with the standard elements of design in Modernist movement in architecture for educational buildings. The paper tried to demonstrate how Modernist elements were introduced successfully in those buildings during the 1960's until today in north Cyprus. The frame work of the methodology approach was developed by author to conduct the investigation:

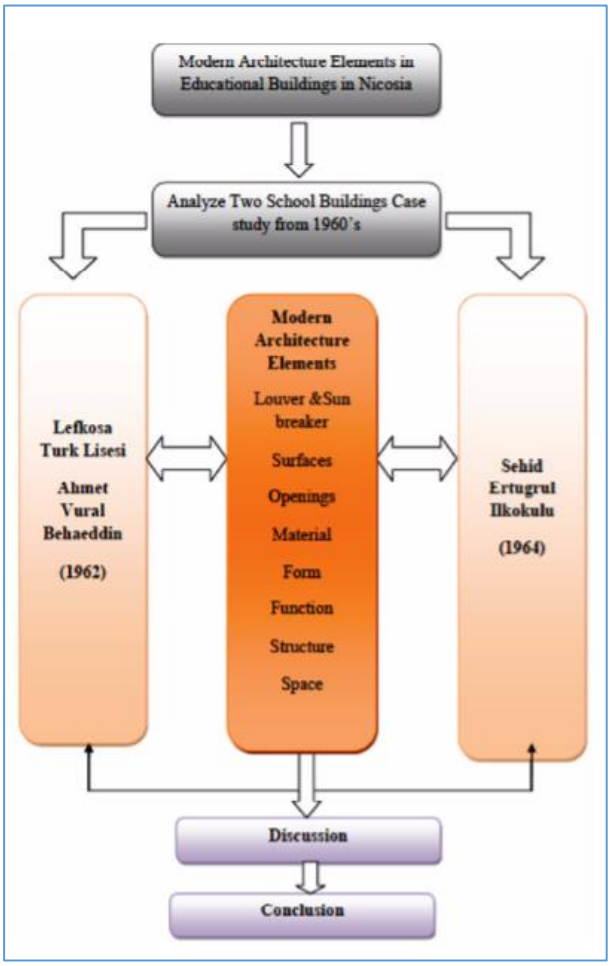

Figure 5. Methodology Framework.

3.1. Case Studies

Two case studies are selected in Lefkoşa to be analyzed by their Modern factors. The case studies selected through some similarities such as, 1. Both selected Case studies are Educational buildings (School Building) in Lefkoşa. 2. Both Schools Building had been built in the first half of twentieth century. 3. Both Schools have holding the character of Modern architecture.

3.1.1. Lefkoşa türk lisesi (1962)

Lefkoşa türk lisesi was designed in 1962 by Ahmet Vural Behaeddin and located at Cemal Gürsel Caddesi. See figure '10'. The building is used as a High school nowadays.

Figure 6. The location of the Lefkoşa türk lisesi, Source; Google map.

Regarding the Lefkoşa türk lisesi School building the author tried to find any documentation (plans, elevations, and sections) or any research about it, unfortunately the author came to know that there is no any documentation for the school until now. Hence, start to attempt to set up the plan by her. Through several visits with measuring and documentation could finally make the plan from scratch. The following plan is the Ground, first and second floor plan of school drawn with author. The building's site has two entrances from outside; one is from 'Gazeteci Kemal Assik Caddesi' street which is the main road and other one from lateral road on the west side. The building is located east-west orientation in the site and has several access ways to the buildings, See figure '5'.

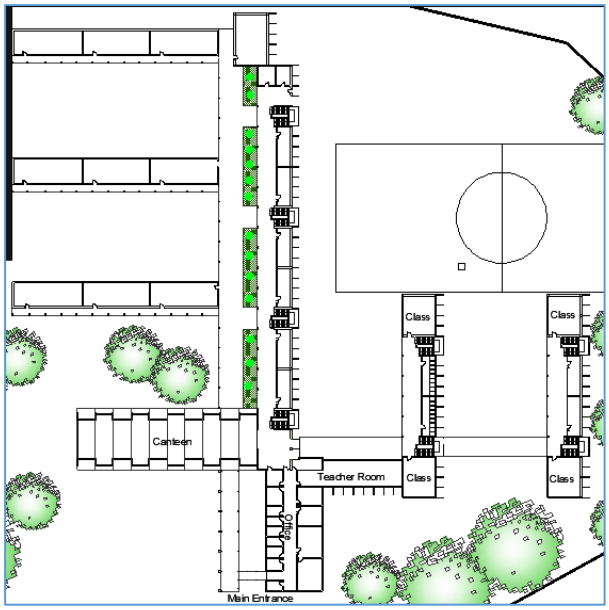

Figure 7. The Ground Floor Plan for Lefkoşa türk lisesi (Drawn by Author).

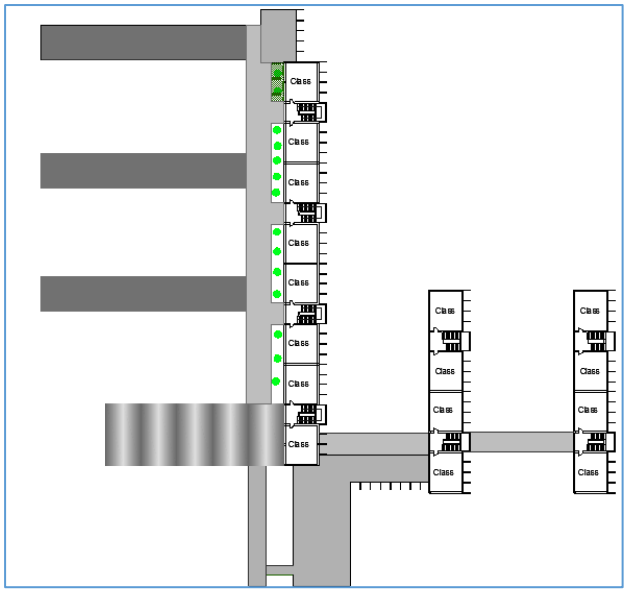

Figure 8. The First and Second Floor Plan for Lefkoşa türk lisesi (Drawn by Author).

The main building in ground floor consist Offices rooms with toilet, another attached building is canteen for students and employees. The canteen slab has been designed as folded corrugated slab. There are four staircases in the building which two rooms are located between them. Class rooms are located in the first and second floors. There are three buildings which located parallel from each other and provide open spaces between them. There is a small

room in the end of the building which based on the author in-situ observation utilized for music lessons room. The building consists of three parts with three floors which located next to the administration building. The ground floor consists small rooms, toilet between staircases, in the north and south side there are classrooms. The first floor consists four classrooms and it is repeating in the second floor, See figures '6'and '7'.

One of the elements in Modern architecture based on Jones (2011) is clearness of structural elements (Beam and Columns) and in Lefkoşa türk lisesi School; the structural elements are designed to be clear as one of the character of modern architecture. Another element in Modern architecture based on Jones (2011) is the sharpness and clearness of the edges between vertical and horizontal surfaces, horizontal and vertical lines create rectangular form for the plans with flat roofs. Hence, these parameters are seen as modern elements in the school building. Large windows in the building are applied for interrelation between inside and outside to enhance natural lighting into the classrooms and office rooms which is another factors of modern architecture based on Jones (2011). Louvers applied in the eastern façade as shading elements to increase occupant comfort is another modern architecture element. The material used in the façade of the building is necked concrete. The relation between outside and inside represented through interrelation between the buildings and several courtyards among them to give good example of transparency between inside and outside as one of the modernist element in architecture. The horizontal and vertical ribbon openings are other elements applied in the building as one of the characteristics of modern architecture.

3.1.2. Şehit Ertuğrul Ilkokulu

Şehit Ertuğrul School was designed in 1964 and located between Sehit Huseyin Bora Sokak and Sipah Sokak and Bedrettin Demirel Caddesi,Lefkosa. The building is used as a primary school nowadays and has the characteristic of modern architecture. The entrance to the site is from Sehit Huseyin Bora Sokak, See figure '25'.

Figure 9. The location of Şehit Ertuğrul Ilkokulu (Source: Google map).

Figure 10. The site plan of Şehit Ertuğrul Ilkokulu .

The Şehit Ertuğrul School building also suffered from lack of documentation. Hence, the author started to document the building from crash. The building is prolonged in north- south direction and the school building consist three parts. The first part is cubic form with courtyard in the middle surrounded by administration and

classrooms opened to middle courtyard. Second part is linear form from north to south with two floors; the third part is closed play yard, See figure '9'.

Beams and columns are observed as clear elements in the building to show the functionality and strength of the building. The building has horizontal and vertical ribbon openings to introduce the indoor with outdoor and invite natural light inside the building. The sun breakers applied in the structure of the building from eastern façade to provide shading in the façade and enhance the occupant comfort as an element of modern architecture. The building materials used was reinforced concrete and concrete blocks for the masonry. The smooth façade with white color were applied in the façade as a symbol of simplicity based on modernist characteristic. The classrooms have large windows dropped from the slab to middle distance to the ground, invite natural light inside the building. The building has central courtyard to enhance the lighting and interrelation between outdoor and indoor. The sharpness of the edges between vertical and horizontal surfaces, horizontal and vertical lines create rectangular form for the plan with flat roof.

4. Discussion

Theoretical analysis and critics have been applied on both buildings regarding the uses of modernist character in them. The table shows the comparison between both buildings basis on the similar elements used in the both buildings.

Table 1. Shows the comparison of the modern architecture elements between two school building, Developed by Author.

No	Elements of Modern Architecture	Name of Building: Lefkosa Turk Lisesi(1962)	Name of Building: Sehid Ertugrul Ilkokulu(1964)	Remarks
1	Orientation of the building			The direction is weak in both buildings because it should be East- West direction.
2	Clearness of structural elements (Beam and Columns)			Both buildings demonstrated clear structural elements.
3	Sharpness of the edges between vertical and horizontal surfaces			The perpendicular surfaces and sharpness introduced in both buildings.
4	Simple cubic form with flat roof			Both of the buildings metaphor simple cubic shape as design basis.
5	Interrelation between inside and outside for natural lighting			First building more successful in achievement of inside and outside relationship. Second building used corridors adjacent the classrooms.
6	Louvers or over hangs to provide shade in the facade			First building employed vertical louvers in eastern and partially southern façade. Second building used sun breakers only in eastern sides.
7	Material(using concrete ,steel and glass)			Both of the buildings used modern material such as reinforced concrete and white paints as well as transparent glasses for the windows. Second building used exposed stone façade in the entrance.
8	Horizontal and vertical ribbon openings			Both buildings used ribbon windows vertically and horizontally.
9	Courtyards		 	First buildings showed maximum interrelation between inside and outside through merging the outside and inside in interlocking shapes with several backyard and forecourts. The second building introduced closed inner courtyard to the building in first cubic part and in second part the building introduced to outside through corridors.

The findings show that both of the buildings had applied the main characteristic of modernist movement in architecture. Lefkoşa türk lisesi was successful in introducing the building as part of its surrounding through extension of the buildings and penetration in surrounded outside spaces. 'Ahmet Vural Bahaeddin' was aware about the elements of modernism and almost applied them in his building as a sample of 1950's model of modern architecture. The building had some shortage regarding the orientation of the building which didn't respect the climate of this Island and generally should be prolonged by east- west direction. In time we can see the widest façade are in the east- west direction. Şehit Ertuğrul Ilkokulu had been introduced the

modernist architectural elements in the design but it took the vernacular architecture as a source of modernity as what Mediterranean Modernist architecture philosophy claimed (Al-Din, 2017). The central courtyard and opening the rooms toward the courtyard as well as the exposed stones in the façade of entrance are elements of vernacular architecture. The building was not successful partially in the orientation regarding the sun ecliptic same previous building. It has directed in the second part of the building (prolonged one) north to south which exposed the wider façade to the east west direction. The findings show the clear modernist architecture elements in educational buildings in Lefkoşa in first half of twentieth century. The buildings demonstrate that there are defects in respecting the environmental factors because of wrong direction of the building orientation which affected the building thermally and visually. Hence, the finding validates the hypothesis. The Hypothesis supposes that if the educational buildings holds the main indicators and elements of modern architecture from beginning of twentieth century until today, then that confirm the awareness and witness of the city in that period about modernism philosophy in architecture.

5. Conclusion

Lefkoşa as a capital of North Cyprus was one of the modern cities in the beginning of twentieth century. Several modern architectures had been designed by modernist architects that time. Many buildings changed under the order of clients afterward. Governmental buildings were less affected with these deformations and the modernist architecture were appearing in them more than other buildings. The paper conducted two questions to investigate that; how much modernist architecture elements presence in style of educational buildings in Lefkoşa? How modernist elements were functionally succeeded to be introduced in the design? To evaluate the effects of the modern elements for school buildings design on first half of 20th century in Lefkoşa, the paper conducted comparing method between two modern architectural schools in the city of Lefkoşa. Identifying the main elements of modernist movement in architecture generally and see how they introduced in the design. The findings demonstrate that there is a clear modernist architecture in educational buildings inside Lefkoşa returns to the era of modernist movement in architecture for the first half of twentieth century. In the same time there are partial defects in respecting the environmental principles in those buildings which could reduce the efficiency of architectural elements in the buildings. As future study the investigation about another type of buildings (residential, commercial or even other governmental buildings) will fortify the findings of this study.

Acknowledgments

This research did not receive any specific grant from funding agencies in the public, commercial, or non-for-profit sectors.

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Journal Of Contemporary Urban Affairs

2018, Volume 2, Number 1, pages 33–44

Classical Chinese Gardens: Landscapes for Self-Cultivation

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ARTICLEINFO:

Article history:

Received 30 July 2017

Accepted 07 Augusts 2017

Available online 08 Augusts 2017

Keywords:

Chinese landscape architecture;
Chinese garden;
Chinese philosophy;
Ethics;
Aesthetics;
Morality.

ABSTRACT

This paper examines the design philosophy of classical Suzhou gardens in China, with regards to their natural and architectural elements on the moral education of the inhabitants. Through studying the metaphorical connotations of garden elements, the author reflects on their propositions for contemporary environmental ethics, aesthetic appreciation, and moral education. As such, the article is structured around three themes: classical Chinese gardens cultivating environmental ethics, classical Chinese gardens cultivating appreciation of aesthetics, and classical Chinese gardens cultivating moral characters. The essay finally suggests that classical Chinese gardens are landscapes for self-cultivation.

JOURNAL OF CONTEMPORARY URBAN AFFAIRS (2018) ***2***(1), 33-44.

https://doi.org/10.25034/ijcua.2018.3654

www.ijcua.com

1. Introduction

A garden is a form of art that is related to nature as well as culture. One aspect of their perpetual appeal to people is that in a garden, art and science, mind and nature, finally intersect. Many world philosophies or religions regard the planet earth as a garden. Christians believe that the "Garden of Eden" once existed in Mesopotamia of the Near East, and the "Hanging Garden" of Babylon has ever captivated humans' creative imagination. Chinese people then believe that "There is Heaven above, there is Su-Hang below" (Su represents "Suzhou," and Hang for "Hangzhou," two historic Chinese cities with classical gardens). These sayings demonstrate humans' cosmological awareness of the interconnection between gardens and the universe from an earlier time.

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Historically in China, mountains were viewed as connections between heaven and earth, and water as a reflection of the vast emptiness of the universe. As such, mountains and water are two fundamental elements in Chinese landscape architecture, as Confucius (551-479 BCE) contended: "The wise find pleasure in water; the virtuous find pleasure in hills."[1]

Living close to mountains and water was Chinese people's ideal since antiquity. However, a hermit lifestyle might not suit everyone. Thus, they created gardens with rocks and water within the confines of their private homes to be close to nature.

Based on their functions, Chinese gardens fall into three categories: imperial, monastic, and residential. This paper focuses on Suzhou's residential gardens because, of all Chinese cities, Suzhou has the largest number of private gardens, the most beautiful in style (figure 1), and the highest in artistic and construction quality (Keswick, 2003; Shao, 2005; Yuan and Gong, 2004).

A Suzhou garden had always been an integral part of a house, and the Chinese concept of a home is explicitly expressed in the terms *yuanzhai,* meaning "courtyard/garden-house," or *jiating,* denoting "home-courtyard/garden" (Wang, 2005; Yu, 2007). Suzhou had about 270 private gardens of various sizes in the Ming dynasty (1368-1644), over 60 are preserved, 19 open to the public today, and nine are on UNESCO's World Heritage List.[2]

Figure 1. Suzhou Lingering Garden (*Liu Yuan*). Photo by the author 2007

2. Classical Chinese Gardens Cultivating Environmental Ethics

In his essay "The Philosophy of Wilderness," Shane Steinkamp argued that "To protect the nature that is all around us, we must think long and hard about the nature we carry inside our heads" (n.d.). He means that humans must uphold a correct attitude towards nature in order to protect the natural environment, which would require a cultivation of our minds. A Chinese garden is a cosmic diagram revealing a profound view of the world; it is nature in a nutshell that enables one to feel the charm of nature, such as mountains, forest, and springs, without going out of the bustling city.

When designing a Chinese garden, *Feng Shui* had often been applied. *Feng Shui*, literally means "wind and water," is Chinese cosmology for determining whether the potential site would bring health, wealth, or misfortune to the occupants. Dating back some 5,000 years ago, *Feng Shui* can be found in classics such as *Shijing* (Book of Odes), *Shujing* (Book of History), *Huangdi Zhai Jing* (Yellow Emperor's Canon on Houses), and other fragmentary texts in the Western Zhou period (1066-771 BCE).

[1] Confucian *Analects*, Book 6 Chapter 21; translated by J. Legge, 1893/1971, p. 192.

[2] UNESCO's Suzhou gardens list: *Zhuozheng Yuan* (The Humble Administrator's Garden), *Liu Yuan* (The Lingering Garden), *Wangshi Yuan* (The Master-of-Nets Garden), *Huanxiu Shanzhuang* (Mountain Villa with Embracing Beauty), *Canglang Ting* (Surging Waves Pavilion), *Shizilin* (The Lion Grove Garden), *Yipu* (The Garden of Cultivation), *Ou Yuan* (The Couple's Garden of Retreat), and *Tuisi Yuan* (The Retreat and Reflection Garden) (Exploration and Discovery, 2016; Shao, 2005; Yu, 2007; Yuan and Gong, 2004). Suzhou is nicknamed the "Back Garden" of Shanghai as it is only 83 km to the northwest of it, about 30 minutes by high-speed train.

According to archaeological discoveries, *Feng Shui* originated from the rolling hilly regions of the loess plateau of China. Initially it was developed for cave-dwellers to search for ideal cave locations. *Feng Shui* is cultural wisdom accumulated through practices and experiences over a long period of time. Although its concept and principles emerged in Han time (206 BCE-220 CE), its practice became available chiefly during the Tang dynasty (618-907) when the compass, a crucial tool for the practice, was invented. *Feng Shui* has been widespread since the Ming dynasty (1368-1644), and because of it, people's attentiveness to environmental conditions was heightened when selecting sites for cities, towns, villages, temples, houses, gardens, and cemeteries (Knapp, 2005).

To reach the ultimate goal of "unity of heaven and humans" (*tian ren he yi*), the basic *Feng Shui* principle is to select a site "at the right time, the right place, and for the right people" (*tian shi di li ren he*) so as to establish an optimum balance. *Feng Shui* masters suggest carefully and thoroughly observing the surrounding environments, to be in harmony with nature, and to modify and utilize nature to create favorable conditions for human existence and development. Traditionally, a site without a dragon-shaped mountain to the east and a tiger-shaped one to the west would not be considered ideal. The key concept of *Feng Shui* includes *Yin Yang* and *Qi*.

Chinese people have always believed that all natural phenomena were caused by the fluctuations in the cosmic balance of *Yin* and *Yang* (figure 2). In Chinese philosophy, *Yin Yang* balance and harmony is a fundamental concept applied to both nature and human affairs. *Yin Yang* literarily means "shade and light," with the word *Yin* derived from the word for "moon" and *Yang* for "sun." *Zhou Yi* (*Yi Jing*, or Book of Changes), originated in the Western Zhou period (1000-750 BCE), suggests that complementary opposites created Heaven and Earth, *Yin* and *Yang*. When Heaven and Earth intersect and *Yin* and *Yang* unite, it gives life to all things. When *Yin* and *Yang* separate, all things perish. When *Yin* and *Yang* are in disorder, all things change. When *Yin* and *Yang* are in balance, all things are constant.

Figure 2. Suzhou street mosaics showing the *Yin Yang* symbol. Photo by the author 2007

All the Chinese schools of thought held that everything in the universe was made up of the basic material *Qi*. In essence, *Qi* is cosmic energy or a life force; it may also refer to air or breath. Daoists contend that *Qi* arises from the ultimate oneness, *yuan qi*, and evolves into a twofold primeval structure: *zheng qi* ("positive spirit") and *xie qi* ("negative spirit"). The design of a Chinese garden guided by the philosophical ideas of Daoism, Confucianism, and to a lesser extent, Buddhism, is to promote the positive spirit and eschew the negative one.

The word *Dao*, literally means "way," refers to the natural law and the method of proper conduct, if the world was to run harmoniously. For Daoists, this word may symbolize the totality of all things and their transformative processes of past, present, and future. In Chinese gardens, the concept of *Dao* is symbolized by placing huge standing rocks in a pond or courtyard because rocks are not only representations of the *Dao*, but also part of the web of life subject to the inevitable process of decay in time (Keswick, 2003; figure 3).

Figure 3. Rocks at Suzhou Lion Grove Garden (*Shizilin*). Photo by the author 2007

A further contribution that Daoists made to garden art grows out of this idea of *wu wei,* meaning "inaction" or "non-action" contrary to nature. In his timeless guide on the art of living, *Dao De Jing*, Laozi (c.571-471 BCE) explained it: "Less and less do you need to force things, until finally you arrive at non-action. When nothing is done, nothing is left undone" (verse 48, translated by S. Mitchell, 1999). This notion has a profound implication for today's world because our contemporary global culture shows that humans attempt to conquer and control nature with little concern for the effects of their actions on the earth, which has resulted in environmental crisis and climate change observable everywhere in the world (Zhang, 2009).

Confucius then believed in agriculture as the basis of the state and looked back to the golden age of the mythical farming Emperors Yao and Shun, when refinement and simplicity were in perfect balance. This Confucian ideal found expression in classical Chinese gardens, side by side with Daoist mystical notions of immortality. So, behind a magic mountain, it is usual to find a country cottage surrounded by an orchard of apricots (Keswick, 2003).

Chinese people found Daoism and Confucianism both valuable, and applied them side by side: while the geometrical and hierarchical plan of a classical Chinese courtyard house mirrored the Confucian desire to be in "harmony with humans," the organic and spontaneous layout of a classical Chinese garden followed the Daoist principle of "harmony with nature" (Exploration and Discovery, 2016; Keswick, 2003).

Buddhism first came to China from India during the 1st century AD (Ching, 1993; Kohn, 2008). The Buddhist concept of the universe centers on an astonishing central peak (Mount Meru or Sumeru) that fits in well with Daoist mountain worship. Amitabha's "Paradise Garden" with its emphasis on mountain ranges separated by oceans mirrors the "Magic Dwellings of the Immortals." Another important Buddhist imagery in a Chinese monastic garden is the pagoda standing high above the rest of the structures. Buddhism has also added an important new theme: instead of Daoist wandering alone in the mountains, Buddhists have often joined together to enjoy the fruits of solitude, an ideal of a monastic community life, in which people sought spiritual enlightenment together (Johnson, 2017a; Keswick, 2003; Porter, 1993).

3. Classical Chinese Gardens Cultivating Appreciation of Aesthetics

In his book, *The Nature of Design*, David Orr (2002) observed that "buildings and landscape reflect a hidden curriculum that powerfully influences the learning process" (p. 127). He suggests that the design of buildings and its landscapes, along with the materials used for building them, have educational functions: they can teach people to appreciate the beauty in the design, and the eco-friendliness of the materials applied. To do otherwise will be like what Rene Dubos argued: "The worst thing we can do to our children is to convince them that ugliness is normal."

The connection of gardens with education has long been a tradition worldwide (Zhang, 2009), and the Peking/Beijing University's main campus (Yan Yuan) is considered one of the finest examples of integrating classical Chinese garden design into a higher educational setting. Both the Museum of Chinese Gardens and Landscape Architecture, and the Beijing

Planning Exhibition Hall, have displayed the campus' original plans.

Classical Chinese residential gardens have also tried to incorporate a little of every experience on an aesthetic level. The Qing-dynasty writer, Shen Fu (1763-1825?), put it explicitly: "The aim is to see the small in the large, to see the large in the small, to see the real in the illusory, and to see the illusory in the real" (Keswick, 2003, p. 213; Shao, 2005, p. 5; Yu, 2007, p. 245).

Classical Chinese garden designs have always integrated the aesthetic theory of *xu shi*, which can be interpreted in numerous ways. *Xu* may denote "void, virtual, potential, unreal, intangible, formless, or deficient," while *shi* may signify "solid, actual, real, tangible, formed, or full" (Zhang, 2013/2016, p. 54).

The application of *xu shi* to Chinese garden design is revealed in an unlimited series of opposite qualities played off against each other: a dark narrow corridor between two high walls followed by a wide space full of sunlight, void in solids, solids in a void, small leads to big, low to high, and the like (Keswick, 2003; Shao, 2005; Wang, 2005; Yu, 2007).

Due to its warm southern climate and favorable natural conditions for growing lush green woods, Suzhou is a place where "one can enjoy landscapes without going outside the city, and live in busy streets with the sights of forests and tastes of spring water" (my translation). Suzhou thus was praised as a "City of Gardens" and "Paradise on Earth." In imperial China, retired officials, literati, and wealthy merchants would like to settle in Suzhou, resulting in its prolific number of outstanding talents and renowned celebrities (Zhang, 2013/2016).

Ming-dynasty garden designer, Ji Cheng (1582-c.1642), who was a Suzhou native, wrote *Yuan Ye* (*The Craft of Gardens*, 1631), which is the first monograph dedicated to landscape architecture, and which has been translated into many different languages (Hardie, 1988/2012). A famous passage from it reads: "Although the gardens are created by the human hand, they should appear as if the work of nature."[3]

Another celebrated volume on Chinese landscape architecture is the 12-chapter *Zhang Wu Zhi* (*Treatise on Superfluous Things*, 1621) by Wen Zhenheng (1585-1645), who was also a Suzhou native and a Ming-dynasty scholar, painter, garden designer, and great grandson of Wen Zhengming (1470-1559, a famous Ming-dynasty painter). While *Yuan Ye* focuses on gardening techniques and plants in southern China, *Zhang Wu Zhi* concentrates on the enjoyment of garden views and plants in northern China.

Chinese garden designers intended to recreate the effect of totality of nature in a generally small space of a private garden to represent nature's infinite change and mystery, and to provide seclusion. There were no planning guidelines for Chinese gardens: organic, spontaneous, and asymmetrical were the main characteristics. In its overall layout, the garden designers paid special attention to the terrain, sight, and views.

The Chinese word for landscape is *shan shui*, which literally means "mountains and water," because Chinese people have observed that where there are mountains, there is bound to be water in the same place. As such, rocks and water constitute the most basic Chinese garden elements, followed by trees, flowers and herbs, walls, gates and windows, pavilions and pagodas, winding corridors, zigzag bridges, footpaths, and so on. Each element has its metaphor, with layers of meanings.

Rocks come from mountains, and mountains symbolize eternity. Chinese people love rocks by placing them in their gardens to gain immortality. Opening on all sides, rocks allow the viewers to see things behind, thus suggesting insight and wisdom (figure 3).

The heart of a Chinese garden is water (figure 4); along with rocks they form a unity between dynamic and static, and horizontal and vertical

[3] See, for example, Exploration and Discovery, 2016; Shao, 2005, p. 5; Yu, 2007, p. 265; Yuan and Gong, 2004, p. 116.

elements, representing *Yin Yang* in perfect harmony.

Figure 4. Water at Suzhou Lion Grove Garden (*Shizilin*). Photo by the author 2007

To Daoists, the mountain here represents the masculine *Yang*: upright, bright, hard, and bony. By contrast, water in its *Yin* aspects is receptive, soft, wet, and dark. The pair takes on further meaning when we remember the ancient legend that rivers are the arteries of the earth's body, while mountains are its skeleton (Keswick, 2003; Yu, 2007; Yuan and Gong, 2004).

To Confucians, however, the *Yin Yang* relationship of mountains and water is reversed: water is regarded as the active *Yang* principle expressing itself in swiftly moving torrents, while mountains as the passive and reflective *Yin* principle because they remain motionless and fixed.

The wall plays the most critical role in a Chinese garden, for it is not only the most common device for separating different areas, but also provides quietness and seclusion, serving as a backdrop for the vibrating shadows of bamboos or plum trees. As the sun shifts, different patterns are cast on the wall, changing its perception of depth and solidity. These walls are a suggestion of infinity (Keswick, 2003; Knapp, 2005).

A "moon gate" is a common shape to denote perfection (figure 5) since a circle focuses the eyes like the lens on a camera to intensify and concentrate all that is revealed behind. In addition to moon gates, the holes in garden walls are found in a variety of shapes and metaphors, of which the most common are in the forms of flowers, petals, leaves, fans, shells, gourds, or vases (figures 6 and 7). Windows in a classical Chinese garden can be even more fanciful in shape and theme because their function is purely decorative (figures 1 and 3).

Figure 5. Moon Gate at Suzhou Humble Administrator's Garden (*Zhuozheng Yuan*). Photo by the author 2007

Figure 6. Flower-shaped Gate at Suzhou Lion Grove Garden (*Shizilin*). Photo by the author 2007

Figure 7. Gourd-shaped Gate at Suzhou Calm Garden (*Ding Yuan*), behind which is the Tea House. Photo by the author 2007

The pavilion is the focal point of a classical Chinese garden and a delightful resting place where visitors can sit for a quiet talk or contemplation (figures 4 and 8). The roofed and open-sided gallery corridors wind up and down the site, connecting pavilions and gateways, at the same time dividing up the space like a screen (figure 9). They unite the garden as a whole and serve as a frame for viewing the garden and as a sheltered walkway. Walking through the corridors is like being inside and outside at the same time (figures 9, 10, and 11).

Ancient Chinese people believed that all evil spirit travels in straight lines. To prevent this, they built garden bridges in zigzag shapes (figure 8). The paths made of stone, brick, or pebble mosaic would have a variety of patterns and themes to harmonize the different occasions on a garden walk (figures 2 and 12).

Libraries and study rooms were an integral part of nearly all classical Chinese gardens. Their owners' time was often spent practicing calligraphy and writing poetry, often in the company of family or friends. Such rooms were usually secluded and surrounded by private courtyard gardens to protect the readers and give them a pleasant view to look out.

Figure 8. Pavilion and zigzag bridge at Suzhou Humble Administrator's Garden (*Zhuozheng Yuan*). Photo by the author 2007

Figure 9. Covered corridors at Suzhou Humble Administrator's Garden (*Zhuozheng Yuan*). Photo by the author 2007

Figure 10. Festival corridors at Suzhou Calm Garden (*Ding Yuan*). Photo by the author 2007

Figure 11. The Little Flying Rainbow Bridge at Suzhou Humble Administrator's Garden (*Zhuozheng Yuan*). Photo by the author 2007

Figure 12. Suzhou Canglang Ting (Surging Waves Pavilion). Photo by the author 2007

4. Classical Chinese Gardens Cultivating Moral Characters

Classical Chinese gardens did not only represent the owners' appreciation of the aesthetics of nature, they can also be settings for peaceful contemplation and self-cultivation. Confucius advocated a moral person (*junzi*) to uphold the positive aspects of life and restrain the negative to maintain a harmonious living, with symbolic elements that can be found in Chinese gardens. For example, Confucius praised the harmonious aspect of water and recommended it for its moral character, as he suggested: "In a water level, the water is in a most perfect state of repose. Let that be your model. The water remains quietly within, and does not overflow. It is from the cultivation of such harmony that virtue results" (*Zhuangzi* [Chuang Tzu], chapter v, p. 68; translated by H.A. Giles, 1981).

Likewise, in his *Dao De Jing*, Laozi commented: "The supreme good is like water, which nourishes all things without trying to. It is content with the low places that people disdain. Thus, it is like the *Dao*" (verse 8, translated by S. Mitchell, 1999). It is true that classical Chinese gardens did not build fountains because it would force water to do things against its nature.

In Suzhou's Garden of Cultivation (*Yi Yuan*), a waterside pavilion was named Longevity Pavilion (*Yan Guang Ge*), inspired by the renowned Western-Jin-dynasty (AD 265-316) scholar Yuan Ji's phrase: "Cultivation of one's mind brings about longevity, which enables one to be as admirable as the great nature" (Yuan and Gong, 2004, p. 170).

In historic China, wars between different nation states were so frequent that people lived in an unstable, transient world. As a result, the thoughtful withdrew themselves, becoming ingrained within the safe barriers of the inner life against outward misfortunes, making their happiness depend entirely on their inward state (Liu, 1989; Wang, 2005). A garden in the minds of Chinese is a retreat from the outside world, a place where they could gain harmony, a symbol of stability in the transitional world.

In southern China, such as the City of Suzhou, where the climate is generally warm, scholars and artists would regularly meet in private gardens where they could actively socialize, quietly contemplate, philosophize, study, compose and read poetry, paint, play chess and games, drink tea or wine, pick herbs for medicine, make elixirs in pursuit of immortality, and the like. Many of these fashionable pastimes were practiced well into the Song (960-1279), Ming (1368-1644), and Qing (1644-1911) dynasties (Wang, 2005, p. 77).

Classical Chinese gardens have also been the places for family festivities, elaborate dramatics, domestic affairs, growing herbs and trees, and millet and tea, as well as literary retreat. Private Chinese gardens were thus products of wealthy

merchants, poets, painters, and scholars, who had all contributed to the theory and practice of garden design.

The unfolding of a classical Chinese garden vistas is often like a Chinese landscape scroll painting, when enjoying tea, poems, and flower arrangements, or playing musical instruments, one gains the most natural inspiration. Classical Chinese gardens thus functioned as spiritual refuges and facilitated a cultured way of life (Zhang, 2013/2016).

Chinese people value plants as symbols of ideas and moral qualities according to their symbolic associations recorded in *Shi Jing* (Book of Odes). Plants discovered in the 19th and 20th centuries without historic associations could not win a lasting place in the hearts of Chinese, and hence tended to be considered unsuitable for their gardens (Keswick, 2003; Yu, 2007; Yuan and Gong, 2004).

It is the forms of nature that suggested ethical ideas to Chinese philosophers: trees and flowers were not only illustrative of aspirations, but the source of them. Aged pines thin and bent with the struggle to survive, were like glorious virtue. Bamboos that can be broken but can never be bent signified a Confucian moral person (*junzi*). Both are evergreen, together with the blossoms of plum tree, they comprise of the celebrated "Three Friends of Winter" (*sui han san you*).

In the 18th century, Qianlong Emperor (1711-1799) praised the moral implications of plants and water in the following lines:

When I find pleasure in orchids I love uprightness;
When I see pines and bamboos I think of virtue;
When I stand beside limpid brooks I value honesty;
When I see weeds I despise dishonesty.
(Translated by M. Keswick, 2003, p. 191)

Magic was an important element in Chinese attitude towards trees and plants, and it became associated with certain kinds of flora. Holiness and health value became inseparably linked: a medicinal leaf was thought of as a holy leaf, and thus considered as beautiful (Keswick, 2003; Knapp, 2005).

Chrysanthemums were first grown for their medicinal qualities, and became an important ingredient in the life-prolonging elixir of Daoists. Their usual flowering season in the autumn have promoted their connection with longevity because they bloom when everything else is dying off.

Peach represents spring, marriage, and immortality, and is a traditional symbol for longevity, which is commonly used for birthday celebrations. Pears signify a more modest longevity as the trees are known to have lived 300 years.

Lotus is seen by Confucians as a model for the moral person (*junzi*) and is expressed in the phrase: "It emerges from muddy waters yet remains uncontaminated" (*chu yu ni er bu ran*). For Buddhists, the lotus is the symbol of the soul struggling up from the slime of the material world, through water to find final enlightenment in the free air above. Lotus is among the most useful of all decorative plants. Their tubers, eaten raw or cooked, are sweet-tasting, crisp and juicy. A starch can be made from them which is readily digestible and usually given to the sick. The seeds can be added to soups or used to make a sweet paste, often used in moon cakes. The leaves are used for flavoring and wrapping things up (Keswick, 2003; Wang, 2005; Yuan and Gong, 2004).

Peony, or *mudan*, in Chinese culture is the embodiment of aristocracy, wealth, and beautiful women. A peony-growing industry developed in China, producing ever finer and more usual variations, but even the most ordinary bloom stood for riches and honor (Keswick, 2003; Knapp, 2005).

The flexible grace of willow trees swaying in the wind suggest images of lovely ladies, and the association of willows with water, and water with women, reinforce this idea. Willow tree leaves are also used to make tea and relieve rheumatic pains and bruises. Chinese parasol or phoenix trees (*wutong*) are often painted in Chinese landscape paintings to signify noble aspirations (Cultural-china.com, 2007-2014; Keswick, 2003).

Thus in classical Chinese gardens, the symbolic meanings of natural elements often seem more important than the elements themselves. The occurrence of such cultural meanings and metaphors indicate that these places are meant to be read as sacred spaces occupying two worlds at once. By immersing oneself in such spaces, one may grow in awareness of the *Dao*'s eternal transformation (Keswick, 2003; Yuan and Gong, 2004).

The author has observed during her 2014 and 2017 trips to China that, there are growing numbers of green spaces and street gardens in Beijing now than in the past (e.g., 1980s-2000s). These greening efforts have not only lessened the dusts in Beijing's Springs, but also contributed to the beautification of its urban scenes, and the cultivation of people's spirit, since Chinese people still hold that the beauty of nature can help shape moral character. As Zhang Chao stated:

The plum tree leads a person to loftiness, the orchid to quietness, the chrysanthemum to unpolished simplicity, the lotus to contentment,….the peony to heroism, the canna to gracefulness, the pine to leisure, the phoenix tree to clarity, the willow to sensitivity. (Meyer, 2001, p. 234)

A professor at Sichuan Normal University also wrote: "Beauty is the bridge which leads to morality….appreciation of the beauties of nature, artistic creativities, or experiencing the beauty of human nature in a social context – all these lead to a purification of the spirit" (Meyer, 2001, p. 234).

5. Conclusions and Contributions

This essay introduced classical Chinese garden design philosophy and their metaphorical use of natural and architectural elements to enhance people's environmental ethics, appreciation of aesthetics, and moral characters. Metaphor as a medium of reflection is fundamental to our search for meaning, and it helps make sense of the world in which we live (Perry and Cooper, 2001). However, the limitation to the use of metaphor is in the cultural milieu from which it originates. The paper is therefore necessary for people from different cultural backgrounds to comprehend the profound meanings in classical Chinese garden design elements.

While the paper is structured around three themes, its focus is on the influence of Daoism, Confucianism, Buddhism, and *Feng Shui* cosmology on classical Chinese garden designs. Confucian promotion of a moral person (*junzi*) is still relevant today as it has often been observed that contemporary Chinese society lacks a moral compass (Johnson, 2017a, 2017b), as exemplified by misconducts such as making unsafe food or tainted infant formula, and especially the recently reported pedestrian ignorance of deadly traffic accidents in cities, and so on.

Of all the 81 verses in *Dao De Jing*, it is evident that there is the spirit of equality of all creatures, of non-domination, and of environmentalism. Daoism gives humans a responsible and modest place in the universe, which is a promising beginning for creating environmental ethics (Johnson, 2017c; Miller, 2017). The current global environmental crisis is largely due to human overemphasis on industrialization, economic, and technological developments (Zhang, 2008, 2009). Through merging oneself with classical Chinese gardens, one may comprehend these philosophical teachings and gain wisdom, which may help summon our efforts to remake the world into a "Paradise Garden" again.

Finally, the author would like to highlight the contributions of the paper with a poem she composed, entitled "The Song of the Dao":

Bright sun shine in your way
Gentle moon light in your way
The way you shine, the way you light
Is the way and let it be
Lofty mountains stand in your way
Soft rivers flow in your way
The way you stand, the way you flow
Is the way and let it be
Little trees grow in your way
Pretty flowers bloom in your way
The way you grow, the way you bloom
Is the way and let it be

Thus, everything in this world
Has its natural course
The path each one takes
Is the way and let it be

Acknowledgements

This essay is fully revised and updated from the author's M.Ed course paper at Brock University in Canada in 2004. The photos were taken during her field trip to Suzhou, China in 2007 for her Ph.D studies at Oxford Brookes University in the UK. Thanks are due to Dr Milree Latimer for her review of the paper in 2004, as well as the journal's anonymous reviewers and editors. The author is also grateful to her late father, Junmin Zhang, and mother, Suzan Xiuzeng Li, for their unconditional support throughout the studies.

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Journal Of Contemporary Urban Affairs

2018, Volume 2, Number 1, pages 45– 54

Evaluating energy consumption in terms of climatic factors: A case study of Karakol residential apartments, Famagusta, North Cyprus

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ARTICLEINFO:

Article history:

Received 23 July 2017

Accepted 23 August 2017

Available online 23 August 2017

Keywords:

Residential Apartments; Energy Consumption; Climatic Factors; Famagusta.

ABSTRACT

Throughout the past few decades, research has demonstrated that climatic factors are some of the most important issues to be considered in respect of energy consumption in buildings. Climatic factors, therefore, directly influence the economic sector. In order to study the impact of climatic factors in Karakol residential buildings in terms of energy consumption, an evaluation of the studies (literature survey) effected in relevant climates, and the analysis of the existing buildings according to these studies is essential. This represents the aim of this research and the other is to present design strategies for minimizing the negative impact of climatic factors on energy demand in these buildings. To approach the research objectives, the climate of the region was initially investigated. In an attempt to evaluate some of the current housing in the Karakol district of Famagusta in terms of the climatic factors, three types of residential apartments were identified and evaluated through observation, interview, and also by the distribution and complication of qualitative and statistical questionnaires to and by the occupants of the apartments. In this paper, basic climatic problems, as a result of which lead to increased energy consumption in residential apartments in respect of heating and cooling were identified and reported.

JOURNAL OF CONTEMPORARY URBAN AFFAIRS (2018) ***2***(1), 45-54.

https://doi.org/10.25034/ijcua.2018.3658

www.ijcua.com

1. Introduction

In most societies such as United States (EIA[1], 1999) and also India (Indraganti, 2010) the use of energy in residential buildings for heating and cooling which provides thermal comfort, is one of the highest consuming sector. Providing comfortable and adequate working conditions for occupants in buildings necessitate the need to control the climatic factors of the building.

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For instance, the issues of temperature control, humidity, lighting and ventilation require the utilization of energy. On the other hand, successful energy conservation is achieved by aiming for the least possible energy consumption and this will be achieved through the support and awareness of both the architect and the resident (Landsberg & Stewart, 1980, p.3-5).

As is demonstrated by the research, energy consumption can be influenced by climatic factors such as temperature, winds, moisture or precipitation and many other factors, so these factors equally and directly have influence on the economic sector and present a major problem in residential apartment buildings, which are generally chosen by people with lower incomes, who wish to have less expensive housing, but who, in fact, because of inappropriate design features and up paying out more than in necessary for energy consumption.

Buildings are comprised of two parts: the interior and the exterior surfaces (roof, external walls, glazing, and floor). Climatic factors impact on the exterior surface of buildings and the energy transmission because of the difference temperature and also surface transmission coefficient will be done by these exterior surfaces (Landsberg & Stewart 1980, P.16-20). In the US between the years 1973–1984, the sudden increase in energy costs attracted the attention of architects to the issue of energy management in buildings. As a result of this awareness and focus, the energy efficiency of buildings greatly improved in respect of improving the design and functioning of windows, roof and wall insulation, and heating and cooling systems, etc. (Galloway, 2004, p.182).

As a result using appropriate materials in external walls and design methods for the existing climatic condition factors is essential. A literature survey on the residential buildings in the relevant climatic condition was carried out to identify typical designs developed in respect of climate. The construction of buildings as per climatic factors is an excellent case for addressing the issue of energy consumption efficiency.

2. Methodology

Qualitative and qualitative approach methods have been used in this research and the techniques applied are those of personal observation, in depth interviews, administered qualitative and statistical questionnaires with closed-end questions, review of related literature, and internet sources.

In general the most significant important factors that impact on energy consumption are: location and climate data of the building, orientation of the building, installed materials, building design and the selecting of the technical systems (Leskovar, & Premrov, 2011).

This study attempts to survey some of these items due to literature review and as aforementioned three residential apartments have been identified in the Karakol district which is shown in figure 2. Analyzes have been done through interviews and questionnaire with the occupants of the Karakol district.

3. Climate zone survey

The district of Karakol in Famagusta has a transition climate, which lies between a composite and a hot, humid climate, however because of proximity to the sea it is called hot-humid climate (Özdeniz and Hançer, 2005; Hançer, 2005).

4. Literature survey of the relevant climate on buildings

In order to evaluate the impact of climatic factors on residential buildings in Karakol_ in terms of energy consumption, it is necessary to survey_ the literature review and analyze the buildings in this area.

4.1 Orientation

Oktay's (2002) evaluation of the vernacular housing in Northern Cyprus, which were adapted for the hot and humid climate, offered useful suggestions such as orienting living spaces towards the south using light colors on the external walls and roofs in order to reflect the sunshine, using a narrow plan with opposite windows in order to create cross-ventilation and thus creating and designing more sustainable conditions for new buildings.

According to Givoni (1994) creating cross ventilation in buildings with two openings in different walls (one of which is facing to the wind direction) for all the rooms in a hot-humid climate is very useful. Providing these openings for each room in buildings especially apartment buildings, but ensuring the free flow of air between all rooms in the buildings is essential.

Aksugur (1996) study examined four cities in Cyprus with four different climates, he and also Thomas (2002, p. 156-158) in his book made some recommendations for minimizing the energy usage in buildings in a hot-humid climate. Buildings in this climate would be oriented with

the longest sides toward north and south with openings for ventilation and they would also have walls to provide shade and external opening by using wide eaves and deep verandas. The ventilation of roof space for minimizing the high solar radiation was also included in their recommendations.

Hot and humid climates usually require air conditioning in order to provide thermal comfort. This process requires energy. Energy performance in buildings refers to the ability of a building to function with minimum energy utilization. This thermal comfort could be improved by creating sufficient microclimate strategies in the surrounding area of the buildings (Zain, Taib, & Shah Baki, 2007).

Acceptable air speed depends on the environment temperature and humidity. At a temperature below 33e°c, an increase in air speed will decrease the heat sensation (Givoni, 1998, p.17). According to the data for Famagusta's climate (Aksugur, 1996) which is shown in figure 1, the air speed process will make the residential spaces in Karakol comfortable.

Figure 1. Average minimum and maximum temperatures for Famagusta over the year (retrieved from url1, 01thapril, 2015).

4.2 Materials

4.2.1 Roof and floor

The Ozdeniz & Hançer (2005) Study examined 14 different types of roof construction, which is used in the hot-humid climate of Cyprus in terms of energy loss and gain. The sloped timber roof with ventilated attic space and inner thermal insulation materials proved to be the best choice for this climate to avoid building up heat in summer.

For the hot and humid climate minimizing the conductive heat gain in the summer (Aksugur , 1996) by using a ventilated double roof with aluminum foil which is attached above the ceiling is essential (Eco-housing mainstreaming, 2009, p.14; Dinsev & Mohd, 2004). In this respect, the roofs with thermal insulation performed the most efficiently.

Coch's (1998) study investigated several typologies of the vernacular dwelling depending on the climate. One such evaluation was carried out in a hot and humid climate. In this climate the roofs are broken constructed so that the hotter air is held at the top along with and an opening for circulating the air in order to avoid_ overheating. These steep slopes_ also provide useful drainage for the frequent rains. The floors are raised to better receive the breezes and are permeable to the air, so in this way the-ventilation facility of the whole envelope of the house is complete.

4.2.2 Windows

Windows and other glazed areas are weak in respect of the transfer of unwanted heat. The resistance of the glazing material, the number of glazed panels, the air spaces between, and the design and detail of the frame affect the insulation value of the glazing unit. (Watson & Labs, 1983, p.171).

Windows, as a significant part of a building's external surface can heat spaces through the glass: the best glass_ is transparent so that the light can reflect the heat. The best reduction of glassing in solar gain is Tri-pane-plate (30% reduction of solar gain) compared with plate glass, double pane-ordinary and double pane-plate (Landsberg & Stewart, 1980, p.30-31; Galloway, 2004, p.21).

Aksugur's (1996) suggestion for hot climates was double-glazing with wooden frames or aluminum frames with thermal break type.

The thermal quality of different types of glass varies; low E double glazing is the standard type and triple glazing is more commonly used for residential buildings. However the perfect glazing systems are those that can react flexibly to the changing incoming radiation quantities and interior conditions by using a movable louvre between the panes of the double or triple glazing units (Hegger et al., 2008 p. 91-97).

4.2.3 Shading

The outcomes of the shading study (Aksugur, 1996; Galloway, 2004, p.19-25) shows that rooms with windows which are located on the south side of a building become hot in summer. In order to combat this problem a permanent awing could attached to the building for shade.

4.2.4 External walls

Hot climates such as Cyprus are excellent for providing passive solar heating (Lapithis, 2004) but a balance is required between heating and cooling in order to prevent overheating and discomfort in summer. In order to achieve this elements of such a dwelling are double- paned glass on the south side where the living spaces are located, the use of mass material such as concrete, brick and stone for storing up the sun's energy as thermal mass, using windows and doors or maybe fans for convicting the heat throughout the house. (North Carolina Department of Commerce, 1999, p.5-6; Givoni, 1992). Thermal mass just stores the heat and does not work as an insulating material (Eco-housing Mainstreaming, 2009, p.3).

4.2.5 Insulation

Thermal insulation in buildings not only reduces the need for air-conditioning, but also reduces the annual energy cost. In all climates walls and roofs must be insulated in order to reduce the heat transmission. Moisture has negative effects on the insulating efficiency of material (Smith, 2005, p.69). Due to the negative impact of moisture on thermal insulation over time it must be controlled in buildings with the use of ventilation or other means (Al-Homoud, 2005).

Roofs provide the main heating for living spaces as a result of radiation. In order to reduce overheating in summer the roof must be protected by the appropriate insulation to provide the desired U-value (thermal conductivity) (Eco-housing Mainstreaming, 2009, p.18).

Data Collection, Sample Size, and Analysis

Random sampling techniques were adopted for this study, in the form of three apartments with two, four and six division of floors (Figure 2) and the occupants were interviewed to obtain their opinion about their energy usage and its cost. These apartments were analyzed in respect of their orientations, their spatial arrangements, their dimensions, surface finishes, construction materials used, and types of glazing.

A statistical questionnaire survey was administered to 100 inhabitants in various apartments within the Karakol district. The questionnaires were completed by the respondents within a specified period and collected. Out of 100 questionnaires 80 were retrieved from the respondents.

Therefore, this data analysis will make use of 80 questionnaires. The data contained in the questionnaires was used to guide the researcher in his findings and to support accurate results.

5. Data Collection, Sample Size, and Analysis

Random sampling techniques were adopted for this study, in the form of three apartments with two, four and six division of floors (Figure 2) and the occupants were interviewed to obtain their opinion about their energy usage and its cost. These apartments were analyzed in respect of their orientations, their spatial arrangements, their dimensions, surface finishes, construction materials used, and types of glazing.

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5.1 Evaluation of three residential apartments

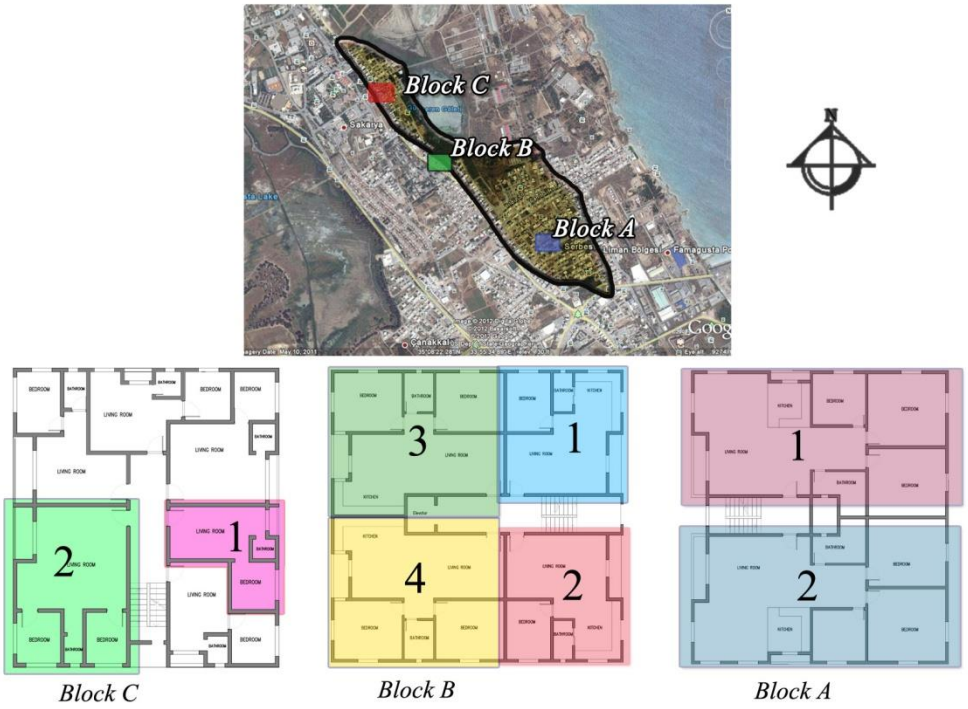

Figure 2. Position of three residential apartment in Karakol area for surveying (Retrieved from URL 2, 13thmarch, 2016), and also plans of three sample apartments; from left to right. Uzun apartment Merkez, Uzun apartment 10, Muçize apartment (drawn by author).

5.1.1. Orientation

Table 1 demonstrates the features of selective units in Uzun apartment 10 and Muçize apartments (Figure 3 & 4).

An analysis of the electric bills over a 4 month period (January, February, March, April) and by conducting personal interviews with the occupants of the buildings within the –same area and with the same number of occupants showed that the occupants located on the North and North-East sides of these buildings consumed more energy, than the occupants or users on the South and South- East side of the building. This means, of course, that they pay more for their energy in winter. In addition, photographs of the exteriors were also recorded, as shown in Figure 3 &4.

Table 1. Feature of selective units (area, orientation and also number in household).

	Area m^2	**Number in household**	**Orientation of the units**	**Position of living room in each unit**
Block A, Unit 1	150	3	North	North-West
Block A, Unit 2	150	3	South	South-West
Block B, Unit 1	60	2	North-East	East
Block B, Unit 2	60	2	South-East	East
Block B, Unit 3	80	3	North-West	West
Block B, Unit 4	80	3	South-West	West

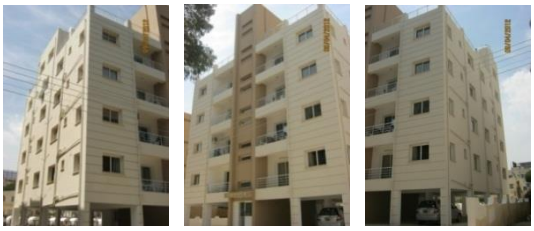

Figure 3. From right to left. North, South and East facade of the Uzun apartment 10 (research's field study, taken by author, 2016).

Figure 4. From left to right. West, North, South façade of the Muçize apartment (research's field study, taken by author, 2016).

5.1.2 Ventilation

By analyzing the selective plan of Karakol buildings, it was observed that the prevailing wind in summer, which comes from the South cannot reach some of the units, therefore these buildings become overheated in summer. As is shown in Figure 5 block C, unit 1 does not have opposite windows so the air cannot circulate in the space especially in living room and during the summer the space becomes overheated and the occupants are required use the air conditioning during May and June, when it should not normally be necessary to do so.

Figure 5. Movement of wind in block C, & block B.

5.2 Evaluation of Karakol residential apartments

5.2.1 Glazing type

From the research study as indicated in the pie chart (Figure 6), it was observed that 75% of the glazed units in the Karakol district are single glazing; this drastically increases the energy consumption as energy escapes from the space during heating or cooling (Landsberg & Stewart 1980, p.31). This factor will increase the cost and monthly energy consumption of these buildings.

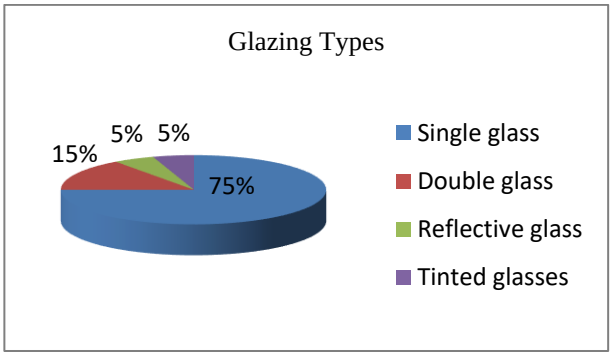

Figure 6. The above pie chart shows the different glazing types in Karakol residential buildings.

5.2.2 External wall material

As it shown in figure 7, the research indicated that most of the external wall materials [about 45%] in these buildings are composed of brick. It was also established that there was no isolation in the walls of the building, which considerably increases the energy usage.

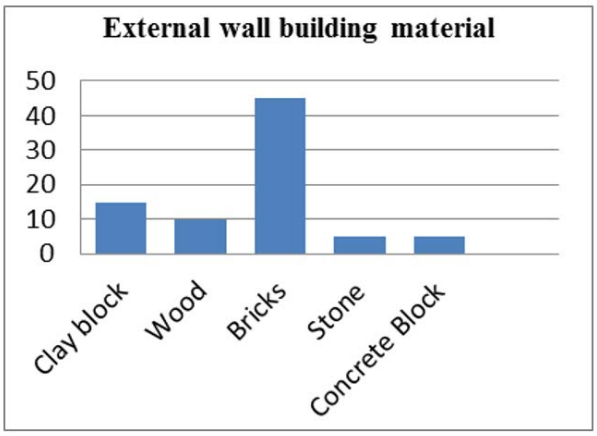

Figure 7. The above bar chart illustrates the external wall building material in the Karakol residential buildings.

From the perspective of embodied energy, brick provide good thermal mass, but it must be well insulated in order to avoid moisture collecting especially at the intersection point between the windows and the walls and in order to prevent heat transfer (Eco-housing Mainstreaming, 2009, p.3). In the research study it was also noted that the total energy consumption is primarily dependent on the conductivity value of the insulating materials in the walls.

5.2.3 Wall thickness

Figure 8 illustrates the effect of wall thickness on the energy consumption of these buildings. It was observed from the survey that all the buildings wall thicknesses are about 25 cm (60%). It was also noted that the walls are not insulated and, therefore will not, store or retain energy in the external or internal spaces of these buildings following heating or cooling.

"Moisture in a building component always increases the transmission because the thermal conductivity of water is 0.6 W/MK. Normally present in the air in the form of water vapor, it infiltrates the insulation and owing to the temperature difference can condense there, which reduce the insulating effect and frost damage. So insulating materials should be protecting against moisture" (Hegger, et al., 2008, p.149).

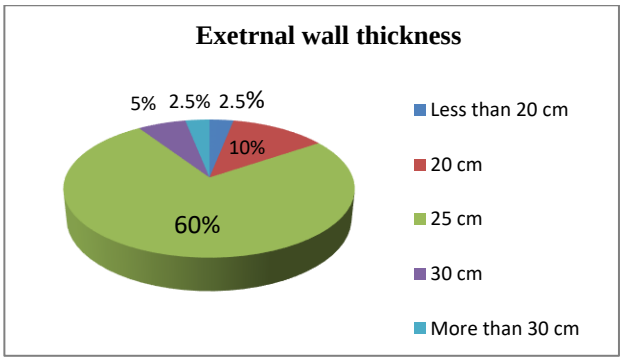

Figure 8. The above pie chart illustrates the external wall thickness in the Karakol residential buildings.

This indicates that wall thickness has little impact on the annual energy consumption. This suggests that building designers should focus on alternative strategies, some of which are contained in this research study, to achieve more significant reductions in the total energy consumption. Furthermore, incorporating thicker walls in the initial building design and planning stages would seem more appropriate than the saving in running cost due to the reduction in the overall energy use.

5.3 Height of buildings

The most significant things that the researcher observed about the buildings in the Karakol district is that in some of the buildings due to their poor orientation, height and distance between them only some parts of these buildings receive direct sun at noon, whilst others receive it during the morning and/or evening. Furthermore, and also as a result of dividing the building plan into four or more, only one side of the buildings gets the best wind for thermal comfort, which leads to a reduction of energy consumption in summer.

5.4 Shading

The researcher also observed that most of the buildings do not have any shading devices or awnings on the south façade and, consequently, the sun's rays enter these buildings directly at certain times in summer. As a result of this the apartments become too hot for the occupants and the air conditioning is required for cooling purposes which results in an increase in the energy costs.

5.5 Construction details

It was also discovered that the intersection points (window-wall, ceiling-wall) were influenced by moisture, which also leads to increases in heat transmission.

5.6 Roof construction

The researcher also noted that the flat roof construction of these buildings, which also have no attic space, more readily permits the direct entry of the sun's rays into the building, which, in summer, creates an overheated living space, which is not at all appropriate for this hot-humid climate.

5.7 Building regulation

From the research carried out and as a result of an interview conducted with two professional architects who study environmental control and climatic design in Famagusta, it was established that there are no specific buildings regulations, codes or guidelines in this city in respect of building controls.

6. Conclusions

As a result, more than half of the energy consumption in the Karakol residential apartments is used for heating and cooling. It may be concluded from this research that the level of the consumption of the energy in this area is due to inappropriate design planning, such as the inordinate division of the floors in the apartments, which created the unfavorable orientation of some of the units. And also the use of improper, inappropriate building materials along with the lack of insulation, which, consequently, leads to increased energy demands and costs. Therefore, it is necessary to adapt the residential buildings in this area in order to minimize the passive, negative impacts of climatic factors on energy demand for heating and cooling.

From this study the research established that the planning and design process of residential apartments in a hot-humid climate, to ensure reduce energy consumption- should include a number of important factors. They are as follows:

1- In designing plans for residential apartments it is important to divide the floor in a way which permits the units to have both a north and south orientation, in order to achieve cross ventilation in summer and to have access to the sun's rays in winter.

2- If it is not possible to have cross ventilation in the apartments, the inclusion of a solar chimney is a good alternative method of circulating the air on all the floors on hot days (Eco-housing Mainstreaming, 2009, p.23).

3- In hot climates, thermal insulation should be used in the walls. Some of the suggested wall insulation types are mineral wool slabs, expanded/extruded polystyrene, or aerated concrete blocks (Eco-housing Mainstreaming, 2009, p.20).

4- Using awning on the south side of buildings in order to prevent the direct penetration of the sun's rays in summer.

5- Using sloped timber roofs with attic space and also thermal insulation materials under the roofs to insulate against the direct entry of the sun's rays, thus avoiding overheating in summer (Ozdeniz & Hançer, 2005).

6- Using double or triple glazing with wooden frames and paying attention to the junction points between the window frames and the walls in these buildings is also essential.

In conclusion, therefore, if these suggested solutions are not incorporated by architects and construction companies in the design and planning of buildings in hot-humid climates in order to reduce the negative impact of such climates on buildings, it is necessary and important to introduce and establish building regulations or codes for both designers and building constructors to follow in order to produce buildings and living space appropriate for the hot-humid climate, as in the Karakol district of Northern Cyprus.

Acknowledgments
This research did not receive any specific grant from funding agencies in the public, commercial, or non-for-profit sectors.

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Journal Of Contemporary Urban Affairs

2018, Volume 2, Number 1, pages 55– 65

Towards appreciating the importance of windowscapes: Evaluation and suggestion for improvement of New Zealand Building Code

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ARTICLEINFO:

Article history:

Received 20 August 2017

Accepted 23 August 2017

Available online 24 August 2017

Keywords:

Windowscapes;

Building code clause and acceptable solution;

Health and well-being;

Visual awareness of the outdoor environment.

ABSTRACT

Rapid intensification of Auckland has made our visual awareness of the outdoor environment (windowscapes) more confined and restricted. The recent changes of Auckland's windowscapes have made the shortcomings of New Zealand Building Code more apparent. This paper aims to demonstrate the importance of windowscapes in urban dwellers' life and suggest some changes to current building code to provide healthier and liveable indoor environments. First, evidence from the literature on the impact of views on building occupants' wellbeing will be reviewed. Then, New Zealand Code Clause (G7 Natural light) and its Acceptable Solution will be critically analysed to identify areas that require improvement.

Our literature review indicates that private views are more relevant for health and wellbeing than building and planning legislation in New Zealand currently considers them to be. Hence, this paper suggests that windowscapes should become an essential part of future building codes and standards. This paper concludes that providing strict requirements regarding windowscapes is essential to building a healthier indoor environment.

JOURNAL OF CONTEMPORARY URBAN AFFAIRS (2018) ***2***(1), 55-65.

https://doi.org/10.25034/ijcua.2018.3656

www.ijcua.com

1. Introduction

1.1 The importance of windowscapes for urban dwellers

Windows have many roles: providing views, daylight, and ventilation. With the advent of buildings with large areas of glazing, increased time spent in buildings and increased awareness of the benefits of improved working environments, the importance of windows for building occupants has shifted in favour of windowscape. The provision of permanent supplementary artificial lighting and

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ventilation reduced the role of the window as the only source of daylight and fresh air, while the concept of transparency in architecture introduced a new type of relationship with the landscape outside. This was coincident, and possibly the result of, changes in the lifestyle of modern urban dwellers who spend the majority of their time indoors (Shoemaker, 2002, p. 141). In agreement with this, McLain and Rogers (1981) say that despite fresh air and natural light remaining the major functions of windows, people are more interested in window as a way of contact with the outside world.

The importance of having a view for urban dwellers is confirmed in most studies on windows. Wells (1965) found that 89% of surveyed office workers stressed the importance of having access to the window even when there was abundant artificial light in the interior. An analysis (Nichols, 1977) of sixty questionnaires from volunteer participants working in an urban high-rise office building revealed that respondents without window views made more non job-related trips away from their workstations – presumably looking for a view to the outside – than respondents with views. Nagy et al. (1995) found that respondents from an underground office rated the importance of having a view much higher than those from aboveground offices. Both groups considered the view as the most important function of a window, followed by fresh air and natural light. According to the literature review by Farley and Veitch (2001, p. 8) "of all the benefits and psychological functions provided by windows the provision of a view appears to be most valued by building occupants." In Bodart and Deneyer's (2004) survey, sunlight and visual contact with the outside were found to be the two most positive functions of windows for building users. Ne'Eman (1974) interviewed 647 users in four types of buildings (houses, school, offices and hospitals) and asked them how they would choose between a window providing sunlight into their interiors but with an unpleasant view and a window providing a pleasant view but without sunshine. The result revealed most would prefer a nice view through their windows to the provision of sunshine. Cooper-Marcus (1982) argued that attractiveness of neighbourhoods mainly depended on what residents could see from their windows. These results can be explained by the theory that humans have evolved to crave visual information about their environmental surroundings (Kaplan & Kaplan, 1977; Verderber, 1986; Arenibafo, 2016).

1. Literature review on preferred windowscapes

2.1 Factors influencing preferences for windowscapes

Windowscape plays a crucial role in modern life for urban dwellers as the majority of their time is spent indoors. The visual quality of urban windowscapes can, consequently, have a great influence on the quality of life. But what factors can influence windowscape preferences and what are the most and least visually preferred features of urban windowscapes? Answering these questions are important as preferences reflect how given environments support well-being (e.g. Van den Berg et al. (2003)).

Research shows that two main factors influence preferences for urban windowscapes: environmental characteristics and attributes of observers. This section only summarises key environmental factors, for more comprehensive literature review refer to Mirza (2015) and Lothian (2000). Environmental characteristics can be divided further into concrete features of urban landscape (e.g. water, greenery, sky, buildings) and psychological landscape descriptors (e.g. complexity and mystery).

Buildings: Since buildings are an inevitable component of urban windowscapes, two key questions for designers and developers are: how can buildings be incorporated in an urban scene to positively increase the visual quality of the views? And what characteristics of buildings are more highly valued by viewers? Kfir et al. (2002) found the presence of residential buildings in the near distance were the most influential factor in negative assessments of the view. However, if the buildings were more than 500 meters away or if the window outlook included a view of the sea, buildings had no effect on view preference. Tuaycharoen (2006) asked 20 students to assess how interesting they found the views of ten rooms

in different buildings; a concrete wall with little colour variation was chosen as the least interesting view. Similarly, in a hospital context, rooms with large windows towards a concrete building were disliked (Verderber, 1986).
Low preference for obscuring buildings might be related to the associated loss of occupants' privacy. For instance, Markus & Gray (1973) found the satisfaction with windows in residential dwellings depends on the number of buildings visible and their infringements upon privacy. In line with these findings, Mirza (2015) noted that blocking buildings were more negatively assessed in home views than office views. This result is due to different levels of visual privacy needed in these two contexts.

Cityscapes: 88% of the office workers (n=348) in Markus' study (1967) preferred to see the distant city and landscape from their windows. A cityscape was rated higher than views showing close natural features (Tuaycharoen, 2006).

Landmarks: Landmarks to be the most preferred built feature of urban windowscapes. In some cases even a silhouette of a landmark on the horizon has the power to positively influence the observers (Mirza, 2015).

Roading: Roading (e.g. streets, highways, and parking lots) can negatively influence assessment of a scene. Parking lots and traffic were identified as two prominent disliked features of urban landscapes and windowscapes (Nasar, 1998; Hellinga, 2013). Weber et al. (2008) found streetscapes were considered more beautiful if the street is broad and laterally bounded by trees with only a few buildings visible.

Sky: The ability to see the sky from the window can keep observers in touch with information such as seasonal changes, time of day and the weather (Markus, 1967, p. 103) and was found to be a main reason behind a desire for windows (Keighley, 1973). Butler and Biner's (1989) research reported a view of outside for temporal information (weather and time of day) to be the strongest predictor of window size preferences. Office workers who could see the sky, were less likely to report fatigue, headache and eye strain problems (Heschong Mahone Group, 2003). While it has been found that a view dominated by sky is more satisfying than a view without this feature (Lottrup, Stigsdotter, Meilby, & Claudi, 2013), the sky alone cannot evoke positive feelings in observers (Markus, 1967).

Greenery: Greenery was found by a significant number of researchers to be the most effective addition to a view for improving the visual quality of: commercial highway strips (Lambe & Smardon, 1986; Smardon & Goukas, 1984), residential areas (R. Kaplan, 1985; Hussain & Byrd, 2012) and streetscapes (Stamps, 1997; Weber et al., 2008). However, it is not the case that all kinds of vegetation are equally preferred. Lottrup et al.'s (2013) research on workplace window views found that flowers, trees and park-like environments increased the odds of being satisfied with the views, while no significant relationship was found for mowed lawns and wild self-seeded natural environment. Participants in Gorman's survey study (2004) identified "trees block visibility" as one of the negative attribute of street trees. Results from Mirza's study (2015) adds to these findings by demonstrating that positive influence of greenery is more effective in blocked and semi-blocked views than long open views. Such results are important for application: if a view to a blocking building is inevitable when designing a new building, the architect should try to minimize the negative influence of a blocked view by providing greenery.

Water: The positive effect of water on preferences has been consistently reported (Nasar, 2000; White et al., 2010; Mirza, 2014). White et al. (2010) found that the extent of aquatic features in a built environment might be less important in influencing preferences than their mere presence.

Complexity: Complexity is a positive and influential predictor of preferences for urban window views (Collins, 1975; Markus, 1967; Rahbarianyazd, 2017). Wolf (2003) found that the increase of complexity of urban scenes by disliked features (e.g. buildings, and overhead wires) could negatively affect preferences. S. Kaplan (1987) reported that natural

landscapes were preferred over urban scenes regardless of the level of complexity. Mirza (2015) found that the effect of complexity on preferences depends on the context of the views. While the complexity was a significant predictor of preferences for office windowscapes, no relationship was found for home views. The researcher explained her result by suggesting that observers in their office are more likely to be mentally fatigued due to the need of staying engaged with their everyday tasks and fighting off distractions compared to when they are at home. As a complex scene can effectively contribute to restoration, the higher preferences for complex views in offices is the result of observers' greater need to recover from mental fatigue.

Openness: Openness is a key driver of preferences (Kaplan & Kaplan, 1989). Openness of an urban view depends on the density and configurations of buildings (Hur, Nasar, & Chun, 2010), as well as the storey level where the window is located (Kfir et al., 2002). Hellinga and Hordijk, (2008) asked their respondents to choose which of six pictures they preferred most and least as a view from their offices. A wide view from a high floor was the most appreciated and a view from the ground floor to a close building was preferred the least. Ozdemir (2010) found identical offices to be experienced differently, depending on their views. Office workers with open expanded views perceived their rooms to be larger and lighter, and thus more satisfying, than those with closed views.

2.2 The benefits of preferred windowscapes

Research has shown that windowscapes can have economic value depending on their content. For instance, a pleasant view can lead to a considerable increase in house price (e.g. Luttik (2000)); while an unpleasant view could be expected to lead to a decrease in the house price. Factors that increase the value of a property include (in descending order of importance) view to the sea, view to urban parks, view from high-rise apartments and view to sparsely populated regions (Damigos & Anyfantis, 2011). Full views to the ocean could increase the market price of single-family homes in Washington by almost 60% (Benson, et al. 1998). Similarly, a wide water view could increase the mean sale price of residential properties in Auckland as much as 44% (Samarasinghe & Sharp, 2008). In Singapore, an unobstructed sea view from a high-rise building could add an average of 15% to the property price (Yu, Han, & Chai, 2007).

Windowscapes have different beneficial values depending on their content. R. Kaplan (1993) reported that employees with desk jobs with a window to natural features (i.e., trees, vegetation, plants and foliage) had fewer ailments, were less frustrated and more satisfied with their jobs. Window views of green vegetation or water, rather than of other buildings or a brick wall, were found to have a positive effect on attention capacity (Tennessen & Cimprich, 1995). Leather et al. (1998) added to this finding by demonstrating that natural features within a view can buffer the negative effect of job stress on intention to quit and a marginal positive effect on general well-being.

The Heschong Mahone Group (2003) found a significant correlation between the content of the views and reports of fatigue, headache, difficulty concentrating and influenza. The study also found office workers with interesting views performed 10% to 25% better on tests of mental function and memory recall than those with no view. Shin (2007) documented positive self-rated health effects of viewing forests through a window on office workers in Seoul, South Korea. A cross-sectional survey on office workers in the Netherlands showed that attractive window views reduced discomfort (e.g. concentration problems and headache) (Aries, Veitch, & Newsham, 2010). A recent study by Lottrup et al. (2013) showed that a view of natural elements was related to high view satisfaction, which then contributes to high work ability and high job satisfaction. Research in this area shows that an attractive windowscape is more than an amenity and underpinning this preference is a fundamental issue of psychological well-being and physical comfort (Tuaycharoen & Tregenza, 2007).

Heerwagen and Orians (1986) investigated whether employees who work in windowless offices use visual decoration to compensate for the lack of having access to a window. Those who worked in windowless offices used more visual materials for

decoration than occupants of windowed spaces. The content of the décor in windowless offices was dominated by nature themes. Bringslimark et al. (2011) reported similar results. Bringslimark et al. (2011) noted that workers in windowless offices were more likely to bring plants and pictures of nature into their workspaces than workers with windows. Radikovic, (2005) argued that an artificial window video would be an excellent replacement for a window in all single-person spaces with a limited view of nature, such as underground, underwater, outer space, or just strictly urban areas. However, a research conducted by Kahn Jr. et al. (2008) showed that a plasma window was no more restorative than a blank wall.

The physiological effect of windowscape is not limited to workplaces. Patients with a view to stands of trees were found to recover faster and required less pain medication than patients facing a brick wall (Ulrich, 1984). Prison inmates whose view consisted of adjacent farmlands had lower rates of sick call than those looking out upon the prison yard (Moore, 1981). An archival study of past residents of a nursing home revealed a significant negative correlation between people view (view to parking lots, the front entrance, or a yard) and length of stay, while view of greenery had no effect on this matter (O'Connor, Davidson, & Gifford, 1991).

Having natural elements in the home window views contributes substantially to residents' satisfaction with their neighbourhood and their sense of well-being (R. Kaplan, 2001). Taylor, Kuo, and Sullivan (2002) found concentration and self-discipline of inner-city girls (but not boys) were positively affected by the naturalness of the view from their high-rise urban homes. The authors explained their results by suggesting that boys typically spent less time indoors. Residents living in greener surroundings reported to have a lower level of fear, fewer incivilities and less aggressive and violent behaviour (Kuo & Sullivan, 2001). Residents of a large metropolitan area in the U.S. rated the potential of trees for helping people feel calmer as one of the key benefits of this natural feature (Lohr et al. 2004). Having a view over gardens has been shown to have a strong contribution to neighbourhood satisfaction (R. Kaplan, 2001; Kearney, 2006); moreover, those whose homes had access to their own garden or to shared gardens had significantly better health (Macintyre et al., 2003). Surprisingly, R. Kaplan (1985) noted that urban parks and large grassy open spaces played a minor role, at best, in residents' ratings of satisfaction with various aspects of the neighbourhood; while the availability of nearby trees and well-landscaped grounds were the two most important factors. Although, from these studies, it can be concluded that viewing natural features through windows has positive psychological effects, it is still not clear which features have contributed most (Velarde, Fry, & Tveit, 2007).

College students living on higher floor levels with open views found their dormitory rooms less crowded and got along better with their roommates (Schiffenbauer, 1979). Undergraduate university students who had views to a lake and trees from their dormitory windows were better able to concentrate than those students with views to city streets, buildings or a brick wall (Tennessen & Cimprich, 1995). Students who were asked to imagine themselves cognitively fatigued, rated settings with views of large natural murals with water more restorative than settings with window views of real, but mundane nature with built structures present (Felsten, 2009).

There is a series of laboratory studies that adds to our understanding of the psychological value of viewing attractive scenes. For instance, experimental research by Tuaycharoen and Tregenza (2007) found less discomfort to be caused by glare from a window when the window offered an interesting view than from a window of the same mean luminance but with a view of less interest. The authors previously conducted a similar study in a laboratory condition with images of scenes, which led to similar findings (Tuaycharoen & Tregenza, 2005). Purcell et al. (2001) found nature scenes with water were rated higher in restorativeness than nature scenes without water. Karmanov and Hamel (2008) study added to this finding by showing urban environments with an outlook onto water could have the same stress-reducing and mood-enhancing power as a natural environment. This may suggest that water bodies can

compensate for the lack of greenery in urban environments.

2. Critiques of New Zealand Building Code G7

In light of previous finding on the importance of windowscapes on urban dwellers' life, this section critically reviews the current New Zealand Building Code (NZBC) G7 Natural light and its Acceptable Solution.

As a performance-based regulation, the Building Code sets the standards that all building work must meet to protect health and safety of building occupants. In practice, 'performance-based' means that any design and construction methods can be used as long as they can prove that the requirements of the Building Code have been met. This flexibility encourages the construction industry to develop innovative and cost-effective solutions. Most clauses in The Building Code have Acceptable Solutions or Verification Methods describing how to meet the performance requirements of the particular clause. Although Acceptable Solutions and Verification Methods are not mandatory, designs based on them must be accepted by Building Consent Authorities.

G7 Natural Light is aimed to ensure that there is sufficient natural light and visual awareness of the outside environment for building occupants. Like other NZBC technical clauses, G7 contains three main sections: objective, functional requirement, and performance criteria. Stating its objective is to "safeguard people from illness or loss of amenity due to isolation from natural light and the outside environment", G7 appreciates the importance of windowscape on health and wellbeing of building occupants (Brookers Building Law Handbook, 2012, p. 355).

The functional requirement specifies that "habitable spaces shall provide adequate openings for natural light and for visual awareness of the outside environment" (ibid. p. 355). However, G7 puts limits on this requirement making it only mandatory for 'habitable spaces' within 'housing', 'old people's homes' and 'early childhood centers'. In other words, offices or student accommodation can be built with no or limited access to the outside views. That is while our literature review showed the significance of window views on the health and productivity of office workers and students. Moreover, functional requirement of G7 (G7.2) appears equivocal as there is no clear definition for 'adequate opening': "adequate to achieve the objectives of the Building Codes". This is also the case for 'visual awareness', leaving it open to any interpretation. For instance, it can be easily interpreted that G7 does not require a habitable space to have a street or landscape view and as long as one can differentiate between day and night, and diverse weather conditions, the requirement of the code are met. In other words, a view to a brick wall a few meters away from an observer can comply with the building code; however, if such views can safeguard people from 'illness or loss of amenity' is most certainly in question.

Two performance criteria are used to fulfil the requirements of NZBC G7. As this research is only dealing with the visual awareness of the outside requirement (G7.3.2) of Clause G7, there will be no mention of the illuminance requirements (G7.3.1) unless it is deemed required. G7.3.2 performance criteria explain that "openings to give awareness of the outside shall be transparent and provided in suitable locations" (ibid p. 355). The code does not define any criteria to determine a suitable location for a window. It can be argued that the best practice is to ensure that the visual privacy of the occupants is secured while a desirable view is achieved. However, the lack of knowledge on influence of windowscapes preferences on wellbeing made architects to become more concerned with how the building looks from the outside and hence give the location of the window from inside less priority.

Using the guides in acceptable solution in G7 to design new buildings can be counted as a one of the main reasons for current lack of sufficient visual awareness in most habitable spaces. The Acceptable Solution (G7/AS1) is divided into two parts: vertical windows in external walls and awareness of the outside environment. However, the emphasis has been more put on natural lighting, while the importance of window views is overlooked. For instance, G7/AS1 suggests overcoming the impact of obstruction in a view on the amount of natural light entering a building by

using high reflectance surfaces. That is while no comments have been made on the impact of obstruction on the quality of the windowscape or how to compensate this. Moreover, G7/AS1 allows visual awareness of the outside environment through another space making this issue even more critical.

Although this section only focuses on G7 but the following shortcomings in current building and planning regulations have been noted that deserves further investigations in future work: 1) The possible impact of future development on windowscapes of adjacent properties hasn't been considered in the Building Act and the Building Code. This particularly becomes more important in mixed zoning areas, as a new office building can get constructed on the boundary and block an exterior view of an existing next-door apartment building; 2) The fact that views from a private domain are not considered important under the current Resource Management Act (2017); 3) The openness of windowscapes hasn't been considered important in Auckland's new planning rule book. Based on the new unitary plan, a minimum net site area for the mixed housing suburban zone is 400m2 and for the mixed housing urban zone is only 300m2. Only one-meter setbacks from the side and rear boundaries are required. These rules are changing Auckland's windowscapes and soon a building within a short distance becomes a common feature within all residential windows.

3. Conclusions

Windowscape is an aspect of health and safety that is at risk of being compromised due to insufficient regulation. Our literature review indicates that private views are more relevant for health and wellbeing than building and planning legislation in New Zealand currently considers. Hence, this paper suggests that windowscape should become an essential part of future building codes and standards. In particular, G7 needs to extend to include buildings that are occupied on a regular basis and for extended periods of time such as working environment, offices and student accommodation. Moreover, it is important that G7 enforces remediation where there is an obstruction in the view. This is because our literature review shows that an attractive windowscape is more than an amenity and underpinning this preference is a fundamental issue of psychological well-being and physical comfort. For instance, if a view to a building is blocked when designing a new building, the architect should try to minimize the negative influence of a blocked view using developing technologies such as green walls. The fact that the NZBC is performance-based and not prescriptive, can make profit-driven property developers lean more towards 'liberal interpretation'. This paper believes that providing strict requirements regarding windowscapes is essential to building a healthier indoor environment. For instance, strict requirements can make designers to consider windowscapes in their initial designs rather than adding component retrospectively to compensate the lack of such amenity.

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Journal Of Contemporary Urban Affairs

2018, Volume 2, Number 1, pages 66– 75

Aesthetics of Space Organization: Lessons from Traditional European Cities

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ARTICLEINFO:

Article history:

Received 20 July 2017

Accepted 24 August 2017

Available online 24 August 2017

Keywords:

Aesthetic quality;
Space Organization;
Traditional European Cities;
Vitality;
Integration.

ABSTRACT

For centuries the aesthetic significance of space organization has been one of the significant subjects of study for most artists, architects, urban designers and philosophers. Cities which experience diverse stages of growth transmit dissimilar aesthetic values due to their locations, culture, history and background. This research will try to take out the aesthetic values of the traditional European cities through the literature on aesthetic of urban design. Accordingly, this study reflects the term urban aesthetics in spatial organization. It tries to answer the question of how space organization can lead to the aesthetic understanding of a place. The methodology for this study developed based on grounded theory study and qualitative assessments of European cities thorough the literature review. Overall, the study assessed integration, visual connectivity, vitality, spatial quality, as the main factors in shaping the aesthetic quality of the urban environment in European traditional cities. At the end, it proposed the findings to apply in contemporary urban designing.

JOURNAL OF CONTEMPORARY URBAN AFFAIRS (2018) ***2***(1), 66-75.

https://doi.org/10.25034/ijcua.2018.3659

www.ijcua.com

1. Introduction

This study emphases on one of the long-standing questions in the arena of urban design: "Does the urban form influence the aesthetic understanding of it?". Traditional medieval spatial organization of European cities is the example of good quality of space organization which many scholars have been studied to take out the aesthetic factors of shaping good quality of urban spaces in traditional countries (Cullen, 1996; Sitte, 1888; Krier, 1889; Zucker, 1959).

As a big umbrella for this study the environmental aesthetic have been selected from the literature by focusing on the interrelation between principals of spatial configuration and human aesthetic perception.

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According to Cuthbert (2006) "an aesthetically pleasing experience is one that provides pleasurable sensory experiences, a pleasing perceptual structure and pleasurable symbolic associations". This description delivers a valuable guide as to the diverse stages of aesthetic perception that are essential to be able to judge an art object or urban spatial configuration. Williams (1996) depicts three interactive elements in the cognitive processes which are representation, perception, conception.

The process of cognition is characterized as the formulation of sensory information obtained from the real world. When sensory information from the world imposes us, cognitive processes at the perceptual level attempt to explicate and understand it (Williams, 1996).

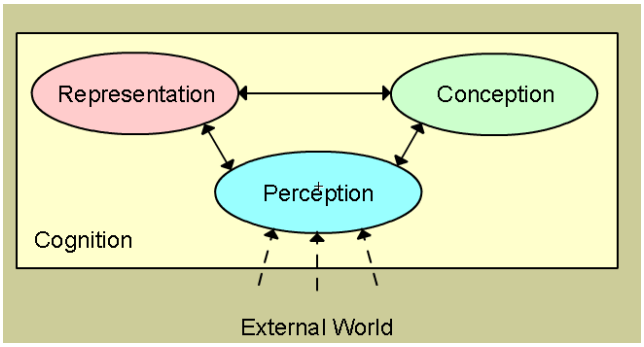

Figure 1. Idealized model of cognition - cognitive processing (Adopted from Williams, 1996).

Lang (1988) divided the aesthetic assessment of space configuration into formal and symbolic aesthetic. Symbolic aesthetic represent meaning which has been hidden in an art object or space organization the symbolic object might also be a doorknob or even a tapering stone pillar so called "*Obelisk*" in ancient Egyptians era. Symbolic aesthetic in a specific culture might have aesthetic value and in the other culture which doesn't have historical roots might not have. Formal factors representing aesthetic quality refers to the organization and spatial configuration of the elements of shaping urban spaces. The three most important formal factors affecting judgment are *diversity, harmony and clarity* that tends toward complexity and ambiguity (Nasar 1994).

Table 1. Grouping of aesthetic qualities.

Aesthetic qualities				
Formal			Symbolic	
Diversity	Harmony	Clarity	Meaning	Function

This study will assess the formal aesthetic qualities in shaping aesthetic urban environments. In this regard, Gestalt psychology will helps to comprehend the distinctive human aesthetic taste to resolve visual objects into ordered patterns. Coherence, unity in variety, patterns in building facades and strong compositional elements such as verandahs are but some of the formal characteristics that can enhance a sense of order in a scene. The indispensable parts of the "Gestalt psychology" is connected with urban context. Gestalt psychology developed a systematic basis for aesthetics (Gibson, 1979) which explains the relationship between whole and the parts.

According to Nasar (1994), human response to the quality of the environment will generate a positive aesthetic experience until reaching a level where preference begins to reduce. In this regard, Stamps (2000) states that the built environment provides stimulation of interest at three scales, which are a). Conceptualized as a silhouette (complexity of the outline). b) Form articulation (three dimensional modelling) and c). Surface texture.

Personal experience is also an important factor in generating environmental stimuli. In this regard, as Weber (1995) stated, cognitive processes by assigning values to the derived meanings, helps to understand the environment and affect aesthetic judgments. Accordingly, understanding how this process working with each other will help us to assess the beauty of each and every context.

"Powerful meanings attach to the way we comprehend the environment. Not only do people assess the nature of the activities they understand to take place within, they are also influenced by the degree to which they can imagine themselves able to participate in those activities". Subsequently, public buildings can have positive "associational meanings" for

people of a society. As Alcock (1993) stated standard of construction, maintenance and standard of detailing can carry messages about the status, owner or the way a building would feel to be inside. Considering above mentioned literature in the field of environmental aesthetic, the following analytical framework is derived.

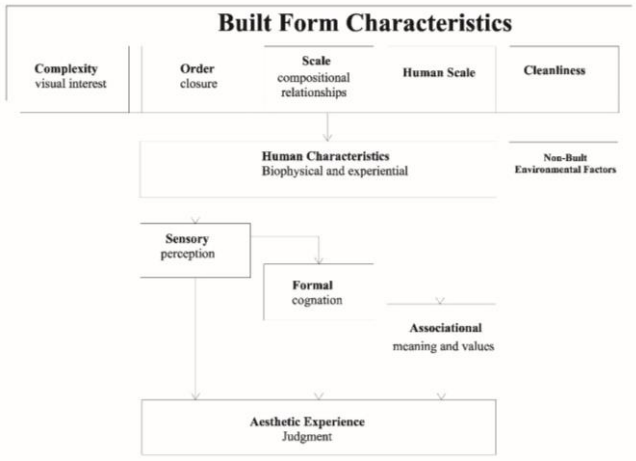

Figure 2. An analytical framework of environmental aesthetics (Adopted from Gjerde, 2010).

According to Figure 2 aesthetic experience or judgment of environmental configuration shapes based on immediate sensory and cognitive appraisal of the scene or object and alignment with schema which formed through experience and appraisal based on meanings and value.

2. The Aesthetic Values

According to Maslow's Human needs, the need for aesthetic is one of the human's essential needs to survive. Aesthetic lids to fulfil the physiological requirements to appreciate the presence. In this regard, beauty can be described as human response to the environment with enjoyment and pleasure.

Webster Dictionary describes aesthetic as a branch of philosophy dealing with "the nature of beauty, art, and taste and with the creation and appreciation of beauty" (Webster, 2016). Oxford Dictionary also defined the meaning of the word aesthetics as "knowledge derived from the senses ". As it comes from the definition, aesthetics are associated to perception by the "senses". According to Lang(1987) the knowledge of aesthetics is concerned with understanding and identifying the aspects that contribute to the perception of an object and understanding the nature of human ability to enjoy creating presentations that are aesthetically attractive (Lang, 1987).

"The aesthetic judgment is concerned with all emotions, feelings and senses in one moment, and has an association with "*physical actions*".

Therefore, aesthetic judgments are subject to cultural condition in some areas. The decisions on aesthetic value can be related to moral, economic and political values and also in terms of relying on feelings: emotions, mental, intellectual, views, preference, behavior of non-conscious, conscious decision, training, instinct and social logic are the other aesthetic factors which human might think aesthetically by relying on the feeling (Hussein, 2009). Many traditional signs and symbols are considered to be creative connotations that signify the experience and originality which are based on the magnificence of the past(Arenibafo, 2016; Hariry, 2017). Overall, it can be concluded that the aesthetic value of a specific culture might be different than the other cultures and it might be varied by considering different social political and environmental variables which have different effects on human taste.

3. The Aesthetics of the City

Urban aesthetic is a tool for city identification; it is an indispensable element in the urban dynamics (Sternberg, 1991:78). To consider a city beautiful, not only judging its architectural style, buildings, traffic and their noise effects, but also social and historical features (as part of its total sensory package) should take into account in the assessment. Despite the fact that some scholars put forward that increasing the aesthetic qualities of cities affects on its appreciation, others scholars claim that "appreciation" is itself a challenging notion. Because it is vague and hard to define and justify. The query of "what it means to appreciate a city" is indeed one of the difficult tasks of urban aesthetic design.

According to Jackson (1959) social - economic efficiency, biological and health are the major goals in designing the city. He revealed that cities should provide for their citizens aesthetic experience. This is a responsibility of urban designer in city scale and citizen in the scale of house by design the houses in human scale. The aesthetic of the city is not a one day job to fulfil all the requirements of its citizens, it might take centuries of try and fail. That's why as Mumford (1966) stated, "cities considered as the greatest artwork of human history, which buildings can be considered as a work of art".

According to Blanc (2013) "… giving the urban setting its full meaning requires aesthetic engagement which involves a visual learning experience from the natural, physical and emotional dimensions as the aesthetic experience is not related only to building environment but it also comprises the living environments"

Indeed, urban aesthetic reached its highest level in traditional European cities. The cities have been designed in such way that to fulfil all the human needs, considered as designing based on human scale. As Rossi (1988) stated, architecture is an inseparable form of urban aesthetic to be able to live with pleasure in the context.

In his documentary movie with the name of "*The social life of small urban spaces*" William H. Whyte (1979) sums up the attributes and qualities that make a public space successful. These qualities are suitable space, street, sun, food, water, trees and triangulation (Whyte, 1979, 42:34). These attributes refer not only to the physical environment and design of the space, but also to the sense of community and the everyday interactions. Following William H. Whyte's perception of the attributes of public space and what makes a successful site, the non-profit organization "Project for Public Spaces" (2012) created a tool or a kind of "protocol" that would assist in the identification and evaluation of those attributes. This "protocol" has given the main guidelines in order to form the research questions of the thesis. The Place Diagram has developed based on the Project for Public Spaces (2012) which was an attempt to identify those attributes that make a place aesthetically successful-by fulfilling all human needs (Project for Public Spaces, 2012). The criteria, the four attributes stated in the figure 3 are the four qualities of space that are used in this research. Comfort, Sociability (stated as Sense of Community and Sociability in the research), Access and Linkages (Accessibility in the thesis) and Uses and Activities are the four "key qualities" of place under investigation. These qualities tries to satisfy human needs in the place and consequently the responds of the users will lead to aesthetically appreciate the place.

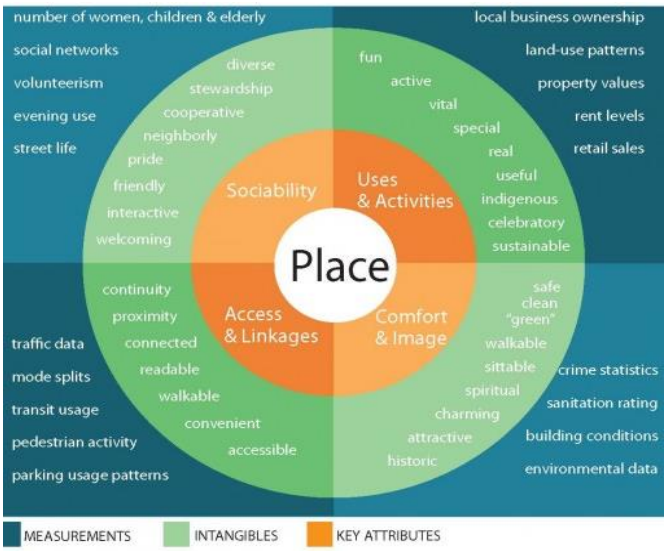

Figure 3. The Place Diagram, developed in the Project for Public Spaces (2012).

It is revealed through this study that aesthetic experience laid down in the cities and it needs moving to explore. Traditional European cities due to its specific medieval alleys have the potential to reveal one specific vista of the city and this sense of aesthetic exploration increase pleasure and satisfaction. Experience of moving, dynamic vision and the sequential rhythm or serial vision is the most important aesthetic characteristics of traditional European cities.

"Since the establishment of the urban landscape is the art of the relationship, and the most important approach in the aesthetic design

of the cities is the art of forming. Urban designers are dealing with aesthetics as visual forming similar to the works of art and considered the essence of success which is the sense of unity associated with clarity". (Porteous, 2003)

According to Cullen (1961), "the buildings that are seen collectively give visual pleasure which cannot be given by each building separately. The building, which stands alone called architecture, but a set of buildings together is an art of forming". Cullen stated that "the cityscape cannot be evaluated technically, but as an art of relationships that need to be aesthetic and visual sensor" (Cullen, 1961). In his book "The Concise Townscape", Cullen (1961) revealed some basic characteristics which have already been developed in European traditional cities which are:

Table 2. Basic principles of aesthetic space organization.

Serial vision	-Exploring the urban aesthetic by moving. - The serial vision of the urban landscape elements as a whole.
The sense of place	-The sense of place that determines the sense of the individual in the environment.
Visual permeability	- The urban content of the scene like color, texture, scale, style, character and uniqueness, as the aesthetic value of urban space determined by the properties of visual sources.
Topographical components	-Linked to the aesthetic values of natural components which reflects the richness of the urban environment, and natural values of high aesthetic properties

4. Aesthetic Qualities of traditional European urban squares

Through the literature of aesthetic urban spaces, urban squares by considering the proportion of depth to width and their degree of proximity are classified into groups based on their ground form and morphology. Many studies developed typologies of squares through the literature. The most important of them undertaken by Sitte (1889), Stubben (1924), Léon and Rob Krier (1975), Zucker (1959) and Ashihara (1983). Differences in the classification vary depending on the distribution of public buildings, form and proportions.

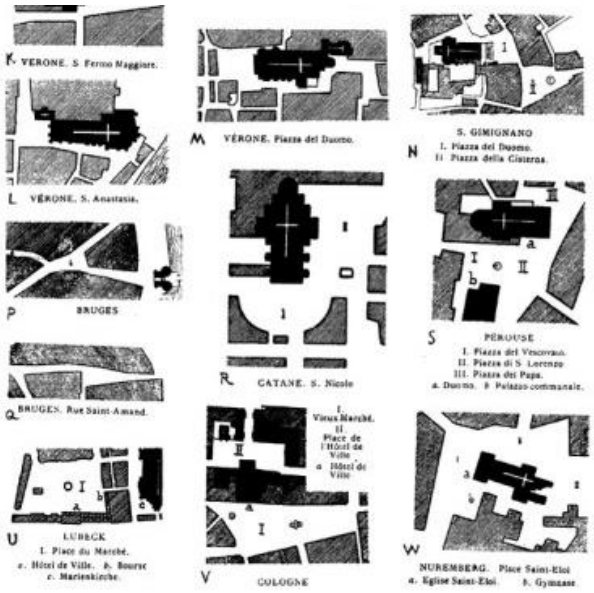

Figure 4. Camillo sitte and the organization of public buildings around the squares.

By considering sitte's analysis of public open spaces, it's obvious to see that urban space getting its quality based on the organization of its objective space. Building organized in such a way that to crease sense of enclosure which leads to positive spaces. In this regard, Alexander (1980) in his book the pattern langue state that "When assessing the quality of a square or urban space it is particularly interesting to note that certain spatial configurations have a similarly positive or negative effect on their users".

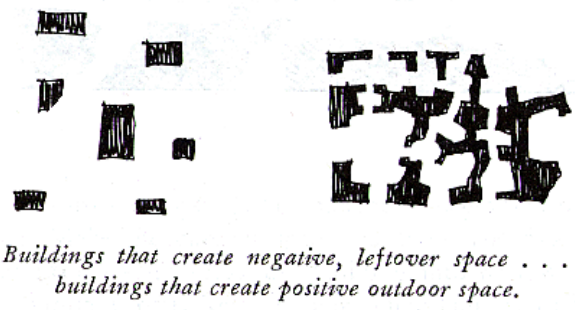

Figure. 5. Building integration in creation of negative space and positive outdoor space. (Alexander et all 1980 p518)

Based on Sitte's analysis (1989), traditional European cities have been developed its knowledge of space organization. Spaces have

been designed in such a way that to increase sense of human pleasure which leads to aesthetic satisfaction. Designing positive spaces by enclosures is a method of creating a pleasurable public open space. Understanding this rule of space organization in designing contemporary urban spaces is the missing point which highly required to pay attention in the design process.

5. Indicators of aesthetic space organization

There are many *indicators* for the quality of an urban square organization. Together they cover three different scales and all aspects of life in a square: a). At the micro scale, its spatial elements and their respective configuration and *emotional impact* on the user. b). At the meso scale, its *vitality* and communicative potential c). At the macro scale, the *integration* of the square into the structure of the city and the quarter,

Each of these three scales of analysis has four quality indicators. Which are 1). Integration 2). Vitality. 3). Spatial quality. At the macro scale the category "integration" describes in essence the context and the degree of connectivity a space has with its context. Traditional European cities have been developed the level of integration in highest as it possible. From the other hand, at the meso scale vitality aimed to develop the communicative potential of urban spaces. Vitality has direct relation with livability. In this regard applying all the methods of converting public spaces to livable place such as mixed use function will lead to increase vitality. Finally, the category "spatial quality" at the micro scale describes those properties that affect our perception of a space and how we experience its spatial qualities.

5.1. Integration

The term integration derives from the Latin word "*integration*" which means the *creation of a whole*. In an urban space "to be properly part of a whole, it needs to have a high degree of integration". This means that it must be mainly firmly intertwined with its close contest. The four indicators defining this category are *Mobility, Connectivity, Access and Spatial System*.

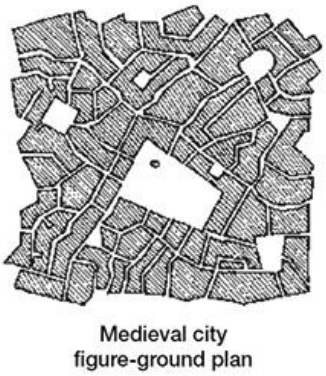

Figure 6. Space integration representing Mobility, Connectivity, Access and Spatial System.

5.2. Visual connectivity

The *visual connectivity* of a space with its environs through sight lines is what Cullen (1996) describes as what constitutes a "sense of here and there" which leads to help its user to find a logical connection between space organization with the feeling of self. This helps to its user's to grow a comprehensible "mental map". According to Cullen access is undoubtedly is the most important of the four indicators defining this category.

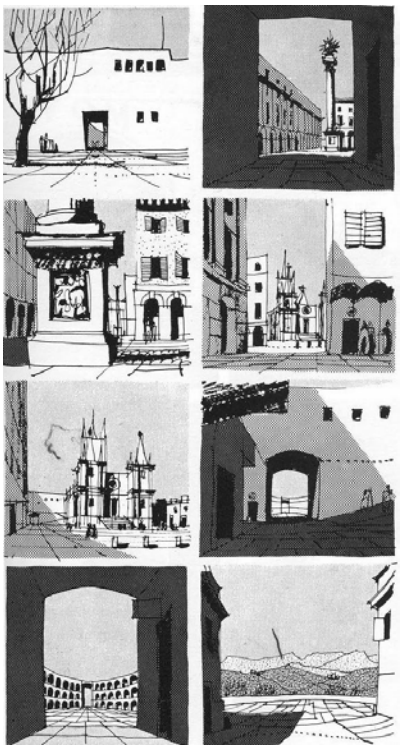

Figure 7. Serial vision as a method of assessing special connectivity. (Cullen, 1961)

5.3. Vitality

The factors that have the biggest impact on the vitality of a square describe the elements that influence social interactions and the kind of ways in which the space is appropriated by its users. The key indicators are *Inward Focus, Dialogue*, *Character*, and *Security*.

Figure 8. Vitality as one of the main factors shaping special quality.

The orientation of the objective elements of urban spaces is the most important factor in developing vitality in space organization. According to Gehl (2010) "The Dialogue between the user and the space is mediated by the orientation, design and functions contained within the buildings that surround a public space". Generally speaking, facilities and buildings that willingly permitted in the public realm to extend into their privately-owned spaces contribute to the vitality of an urban space.

Sense of security is another factor which leads to the vitality of urban spaces. When people of a city feel a sense of security they will participate in the daily activities of urban spaces, this kind of participation which might encompass different people from different culture and background will increase the livability and at the end the vitality of urban spaces.

As it is already mentioned, positive enclosure which will leads to increase the viability of urban spaces is another factor which will lead to increase sense of security.

Jane Jacobs in her book "the death and life of great American cities" revealed that designing a buildings in such a way to increase the number of opening from the buildings to the public spaces will increase the séance of security "... Residential apartments with windows overlooking public spaces, and cafés and shops that face public spaces make it possible for see what goes on in the public space and provide a level of social control, in turn heightening the actual and perceived sense of security". (Jacobs, 1961)

Figure 9. Corso Vannucci, Perugia.

5.4. Spatial Quality

All the objective elements composing the public spaces participating in the aesthetic representation of all the spaces, and urban squares in particular, is defined to a large degree by water, trees, walls, texture, floor and any objects that may be in the space. The way which it needs to be organized the objective elements is also affected in increasing the spatial quality of spaces. Even while the shadow of the building is moving through the day is also affects in spatial quality of the spaces.

Figure 10. Objective organization of space elements affects on spatial quality.

"These elements do not themselves describe the quality of a space, but each element, through its constitution, size and proportion, position in space and by relationship to other elements of urban spaces influence the quality of the urban space". They make atmospheric and spatial qualities through their composition and elaboration in terms of topography, scale, access, figure, position and formation as well as their mutual interrelationships which will have a significant effect on the overall spatial and atmospheric quality of the space.

According to Ashihara (1983) "The boundaries that surround a space, not just the walls but also facades / Floor surfacing that extends to a boundary and makes the extents of spaces legible / Inside corners that define the sense of enclosure / harmony and unity, and of the buildings that surround the space / A balanced association among the height of the surrounding walls and the distance between them, constitutes an urban space with the spatial qualities" (Ashihara 1983).

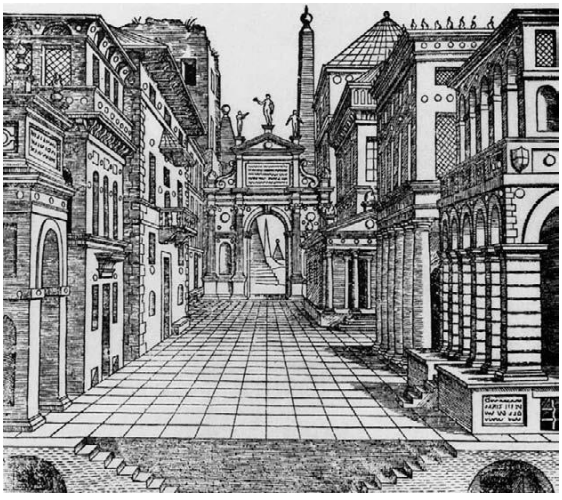

Figure 11. Objective elements of the space representing spatial quality (Moughtin, 1992).

Overall, urban spaces are deemed good quality if it by providing pleasant condition both from an objective space organization based on human scale and subjective symbolic quality of space organization. The amalgamation of objective and subjective elements of urban space organization might lead to pleasant condition. Spatial qualities in urban spaces can be labelled by three indicators: 1). Centrality, 2). Directionality and 3). Enclosure.

1. Centrality in urban spaces is spatial quality which generally developed based on the organization of the objective elements of the urban spatial configuration. As Zucker (1959) stated *Centrality* is perhaps the most elementary form of European squares that defines the significance of the enclosure.

Figure 12. Centrality representing spatial quality. Example St Peter's, Rome.

2. *Directionality* is another factor in space in space quality. Meaning that objective elements of urban space organization have been designed in such a way that to highlight on specific events or art object at the end of its own direction. Lynch (1960) called this sense of directionality as "channel" which is one of the most important indicators of imageability in urban spaces. Directionality can also be shaped by the repetition of specific shape or object in one specific axes.

Directionality will also increase the pleasures of exploring the spaces. In most of traditional European cities directionality in alleys leads to public space or a specific public landmark.

Figure 13. Directionality representing spatial quality.

3. Enclosure which is the result of enclosing surfaces in public urban spaces can be applied by organization of the objective elements of urban space configuration with the aim of centrality and increasing the sense of security and quality of urban spaces. Lynch (1960) describes Enclosure as "as an area that is separate from others and with its own character."

6. Conclusions

It has been revealed thought this study that urban spatial organization in European traditional cities have been developed throughout the history and enriched its aesthetic values by considering and fulfilling all the requirements of its users. In despite of the fact that human scale in design and designing based on human taste and requirement are the most important factor in increasing aesthetic appreciation, there are other factors such as: integration, visual quality, vitality and spatial quality.

The study also revealed that aesthetic values in an urban space organization have direct relation with quality in terms of fulfilling all the basic humans' needs of its users. The study also revealed that the experience of moving, dynamic vision and the sequential rhythm or serial vision are the most important aesthetic characteristics of traditional European cities. As it has been already mentioned Maslow's hierarchy define this human needs which have been starts from a need for food to survive till aesthetic needs. European cities through the process of the development of the cities have been fulfilled all the requirements of its users. It has also revealed that serial vision, the sense of place, visual permeability and topographical components are the Basic principles of aesthetic space organization. The study of the symbolic aesthetic of urban spaces in European cities have been proposed as future study in this research.

Acknowledgments

This research did not receive any specific grant from funding agencies in the public, commercial, or non-for-profit sectors.

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Journal Of Contemporary Urban Affairs

2018, Volume 2, Number 1, pages 76– 83

Urban Renewal Strategies and Economic Growth in Ondo State, Nigeria: A Case Study

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ARTICLEINFO:

Article history:

Received 23 July 2017

Accepted 23 August 2017

Available online 16 September 2017

Keywords:

Urban decay; Renewal strategy; economic growth; Urban living.

ABSTRACT

One of the negative effects of the high rate and pace of urbanisation in developing countries is the decay of urban centres. While this decay has eaten deep into the fabric of these settlements turning them into urban slums and ghettoes with poor infrastructure, the effects of the decay are multifarious. Despite the fact that economy is the "life-wire" of urban centres, its untold downturn consequent upon urban decay is unimaginable because of the relationship that exists between environmental quality and economic growth. This calls for a proactive approach called urban renewal towards creation of successful urban places. This paper therefore reviews urban renewal strategies and their implications on economic growth with particular focus on Ondo State, Nigeria towards identifying the means of enhancing the sustainability of its economic proceeds. The study relied on secondary information sources and discovered that appropriate urban renewal strategies yields corresponding economic growth. The paper asserts that the urban renewal fit achieved in the state during the period 2009 to 2012 can be replicated in other states in Nigeria if similar political willpower is available. The paper recommends the participation of the public combined with appropriate strategies in urban renewal schemes for the best result and argues in conclusion that urban renewal is the only feasible solution to the current dwindling economic sector in Nigeria and other developing economies.

JOURNAL OF CONTEMPORARY URBAN AFFAIRS (2018) ***2***(1), 76-83.

https://doi.org/10.25034/ijcua.2018.3662

www.ijcua.com

1. Introduction

The creation of successful urban place is not only germane to the effective functioning of our city centres but crucial to life in the cities which is hinged upon economic growth. Unfortunately, the built environment of urban centres in many developing countries like Nigeria is fast decaying (Ahianba, Ahianba, Dimuna & Okogun, 2008). While the spate of the decay is continually worsening, its spread varies in magnitude from city to city with consequential grave economic implications. Collapsing existing urban infrastructural facilities or complete lack of them in some urban centres, indiscriminate change of

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use, lack of use, abuse of use, unused and disuse of urban lands, which develops into slum, blight and decay of urban centres, unregulated development of urban fringes, which lead into development of ghetto and squatter settlements are among the too-numerous evidences of the decay in Nigerian urban centres. Others include incidence of urban villages and rise in crime rate, negative impacts of informal economic sector, and congestion of transport corridors, human induced disasters like fire outbreak, flood and erosion, incidence of destitution, homelessness, overcrowding, poverty, crime and diseases. The World Bank (2005) attributed this malaise to rapid urbanization, rural-urban migration and decades of speedy economic downturn, among others.

These conditions will continue unabated except sustainable urban renewal strategies are formulated and implemented in urban centres. Presently, because of the causal relationship between the quality of the urban environment and economic activities, Nigeria is presently experiencing urbanisation of poverty (Babanyara1, Usman & Saleh, 2010) in the urban centres. With the increasing scale and pace of urbanisation in Nigeria (Fadamiro & Adedeji, 2009; Arenibafo, 2016), the hope for economic growth amidst unstable public economic policies, global economic crises and its attendant consequences on developing nations, coupled with lip-service attention paid to environmental quality issues by the government, is dizzy. The outcome is a weak environmental support for economic activities in urban centres. This paper therefore reviews the impact of urban renewal strategies on economic growth in Nigeria with focus on Ondo State towards identifying the means of enhancing the sustainability of its economic proceeds. This becomes necessary in view of the importance of the economic sector as the major 'driver' of sustainable human settlements at all spatial scales from village to towns, cities, megacities and megalopolis.

2. The Need for Urban Renewal

The myriads of urban problems that have far-reaching economic implications on the urban populace can be identified as follow: Collapsing existing urban infrastructural facilities or complete lack of them in some urban centres; Increasing rate of street trading street parking and encroachment on road setbacks by informal activities as a result of lack of organized markets and shopping centres/shopping malls; Congestion of transport infrastructure-road and its precincts in particular, manifesting in accidents, hold-up and go-slow (Adedeji, Fadamiro & Adeoye, 2014). Others include human induced disasters like fire outbreak, flood and erosion; Inefficient urban infrastructure and utilities like power, water, drainage, hospitals, post and telecommunication; Unsanitary conditions resulting from poor waste disposal methods and blockage of drains (where they are available); Incidence of destitution, homelessness, overcrowding, poverty crime and diseases; Landlocked developments resulting from unorganized and unregulated new developments which cause lack of access to some land use activities; Lack of adequate data for policy makers, administrators, researchers and urban managers; Rural neglect, which results from sentimental regional development plans; Destruction of urban aesthetics as a result of lack of organized open space and destruction of informal open spaces. While the national status of the problem has been acknowledged, the magnitude of its presence in Ondo State cannot be overemphasized.

3. Theoretical Framework of Urban Renewal

Urban renewal has been described as a deliberate effort to change the urban environment through planned, large-scale adjustment of existing city areas to present and future requirements for urban living and working (Grebler, 1965; Osuide, 2004). According to Tetlow and Goss (1968), it is the elimination of excessive noises, smells and atmospheric pollution especially from the residential scene. Urban renewal or redevelopment has been considered as a tool to solving the problem of squatter settlement (Aluko & Amidu, 2006) and its theories were largely influenced by social, economic and historical developments as well as city planning movements immediately after the Second World War. Indeed, many countries embarked on rebuilding efforts, characterized by demolition of old dilapidated areas, large-scale clearance of city slums and construction of modern high- rises after the war (Gbadegesin, Oladokun & Ayorinde, 2011). Often, urban renewal schemes are fraught with many challenges which can be grouped into:

Physical: The proposed sites for the project may possess great challenges to its implementation. One of such site constraints is topography in terms of great differences between existing road levels and areas of possible extension. In a number of cases, there may be road meanders and possible

encroachment into natural elements like rivers, streams and water ways are needed to be overcome. Not only that, the volume of existing services installation to be relocated may be high. These include electricity, water supply mains and communication installations.

Social: Urban renewal projects have always been fraught with social implications. This is due to the change of land use from private to public and reclamation of public open spaces that have been encroached upon for private use. Therefore, the required accompanying demolition of residences, commercial buildings, temporary structures and other physical elements usually attract public criticism by the affected. A strategic public re-orientation concerning the many benefits of the projects is a sure antidote even though the government has its entire implementation instrument at disposal.

Political: Political opponents who are not as visionary and courageous as the incumbent government may raise unguarded alarms to distract the government from its renewal goals of the cities. Public campaign and non-partial implementation concerning the demolition of all affected physical structures on the sites is crucial to putting to silence all "Sanballat and Tobiah".

Cultural: One of the usual challenges to urban renewal schemes is the presence of cultural artefacts like shrines, historical emblems, graveyards, among others, along the re-development paths. This problem can become a stepping stone to project implementation by inclusive design approaches in majority where necessary.

Economic: The capital requirement for urban renewal projects is usually awesome. This is made up of necessary compensations, project fund and post-construction management. This problem could be overcome by a phased-approach to project implementation and overshot by the numerous benefits of the project aside from the prospect of revenue generation from some of its components which is a long-term advantage.

Large-scale redevelopment creates many social problems and encourages many city planners and scholars to question its effects and functionalities. Indeed, large scale renewal and redevelopment efforts have been criticized for neglecting the complexities of the urban fabric; it is not only uneconomical, but also damages the city's heritage and degrades various socio – environmental qualities. As described by Waque and Hirji (2005), urban intensification produces a diversity of densely packaged, highly valued economic interests.

According to Olusule (2010), five procedural steps are necessary to be followed to accomplish a desirable urban renewal exercise for the community. They are; acquisition of land in accordance with the plan, relocation of residents from the acquired building into satisfactory quarters, site clearance – the razing of the structures on the land may be carried out only after the quality of such structures have been determined, site improvements and supporting facilities and services are undertaken by the agency and land may be built upon by agency or sold to original owners if compensations have been paid. Urban renewal has also been linked with the sustainable provision of basic amenities such as water, and electricity (Vander & Graaf, 2010; Newman, 2001; Ashley, Blackwood, Butler, Davies, Jowitt & Smith, 2004). The provision and continuous means of management of urban renewal products should also be part of the programme.

4. Urban Renewal Strategies

There are three basic Urban Renewal Strategies (Carmona, Heath, Oc, & Tiesdell, 2010). These are: Comprehensive Redevelopment, which can be applied to a structure or a cluster of structures where obsolescence and decay is absolute. It is otherwise called complete demolition and reconstruction; Rehabilitation or Renovation, which is the process of neigbourhood revitalization by removing worst structures repairing and constructing streets with additional parks and public utilities; Conservation, which concerns preservation of urban items with historic, cultural, aesthetic and architectural values.

The three can be broken down into action plan, which include the following (Wahab, Adedokun &Onibokun, 1990; World Bank, 1996): (1) Acquisition of a slum area or a blighted area or portion thereof; (2) Demolition and removal of buildings and improvements; (3) Installation, construction or reconstruction of streets, utilities, parks, playgrounds, and other improvements necessary in the urban renewal area the urban renewal objectives of this appendix in accordance with the urban renewal plan; (4) Disposition of any property acquired in the urban renewal area including sale, initial leasing or

retention by the municipality itself, at its fair value for uses in accordance with the urban renewal plan; (5) Carrying out plans for a program of voluntary or compulsory repair and rehabilitation of buildings or other improvements in accordance with the urban renewal plan; (6) Acquisition of any other real property in the urban renewal area where necessary to eliminate unhealthy, unsanitary or unsafe conditions, lessen density, eliminate obsolete or other uses detrimental to the public welfare, or otherwise to remove or prevent the spread of blight or deterioration, or to provide land for needed public facilities; and (7) Preservation, improvement or embellishment of historic structures or monuments. While these procedures are not mutually exclusive, they may not all present in a single scheme at one time.

Generally, urban renewal process is perceived to overhaul the congestion in the city centres (Vigdor, 2007). Its strategies can also be classified as filtration, social planning, the boot-strap strategy, replacement, guiding urban growth through investment and local government strategy (Balchin, Kieve & Bull, 1988). Filtration is based on the out – migration of households and employment followed by the clearance and redevelopment of vacated sites. It can also be in the form of expanded towns or satellite towns. The expanded towns received even less overspill than the new towns. Webster (2004) underlines the importance of peripheral development around metro cities, arguing that in case of fast growing urban centres, peri-urban areas have experienced rapid economic growth as that is the easiest environment in which new communities and manufacturing structures can be built, absorbing large numbers of migrants. This approach, however, calls for the resuscitation of new town creations in the time past in Nigeria such as satellite town, Lagos and Ajoda New Town in Ibadan.

Social planning, as described by Balchin et al. (1988), has been regarded as being secondary to physical and economic planning. It focuses on people rather than on urban space or property, and should first involve analyses of the basic causes of deprivation as a prelude to the application of needs – related policies. The boot – strap strategy entails rehabilitation and is mainly confined to housing. It does not involve the displacement of occupant and it is often thought that in economic terms, it is less costly than redevelopment, although evidence is conflicting. Needleman's renewal theory thus suggested that the comparative economics of redevelopment and rehabilitation depends on (Newman, 1999):

(i) the rate of interest (ii) the future life of the rehabilitated property and (iii) the differences between the running costs of the new and rehabilitated property. Normally, rehabilitation would be worthwhile if the present cost of clearance and building exceeds the sum of the cost of rehabilitation, the present value of the cost of rebuilding, and the present value of the difference in annual running costs.

5. Ondo State: an Overview

Ondo State (Figures 1 and 2) of Nigeria was one of the seven states created on 3rd February, 1976. It was carved out of the former Western State. The state covered the total area of the former Ondo Province, created in 1915 with Akure as the provincial headquarters. Ondo State took off formally on 1st April, 1976, consisting of the nine administrative divisions of the former Western State (Ministry of Information and Culture, 1979). These nine divisions then were Akoko, Akure, Ekiti Central, Ekiti North, Ekiti South, Ekiti West, Okitipupa, Ondo and Owo. Akure town ship was retained as the state headquarters. However, on 1st October, 1996, Ekiti State was carved out of Ondo State.

Location: The state lies between latitudes 5°45' and 7°52'N and longitudes 4°20' and 6° 05'E. Its land area is about 15,500 square kilometres. Ondo State is bounded on the east by Edo and Delta states, on the west by Ogun and Osun States, on the north by Ekiti and Kogi States and to the south by the Bight of Benin and the Atlantic Ocean.

Administrative Areas: The apex of the administrative structure is the state headquarters, Akure. Prior to the carving out of Ekiti State from Ondo State there were twenty-six Local Government Areas. Fourteen of these remained in Ondo State, and from these, additional four LGAs were created. As at now, there are eighteen LGAs in Ondo State. The physical and infrastructural conditions of Nigerian urban centres described under the conceptual framework of this study can be said to be true representation of Ondo State.

Figure 1. Showing location of Ondo State in Nigeria and Africa.

Figure 2. Showing the various Local Government Areas in Ondo State, Nigeria.

6. Methodology

The cityscapes of the State was studied to evaluate the environmental quality that has emerged from the institutional frameworks of the Ondo State Government's relevant departments, especially the urban renewal products. Secondary data was used to glean renewal strategies of the state government and the products of the renewal efforts.

7. Urban Renewal in Ondo State

Ondo State Government (2012) identified the aim of its urban renewal programme as making the towns and cities in the state serene places for living, work and decent environment for leisure and attractive to investors through the following objectives: To harness the potentials of the towns and cities as engines of social and economic growth and development; To create orderliness and ensure that components of the towns and cities function efficiently; To improve the ecstatic of the towns and cities to promote healthy living; To promote tourism and enhance the urban economy. This aim and its objectives has been pursued through the following strategies (Ondo State Government, 2012):

Identification and delineation of contiguous urban communities as a key step in strategic management of urban areas with a view to providing community-based integrated infrastructure and services;

Sensitization and mobilization of community stakeholders such as neighbourhood organizations traditional institutions for sustainable improvement of urban communities; *Baseline Survey* for the collection of baseline data in order to generate statistically–valid estimates that quantify, characterize and measure the intensity and magnitude of slum conditions for formulating action plans;

Community Consultation and Participation for building confidence, establishing buy-in and ownership for project support and post implementation maintenance and sustainability. *Integration and coordination* of service delivery in the face of financial constraints;

Ownership of development projects by beneficiaries to ensure post implementation maintenance, protection of investment and sustainability.

Monitoring and Evaluation built into project development to ensure that lapses in design and implementation are noted early and correction made to improve project outcome.

These strategies have yielded urban renewal products in the state with resultant economic growth driven by uncommon political will. These products can be grouped into general goods neighbourhood and regional market infrastructures as shown in Table 2, specialised market infrastructure like Akure International Auto-mart (Figure 3), electrification, transportation infrastructures like Modern Motor Park, Akure, road dualisation and landscaping, general and specialised health facilities, sanitation and waste management infrastructures, and recreation facilities as shown in Table 1.


Figure 3. showing Akure International Auto-market, Akure, Ondo State, Nigeria

Table 1. Summary of urban renewal products in Ondo State, Nigeria.

S/N	Component	Location	Urban Renewal Strategy
1	General goods Markets	State-wide	Re-construction, New developments
2	Mechanic Village	Akure	New construction
3	Electrification	State-wide	Rehabilitation, New construction
4	Model Motor Park	Akure	Rehabilitation, Re-construction
5	Recreation Parks	State-wide	Rehabilitation, New construction
6	Tomato Factory	Akure	Rehabilitation and Redevelopment
7	Health infrastructures	State-wide	New construction, Renovation
8	City Beautification	State-wide	Renovation, Rehabilitation, New construction
9	Flood and erosion control	State-wide	New construction
10	Housing Estates	State-wide	New construction

Source: Compiled from Ondo State Government, 2012

Table 2. Data on major market developments in Ondo State as urban renewal products.

S/N	Location	Size	Operation	No of Open Stall	No of Lock Up Stalls	Available Facilities	Major Wares In The Market	Operational Coverage
1	NEPA Neighbourhood Market (Akure)	5,100 m^2	Daily	192	24	Pipe-borne water, toilet, admin. block, parking, security post, canteen	Mainly food stuffs and general provision	Neighbourhood
2	NEPA Main Market (Akure)	1.325 Hec	Daily	-	275	Admin block, crèche, canteen, security post, pipe borne water, toilet	Varieties	City wide
3	Isikan Phases I and II	1.79 Hec	Daily	150	336	Admin block, pipe borne water, toilet, security post, electricity	Varieties mainly food items and clothing	City wide
4	Ikare	2.13 Hec	Daily	520	-	Cold rooms, water supply, electricity supply, livestock section, milling section, grains section	Mainly food items, textiles, and kitchen utensils	Regional coverage up to Ekiti and Edo States
5	Okitipupa	2.00 Hec	Daily	531	108	Cold room, toilets, security post, admin block, fire sub-station, canteen	Food stuff, general provision, textile, kitchen utensils etc.	City wide
6	Ondo (Moferere)	3.267 Hec	Daily	252	-	Admin block, water supply, toilets, security post, fire station, fire station, waste disposal management unit	Textiles, food stuff, general provision, kitchen utensils	City wide
7	Igbokoda	2.83 Hec	Daily	932	150	Clinic, cold rooms, police post, canteen, water supply, toilets, admin block, etc.	Food stuff, various types of fresh and smoked fish, textile, kitchen utensils, local dry gin, etc.	International with influence along West African coast
8	Iju/Ita-Ogbolu	-	Daily/ Weekly	70	-	Water, toilets	Varieties	Neighbourhood
9	Oba-Akoko	-	Daily	86	-	Water, toilkets	Varieties	Neighbourhood

Source: Ondo State Government, 2012

The significance of these urban renewal products to economic growth cannot be overemphasized. Importantly, they were conceived to reach the entire economic population of the state, especially the informal economic sector which has the highest percentage. While most of the market-related renewal products have direct economic growth influence, others have indirect impacts on the economic growth of the state. Transportation infrastructures like roads and modern motor parks have indirect but high positive influence on the economy of the state as they provide economic linkages to other economic centres in the sub-region. Health infrastructures are not only germane according to the saying that "health is wealth" but as drivers for the health of

the population to enhance active involvement in economic activities. In view of the provision of suitable spaces where economic activities are efficiently carried out, productivity is easily enhanced (Adedeji & Fadamiro, 2012).

8. Recommendation and Conclusion

Urban renewal products have an overwhelming impact on the overall quality of lives in cities and economic growth in particular. Even though it encompasses a gamut of problems, urban renewal is inevitable for the sustenance of urban life in city centres. It is almost compulsory for every urban human settlement considering the lifecycle of built environments in general with birth, use, decay and death phases.

The present study discovered that a great urban renewal fit was achieved in Ondo State, Nigeria. In view of the multi-dimensional goals of the programme targeted towards all economic groups in the state, its economic growth impact cannot be overemphasized. The informal economic sector of the population who has suffered gross neglect of their economic-related environmental concerns in the past has benefited immensely from the urban renewal programme of the Ondo State government. Consequently, because of the relationship between the quality of work environments and quality of outputs, economic growth has been enhanced in the state. The programme has been much successful because of its cardinal driving forces of vision, passion and properly directed actions. Also, the engagement of appropriate renewal strategies for peculiar components of the schemes with necessary methods of public participation, payment of required compensations, and impartiality in the implementation of the strategic plans was observed. This fit can be replicated in other states in Nigeria if similar political will is available.

In view of the results of this study, effective public participation combined with appropriate strategies are the sustainable tools for the best result in urban renewal programmes while urban renewal itself is the only feasible solution to the current dwindling economic sector in Nigeria.

Acknowledgments

This research did not receive any specific grant from funding agencies in the public, commercial, or non-for-profit sectors.

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Journal Of Contemporary Urban Affairs

2018, Volume 2, Number 1, pages 84– 95

A Lesson from Vernacular Architecture in Nigeria

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ARTICLEINFO:

Article history:
Received 20 July 2017
Accepted 10 August 2017
Available online 21 September 2017

Keywords:
Vernacular;
Architecture,
Nigeria;
Contemporary;
Values.

ABSTRACT

Contemporary architecture has its roots from the vernacular. Every cultural group in the world has its own form of vernacular though the approach may vary from place to place and from people to people. Vernacular architecture has many values which are relevant to contemporary architecture today. This paper looks at vernacular architecture in Nigeria as practiced by two ethnic groups who have varying climatic, religious and socio-cultural practices. The approaches to architecture by these two groups, i.e. the Hausas and Igbos, are looked at with the intention of finding positive values in the vernacular which can be applied to the contemporary. One of such values as seen in this paper is the harmony of traditional building materials with nature. Local building materials are able to meet housing needs without having detrimental effect on the environment. More emphasis should therefore be given to local building materials in the building industry today. The paper concludes by stating that for contemporary architecture to adequately meet the needs of man today, vernacular values which apply to the cultural and climatic needs of such places should be selected and imbibed.

JOURNAL OF CONTEMPORARY URBAN AFFAIRS (2018) ***2***(1), 84-95.
https://doi.org/10.25034/ijcua.2018.3664

www.ijcua.com

1. Introduction

The Dictionary of Architecture and Landscape Architecture, (2000), describes vernacular architecture as *"unpretentious, simple, indigenous, traditional structures made of local materials and following well-tried forms and types."* Man has always sought to provide shelter for himself through the use of local materials and techniques in ways best suited to meet his own individual, socio-cultural needs and also fit into the existing climatic conditions.

Too often, vernacular architecture has been portrayed as something that is local, primitive, unattractive and unworthy of being preserved. This perception seeks to give the vernacular a reflection of negativism and underdevelopment. Yet despite this bleak portrayal of the vernacular, one only has to take a closer look at the way the traditional builders used local materials and techniques to display technological sophistication and ingenuity in their structures to develop a sense of respect and admiration for the vernacular. These local societies were able to bring a sense of communality and ethical representation into their buildings and settlements.

In his book, 'Vernacular Accommodations: Wordplay in Contemporary Architecture Theory,' Andrews (2012) introduces the reader to a world of vernacular that reflects *living traditions* and *ethical approaches to creativity*, a form of architecture that is *original, reflects peasant lifestyles* and *shows an integration of the building in the life of the community as a whole while addressing local conditions of climate*. This paper intends to search for such values of the

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vernacular in Nigerian traditional architecture with the aim of drawing lessons from it which can then be incorporated in Nigeria's present contemporary architecture.

Nigeria is a vast country with a rich diversity. This diversity is seen in various dimensions such as: ethnic group representations, climatic conditions, religious affiliations, cultural beliefs and practices and art forms. Because of the vastness of its diversity, approaches to architecture also vary. Different ethnic groups in Nigeria approach architecture in different ways in an attempt to address local conditions and needs. To better understand and appreciate vernacular architecture in Nigeria, this paper is considering architectural approaches of two ethnic groups under varying climatic conditions, religions and socio-cultural practices.

The paper has a number of objectives. To review vernacular residential architecture in Nigeria as practiced by two cultural groups, i.e. the Hausas and the Igbos, so as to better appreciate their approaches to architecture. To determine the values that might have influenced their local architectures. The paper intends to compare vernacular and contemporary architecture in Nigeria, and to find positive values embedded in Nigerian vernacular architecture which might be appropriated in contemporary Nigerian architecture.

2. Nigeria

The Federal republic of Nigeria is located in West Africa and lies between latitudes 4° and 14ºN, and longitudes 2º and 15ºE. (Figs. 1&2)

Figure 1. Map of Africa Showing Nigeria in Red. (Source: www.google.com)

Figure 2. Map of Nigeria Showing 36 States and the FCT Abuja,
Source: www.google.com

With a current population of over 180,000 million people, Nigeria is the most populated country in Africa. Of the over 250 ethnic groups in the country, the three largest are the Hausas, located in the northern part of the country, the Yorubas, in the south western part of the country and the Igbos, found in the south-eastern part of Nigeria. (Figure 3)

Figure 3. Map of Nigeria Showing the Broad Distribution of Major Ethnic Groups6.
Source: www.google.com

British colonial rule began in Nigeria from the 19th century when the Northern and Southern Protectorates of the country were merged together to form a single entity called Nigeria. This was done in 1914 by the British. Nigeria eventually gained its Independence from the United Kingdom on 1st October 1960.

Nigeria is a multi-religious country made up of two predominant religions, i.e. Christianity and Islam. The population is divided roughly in half between these two major religions.

Basically, Nigeria's climate can be classified into two. The northern part of the country, where the Hausas predominate, is characterized by hot, dry climate and extremes of temperature between day and night. Rainfall is minimal and often less than 500mm per year. The southern part of the country, where the Igbos are found,

is mostly hot and humid and has a high annual rainfall of between 1,500 to 2,000 mm a year.

3. Methodology

The main aim of carrying out a research is to add to existing knowledge in a particular area of study. This can be achieved through investigating new dimensions of any field of study. Through the process of carrying out a research, problems are defined and redefined, hypotheses and theories are formulated, new approaches are developed, solutions are suggested and conclusions drawn. This process also involves the use of strategic and systematic methodology in pursuit of knowledge so as to arrive a logical solution and develop a problem solving theory Rajasekar et'el (2006).

This study employs the exploratory research tool for collecting its data from existing publications on the Research. Information will be sought from journals, reports and books on related topics. Personal knowledge about the study area will also be applied.

4. CASE STUDIES: HAUSA, IGBO

4.1 Hausa

4.1.1 Hausa People

The Hausas are one of the major ethnic groups in West Africa and are among the three largest in Nigeria(Arenibafo, 2016). They can also be found in significant numbers in Niger Republic. They all speak the Hausa language which is the most widely spoken language in West Africa.

Long distance trading has long been practiced by the Hausas. They also engage in other occupational practices such as: farming, animal herding, and practice of crafts such as dyeing, thatching, leather working, weaving and silver smiting. The Hausas predominantly follow the Islamic religion. Its influence is significant and permeates almost every aspect of their life and culture such as their dressing, social interactions and even architecture. Agboola and Zango (2014) state that the Trans-Sahara Trade coupled with the new religion of Islam had the most enormous impact on the settlement pattern and local building practices of Hausa land. Some of the effects can be seen reflected in the façades of their buildings as a number of the designs employed were borrowed from other parts of the Islamic world.

4.1.2 Typical Hausa Vernacular Architecture

Hausa vernacular architecture is greatly influenced by socio-cultural practices, religion, climate and available material. Culture and social practices have affected the layout patterns of both settlements as well as family compounds. Within the settlement, there are three important focal points. These are the mosque, emir's palace (chief's palace) and market. The emir's palace acts as the seat of administration of the community while the market draws people from within and around the community once a week for trade and social interactions. Family compounds are built around these three focal points.

Within the family setting, the extended family system is an important cultural practice. It is not uncommon for members of an extended family to live together in one large homestead which is sub-divided into units, each unit belonging to a married male member of the family. Family compounds can be quite large in size depending on the number of wives and children a man has and in the case of the Hausas, four wives are allowed according to the Islamic religion. Building units are added within a compound as the need arises or as the family size increases. So also, the reverse is the case. The size of the compound may diminish as children move away from home to settle elsewhere or as huts fall into disrepair.

Social relationships within the community are important to the Hausas and provision for this is made in the compound by the introduction of an entrance or reception hut called a *zaure* (Figure 4). This is a multi-functional entrance lobby which is used by the family head for relaxation, entertaining visitors, practicing crafts, etc. Open spaces are also provided in front of family homesteads and serve as relaxation spots for the family head and his visitors and where he often sits to share meals with neighbors (Figure 5),

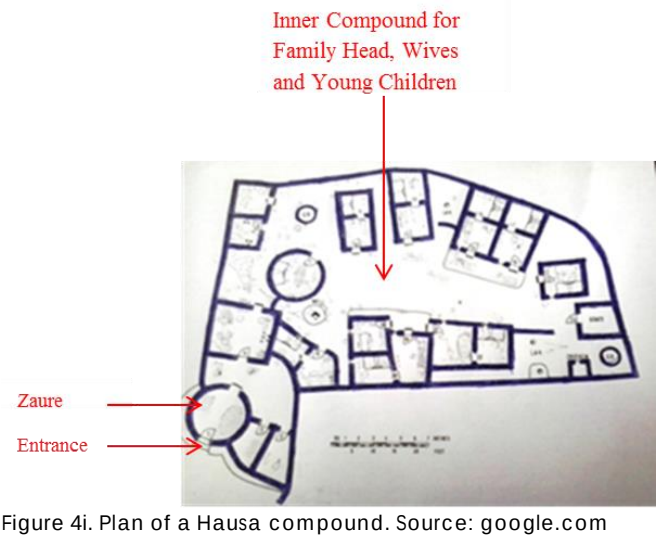

Figure 4i. Plan of a Hausa compound. Source: google.com

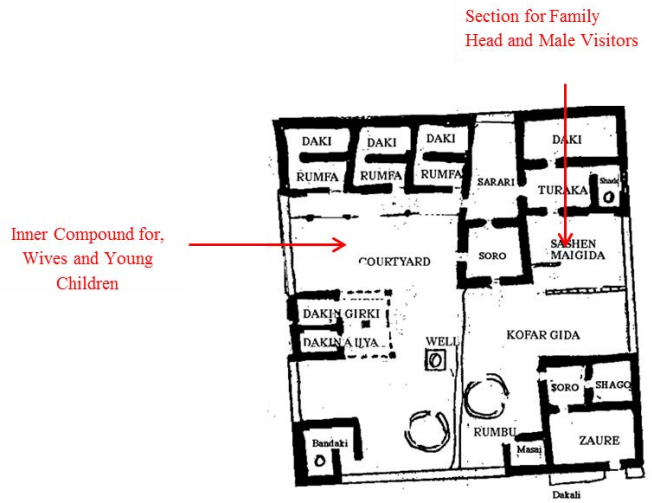

Figure 4ii. Plan of a Hausa compound. Source: Muhammad Oumar, 1997

Figure 5. Outdoor Space for Relaxation (Moughtin, 1964).

Religion plays an important role in Hausa architecture. The Islamic religion which is practiced by most Hausas in northern Nigeria encourages seclusion of women and separation of the two genders. For this reason, a *zaure* or male reception area was introduced into the plan of Hausa buildings. It acts as a foyer and sets limits beyond which strangers and males outside of the family unit cannot exceed. Women stay within the inner compound which is veiled from view. Privacy is further encouraged by the absence of windows on exterior walls

The effects of climate are addressed in Hausa buildings. Northern Nigeria, where the Hausa people can be found, falls within the Sahel savannah. This area is characterized by hot dry climatic conditions with extremes of temperature between day and night. Traditional Hausa houses are built to accommodate these climatic conditions. Openings are small and few in number so as to keep out dust and as much as the sun's heat and glare as possible. The walls are made of adobe mud which is a good thermal regulator, helping to regulate extremes of temperature between day and night thus keeping interiors cool during the hot daytime and warm during the cold nights. Flat mud roofs are employed on the rectilinear walls. They act as good thermal insulators and are ideal in an area which is prone to fire outbreak due to dry weather conditions. The flat roofs are also suited to the limited amount of rainfall experienced within the year (Figure 5).

Various building materials are used in Hausa building construction. Moughtin (1964) names them as earth, timber, reeds, grasses, and stones. Dry straw when mixed with mud is used to make adobe bricks of great strength which is used for the wall construction. A local waterproofing plaster is made from a mixture of mud and either ash additives or liquid from locust bean pods. Building forms are either round or rectilinear in shape.

Roofing is of two types depending on the shape of the building. Round huts are roofed with conical thatched roofs made from cornstalks and grass. Rectilinear buildings usually have flat mud roofing. These are made from timber from the palm tree (azara) which is very strong and insect resistant. The timber pieces are laid across each other in a herringbone fashion after which both sides are plastered with mud. A special water proofing plaster is applied to the roof.

Ingenuity is seen in the construction of interior arches (*Figure 6)*. Moughtin, (1964), describes the arches as: *A series of cantilevered lengths of azara (a fibrous palm tree which is free from attack by white ants) built into the mud arch to form the main reinforcement while additional azaras are used to counteract shear and to distribute the thrust of the arch into the walls*

Creative façade designs are important elements in Hausa architecture. According to Adamu, (2005), decoration in Hausa traditional architecture can be categorized into three groups namely, surface design, calligraphy and ornamental. The surface designs are predominantly reliefs, engraved or carved

designs and murals (Figure7&8). Decorative elements called *zanko,* protrude from the roof parapet. They are unique additions to many Hausa buildings.

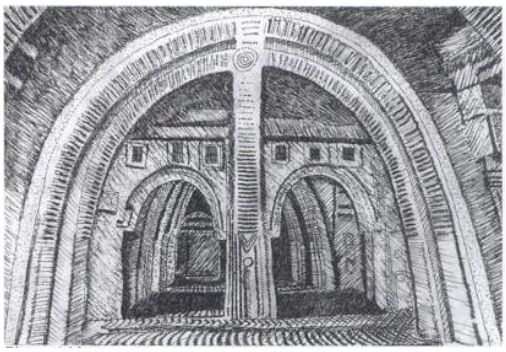

Figure 6. Indoor Arches.

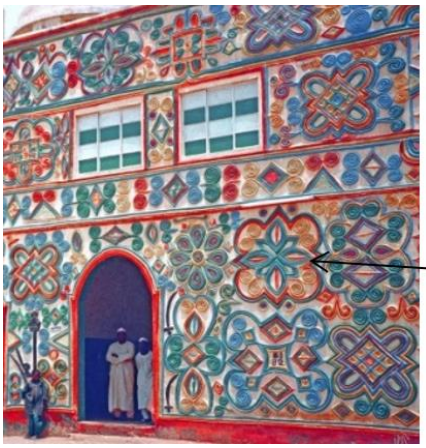

Figure 7. Emir of Zazzau. Palace in Zaria, Nigeria, built 1995–
Mural Facade Design
Source:www.google.com

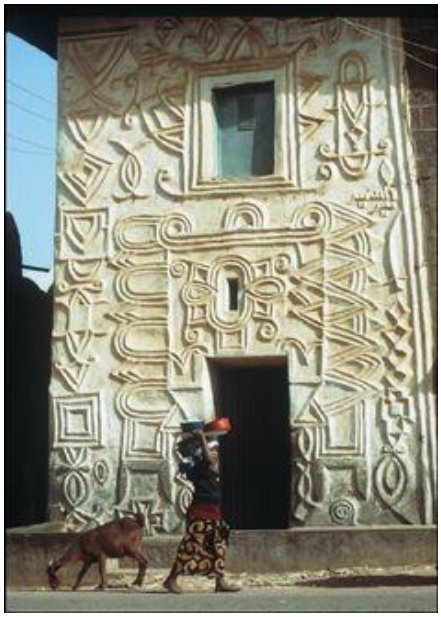

Figure 8. Relief Design on a Street Facing Façade.

5. Hausa Contemporary Architecture

The first impact of modernity on Hausa buildings came with colonialism. Schwertfeger, (2014) attributes the late 1940's as the period when modern building materials were introduced into Nigeria. The import of these materials, particularly cement, played a great role in changing the practice of vernacular architecture in Hausa land and Nigeria in general. Modern materials like cement allowed people to construct longer lasting homes. As such, adobe bricks were gradually replaced with cement blocks which are longer lasting and carry greater prestige in the society. Modern roofing materials have to a great extent also replaced mud and thatch roofing.

Modernity has also improved health conditions in many traditional Hausa buildings. Where before, ventilation was insufficient in the indoor rooms because of the small and inadequate number of windows, contemporary buildings now have larger openings which allow for cross ventilation. This has reduced the incidence of meningitis in many Hausa settlements in Nigeria. Cholera and other such diseases have also been reduced since modern toilets were introduced, replacing pit latrines in many homes.

The practice of gender separation and privacy for women is still seen in many contemporary Hausa buildings. In the plan below, the first floor plan is reserved strictly for family members while on the ground floor, there is complete separation of the visitor's space from that of the family space thus ensuring minimum contact between non family members and family members, particularly women (Figure 9). Separate entrances have been provided for the women folk so that they can have access into and out of the house without being seen by any male visitors. This is in accordance with the socio-cultural and religious lifestyle of the Hausas.

Figure 9. Plan of a Contemporary Hausa Building Designed by Zailani and Sa'ad Raji (Aliyu, 2015).

One effect of modernity on Hausa cultural lifestyle is the gradual loss of extended family ties. Many contemporary residential buildings are designed solely for single family units thereby effectively cutting out the extended family lifestyle. Some contemporary buildings have maintained some elements of the vernacular in their external facades. For instance the buildings in Figure 10 below have added pinnacles (Zanko) at the top of the parapet roof. This is a distinctly Hausa element and gives the building a "Hausa" appearance.

Façade designs have gradually become less popular than before and are not as extensively applied as in the traditional buildings. This can be seen in the pictures in Figure 10ii below where the greater part of the façade has been left unadorned with the exception of the front entrance which has some ornamental decoration around it, reminiscent of traditional Hausa architecture. Also, the facade design in the buildings in Figure 11 is not as elaborate as is found in the traditional buildings. (Compare with Figure 7).

Figure 10. Contemporary Hausa Architecture With the 'Zanko' Added at the Top Giving it a 'Traditional' Look Source: Aliyu, 2015

Figure 11. Pictorial Views of Postmodern Residential Designs Displaying Northern Cultural Symbol Popularly Known as Arewa Symbol (Aliyu, 2015).

6. Igbo People

The Igbo are also a prominent people group found in Nigeria. They live in the south-eastern part of the country in scattered towns and villages and speak the common Igbo language. Igbo people are very industrious and engage in a wide range of commercial activities. In the rural areas, Igbo people work mostly as craftsmen, farmers and traders.

Prior to the coming of missionaries to Nigeria, the Igbos predominantly practiced traditional religion which involved belief in a vast number of gods and goddesses. With the coming of missionaries however, most Igbos embraced Christianity though a small percentage still follow the traditional religion.

The Igbos are also known for sculpturing and carvings. Many of their doors and wooden pillars have various designs carved into them. Uli design is a form of body beautification, done mostly by Igbo women. It is sometimes inscribed on facades of buildings.

6.1 Igbo Vernacular Architecture

Igbo architecture, as practiced by the Igbos of south eastern Nigeria, display values of vernacular. Their buildings seek to integrate spiritual, cultural and lifestyle values into their architecture. Chukwu (2015), states that '*apart from the Igbo language which was the number one distinguishing factor, the traditional Igbo society was both theophorous and communal*.' He goes on to say that '*these two traditional indices of the Igbo society namely, the religious and communal life traits were always expressed and represented in the building architectural designs of every Igbo society.*'

Communality is an important aspect of Igbo cultural life and is ingrained into the layout of the settlement pattern. Settlements typically have community spaces at the center, and these spaces are the sites for public gatherings, discussions and meetings, as well as other community interactions *(http://africanurbanism.net/2012/03/31/tradition*

al-igbo-design/). Festivals and displays by masquerades are important activities in the Igbo community and are done in these village squares (Figure 12).

A typical family compound contains a number of huts or building units, each having a separate function (Figure 13, i&ii). The number of such building units is determined by the number of wives and children a man had. Before the advent of Christianity into Igboland, the Igbos were predominantly a polygamous society. A large number of wives and children was seen as a sign of wealth and moreover, increased the workforce of the family, considering that farming was the mainstay of their economy.

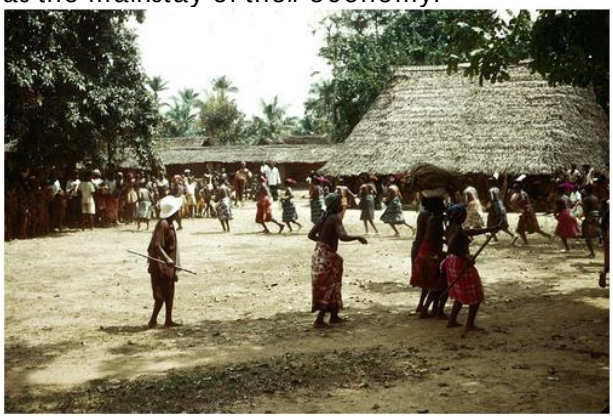

Figure 12 i. An Activity Taking Place in an Igbo Community Village Square Source: (http://africanurbanism.net/2012/03/31/traditional-igbo-design/

Figure 12 ii. Masquerades Permorming in a Village a square.

The compounds are surrounded with an earthen wall having a single entrance gateway. Okoye (2001) states that this entrance gateway indicates the status and power of the family and the importance of the head of the compound, which is communicated through the elaborate nature of the gate structure, and the richness of the door leaf it probably had once framed.

As with the Hausas, the extended family system is important in the Igbo community. Clans men often live in a large family compound demarcated into separate units by a common fence. Meetings and family gatherings are regular events. An important element called *obi* is provided in the compound of the eldest male member of the extended family for these gatherings. Cole and Aniakor (1984) describe the obi as '*the male meeting house which is the conceptual and, often, the physical centre of a domestic Igbo architecture* (Sourced by Ikebude, 2009).

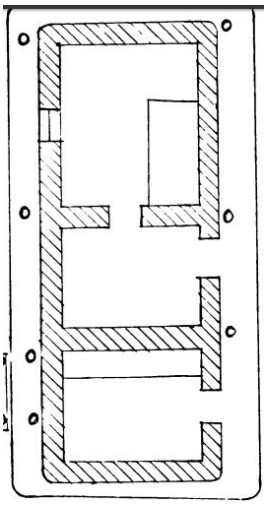

Figure 13 i. Plan of a Family Unit, Source. (Nsude, 1987)

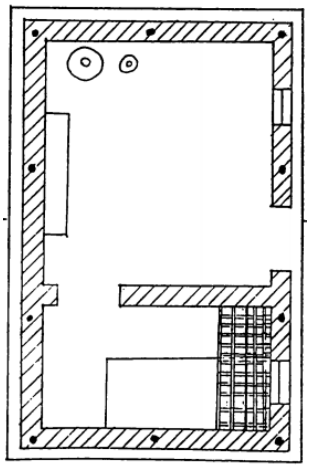

Figure 13ii. Plan of a Family Unit, Source Nsude, 1987.

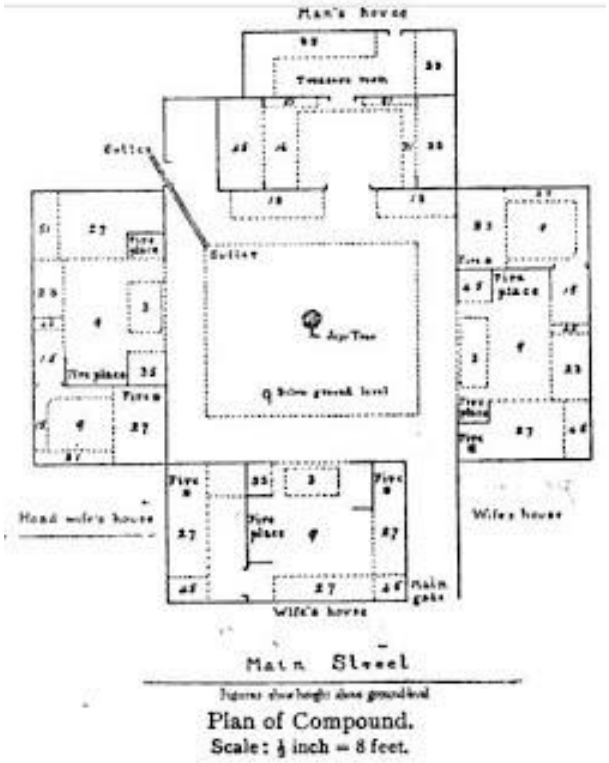

Figure 13iii. Plan of a Family Compound with courtyard in the centre and Building Units Surrounding it.
Source:www.google.com.

Traditional religion as practiced by the Igbos, involved belief in various gods and goddesses and led to shrines being erected within the larger community, in their honor. An example of this is the *mbari* hut which is a shrine built for the deities. Each deity had its own individual shrine (Figure 14). Within the family compound, sacred family shrines were also erected.

Figure 14 i. Mbari house.

Figure 14 ii. Entrance to a communal shrine.

The predominant building materials of the Igbos were clay, grasses and bamboo. These were used to address local weather conditions. Hot humid conditions prevail in south-eastern Nigeria so clay was used for building adobe walls which sufficiently regulated temperature between the indoors and outdoors. Nsude, (1987) states that the warm humid climate of Igbo land and its tropical rainfall dictate the use of steeply pitched roofs. The roofs are thatched with palm leaf fronds and grasses which are commonly available in that part of the country.
The building forms are basically of two types: the rectangular and the circular. Roof forms are also built in accordance with the building form, thus, rectangular buildings had hipped roofing while circular buildings had conical roofing.

Figure 15 i. Thatching with palm leaf mats, early 20th century.
Source: Basden 1921

Figure 15 ii. Steeply Pitched Roofs Source: Nsude, 1987.

Building of houses was usually a family and communal affair. Members of the extended family and community members usually joined hands to raise structures. Walls were often plastered with mud after construction. Nsude (1987) talks about cow dung being used as a plastering material. According to him, not only is the dull greenish color more pleasing to the eye than the natural earthen color, it also has better water proofing qualities than ordinary mud.

The art of surface decoration is also practiced by Igbos in their buildings. Decoration in traditional Igbo architecture is not restricted to their compounds and homes only but shrines, meeting houses and club houses are also often decorated (Nsude, 1987). He goes on to say that decoration often involves bas-relief, insertions, color mural painting or the use of moulded and carved objects. Creativity is seen in Igbo architecture in the carvings and sculptures on doors, gateways and pillars. In Igbo architecture, generally, building extensions such as walls and posts, and panels such as doors, are considered architecture as such murals and other wall decorations, and relief carvings on posts and doors are all architectural processes (Ikebude,2009) (Figure 16&17).

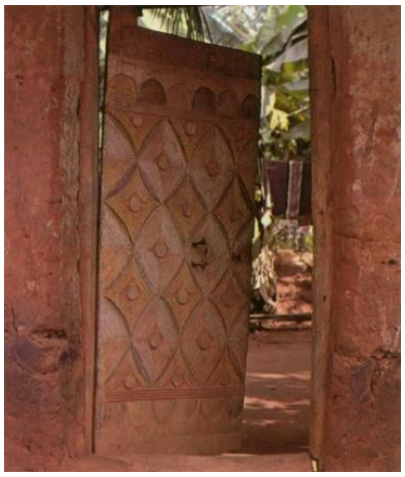

Figure 16 i. Carved Igbo Doors.

Figure 16 ii. Carved Post. Source: nairaland.com

Figure 17. A decorated wall surface Source: howafrica.com

6.2 Igbo Contemporary Architecture

Vernacular Igbo architecture has seen several changes due to the influence of modernity.

The wider choice of modern building materials is one of the more obvious influences of modernity on Igbo vernacular architecture. Longer lasting buildings of varying sizes are now seen in contemporary Igbo societies. Buildings are more compact with rooms opening into one another with a single common roof over them. The compound is no longer in the centre but around the building. Pitched roofs have been

maintained on contemporary buildings due to the frequent rains; however modern roofing materials are now used.

External wall facades made up of carved images and murals are now absent from contemporary Igbo architecture. Rather, modern paints and wall tiles are applied. Where community members used to join hands to raise buildings, now paid labor is the common method of building. Modernity has brought about a disintegration of community and extended family lifestyle. Buildings are designed for smaller family units.

Table 1. Comparison between Traditional Hausa and Igbo Architecture.

	Hausa	*Igbo*
Settlement	3 important elements in the settlement: mosque, emir's palace, market	2 important elements in the settlement: Village square, Shrines
Compound	Privacy and gender separation highly emphasized. Non male members of the family cannot gain entrance into the inner compound. Building units of round or square huts having different functions are repeated throughout the compound.	No gender separation. Inner compound is open to visitors, both male and female. Building units of round or square huts having different functions are repeated throughout the compound.
Building Materials	Mud, grass, cornstalks, timber	Mud, grass, bamboo, raffia palms
Roofing Types	Flat mud roofs Conical thatched Roof	*Pitched Thatch Hip Roof Conical Pitched Thatch Roof*
Openings	Small and Few Windows	Small and few windows
Façade	Facades are highly decorated with reliefs, murals and engraved decorations.	Facades, doors, pillars and posts are highly decorated with reliefs, murals and carvings
Courtyards	Open spaces within the compound make up the courtyard.	Open spaces within the compound make up the courtyard.
Family Size	Large due to extended family practice and influence of religion which permits up to four wives.	Large due to extended family practice and socio-economic reasons.

Table 2. Comparison Between Contemporary Hausa And Igbo Architecture.

	Hausa	Igbo
Settlement	No focal points. Settlements have expanded due to urban growth.	No focal points. Settlements have expanded due to urban growth.
Compound	Privacy for women still emphasized. Women's quarters separated from external contact with visitors.	No gender separation.
Building Materials	Cement, Sandcrete blocks, burnt bricks, modern roofing materials	Cement, Sandcrete blocks, burnt bricks, modern roofing materials
Roofing Types	Pitched roofs. Parapets used in many buildings obscuring the pitched roof and giving the appearance of a flat roof.	Pitched roofs.
Openings	Larger in size and variety.	Larger in size and variety.
Facades	Traditional façade decoration still applied in some instances though not as frequentle as before. Modern paints and textured finishes now common.	Sculptures, wall carvings and traditional façade designs not practiced. Modern paints and textured finishes now common.

Courtyards	Compact building plans. Courtyards surrounding the building rather than at the centre.	Compact building plans. Courtyards surrounding the building rather than at the centre.
Family Size	Still large due to allowance of four wives by Islamic religion. Extended family practice not as commonly practiced.	Smaller due to influence of Christianity which allows only one wife and due to gradual disintegration of extended family practice.

7. Conclusion

Vernacular architecture has undergone a number of changes over the years as a result of the influence of modernity. This has led to the emergence of contemporary approaches to building in the Nigerian society. Values of the vernacular however are still very relevant to our contemporary buildings today.

For instance, vernacular architecture uses local eco-friendly materials to address local climatic conditions. Adobe is a good example of a traditional building material with natural thermal regulating qualities and no detrimental environmental effects. Modern building materials are not eco-friendly like the local building materials and have caused various threats to the natural environment. Now with the issues of climate change and global warming, it is becoming increasingly clear that there is a need to revisit the use of our local building materials. With some improvements our local materials can function in the same capacity as the modern materials with the added advantage of not harming the environment.

Values of ethics, family living and cultural practices define vernacular architecture in Nigeria. This is absent in contemporary architecture today. Creative means of expressing culture should be encouraged in our contemporary buildings. For instance, rather than using expensive wall finishes which have no cultural expression, simple yet attractive traditional wall finishes can be applied in our contemporary buildings. This will not only save money but will also preserve our cultural heritage.

Acknowledgments

This research did not receive any specific grant from funding agencies in the public, commercial, or non-for-profit sectors.

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Journal Of Contemporary Urban Affairs
2018, Volume 2, Number 1, pages 96– 101

Opportunities for Practicing Sustainable Building Construction in Kurdistan Region, Iraq

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ARTICLEINFO:

Article history:
Received 30 July 2017
Accepted 20 August 2017
Available online 17 September 2017

Keywords:
Sustainable Construction;
Green Rating Systems;
Sustainable Construction Barriers;
Kurdistan region of Republic of Iraq

ABSTRACT

Construction sector of Kurdistan region of Republic of Iraq has witnessed a huge development in construction sector last ten years. However, there are lack of awareness and legislation regarding the sustainable construction in buildings sector. The aim of the paper is to find the required mechanism to introduce sustainable practice and implement sustainable construction in the buildings construction sector at Northern Iraq. The main objectives in this study are identifying the barriers in sustainable construction at Northern Iraq and investigate the law and regulations in dealing with these barriers.

JOURNAL OF CONTEMPORARY URBAN AFFAIRS (2018) ***2***(1), 96-101.
https://doi.org/10.25034/ijcua.2018.3665

www.ijcua.com

1. Introduction

The necessity to overcome the global warming and climatic changes, which the world facing it in 21st century, requires the action towards sustainability are crucial subject nowadays. Growth population and expanding of urbanization will continue increasing the buildings construction. In the same context, the needs for the safe and good life of future generations are also important.

To reach this goal there is vital requirement to control urban planning, design and construction. Thus, sustainability in design and construction became crucial for the storing of natural resources for next generations. United Nations World Commission on Environment and Development (UNWCED), defined Sustainability was defined as that which

> *"meets the needs of the present without compromising the ability of future generations to meet their own needs" (1987), (Al Surf, 2014).*

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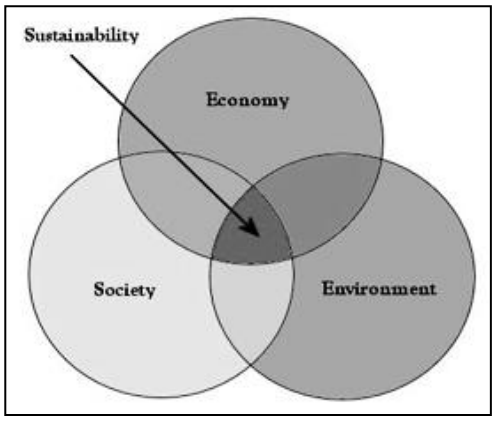


Figure 1. Three main aspects of sustainability (from Juneau Commission on Sustainability)

Sustainable development and construction of the buildings are directly affecting one another, as Section 7.67 of the United Nations' Agenda 21 states:

> *"The activities of the construction sector are vital to the achievement of the national socio-economic development goals of providing shelter, infrastructure and employment. However, they can be a major source of environmental damage through depletion of the natural resource base, degradation of fragile eco-zones, chemical pollution and the use of building materials harmful to human health"(UN - Agenda 21, 2004).*

Sustainability consists of three main aspects, the interrelation of them creates the sustainability. Sustainable development recognized in three terms, that are environmental protection, economic growth, and social development (Adams, 2006). These aspects should be available in order to achieve sustainability in any field. See figure '2'.

Generally sustainable buildings supposed to achieve the three main aspects of sustainability: Environmental sustainability, economic sustainability and Social sustainability (McConville, 2006). Table '1', shows the main factors to achieve sustainability in the buildings considering the three aspects of sustainability.

Constructions, involves into socio-economic fields and environmental field as well, through making remarkable use of natural resources and increase the generation of greenhouse gasses through buildings (Asif et al., 2005). According to Zainulabidin and Pasquire, (2005), the main principles in sustainable building are to implement the safety and comfort to occupants as well as the surrounding environment and society.

2. Documents and Discussion

2.1. Kurdistan Region (Northern Iraq) Of Republic Of Iraq

Northern Iraq is a federal part in federal state of Iraq. The region bordered by Turkey from the north, by Iran from the East, by Syria from the west and from the south by the rest of Iraq. The capital of the region is 'Erbil'. The population of Northern Iraq region is 5.2 million. It consist of Three governorates of Erbil, Slemani (including administration of Garmian), Duhok, and later in 2014 the forth governorate added to the region named Halabja.

Those four governorates cover approximately 40,000 square kilometers which is larger than the Netherlands, Bahrain, and four times the area of Lebanon. This include the governorates administered by KRG, but does not contain areas of Kurdistan outside of KRG administration, such as Kirkuk (Soderberg, and Phillips, 2015).

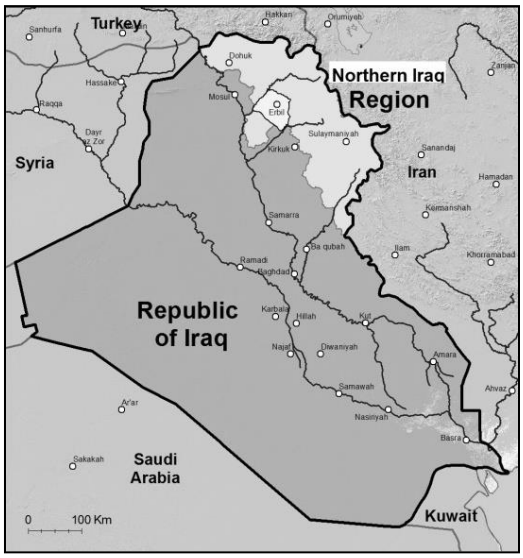


Figure 2. Northern Iraq Map
Source: (http://www.iran-daily.com/News/155384.html)

2.2. Building Construction In Northern Iraq Region

The construction sector is a big part of the Northern Iraq Region's economy because of its influence on other sectors. The span of the development market is evaluated at $2.8 billion, with 95% of the market controlled by Turkish construction companies. According to ECU (Erbil Contractors' Union), the total numbers of construction contractors in the region is estimated by 2,500 contractors, there are 59 foreign Members out of that, 51 of them are Turkish and 8 are Iranian. According to, 'the Turkish Daily News' mentioned that the total numbers of the Turkish contracting companies are estimated by 634 companies working in

Northern Iraq, (USAID, 2008; Alizadehsalehi et al., 2016).

Building costs rising progressively in Northern Iraq, because of the rising of prices for fuel, materials, as well as labors. Since 2000, steel-bars have increased from $200 per ton to reach $700–$800 per ton in 2008. Also, the cost of cement increased from $25 per ton to $125–$150 per long ton. According to the Contractor Union in Northern Iraq asserted, that the construction costs have increased 6 time over 10 years (USAID, 2008).

2.3. The Elements of Sustainability in Building Construction

Previously many institutes and researchers such as; UNEP (2003), Huovila and Richter (1997), have viewed sustainable construction as an environmental issue. Consequently, this made many researchers to consider sustainable construction as a good environmental management, but this understanding of sustainable construction has been changed over the years. In the beginning they focus on the resources depletion subject through energy consumption, and reducing the impact on environment.

Therefore the technical solutions through building material, and design concept were the goals (Sjostrom and Bakens, 1999). When sustainable construction have been understood as application for the principles of the sustainable development in construction sector, then it is generally accepted that similar to SD, sustainable construction addressed the three aspects of environmental, social and economic elements. Hence, and according to Gunatilake (2013), some of extra components have been considered by several researchers in different studies. These elements are:

1. Environmental/ Ecological/ Biophysical
2. Social
3. Economical.
4. Institutional.
5. Legal.
6. Political.
7. Cultural.
8. Technical.
9. Managerial.
10. Community.
11. Moral.

Some other researchers use additional elements, such as Liu, (2006) who used two different components, socio-economic; which refers to the construction process participants behavior in procuring assembled resources) and socio-environmental, which refers to the social and environmental aspects. These two elements used in place of the more common three aspects (environmental, social, and economic)

2.4. Green Building and Green Building Rating System

There are many definitions for 'Green Building'. Green Building can be defined as, the building whose construction and operation lifetime assure the most efficient and least degradation use of land, efficient use of water, energy and resources, and offer the healthiest environment (Gunatilake, 2013). The best design solution is that simulate all of the natural systems and conditions before site development and after the development, effectively.

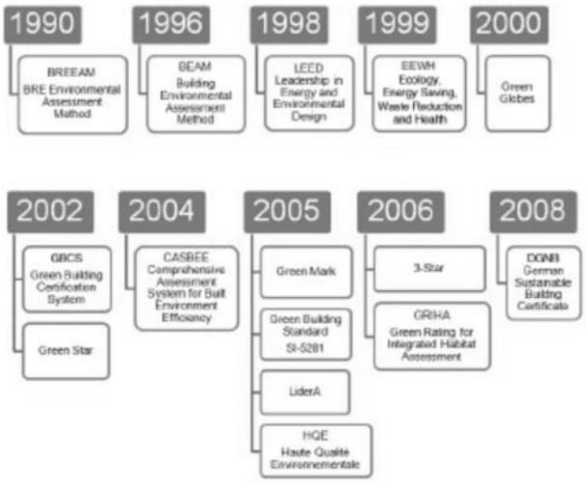
Green building were described according to, Office of Federal Environmental Executive as; the process or application that increase the efficiency within buildings and their sites in usage of energy, water and material, and the buildings which reducing the impacts on the environment and human health. This could be achieved through better sitting, design, construction, use, maintenance, and demolishing (U.S. Green Building Council, 2006).

Different terms were used by the researchers to address the same meaning. For example, Robichaud and Anantatmula (2011) mentions that green building is also giving the meaning of sustainable construction, and 'High performance building', or 'Sustainable building'. In general the sustainable construction leads to achieve green building in the same time high performance and sustainable one.

Rating system is the building environmental performance assessment system; the purpose of this assessment system is to measure the environmental performance of the buildings. In UK In 1990, the Building Research Establishment, LLC (BRE) made an environmental evaluation technique (BREEAM), (BREEAM, 2009). Fourteen countries in 1996; Canada, Austria, Denmark, Finland, Poland, France, Japan, Norway, Sweden, Germany, Switzerland, Netherlands, United States and United Kingdom, started to develop technique known as the 'Green Building Challenge'. The aim was to develop and apply a system for measuring the performance in the buildings environmentally and through energy issues. The Green Building Challenge proceeded with its advancement through 2000 to 2005, and come about of the advancement was the' GBTool'. It is an apparatus to help in the environmental assessment of buildings. 'Green Building Challenge' became presently the

'Sustainable Building Challenge' and proceeds to develop the process about environmental building implementation performance and green building design (iiSEBE, 2009). Many other green rating systems have been created in many countries based on BREEAM, based on the needs of a country through environmental perspective. Rating systems evolved in coming years according to two main factors; user feedback and the technology development, in order to enhance the achievement of buildings in term of environmental level. Green rating systems started as a voluntary measure of environmental performance. Nowadays certification is recommended for buildings in many countries. Currently, there are fifteen rating systems that give certifications to buildings performance around the world, see figure '3'. Only three systems of them are using currently for structures outside of their nations of origin, there are; Leadership in Energy and Environmental Design (LEED), BREEAM, and Green Globes.

Figure 3. Rating system based on their development timeline.



Source: [Retrieved] on 3rd of March, 2017 from IFMA Environmental Stewardship and Sustainability Strategic Advisory Group (ESS SAG): http://cdn.ifma.org/sfcdn/membership-documents/green-rating-systems-htg-final.pdf

2.5. Barriers To Achieve Sustainable Construction Practices

There are several factors that could make barriers to achieve sustainable construction, and one of the main those factors are cost factor. In common sustainable buildings cost more than ordinary buildings through initial cost by around 2% to 7% (Castillo and Chung, 2005). Some projects can recover that extra cost through short time pay back. Awareness about sustainability and teaching stakeholders to think about value more than cost and think in the direction of long-term instead of short- term could overcome the problem.

The political factor is another important factor, which refers to the deficiency in government legislations or support, lack of building construction specification and codes on sustainability (Rydin, *et al.*, 2006). The successful sustainable construction is highly depending on the government commitment in addition to the regulation and legislation. There are many benefits regarding sustainable construction, hence, governments should encourage and incorporate sustainable construction practices in construction projects to stimulate private sectors and individuals to act in the same way (Dzokoto and Dadzie, 2013).

The awareness and knowledge about sustainability have significant impact on the implementation of sustainable construction (Häkkinen, and Belloni, 2011). This factor refers to the shortage of professionals or professional knowledge, also un- awareness of clients to the benefits of applying the sustainability, or the misunderstanding about sustainability. In additional to that, shortage in knowledge about sustainable design. Williams and Dair (2007), in their research addressed that the hindrance front of applying sustainable construction is a shortage in stockholders awareness about sustainable measures that fall within their career field.

Socio-Cultural factor is one of the barrier fronts of implementation sustainable construction. This can be realized through the deficiency in the demand on sustainable products by the client. This refers to the society resistance to change the traditional way or concepts in construction ways (Williams and Dair, 2007).

The technical factor is one of the barriers which have significant effects on sustainable construction. The lack of sustainable materials or eco-friendly materials, also, the shortage of sustainable measurement tools, lack in technical potentials, skills and labor experience shortages (Nelms, et al., 2005).

The leadership and management factor is another barrier in the way of achieving sustainable construction. It affects the construction industry and individual organizations to implement successful creative strategies, (Osaily, 2010).

3. Conclusion

The study identified the most important barriers front of the sustainable construction in the

buildings based on literature review and deep theoretical analysis. The literature review came out with international list of barriers that could be hinders front of the sustainability in building construction sector. Also, to examine the ability of applying LEED green rating system in Northern Iraq as one of the international standards, and how it could be useful. The Author employed that to apply it in a questionnaire in order to get the opinion of professional people in this field or to find other barriers, which could be limited to the region of the study out of the international barriers. In spite of the lack of the professionals in the field of sustainable building construction and design in the region of the study, but the Author could get 20 participants to participate in a questionnaire, which had been conducted in the Northern Iraq. The result of the questionnaire was compared with the obtained data through theoretical analysis, and the results demonstrate the following;

1. The most important barriers in sustainable building construction is the Initial cost and lack of regulation and legislations regarding the issue of sustainability in the construction specifications.
2. The international barriers in the sustainable construction in all around the world is the same barriers in the region of the study.
3. LEED green rating system is possible to be employed as sustainable rating system in construction projects, at Northern Iraq, but with some developments to be adapted to the climatic characteristic of the region and some modification to harmonize the socio-cultural needs.
4. The study demonstrated that the most prior and important aspect in sustainability three aspects is the social aspect, and then follow by environmental aspect and in the end with economic aspect. These priorities highlighting the type of the society were the social factor is the most important and then the environmental factor and finally the economic factor. The Author interpretation about putting the environmental in foreground upon economic is that the professionals in the field of sustainability are prior the environmental issue due to their awareness about the global challenges, and the danger of continuing with the way that don't stop that environmental impact. However, the economic issue was one of the priorities as well.
5. The study demonstrated that sustainable construction practice in the Northern Iraq l poor and many actions should be taken in order to develop this situation. This could be done with two main ways; the legislations and new regulation in the building construction sectors enforce the people to apply sustainable way in construction sector. Another way is to promote the awareness about the sustainability and the benefit behind applying this system.

Acknowledgement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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Journal Of Contemporary Urban Affairs
2018, Volume 2, Number 1, pages 102– 112

The Pedestrianisation and Its Relation with Enhancing Walkability in Urban Spaces

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ARTICLEINFO:

Article history:
Received 20 June 2017
Accepted 20 August 2017
Available online 25 September 2017

Keywords:
Walkability;
Pedestrianisation;
Safety;
Quality of urban environment.

ABSTRACT

The study aimed to answer the question of how pedestrianisation can influence walkability to increasing physical activity vitality and livability of urban spaces. Therefore, after the theoretical understanding of the framework of the research, the study will focus on experimental research on the Salamis rode of Famagusta to assess the problems of walkability in the street to propose a sustainable and human friendly solution for this area. The main aim of the research is to find what is the interrelation between pedestrianisation in public urban spaces and walkability? Therefore, it concludes that walkability as a part of pedestrianisation scheme will lead to increase the quality of the urban environment by increasing safety and organization in urban infra-instructors.

JOURNAL OF CONTEMPORARY URBAN AFFAIRS (2018) ***2***(1), 102-112.
https://doi.org/10.25034/ijcua.2018.3666

www.ijcua.com

1. Introduction

Due to increasing the vehicular traffic in the contemporary urban spaces, it creates lots of problems for its users. These problems effects on the ability of walking in space by increasing noise and decreasing safety in the environment. As a result the vitality and livability of urban spaces will decrease and people will also lose sense place which is the result of unsustainability in spaces. This research after a theoretical understanding of the pedestrianisation and its relation with walkability in urban spaces will introduce a model of assessment in public urban spaces. Consequently, the study will apply the model in the context of Famagusta. The output of the study will also be useful for urban designer and architectures to understating the problems which lack of walkability might appeared for its users the fore it will propose long term and short term proposal to increase walkability in urban spaces and especially in Salamis Road of Famagusta.

2. Literature Review

2.1. The Role of Pedestrian Walkable Streets in Urban Sustainable Development

Appleyard (1981) in his book "livable streets" claims that streets should have social functions as well as facility functions. Gehl (1987) discusses about the appropriate planning of streets for pedestrian by highlighting social activities. Simpson (1988) believes that developing old city centres might increase walkability and the quality of urban spaces. in this regard, Bahreini (1998, 292) states that, Street related issues are self-governing subjects in new urbanism, as well as safety, social aspects, attraction, pedestrians, mixed land uses. Previously, cities were recognised by its tall and huge building and construction, but nowadays pedestrian streets

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are the main streets to identify the identity and characteristic of a city.

Compensations of pedestrianized streets and alleys presents the flexibility, exhilaration, dynamism comfort, breezing, clarity, connection, not using unsustainable energy resources, reliability. Table 1 illustrates the role of pedestrianisation in increasing the quality of urban environment.

Table1. The role of pedestrianisation in increasing the quality of urban environment.

Environmental importance	Definition	Role
Preventing pollutions and activate people	Most contemporary cities are automobile oriented which lead to less activities and high risk(Ahmadi,Habib,2007). (Montgomery, et al,2008)	The role of physical and mental health
Increasing public control on environment and preventing harms	Pedestrian streets are beds of social interactions which increase public control and lower crime and disorders(Ahmadi,Habib,2007). (Montgomery, et al,2008)	Social role
Decreasing fuel consumption, traffic, etc	Pedestrian streets affect economic issues seriously and cause citizens` interaction with financial landuses.	Economic role
Decreasing unsustainable energy consumption and CO_2 production, increasing greeneries	25% of pollutions rise from automobiles while transportation system energy consumption is about 12% in different countries(Ahmadi,Habib,2007). (Montgomery, et al,2008)	Ecologic role
Comfort, vitality, exhilaration, linked natural and human made environments	Pedestrian spheres pave the ways for social interactions which create memories. They strengthens people` image of the city(Ahmadi,Habib,2007). (Montgomery, et al,2008)	Perceptual role
Decreasing pollutants, conserving land, optimizing transportation system	Using non-motorized vehicles affects quality of life severely(Ahmadi,Habib,2007). (Montgomery, et al,2008)	Non-motorized vehicles
Compatibility with ecology, being inclined to walking, reduce the use of cars	Walking is healthiest and cheapest way of moving in cities, in harmony with the environment(Montgomery, et al,2008).	Proper spaces for walking
Using clean energies, meeting needs by walking, decreasing trips and contamination	Vehicles need to be environment-friendly, have low energy consumption with no sound pollution and be safe for the users. Optimized management is necessary for each city, designed for human priorities.	Trip management using pedestrainizatio n

2.2 Walkability and Its Interrelation between Quality of Urban Environment

Gehl (1996) defined social activity while two people are together in one specific place. So the purpose of being with each other might vary. The meeting is somehow represent as a seed for inclusive forms of social activities. This construction is important in relate to pedestrianisation. Even if the physical component and its organization does not have a direct effect on the quality of urban environment and intensity. By respecting to the outcomes of pedestrianisation can affect the possibilities for meeting, seeing, and hearing people.

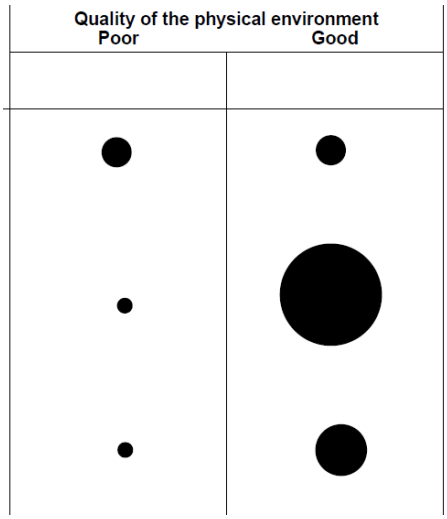


Figure 1. The interrelation between walkability and quality if physical environment based on Gehl, 1996.

In this regard it is hypothesized in this research that the quality of public urban spaces has direct relation with walkability in urban spaces. It means that in order to increase the amount of users in urban spaces. The environment should fulfill people's requirements by applying the principals of pedestrianisation.

3. Pedestrianisation

Pedestrianisation is a process of closing streets to vehicle traffic. It might be during certain hours or permanently. - Pedestrianisation improves safety and accessibility for pedestrians. From the other hand it brings larger environmental, economic and social benefits for its cities. It develops public health by preparing a chances of physical activity over traffic safety and active transport. Pedestrianisation by decreasing traffic and the cars on the road helps to decrease greenhouse gas. Therefore it mitigate global climate change. Lastly, pedestrianisation help to fosters businesses in small scale and economic growth by considering cultural exchange and tourism. By combination and implementation of pedestrianisation in context of urban spaces it leads to generate urban spaces that are sustainable and liveable by refining quality of life for residents of urban spaces.

3.1 Types of Pedestrianisation

There are different type and methods on the pedestrianisation of urban spaces regarding to the problem of the context and aim of the projects in urban spaces the methods of applying one of them might be different in different contexts:

A-Full time pedestrian streets

In this method of design of streets for urban spaces the main aim in to increase and highlight the social activity and livability of public urban spaces in sum part of the city. Therefore, the method of design is based on abandoning the vehicular traffic inside of the streets. It means that the streets will just belong to the pedestrians and only emergency service vehicles will be allow to enter to Full time pedestrian streets.

Figure 2. Full time pedestrian streets.

B- Part-time Pedestrian Streets

There are some pedestrian streets which are allow for vehicles to come streets for one specific time. In this kind of streets there is no parking spaces for cars along the streets. But loading bays are obtainable.

Figure 3. Examples of Part-time Pedestrian Streets.

C- Traffic Calming Streets

The last type of streets regarding to pedestrianisation designed to decrease the speed and dominance of road vehicles. In this kind of streets there are no limits for access of motor vehicles. But footpaths for pedestrians extended and parking spaces are reduced as much as possible. In these streets they are using different methods and technique to slow down the speed of cars by using diverse colors and road textures to tell the drivers that they are in traffic calming streets

Figure 4. Examples of Traffic Calming Streets.

4. Why Pedestrianisation Is Required?

There might be a various reasons for applying pedestrianisation principals in the context. As a result of pedestrianisation pedestrian's safety and mobility will increase. Pedestrianisation also has environmental effects by helping to reduce noise and pollution by restricting access of vehicles. It also increase walkability by increasing the quality of urban environment. As a result of pedestrianisation schemes in the urban context safety and social activity might increase.as a result, pedestrianisation might create an enjoyable atmosphere that people can involve in it from diverse cultural, social contexts. It also effects on the quality of tourism. The study also revealed that pedestrianisation can lead to economical growing of a context.

Pedestrianisation is related to the pedestrian facilities and in order to successfully design of it. The designer should consider that human needs are vary from different culture and background. And the successful design should encompass all of the requirements.

Considering Maslow's hierarchy of needs the study developed a framework (figure5) which are suitable to apply and interoperate in pedestrianisation programs. Therefore the program of pedestrianisation starts from the basic physical requirements in urban spaces such as the basic physical and structural requirements of urban spaces. Then the pedestrianisation should support and increase safety by decreasing vehicular traffic and crime prevention in pubic urban spaces. After the fuilfiling the physical needs in the pedestrianisation schemes the other needs which the designer should focus is socialization needs. It means that in the design should be in a way that people easily interacts with each other and also it should prepare a chance of self-actualization.

Figure 5. The hierarchy of human needs regarding to walkability (Developed by Author).

Accordingly, Sobri and Sulaiman (2004) believes that participation of a large community with the body of local institution can be able to create more pedestrian friendly, responsive environment with high quality therefore it reveals the significance of pedestrian activities in environmental configuration. In this regard, Qualitative assessment of Pedestrian Flow are possible by A) Ability to walk B) Freedom to pass. C) Adjournment at signalized intersections. D) Ability to cross a stream of pedestrians. E) Ability to move without conflicts. F) Freedom to select a desired speeds. As a result, the study proposed to categorize the compensations of pedestrianisation in three main category:

4.1 Environmental Impacts of Pedestrianisation

Considering the effects of pedestrianisation on physical objective environment it would be possible to mention that decrease noise and air pollution by reducing the number of vehicles around the pedestrianized area. Pedestrianisation by preparing the opportunity to

walk as one of the modes of transportation without any need to oil, so pedestrianisation can reduce fuel consumption as well.
Pedestrianisation also prepares opportunities for additional planting areas and improving landscaping and street furniture and as a result of pedestrianisation it's possible to conclude that it helps to create a better environment and beautify the local streets.

4.2 Economic Impacts Pedestrianisation
Pedestrianisation by decreasing heavy motor vehicle traffic leads to large economic saving in term of air pollution and medical expenses due to the healthy environment that urban environment might prepares for its environment.
With less car traffic and fewer pollution once pedestrianisation, there are often a discount in prices incurred. Consequently, the less air pollution will lead to the less interrelated medical costs. From the other hand by increasing the number of people which come to use of the spaces due to the opportunity which pedestrianisation prepares by walkability will increase retails income in that area. From the other hand the role of rental income and occupancy rate will also increase. In pedestrianized spaces people will welcome food retails and coffee shops. From the other hand the pedestrianized streets are also welcome to tourists to come and enjoy the quality and potential that the environment might propose for its users.

4.3 Social Impacts of Pedestrianisation
The application of the rules and principals of pedestrianisation might have a number of social impacts. Firstly it increase walkability. As a result of walkability people will have the opportunity of social interaction with each other it will help them to be familiar with people and culture around them. ''Pedestrianized streets in many cities also served as cultural and entertainment plazas where people meet and greet not only during ordinary days but also during holidays and festive seasons as well. Free of vehicle Traffic Street, in many cases by landscaping, street furniture and sidewalks, help to create a comfortable environment for people to engage them in various social activities.'' (Iranmanesh, 2008)
Pedestrianisation can also by increasing separation vehicles from peoples lead to the safety in urban spaces.

5. Walkability and its Relation with Pedestrianisation
Walkability is a quantity of how friendly an area is to walk in that environment (?). Walkability has many economic, health, and environmental and benefits. Factors which effects on walkability contain traffic and road conditions, sidewalks or other pedestrian right-of-ways, building accessibility, and safety, land use patterns and quality of footpaths . Walkability which is one of the strategies of pedestrianisation prepare many community and individual health benefits. As an example the chances for increasing social interaction by increasing the number of friends in social environment. From the other hand, since, more people watching and walking over street it will reduced crime. Consequently, Walkability will lead to increased volunteerism and increased sense of pride. ''Walkability has also been found to have many economic benefits, including accessibility, cost savings both to individuals and to the public, increased efficiency of land use, increased liveability, economic benefits from improved public health, and economic development, among others.'' (Refaat and Kafafy 2014).
Considering the definition of "walkability" in the dictionary of Merriam Webster Which refers to *"suitability for walking"* it prepares easily walking to different places.in this regard, Abley & Turner(2011) believes that the environmental configuration can prepare the main role in the creating an suitable status for walking'' . Consequently, based on *MARC report (1998) "Walkability is the quality of walking conditions and the degree to which the built environment encourages walking by providing pedestrians a safe, comfortable, convenient and appealing travel corridor"*
To be able to assess the interrelation between walkability and pedestrianisation it's necessary to mention that walkability is part of strategy for pedestrianisation of the environment. Pedestrianisation strategy needs the concentration of different dimension of urban design from social, economic, environmental and morphological dimension. So it looks a kind of master plan which needs to assess and evaluate the context before applying in the context. From the other hand, according to the definition in previous paragraphs walkability is qualitative assessment of the environments to assess how pedestrianisation is successful in urban environment.in the following figure 4 you may see some successful examples of applying pedestrianisation principals in urban context.

Pedestrianisation increase the quality of urban environment.

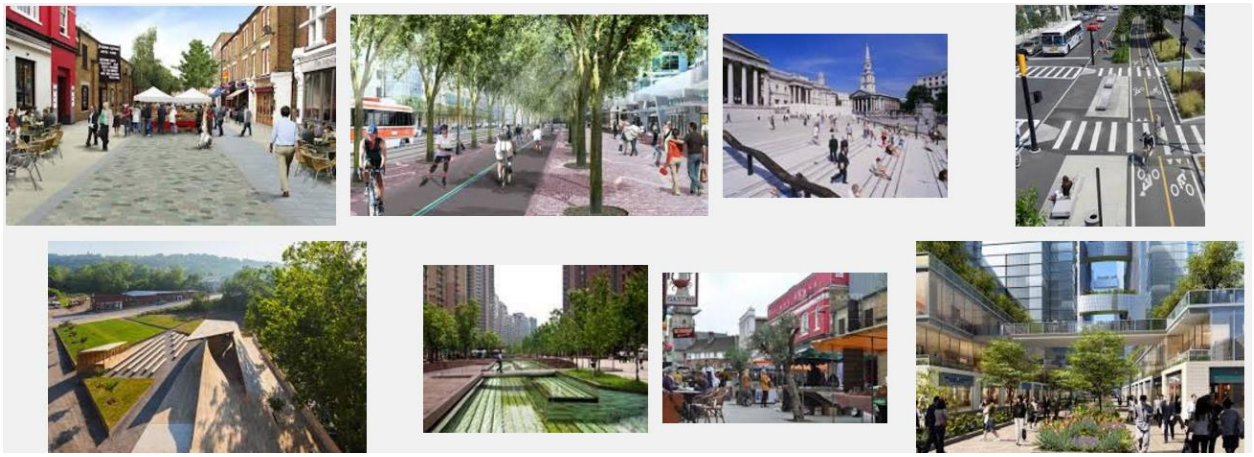


Figure 6. Examples of applying pedestrianisation principals in urban spaces.

6. Concepts for Improving Walkability:

The study on NZTA (2009) on the principals of improving the pedestrian environment reveals four main classification in this literature which are highly effects of the applied context. These potentials are A) shared zones and sharing the main street Living streets, pedestrian precincts. Below paragraphs explains these concepts in detail. Understanding the component of each classification will help to comprehend the diverse ways and methods for improving the walkable urban spaces.

Living streets

The idea of living streets (LS) refers to the fact that Streets must designed with community and living interface. It objectives of LS is to create an increase the quality of life and urban environment by creating a balance between pedestrians and cyclists with cars, residents, businesses. Therefore LS will lead to greater rage of street and community activity.

LS may include:

A) Designing soft and hard landscape area. B) Methods of Traffic-calming. C) Designing places for social activity which are inclusive for all range of peoples. D) Designing with the purpose of mixed activities. E) Designing public art, and essential requirements of street infra-instructors. F) Increasing infrastructures of lightening in the night time. In theory the idea of LS can be applicable to any other streets. Therefore there is always a solution for designing a livable streets.

Pedestrian precincts (PP)

Approximately all pedestrian places designed in such a way that to limit the access of vehicles to the pedestrianized area. There are four type of PP which are:

A. Using of alleys and lanes.

B. Modified PP which in this case one block is locked for only pedestrian use.

C. cross-streets and several blocks are closed.

D. Plaza

Figure 7. Examples for strategy Pedestrian precincts (PP) streets.

The strategy of PP are most helpful if we had a high number of pedestrian and/or vehicle

conflicts, heavy pedestrian activity, retail or mixed development. Therefore, the access should design in such way that to emergency services.

Shared Zones

Shared zone (SZ) is a method to apply and regenerate Living Street in the streets which entering the vehicles to the area are inevitable.in this regard the will be specific restrictions for vehicels wile enterin shared Zones such as speed limits.

"Shared zones are most suitable for streets and compact areas with a low demand for through traffic movement. Their maximum size is restricted by the need to maintain response times for emergency services and to limit the extent of roadway that must be negotiated at low speeds by motorists accessing their properties." (Gerrard, 2005). Figure 8 illustrates some examples of shares zones in urban spaces.

Figure 8. Examples of shares zones in urban spaces.

Sharing the Main Street

Sharing the main streets refers to the idea of peaceful coexistence of pedestrians and cars next to each other. Therefore the design strategy for main streets by considering the principals of sharing the main streets refers to the Ida of improving quality of street environment and safety for all people (Grant, et all 2005). In this kind of street there are some concern which needs to consider while designing it:

A. Businesses should design in such a way that to increase vitality and livability.

B .preparing a situation for pedestrian for crossing safely.

C-there should be able of possibility for visitors of street to park along the street.

D-there should be parking spaces for trucks for loading and unloading.

E- Cyclists and Motorists needs to move safely and slowly.

6. Case Study

Salamis rode of Famagusta selected as a case study. Since the area has lots of problems regarding to walkability the strategy pedestrianisation is required to apply in the context. In this regard, experimental research method have been used as a methodology for assessment of the problems regarding to walkability.

Figure 9. The location of Salamis Street in Famagusta town.

The study realized that the streets and pedestrian walkways are not in standard size and dimension. In this regard the proportion of street organization has different variety which increase the problem of walkability in urban spaces (See Figure 10).

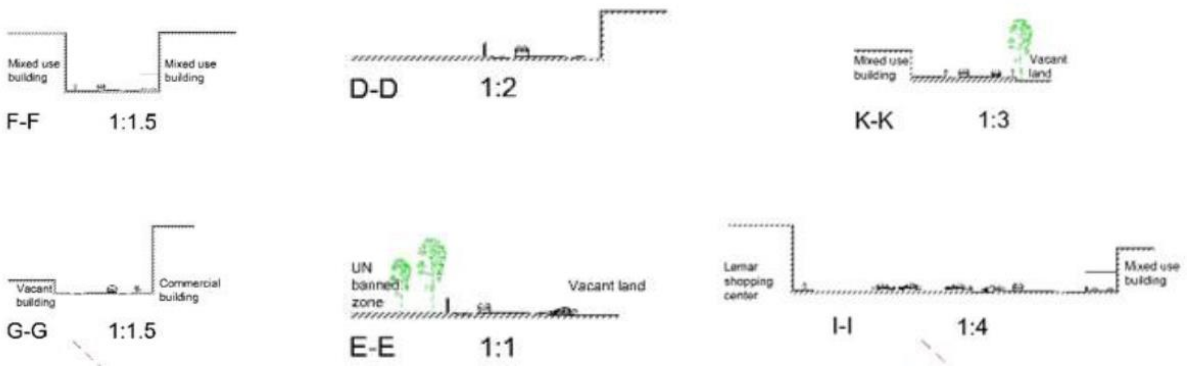
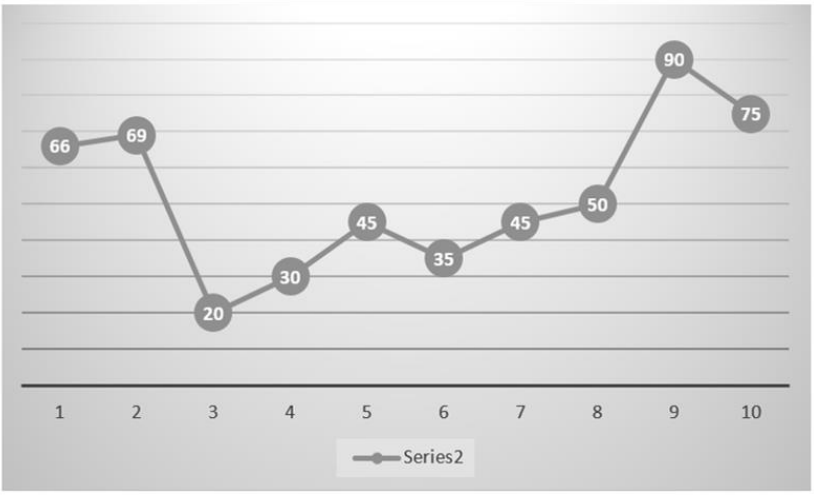


Figure10. Various street proportions in Salamis Road.

Considering the theretical fraimwork of the research the study investigate major physical problems of Salamis road of Famagusta regarding to walkability. Considering the theoretical framework of the research the study prepare 10 main question which asked from the residence ans passenger of salamis road to assess the level and quality of walkability in urban spaces. The questioners distributed in the slalamis rods between the pedestrians. Finally 81 questioners collected from them. The average/mean of each question revealed in Table 2.

Table 2. Problems regarding to Walkability in Salamis Road.

1	Low permeability.
2	Having not a proper design.
3	An undefined roundabout.
4	Existence of many vacant lands.
5	Existence of abandoned buildings.
6	Low street enclosure.
7	Existence of banned areas of UN.
8	Existence of many poor architecture buildings.
9	Narrow sidewalks with decayed pavement materials.
10	Lack of parking spaces.



7. Discussion

Literature of pedestrianisation in public urban spaces revealed that increasing the quality of public urban spaces by respecting to the Maslow's hierarch of needs will leads to increase the walkability of the urban spaces. Pedestrianisation also can be as a good methodology to increase walkability in the context. Salamis road is a good example to show that the lack of principals of pedestrianisation might lead to catastrophic in the cities. The experimental study have been conducted to Salamis road of Famagusta by 10 questions regarding to the problems of walkability. 90 percent of the respondents believes that the major problem in the street is damaged pavement materials and narrow sidewalk. Based on the analysis of the question, they believes that the street does not have a proper design. The idea refers to the fact that the city doesn't have any specific master plan. Lack of public spaces is also another problems which creates lots of problems for its users by decreasing safety.

Existence of UN area are and the lack of Enclosure in street environment leads also to the main problems of walkability for its users.

7.1 Difficulties in Creating Walkable Streets in Salamis Streets

As a discussion the study revealed the main Difficulties in Appling the principals of pedestrianisation in the Salamis Road in Famagusta.

Table 3. Difficulties in creating walkable streets in Tehran and proposed solutions.

Difficulties	Solutions
Non-awareness of citizens; duty of people and the local government regarding the advantages of walking and walking streets	Defining the importance and characteristics of walkable streets in the domain of urban livability and economic growth
Famagusta's citizens overuse private cars for intercity trips	Development of public transportation and providing for necessary facilities and financing
Unsuitable location of walkable streets	Establishing a technical committee for walking streets, composed of beneficiary organizations for locating, approving plans and supervision of their implementation
Some incorrect beliefs in a few people	Defining public advantages resulting from the creation of car-free zones, especially as a Means for increasing social ties.
Creation of inharmonic land uses	Paying attention to areas with high potential in non-central new neighborhoods
Partial and one-dimensional attitude in definition of pedestrian-oriented projects.	Creation of consensus among experts and influencing organizations via proposed technical committee
Little experience in creating pedestrian streets in Famagusta Municipalities.	Increasing the number of pedestrian-oriented projects to be implemented at different scales

Regarding to these problems in the city of Famagusta which completely suffering from lack of pedestrianized streets. It seems that there should be some polices for increasing quality of urban pedestrian streets.

Table 4. Polices for increasing quality of urban pedestrian streets.

Designing policies	Components
- Protect pedestrians against accidents by designing alternatives - proper site selection for pedestrian streets - building responsive places by designing alternatives - illumination - directive tools and signs - desirable image - regarding human scales - bump removing - local materials, appropriate with climate - participation and vitality - respect interest groups by considering their opinion - predicting places for special events - urban furniture - protect valuable historic buildings	Aesthetic (objective approach)
- Legibility - comfort - safety by designing alternatives - low traffic volume - predicting resting facilities - sense of place, meaning, perception - hygiene - spatial identity - signs and symbols	Aesthetic (subjective approach)
- Improving public transportation - a network of pedestrian streets - linked greeneries to walkways - temperature and humidity, climate, wind - desirable landscape - local trees and plants - removing pollution origins - 24 hours landuses - encourage citizens to use public transportation - designing a movement pattern - recreational facilities	Environmental
- People attendance days and nights - Considering gender in designing - Various landuses, with attention to consistency and harmony -Involving all groups of people in designing	Functional

Thesis policies theoretically developed. In order to apply in the context there should also be a methodological proposal to apply in the context. The following table prepare a comprehensive context for architecture and urban designer to

use all of them to apply in the context. The indicators and proposals developed based on the literature review.

Table 5. Methodological proposal of designing pedestrian urban spaces with the focus of salamis road.

Inclusive dimensions			Quality components of sustainable city designing
Social interactions, survival, respect, celebrating the city, memories, customs, distinctive spots(Risser,Chaloupka,2010)		Social and cultural	Aesthetic (subjective approach)
Ecological sustainability related to drainage and wastes, air and sound pollution, traffic and greeneries (Risser,Chaloupka,2010)		Environmental	
Net income, life standards, retails, land value (Risser,Chaloupka,2010)		Economic	
Traffic control, directive signs and tools, proper image, bump removing, up leveled walk ways with streets		Physical	
Designing features, related to street networks, pedestrian streets and sidewalks (Risser,Chaloupka,2010).	Comfort	Individual needs	Aesthetic (objective approach)
Designing features, related to crime, landuses, attendance, violence (Risser,Chaloupka,2010)	Safety		
Variety, proximity of landuses, pedestrian streets network, related buildings (Risser,Chaloupka,2010)	Access		
Dynamism, time and responsibility (Risser,Chaloupka,2010)	Feasibility		
Diversity and complexity, scale, aesthetic, vitality (Risser,Chaloupka,2010)	Desirability		
Low air and sound pollution, safety, greeneries, slow down the traffic in neighborhoods(Fruin.2004)(Longo, 2004)			Environmental
Omitting cars from urban spaces and developing walkways (Fruin.2004)(Longo, 2004)			
Traffic management using public transportation (Fruin.2004)(Longo, 2004)			
Accessible for all groups with any age, gender, ability and color, safety against accidents, charisma and diversity, various facilities and equipments.			Functional

8. Conclusions

The main aim of pedestrian streets is to design public spaces with high priority for pedestrians. In pedestrianized streets vehicles entrance to the area are abandoned. Therefore designing a pedestrianize street will increase vitality and livability of urban spaces. In the case of Salamis Road which is suffering from lack of walkable public urban spaces should reinforced with basic urban infrainsructurs such as public transportation, parking lots, urban furniture and fixtures should also organized. The pedestrian pathways should also linked and connect with each other in such a way that easily usable for disables as well.

The study conclude that increasing quality of urban spaces and street connectivity and finally applying al the principals of walkability will have direct effect in increasing the walkability of urban spaces.

The outcomes of this paper offers initial indication to highlight the meaning of "Including street connectivity" regarding to walkability of urban spaces. Therefore, the primary elements of

walkability should support and organize in such a way that to increase safety in urban spaces.

Regarding to the research question the study highlighted the fact that walkability is the result of pedestrianisation program. It means that pedestrianisation considers broad area in urban design from social to economical to find a solution to increase the quality of urban environment. As a result of increasing quality of urban environment regarding to urban infrastructure and furniture and fixtures, walkability in urban spaces will increase.

Acknowledgement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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JCUA
International Journal of Contemporary Urban Affairs
Journal of Contemporary Urban Affairs
Managing Editor:
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Printed: Anglo American Publication LLC