

MORPHOLOGY OF THE EVOLVING COURTYARD WITH SPECIAL REFERENCE TO LIGHT HOUSE HOTEL IN GALLE

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Abstract - With the rapid urban development and globalization, the vernacular architectural style of Sri Lanka has been affected by arbitrary and westernized style. Due to these influences the traditional architecture was declined with direct imitation of European architecture models. This caused the disappearance of regional cultural elements such as, courtyards. Vernacular form of courtyard was an expression of the climate of the region and national spatial model of the country. With global climatic issues, the built environment is intended to find more innovations on sustainable architecture. With this, once again, modern architecture paid its attention towards courtyards. As courtyards create a link to history and culture of the country the usage of it in modern architecture is found abundantly. Traditional courtyard was a central open space bounded with four built forms around. This central space was used for the spatial organization and to strengthen the building penetration of indoor and outdoor atmosphere. The courtyards were used for many cultural and social activities throughout the past. Modern adaptation of traditional courtyard is an old topic, which was discussed through many studies. But most of them were based on the value of courtyard usage and theories proving it. The issue here is that the use of practical application methods that have not been summarized. And there aren't many studies on modern courtyard applications and about the morphology of the evolving courtyard. The goal of this paper is to study the application of traditional courtyard space in modern architecture through a case study on the Light House Hotel in Galle, by Architect Geoffrey Bawa. The paper is divided into three sections. Section one describes the origin and evolution of courtyards in history section two defines and describes the usage of courtyards I modernity, and finally conclude the paper with the case study on Light house hotel Galle.

Keywords: Courtyards, evolution, morphology

I. INTRODUCTION

When Ceylon turns into Sri Lanka with the independence in 1948, it provides grounds for a huge change in the country. Loss occurred due to the invaders empowered the rebirth of the country. This socio-cultural background took architecture towards the proud history and direct adaptation results not a unique architectural style but pseudo tradition.

“As an Architect you design for the present with an awareness of the past for a future which is essentially unknown.” (Norman Foster)

World renowned Sri Lankan architect, Geoffrey Bawa was one of the leading roles to identify this awareness of past which is essential in present and also to cater the unknown future. Therefore he practiced with his own guide line, “a new vital- and yet essentially Sri Lankan”. With this approach they were able to adapt traditional element to modern era. When studying the designs of the great architect, the founder of “Tropical modernism, continuous use of courtyards is noticeable.

Present day world faces huge global environmental problems as a whole. While conserving projects are ongoing, research shows that a large amount of building contribution to environmental pollution. Still at the present most of the buildings in Sri Lanka are not responding to the immediate micro climate or neither macro climate. Studying the incorporation of traditional building elements in contemporary building would be

a worthwhile study as those forms did not consume nonrenewable energies to achieve internal comfort levels. At this moment, as a country with a great history and a proud culture, its own architectural style should cater for both climatic and socio-cultural requirements. Based on this identification, study is conducted on the main traditional architectural element used continuously in Sri Lanka.

The courtyard was originated thousands of years ago and the birth place got many disputes. But its evolution can be seen through number of stages and even in the contemporary modernity too. Through its long evolutionary history, 'Courtyard' played as a microclimate modifier, which make the interiors livable at any outside climatic levels.

As a country at tropics micro climate modifiers are hardly required compared to other regions. And also with the Sri Lankan society and its culture courtyards act as the private outside space which safeguard the inhabitants and yet provides an outdoor space.

Due to all these reasons courtyards are continuously used in the modernity too. But as an evolving element direct adaptation of basic courtyard form of a square shaped open space bounded from solidity on all four sides won't work in the modern day as predicted depending on the historical proofs. Therefore a study on its evolution and identification of its morphology is a worthwhile study at this present day.

By studying the courtyard origin and its evolution morphology of the evolving courtyard is figured as a timeless element yet with many variations. The ideal way of reusing the courtyard on the place of adaptation is further expressed through the case study at Light house hotel at Galle - one of the master pieces of late iconic Sri Lankan architect Geoffrey Bawa.

II. Origin and Evolution of Courtyards.

Definition of Courtyards

"Courtyard should conclude nothing but the whole universe" Louise Baragan's reference to the court of Myrtles the Alhambra in Spain.

Courtyard was often defined as an open space to the sky usually enclosed by building from all four sides.

During pre-historic ages man was a direct dependent of nature. But with the flowering of human civilization man became spate from nature through the creation of dwellings. But with time man wanted to interact back again with environment while they live behind the frame of their own dwelling. And courtyard was the solution for this, which was an interior space located within the boundaries. And this space accommodated the nature. Courtyard was the place where the whole outdoor universe was established within each separate dwelling.

"Man requires a place of seclusion, meditation, peace in his daily life. The courtyard serves as a 'room without roof'. The sheltered court garden t'ien ching (Well of heaven) served as a tranquil link with the cosmos for various independent ancient civilization including the Egyptian, Mesapothemian and Chinese."

The origin of the courtyard is disputed. Some consider Egypt as the birth place while some consider China as the birth place of the courtyard. It is revealed that the courtyard evolved from the early fire place that was found in the center of the building with a small hole on the roof about it to let the smoke out.

With the time this courtyard or the primal altar evolved into a central space enclosed by buildings from all four sides that open to the sky. According to Marc Olivier the man in the middle of the circular shaped floor of the primitive cosmic house connecting the sky was called as a "shaman" / priest. Reason behind this is that the cosmic energies get connected at the center point and this is why that the center space was left open in houses.

This same concept was what practiced in vasthu shashtra as well. According to vasthu shashtra, the centre point of any plot is known as Brahmasthan and that is the point where forces from all the directions get concentrated therefore this point is kept open to the sky with no hindrances from buildings. In order to keep brahmasthan free from buildings courtyards were used. Both these two concepts primitive cosmic house and vasthu shashtra proves the importance of including a courtyard to a dwelling. Due to followings reasons courtyard often serve as a space for religious activities and mediation. It is popular that in Hindu dwellings they plant their sacred thulsi (basil) plant which they worship daily in the courtyard. In Islamic houses the utmost place was given to the theory of segregation. Furthermore, the privacy is one of the main considerations.

According to Islamic beliefs, women should not be seen by outsiders or exposed to the street. The traditional Islamic courtyard house was designed as a spatial progression. To accommodate this concept, in order to permit women to enjoy leisure activities without being exposed to the outside. Furthermore, the courtyard located between four solid boundaries is considered to be a spatial symbol of inwardness and femininity in the dwelling. Courtyards provide more spaces for interactions among family members while ensuring safety and privacy.

1.2 Origin and Evolution of Courtyards.

Earliest written references to courtyards can be found in bible, book of Exodus. According to earlier written records it may be reasonable to assume that Egypt was the birth place of the courtyard. The generic form of residential courtyard houses has evolved from Egyptian- Sumerian civilization to the Mediterranean areas then up to Indus-Valley. When we consider these earliest stages of the courtyards, it goes back to thousands of years, of where there were Neolithic settlements. Therefore we can assume that the evolution of courtyard started around 3000 BCE. At earliest stages of this evolving courtyards it was only used for the protection from outside forces, marauding animals and from adheres weather effects. Early form of the courtyard is clearly different from the present courtyard. Because the intentions and requirements of having a courtyard get altered with time. When the considerations got focused on elements such as water bodies, plants, walls, the design of courtyard was neglected. Rather than the design these elements were used to enhance the quality, intimacy and quietness. Though the courtyard found today is modified to suit the present needs primarily it was the whole that was found in the middle of our ancestor's dwellings that was designed for the purpose of obtaining light and ventilation. This is the conventional courtyard type which has evolved over centuries. This primary courtyard has now undergone many changes to suite to the topography, site restrictions and building orientation.

With the passing time the primary form of the courtyard which is a central open space surrounded by built forms, evolved into a more complex urban tissue, or a fabric through aggregation of more built forms around a central space. During later periods the quality of the enclosure and its inward looking elements began to emphasize as a place of protection.

When we study the evolution of courtyard there was a distinct moment, it is when a precursor marked an area

around a monocellular by an enclosing wall, then it became a reference point and then many aggregation of more cells around the central space. This same distinct moment affected the permanent settlements too. In permanent settlement, placing the dwelling units side by side as a serial cells is less regarded due to the more preference were towards the enclosure with a central opening with inward looking content, as in courtyard houses.

Accommodating the primary concept of courtyard in early stages made the shape of the courtyard either a rectangle or square in plan form. But over time its plan and three dimensional forms continued to evolve in many ways gaining rise to the dynamic modern courtyard. Courtyard is considered to be an extension of the living quarters which accommodates a multiplexing of functions. With these various kinds of activities courtyards were subjected to diverse influences and impacts with many implications. Therefore courtyard can be considered as the single architectural element which contains a huge range of changes.

1.3 Implications

1.3.1 Social implications

Society is main body that could influence an individual. With the formation of permanent settlements people were organize as a society, and they created neighborhoods. Within this society individuals were bound with bonds and norms .As courtyard served as a place where the family and other visitors could interact it became one of the most popular space in a dwellings. Courtyard provides the privacy and safety to a personal while it let the personal to interact with his family and the immediate society. This was one of the reasons that caused the evolution of the courtyard.

As biological clock ticks away human activities, their intentions, requirements got changed. As a result of this the primary courtyard got evolved for centuries to suit the present day requirements. Even though the primary courtyard served as a space that provides only the safety and privacy, present-day courtyard is used more as a decoration element. Today courtyard has become the only room to accommodate the nature in a dwelling.

1.3.2 Cultural implications

Culture comprises a system of beliefs and ways of living common to a specific group of individuals. With time

these cultural influences grew stronger. With the evolution of culture many beliefs were introduced to the daily routines of man. Courtyards found in Islamic dwellings are a better example to show the influence of culture for the evolution of the courtyard. In most of the Islamic houses they have more than one courtyard; main intention here was that to separate the public and private regions of the house. The public sphere is open to the outside visitors therefore it is only used by the male members of the house. Inner courtyards were built for private use; these areas are restricted for outsiders. This probably show how the cultural concept of gender implicated to change the configuration of courtyards.

1.3.3 Climatic implications

Courtyards demonstrate ability to moderate high temperatures, channel breezes, to adjust humidity levels and provide thermal comfort within the interiors. Thus, courtyards are considered as microclimate modifiers in dwellings.

Inherited properties of courtyards such as self – shading and thermal lag are used to reduce the heat gain in houses. Furthermore, properly planned orientation, proportions in designing and materials in construction of courtyards may overcome extra heat gain. Courtyards are normally found in hot arid climates to reduce high heat levels and moderate temperature levels to achieve liveable conditions. As clear sky is a common feature of hot and arid climatic zones, courtyards facilitate heat radiation from surface materials, functioning as a cool air reservoirs, which help to reduce heat in ground level rooms.

III. MODERNITY OF COURTYARDS

Courtyards in Modern buildings.

2.1.1. Place of courtyards in contemporary living.

The contemporary living house is not just a simple shelter but also an image which expose the social class or the status of the inhabitants. Therefore the image of the house is much more concern than the interpretation of spaces within it. The modern house has become one of the mediums that are used to convey their status and power within the society.

Except for this sociological justification societies were further influenced by the outside world due to globalization

that took place rapidly with the time. And also with the colonial influences on Sri Lanka the orientation of the house layouts was changed. In traditional forms house was oriented around an internal middle place (courtyard) but with the European influence these houses were reoriented on the basis of access road. There by the internal middle spaces were neglected while the front spaces became prominent.

Furthermore the reorientation of courtyards was neglected as it was no longer useful to symbolize the social status once compared with the front spaces. Courtyards were further neglected with the notion of individualization of rooms. Therefore there was no any need of a central space which interconnect all the spaces. And also with modern socio-cultural changes most of the joint families are now use to live separately as nuclear families. Therefore even they don't want any specially designed courtyard kind spaces for them to integrate, the small living rooms are sufficient enough for this. With the urbanization and imposed housing policies placing a courtyard on a small land plot was difficult. And the inhabitant prefers more functional spaces than courtyards. With all these, courtyard was neglected from the contemporary living. Courtyard was permanently removed with the introduction of high rise apartments and compacted houses on small and narrow land plots.

2.1.2 Need of courtyards in modern buildings.

The modern world faces a vast number of environmental issues. And many different fields are responsible for them. Buildings too contribute for the 40% of the Carbon Dioxide emission. The main cause behind carbon dioxide emission is that the use of mechanical vents and other energy consuming means. With the urbanization and compact neighborhood in contemporary living, these modern small, compact houses are tend to ventilated mechanically. As built environment is responsible for the major portion of these environmental issues, the need of courtyard is exposed in modern buildings especially in tropics. Apart from the climatic factors socio- cultural aspects too expose the need of courtyards. Sri Lanka is a country with a proud history and a complex cultural background. Therefore some of these house layouts and elements like courtyards are bounded to our origin and identity. Therefore courtyard is a better option in modern day architecture. Architecturally courtyard is identified as an element that is beneficial both economically and aesthetically. Courtyards draw cool air and natural light and it reduces the use of mechanical vents and the

energy consumption which is economically beneficial. As courtyard accommodate green plant, water bodies, natural light having a courtyard is aesthetically beneficial.

Descriptively the courtyards are climatically ideal for the tropical regions as it circulate the natural cool air within the interiors. Courtyards can be made beneficial even for non-tropical regions, if the shape and the form of the opening is specifically designed to suit the location. And also due to Hindu influences Sri Lankans too believe in Vasthu –Sashthra and other spiritual theories and norms. And they further clarify the need of courtyards for modern buildings. Climatically a courtyard acts as a connective thermo stat and it provide the comfort and protection for the inhabitants from the weather conditions and the outside threats. The protection given by the courtyards along with its roof projections and orientations from the dust storms can be illustrated as a better example for this. Courtyards were extremely popular and wide spread not only on Sri Lanka but also all over the Indian subcontinent. Courtyard is not a fix element. It can vary from a very tinny opening to a large and a wide opening. And also once central courtyard can be the platform for another five or six courtyards enhancing the uniqueness of modern day architecture. For thousands of years courtyards have been playing a major role in built environment as an element which grabs the natural light and ventilation, creating the thermal and visual comfort within the interior. And also it has been acting as the common space of the dwelling which accommodate gathering of inmates. Though the modern day designs lack these ideal elements of tropics it is an ideal way for sustainability.

2.1.3. Usage of courtyards in contemporary design.

Though courtyards are neglected in contemporary living it was placed back in modern buildings, once the designers and the inhabitants need to incorporate their lives with the nature. Modern courtyards are defined as a room without a ceiling. The courtyard is the central feature of the architecture that brings two separated parent's and children's wings together while being the main private outdoor space. A series of courtyards can be seen instead of a one central courtyard in modern designs. This is clearly emphasized by the house at Walsh Street, Melbourne, Australia by Robin Boyd. The main function of the modern day courtyard is to enhance the aesthetical beauty and to allow natural light to central interior spaces of the house. And also these modern courtyards are used to grow vegetation within compacted dwelling envelope.

To soften the built forms of the particular space and it adds a green backdrop to solid built form.



*Figure 2.1 - Malalasekara house at Borella.
By Archt. C.Anjalendran.*



Figure 2.2 - Own house of Archt. C. Anjalendran

In contemporary dwellings and in other non-domestic buildings usage of windows from floor to ceiling is common. This modern trend further influences the use of interior courtyards of the modern houses. Furthermore courtyards are useful for entertainment and leisure activities due to its close proximity with the nature, which indirectly relax human mind. At present small private courtyards are made focusing on a single bedroom or a bathroom. These courtyards help to gather light and ventilation. And also while securing once privacy it gives an internal feeling of being outside in nature.



Figure 2.3 - Maya Resort at Tangalle, Sri Lanka.



Figure 2.4 - Maya Resort at Tangalle, Sri Lanka.

Varying from above mentioned courtyards, it may also accommodate the entrance. In modern designs use of a courtyard just behind the entry hall is very common. This allows the entrance way to get open to a well lightened and a ventilated space that creates a good first impression in human psychic level. And also it allows a cross view through the house.



Figure 2.5 - Cross view through spaces in modern dwellings.

The materials are one of the determining features of an architectural space. Materials that are being used in courtyards are one of the main ways how the present day courtyards are made different from the traditional forms. Natural unadorned materials are used in modern courtyards. Modern trend is a movement against “Featurism” and therefore courtyards are made simple, non-decorated and they expose the basic structure of the building.



Figure 2.6 - Garden house in Sri Lanka

Modern courtyards aren't afterthoughts of the major design. It is used in designs by most of the contemporary architects all around the world. Diverse shapes of courtyards and the designs based on courtyards create interesting forms in modern dwellings. And also it increases the comfort level of the inhabitants as it facilitates with well-ventilated spaces. Therefore this is commonly used in compact urban fabrics. Sometimes courtyards are also used to create interesting unique forms which indirectly create rich spatial progression through the interiors. As seen in the modern house by Roy Grounds, in Troom courtyards can be easily identified due to its perfect geometry with a central circle shaped courtyard blending with a square shaped building around it. The traditional courtyard that was used for rituals and religious activities are now being replaced by *‘Al-fresco’ kind of courtyards. (*Al-fresco :- an undercover outdoor entertaining areas.) The traditional courtyard form isn't a fix form, it got evolved with time. But before the modern civilization development of courtyards. It was seen through few distinguish stages such as, Ancient civilization, Classical civilization, Middle age and Renaissance civilization.

2.2. Traditional Courtyard Form Evolving into a Modern Form.

2.2.1 Traditional Courtyard Forms Ancient civilization.

According to Schoenauer and Seemen primeval and the homogenous society in the village of Matamatas, Southern Tunisia, was the first social group to build a courtyard house form. Schoenauer and Seemen define this primeval courtyard house form as, “Each dwelling unit is built around a carter open to the sky with slope wall and flat bottom”. [Schoenauer and Seemen,1962] Except for these primitive societies the first rectangular dwelling in Morocco introduces the first prototype of courtyards.

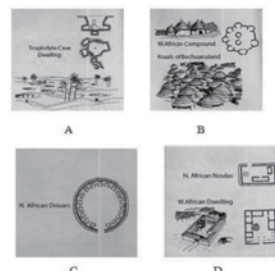


Figure 2.7 - Different types of courtyard form in Africa (Schoenauer, 1962).

Another ancient courtyard form can be found in China. Chinese primary dwelling forms are highly influenced by their religion and their philosophy ‘Yin and Yan’ [Schoenauer and Seemen,1962]. And therefore the courtyard was used as a private space for meditation. But the noticeable point here is that the un-identical nature of the reasons of using courtyards in the two primeval forms. (Mesopotamian and Chinese traditional forms) And also in Mesopotamian forms courtyards were surrounded by number of rooms and in Chinese courtyards, they are surrounded by individual housing units which were owned by different people.

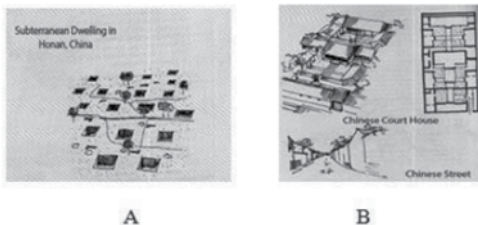


Figure 2.8 Typical layout of Chinese dwelling and courtyard houses (Schoenauer, 1962). Classical civilization.

This civilization adds another traditional form known as ‘The Atrium’ house. This form was developed around 700 BC in Italy. Atrium house has a small form courtyard in the centre with a container kind of opening. It was surrounded by rooms. The significance of this form is that it provides a private outdoor space. Later this container type enclosed courtyard form got mixed up with a Greek pre-style. Therefore the enclosed atrium courtyard turned into a new form of Atrium pre-style in which court was enclosed by columns. Thereby two traditional forms are found as Atrium style and Pre-style atriums. They were placed in large massive built houses. Primitive pure form of courtyards could be seen in classical civilization along with many changes.

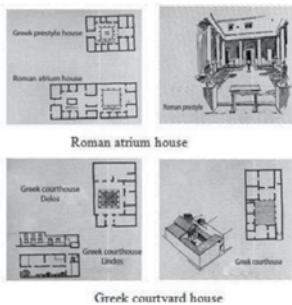


Figure 2.9 - Typical courtyard dwellings prevalent during Classical Civilization (Schoenauer, 1962).

Middle ages civilization and Renaissance

This era is significantly marked due to the fall of Roman Empire in 476 AD. Still courtyards prevailed in Christian church was used as a place to conduct meetings and also as a space to place water fountains. And in Islamic countries such as Middle East courtyards were made ensuring their privacy for the sake of their women and children while providing them a place to relax.

When considering dwelling type courtyards there are two specified forms in Northern areas around the Mediterranean Sea. (According to Das, 2006) One of them is in Spain which is basically influenced from Roman Atrium style. And the other one is found in North of Spain which is comparatively solid and used for daily outdoor routines. At later periods due to Spanish Colonists, Patio design style was also got mixed with Latin American courtyard forms.

2.2.2. Modern courtyard forms

2.2.2.1. Origin of modern courtyards.

In the modern era the courtyard was initially found in west coast of North America. Later the courtyard type was popular all over the United States. In these modern houses courtyards were used to separate the living spaces from private bedrooms in a unique way. (Das, 2006) Narrow terrace houses that were seen in States in this era further modernized the use of courtyards. (Duncan, 1973) During the modern era simple one storied courtyard house form was wide spread all over the Europe as it was popular among the low income groups of people. (Duncan, 1973) The first house of this kind was done by Hugo Haring in 1928. This form was later derived into more popular L shaped house form in England and Germany in 1960.

2.2.2.2. Modern courtyard as a static architectural element.

From the very beginning, courtyard was not a static element as it varies from every era to every civilization. Courtyard does not have a rigid form or a specific shape, area or volume. In early traditional forms rectangular, circular or a square shapes could be seen. But with technical innovations, urbanisation, psychological and cultural backgrounds altered the courtyard into different forms. And also the function of courtyards too got evolved with time. The traditional shape was later altered to U, L, T, and V, H or Y shapes in modern buildings.

Positive and Negative impacts of Courtyard usage in contemporary living.

Using a courtyard in the modern design has many positive potential and benefits. And at the same time there are difficulties, negative impacts and short comings as well. The way how a courtyard is been adopted determine whether the impact is negative or positive. Shape of the courtyard determine the benefits. Rectangular shaped courtyards can be used to protect the building basically from solar radiation and dust. (Tablada.2005)

Courtyard which is surrounded by solid built only from three sides is a new form of courtyards. Due to the well planned orientation of these three sided courtyards they create a more comfortable conditions within the interior. (Meir 1995) with further ecological consideration, courtyards can be also used in high rises for sustainable urban living. (Rajapaksha .2003)

Impacts of courtyard are determined by many variables such as, Orientation, Wall enclosure, Courtyard natural elements.

Orientation

Orientation of the courtyard may cause the thermal comfort or discomfort. Therefore courtyard should be planned on the building layout considering, Solar path, Solar angle, Wind direction, Shading performances. (Meir, 1995)

Wall enclosure

The term wall enclosure refers not only to the wall around the courtyard but also to all the elements such as walls, doors, windows, etc. These elements together define the form of courtyard thus the form affect the micro climate. By manipulating these elements at the design stage can increase positive impacts. According to Almhafdy (2013) colour, material, shading devices can also add a direct effect on the micro climate.

Courtyard natural elements.

There are many natural elements within a courtyard such as vegetation, water bodies or spray. These elements can affect the thermal comfort and micro surrounding of the courtyard. According to Almhafdy (2013) vegetation on the courtyard can reduce the air temperature as plants on ground prevent the surface heating. Water bodies, water sprays or fountains further cool down the air and make the interior more cool and liveable even in extremely sunny days.

2.3. Morphology of the evolving Courtyard.

Sustainability is one of the most prominent modern architectural moments due to present global environment issues. Sustainable living is a way of living in which the energy and materials are consumed in a manner it also allows the future generations to use them. In order to achieve sustainability weather should be considered as a co-author with architects, and also building should be considered as a vessel of human activities. Further it enhances materiality and immateriality and also the human topography rather than the material topography. In an island like Sri Lanka it's not enough to consider only these theoretical approaches to achieve sustainability as its whole system is inspired and originated from its traditional wisdom. In Sri Lankan history of architecture the courtyard is one of the most prominent elements which is used to achieve traditional sustainable living. Therefore it may be beneficial to adopt courtyards to modern buildings. But the courtyard was a dynamic element throughout the evolution. Therefore it is compulsory to identify the morphology or the structure of this evolving element, courtyard, in order to use it appropriately in modern day designs.

According to Yiorgos Hadjichristous, 'Placeness' is the major force behind the evolution of courtyards. 'Placeness' has been further discussed by many architects all over the world.

"the origin of architecture is to provide a physical shelter.... however the primary task of architecture is to create the experience of 'Placeness'..."

[J. Pallasmaa, The Aura of Sacred. Catholic University's School of Architecture and Planning in Washington, DC, 2011.]

" distinction between place and space, where space gain authority not from 'space' appreciated mathematically but 'place' appreciated through human experience."

[M. Heidegger, Building Dwelling Thinking. Harper and Row, 1971.]

" in order to discover the richness of 'place' through architecture, the designer must engage with the specificities of culture, location, and experience that make up everyday existence.

[T. Randall, Building-in-place. Phaenex 3, 2008]

This can be further prove through the diversity of courtyards in different regions such as Mexico, China, Cyprus and India. This diversity occurs only due to the 'Placeness'. Because courtyards are not defined only by the solid built form around it but also by the preference of human mind. Therefore the courtyard should be identified through Placeness as Placeness or the place is an experience of human mind. Even though the courtyard is a dynamic element, it has two basic principles which were constant throughout the history. And they are, 1- to create a micro climate and 2- to provide a private outdoor space exclusive to the residents.

Morphology of the evolving courtyard can be concluded as a dynamic form adapted from past with considerations such as degree of enclosure, spatial configuration, facade proportions, architectural details and materials. But not the basic traditional form. And also the morphology of the evolving courtyard is also identified as a place to accommodate landscape as small plots of present doesn't have any gardens.

When considering about shape it should be Malleable and Flexible.



Figure 2.10 - Network of central and peripheral courtyards

And at last the most important thing is the way to use it on realistic designs, not as an object which adds at the later part of the design but at the very first beginning of designing. Ultimately when considering the morphology of the evolving courtyard it is the compositional element in a design. Therefore it should place at the beginning and then design other spaces will raise the positive potentials. And also morphology of the evolving courtyard should identified by the designers as the core blending medium of human topography with built topography rather than a decorative element.

III. CASE STUDY

3.1 Justification for the Case Study Selection.

This essay is based on the architectural element, 'courtyard' which prevailed over many decades, and its evolving morphology. Theories regarding courtyards, its origin and evolution were presented in previous chapters. The practical Usage of courtyard and correct adaptation is what discussed on this third chapter.

Sri Lanka is an island located in the tropical region, with a unique patter of climate, geography and topography. Architecture of this Island should be in a unique style to suit its tropical climate. Ultimate achievement of architecture is not just the beauty but also the satisfaction of inhabitants through their physical and mental comfort. Therefore adapting European modern architectural style directly to present day designs here on Sri Lanka won't be sufficient enough to achieve its ultimate goal of success.

Sri Lankan professionals understood the requirement of a unique style of architecture to achieve an interior comfort against this tropical climate. Great Sri Lankan iconic architect late Archt. Geoffrey Bawa was the founding member of 'tropical modernism'. This is a unique architectural style that suit for both the tropical climate and modern day movement. Sir Geoffrey Bawa found this style after going through a series of experiments and continuously practicing it in his designs. Later tropical modernism was widespread all over the world.

When we consider the masterpieces of Sir Geoffrey Bawa such as kandalama Hotel, Benthota Beach hotel, his own house, house of Ena De Silva it can be highlighted that courtyards have being used as the major architectural element in tropical modernism. As this essay is based on the courtyard, a design by the founder of its own movement is selected for the case study. Among no of great designs, Light House Hotel at Galle got a series of courtyards throughout the premises. And its whole journey was created through courtyards. Therefore the Light House Hotel by Jetwing was selected for the case study.

Furthermore huge number of positive comments from guests all over the world and its great appearance along with comfort and satisfaction of users, justify studying this 'House of Light' at tropics.

3.2 Light House Hotel in Galle

3.2.1 Introduction

Light House Hotel is located in the outskirts of the ancient city of Sri Lanka, Galle. Hotel site is on a rocky outcrop, which is three miles long to the west of Galle. The hotel was commissioned by Herbert Cooray in 1995 under his own company "Jetwing". Earlier this site was used as the magistrate's circuit bungalow. The site is demarcated from the Galle- Colombo main road and the Indian Ocean. The ocean status is hospitable at this site but fortunately the site is open for a great vista towards white waves of Indian Ocean.

Galle as a distinct tourist city its coastal line is full of hotels and resorts. Giving the true meaning to its name, "The Light House Hotel" it stands out as the "beacon of light in the dark". And Light House Hotel is the architectural design by the great Sri Lankan Architect Geoffrey Bawa. Its minimalism along with elegance creates visitors a wonderland.

The Light House Hotel is famous all over the world for its spectacular views and vistas, the journey through the hotel and marvelous pleasant spaces all over the hotel.

3.2.2 Design

Light House Hotel which is a masterpiece of Sir Geoffrey Bawa is a very architectural design that has been appreciated by all the visitors who are related and non-related to the profession of architecture.

Showcasing the greatness of the architectural design of the Light House Hotel, it owns a rich and interesting space progression through both vertical and horizontal axes. This space progression acts as a connector as well. Through the vertical axis it connects the earth and sky, and horizontally it connects the land and the Indian Ocean.



Figure 3.1 – Architectural floor plan of Light house hotel.

The main entrance of the hotel faces the Galle- Colombo main road. Stone licensed walls in the exterior give a grand appearance to the building. Instead of a one single defined space there is a series of spaces at the entrance which gives an exciting first impression.



Figure 3.2



Figure 3.3

Right after the reception lobby, visitors are taken five centuries back to the battle of Randeniya, through the sculptural stairway designed by Artist Laki Senanayaka. This historical story is made on the hand railing of the stairway. Reception lobby ends at this round shape well defined space, in which the stairway rolls up. And on the centre of the stairway rocks and water bodies are placed to represent the mother earth.



Figure 3.4

Right after this historical drama, visitors are directed to a huge lobby that opens directly to the infinite Indian Ocean. This makes every soul to be so attracted to this place. This lobby basically comprises of two levels. One lobby serves as the main lobby while the other serves as the intermediate lobby that gives access to other areas.



Figure 3.5

One side of the intermediate lobby opens to an eye catching dining area that opens to the infinite Indian Ocean. And one side of this dining area opens to a colonnade that leads to beautiful garden courtyard that faces the old Dutch Galle Fort the other side of the intermediate lobby opens to another colonnade which lead the visitors to private room areas.



Figure 3.6

Further enhancing the soulfulness of this design this colonnade ends at the foot of a statue. At the end of this colonnade there is a natural courtyard comprising all the beautiful elements of nature. In middle of this courtyard there is a small ring of rocks that divide the courtyard into two paths. One of these path leads to private room areas while the other leads to another courtyard and garden where the infinity pool is located.



Figure 3.7

Above detailing present the design of Light House Hotel along its horizontal axis. And this design is much more than what is there we found in this horizontal axis. Light House Hotel has a very unique style in its vertical axis as well.

Apart from the walk you take horizontally at Light House Hotel there is another interesting and exciting part of the journey left which you should climb up along its vertical axis to experience the untold beauty behind it.

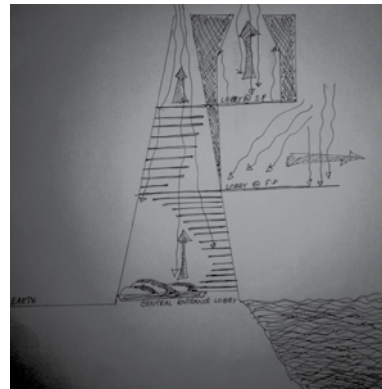


Figure 3.8

3.3 Usage of Courtyards

Light House with its particular location, is really a house of light .It is not just a shelter but also a bridge that let the people to take a walk from this tiny Island, Ceylon to the infinite Indian Ocean and it is also a ladder that let the people climb to the limitless sky. Light House hotel makes every soul surpass all the limitations and makes our heart and soul sore to the infinity. Light House Hotel is a place that stimulates the sixth sense of human mind. Early segments of this chapter emphasized and discussed the greatness of the architectural design of the Light House Hotel. And here in this segment the usage of courtyards and the importance of it will be emphasized.



Figure 3.9 - Plan showing only the solid spaces



Figure 3.10 - Plan showing only the courtyards



Figure 3.11 - Plan showing the complex including solid and courtyards

Folding these plans one by one itself shows the importance of role that has been played by courtyards. Without these courtyards Light House won't be this interesting and appreciated.

Important point out here is not the use of courtyards, but the fine detailing of it. Such as location, size, shape, form, volume and elements. Furthermore this interesting spatial progression was achieved through a series of courtyards. Further the courtyard study can be done through studying each courtyard type separately. Below plan shows the numbering of courtyards.



Figure 3.12

Courtyard 01

It is a round shaped space that opens to the sky. This courtyard represents the primitive form of the courtyard and the cosmic house. Rocks and brackish water on the ground represent the earth. The hole on top allows the light to enter. The person who is standing in between will always feel the soulfulness through the correct touch of Genius Locai.

Courtyard 02

It is a rectangular shaped courtyard which is a modern form of courtyard which bounded by solid built forms only from three side, and works as an intermediate space in circulation. Moreover it is not centered as in early forms.

Courtyard 03

This is much more an evolved form of modern courtyards. The shape of it is a rectangle which represents the modern courtyard forms deviated from the primitive square shape. And also it is not bounded by built forms from all four sides.

Courtyard 04

This form of courtyard can be identified as a pure traditional form. As a traditional one it is a rectangular centered space which opens to sky. And also it is bounded by solid built forms on all four sides. But to adapt to the particular location it holds some stairs, trees and some rocks as elements of modern courtyards.

Courtyard 05

This can be identified as a fusion of modern and traditional courtyard forms. It is a rectangular shaped space which is open to sky. And also as in primitive forms the intention of having this is to gain natural ventilation and to provide privacy for the guests. But still as it not a centered space, and as it is not bounded by solid forms, it express the modernity.

Courtyard 06

This can be identified as the most modern form as it runs from solid to the void of infinity. And also the water body which is added as an element have been the major element at this point, as a swimming pool.

Morphology of a courtyard can be stated as a timeless element. Courtyard study of Light House shows that there are diverse forms of courtyard that belong to different evolving stages. This shows the timeless morphology of the courtyard. Though the design is made to suit the modern day right placement of primitive courtyard forms can add a more colour to the design. Understanding the morphology of the courtyard as a timeless element will enable the designer to use any forms of the courtyard that is at any evolving stage to suit the requirements of modern day. Furthermore Light House design prove that the morphology based only on the shape is not the real understanding. Morphology of the courtyard again is not about the time of the evolving stage. It is all about the “placeness”, spirit of place gained through the structure. Though how timeless it is, morphology of courtyards include two basic points such as creating a microclimate and to provide a private outdoor space. This is clearly shown by the Light House design. Courtyard No four can be illustrated as a better example for this is the courtyard 4.



Figure 3.9 - Plan showing only the solid spaces

As the courtyard is in between built forms, this makes the courtyard to take more or less shape of contemporary form of courtyard. This courtyard in between these built forms creates a microclimate all by itself and won't let us feel that this is in the coastal line. Furthermore this courtyard provide a private outdoor space for the users in between their rooms, pool and the lobby

If all these concepts of Light House Hotel are summarized together it could be stated that the morphology of a courtyard is a timeless element, which can be use appropriately for the designs determining the number of courtyards. And also it can be stated that it is an element which accommodates other elements that stimulate the human mind in a pleasant way. Courtyard can be used as an element that brings physical comfort and beauty. This can be concluded by saying that morphology is basically depends on its place, design and concept regardless of the time and the quantity.

IV CONCLUSION

The courtyard which was originated as a central fire place has been evolved into a more modern courtyard complex. This essay shows the entire evolution of the courtyard up to the present day. Moreover as described in second chapter it's not just an element of history but one of the comprehensive solutions to all present day environmental issues. As pointed in scientific researches the built environment contribute in environmental pollution with a noticeable weightage. Therefore modern world appreciate the sustainability of the building more than its appearance. Architects as professionals should be responsible for the built environment of the country. Therefore they should be more concerned on the sustainability of the building. For gaining sustainability courtyard can be easily used.

As presented in this essay timeless morphology express that the designers should use it not as an element which can be added later, but as a design factor which should considered at initial design stages. Moreover there isn't any requirement of using the most modern form of courtyard or neither the pure traditional form but the perfect morphology depending on the site, architectural design and inhabitants.

Long term validity of this whole essay is that the morphology which is expressed in the essay can be easily use for modern high rises and also for future giant buildings too. But the most important thing is that the courtyard can be used in these high rises only if it is

designed considering the one particular high rise at its own site. With that concern courtyard morphology which is described through this essay can be further developed towards the future which is yet unknown.

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