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**AN ANALYTICAL STUDY OF INDIRECT REUSE AND ITS IMPACT ON  
SPATIAL QUALITY.**



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A Dissertation

Submitted to the Department of Architecture of the  
University of Moratuwa in partial fulfilment of the

requirements for the degree of

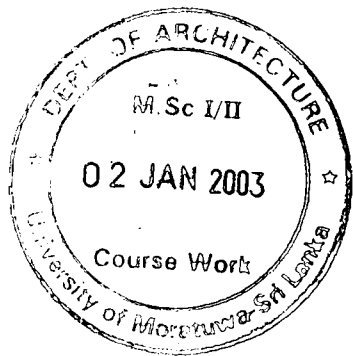


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UM Thesis

By

**Rasika Sanjeewa Wickramanayaka.**

79044

02<sup>nd</sup> January 2003.

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**Introduction.**



## **1.0 INTRODUCTION.**

### **Scope of the Study.**

The incompatibility between architectural elements, buildings, and urban contexts arisen, has created an inability to identify contexts. Because the link of new buildings with existing buildings is lost. To get back that lost link should understand the existing buildings, elements and concepts. "The new arises from the old". Creative design has to flourish from existing. So that, they become stable and absorbed in the evolution of architecture. Creativity happens in the thinking process. With the use of the available materials in contemporary designs to be use in able to achieve 'creative design'. In this task, reuse is playing a major role.

Reuse has become a trend in contemporary architecture. It has a wider sphere in the field of architecture. It varies within a large range from reuse of old discarded building element to reuse of whole building; reuse of the idea of attractive element in modern materials to reuse of planning concepts.

Reuse in the sense briefly has two ideologies. They are direct reuse and indirect reuse. Direct reuse means reuse of physical things in architecture. Reuse of buildings, reuse of elements, reuse of materials and waste reuse falling in this category. Reuse of ideas and concepts falling in the category of indirect reuse. This is again can be categorized in to reuse of planning concepts, reuse of detailing ideas, relations with colours, textures and proportions etc ... this is the study area selected to explore in this study, where a research gap has been identified.

Until the direct reuse and indirect reuse belongs to same origin, it is necessary to understand the link between them. Are they interdependence or independence, what is the most important in architecture. Until there is no such attention focus in the field of study, more attention will be towards indirect reuse. How it affect the main parameters of architecture, spatial quality, especially to be deeply analysed. The final aims to identify clear link between direct reuse and indirect reuse. specially the link between indirect reuse and spatial quality, the main parameter of architecture.

## **Justification.**

### **Historical aspect**

'Reuse' is not an alien thing in the field of architecture. It has a history dated to pre-historic eras, in the world history, as well as Sri Lankan history. As an example there is an idea that the beautifully carved columns of *nissanka latha mandapaya*, *Polonnaruwa* era has been taken from elsewhere of the region, probably from India until there was no that type of superior craftsmanship in other buildings belongs to the same era.

Ideology of 'reuse' directly links with the idea of eco friendly architecture and energy safety. In this aspect, traditional religious philosophies such as Buddhism, Christianity and Hinduism relating to the above concept. Relating to Buddhism, the lord Buddha once preached, about the *sivra*, the robe of the bhikkhu. Raw materials to be picked up by the cemetery, *amu sohona*, and by the pieces of them to be sewed together to form a cloth. Then it has to be coloured by eco friendly tree dyes. The finished robe firstly can be used for its original purpose, as the robe. Then as *andanaya*, second robe. Then as a bed sheet and so on. Finally it can be used as a fabric source for wattle and daub houses. Some architectural concepts, which governs the current architectural practice such as *vaasthu* and *feng shui*, has its own ideas about reuse. A brief study of such concepts will also create a good background for the study.

### **Environmental aspect**

In Sri Lanka, presently there is a crisis in architecture, with reference to materials, construction cost, labour cost etc. Day by day this trend increases. Reuse is one of the good solutions for this problem. By reusing old buildings for new functions a lot of energy and cost can be saved. Generally, the lifetime of a present building is not more than fifty years. So, at the end of that period there is no other traditional solution than reuse or demolition. So, reuse of materials easily can be done.

Environmental pollution is again one of the boiling issues in contemporary situations. Deforestation, damage of ozone layer, pollution of air, water and land, green house effect are causing as a result. So, reuse can largely contribute to the problem. As an example timber is a very necessary thing in construction. By reusing old timber, it is possible to avoid cutting down of trees. Bricks coming from earth. By

reusing them soil can be preserved. Also, lot of fuel can be preserved. In this aspect it is important to study the reuse through the environmental aspect.

### **Architectural aspect.**

As described earlier, reuse is a trend in contemporary architecture. In general lot of people interesting in antiquity because of several reasons. Far from that there is a social logic behind them. When considering indirect reuse, logic and theories, which have been used, have been experimented within the laboratory called 'society' for thousands of years. It is not necessary to search for new, all the things have been invented. This has been practised for several years. As example, the plan of yeoman's house in different eras in Sri Lanka such as Anuradhapura, Polonnaruwa and Kandy, most of them are very same. All the aspects, which are using in contemporary architecture, have to be examined in order to find what is the real path to go forward. (Examination of how architecture has developed).

### **Methodology.**

The background study will be done through a literature survey. Here, by analysing the different ideologies and terms about reuse, own interpretation of term reuse will be achieved for further studies. On that basis, analysis of types of reuse will be happen. (Direct reuse and indirect reuse.) Direct reuse will be analysing generally in able to gain an overall idea about that. Indirect reuse will deeply analyse because of the selection as the main focused area. This will form the first chapter of the dissertation. This will also include analysing of critical history (Sri Lankan and world.) in order to capture the path, which can be, derive from the history and to prove the historical background of it. Reuse and echo friendly architecture, as an approach to sustainable living also considered within this chapter. A brief analysing of reuse aspects in religion, present concepts such as *vaasthu* and *feng shui* will ended up the chapter.

In the second chapter reuse and architecture will be connected. There; analysing of design process and its involvement will be covered. Then, reuse and its impact on spatial quality will be analysed. Firstly, term spatial quality will be defined. Governing factors of spatial quality, such as spatial definition of form, organisation of form and space, proportions, scale, rhythm and repetition etc, and also some theoretical aspects.

Case studies will be selected to proven the above gathered and analysed knowledge. Selected masterpieces of Sri Lankan architecture will be analysed with reference to already available concepts, Traditional Sri Lankan architecture and modern movement architecture. There, analysation will be done through possible maximum aspects of architecture. Plans, sections, elevations, lighting and ventilation systems etc. are some of the examples. This will help to prove their similarities and dissimilarities. How they have been used, what are the aspects, finally, to conclude the impact on architecture.



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## **Chapter One.**

## **1.0 CHAPTER ONE: REUSE; ITS CONCEPTS AND APPROACHES.**

### **1.1 Different Ideologies and Terms about Reuse; Its Definitions.**

In Sri Lankan context reuse can further be simplified in to the aspect of maximum use of resources. Until the country from the history based on agriculture, it is more about the land and water. King Parakamabahu the great once said,

“Even one drop of water from the sky should not be allowed to reach the sea with out taking it for the benefit of people”

This is the way our ancient rulers looked at the aspect of maximum use of resources. Not only in Sri Lanka, other native rulers all over the world had the same aspect. Red Indian chief Seattle's very famous statement is as follows,

“Every part of this earth is sacred to my people. Every shining pine needle, every sandy shore, and every mist in the dark woods, every clearing and humming insect is holy in the memory and experience of my people. The sap, which courses through the trees, carries the memories of man. We are the part of the earth is sacred to my people”

Reuse simply means the use of existing entity or element for same or different purposes. This again can vary with in a large sphere due to the nature of use or due to the nature of entity. It may vary from a piece of timber to reuse of an entire building, or a total idea of planning. As a general term reuse incorporates archaeological aspects in conservation also. Reuse in the sense is a general term, which represents reuse, recycling; re-adaptation etc. in this study the selected area will be reuse in architecture. Architectural reuse again can be categorised in to two parts. Namely direct reuse and indirect reuse, or physical reuse and ideological reuse.

### **1.2 Critical History about Reuse.**

‘Reuse’ is not a fresh term for the field of architecture. It is dated back to pre-historic eras. Actually, it begins with the beginning of the human kind. Examples for this situation can be identified in world history of architecture, and also in Sri Lankan history.

### 1.2.1 World History about Reuse.

Any art cannot be creating repetitively day-by-day as a general term. Always it should have some sort of influence from previous incidents. From pre-historic eras to present day this incident took place. So, it is not possible to discuss about the all the issues though out the history at this moment. But it is important to concentrate about present day situation; how modern architecture influenced and get the benefit of reuse when formulate in to present-day situation.

"The architecture of the modern world to an extent hardly parallel to other periods of cultures, can be seen as the symbolic representation of ideological and political change. Ideas created buildings and ideas destroy them" (Kenneth Frampton, 1992: 07)

The closing years of 18<sup>th</sup> century can be identified as a period of anticipation and of upheaval in political, social and economic endeavour witnessed a series of creative events that heralded. The appearance of new art. Behind this trend there were two main reasons. First was the sudden increase in mans capacity to exercise control over nature, which by the mid 17<sup>th</sup> century has began to advance beyond the technical frontiers of the renaissance. The second was the fundamental shift in the nature of human consciousness, in response to major changes taking place in the society.

With in this period architects tried search for a 'true' style for architecture. Their first attempt was that to search for a true style precise reappraisal of antiquity. In other words, reuse of ancient architecture. They did not simply copy them. But they obeyed the principles. So, archaeological researches took place highly with in this time period. Firstly they reuse the total building form in their designs, but gradually it became the use of ornaments. Adlof Loos is one of the pioneering architect and researcher with in this period of time. Abbe Lonugier in *Eassai sur l'architecture* (1753) introduce the style call universal natural architecture where consisting of four tree trunks and supporting a rustic pitched roof. Then additionally, the in-between walls, or in other words partitions were proposed to be with glass, not archers, no pilasters or any thing as that. This can be identified as the first vicinity in modern architecture. This type of structure firstly appears in Jacques-German Soufflot's church of St. Genevieve in Paris, 1755. Soufflots was a pioneer architect to visit Doric temples at Paestum, was determined to recreate the lightness, the spaciousness and proportion of gothic architecture in classical times.

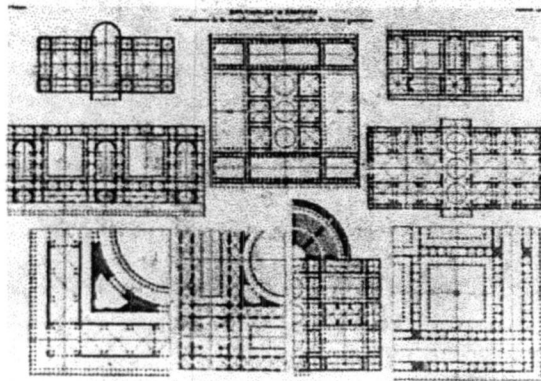


Plate 1.1: Duand, Possible combinations and permutations of plan forms, from his *Precis – 1802 – 09*. Note clear influence from ancient Italian, Rome and Greek cities.

(Source: *Modern architecture, a critical history*, p15)



Plate 1.2 : Schinkel Altes museum, Berlin 1823 – 30. Reuse of details and proportions in great Roman cities.

(Source: *Modern architecture, a critical history*, p17)

This style of inspiring from ancient civilisations was known as Neo-classicism. The innovation of new materials such as steel, glass, concrete refined this idea after the industrial revolution.

This new innovations and traditions of architecture endeavoured to the pioneers of the modern moment after the turn of the century. So, modern moment cannot be identified and described as a very new intervention; but as an abstraction and reuse of formalised principles of architecture through out the centuries.

### 1.2.2 Sri Lankan History about Reuse.

Considering Sri Lankan history, reuse is very definite term. King Asoka the great, in India donated most of the art and craft traditions to Sri Lanka with the Buddhism in third century BC, with Arhath Mihindu maha thera. People who belonged to several kinds of arts and traditions arrived in Sri Lanka. Coomarswamy describes this situation as follows,

“It should be remembered that in India, stone buildings wasn't practised until a little before Asoka's time. (Third century BC) and no doubt the knowledge is come to Ceylon from north India along with the Buddhist monasteries;





but a wooden style was already well established, and while serving as the model for the work in stone, has never been itself displaced. At a later time, when a knowledge of stone has spread to southern India and great Dravidian building tradition sprang up, as they required thence; and it is probable that most of the *gal waduwo* actually living in Ceylon are subjects of the Sinhalese kings in late times, were of south Indian blood" (Coomarswamy A.K 1979: 114)

So, the beginning of architecture of Sri Lankan civilisation itself is a typical example for reuse. The traditions, style, labour force. All were absorbed to Sri Lanka from north and south India.

There are examples to prove in Anuradhapura era, reusing of pre-used materials and elements took place. Sometimes, when construction of large monasteries, parts of ruined small monasteries have been used. Most of the huge stupas built within that era have been enlarged to that situation by layers of bricks by various kings. The samadhi pilima located in *maha mewna uyana (garden)*, originally located in *pacheena tissa pabbatha*, according to historical chronicles.



**Plate 1.3: The Samadhi pilima (statue) at mahamewna uyana Anuradhapura, which was originally located at Pacheena tissa pabbatha.**

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(Source: [Origin.island.lk/2002/02/23/satmag01.html](http://Origin.island.lk/2002/02/23/satmag01.html))

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Not only direct reuse, but also evidence of indirect reuse is also there. The Sigiriya, was designed and built by King Kashyappa with in his royalty as same as the *alaka mandawa* of *kuwera*.

Considering Polonnaruwa era, *Nissanka latha mandapa (pavilion)*, consist of nicely decorated lotus columns, there is an idea by archaeologists that these columns has been taken from else where; until there was no such clever craftsmanship in other buildings belong to same era. Even in medieval eras of Sri Lankan history, this kind of evidences can be identified. As example, according to the Coomaraswamy the present *Malwattha* temple in Kandy have been partly constructed by the remains of the king's palace at Mapanavatura. The doorframes of the royal bedchamber of the above palace have been used to build the relic room at Sri Dalada Maligawa. (Coomarswamy. A.K 1979: 119))

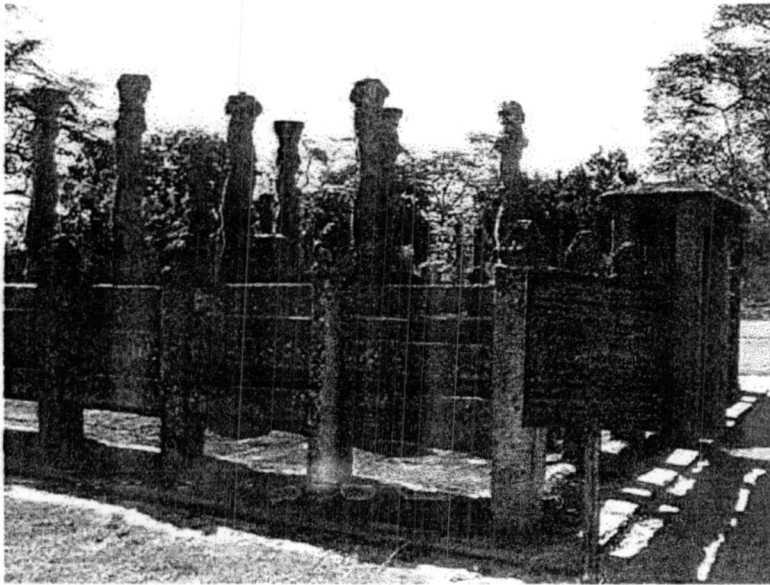


Plate 1.4a: The Nissanka Latha Mandapa, Polonnaruwa, with its decorative lotus columns.



Plate 1.4b: Columns belong to same era, without such decorations or forms.

With the colonial era, Sri Lankan architecture highly influenced by their traditions. Influences from Portuguese era are not very prominent in Sri Lankan architecture, but Dutch influences are highly visible in Sri Lankan buildings. As example, they introduced gable roof to the Sri Lanka.

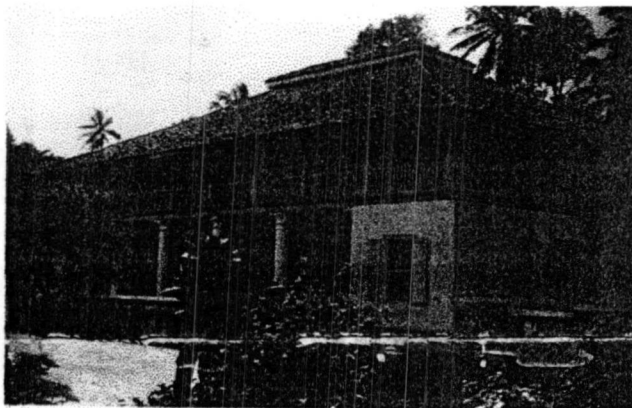


Plate 1.5: Dutch influenced building in Sri Lanka, with the characters of Dutch architecture (Lodge Harmony, Mathara). (Source: Architecture of an Island, p228)

Also, they are the people who started an urban architectural tradition in Sri Lanka, which consist of line houses, very dense living etc. They also introduce lot of architectural and building elements to Sri Lankan

tradition. Half round tiles, circular masonry columns, and living rooms are some of them.

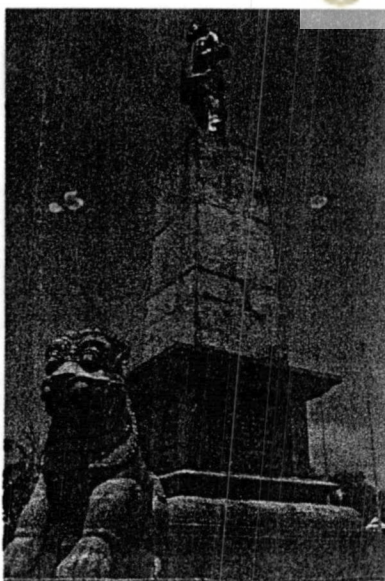
Then the British architecture influenced on Sri Lankan architecture too. White blank wall facades, hidden roof, British arch, geometrical houses, balconies, calicate tiles, cement, they introduced glass to Sri Lanka.

After the independence in 1948, Sri Lanka faces a trend in creating its identity in every form of arts. As example Mr. Lester James Pieris try to create a Sri Lankan cinema tradition. Prof. Ediriweera Sarathchandra tries to create Sri Lankan dramas. So, these new trend influence also in the field of architecture. Firstly Sri Lankan architects at that time thought the countries identity lies in architecture of the history. So, firstly they imitate details and languages of this ancient architecture in new buildings. As example, moonstones and balustrades made out of concrete and mortar in Peradeniya University, Kandian woodcarvings made out of concrete and cement in Independence Square can be given. But, gradually Sri Lankan architects realise that they are not belongs to present era, but to the past. Then some pioneers in Sri Lankan architecture such as Archt. Geoffry Bawa, Minnette de Silva, and Valentine Gunasekera etc, developed their own traditions in Sri Lankan context. Then in around 70's clearly identifiable Sri Lankan tradition seems to emerge.



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**Plate 1.6a:** Famous Yapahuwa Lion figure near independence square, Colombo.



**Plate 1.6b:** The Yapahuwa lion figure.



Plate 1.7: Peradeniya university buildings with Kandian type roofs.

(Source: pdu.ac.lk)

### 1.3 Customs and Beliefs about Reuse.

As an Asian country, Sri Lankan society has some sort of beliefs and traditions in their lives. Basically, there are two types of customs and beliefs. Religion, mostly the Buddhism and others such as vaastu shilpa sashtra are they.



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#### 1.3.1 Approaches in Religions.

It is a well-known factor that the 'civilisation' of Sri Lanka mostly happened with the introduction of Buddhism by arahath Mihindu Maha Thero. So, the influences of Buddhism are visible in every sides of the human life in Sri Lanka. This is common to art traditions especially to architecture. Basically Buddhism is not just a religion. But, it is a very strong philosophy. It has very environment friendly, very echo friendly characters other than any other religion. In the aspect of reuse, Buddhism mostly focuses to maximise the use of resources. *Vinaya pitakaya*, bhikku's code of discipline, is the document, which describes about the behaviour and well being of monks. The special part of the *vinaya pitaka*, which describes about this topic, is *pacittiya*. This document mainly content of *pacittiya*, *patidesaniya*, *sekhiya*, and *adhikarana samantha*. (*sinhala*) When considering some examples, this will be more prominent.

In *nissaggiya pacittiya* part one; the robe cloth chapter,

".....7. If the unrelated man or woman householder present the bhikku with many robes (pieces of robe cloth), he is to accept at most (enough for) an upper and under robe. If he accepts more than that it is to be fortified and confessed....."

With the increasing of bhikku population, Lord Buddha had to set some sort of rules to control them. So, these rules mostly focus on maximum use of available resources. If any bhikku did not receive the robe cloth, he has to find it from a cemetery (*amu sohona*), then to be dyed with natural wooden dyes. It to be use as robe firstly. Then when it got older, it will be converted to second robe (*adanaya*). When it gets older, it will be converted to bed sheets, then to serviettes finally, becomes a fibre source for wattle and daub wall construction. This is how the Buddhism responded to the idea of reuse. The logical reason behind this aspect to train bhikku from the beginning of their career, and also to approach minimalist life pattern.

In the silk chapter of the same document it has mentioned as below.

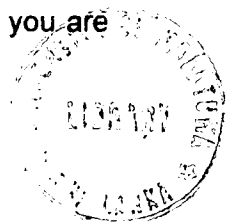
".....22. Should a bhikku with an alms bowl having less than five mends ask for any other bowl, it is to be fortified and confessed. The bowl is to be fortified by the bhikku to the company of bhikkus. The company of bhikku's final bowl should be presented to the bhikku (saying), "this bhikku, is your bowl, it is to be kept until broken" this is the proper procedure here..." (Klas Sandell 2002 with reference to [accesstoinight.org/canon/vinaya/bhikku](http://accesstoinight.org/canon/vinaya/bhikku))

So, even the bowl, (*Pathra*) is to be mended five times before discarded. So, it is again same as above; the idea of maximum use of resources and reuse.

Other than the Buddhism, which is an eastern religion, in western religions such as in Christianity also have aspects about reuse.

In Christianity, there are ten scriptural themes for ecological living. (Mennonite Central committee resources 2002 with reference to MCC resources and publications, occasional papers, [www.crist.org](http://www.crist.org)). Under point ten, it has mentioned, "all things (in the creation) will be renewed". Revelation 21:5 "he who was sitting on the throne said, I'm making every thing new; write this down for these words are trustworthy and true" (New International Version (NIV) [www.crist.org](http://www.crist.org))

Here it has described that god makes every thing new, or renew. He is freshening every thing. Further, in Christianity every thing is made by and owned by the god. So, people have to use god's devotion with much of care, maximum usage. Proper care of the land is recurring theme in bible. The land is gods. Leviticus 25:23-24 says, " the land shall not be sold in perpetuity, for the land is mine; for you are strangers and sojourners with me".



In deep analysis comparing Buddhism and Christianity, the main visible difference in the aspect of reuse is that the how the concept of environment friendliness and eco friendliness has been communicated to the society. In Buddhism, it has clearly reasoned out, but in Christianity it is more likely a law. People don't harm the nature because they believe in god. However, the religion, the closest philosophical idea to the society has clearly discussed about the idea of reuse and maximum use of resources for the benefit of the society.

### 1.3.2 Approaches in Traditional Concepts.

Other than the religion, there is another major concept, which governs the architecture of this island. It is known as 'vaasthu shilpa sashtra'. Apart from a concept it has applied to the architecture as a set of guidelines. However, it has become a necessity in the society from ancient times, mostly with the royal architecture. Because there were no big residences for yeoman, only for the royalties. But when this system gets changed gradually this aspect also get applied to the whole society. So it is important to consider what the aspects with in these concepts about reuse are.

The part, which belongs to reuse in vaastu, is known as vardhamana vaastu. This includes adding to existing buildings, change of use with minimal alterations, restoration of historical buildings and extensions and enhancement of facilities. According to the vaastu sashtra, these changes are to be done with the sensitivity to the energies of the building, together with awareness of form, space, colour aesthetics which are inherent to the design, and understanding of the lifestyle and relationships of the past occupants of the building.

The fundamental principle behind reuse in vaastu is that additions should be rhythmically added to the core of the building along X, Y, Z-axis of it. All the additions should be multiples or fractions. This part further mentions about the types, materials and their nature, which can be reuse. Vaastu mostly focused about the reuse of physical things other than the concepts and ideas. Reuse of timber is to be avoided according to vaastu. Elaborating further, trees, which are died by thunder storms and self died, trees which are habitats of animals such as owls, cobras, trees which are in cemeteries, should be avoided. Especially old door and window frames to be avoided in new constructions. Other than timber, there are no problems with other materials. The logical reason behind this factor is not very clear. But it may be because of human feelings about natural disasters and threats. Elements, which are damaged by them, and dwellings of socially unaccepted, condemned animals such as owls,

have been rejected because of may be the above-mentioned reason. A gradual improvement of these ideas some time ma led to a guideline. Some how, this is very important point, that reuse is also with in the traditional architectural concepts for centuries.

#### **1.4 Design Process and Involvement of Reuse.**

In architecture, the idea of reuse or element is visible in the final product. But, it is important to see that at design stage it is really been incorporated, the idea of reuse in the design.

Basically, idea of reuse can generate in creator's mind three different levels of design.

- Pre construction stage. (Design development stage).
- Construction stage.
- Post construction stage.

Pre-design stage starting conceptual design stages to start of the construction of the building. Here, it may be because of several reasons. If any client has set of reusable building materials and elements with him, he may ask the architect to design a building with them. In that sort of incident, architect has to advice them. In other words, he has a set of guidelines through materials itself. Again, in the situation of design of fixed-planned structures, such as stupas, there are fewer amounts to design. Plan form is already available and fixed. Scale and the basic shapes are only to be determined. In both cases, the role played by the architect is differs in the earlier instance it is much difficult and restricted comparing to the second situation. One of the good example for this situation is Lidia Gunasekera house by Archt. Geoffrey Bawa. One of the old house was destroyed with care and rebuilt with some changes to cater to modern day living. Here, architect is restricted not only by materials and elements, but also with the spaces.

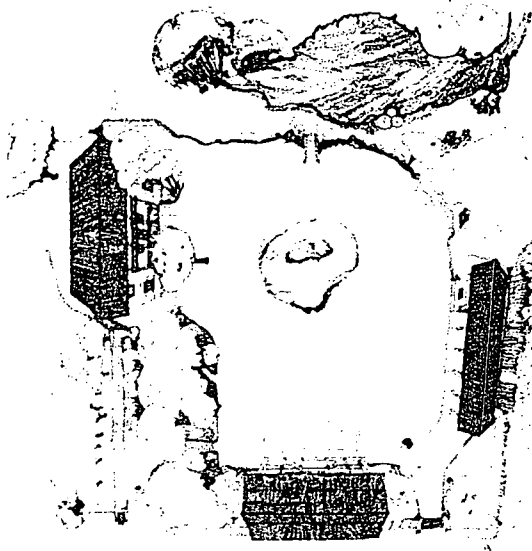


Plate 1.08 : Lidia Gunaskera house by Archt. Geoffrey Bawa. And example of idea of reusing gets involved from the beginning of the design.

(source: Geoffrey Bawa p68)

The involvement of the idea of reuse during the construction mostly happens based on the economic sphere. During the construction, with the lack of resources for carrying out the construction work, they mostly end up with the use of old materials. As an

example, such an economic drop in the construction of a house may result in poor roofing materials used for the roof. With some times this will largely determine the final appearance of a building. Some times, when the construction is going on, the architect may apply suitable elements, which are available with, to the building. Timber columns, stone pillars are such examples in most of the occasions. As an example, Archt. Geoffrey Bawa adds some of the old building elements and parts in his designs, which are not pre-determined designs. But additions while construction. This gives the ability for architect to improve the spatial quality of his designs with the freeness of experimenting. Architecturally, it is a good potential to 'fine tune' the design when construction is going on, because an architect can only realise the actual situation of a design from the construction of it, not from the drawing it self.

Adding of used elements to the building is a very prominent phenomenon in today's architecture in Sri Lanka. This is largely happening in interiors with adding of furniture to the interior. It has become a style now a days. Lot of antique shops are coming up here and there. This is very prominent with in the city boundaries of Colombo, where migrated people live. Further analysis of this kind of 'reuse' shows that the logic behind them is not that simple. By keeping old *pettaganma* (storage box) or two caskets some times it is attempted to show the historical relationships of their cast; or high level of the social conditions. On the other hand, it may be just the interest in fashion.



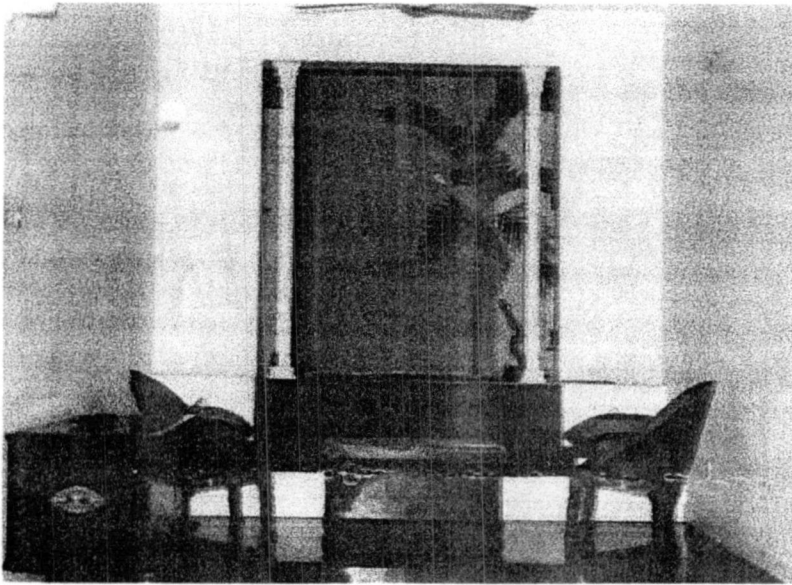


Plate 1.09: Use of antique furniture in a house by Archt. Bernard Gomez.(source : The Sri Lanka Architect, Vol. 101, no 10, p21)

Reuse of elements in post construction again mostly can be happen in the form of architectural

renovation. As described and discussed at the beginning of this chapter, the character of a house changes from person to person. So, it may be one solution to change the 'character' of the building by these means of reuse. Architecturally, this can create a rich ambience of spatial quality with in the house.

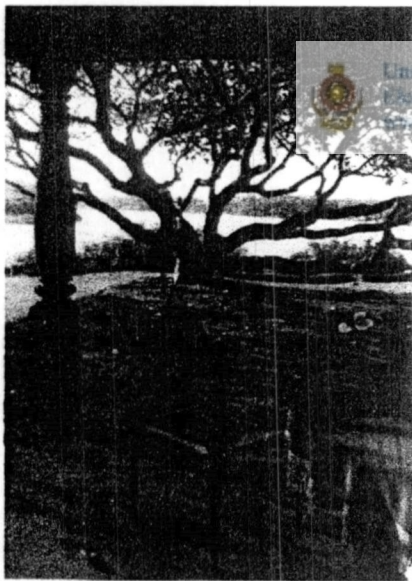


Plate 1.10: Reuse of timber pillar in post construction by Archt. Geoffrey Bawa. (Source: Bawa, p10)

Other than with renovation, people try to change the appearance and the quality of their dwellings and working places from time to time, to get rid of monotony of life and to improve the quality with economic developments are such two situations where people tend to change their life-style.

### 1.5 Reuse And Environment Sustainable Architecture; An Approach To Echo-Friendly Living.

The construction and operation of buildings consume the majority of world's natural resources and energy, and contribute to the bulk of landfill and waste. This has become one of the boiling problems in day-to-day life of people.

After agriculture, building is the second largest industry in the world. (Enercia building systems, Inc 1995) the manufacture of building materials consumes enormous amount of energy and exhaustible resources. To its credit, the building industry also uses the most renewable, i.e. timber, but without processing them against degeneration. So buildings not cars are the major dangers of earth. Pollution from the heating and cooling of the buildings exceeds that from cars, most of the countries of the world, especially in developing countries including Sri Lanka. Anyone ~~does~~ don't see it except may be from the chimneys of factories which are manufacturing building materials.

Fortunately, this is about to change with the emerging of new concepts as echo-friendly architecture, or sustainable development. Now it is mostly emerging in developed countries such as United Kingdom and United State of America where the industrial pollution is very high. As Sri Lanka is not polluted as such, it is important to switch in to environment friendly architecture, because prevention is better than the treatment.

The basic goals of the echo-friendly architecture is to achieve is simple; attractive comfortable, affordable, shelter that don't harm the earth in its manufacture or in its use. In practice, this has some relevance to reuse. Basically there are two of such concepts Namely,

- Maximum use of renewable building materials. Obviously this is wood. Already accepted even cherished, for its beauty, workability, energy efficiency and now, renewability. It could be used as close as possible to its natural status, but not untouched, as modern science can alter wood. So that it will not rot, burn, or become food for insects. Wood is solar energy transformed by photosynthesis in to building materials.
- Minimum use of non-renewable, energy intensive building materials like steel, brick, vinyl aluminium and insulations.

It is good to see some of the contemporary architects are on the path to sustainable architecture. Uses of sustainable materials, techniques are visible.



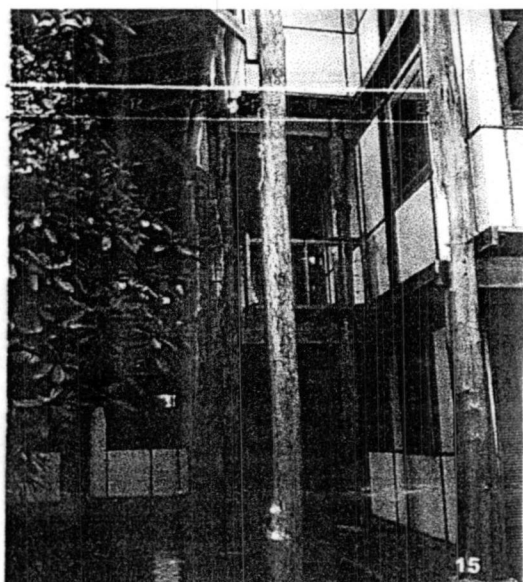


Plate 1.11: use of timber as a sustainable material in a house by Archt.N.V.W.Basnayake.

(Source: Sri Lanka Architect vol 103, no 03 p54.)

## 1.6 Types Of Reuse.

Reuse very briefly can be categorised in to two parts. They are direct reuse and indirect reuse. Direct reuse means the physical reuse. And the indirect reuse means reuse of ideas. These two also classified as tangible reuse (direct reuse), and intangible reuse (indirect reuse). There may be other sort of classifications. But in this study the basic classification will be as the above mentioned terms.

### 1.6.1 Direct Reuse.

Reuse of physical things coming under this category. This differs with in a wide sphere. It may vary from reuse of discarded piece of timber to an entire building.

This again can generally categorise in to four main parts. They are namely,

- 1.0 Reuse of buildings.
- 2.0 Reuse of elements.
- 3.0 Reuse of materials.
- 4.0 Reuse of waste.

#### 1.6.1.1 Reuse of Buildings.

There are again two major groups. They are namely reuse of old buildings and reuse of existing buildings. A building has a certain period of life. Now –a-days, this is about 50 years. After that period, it is to be demolished or reused. The main reason behind this is that a particular building is belongs selected person or group of

Reason behind this is that a particular building is belongs selected person or group of persons; throughout their lifetime. So, the building becomes a 'part' of that person. (Become personalised'). Until the every person differs from each other, the adoption of some one else to used building is difficult. Also, in present day, social, economic, and political conditions of the society changing very rapidly. So, with these changes, a building cannot change in same speed. So, after a certain number of years it gets old.



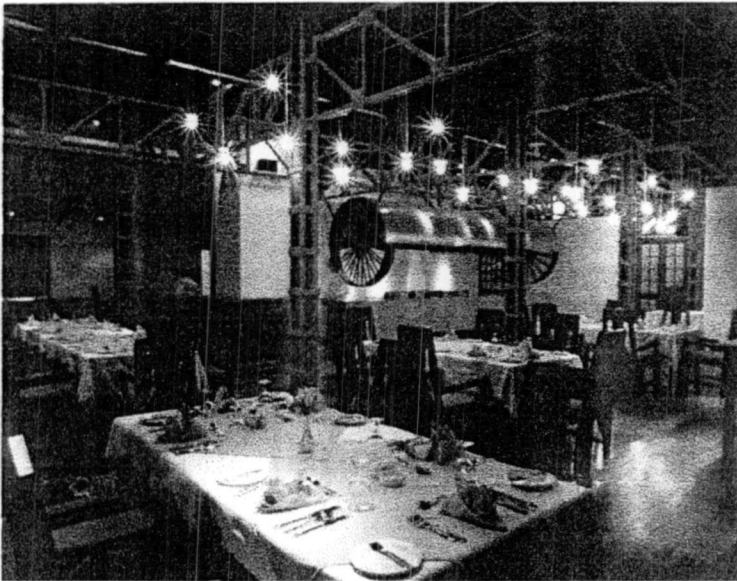
Plate 1.12a: An example for reusing of building; the 'Avaranaya' building Colombo before renovation.



Plate 1.12b: the 'Avaranaya' building Colombo after renovation.

Source Suchith Mohotti Associates (pvt) Ltd.

In some situations, buildings become uneconomical with its function within its lifetime. So, then it has to be reused with another function to get maximum benefit of the building. Other than that, it may create lot of social problems and economic losses to the owner. So, now it has become a trend to change function of existing buildings within the lifetime of it.



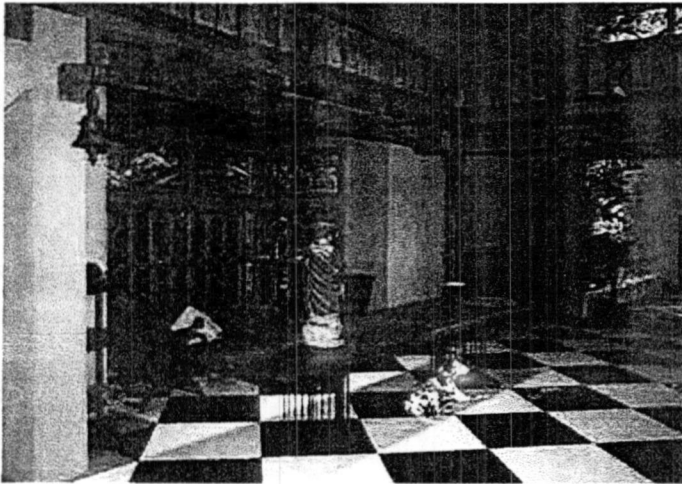
**Plate 1.13 : Tea Factory hotel, Kandepola, Nuwara Eliya, Sri Lanka. A tea Factory that has converted in to a luxury hotel. (Source [good-hotels-guide.com/asia/sri\\_lanka/up\\_countrytea\\_factory.html](http://good-hotels-guide.com/asia/sri_lanka/up_countrytea_factory.html)/ The Sri Lanka Architect, Vol. 101, no 20,p21)**

### 1.6.1.2 Reuse Of Elements.

Reuse of elements in architecture can be take place due to several reasons. It may be aiming saving of resources and money, (economic aspect) symbolic representation of some ones cast and class, or just to aesthetic purposes. Some how this 'elemental reuse' can again be categorised in to two parts. They are namely direct reuse of elements and indirect reuse of elements.

Direct reuse of elements in the sense means reuse of some building element to same purpose. As example reuse of an old window again as a window in a new house can be taken. Now – a –days, this is a very common trend in Sri Lanka. The main reason behind indirect reuse is the economic aspect. With the busy living conditions much finely decorated elements made out of good timber materials hard to be found, or it is not possible with their high prices. So, it is most of the times cheap to go for used building elements.

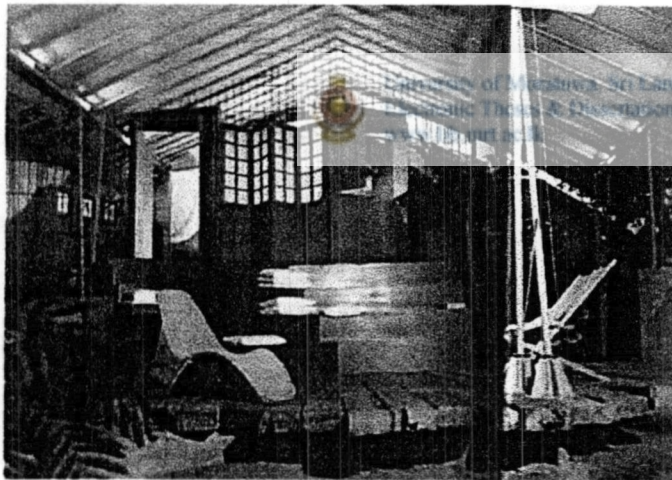




**Plate 1.14: Reuse of building elements in Lunuganga by Archt. Geoffrey Bawa.**

(Source: Geoffrey Bawa, p 40)

Indirect reuse of building elements is mostly made for aesthetic purposes. Here reuse of some building elements apart from its original purpose is considered. Load bearing columns as non-load bearing columns, trellis works as decoration panels are some such examples. It is also a reason for the poor craftsmanship in today's context. Also, old building elements are long lasting, and rich of 'antique' quality. But in most of such instances the economic aspect has been ignored, until these antique elements are of high prices.



**Plate 1.15: Old door panels used as partition walls in 'steel house' by Archt. N.V.W. Basnayaka.**

(Source: Architect Sri Lanka, vol 103, no 03, p48)

### 1.6.1.3 Reuse of Materials.

Building materials such as brick, sand, mortar, timber, tiles, rubble etc, arranged and bonds in such a way to form building elements; and finally buildings. After the life period of buildings, when the demolition of the buildings take place building materials get their original position again, and to the nature. Then they can

again be used in new constructions, as building elements. Also, these materials are available at fewer prices, other than the new ones, all over the country.

There is an important aspect to look at. It is that every old building, which is demolished these days, is capable of separate to their original conditions. Most of them are out of mud-sand or lime-sand plaster, roofs are out of homogeneous tiles. Floor out of cow dung or mud so on. But has the buildings, which are put up now a days has that capacity for future? The answer is no. Because they are made out of cement, concrete, glass, steel etc. they are very 'permanent' sort of constructions, not easy to separate. Also, harmful. So, it is necessary to consider this particular aspect.

However, this can again be categorised in to two main parts. They are direct reuse of building materials and indirect reuse of materials.

Direct reuse of materials means reuse of reclaimed materials for same purpose. As example, old bricks being used again for wall construction, old rubble for construction of foundations etc can be taken. Indirect reuse of building materials means as the name implies reuse of reclaimed materials again for a construction purpose apart from its original purpose.



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Plate 1:16: reuse of reclaimed limestone for a new wall in Pieris house by Archt. Minnette De Silva. (Source: Minnette De Silva, life and work of an Asian woman architect, p185)

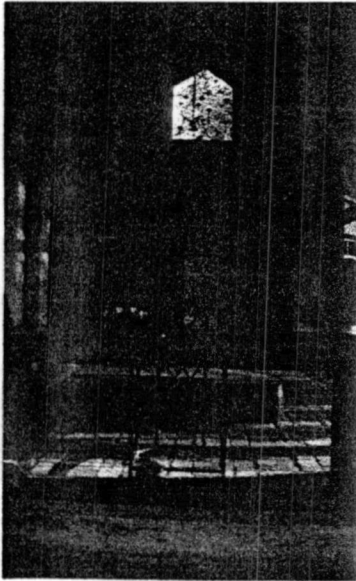


Plate 1.17: Reuse of bricks as flooring materials, Cinnamon hill house by Archt. Geoffrey Bawa. (Source: Geoffrey Bawa, p179)

#### 1.6.1.4 Reuse of Waste.

With the high urbanisation and urban growth, waste production also gets increased. Final result will be that waste becomes a problem. There are so many ways to treat the waste. Burning, berring under ground, decomposing, recycling are some of the common methods. Out of all these methods, recycling is one of the leading methods, which gives some thing back. In other words, it has an economical aspect. These recycled products can be used in the building industry. Partition boards out of discarded paper, plastic accessories with recycled plastics; insulation boards out of grass materials are some of the common applications of recycled materials. This type of reuse of waste can be identified as indirect sort of reuse.

Apart from that, waste can be used in architecture. This is common practice by low-income category of people, to put up their slums and shanties. Whatever found from the surrounding are put up in their temporary dwellings, tar barrels discarded wood, polythene sheets are some of such materials. At the particular context, there is no logic behind it, only the fulfilment of the requirements.

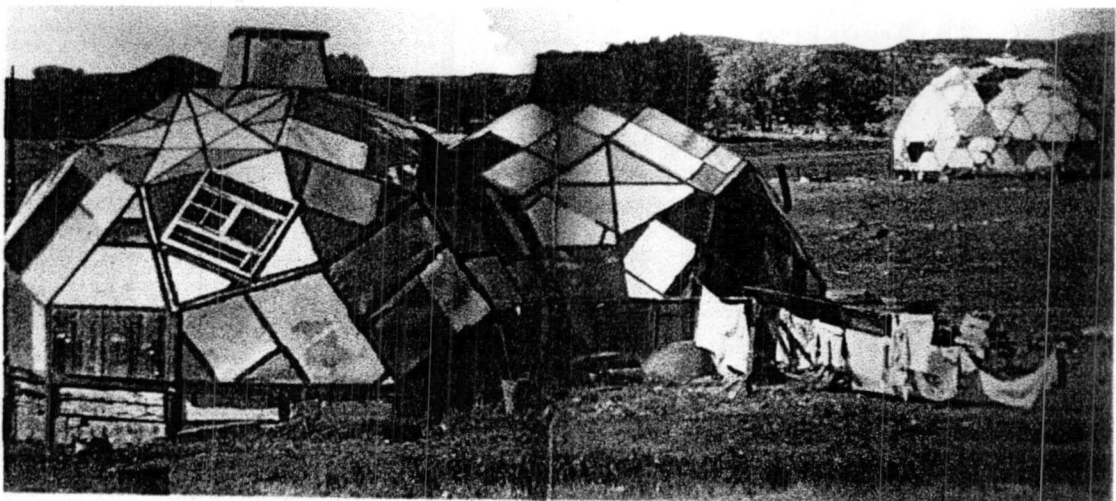


Plate 1.18: Slums and shanties out of waste. (Source: Green Architecture, p105).



Architecturally, this is a more adaptive criterion. Most of the waste products can be used to enhance the spatial quality, colour and texture, in interior and exterior both. Some modern moment architects such as Archt. Bruce Goff used this concept in several buildings. So, reuse of is also a tool for energy management and to avoid environment pollution.



Plate 1.19: A building by Archt. Bruce Goff with waste. (Source: post modern Architecture, p107).

### 1.6.2 Indirect Reuse.

As indirect reuse is the focus area of the study, it has to be further emphasised. Indirect reuse mostly happens through influence. Also it is very accurate and acceptable ways of improve architecture Human kind develops day by day with their concepts and technologies. They learn from every moment, every minute so it is not needed to start from the beginning, the best way to do such is to learn from history. Grasping important and acceptable concepts from the past examples and to continue in a continuous path. Not only by means of learning but instinctively.

"The architecture of the modern world to an extent hardly parallel to the other periods of cultures can be seen as the symbolic representation of ideological and political change. Ideas created buildings and ideas destroy them."

(Kenneth Frampton 1992:7)

So, getting influenced from history is a very prominent situation. This influencing mostly was occurring as indirect reuse and not direct reuse. Direct reuse is very prominent in day-to-day architecture, because it is very tangible. Reusing of elements, furniture, finishes are easily carried out. But indirect reuse is not so. Because it happens in long period of time. Also it is not directly visualised. As examples, the plan layout, textures, forms and other things are only visible to very keen, analysing eye. So it is a very predominant part of the concept of reuse.



## 1.7 Conclusion.

The concept of 'reuse' is not new terminology in the field of architecture; it has been practised thousands of years throughout the history. Considering world history or Sri Lankan history, it is very prominent situation. The approach to the concept of reuse in Sri Lanka has most influence from the Buddhist philosophy, although it is the main religion in the country. Further it has influence from other beliefs of people such as *vaastu shilpa sashtra*. Reuse can mainly be divided into two parts; namely indirect reuse and direct reuse. The involvement of the concept of reuse in architectural design can take place before construction, during the construction and after the construction. In environmental aspect, it can be used as a leading tool for environment friendly and sustainable living.





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## **Chapter Two.**

## **2.0 CHAPTER TWO: INDIRECT REUSE, TERMS AND ITS IMPACT ON SPATIAL QUALITY.**

### **2.1 Spatial Quality; Its Ideas and elements.**

Several people have defined the term 'space' in several different ways. It has been described in many aspects. Space as a problem in architecture or architecture as a problem in space. To be described in architecture space must exist with in the environment. So, existential space is the basic idea to discuss here. Christian norbeg Schulz defines the existential space as a relatively stable system of perceptual schemata, or image of the environment. (C.N.Schulz, 1971, 17) existential space has an object character. From childhood, even from birth, human being got feelings about his space. With ageing, the perception of the space gradually changes in mind. As example, the world of the child is 'subjectively centred' 'around him. (C.N.Schultz, 1971, 18). The infant's space is defined as a collection of separate spaces; each entirely centred on a single activity. Existential space has its own elements which defines its quality; the spatial quality. Space has a centre. Most of the occasions, it is the beginning point, or the focal point. In day to day living. the centre, in the most occasions is the home. A place is generally situated in a context for its existence. So, it should have a path. Then the path becomes another element of space. Arrange or allocation of path was done with several reasons. Some times, they were spiritual reasons; (church altar always face east), sometimes technical reasons. (Lighting angles etc). Sometimes, this may determined by the nature itself. (A road with many bends in a hilly terrain).

Space has areas and domains. The paths create these domains. These areas basically can be categorised as well-known areas and less known areas, preliminary. Theses spaces get together to form a mosaic or in other words, a space. Domains can be defined in several different ways. Sometimes, by strong natural elements, particular human activity carried out in the particular area etc...

Above-mentioned places, paths and domains are the basic elements in spatial quality. They get together in such a way to become a real dimension for human existence. The character of a space, the spatial quality, only taking place with the real situation of it, interaction of it, with the surroundings as a product.

Above description forms a theoretical background for spatial quality. This will further scrutinise in to its practical situation at the end of this chapter.



## 2.2 Reuse and Its Impact on Spatial Quality.

"Aristotle defines space as a container of things. A sort of succession of all enhancive envelopes, from what is "within the limits of the sky" to the very smallest, rather like Russian dolls. Space is therefore, of necessity a hollow, limit externally and filled up internally; there is no empty externally and filled up internally; there is no empty space; every thing has its position, its location, its place". (Pierre Von Meiss-1990, p101)

So, the spatial quality of any architectural work is the most important. The term 'spatial quality' has to be determined by several factors. Scale and form, organisation and spatial progression, appearance, proportions, colours and texture are some of them. These parameters are needed to analyse comprehensively, in order to understand reuse, especially indirect reuse, putting its impact finally on spatial quality. One aspect to study these things is to prepare a base to the study in case studies; how the aspects are been incorporated, and to identify there impacts.

### 2.2.1 Form and Space.



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"Space constantly encompasses our being. Through the volume of space, we move, see forms and objects hear sounds, feel breezes, smell the fragrances of a flower garden in bloom. It's a material substance like wood or stone; yet it is inherently formless. Its visual form quality of light dimensions and scale depend totally on boundaries as defined by elements of form. As space begins to be captured, enclosed, moulded and organised by the elements of form, architecture comes in to being".(Ching Francis.D.K.-1949 : p108)

So the spatial quality gained by scale and form further can be explored to parameters such as visual forms, quality of height, dimension and scale etc. According to Ching, to define a form within a space there should be two types of elements. There are positive elements and negative elements. Positive elements act as a form, until negative element act as background. Relationship between form and space may be varying form instant to instant. Building form can form a wall along the edge of its site; or can be a surrounded enclosure, merge to interior spaces, Enclose patterns of its site, stand as a distinct form stretch out and present a broad way,

stands free within its site as an element, and can stand as a positive form in negative space.

So this sort of impact can be strengthened or weakened by indirect reuse. In further classification, as example it can be considered the concept of merging to surrounding site. When a new building is coming up in a historical fabric, general practice is to obey the principles of surrounding context, harmonise the design with it. This can be totally changed in to a concept of standing out as a distinct form by overriding the contextual form and rhythm. Such example is visible in old parliament building in Sri Lanka with its new addition of building portion, which obeys the principles of British colonial period.



Plate 2.1: Old parliament building with new portion.  
(Source : )

[inforeng.ee.ic.ac.uk/samhet/sri lanka.html](http://inforeng.ee.ic.ac.uk/samhet/sri%20lanka.html)).

Further, in a modern context, historical, ancient appearance can be given to a building, by the use of proportion and scale in a historical context. Then it stands against as a distinct form.

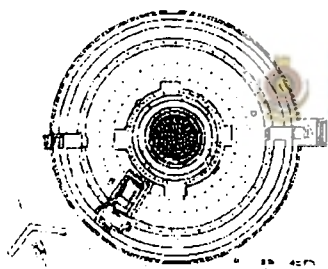
### 2.2.2 Organisation and Spatial Progression.

According to Ching, there are five kinds of basic spatial organisations in architecture. They are namely centralised, linear, radial, clustered and grid organisation.

In centralised organisation there is very prominent stable central space, and a set of spaces around it. In leaner organisation there is series of spaces: combined of both centralised and leaner spaces coming up as a radial organisation: clustered

organisation use of proximately its spreads from one to another; finally three dimensional grid pattern which regulates the spatial relationships of forms and spaces, each of these spatial organisations has there own qualities and characteristics. So these characteristics are common for all of the spatial organisations, they can be used to fulfil unique function, as example, centralised organisation can be use to established points or places in space, terminate axial compositions, serve an object or form within a define field or volume of space. Reuse of this kind of spatial organisation is possible in architecture, where, same kind of social and architectural environment is created. As example the Stupa lay out can be considered which has centralised organization. Repetition of same lay out pattern has helped to create spiritual spaces in every Stupa construction, even today.

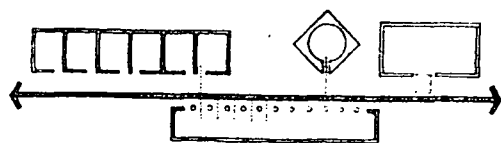
**Plate 2.2 : General Layout plan of stupa.(Note the centralized organisation).**



Spatial progression is a link between movement path and the space. This path-space relationship can take place in three different ways.

(Ching Francis D.K .1949)

- 1.Passby spaces.
- 2.Path through spaces.
- 3.Terminate in a space.



**Plate 2.3: Spatial progression patterns. (Source: Form, space and order, p282).**



In these three relationships of the space, user relationships take place in three different ways. In pass by spaces the integrity of each space is maintained and the path is flexible. In pass through spaces path touches the space to create a certain pattern and in the case of space

termination the location of the space stabilises the path. These kinds of ideas of spatial relationships have been used in Sri Lankan architecture, as an example large scale Walawwas consist of mostly pass by spaces in both size of the verandas. These same ideas can also be visible in modern houses.

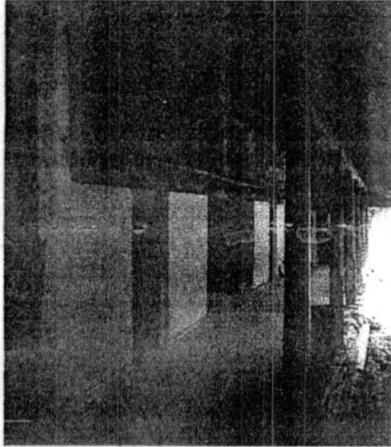


Plate 2.4: Pass by spaces in Eknaligoda wallawwa. (Source: Architecture of an Island, 265).

### 2.2.3 Proportion and Scale.

Building materials have their own proportions, same to structures and manufactured things. As example a stone plate of four inches thick, eight feet long can act as a bridge over two points. But if the length increased, in a certain point, it will collapse itself. Apart from natural materials this is common to artificial materials as well, such as bricks, tiles etc. As they are mostly manufactured according to set of standards they have their own proportions.

Apart from the proportions of materials, human being has set several proportioning system in architecture. There are some systems, worldwide accepted, genetic to some particular country, proportioning systems. They are known as theories of proportion. The golden section, the orders, renaissance theories, modular, the 'ken' of Japan and anthropomorphic proportions are some of them. Some great architects such as Le Corbusier, who developed his own proportioning system, have practiced these systems.



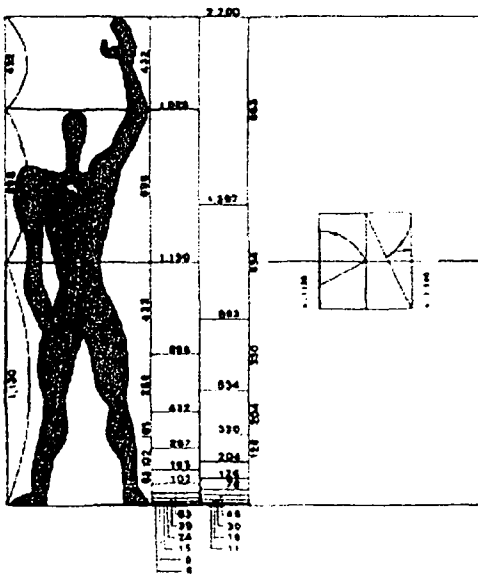


Plate 2.5: Le Corbusier proportioning system.  
(Source: Serialdesign.com).

In Sri Lankan context, craftsmen's, who acts as architects in the past periods had their own proportioning systems. According to Coomarswamy master builders of Sri Lanka have used a proportioning system based on human body dimension. 'Cubit' was the basic dimension. It is the length from the elbow to the top of the second joint of the little finger, the first being closed. This is approximately 17 inches or 425 mm. But this may vary from one master craftsman to another, based on the body dimensions. But the ratio in between them to be same. Chandrasekara has identifies that same type of proportioning system has been used in Sinhalese vernacular architecture; in small-scale image houses such as Tam pita Viharas. (Candrasekera D.P, 2002-14)

Same kind of proportioning system has been used in Sinhalese and Indian vaasthu sashtra, known as '*pada bedeema*' (dividing in to segments known as *pada*), here both side of the houses are divided in to '*pada*' segments, giving numbers 1 to 5. 1,3,5, segments are good for opening and 2,4 are not. This is also a proportioning system even used in today.

"While proportions refers to the material relationships among the real dimension of form and space, space refers to how people perceive the size of a building element or space relative to other forms. In visually measuring the size of an element, we tend to use other elements of known size in the context as measuring devises".(Ching, Francis D.K.-1949, p326).

Further there are two types of scales. One is generic scale where a building is compared with other buildings in it's own context, and human scale where a building is compared with the dimensions and proportions of a human body.

When person is with in a space, at the boundary walls, which are tangible with in his body dimensions, what he first does is to 'touch' them and get a feeling

about it. If the boundaries are intangible, then the generic scaling will take place. From outwards of the building same thing happens. Generally the size of a window in a wall, height of floor can give an idea of what kind of place it is. Similarly if the number of windows on the wall are less, it is known as 'small' building. If there are large number of openings it will be perceived as a huge building. This may be some times wrong. But generally it is right in a school building, vary from a hospital building based on its scale, solid-void ratio etc...

In the case of reuse doors and windows happening in a large scale. This may sometimes be exploited in the factor of scale. If a large doorframe of large walawwa, used in a small house then the scale which is visible is totally misleading.



Plate 2.6: Reuse of doorframe in a different proportion in Cinnamon hill house by Archt. Geoffrey Bawa. (Source: Geoffrey Bawa, p179).

#### 2.2.4 Colour and Texture.

Other than the vertical dimension, of a space there are some other factors, which affect the scale, according to Ching.

- The shape, colour and pattern of its boundary surfaces.
- The shape and disposition of

its opening.

- The nature and scale of the elements placed with in it.

So, all above factors determine the colour and texture within the space.

Technically, colours and textures have the capacity in making psychological effect in human mind. Red and reddish colours create anger, hot feelings in human mind and Blue and more Bluish colours generate more pleasing feelings in human mind. This can be used as a tool in architecture. Not only colours, but lighting levels. Brighter colours generate rapid and quick moments in human Behaviour as dim, diffused light slower the speed. That's why most of the nightlife places such as clubs are using dimmed light.

In reusing of texture and colours it is very superficial to take the colour and texture is impact of spatial quality totally, But to some extent. For a moment using of antique old Blackish colour furniture in a living room may create calmer environment than a room with White or Red colour furniture. Same thing applies to wall finishes, Murals, Paintings, door panels etc... Other than pure white walls they are psychologically minimising the space. A good example to show reuse of ideas in colours and textures is the earthen colour wall in central yard of Light House Hotel by architect Geoffrey Bawa.

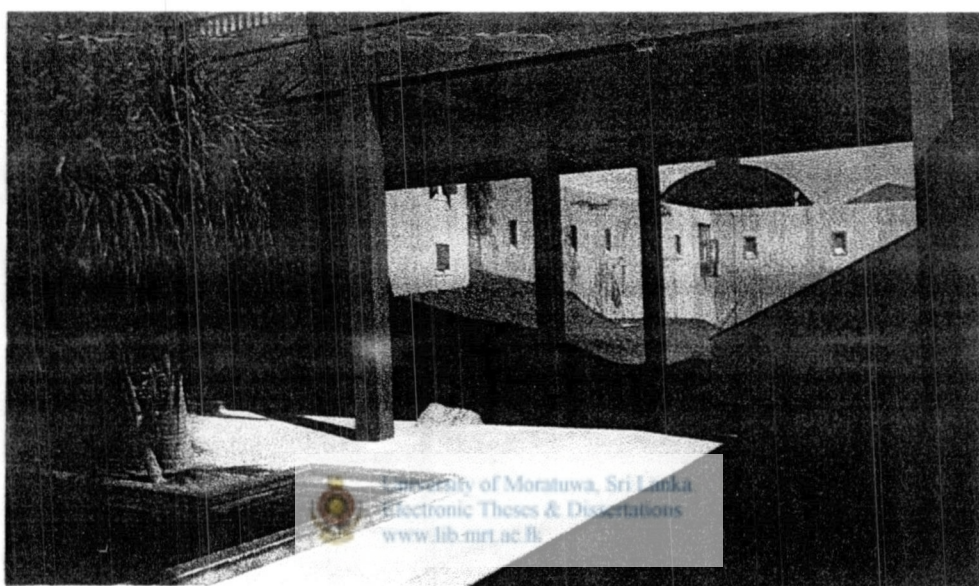


Plate 2.7: use of earthen colours and mud textures in walls of Light house hotel Galle by Archt. Geoffrey Bawa. (Source: The Sri Lanka Architect, vol. 101, no 20, p25)

Here, he has used the earthen colour to sense that the building is part of the earth and it has emerged from the earth.

### 2.3 Indirect Reuse of Ideas.

Indirect reuse is also known as ideological reuse. That means it is a business of reusing ideas. This category of 'ideas' are to be clearly identified. Architecture totally depends on ideas. This idea is replaced with 'concept' in architecture. The building has concept for most of the aspects. Not all the buildings are within a written concept. But it is within the ideas of the architect. He can be influenced from his past experiences, available resources, learning etc... This will come out as his-own work. Then the influences can be visible in a deep analysis how they have influenced from other architectural traditions.

### 2.3.1 Reuse of Planning Concepts.

Plan form of the building is the only surviving experimental feature of the building in Sri Lankan historical context, other than some stone and brick elements. Because the foundation of a building, in 2D form, mostly remaining on part decaying soil. As an example, still Sri Lanka has the 2D plans of its very early kingdoms, Anuradhapura, Polonnaruwa but not most of other details. So the planning is easily examined, which is a considerable aspect in present day context. From historical eras to present day, in Sri Lankan architecture, this planning or 2D composition on the ground has changed from time to time from place to place for several reasons. Climate, Topography, available materials are some of determinant factors. It means that the planning as a concept in Sri Lankan context is experimented during thousands of years. Throughout the history it has absorbed several characters to function well in the situation of Sri Lanka. Briefly there are two types of reuse of planning concepts. They are namely, direct reuse of planning concept (repetition) and indirect use of planning concept.

#### 2.3.1.1 Direct Reuse of Planning Concepts (Repetition).



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This mostly happen in the instances of religious based buildings. Planning of mostly of the religious buildings is predetermined and not possible to change, very prominent. Very good example for such situation is the stupa construction. If very early type of stupa and modern day stupa are compared the plan is all most the same.

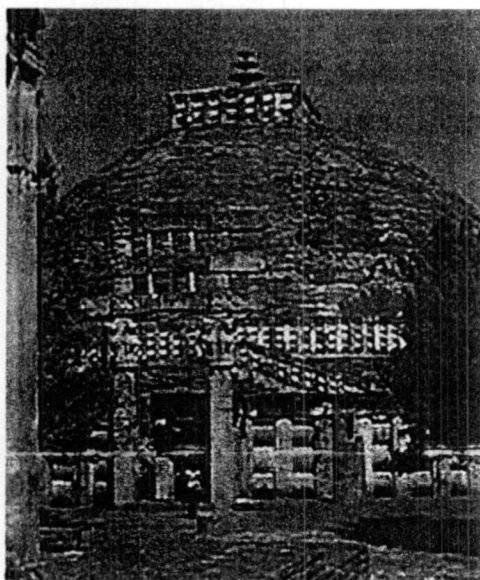
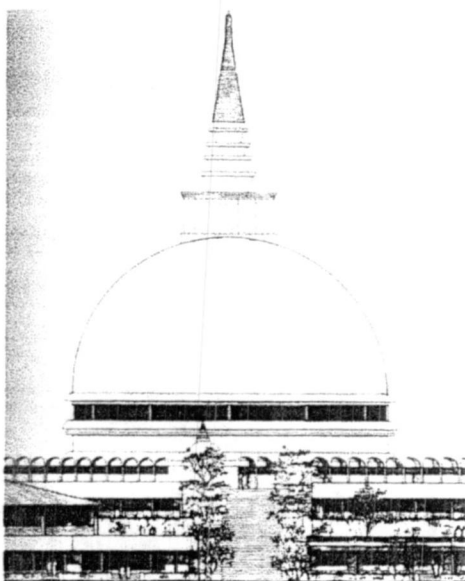


Plate 2.8. Sanchi stupa in India, oldest stupa that exists in the world. (Source: travel.indiamart.com)



**Plate 2.9. Kaluthara stupa, very modern stupa, with same proportion, shape and detailing to stupa at plate 2.1. (Source: The Sri Lanka Architect, Vol. 101, no 19, p19)**

This is mostly same to the image houses. The inner shrine of the sun goddess, Japan is another good example of such situation. This is a temple of king dynasty, the religion is 'Shinto'. It is a habit in their culture to re-build the shrine every 20 years. There are two sites for same shrine and one occupies the shrine. When 20 years time gone the existing shrine is to be demolished. So, they built another shrine at the other side, then demolish the existing shrine. Then remains kept for next construction of shrine.



**Plate 2.10: inner shrine of sun goddess. (source : World Architecture, p113)**

Again this type of direct reuse can happen in replica or model construction. In the case of replica, a building or monument get constructed again in a small scale. As example, in early 80's and 90's in Sri Lanka, the existing government started the 'Gam Udawa' (village reawakening) programme. For this festival, several replicas were built of the existing buildings. With same planning concept in small scale. Replicas of town hall building, Buddhagaya temple are two of such examples.

### **2.3.1.2 Indirect Reuse of Planning Concepts.**

The idea of reuse of planning concept in Sri Lankan context can be demonstrated with several examples, from the beginning of the civilisation, there were two basic type of building traditions in Sri Lanka. They are great tradition and



small tradition. (Chandrasekara 1999, p08). Kings palaces, monasteries are belongs to great tradition (*Maha sampradaya*), and residential buildings belongs to small tradition (*Chula sampradaya*). Image house is one of the building types belonging to great tradition. With the time changes, from Anuradhapura kingdom to Kandian kingdom, it has gradually changed but all the secondary styles are been influenced from previous one. Considering Pulliyakulam monastery Anuradhapura, Thuparama image house Polonnaruwa and Kempitikanda tam pita vihara Kandy; there are same characters throughout the progression.

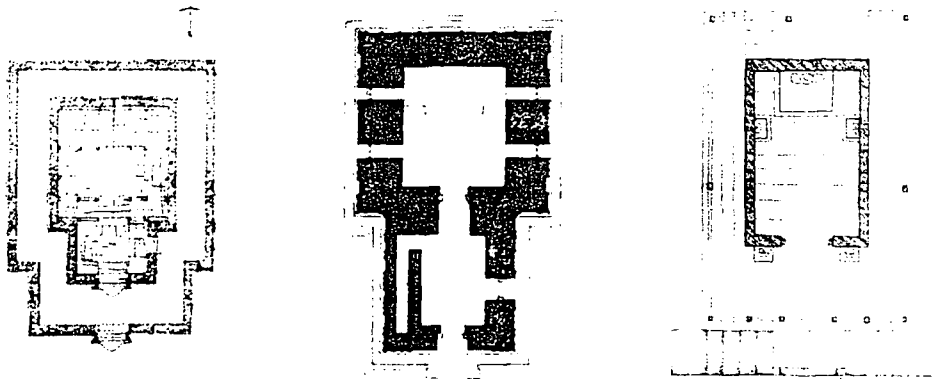


Plate 2.11: Comparative study of image house plans.

(Source: Tam pita viharas in Sri Lanka).



Three of these have a square in a sanctum, enclosed by brick, stone, wattle and daub, and small projecting porch and a Buddha image in rear wall. So, it is reasonable to assume that each of these have been influenced and linked together. In depth analysis of the plan, shows the spiritual aim of the total image house is not clearly identified, but there are three conceptions. First is to symbolize the great achievement of the load Buddha, second is to represent the 'perfumed chamber's or *ghandha kuti*, where load Buddha used to live in. Thirdly and finally to represent the Buddha as 'lord' of the world'. (Chandrasekara 2002 p22). How ever, the aim of the craftsmen of these various time periods was to represent these conceptions somehow. So, if the representation is separately designed every time, these three image houses should be very much different in appearance. But, it is not until there are so many similarities; it is obvious to imagine there is some sort of influences from each other.

Residences of yeoman's belong to small tradition or *Chula sampradaya*. Any evidence of this type of domestic buildings not in existence, which belonged to early kingdoms such as Anuradhapura and Polonnaruwa. Only with reference to great chronicles such as *Mahavamsa*, *Chulawamsa* and epigraphically

evidences. So, most visible and remaining domestic building types belong to Kandian period. According to Coomarswamy, these buildings are put up on a mud foundation raised from ground level, which forms the floor and inner veranda, a narrow ledge or outer veranda and a central court yard, Granary or *atuwa* built to match with economic level and social condition. These spatial items get multiplied, with the growth of family. *Maduwanwela Walawwa* is such an example.

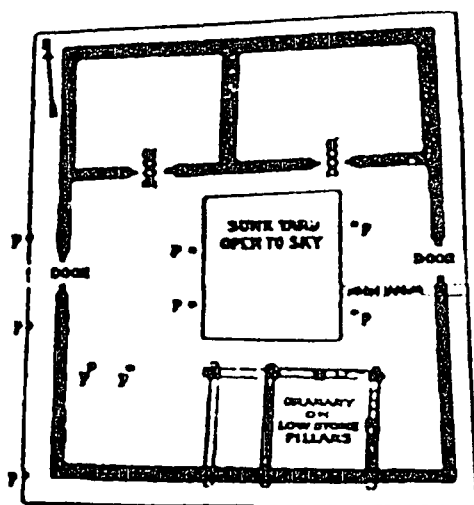


Plate 2.12 : plan of small Yeoman's house.  
(Source, *Architecture of an Island*, p20)

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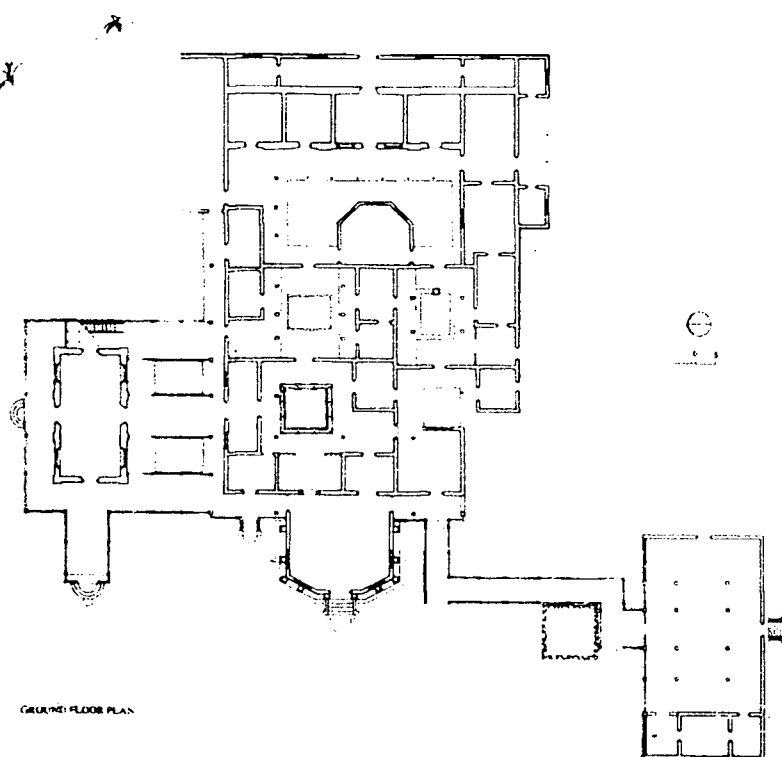


Plate 2.13:  
Maduwanwela  
Walawwa, the plan.  
(Source: *Architecture  
of an Island*, p39).

The logical reason behind this type of planning is that the expansion of *hatarandi ge*. The evolution of *hatarandi ge* can be described as below.

From the beginning of it to evolution of the large wallawas at the end. Firstly a small

linear type of building put up with a courtyard surrounding it. Then gradually it was developed in to 'four unit' houses with the aspect of privacy, blind wall, right round the building and a central courtyard. They further get expanded to form a large-scale wallawwas with a series of small courtyards.

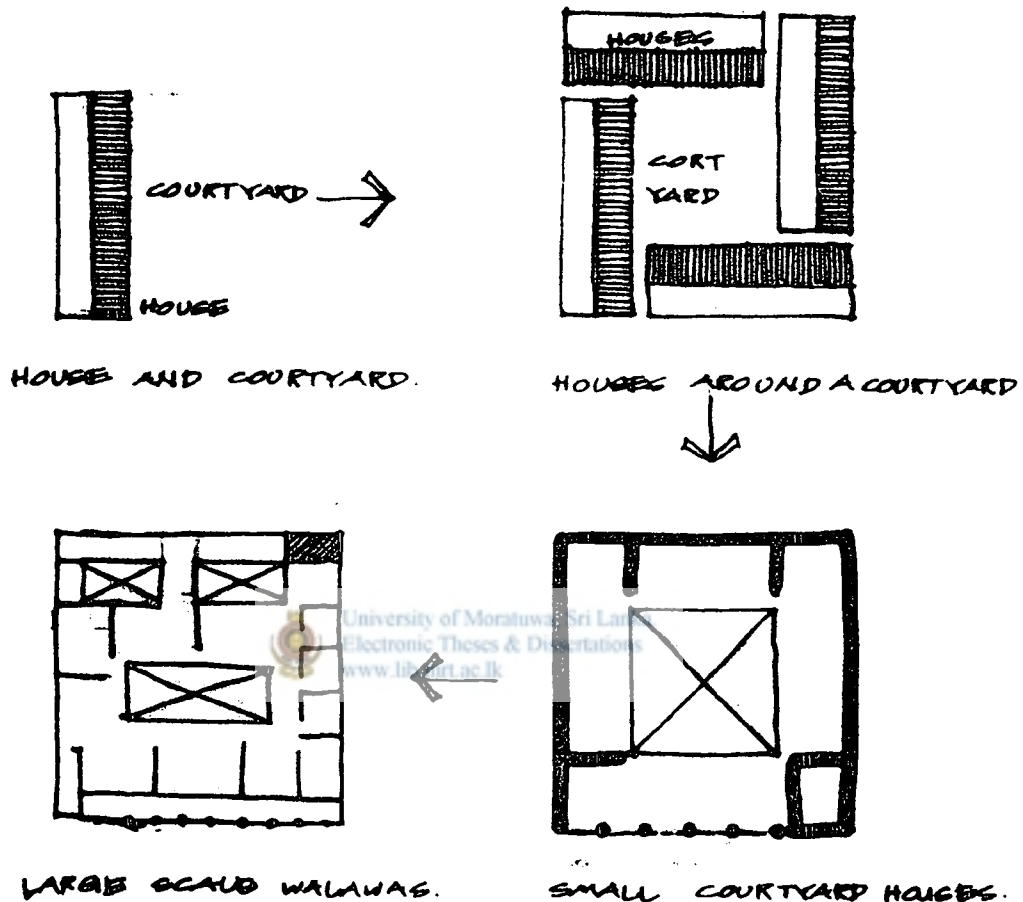


Plate 2.14: Formation of hatarandi ge.

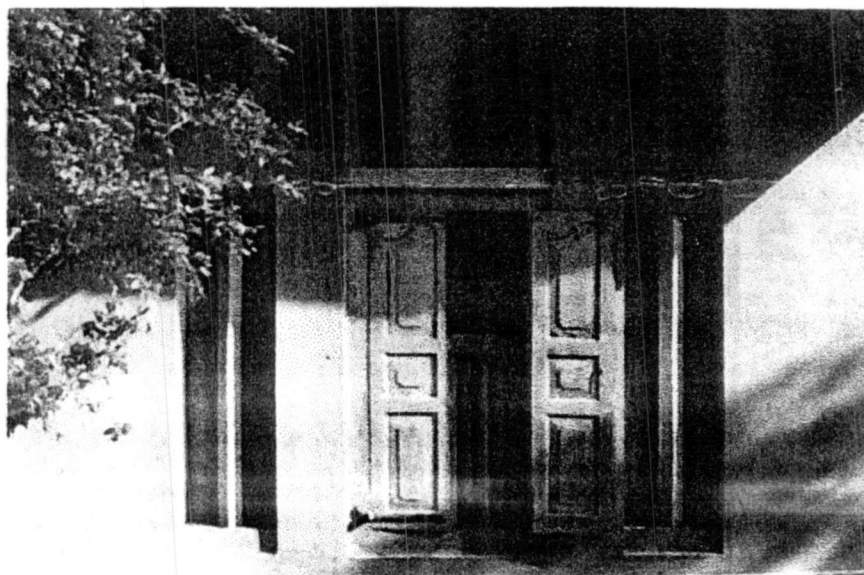
### 2.3.2 Reuse of Colours and Textures.

Apart from other things, colours and texture are the governing factors for the expressions generated by buildings. In other words, the colours and textures of the buildings determine the characters of buildings. So, same sort of colours and textures in two different buildings may give same character and feeling.

Reuse of these aesthetic ideas in a totally different building can generate relevance of idea to previous building. Lot of such examples can flourish and be



found in a deep analysis of Sri Lanka. Though change in texture buildings can obtain an ancient historical quality, by some special treatments on timber they can be made to look old, by changing the Applying method of paints, also can obtain this 'old quality', this tool has been used by architect Geoffrey Bawa in his light house hotel in Galle. Such examples can be visualised in their window frames.



**Plate 2.15: Antique quality window (artificially treated) in cinnamon hill house by Archt.Geoffry Bawa.**

(Source: Geoffrey Bawa, p178.)

Influences of architectural moments and styles such as modern movement flourished in Sri Lankan architecture through textures and colours, other than the form. Considering architecture of Archt. Valentine Gunasekara, who was one architect greatly influenced by modern movement architecture this is more clear.

"He (Valentine Gunasekara) admired the clarity, purity and accuracy of the works of Frank Lloyd Wright, Mies Van de Rohe, Le Corbusier and Eero Saarinen"

(Rajapakse, Anusha-1998, p15)

He has elaborately used pure colours such as black and white, rough textures of shuttering, brush storks etc., to obtain above-mentioned qualities in his buildings, which was samely followed by modern movement architects such as Le Corbusier.

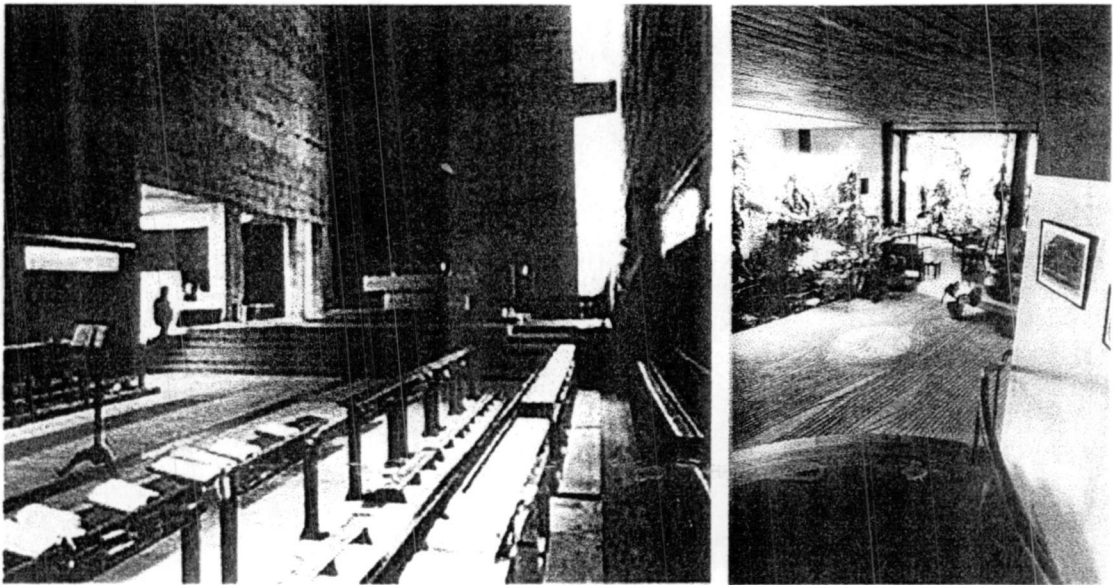


Plate 2.16a The Comparison of Ilangakoon residence by architect Valentine Gunasekara. (Source, Sri Lanka Architect, Vol 101, no 21, p 13). And La Tourette interior (2.1b) by Le Corbusier. (Source serialdesign.com)

Reason behind such usage is interesting to study. In above case, it has happened basically because of strong philosophies by the architects. (Rajapakse, Anusha-1998, p15). She further states, "He (Valentine) embraced the clarity, serenity, purity and genius of the universal modern movement. He totally rejected the special mysteries of the confused architectural language of walls, the roof clusters and the mundane verandas of the conventional Sri Lankan scenario."

Apart from that to obtain required appearance to show antiquity, or modernity such things can be happened.

### 2.3.3 Form Reuse.

"Form has its visual properties, shape, size, colour, texture, position, orientation and visual inertial"

(Francis D.K Ching 1943: p51)

So change of above qualities of a building, Use of predetermined forms to the new building can be categorised under the reuse of form. Basic forms, which are used by the architects, are not very newly intervened things. They belong to very ancient civilisations or to the pre-historic eras. A fine example is pyramids at Giza.

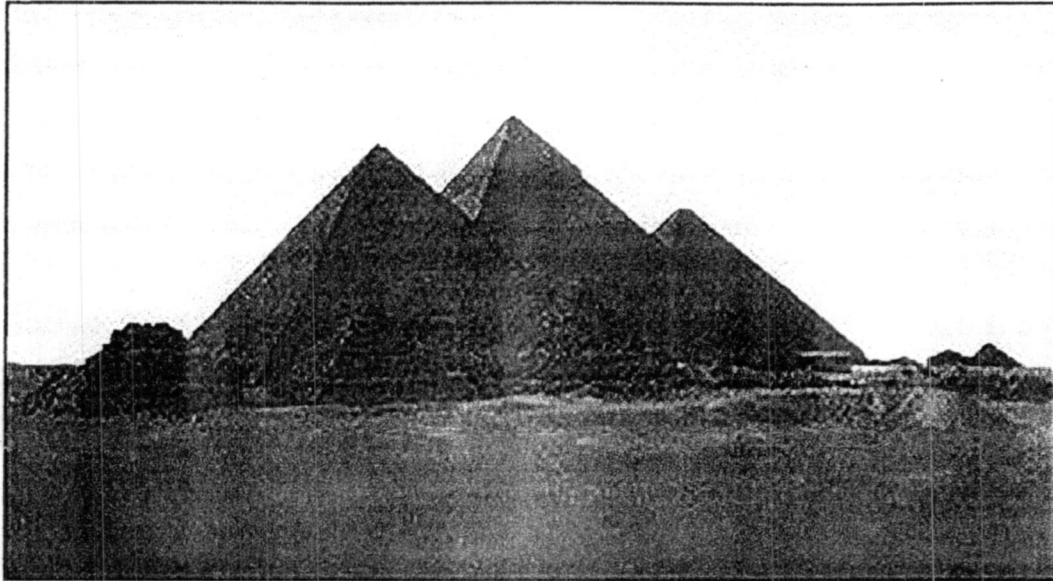


Plate 2.17 : Pyramids at Giza. (Source: [ancientegypt.co.uk/pyramids/home.html](http://ancientegypt.co.uk/pyramids/home.html))

The new aspect is the use of this kind of combination of forms in a different way. As example, Architect Le Cobusier use these forms of pyramids, cubes and triangles in his own way to form his own style. He states that,

"I gabble elementary geometry; I am possessed with the colour white, the cube, the sphere, the cylinders and the pyramid..."

(Le Cobusier 1911, as quoted from [serialdesign.com](http://serialdesign.com))

This is the way of Le Cobusier; how he has interpreted the idea of form. This led him to put up buildings with special combinations of forming in a very creative way. As examples Ron Champ Chapel, Unite de habitation can be considered.

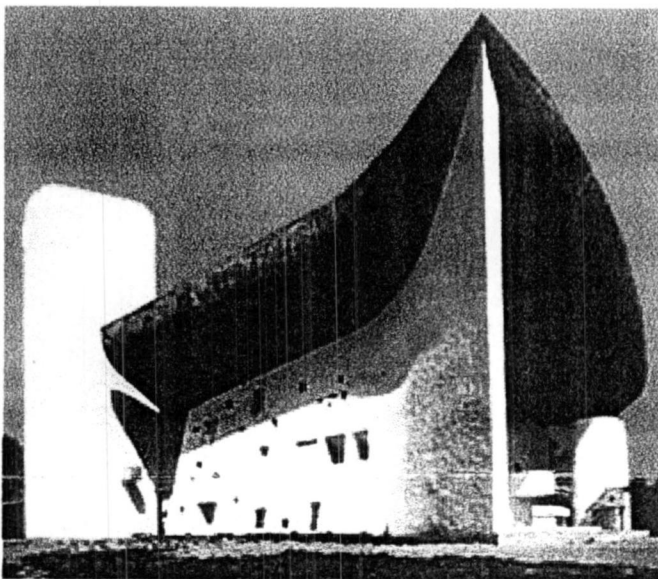


Plate 2.18: Ron champ chapel by archt. Le Corbusier. (Source: [Serialdesign.com](http://Serialdesign.com)).

In Sri Lankan context, architects such as Valentine Gunasekara got inspired from this sort of new combinations of forms and reuse in his designs, in a very successful manner. Jesuit Chapel at Bambalapitiya and Bishop house Galle are

some of such examples.

Other than the influences, there are instances where repetitions of form taking place. Such a good example is stupa. The Bubble shape, the bell shape, the pot shape, the lotus shape, the heap or paddy shape and *amalakara shape*. (L. K. Karunaratne 2002, as quoted from web). These shapes are been used for the stupas for centuries without questioning. The Ruwanmali Seya by king Dutugemunu and Kalutara Chaithya, (stupa) which was built in early 50's, are same in shape, Bubble shape without any deference for thousands of years. These forms are pre defined and used continuously.

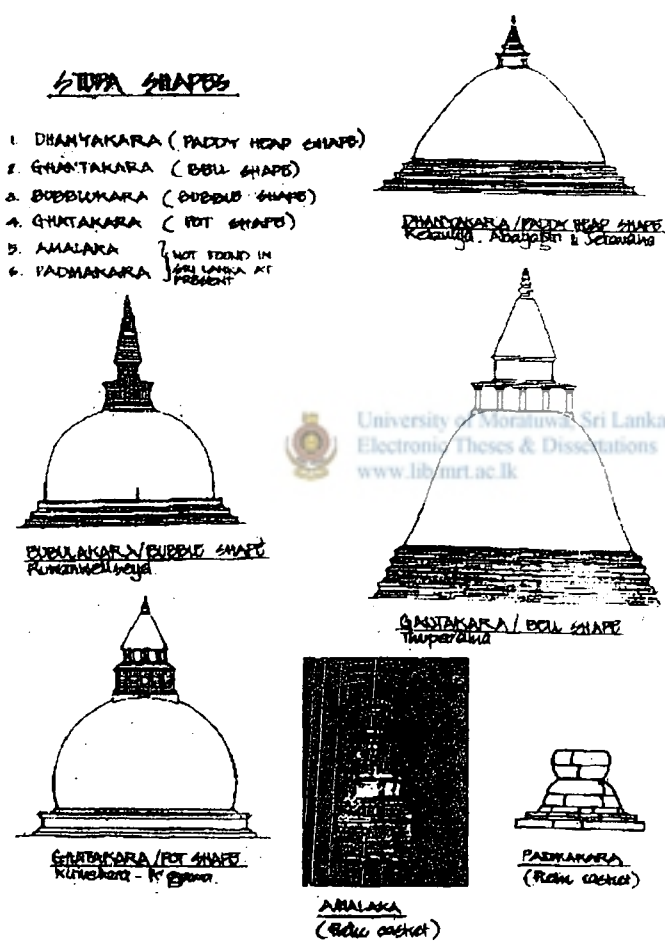


Plate 2.19: Various forms of Stupas.

### 2.4 Logic Behind Indirect Reuse in Architecture.

Indirect reuse is crucial in architecture and it is important to look at what the logical reason is behind it. Several reasons are being identified through research.

First basic reason is to obey the principles. If the set of guidelines have been fixed to a certain building type, people tend to follow it with out questioning. Typical example is the Stupa. In

Buddhist Architecture, it has mentioned that there are particular types of forms to obey, and then architects and craftsmen follow its form time to time.

Second reason is to follow a certain tradition. From time to time architectural traditions get changed. In a particular period of time the well-known style of that time become famous, and become the style of the era. In the period of modern movement architects all over the world, even in Sri Lanka get inspired from particular styles.

Most of the buildings by architect Valentine Gunasekara are typical examples of modern movement in Sri Lanka.

Another reasonable logic behind indirect reuse is to search for a new style. In several instances this becomes a requirement by architects. In the case of Sri Lanka, just after the independence, there was a trend to search for Sri Lankan architectural tradition by the master architects like Geoffrey Bawa, Minnette de Silva etc.... In that case the first possible solution is to learn from history. That is why at that period most of the Anuradhapura and Polonnaruwa period architecture got imitated in most of the buildings. Gradually, with time Sri Lankan architecture was caused by, and still consists of the indirect reuse of ideas, which was identified by the masters as the 'spirit'.

Indirect reuse can happen naturally, when a person, especially an architect gets exposed to a certain type of architecture. The essence of concept comes to his or her mind. Then his creations even in a remote way can show the marks of the particular style, which influenced him. As example Archt. Minnette de Silva's early works such as Pieris house has European modern movement characteristics where Minnette lived and learnt before came to Sri Lanka.

Other than the above reason this indirect reuse can get involved in simply by coping or in imitative architecture. If some one is very interested in particular building or style, he may try to put up a replica of that. But this also can happen purposely in cases such as exhibitions etc...

## 2.5 Conclusion.

**Sense of the place mainly can be the spatial quality. This spatial quality is governed by several factors; such as form and space, organisation and spatial progression, proportion and scale etc... These parameters can be changed by changing the quality and characteristics of tangible things which are used in architecture such as materials, colours etc.. Indirect reuse can be generally categorised in to several types, some of them are namely reuse of planning concepts, form, colour and texture etc.. Because of several reasons the term indirect reuse came in to action. Some times tentatively or not. Also it can be used as a 'tool' to identify and absorb important factors of architecture and learn from past. Other than the direct reuse, most of the impact on indirect reuse is not easily visible. Only a deep analysis is able to perform the task. The main aim of the next chapter is to do such analysis.**



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## **Chapter three.**

### **3.0 RELATED ARCHITECTURAL WORKS - SELECTED CASE STUDIES FOR INDIRECT REUSE.**

#### **3.1 Background for the Study.**

##### **3.1.1 Justification.**

It is observed that in second chapter, mostly indirect reuse taking place with the search for new architectural traditions. After the independence, in Sri Lanka, leading architects of the island, try to establish their own architectural traditions. Architects such as Geoffrey Bawa, Valentine Gunasekera, Minnette de Silva are such persons. What they did at the beginning was to identify architectural traditions in historical architecture of Sri Lanka, interpret them and present in a modern way, which was suitable for the present context. At the beginning, it was not so much successful, but gradually. So, it is obvious that the early creations of these pioneer architects should contain examples for indirect reuse other than their later creations. This was the basis for the selection of cases. Ena De Silva house by Archt. Geoffrey Bawa, Pieris house by Archt. Minnette De Silva, Galle archbishop house by Archt. Valentine Gunasekera and Polonthalawa house by Archt. Geoffrey Bawa and Ulrik Plesner are the selected case studies. Selection was focused on domestic buildings except Galle archbishop house, because their scale is small and architect has more freedom to represent his/her languages in domestic buildings. In the case of Galle Archbishop house though it is a religious building, mostly content of domestic characters until it is the official residence of Galle archbishop. These domestic buildings represent all the contexts which can consider about; urban, suburban, and rural. The selection of the comparative cases basically based on the results of the literature survey, and the ideas of the experts in the field.

##### **3.1.2 Method of Study.**

A basic research about all the cases including comparative studies will be done at the beginning. Visits when possible, and a literature survey to capture the 'design essence' of them will be also done. Here, maximum possible aspects such as planning, spatial organisation, detailing, colours and textures, design concepts will be risen up here. Interviews with relevant personals in the field will be very much helpful.

In comparative study, then the local case will be analysed in same way. Then the comparison will be done through above mentioned aspects mainly through the outcomes of the first and second chapters. The comparison will be as follows; Ena De Silva house with reference to Ekneligoda Walawwa (traditional vernacular architecture), Pieris House with reference to Villa Savoye and Tam Pita Viharas

(modern movement architecture and Vernacular architecture), Galle archbishop house with reference to La Tourette (Modern movement architecture), and Polonthalawa house with reference to Maligathanna monastery (Rock and Boulder architecture).

The basic aim is to conclude and point out how Sri Lankan architecture has benefited from concept call 'indirect reuse' throughout the history, and what is the proper process of doing so. The importance of this criteria also aiming to pointed out. It is also important in this study to rise out how it is important in the field of architecture. The acceptability of comparative studies, in other words, is there a similarity in traditions in above cases will be discussed at the end.

### 3.2 Introduction to Cases and Their Architecture.

#### 3.2.1 Ena De Silva House and Ekneligoda Walawwa.



Plate 3.1: Ena de Siva house, view of the inner courtyard. (Source: Geoffrey Bawa, p46).

The Ena De Silva house, Colombo, was designed by Archt. Geoffrey Bawa in 1961 to one of his close friend and a work partner, batik designer Ena De Silva. So, a good understanding between client and architect was visible. It is one of the bawa's early domestic buildings in Sri Lanka, with a traditional courtyard with in the house. Geoffrey Bawa himself states about the house and the client as follows,

"I remember talking to Ena, seeing around her all the things she asked and all she wanted were brick walls and a roof. The plan come about largely because she, and consequently, I wanted a private compound which was not interfered with by the neighbours"

(Geoffrey Bawa; as quoted from Ken Yeang 1995: 12)

So, the client herself required a house with traditional architecture, with some conventional materials.





Plate 3.2: Ekneligoda walawwa, view from entry. (Source: Architecture of an Island, p262).

The Ekneligoda Walawwa, which is selected as the comparative study is a large scale Walawwa that situated near Eheliyagoda, with in Ratnapura district. This is the residence of Ekneligoda disawe, who was the provincial ruler for the area. Though the house was built with in the Kandian period; it has later additions and alterations, which is showing the British colonial architectural characteristics. The Walawwa compromise of a double veranda at the entrance, and a large central courtyard where all the activities get arranged right round. A secondary yard or *midula* situated at the front where secondary activities happened such as the judgements given by the ruler.

#### **Architecture of the Building Traditions and Relevant Architects.**

Architect Geoffrey Bawa, who was largely influenced from the domestic vernacular architecture of the island of Sri Lanka, created his own identity and character, with in the field of Sri Lankan architecture. Several important points arisen from his architecture which gives him above-mentioned identity. He mainly focuses about the building detailing. Also, the proportion of doors and windows, sweeps and the pitches of the roof etc. from his point of view, traditional half-round tiled roof is the essence of Sri Lankan architecture. According to him roof, columns and the floor fulfils the requirements of a house. Considering interior architecture, Geoffrey Bawa was so much concerned about views. What is looked at from a room, through what, what is to be seen, how close or far from a room etc.. are his main considerations.

Considering domestic vernacular architecture of Sri Lanka; there were two types of buildings namely *chula sampradaya* (small tradition) and *maha sampradaya*

(great tradition). Both of these types of vernacular buildings can be found within the region. In the case of domestic architecture, there are residences, which belong to both of these traditions, as Large-scale walawwas or minor scale houses belonging to great tradition and small yeoman's houses belonging to small tradition, considering their permanent or impermanent nature. But, with the influences from Theravada Buddhism, there is not a huge difference, in both of these houses, considering the planning and social aspect, which is mere, relevant to the human life. Most of these kind of buildings are simple formed, single storey buildings with a square courtyard open to sky at the middle. The courtyard was surrounded by an inner veranda where most of the family-based activities were going on. They were very open sort of buildings with cross ventilation. The ventilation was guaranteed by several means. Mostly with high-pitched roofs, and face-to-face doorways at front and back. With the increase of number of people living in the house, the number of courtyards got increased. This creates the concept of 'family house' within the Sri Lankan context. Adding of courtyards and building houses around it gradually performed to a very large-scale walawwa type buildings such as the one at Maduwanwela, which originally had 121 rooms and 47 courtyards.

The external verandah in front of the Sinhalese house, constructed with wooden piers and masonry columns are mostly because of the external influences mostly Dutch, with their concept of having more security. But it has replaced and internal veranda around the central courtyard, with also the domestic functions within it. Later, this veranda got protected from rain in bad weather condition with cane louvers and continued as a Sinhalese tradition.

### 3.2.2 Pieris house, Villa Savoye and Tam pita Viharas.

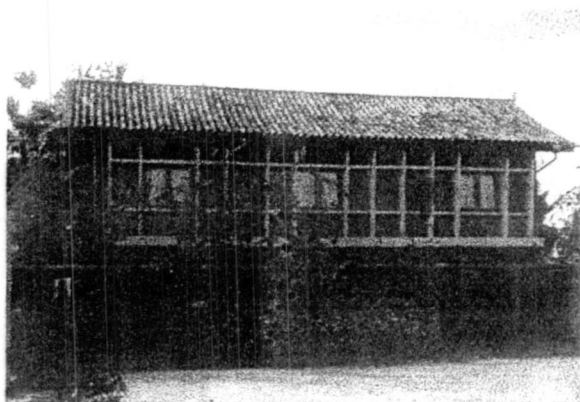


Plate: 3.3a Exterior view of the Pieris house.  
(Source: Minnette de Silva; life and work of an asian woman architect, p182).



Plate 3.3b Exterior view of Villa Savoye.  
(Source: Serial design.com).



Plate 3.3c Exterior view of the Dorabavila Tam pita vihara. (source: Architecture of an Island, p120).



Pieris house at Alfred house gardens designed by Archt. Minnette De Silva in 1953, for her close family friend Mr. Ian Pieris as the first house designed for Sri Lanka which incorporates 'floating slab' out of reinforced concrete for the first time. The architect herself introduced the house as,

"High walls enclosed the garden and the house shutting out the dust and noise and curious passer by; main rooms look in to the courtyards or midulas. – 'Open air rooms'- Garden areas designed as an extension of the house with a place for games, a place for sitting out, and enclosure for open-air bathing and space for walks, for flowers and pools. All this integrated in to one. Fifteen or twenty perches of ground appear double the size. No space is wasted pretentious inadequate

driveways. You drive straight under or beside the house. All the garden area possible is collected with in for the enjoyment of the house holder”

(Minnette De Silva 1998 : 180)

So, the above totally describes the concepts of the house by the architect. In addition, the client also needed an unusual, revolutionary, modern house.

Villa savoye, by Archt. Le Corbusier, has been selected as one of the comparative study, with the Pieris house. The architect designed it, with in 1928-31, at 82, Chemin de Villiers, Poissy in France.

The house is located in top of a steep hillock, with nice vegetation and lot of views surrounding it. . The house is considered as one of the outstanding and a masterpiece in modern movement architecture. It was designed based on modules, with abstracts from human scale, golden section etc. the house compromised with strict geometry and dynamic curved forms. The colour is pure white and consists of lot of built-in furniture. No clear demarcation is visible between inside and outside. Visual experience was focussed on designing mostly from outside, other than the inside. Archt. Le Corbusier considered this as the type house. From his own words, the terminology 'house' can defined as follows,

“The house must not have a façade. Situated at the top of a dome like hill, it must open on to all four directions. The living area with its hanging garden, will be raised above the columns, so as to give views right to the horizon”

(Le Corbusier 1931 : 2)

This house consists of 'five points of architecture' by Le Corbusier, with its genuine form, which will be discussed in the next section.

The second comparison will be to tampita viharas from Sri Lanka. Until it has not selected one such tampita vihara for the case study, the tradition of the building type will be discusses in the next section. But it is important in this part to discuss that how the tradition called tampita vihara gets emerged.

In the 16<sup>th</sup> century, the Kandian kingdom gets established under the royal patronage of Kirthi Sri Rajasinghe. In this era, there are two types of image houses namely rock-cut and free standing. (Chandrasekea D.P 2001 : 11) free-standing again can be further sub-divided as plinth type and tampita viharas. Key different between two of them is that the construction of main structure at ground level. In tampita viharas as the name implies, the whole structure risen up on pillars or tams.

### **Architecture of the building traditions and relevant architects.**

Archit. Minnette de Silva, who was the first Asian woman architect to obtain the fellowship of Royal Institute of British Architects, was highly influenced by modern movement architecture. She got influence by father of modern movement architecture, Frenchman Le Corbusier, who was a lifetime friend of architect De Silva. Architect C. Anjulandran, who was another pioneer in Sri Lankan architecture, describes as follows,

"In her (Minnette's) early buildings, reflects uncompromisingly modern thinking, with tradition incorporates in the form of details"

(C.Anjulendran 1999: 29)

So, it is reasonable to think that she tried to incorporate both modern moment characteristics and traditional Sri Lankan architecture in her buildings with transformation to suit life style in Sri Lanka. It is more clearly visible when examining her buildings further. Use of the concept of central courtyard, and traditional Kandian crafts, use of local craftsmanship are the are examples for the influences from traditional architecture and the use of columnar supports, open or movable panels, close relationship between inside and out, use of reinforced concrete (at that time) curvilinear forms, use of pure colours etc can be considered as the influences from modern movement.

Architect Le Corbusier is known as the father of the modern movement, who created his own architectural tradition. Le Corbusier gets ignited with the possibilities of reinforced concrete, and did experiments further to create the new tradition. His philosophy, from his own words can be described as follows,

"I grabble elementary geometry, I'm possessed with the colour white, the cube, the sphere, the cylinder and the pyramid. Prisms rise and balance each other, setting up rhythms in midday sun, the cubes open to in the surface at night fall a rainbow seems to rise from forms in the morning, that are real, casting light and shadow and sharply outlined as a drawing"

(Le Corbusier 1911, as quoted from serial design.com)

He discovers and applied his famous 'five points of architecture' what he thought that which make universal, functional architecture. This is common to all of his designs, including villa savoye.

Le Corbusier's five points of architecture are as mentioned below.

- Pilotis: use of reinforced concrete columns to raise the building above the ground. Permitting garden to continue under and through the building.

- Use of roof gardens: for privacy. To allow the ground captured by the building to be freed creating parks in the sky.
- The open plan: permitted free and open interior planning; to arrange partitions and other spatial devices.
- Ribbon glazing: horizontal rather than the vertical windows, extending from one structural column to other, to provide more even distribution of light to the interior of the building.
- Free façade: to satisfy functional and aesthetic requirements, non-load-bearing walls.

Considering interior architecture of Le Corbusier, it was based on the principle call, the 'two to one interior space' which is the creation of interlocking Spaces of different but related heights.

Tam pita viharas has very distinctive character other than the all image houses belongs to the same period. That is as mentioned earlier, the entire structure have been rise from the ground level, about three feet with the help of series of stone pillars. These buildings are simple, compact image houses. There are two logical reasons behind to rise up the image houses. First one is a spiritual reason; to division of sacred and profane areas, and secondarily, a technical reason to avoid get contacted with the ground, to prevent termites and water, which is a huge problem in construction at that time with in the region. There are two spatial components with in the image house; small vestibule, which consists of, a seated Buddha image and a veranda right round which is acting as a circumbulation path. The walls of the inner sanctum were out of mud or wattle and daub, and covered with either double or single pitched, tiled hipped roofs. The walls of the inner sanctum were consisting of paints, which always related to Buddhism.

### 3.2.3 Galle Archbishop House and La Tourette.

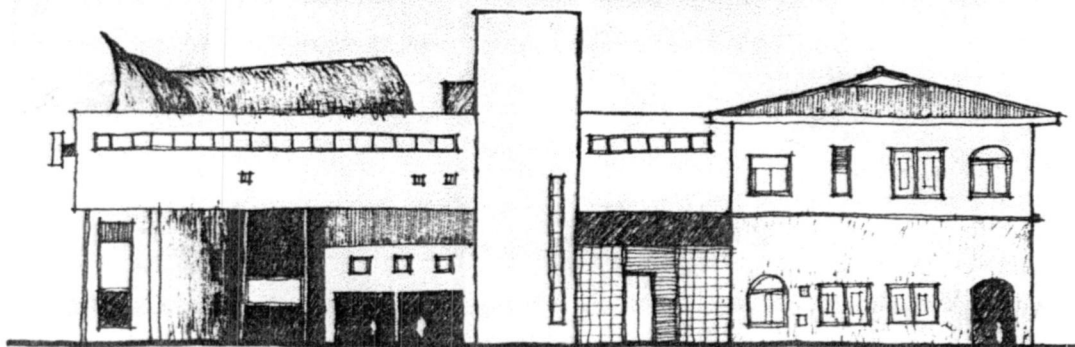


Plate 3.4a: external appearance of the Galle bishop house extension.

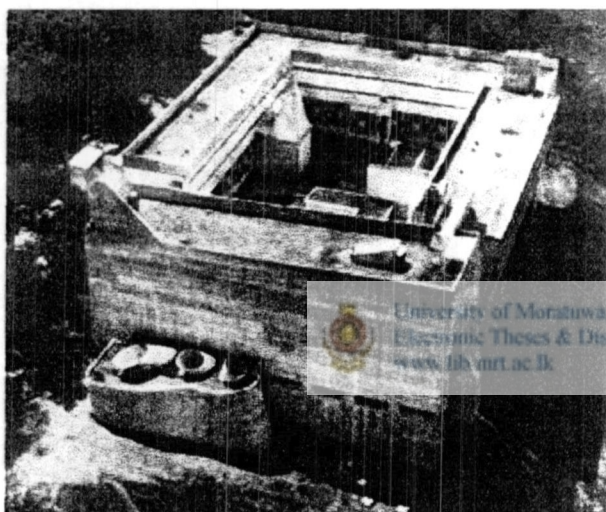


Plate 3.4b: External appearance of La Tourette. (Source: Serialdesign.com).

Architect Valentine Gunasekera did the bishop house extension for Galle for Galle archbishop, between 1968-1973. This was an extension to existing archbishop house, which was done with in the colonial era. The

extension is not visible from the point of entry to the church. It is only visible from the western and northern sides of the site. The building is located at a steep slope site and the building is four storied, including a basement. It connects with the existing bishop house from interior and also from the exterior.

The convent of Suiant-marie de la Tourette, design by the architect Le Corbusier between 1957-60, located in Eve ux Sur-Arbresie, New Lyons, France. The monastery for very strict religious order of the Dominicans of Lyons and he endeavoured to find a modern interpretation to the to the requirements of the order as laid down by the rules. The use of bare concrete and stark forms seems very appropriate. The monastery is built entirely of rough reinforced concrete and stands isolated in the landscape on the top of a steep hill. The monastery proper is built on an uneven site in a 'U' shape, which corresponds to the idea of the 'cloister'. The monastery chapel closes the end of the U. There is a very special kind of relationship existing here between the architecture and the landscape. The chapel is consisting of

series of altars. The concrete roof consists of cylindrical light canons. Bell tower is just above the light canons. A stylistic analysis of this work (types of balconies, modulations in the areas of glazing in communal rooms etc..) Reveals that it is derived from the experiments made by Le Corbusier. Most of the design aspects seem a close relationship with Ron Champ Chapel.

The common portions of the monastery are set in the recessed lower level. The refectory is situated at one level down from the entrance floor, but since the site is sloped so steeply, it provides a splendid view over the midows. The chapel is entered from this lower level too. But is entirely inward looking and is a full triple volume in height. There are 'found objects' like a triangular skylight or a protruding balcony and spread around the entire structure. This particularly apply to the chapel which protrudes in to the inner courtyard supported by a cross style of two intersecting pilotis with its triangular steep top. A passage links the assembly rooms with the chapel.

#### **Architecture of the building traditions and relevant architects.**

Architect Valentine Gunasekera has his own, clearly defined architectural principles for his designs. He is one of the pioneer architect in modern architecture in Sri Lanka, and one of critic who highly criticized and point out weak points of Sri Lankan vernacular and traditional architecture. He considered the downward roof of traditional architecture as an obstruction to the inside-outside relationships. Canopy edge or roof edge are to be raised up. At the same time, he admired clarity, purity, and accuracy of modern movement architecture. Valentines 'stamp' were evident in Sri Lankan field of architecture in use of concrete facades dramatic roof forms etc.. He totally rejected the spatial mysteries of the confused architectural language of walls, the roof clusters, and the mundane verandas of the conventional Sri Lankan scenario. He was guided with several concepts, which he thought right and accurate to best of his knowledge. One of his famous concept was to realise a strong sensory connection with nature and forgoing a bond between exterior space and interiors, from his each and every project. He constantly search for new spatial concepts; that could be created with the technology and materials of the time; such as glass, reinforced concrete etc..

It is not necessary to prove these things with a hard process, but most of the buildings are keen examples. Other than these concepts, he has several philosophies, which he adhered to in his designs. 'Breaking the box' is one such philosophy of Archt. Valentine Gunasekera. Here; walls are treated as composition of planes. 'Colours and international order' is another. In this point he try to create



informal, joyful international order. 'Gentleness vs. firmness and rigidity' is another philosophy. A tendency to curvilinear forms, and cylindrical forms as famine objects used in this philosophical approach. His architecture doesn't has front facades or rear views. Lot of mystique in lighting effects is a unique character in his architecture.

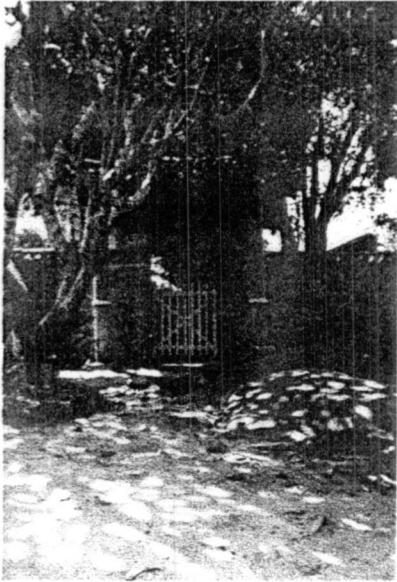
I.E.: architecture of Le Corbusier has been discussed under the case study two introduction.

### 3.2.4 Polonthalawa House and Maligathanna Monastery.

Archt. Geoffrey Bawa designed Polonthalawa house together with Danish architect Ulrik Plesner. The house was designed for estate manager of Polonthalawa estate of the A. Baur and company. The land is 1000 aches in extend, so, architects had the freedom to chose what ever the site. The selected site is a beautiful spot with orange coloured rocks. Several rocks were blown up to create necessary space and to obtain necessary rubble for the construction. House was constructed with in 1964 – 65.



Plate 3.5: Maligathanna monastery, entrance level.



**Plate 3.6: Polonthalawa house, entrance level.**

Maligathanna monastery is one of the very historic monasteries in Sri Lanka. It is dated to very pre-historic eras even to Rawana's Lankapura. It was considered as a secure place for kings throughout the history. The monastery consists of two terraces, namely upper terrace and lower terrace. Lower terrace consists of five caves. Upper terrace is a large flat area extends about half an acre. Maligathanna is a temple which linked to a *Puranagama*, and old village. The Forest surrounding the Maligathanna monastery is a feeding area for the low terrains of Gampaha district.

#### **Architecture of the building traditions and relevant architects.**

Archt. Ulrik Plesner, engaged in architecture in Sri Lanka together with architect Geoffrey Bawa. He also got involved with the works of other leading architects in Sri Lanka such as Architect Minnette De Silva, Architect Valentine Gunasekera etc. in his eight years in Sri Lanka Mr. Plesner gave his large contribution to country's field of architecture, to get rid of pseudo architecture and create it's own tradition. Here in the sense both architects, Geoffrey Bawa and Ulrik Plesner, get influenced by each of them architecture as well, and Sri Lankan architectural styles too. Ulrik Plesner describes about his architecture as follows,

"What we were doing was not coping a style or try to make look like old buildings. What we were trying to do one day, was starting obviously with the same kind of climate, and the same materials that were always available in Ceylon and not with the things that were imported and expensive and always unavailable"

(Ulrik Plesner 1982 09)

He had other several key ideas which determined his architecture. As his point of view, building, from outside must be inviting. In the context of Sri Lanka, big heavy, tiled roof was considered as the identity of the region. Verandas, balconies make a beautiful building he says. Also the architect interested in simple details and simple building forms.

Sri Lankan rock and boulder organic architecture has its own unique characteristics. The first step is the organic creation. This kind of architecture always keeps an axial arrangement of either buildings and terraces or pathways.

The wonder of the eternal struggle between the organic and geometric or the natural and human interpretation of nature is quite obvious in the attempted rock and boulder architecture. Here, spaces comprising of a multiple of levels and terraces and canopies. Pathways of these monasteries embraces the sites; fauna and flora, every small detail on the way giving respect to them at every phase, every bond, every step while walking with the site to the destination.

Mountains, rocks and boulders consist of the feeling of unable, unobtainable, which is the organic speech or sacredness against the secular plains.

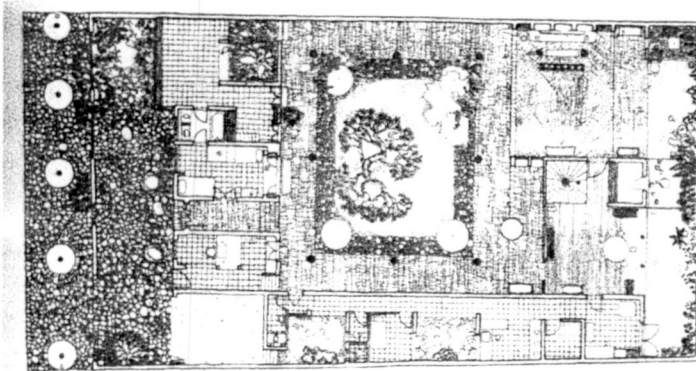
The pathways of the monasteries out of rock and boulder follow the same flow of water, which is very clever in finding the shortest pathway to the bottom. But the pathway is two directional, come and go. Pathways with ramps, steps with varying steep act as a replica of a stream. Starting the small geometric multiple series of steps, which embraces smoothly and friendly create the contact the hard, heroic organic rocks. The result is the strong fascination achieved by the perceiver.

Caves of rocks and boulder monasteries have been arranged in such a way to have *maha pradarshana* (a pleasant sight) and *maha sudarshana* (highest feast to the edge). Roof for these caves provided with lean to roofs, rock edges with drip ledges etc., sometimes trees and sometimes sky.

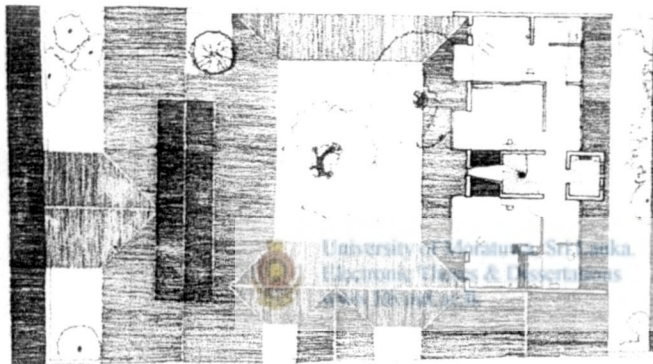
Pathways, terraces or *malakas*, baths and ponds, boulder gardens, rocky arches, narrow covered paths going between, when impossible underneath and sometimes around the rocks, which passes from one rock to another by means of bridges are preliminary elements of a lesson in organic architecture.

### 3.3 The Study.

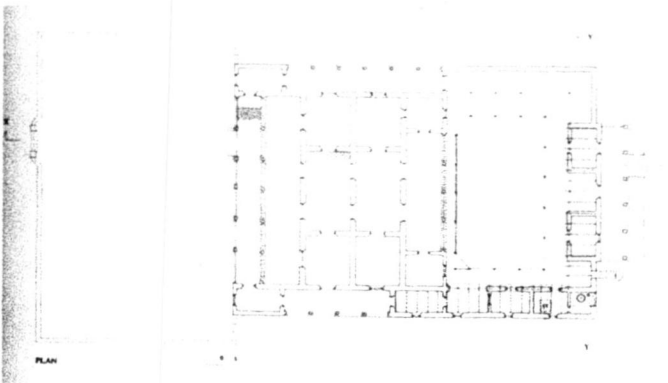
#### 3.3.1 Ena De Silva House with reference to Ekneligoda Walawwa.



Ground floor plan



First floor plan



PLAN

Plate 3.7a: Plan of Ena De Silva house. (Source; Geoffrey Bawa, p47)

3.7b: Plan of Ekneligoda walawwa. (Source: Architecture of an Island, p265).

#### Planning aspect.

Both Ena de Silva house and Ekneligoda walawwa compromise with a square shape plan. In Ena De Silva house, it was only thing to do, until the site is same shape and limited space. In Ekneligoda walawwa, it has obtained its privacy with blind walls outside and introverted habitable spaces. In the case of the house, it has been done with the blind wall right round the building and introverted functions. In the

case of walawwa, living functions happen around the courtyard with a series of lined rooms. For the case of the house, it is exactly the same, and the service functions such as kitchen, dining room etc, arrange in the rear part of the house. In Ekneligoda walawwa, entrance is demarcated with a double veranda, with two rows of masonry columns, but not in De Silva house. But here is a jutting out eave at the entrance of the house, which protects the walls of the house, from rain in bad weather conditions. Though multiple inner courtyards are not visible in the Ekneligoda walawwa this factor is visible in Ena De Silva's house. Until the walawwa is not vast in scale like one in Maduwanwela, this character cannot be seen. But if the building gets further expanded, the only solution will be multiple inner courtyards.

In the both cases, living tradition is different. In the case of walawwa, ample space of garden right round the building is linked with the veranda and living room. So, no need of 'creating' the environment. But, in the case of the house, the inner courtyard itself is the garden. So, shifting of living room towards the deep of the house can be justified and accepted.

#### **Other Aspects.**

Sectional-wise, the Ekneligoda walawwa is single storied and Ena De Silva house is double storied. It is necessary in an urban site in Colombo, due to the land value and lack of spaces. Both the houses are of double-pitched tiled roofs and large eaves. In Ena De Silva house, roof is more complicated than the walawwa, due to the number of inner courtyards to obtain light and ventilation. In Ekneligoda walawwa, cross ventilation has been obtained by means of high roof where hot air rising up to give provision to cool air. In the Silva house, it is by means of openness.



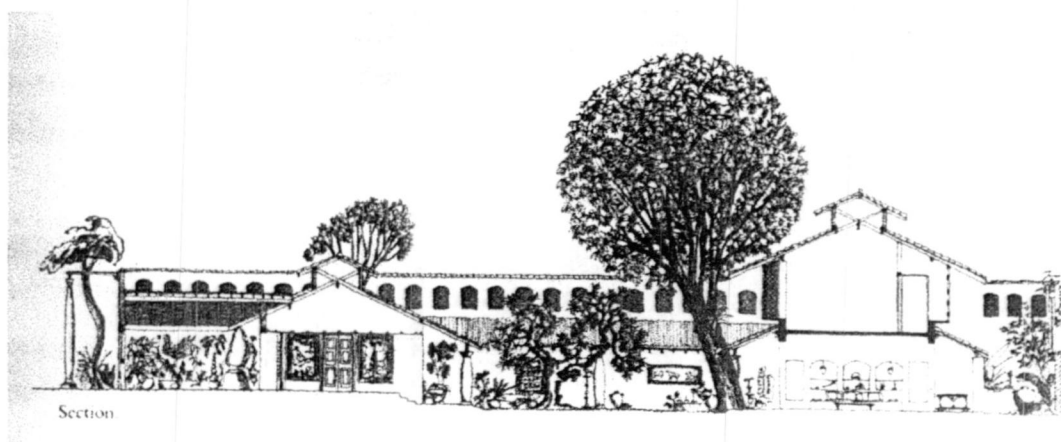


Plate 3.8a: Section of Ena De Silva house. (Source: Geoffrey Bawa, p47).

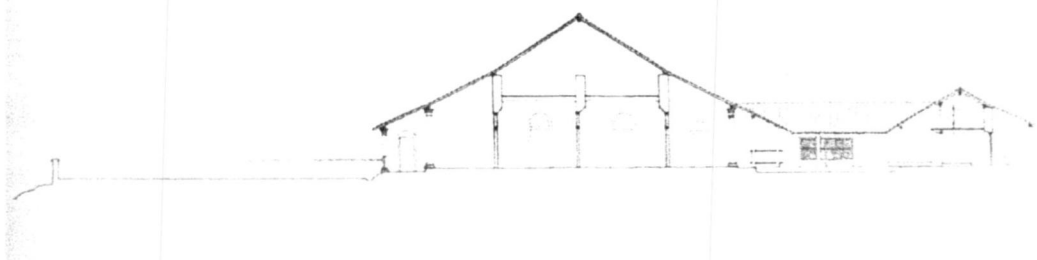


Plate 3.8b: Section of Ekneligoda Walawwa. (Source: Architecture of an island, p265).

Other than the indirect reuse, some of the direct reuse of elements within the Ena De Silva house has given some sort of same character to Ekneligoda walawwa, *pettagamas*, (Storage boxes) several old jars, bronze lanterns are some of such elements.

### Detailing and finishes.

In Ekneligoda walawwa, inner veranda around the courtyard, is supporting the roof with square timber columns on stone pediments. Same thing happens in De Silva house, but the columns are circular. Both houses were plastered with lime mortar. In traditional Sinhalese courtyards, the paving was done with large gravels and planted with small shrubs. This is common to the Ekneligoda walawwa also. But in the Silva house, the central courtyard consist with a huge plumeria tree and mango tree which over rides the tradition, but providing a pleasing quality to the space. In Ekneligoda walawwa, the floor is out of cement rendering which was considered as 'high qualities' finish at that time. In De Silva house, most of the area of granite, both cut and uncut, and fair-face bricks. This gives the rough, earthen finish to the

building. The high podium or '*pila*' in Ekneligoda walawwas not visible in De Silva house. As '*pila*' serves the function of sitting and sleeping, especially for the low cast people in the case of Walawwa, which is not necessity in a contemporary house.

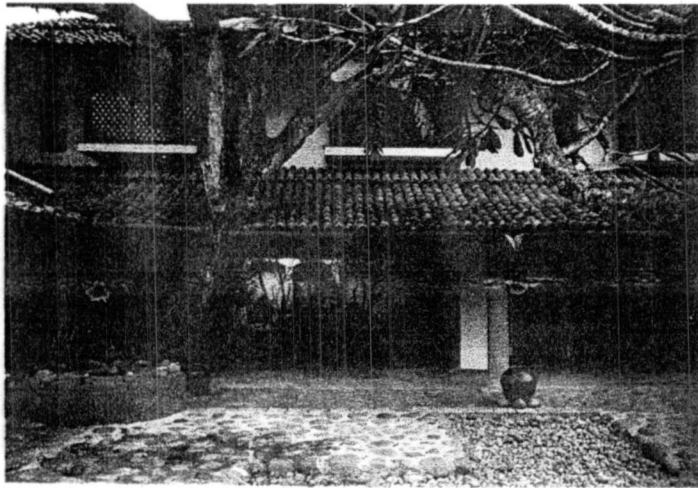


Plate 3.9a: Central courtyard of Ena De Silva house. (source: Geoffrey Bawa,p46).



Plate 3.9b: Central courtyard of Ekneligoda Walawwa. (Source: Architecture of an Island, p266).

As one of the early house done by Archt. Geoffrey Bawa, in his practice, the house has some sort of busyness compare to his late buildings. Lot of competing details, colours, textures and finishes, direct extracts from antiquity reflects this small weakness. As example, the bubble fountain in rear garden, which is similar to one at Sigiriya rock fortress, other than the beauty, it is difficult to understand what is the logical reason behind it. However, it is possible to prove that Archt. Geoffrey Bawa has got influenced from Ekneligoda walawwa or Sinhalese vernacular architectural tradition in his design of the house to Ms. Ena De Silva.



Plate 3.10: Bubble fountain at the rear garden of Ena de Silva house. (Source: Geoffrey Bawa, p48).

### 3.3.2 Pieris House with Reference to Villa Savoye and Tampita Viharas.

It is questionable to compare an image house tradition and two houses, of courses comparison of two houses is acceptable. Until the Sri Lankan life pattern mostly related with Buddhist philosophy and Buddhist way of life, the both image house and normal residence act as a place where people obtain some sort of ritualistic level.

So, it is considered that the comparison of an image house and a house is acceptable to an extent.

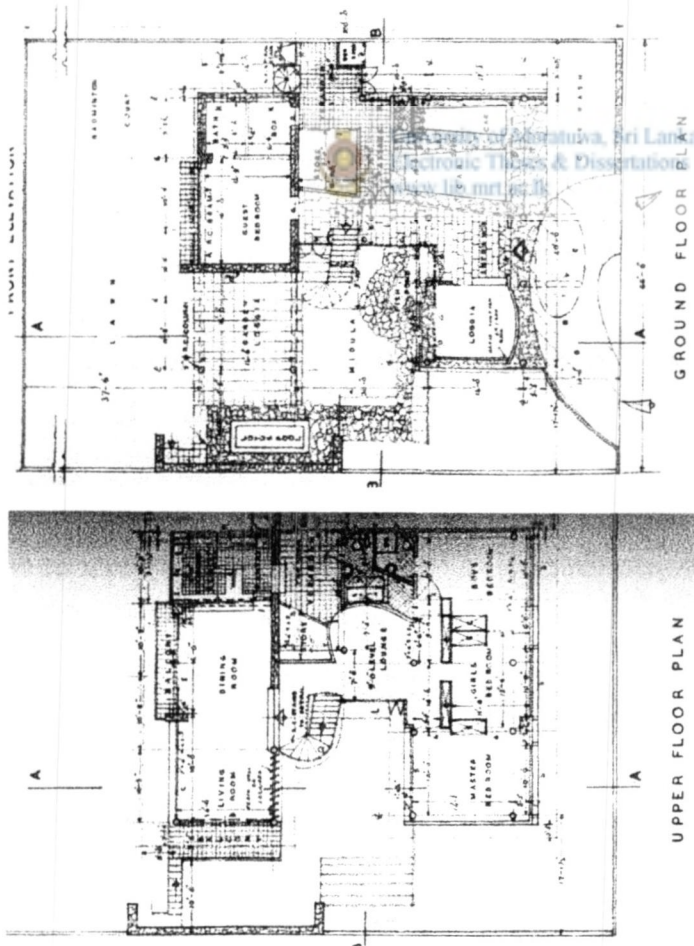


Plate 3.11a Plans of Pieris house. (Source: Minnette de Silva, life and works of an Asian woman architect, p180).



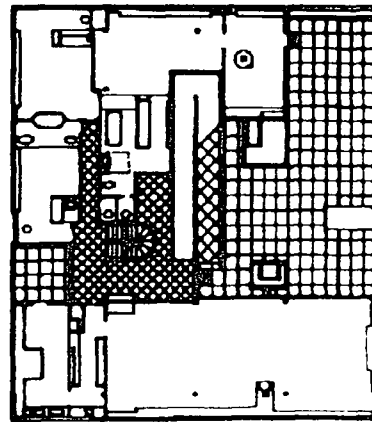
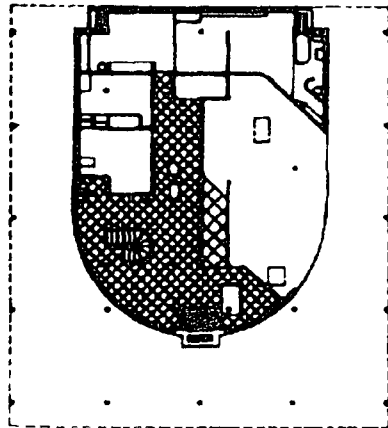


Plate 3.11b  
Plans of Villa  
Savoye.  
(Source:  
modern  
architecture,  
p120).

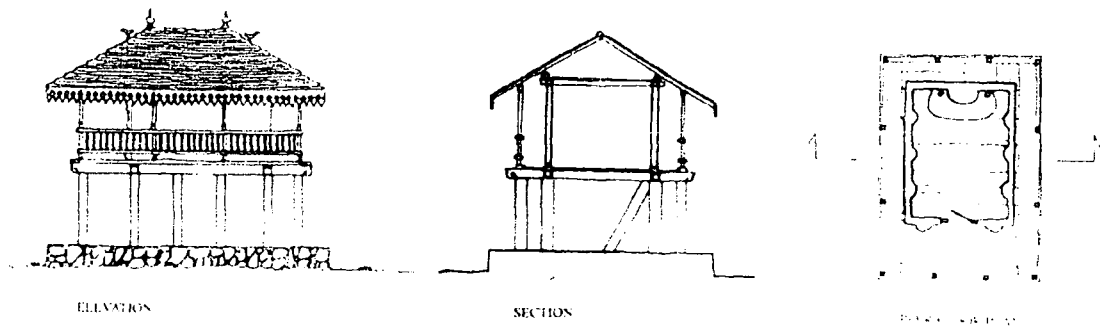


Plate 3.11c Plan and sections of a tam pita vihara (Dorabavila). (Source: Architecture of an Island, p120).

### Planning aspect.

Considering plans of the Pieris house, Villa Savoye and tam pita viharas, the first thing, which is noticeable that in all three buildings upper floors are denser than the lower, or ground floor. (The tam pita viharas has no two floors generally, but it is logical to think that the whole image house is act as an upper floor, or mezzanine level though the ground beneath it is not functional). In villa savoye, it is due to the philosophies and theories by the architect to permit the garden to continue under and through the building. Also, to rise up the building to grab the distinct views. In tampita vihara, it is to separate sacred areas and profane areas, to highlight the spirituality. But in Pieris house, above any logic cannot be until it is not a religious building or situated with in a nice environment, it is only highly urban site. There are no views to borrow, cannot connect the garden by means of uplifting until there is no free, open areas right around. But it is treated like a garden with open spaces, pools, *midulas*, (compounds), lawns and badminton courts. Also, this separates public and private area, where all the family activities are located at upper level. It also can be guessed

that until the architect has highly influenced by the modern movement, she just imitated the concept of pilotis with out such a logical reason. But the pilotis of the house is circular, where some of them are square in shape. That clearly reflects the doubt and busyness of the architect to select the suitable abstracts from modern moment architecture and Sri Lankan traditional architecture, for her designs. Section wise, the roof is double pitched, which is from the traditional Kandian architecture, but it is difficult to get a logical reason behind it.

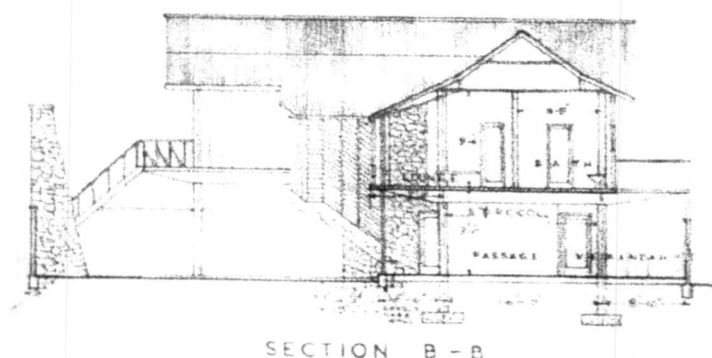


Plate 3.12: Sections of Pieris house. (Source: Minnette de Silva, Life and work of an Asian woman architect, p181).

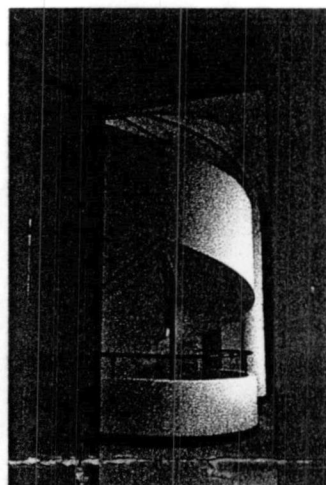
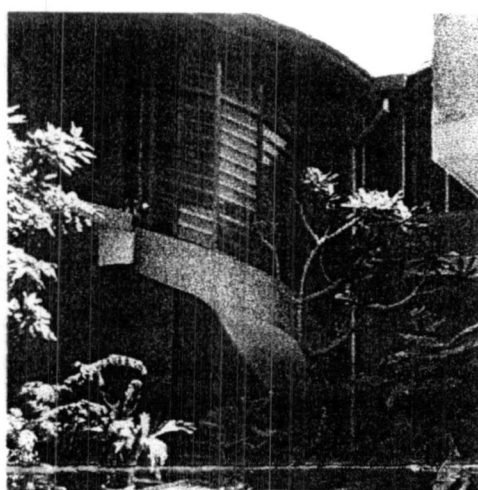
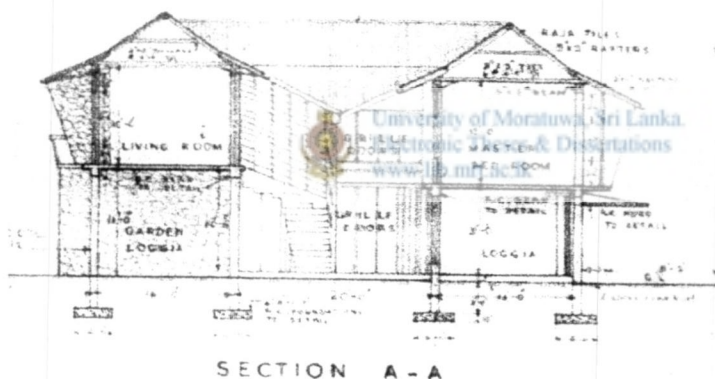


Plate 3.13a,b: Curvilinear forms of Pieris house, compared to Villa Savoye. (Source: : Minnette de Silva, Life and work of an Asian

woman architect, p183, serialdesign.com, respectively).

Also, it is visible hardly. Most of curvilinear forms which are also in Villa savoye plans can also be seen in Pieris house, with no a logical reason. As architect says, she wanted to save the spaces, some times this curve forms wasting it. As an example consider car port at the front of the house. It has used ample extra space to place the curved pathway. Simply, with out that space, cars can get in and get out. But it is nice to notice that, it is one of the early houses which connects inside and outside of the house, with lot of open spaces, which is commonly practiced even today's Sri lankan urban architecture.

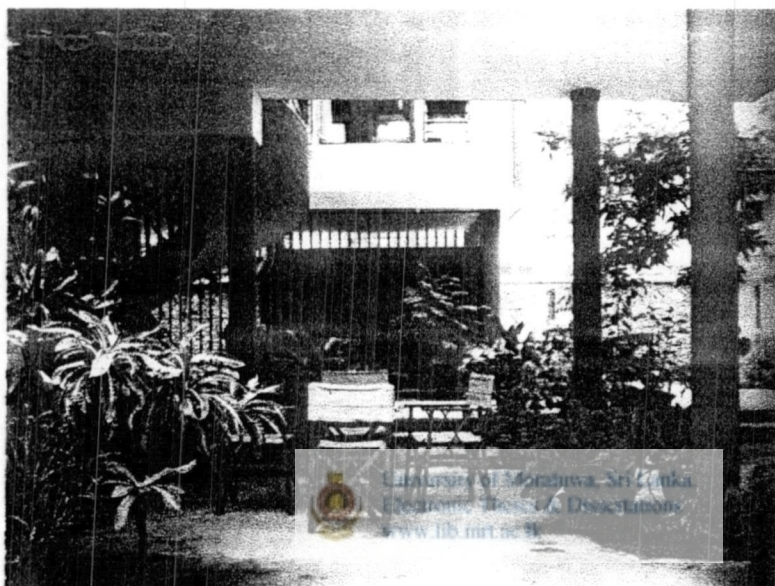


Plate 3.14: Pieris house, Prominent link between inside and out. (Source: Minnette de Silva, Life and work of an Asian woman architect, p183)

Also, most of the aspects in Sri Lankan traditional living system, has taken in to consideration by the

architect. As example, flexible spaces, where the movable partitions are been used to separate the spaces, with the flexibility to remove them and to create large spaces for ceremonial functions, such as *pirith* chanting. This partition concept has some sort of connection with Japanese traditional tatami houses and also, with the modern moment architecture. The third point out of five points of architecture, by Le Corbusier is that, the concept of open plan. But it has well fixed with Sri Lankan living tradition.

### **Detailing and Finishes.**

Architect has indirectly reused the aspirations of Sri Lankan vernacular architecture, which also was the tradition which tampita vihara belongs to. Deep protecting eaves which protect walls from being get wet. Lacquered balustrades for handrails, durnbara mats (*kalala*) for door panelling and flooring, limestone for walls, half round tiles for roof, are all abstracts from traditional Sri Lankan vernacular architecture. Architect her self describes about her style as follows,

"I tried to synthesize my modern training with past traditions and with present living conditions"

(Minnette de Silva 1998 : 89)

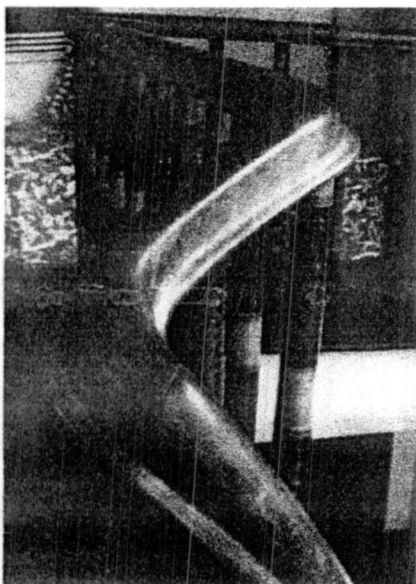


Plate 3.15: lacquered balustrades at the staircase, Pieris house, which has abstracted from Kandian traditional architecture. (Source: Minnette de Silva, Life and work of an Asian woman architect, p186)



Plate 3.16: Dumbara mats for door panels at Pieris house. (Source: Minnette de Silva, Life and work of an Asian woman architect, p186)



Plate 3.17 (Above right): *Bo leave* shaped grill work at Pieris house by architect Minnette de Silva. (Source: Minnette de Silva, Life and work of an Asian woman architect, p187)

Even detailing of furniture, “the old custom of have rooms with little and light furniture – divans, tools, stools, mats and carpets for relax on – fits well with today’s living conditions” she described.

But unfortunately, this doesn’t match with the use of modern movement architecture, with most of the time. They just have icing effects of the cake. As example, dancing wall figure at the entrance, *bo* tree leaves grill work, touching of lacquered balustrades with concrete slab are poor detailing also has no any logical reason. But as a beginning it was a good effect, to be further tuned.

From outer appearance, it is mostly close with the appearance of tampita viharas, not to modern movement houses, until it doesn’t have any pure forms, or pure white colour and roof gardens.

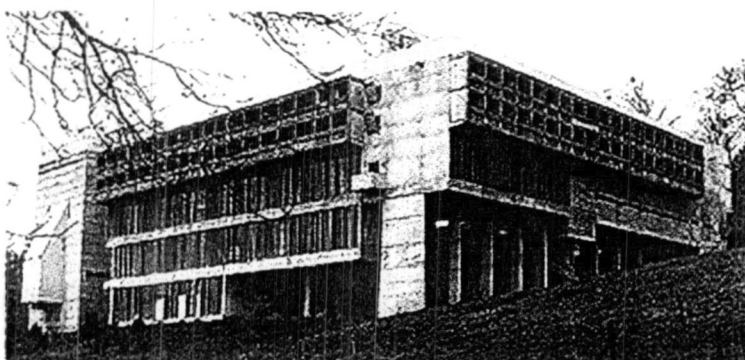
It is like ‘uplifted’ a house from the ground above the boundary walls. It may be some sort of requirement by architect. Same as the tampita vihara separates sacred and profane areas have been separated.

### 3.3.3 Galle Archbishop House with reference to La Tourette.

#### Building form.



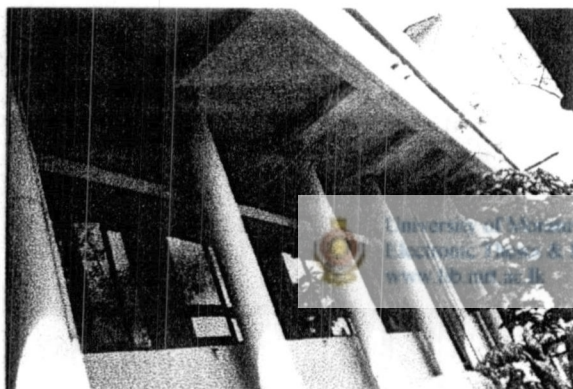
Plate 3.18: comparison of forms of Bishop house and La Tourette. (Source: Serial design.com).



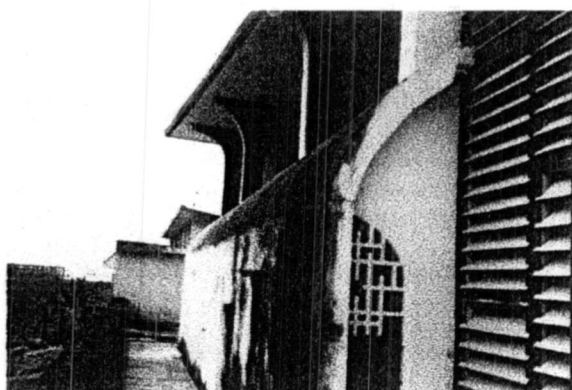
Both of the buildings to be compared are Christian religious buildings. So, the living environment and concepts are mostly the same. Both buildings are located in a same sort of hilly site. So, it is an advantage to consider the external backgrounds of the buildings to be merely equal.

Considering forms of both buildings, both of them are very cubic in shape. Other than the cubes, they occupied by forms such as cylinders and prisms. This is

common to both two of buildings. Very basically it is visible that how architect Gunasekera get influenced from modern moment architecture, in very basic look from the outside. Direct influences from Le Corbusier's five points of architecture also visible at Galle bishop house. The first point, using of pilotis can identified here. Corbusier uses this thing to uplift the building from ground level and continue the nature underneath it. Here, in Galle, it is not possible. Because the site is so much steep. So, anyone cannot see underneath the building. Pilotis uplift the building of course, but the area has occupied as a service basement. Use of roof gardens is a dominant character in Corbusier's buildings, the second point of his five points of architecture. He uses this thing for privacy, create parks in the sky and give back the ground area occupied by the building. In Galle, vegetated roof garden is not visible. But, at the top floor where the small church existing; there is a small roof terrace, which gives nice scenery of the Galle fort.



**Plate 3.19:** Pilotis, ribbon windows, and face concrete in Galle archbishop house.



**Plate 3.20:** View of the roof terrace level at Galle bishop house, use of dramatic forms is also noticeable.

Open plan concept has given in Galle by means of using reinforced concrete. The structure of the building is a series of columns and slabs. So, space deviation and partitioning is possible in whatever way. Horizontal windows rather than the vertical windows, which spread from one column to another, to provide even lighting to the interior has samely adopted to the bishop house in Galle. Unlike in Sri Lanka, the sunlight is not a welcoming factor, in its hot humid climate, this creates so much of heat and glare

with in the building. Though the building is out of reinforced concrete and masonry, this happens in a great amount. The free façade gives the necessary providence to the designer to do it in any preferable way.

So, this shows that architect Valentine Gunasekera has indirectly reused the modern movement concepts in his architecture. But here, it is possible to see some of his own characteristics. Dramatic use of roof form is visible in the bishop house. It is further can be considered as a deviation from Corbusiers use of curvilinear forms. But in interior spaces, there are no curves except the two spiral staircases.

Use of colours again also differs from Le Corbusier. He mostly use white as a pure colour in his building and sometimes fair face concrete in its own colour. In Galle Bishop house Valentine has use buttermilk colour in exterior where visible, to match with the existing building colour around the site. A part of the exterior, especially at the basement area below the ground level consists of ash colour. In one hand, it is the colour of the great chapel existing there and the colour of reinforced concrete. In interior, some of contrasting colours such as black and white have been used.



Planning aspect.

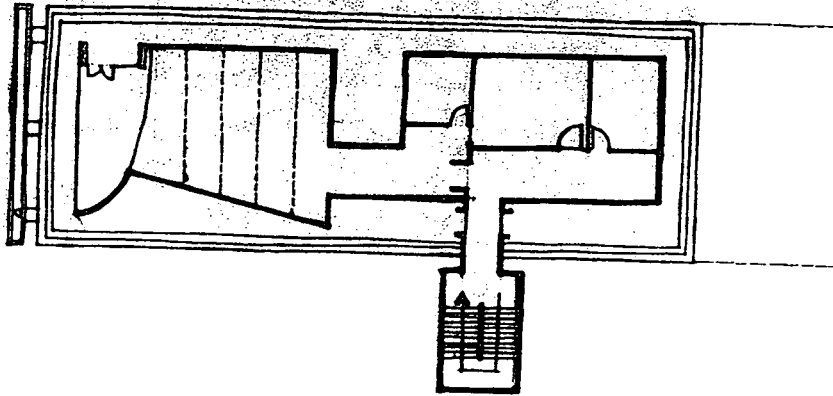
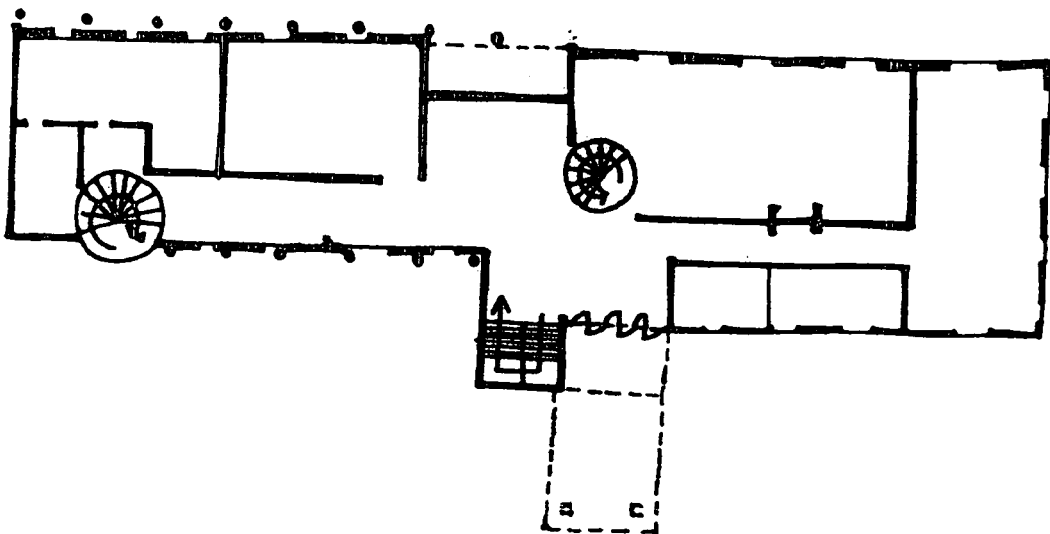


Plate 3.21a:  
Plans of Galle  
archbishop  
house.



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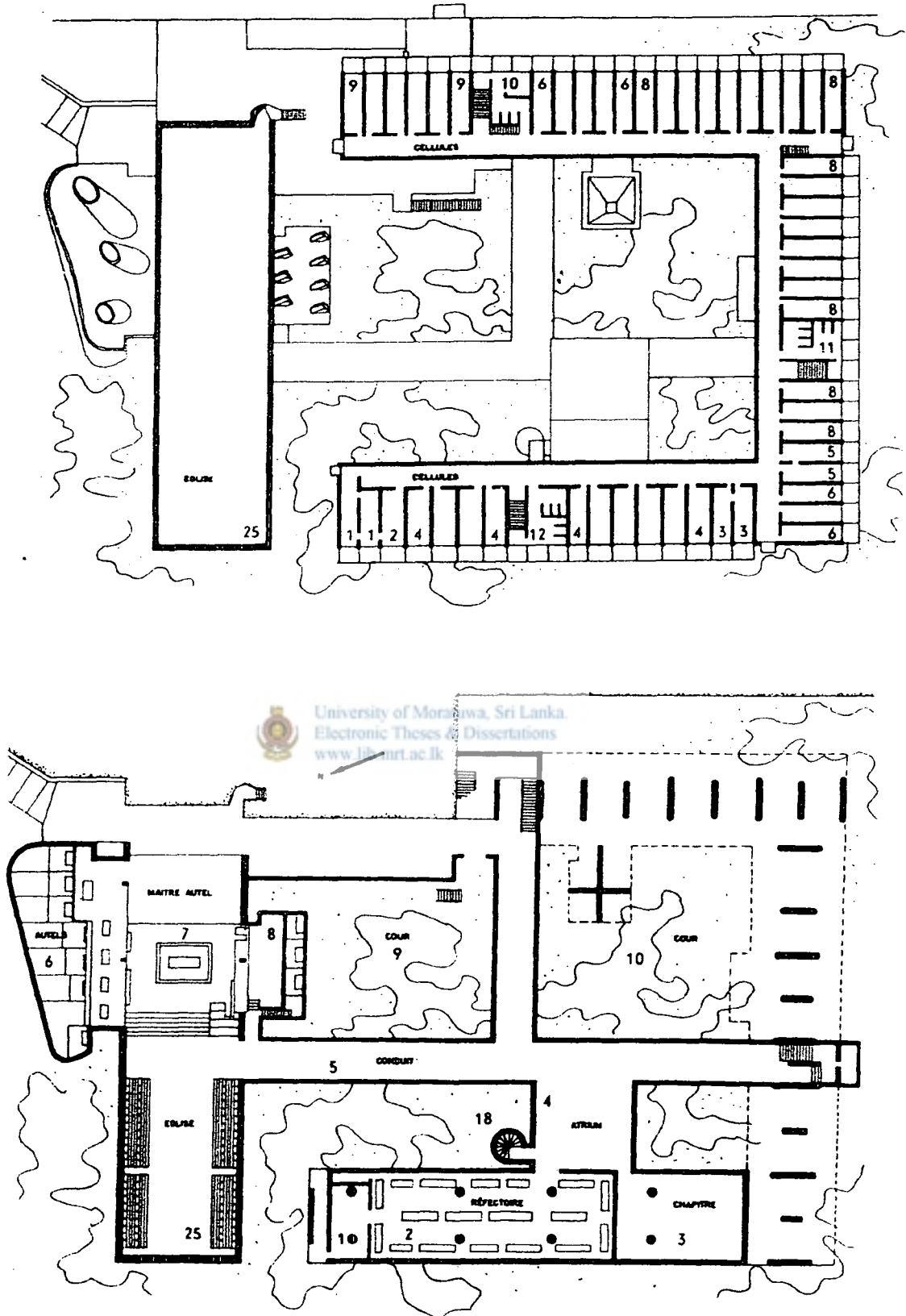


Plate 3.21b: Plans of La Tourette. (Source: Modern architecture, p44,45,46).

La Tourette plans are always introverted which provide very separate and unique environment to priests; who are of highly restricted religious order. In Galle it is not necessary, where it is acting as a village religious place. In both buildings, rooms are arranged in a linear way which gives inhabitants very separate sort of life.

In a country like Sri Lanka, which has tropical climate, fair-face concrete surfaces created lot of problems. Rough surfaces easily get discoloured and get damaged, and create lot of heat inside the buildings.

So, in adopting modern moment concepts in Sri Lankan context, it is necessary more attention on this. In Galle to an extent have been sorted out luckily. The constant sea breeze naturally cools the reinforced concrete surfaces, from heat. Until it is located on a hillock, it is acting as the monument in the context. Some of the internal spaces, specially room arrangement sometimes separate rooms from each other unnecessarily, where in Sri Lanka, social gathering is part of the day-to-day roof gardens are not also very much functioning in Sri Lankan context, as the places for social activities.

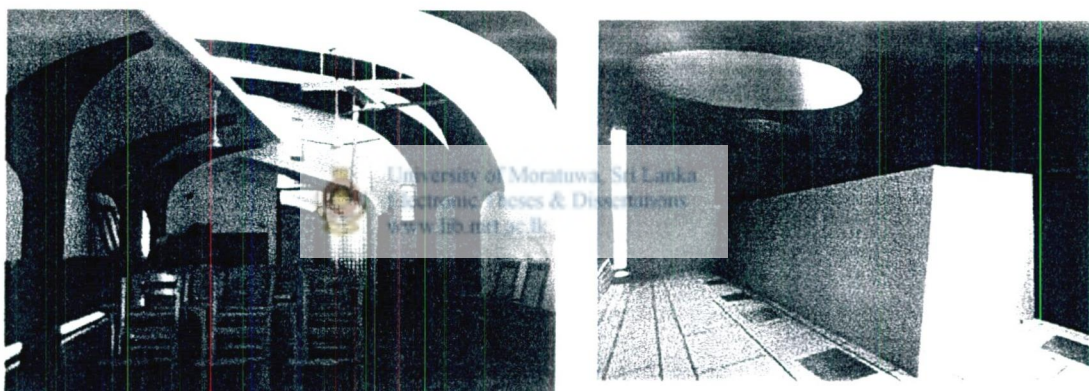


Plate 3.22a,b: use of pure, contrasting colours in Galle archbishop house, same as in La Tourette.

### 3.3.4 Polonthalawa House with reference to Maligathanna monastery.

#### Plan form.

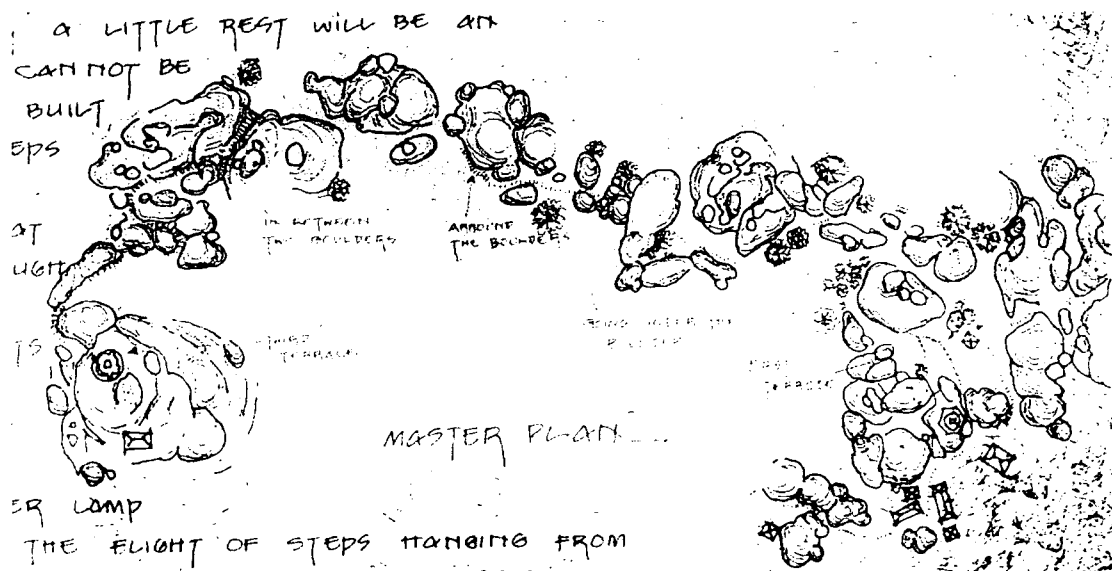


Plate 3.23a: General layout pattern of Maligathanna monastery.

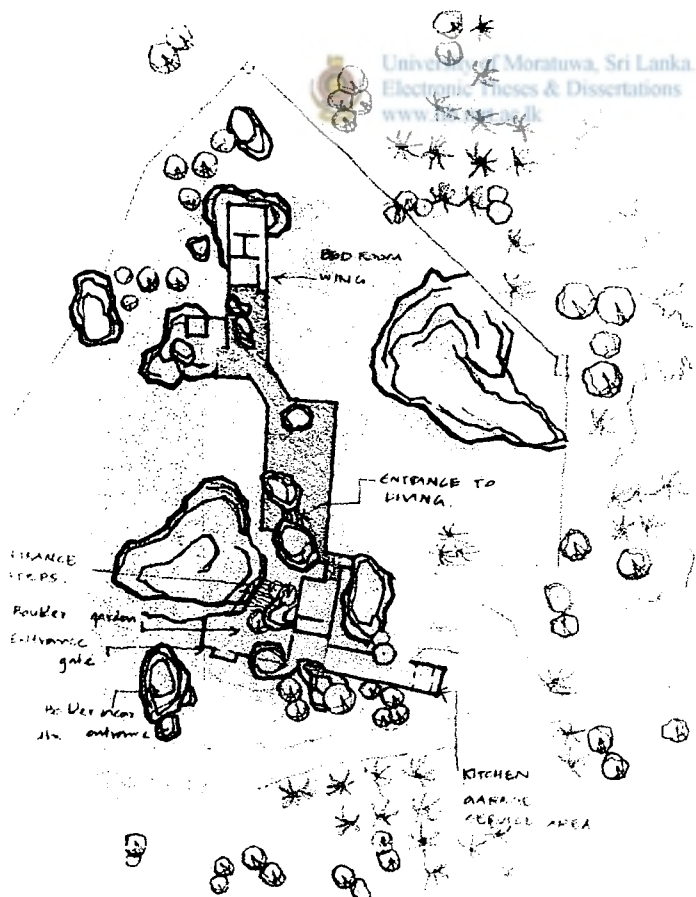


Plate 3.23b: General layout pattern of Polonthalawa house.

Both in Maligathanna and Polonthalawa, the plan form has emerged naturally. It is not justifiable to use the word plan, but 'complexes'. In the instance of Maligathanna, the whole complex has evolved with in thousands of years, and in Polonthalawa, it has emerged with in two years, but drawn in the air with out plans or any drawings. Both of them compromise of journeys, in Maligathanna from lower terrace to the upper terrace.

In Polonthalwa, it is from entrance gate to the bedroom wing. Actually in Maligathanna, the first terrace is the place, which connect all the secondary paths, caves, meditation places, other terraces etc. Samely in Polonthalawa, living areas acts as the connecting lobby. The journey in both places is also comparable in the aspect of making feelings in the visitors mind. In a sacred place like Maligathanna, this is done in the aspect of attaining the ritualism, but in a house it will not be the same. Some times this may be demarcation of privacy, territoriality, or some thing like that. But same tools have been used. The classic example of that is to the use of 'S' bend to break the monotony. Bridges which links two kinds of spaces, visual attraction points such as pools and ponds are also common in both of the cases, with in a varying scale. In Maligathanna the pathways out of natural earth, but in Polonthalawa it is out of artificial tile floors, which are homogeneous tiles.



Plate 3.24a: 'paths' of Maligathanna monastery, stone steps.

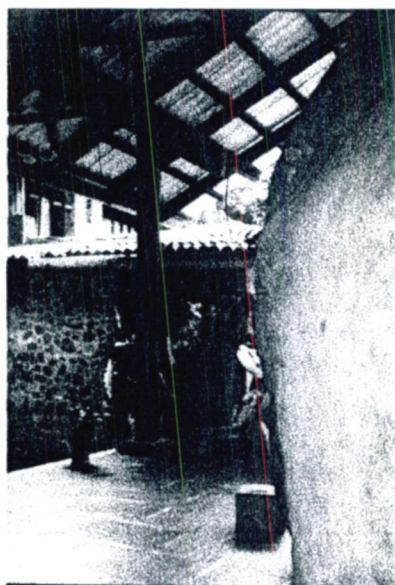


Plate 3.24b: 'paths' of Polonthalawa house, corridors.

### Spatial locations.

In Maligathanna monastic complex, most of the spaces are located with the natural devotions of nature. Natural caves, tree shades and some artificial dwellings fulfil the requirements of shelter. But there is some hierarchical order until the stupa and other high ritualistic places located in the *uda maluwa* or upper terrace. This kind of hierarchical order to some extent can find in the bungalow at Polonthalawa, where the masters bedroom is situated in a higher position. It has given a cave appearance where the ability to one-way visual axis where only outward looking is possible. This is a very different aspect in privacy.



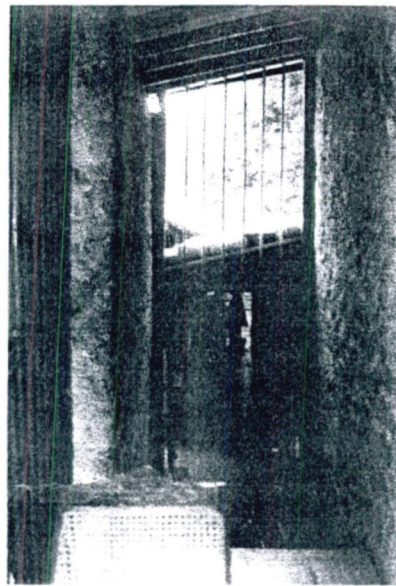
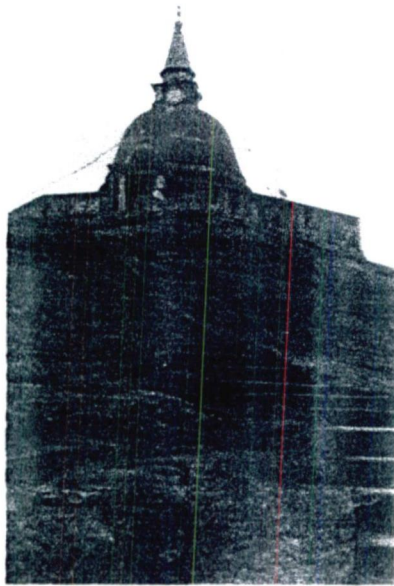


Plate 3.25 : Climax of the two complexes, upper terrace of the Maligathanna monastery and Master bed room of Polonthalawa house, respectively.

### Detailing.

Here, most of the attention to be focused on the bungalow. The double pitched roof covers most of the areas of the building is located on the boulders. The same aspect in the caves and dwellings in Maligathanna, where lean-to roofs are been used. As there are no caves as such in Maligathanna, to next simple roof form that is double-pitched roof is used. The roof is out of simple construction with cross-patterned rafters underneath. This connects the spaces on both sides of the roof, sky and the living area of humans, as the concept of limitlessness in Maligathanna.

Use of materials what is available in the surroundings can be found in both of the buildings, which gives the minimalist approach in traditional Sri Lankan architecture.

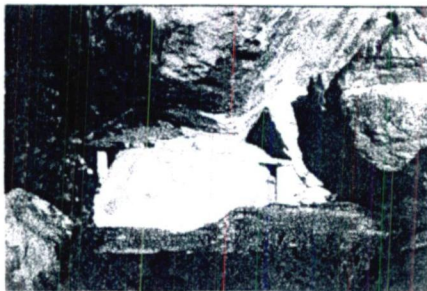


Plate 3.26a, b: Roof forms in Maligathanna monastery and Polonthalawa house.

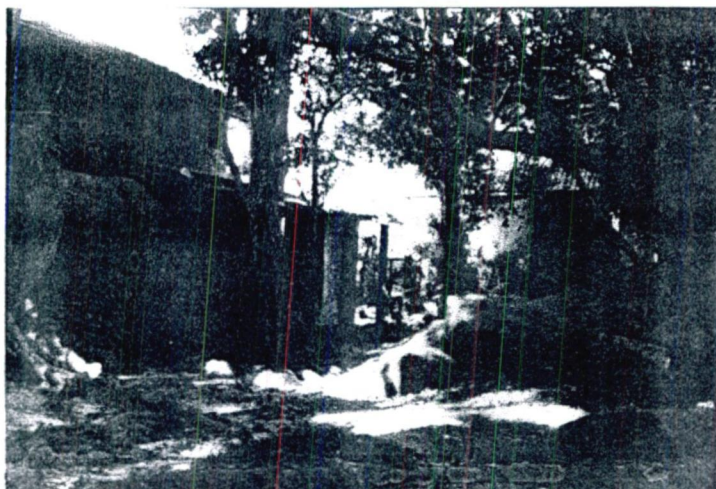


Plate 3.27a, b: buildings with in the rocks in Polonthalawa.

### 3.4 Implications and Results.

Sri Lanka has its own great architectural tradition throughout the history; dated even to pre-historic eras. It had several concepts, which are eco-friendly, such as maximum use of resources etc. This was practiced until about 1505 AD; without any prominent modifications within the region. But with the introduction of colonial architectural tradition, this gets rapidly changed. Lot of alien materials and architectural traditions were introduced to the Sri Lanka, mostly 'by force'. Then gradually, the native Sri Lankan architectural traditions with its concepts get started to sink. Lot of environment and social problems arise with these alien traditions.

At the time Sri Lanka get independence, the region had an architectural tradition not belongs to Sri Lanka or any other country. Then the country had a trend to find its own art traditions including architecture. At that instance, some leading architects get the carrier to find out native tradition for the country. Some of them were influenced from Sri Lankan Historical architecture, as some of them influenced from famous architectural traditions of the world. Somehow, the aim was same.

According to above-analysed selected case studies, it was visible that above-mentioned thing has happen. But most of them have not developed in to a level of developed architectural tradition. Country has again overpowered with alien traditions and materials any how not suitable to the country. As example, glass facades, fair face concrete surfaces, aluminium windows, concrete, fully air-conditioned buildings etc. this trend has created lot of social and environmental problems to the country. So, architects have to get the benefits of the history, to create native tradition for the benefit of people. Even most of the western regions have learnt from Sri Lanka. So, the concept of indirect reuse has to use as a 'tool' for the benefit of Sri Lankan architecture.



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**Conclusion.**

#### 4.0 CONCLUSION.

'Reuse' is not a new trend in Sri Lankan context. For thousands of years it has been practiced within the country. With large influences from Buddhism and Buddhist culture, some of its aspects such as minimalist living, maximum use of resources etc. has continuously practiced. Until the beginning of 21<sup>st</sup> century, most of the island was covered with forests and had regular seasonal changes of climate etc, but not at the moment. Most of the day to day products which is used by the human being are non-recyclable, non-decomposing things such as PVC, plastics, polyphone etc.; throw away culture have been created. So, in the aspect of environmental and social well being, the term 'reuse' will be very much useful. In a deep analysis, it is visible to identify, that there are two main categories of reuse. Namely, direct reuse and indirect reuse. Direct reuse means the physical reuse of some thing and indirect reuse means ideological reuse of some thing.

The basic selected area for the study from the two above is indirect reuse. There were several reasons for the selection. It was basically focused on to prove that the logic behind direct reuse is, nothing else, but indirect reuse. Also, it was aimed to fill the research gap of indirect reuse, which has not so far studied in the level of postgraduate.

Firstly, as the first chapter also the background chapter reuse was discussed as a general scheme. From historical and philosophical background, it was further explore in to a general categorisation of reuse. This also incorporates and discussed how the ideas of reuse get incorporated in the design process. Finally, some of the important issues, such as sustainable architecture conclude the chapter. This chapter gave a strong background for the aspect of indirect reuse, from 'highlighting' it among the other types of reuse.

In the second chapter, term 'indirect reuse' was further explored in able to define a distinctive identification for it. Here, it was possible to identify that the indirect reuse is basically happening through the reuse of ideas. Ideological reuse can further explore in to reuse of planning concepts, reuse of colours and textures, reuse of form and finally, other types of reuse. In the study, some of them were further sub-divided. A major aim of this study was to identify and point-out logical reasons behind reuse, basically, the indirect reuse in architecture. Architecture creates spaces, so, the space is the preliminary objective in architecture. 'Spatial quality' is the way the feeling of space connects with the human feelings. Finally, how reuse of ideas impact on spatial quality was try to search. Several aspects and determinant factors of spatial quality such as form and space, organisation and spatial progression



proportion and scale colour and texture were discussed here. One of the very prominent conclusion which was arise here is that the applying of some pre-determinant scale, form, texture, in two different location, is capable of making same spatial qualities. This was formulate the background for the third and final chapter, where several examples were discussed taking the issue 'indirect reuse' in to account.

In the third chapter four major case studies were discussed as comparative studies. Works of Sri Lankan pioneering architects were discussed and compared with local and international traditions with the assumption of that particular architects, has influenced from particular architectural tradition in particular design. Before the comparative study, a general introduction to the building types and the tradition of the architecture or architects given, in able to create separate backgrounds for separate studies. In most of the occasions the given assumptions were exactly right until the experts in the field helped to select them with a clear logical basis and proper guidance. Here, two types of indirect tradition were explored. They are namely,

- Imitative aspects: just for appearance; 'trend' of a period of time.
- Creative aspects: properly inspired and apply in to its own context.



However, indirect reuse has identified as an important criterion in the field of architecture. It is very useful tool in creating own styles. It is obvious that nothing has created with out past experiences.

Country's architectural traditions get nutrition's in several ways. One is from history. It is the main thing, which is can easily justifiable. Today's architecture is a continuation of yesterday. Also from time to time total different architectural styles introducing to the region. As example, in Sri Lanka, Dutch and British styles can considered. Gradually this gets absorbed in to existence style by means of adopting possible surviving characters to the existing tradition. Then this becomes a part and character of the regions architecture. Another type of indirect reuse is visible in Sri Lanka. In that instance, some planning concepts, forms, details etc has been adopted without questioning. The prominent example is the stupa. Its plans, form, etc are pre determined and they use repetitively in each and every construction of stupa for thousands of years. This is possible to consider as another type of architectural tradition of reuse. Mostly religious architecture creates with repetition. However, all these traditions are the aspects of indirect reuse.

Apart from the direct reuse, indirect reuse also playing a role to develop one particular architecture and philosophical background for the region, time or person.

Then the aspects such as energy safety, echo-friendliness etc, come in to being as the secondary aspects. Same as the direct reuse, it can help to sustain the nature. To help regenerate histories mysteries by means of new buildings with its own traditions.

It was possible to identify that indirect reuse of ideas in Sri Lanka falling in to two categories. Some architects get influences from traditional architecture of Sri Lanka, until another group focused on European or foreign traditions. Here, 'influencing' is the basis on that. Somehow, they all has not copied them, simply inspired from them and has try to create their own styles. As a beginning, it was a good starting point after the independence in 1948. But gradually, this trend has weakened. Weaken in the sense the logical par of it, suitability to the context has been lost at present. Most of the new building coming up now has lot of ultra modern materials such as glass, steel, aluminium etc, but with the question of are they suitable to the Sri Lankan context. Although this has led to lot of social and environmental problems. So, it is now the time to question country's architecture and rethink about it.

Until the study area is vast, a general discussion of indirect reuse has done, in able get above mentioned conclusions and outcomes. Also, the selected case studies were also with in one category and number is less. This study can further explore to aspects of indirect reuse of selected building elements such as ritualistic towers of religious places, (minarets, *kota* in stupa etc) or study with in another region out of Sri Lanka. Also, it is possible to examine some more aspects of indirect reuse, such as proportion studies etc.



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