

# "REUSES" AN EXAMINATION OF THE CONCEPT AND ITS ADAPTABILITY IN CONTEMPORARY ARCHITECTURE



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A Dissertation Submitted to the University of Moratuwa  
As a Partial Fulfilment of the Requirements for the Degree of  
Master of Science in Architecture

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**ABSTRACT**

The past lives in the present and the present in the future, which the concept of reuse always harmonize with present need and future aspirations. Since remote times, man has made use of the concept of reuse. But the change has become the most characteristic phenomenon of our age and the concept reuse also gets changed and evolves with this changing context. In this evolutionary process the use of reuse concept get faded due to the profit-motivated society.

Much attention has been given to the concept of reuse in architecture and it has been subjected to greater discussion since it is required by the modern world. Because it has been realized that this concept is a good solution for the problem of unlimited consumption increasing needs.

This study thus concentrates on the importance of revitalising the concept and intends emphasize the importance of its applicability in architecture. Therefore it hopes to identify the reuse as a concept and explore its principles under ping the concept in relation to architecture. Finally it will emphasize the need for this concept in contemporary architectural practice, as it is required urgently.



## ACKNOWLEDGEMENTS

I am deeply indebted and thankful to many inspiring individuals who helped me throughout this study making it a success.

First and foremost to Archt Vijitha Basnayake, my tutor whom with his great patience and advice guided me at all stages of the study providing me sources of encouragement and his valuable written material to fall into the correct track of thinking and me every courage and strength to go ahead with the study.

Archt. Chirs De Saram, Senior Lecturer and Department of Architecture for his advice to select the dissertation topic and advice given at the initial stages of the study.

Dr. Ranjith Dayaratne, Senior Lecturer and the course co-ordinator of the M.Sc. Final year, Dept. of Architecture, who has been a source of inspiration to me providing valuable criticism and patient guidance.

To Dr. L.S.R Perera, Dr. S. Manawadu, and Archt. D.P. Chandrasekara, I present my grateful thanks for their precious contribution to clarify my dissertation in indistinct situations.



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My special thanks to Ven. Ussapitiye Pagnanaransi thero and Ven. Kiulegedara Naradha thero for providing me the Buddhist literature and advice given.

To Sumadha and Jayanth for their immeasurably steady support, inspiration and encouragement through out the study.

To my friends Lalith, Chaminda, Somathilaka Aiya, Manoj Aiya, Saman Aiya Anuruddha, niroshan, Sumudu, Dakumpitiya and wejesekara for helping, encouraging and supporting me in numerous countless ways.

Finally my amma and sisters for continues guidance and blessings extended all the time

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## INTRODUCTION

## INTRODUCTION

Primitive man was nature-bound, worshipped natural phenomena, and closely guarded and moderated his use of natural resources. Although the natural resources may be plentiful, they used only the amount, which is required for once sustenance and no more. As a result of this until recently we had virgin land with plenty of resources. This idea applies to buildings in that our vernacular buildings were made of sustainable materials so as its reuse the land for future. Because these buildings having served their useful purpose would perish naturally and return to the earth from which they were made.

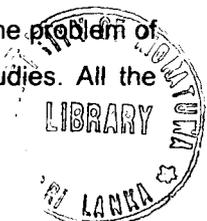
But with period of time they get change due to various changes like industrial revolution. The contemporary society is undergoing qualitative transformation. The age of uncontrolled industrialization is giving way to a new wave of social direction.

With the advent of colonialism and western precepts of profit motivated work and the open market and capitalist philosophies of the postcolonial era, the idea of reuse faded. .

With increasing market competition came the introduction of more long lasting non-reusable material shaped the way we live. The order of the day was 'use and throw away'; recycling was not an issue. This applies as well to architecture, where, concrete, steel and glass created buildings catering to mass appeal and later torn down when trends and fashions changed. The resulting pollution, both environmental and architectural has become enormous. When in modern society realized the negative consequences of the aforesaid phenomena occurred last few decades they began to quest new was of reusing architectural materials and building which a sustainable in modern context. It is important to investigate the concepts of reusing a buildings and materials.

As mentioned above the concept of reuse has been used from the remote time and it developed with religious philosophies and culture. But when it became mediaeval period after industrial revolution this concept was eliminated from the world. Therefore it is essential to revitalize this concept as a main concept in architecture. Because the concept of reuse much more related with architecture than other subjects. Therefore this present study intends to establish the importance of the reuse concept. Thus this present study is needed as a separate study.

In the present study, it offers a new approach to the problem in architecture, which arise due to the absence of reuse concept. The problem may be approached in many different ways conserving the environment and architecture. The people have given the problem of environmental degradation. It has been predicted in several in several studies. All the



researches are done on green architecture, Eco sensitive architecture and sustainable architecture or fragment studies or researches. But the concept reuse has not been given a separate study. Therefore the concept of reuse should be given is in-depth study as it is needed by the contemporary situation. Thus this study is needed and there are several intentions to be achieved by this study.

It intends to identify "reuse" as a concept used by people from the remote time. Therefore it will be examined the concept of reuse as a beginning for the study and then it intends to reveal this concept as a major path of architecture. Here it will be analyzed the concept under several principles and hopes to discuss applicability of this principles in contemporary architecture.

The major scope of the study is to establish the importance of rediscovering the concept of reuse. Because it will identify the demerit s of the absence of this concept, present study many thus conclude as an attempt to revitalizing of the concept of reuse in architecture.

To achieve the above intention this study will consist of three main chapters. It initially concentrates on identifying the concept of reuse and its development with the culture and with religion background. Then it will be studied the concept of reuse under several principles and applicability in contemporary architecture. Finally the study intends to emphasize the importance of rediscovering of the concept reuse. Thus this study will be presented as in the following chapters.



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## **CHAPTER ONE**

### **REUSE ATTITUDE IN ARCHITECTURE**

## CHAPTER ONE

### 1. REUSE ATTITUDE IN ARCHITECTURE.

#### 1.1 REUSE - THE CONCEPTS

“ Man can not plan the world without design himself”. At the time he took his land, he already decided the plan of his life and he measured the earth accordingly and placed the ground and plan of his historical existence within it. Schultz, C.N 1971:15

Man is the part of the nature. Nature that is soil, rivers, mountains and forests play a great part in the man's history and influence the man's life and man can not be separated from the nature.

In 1854, as Red Indian Chief Settle said –“Every part of this earth is sacred to my people. Every shining pine needle, every sandy shore, 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 the man... We are the part of the earth is sacred to my people”. This is how our forefathers treated our plane.



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It is therefore clear that the man has plan himself at the beginning of his existence since remote times he thought that the environment should be defined as a place to make his lived in world. In this sense he made his own world by concretisation of the existing environment so as to have the lived in world where he made the environment as required but not destroy the whole environment. From the remote time, he has also perceived environment, existed in environment and thought about the environment for the sake of his future generation. In the sense the concept of reuse came to exist.

“In certain sense, any man who chooses a place in his environment to settle and live is a creator of expressive space. He makes his environment meaningful by assimilating it to his purposes at the same time as he accommodates to condition offers”. Schultz, C.N 1971:11

One basic aspect, of however has adopted is the environment concerning of man's individual and public world. Because the environment is understood as a part of his life. which should protected for sake of his own generation. Therefore the concept of reuse

has its early root from the beginning of human existence in remote time and developed with their culture and their religion.

It may thus conclude that the concept reuse develops with religious philosophical and cultural approach.

1.1.1 Philosophical Approach

Religious background of this concept can be discussed with the teaching or the philosophy of Buddha. Buddhism had been the greatest philosophy in Asian and developed towards other countries.

Simple life style is the basic teaching among the teaching of great Buddhist literature.

'Vinaya Pitaka' is the main resource, which talks about the concept of reuse. There are several strict rules, which are laid down for bikkus to get the maximum use of their articles and to reuse them.

The king Udena questioned the Anannda Thero about the use of the robe of the bikkus. The answer given by the Anannda Thero is mentioned in "Vinaya Pitakaya" as follows.



තෙත සමයෙහි උනපඤ්චිකුත සිකාපදා, තච්චා යා  
මුඛි සො ජුර යදි අරියච්චො නාමච්ච සං අද්දාප්පාපාප අප  
සං, එවං තෙහි උබ්බාලො, සොතාපනානා පනා පනාප්පා  
පුරෙතෙව් න යාපෙයි,<sup>6</sup> පහත දැක්වේ. "අපායාපි නා පාපෙයි  
සංදර්ශනියා ජිලමනි"හි<sup>6</sup> උනපඤ්චිකුතෙහි එව් උනානි  
සඬු බිකුනානි අයාහි උනපඤ්චිකුතො, නායං පඤ්චිකුතානි  
පුරෙතෙව් අපෙඨා, තෙත උනපඤ්චිකුතො. ඉදං ජායාසං  
කමෙත්ත ජරණච්චනං, තච්ච සපා අවකාශොපි පඤ්චිකුතානි  
පුරෙතෙව් සබ්බෙසො නජිතාය, තස්මා පදසාප්තො "අවකාශො  
"හි ආදී වුතං. "උනපඤ්චිකුතො"හි ච වුතංතං යෙස  
සබ්බිකුතො පඤ්චො භොති, තස්මා සො අපභොතා, තස්මා අද්දා

Vinaya Pitaka, Cullavaggapali, part-2 :  
Balangoda Ananda Maitreya Thera and Uduwe Janananda Thera 1983: 560

As guide in the section shows how concept of reuse has become as a strict rule, which should be adapt by the bikkus. Buddha had laid down rules and methods for his bikkus to use their robe until the very end of its useful life. This has mentioned the way that a role should he used by a bikkus. After using as the siuru (robe) it should be laid on his



bed as the *Athirili* (bed sheet) then thirdly as the covering for the *bisi ura* (mattresses) then it should be used as *bumuthurunu* (floor covering) and then as a *papisi* (door-mat), then it is used as *rajas harana kada* (dirt-remover) Finally, it should be used for *piribada ālepa kireema* (plastering the robe on walls with mud). In this manner it must be used seven times for different purposes.

It is therefore the concept of reuse had a main feature of Buddhist philosophy. It was further explained in "*Samantapasadika*." That how a one should get the maximum used of their *pattraya* (receptacle).

15. අර මො රජා උදෙසා යෙහායෙහි ආනන්ද කෙනුට-  
 සෙසම්. උපසවකම්භා ආයෙහිසා ආනන්දන සද්ධි- සමෙද්දි.  
 සමෙද්දිද්දි- කර- පාරාද්දි- විච්චාරෙත්වා එකමනා නිසිද්දි.  
 එකමනා නිසිනෙක මො රජා උදෙසා ආයෙහිසා ආනන්ද-  
 එකදොව්: ආමො හු මොට් මො ආනන්ද අමොක- මරොටොති.

"ආමො මො කෙට් මහාරජ මරොටොති".  
 "අපි පන මොකො ආනන්දන කිසිද්දි අද්දි".  
 "අද්දි මො මෙ මහාරජ පඤ්ඤාකරාසංඝසකානි"නි.  
 "කිසිපන හට- ආනන්ද හට ඔහු- වීර- කර්මකම්"නි.

යෙ පන මෙ මහාරජ කිසිද්දි දුබ්බලච්චරා කෙහි සද්ධි-  
 ස-විහරිකොමිති.

යනි මො පන මො ආනන්ද පොරොණකානි දුබ්බලච්චරානි  
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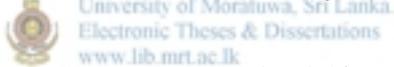
නානි මහාරජ උපකරණ- කර්මකරානි.

යනි පන මො ආනන්ද පොරොණකානි උපකරණ-  
 නානි කර- කර්මකරානි.

නානි මහාරජ කිසිද්දිමො කර්මකරානි.

Samantapasadika or Vinayathakatha part-1

Baddegama Piyaratan Maha Hhero and Welivitiye Pandita Soratha Thero 1929: 513



It says that the "*pattraya*" (receptacle) of a *bikku* can not be replaced until it gets damaged with five damages. If one request for new one without having such damaged "*pattraya*" (receptacle), it will be a offence for him. Because it has become a strict rule to use something until it gets end of its useful purpose.

This shows how the concept of reuse has been used in the philosophy of Lord Buddha. Thus the concept of "reuse" is not a new idea to the people of Asian countries since they nurtured on the tenant of eastern Philosophies.

Further Buddha had said in "*Singalowada Sutra*" how this concept becomes impotence in the life of a layman.

There this concept expressed in economical aspects of the life as it peoples mattered by the economic problems. For laymen Buddha has directed how to use their belonging with thrift. It has given some important considerations in the way of production and how to use this production carefully.

Therefore the Asian people who had born and bread in this religious environment had good base enriched by a good knowledge and sense about the nature. This could lead them to get maximum use of it and in a habit to reuse it although there was available more than enough resources. Therefore the concept of reuse had got it root from primitive time and developed into a philosophical thinking of various religious and culture.

### 1.1.2 Cultural Approach.

"In contrast, the view of the primitive hut that Thoreau gives is one of human life as part of nature rather than in opposition to it. The human intelligence is never separated from the recognition of natural laws." Vale, B and Vale, R 1996:12

Throughout the history and in virtually every part of the earth men have lived and multiplied and have created some form of culture. Always and everywhere they have found their means of subsistence and something to share. Civilization have been built up have flourished and their thinking process are arisen from the same ground. It is the fact that it is the nature that provides resources. Therefore they lived in a manner to honor the nature and protect it as a resource.

Primitive people honour the nature as a god. This concept had lead them protect the natural resources as divine gifts. Dissanayaka J. B points that there are several gods giving divinity to the nature in the belief of Sri Lankan people. He had identified five gods and goddess who control the nature there are *Iru Deviyo* (Sun-God), *Sandu Deviyo* (Moon-God), *Gopalu Devatawun Vahanse* (Cow-God) and *Mihikat Deviyo* (Earth-Goddess). He further explains that the earth belongs to goddess *Mihikata* or *Polc Mahi Kanthawa*. It is behind that earth is also guarded by a set of god things known as "bahiravayo" who have the power to bring evil (bad) upon those who harm the earth (Dataratne, R 1999: 183; Dissanayake, J.B 1999: 13)

This is how the folk of our country express this concept of reuse. Because small colloquial verse reveals a strong concept that the surplus or the more than enough part should be left getting required amount for the use. This concept is used without knowing as a concept but only with consciousness, because our folk life or the culture had use this concept for the sake of our future generation.

In traditional Sinhalese colloquial verse as

මේ ගස බොහෝ පැයී දොඩමි      තිබේ  
 පැයීලා ඉඳිලා බිමට නැමිලා බර වෙලා      ඇතු  
 නංගිටයි මටයි ගෙඩි දෙකක්      ඇති  
 වැඩිත කඩත නරක ඉමයි ගෙම නොවේ      අරී



This means although there are more than enough or ample ripe fruit on a tree they pickup. Only the amount they want or the sufficient amount. Rest will leave for others. Because they thought that getting more than enough is a bad habit.

Thus the Sinhalese Traditions are inseparable from the Buddhist conceptions of the world; its make up, existence and peoples habitation in it. This is demonstrated by Schumacher as;

"A Buddhist economist would consider this approach excessively irrational: since consumption is merely a means to human well-being, the aim should be to obtain maximum of well-being with the minimum of consumption".  
Schumacher, E.F 1973:52

Ise shrine temple in Japan is a good example for such cultural approach for this concept. Shinto is the religion of the king dynasty in Japan and their shrine is known as Ise shrine. There is habit in their culture to make new shrine for every twenty years. For this there are two sites at the same land, which consists two shrines. Ones the shrine gets twenty years old, it has to be demolished. Therefore new shrine is constructed according to the existing shrines. This construction is done for twenty years and after completing the building they break the existing shrine and replace all the images and utensils in the new one. Then they keep the remains and reuse for the new shrine. In this way they build new shrines by reusing the remains of old buildings. Therefore, it is a good example for how the Japanese culture uses the concept of reuse from the early ages.

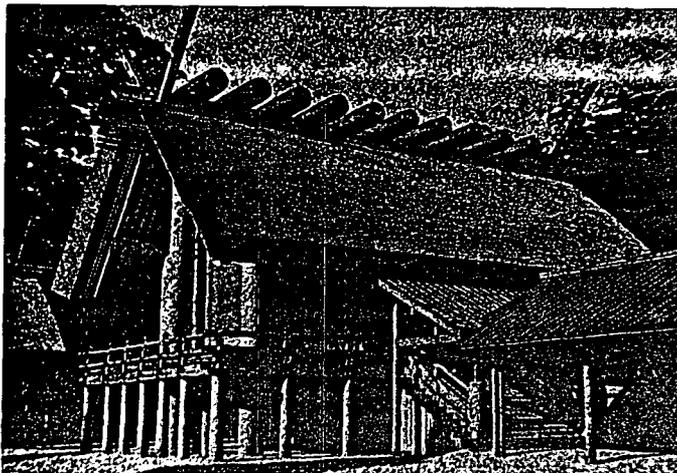


Plate 1.1

The inner shrine of the sun goddess, Ise Fifth century. This shrine has been continuously rebuilt without alteration every twenty years. Its steeply pitched thatched roof is a developed form of the indigenous tent-shaped thatched Japanese hut on stilts. The thatch is laid on a framework of closely lashed bamboo poles.

Source; World Architecture: 113

In this way the concept of reuse had been a main character in most of the countries from past. In this way this concept has been developed with culture from primitive time and it also developed as a philosophy with their religious background. Therefore in this concept have been evolved throughout the history and it get changed in the mediaeval period.

## 1.2 CHANGING SITUATION OF REUSE-CONCEPT.

Change has become the important character of our age, new materials develop, Social systems alter quickly and culture itself is changing faster than ever before. This will create betterment of our life and degradation of the whole environment and life of the people.

"Primitive forms are good as a result of process of gradual adaptation that over many centuries such forms have gradually been fitted to their cultures by an intermittent through persistent series of correction". Alexander, C 1967:35

Because the people response to various environment which are governed by their attitudes and ideas. These reposes get change from place to place because of changes and differences in social, cultural, ritual and economic status. These status and responses may also change in the same place with the passage of time.



Therefore the concepts of reuse also get change with the changing pattern of physical, social and cultural context. Therefore the industrial revolution is one such great changing step of our history and it influences in every aspect of our life.

"Modern man does not experience himself as apart of nature but as an outside force destined to dominate and conquer it. He even talks of a battle with nature, forgetting that, if he won the battle, he would find himself on the losing side. Until quite recently, the battle seemed to go well enough to give him the illusion of unlimited powers, but not so to bring the possibility of total victory into view". Schumacher, E.F 1973:11

Therefore the concept of reuse has been faced and given new vision after industrial revolution. People thought about the reuse in a different manner. After this revolution whole world gets changed, market economy came to exist even in eastern countries. The profit oriented market economy has been changed attitudes of the man completely. Therefore people tend use the concept reuse. People tend to see the life with a new vision. Due to technological development people tend to use more resources and the



problem scarcity of resources came to exist. Because that they used resources more than enough and make people to go for new materials and the reuse concept become to a lesser value. The economical way of thinking seeks to do the work in a less time. Therefore they try to find out shortest method for every thing. Therefore concept of reuse gets change for the sake of several reasons in mediaeval period.

The open economy came to exist after industrial revolution and it made the financial return oriented economy. It gives lesser value to the human welfare and it becomes a great problem to the world. Because competition in the market is made people to think about new passions and it become as a crisis. Because it leads the people to not to think about reuse but new production and new passion come to exist instead of that. Because all the mass media were trying to advertise such kind of things to market their goods. This lead the concept of reuse goes for away from the man's mind.

E. F Schumacher describes this changing as follows;

*"Simplicity and non-violence are obviously closely related. The optimal pattern of consumption, producing a high degree of human satisfaction by means of a relatively low rate of consumption, allows people to live without great pressure and strain and to fulfil the primary injunction of Buddhist teaching: 'Cease to do evil; try to do good'. As physical resources are everywhere limited, people satisfying their need by means of a modest use of resources are obviously less likely to be at each other's throats than people depending upon a high rate of use". Schumacher, E.F. 1973: 53.*

As a result of the open economy people tend to seek more product. Thus they wanted to seek more profit. This lead to maximum use of resources and also they tried to get maximum benefit from minimum investment to get larger profit from their good. This profit-motivated society made the problem of scarcity of resources and the reason behind this was the not using of reusing concept.

### 1.3 APPLICABILITY OF THE CONCEPT REUSE

*" Earth provides enough to satisfy every man's need, but not for every man's greed" – Gandi -*

This means that there can be growth towards a limited objective and there can't be unlimited growth. It is a must to discuss importance or applicability of this concept in architecture. Because it has become a great threaten for the built environment. To satisfy the man's basic needs it is essential to provide him with' a shelter. However, this satisfaction has gone faraway from the limited objective. Therefore, the unlimited

consumption of resources has become as a problem in architecture. As a solution, for this problem the concept of reuse comes to exist in the present day.

Man has to think about the concept of reuse because of the scarcity of resources, the economical way of thinking and limited time availability of their lives.

### 1.3.1 Scarcity of Resources.

"First of all, the world has limited supply of minerals and underground energy resource-one day they will dry up. Secondly, the environment is suffering. Resource extraction hurts the environment-using these resources and making product out of them pollutes the air and water, and throwing them away one day continues the world, people realize that the mass-production, mass-consumption, mass-disposal system must change". Negoro Isao, 1999: 6

Mass consumption comes to exist in the built environment, because man had built more than enough for beyond the basic need for the shelter. This had led the world to a great problem that is the scarcity of resources. They excavate riverbeds for sand more than enough and for the sake of the construction.



This had led to lay a set of rules for using of natural resource. People have to face several environments limitations. Therefore the price of these resources has been rased newer before and it was unbearable. This will lead people to search alternative method and the concept of reuse has to be alive again. People tend to reuse old material or remain of old building due to the scarcity of resources.

### 1.3.2 Economic Approaches

Due to correct economic inflation existing the third world countries, people have less money to allocate for the their construction. Because they have to allocate more for the other basic need. This had lead people go for economical way of thinking. Because of this economic inflation, people have to spend more money for construction. Because the price of material, resource has been increased. As an alternative method for this problem, they tend to reuse old building, old materials and old elements etc. (Instead go for new one they go for old one because of their poor economic condition.)



### 1.3.3 Time Constraints

With the development of the world man needs has also developed more than basic need. They wanted more time to fulfil these complex needs. Unlimited needs lead then very "Aveveweki geevitayak" (restless lives). Therefore limited time allocation for each work becomes as a main feature of their life. This will lead quick constructions, because they wanted to build their house quickly. As a solution for this they thought about already built element instead of newly built element. They go for reuse to build their building.

People go for old artistic work or decoration to use in their new constructions because they have not such a marvellous craftsmanship available today and enough time to develop such artistic ability. Therefore they go for reuse.

This shows how the limited time availability makes people to reuse.

### 1.3.4 Other factors influencing the reuse

#### 1.3.4.1 Social background



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"Architecture meets social needs

Needs met: social architecture

Architecture meets society's needs

Social needs: architecture meets

Social architecture meets needs".

Oakley, D 1972: 206

Some people like to show their own traditional lifestyle or their classical states what they got from their generation. There is no such difference of class in the modern society. But some people tend to show their social background by reusing their old furniture, antiques or building element. Sometime it has to be designed the house also according to traditional form.

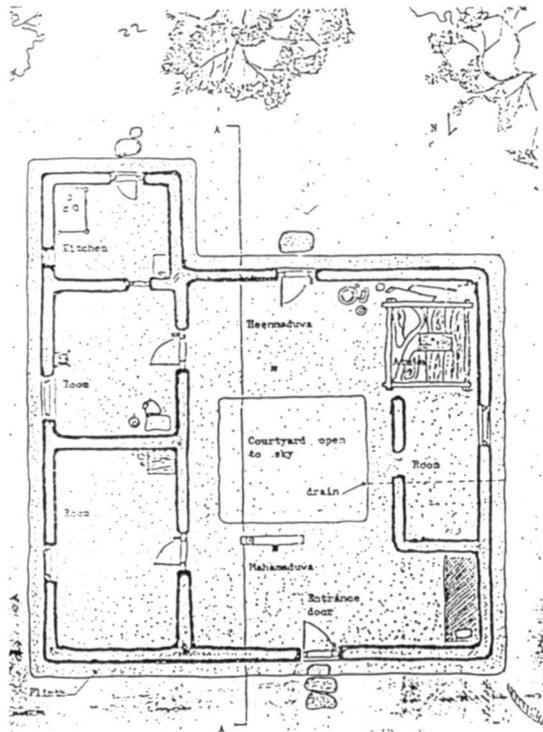


Fig.1.1  
Traditional courtyard house (Hathara athi geya) E.R.M. Muthubanda, Dulleww, Mathale

Source: Basnayaka, N.V.W 1980:21

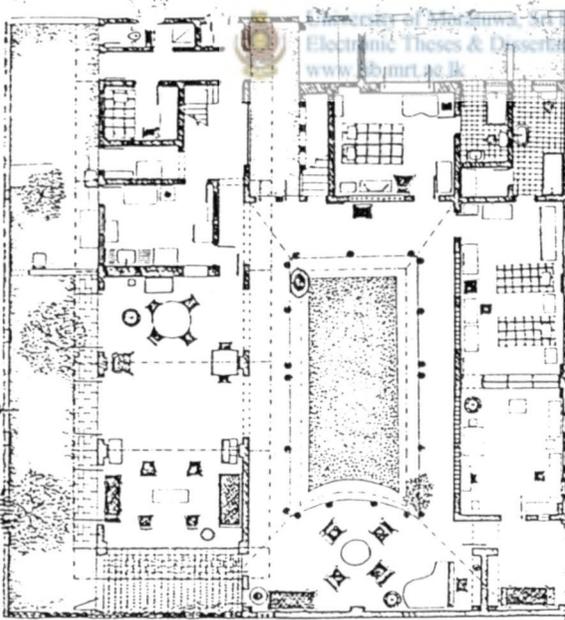


Fig: 1.2  
House for Ian Peris in 15/8, Alfred house Gardens, Colombo 3.

Design by Arct Minette de Silva, 1966

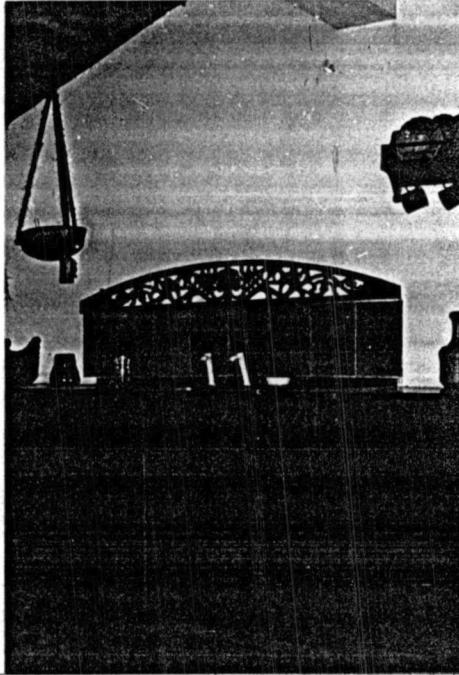
Source: J. Munasinghe and W. Wijesinghe.

GROUND FLOOR PLAN  
DRAWN BY  
INDIRA ARYARATNE  
SRIMANTHA FERNANDO  
JAGATH HEWAGE  
JAGATH MUNASINGHE  
SANTA SAPUTANTER  
KAUMALLE WIENBAMATHILAKI  
WASANA WIJESINGHE

Because to exhibit their antiques it will be the most suitable form. In such situation it has to be reused not only building element or furniture but also the form has to be reused.

Some people tend to reuse these element and buildings because of not other reason but only as a pattern. Because in these days reusing of old building element and antiques comes to exist as a pattern or mere imitation.

### 1.3.4.2 Individual Preferences



There are some client who personally preferable to our indigenous works and indigenous method, of life. They like to follow traditional life style. In such situation people tend reuse old material, old buildings antiques because they individual taste. In such situation they have to pay more for old elements then newly constructed element.

Plate: 1.2

Decorative floral fretwork panel at the kitchen  
The residence of Prof. Ediriweera Sarathchandra



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## 1.4 Conclusion

Concept of reuse has become to exist from the primitive time and it developed with culture and religion of the people. After industrial revolution the concept of reuse get changed and given new definition. It is because this concept goes away from man's mind after this industrial revolution. Although modern world made the man away from this concept, it still used as a concept in domestic level in eastern world never wanted to get rid of something, if they are given new one. They are having a custom to keep the old one latter for the emergency situation.

Therefore the concept of reuse is thus important for our existence there is our lifestyle. our culture, religion and our built environment as human need plays a major role in our lifestyles. It is thus important to examine the applicability of this concept in architecture

The concepts of reuse in architecture can also be examined under several basic principles.



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## **CHAPTER TWO**

### **THE PRINCIPLE OF REUSE IN ARCHITECTURE**



## CHAPTER TWO

### 2. THE PRINCIPLE OF REUSE IN ARCHITECTURE

#### 2.1 DIFFERENT METHOD OF REUSE PRINCIPLE

The evolving of new life style should be for the sake of our future. Limited consumption is the main consideration in new life style. It will lead people to seek various ways of consumption and the applicability of the concept of reuse also get change from the remote times.

Due to simple life style of the ancient people they had always satisfied from what they got. Because of these qualities, they could satisfy themselves with small amount by taking the maximum use of it. In this sense, they tend to reuse what they use.

However, present situation is much more different from the past. Today the concept of reuse has been used due to various reasons. It can be identified several principles reusing in architecture or in the built environment.

Different methods of reuse come to exist to satisfy the need of present day world. With the development of technology, the method of reusing has become much different from the ancient time.



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All this methods can be divided into two groups that are tangible and intangible. The Principle of reuse can divide in two basic methods. That is intangible method and tangible.

Architecture is many things. As Antoniades Anthony C. states:

“Architecture is many thing in one  
Something's tangible and other intangible,  
Something visible and other invisible  
Where all thing tangible and intangible  
Visible and invisible are in balanced  
Harmony among themselves  
Constituting a useful and mind  
Elevating whole  
Then the whole is Architecture.”

Antoniades Anthony C., 1980, p-86

All principle of reused can be discussed under these two categories.

### 2.1.1 Methods of Tangible Reuse

Reusing of old material, building, building elements etc are considered tangible reuse. These are the physical elements, which used for previous construction. This tangible reuse can again be divided into two groups. That is direct reuse and indirect reuse.



Direct reuse is the directly reuse of a physical element for the same purpose as it was in the previous construction (plate: 2.1) (Plate: 2.2). If the elements are reused for other than the previous purpose, it is know as indirect reuse (plate: 2.3).

Plate: 2.1

Old timber column supporting the roof

The residence of  
Arch. P. Paranagama



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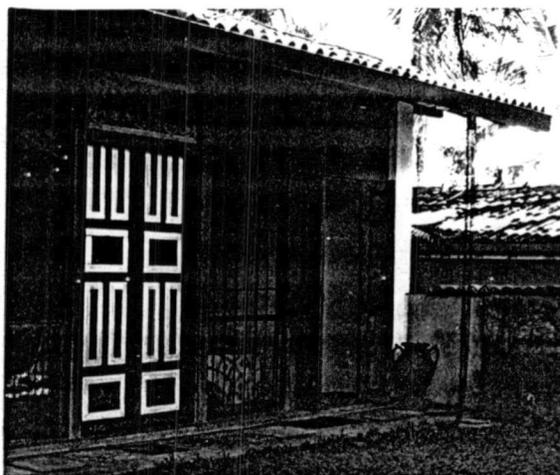


Plate: 2.2

Series of old doors

The residence of Arch. P. Paranagama



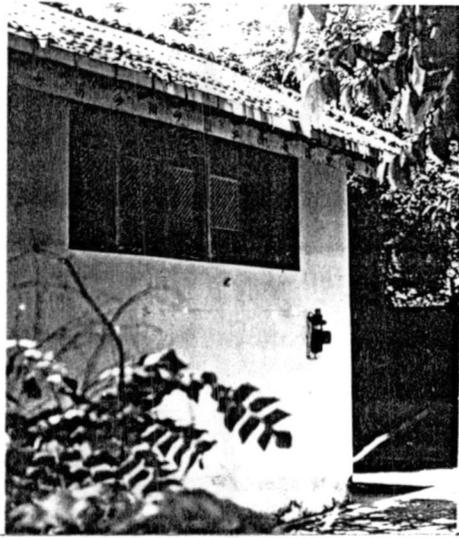


Plate: 2.3

Old window frame used as a column to support the wall plate

The residence of Archt. V. Basnayake

### 2.1.2 Intangible Reuse

Intangible reuse is not a reusing of physical element. But there are ways of reusing the traditional concepts, Forms and ideas which are not physical. There can be thing which are developed with a periods of time to suitable for the climate condition, environment and they reuse as a habit. They can be the form, spaces or plan form of a building.

Tropic vernacular concept is also reused in modern urban context.

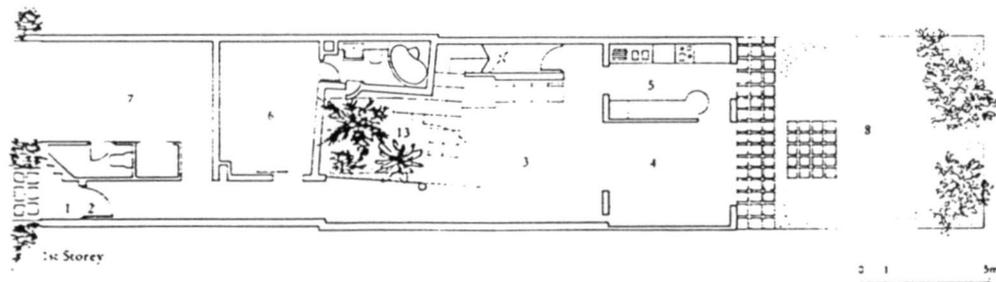


Fig: 2.1 Ground floor plan of Archt. Madura Premathilaka's house

Source: The urban Asian House.

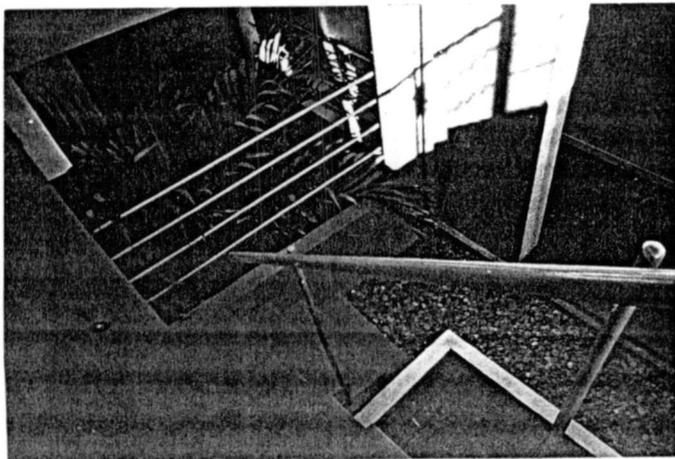


Plate2.4

Archt. Madura Premathilaka's house  
The traditional courtyard concept is used in modern urban design

Source: The Urban asian House.

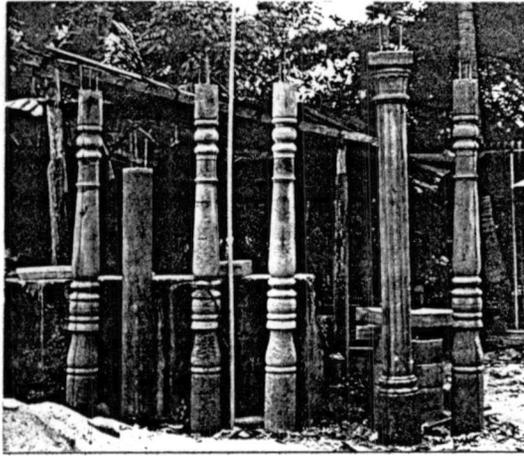


Plate: 2.5

Decorated precast concrete column

It is difficult to find the timber columns, belongs to Dutch period. These columns are very aesthetically designed and have good proportion and depict the enough strength to bear the load by its proportion. Instead of this Dutch column it has been used concrete column (Plate: 2.5), which are designed with that form and proportion. But this column has been failed to recapture the texture and lightweight quality of the original timber column.

## 2.2 PRINCIPLE ONE: BUILDING REUSE.

This principle comes under the tangible method of reuse. Lifestyle of the people get change due to rapid change in political situation, social situation and the technology of a country. Mostly the change in the government of the country will directly affect life style of the people. Therefore, the built environment which they live is also get change with this changing life style and the function of the buildings may change with this changing pattern. Due to its abandon in function buildings get destroyed. This destruction can be avoided by reusing the building and it can be minimized the amount of resources goes into the building. Therefore, building reuse becomes as a good solution for the scarcity of resources. The principle of Building reuse can be discussed and two categories that is reuse of old buildings and reuse of existing buildings.

### (1) Reuse of Old building

Existing built environment is already consists with a large part of non-renewable resources. Therefore constructing a new building is utilization of new amount of resources on earth. Therefore it will directly affect the resources in our habitat; actually it is a wise use of resources.

It is unpredictable the historical importance of the old building. It can therefore get several benefits by reusing this old building with their historical importance.

1. Saving non-renewable resources.
2. Saving new resources.
3. Can protect these building for the future generations.

It can be identified several circumstances where old building had been reused for various functions. In certain situation it had been used the building from other function without having any disturbance for its old built environment. In some situation, it has to be changed the existing condition of old building due to the change in its function. This has to be done very carefully protecting the initial architectural features of the old building.

Example-1: Magulmaduva or council chamber, Kandy, 18<sup>th</sup> century.



Plate: 2.6

Magulmaduva or council chamber,  
Kandy, 18<sup>th</sup> century.



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"The council chamber". "Popularly known as Magul Maduwa, The Royal Hall in which the king and his Ministers sat for business of administration and judgment is an excellent example of the timber architecture of the Kandyan period. The present structure was designed by the Architect Devendara Mulachariya in 1783 during the reign of King Rajadhi Rajasimhae, and finally completed by Sri Vikrama Rajasimha. Investigation revealed that many additions and changes were carried out during the British occupation." –Unesco Publishing/ CCF, The Cultural Traingal, 1993: 169

Today this building is used for special national functions presided over by His Excellency the president

### Example-2: Club Villa Hotel, Bentota

This hotel is a good example for the reuse of an old building. Previously it was a century-old country house on the shoreline south of Colombo and later Geoffrey Bawa converted it into a hotel in 1979. Adding new low-rise extensions totally in keeping with

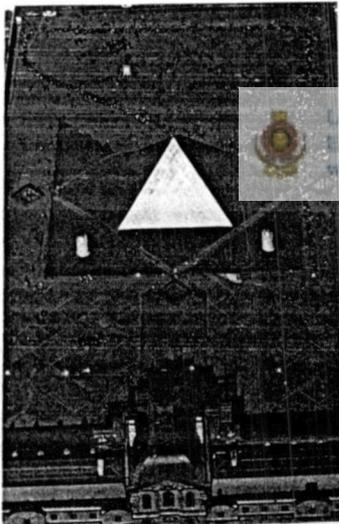


the spirit and character of the original complex preserves old building. Local materials such as wood brick and roof tile were utilized to create these harmonious additions.

Plate: 2.7

Club Villa Hotel, Bentota

Source: Mimar, 25 Sept 1987



### Example-3 Louvre Museum

It was difficult to maintain the Louvre Palace further as king's palace after termination of king's dynasty. Therefore, it has to be changed the function of this palace and convert into a museum. It is now internationally reputed as Louvre Museum.

Plate: 2.8

"Showcase of the State: Museum and Palace

Source: The architecture of Louvre

## (2) Reuse of Existing buildings

Mostly the reuses of buildings are done due to the fluctuation in the economic system of the country. Considering the function of the building, there may be economic losses in economic activities or businesses activities due to these economic differences. In such situations, people tend to reuse the buildings for other function, which is not the original purpose for which it was erected. Because changing of the original function will make more economical business for them.

Buildings, which are located around cities and factory buildings are mostly converted into other functions due to the economic losses in the industry. Redundant industrial buildings have been as a ready stock of buildings easily reused and forming a part of the development of the inner suburbs of many modern cities.

Example-1,

Tea Factory Hotel at Kandapola in Nuwaraeliya can be taken as a good example for such conversions. Tea factories are indeed an integral part of the landscape of the hill of Sri Lanka. The conversion of the redundant tea factory of the Hethersett Estate built by the Architect Nihal Bodhinayake is an excellent state of preservation having been put to use for a mere 30 or 35 years.

Plate: 2.9

An interior view of The converted Tea Factory Hotel, Kandapola, Nuwara-Eliya.



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Source: SLIA Journal, June-August 1997.

Recycling materials have been a part of building trade in this country for some time, however the effective conversion of buildings is yet to catch on. This project stands as a pointer to what potential an existing building stock can have. Most of the older more solidly constructed buildings are a valuable resource of materials and energy which can be reused with imagination. Understanding the logic of the initial builders and a rigorous application of that logic to the new intervention can result in a product that manages to live a second life that is enriched by the former.

With the development of cities, buildings in and around them get more demand or get more valuable than before. In such situation dwellings or residential buildings around the city are converted into commercial buildings.

Example-2, Most of the old residential buildings in the Duplication Road, Colombo Seven are used for commercial activities.

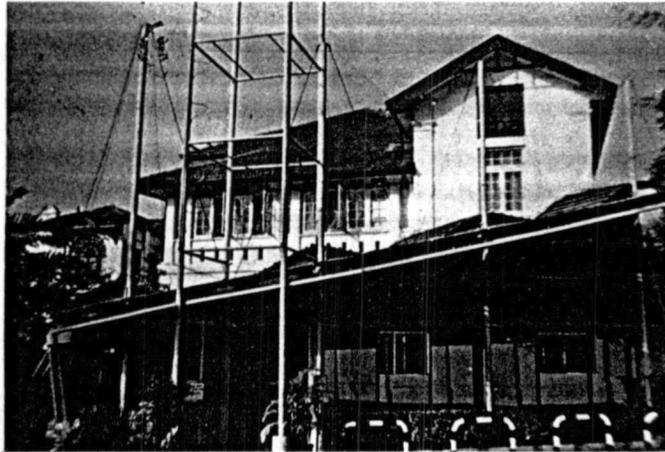


Plate:2.10

CBA Head office, Colombo

### 2.3 PRINCIPLE TWO: ELEMENTS REUSE.

Reuse of building element had been a main feature in the history of architecture, as a source of saving resources. It is developed, as a principle consisted of several think with the development of human needs.



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Various methods of reusing of building elements are done due to several reasons in the present architectural work.

- i. For economical aspect.
- ii. To save resources.
- iii. As a symbolic representing of their generation.
- iv. To have some kind of social states.
- v. For the purpose of aesthetical aspect.

Whatever the reasons behind this principle there are two basic categories can be identified that is direct and indirect.

#### (1) Direct reuse of Building Elements.

It is the direct use of an element from a previous bulging for the same purpose in a new construction. This method of reuse can be discussed considering the Sri Lankan context. Reuse of building elements has been done as a tradition in our traditional architecture. There are several reasons behind this reusing of elements.

"Nine piece door" is the main door of traditional "*Hathara adi geya*" (Traditional courtyard house) and has become the special feature which can express something about their generation because it is an important heritage, which comes from generation it is reused as the main door when the construction of new house by the new generation. Reuse of form of traditional courtyard house will be discussed in third chapter.

"Entrance door of the yeomans house appears to have been design to indicate the social status of the inmates rather than to serve the function of security and Privacy. This front door of yeomans house is known as a 'nine piece door". Basnayka, n. v. w 1980: 63.

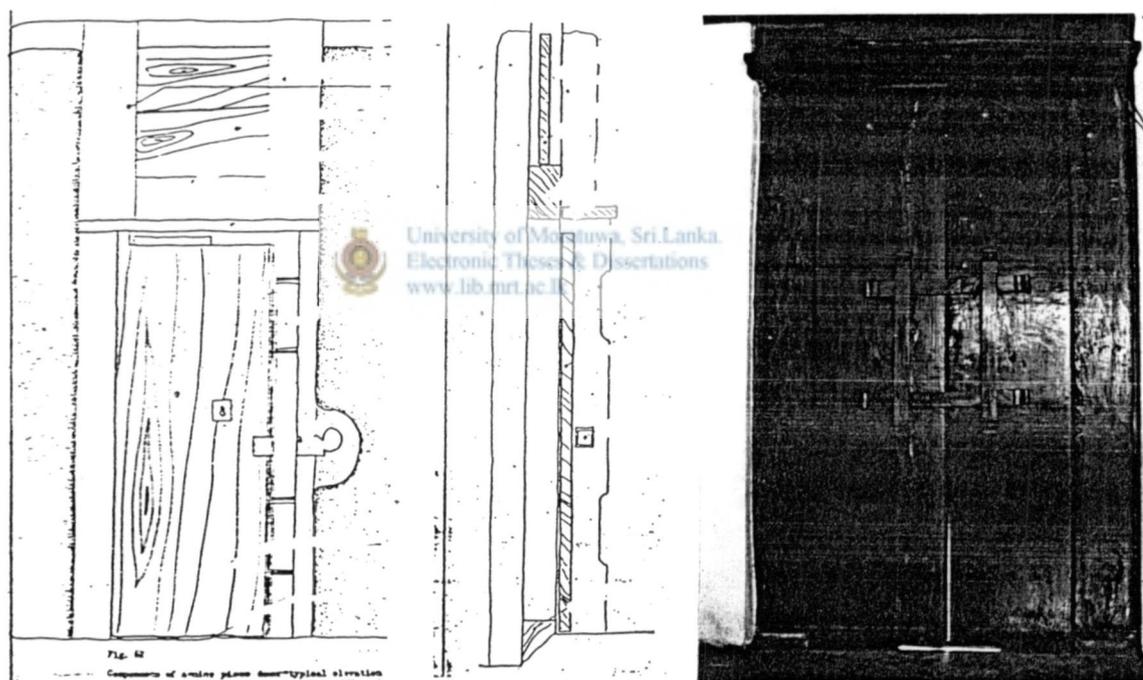


Fig. 2.2  
Components of a "Nine Piece Door" typical elevation and section.  
Source: Basnayaka, N. V. W 1980: 66

Plate: 2.11  
"Nine Piece Door" at Degalthoruwa pansala in Malwatta monastery complex.

Elements like decorative doors and decorative columns are very commonly reused building elements from old buildings. These elegant woodcarvings are reused because there is no such an elegant craftsmanship in the present context. These carvings and decorations are the wonderful gifts, which are given to us by our ancestors, and it is a must to protect them for the future generation.

Since the man interested in decorative surrounding they always elaborate their buildings with decorative elements. Although the modern man wanted to have such a built environment he may not having required leisure time for such decorative work or may not having such creative craftsmanship. Further, they have to pay more for other basic needs than artistic work. Due to these reasons modern man go for the reusing of old decorative building elements.

## (2) Indirect Reuse of Building Element

In this method, old building element is used for other purpose, which is different from its previous purpose. Structural elements in most of the traditional building are not reused for mere structural purposes but also for the aesthetic purposes. Structural elements have been used giving an aesthetical consideration. Structural columns are done with smooth decorative carvings. As an example the decorative structural columns in old vihara or devala are used as a decorative element of newly constructed buildings



Without having any structural purpose they used decorative elements for other artistic purposes. (Plate: 2.12). Decorative columns, decorative doors and windows are some of these decorative elements. They could give different impressions by using their decorative elements and different architectural languages. It can be seen in some very sensitive environment in different architectural methods.

Plate: 2.12

Column, without having any structural purpose.

Source: Lunuganga 1990

Because of the scarcity of such craftsmanship people tend to reuse these decorative structural elements and sometimes they have to pay much larger value for these old elements than a newly constructed one.

Sometimes aesthetic aspect of the interior space in the present context has been given prominence, In such situations people tend to prepare their interior space aesthetically by using antiques or old furniture. In the houses of colonial period, they used this furniture because of its usage. But nowadays people go for this old furniture due to its



traditional value. Some old kitchen utensils like brazen antiques and ornamental light fittings are reused as exhibits in modern houses and also antique furniture.



The decorative floral fretwork panel of the old building have been reused for direct aesthetic purpose, where enhancement of tradition to be reflected. There may be present use more than its basic need in previous element.

Plate: 2.13

Decorative floral fret work on exterior wall of music room, the residence of Prof. Ediriweer Sarathchandra.

Associated small structures had been the building element of the main building in our traditional architecture. 'Atuwa' the granary or the Rice bin was special element old building or building complexes.

Latter this Atuwa has been converted into a 'Tampita Viharaya'. Therefore it is a good example for indirect reuse of elements associated with building.

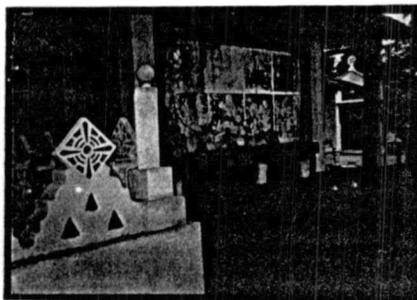


Plate: 2.14

Udasgiriya Tampita Vihara at Matale. 'Atuwa' was converted into a Tampita Vihara at Udasgiriya.

## 2.4 Principle Three: Material Reuse

Bricks, sand, rubble, timber, cement etc. are the required materials for building construction. Building elements like walls, roofs windows etc. are made by the combination of those materials. Sometimes these buildings have been removed due to various reasons. In this removal the building elements can be separated into these materials.

It was very much easy to separate building materials from previous construction in our traditional architecture and "*Saka Bemma*" and "*Kabook*" walls are good example.

"In one of the examples a wall type known as "*Sakka Bemma*" is used. Stone of various dimensions are used for construction of these walls. Mud and sand added with water, mixed to form binding material. These type is also plastered as the wattle and Daub wall." Basnayaka, N.V.W 1980: 85

Therefore reuse of building materials was a special feature in our ancient constructions. They thought about the reuse of building at its construction stage because it had been used earthen materials and other materials, which are directly taken from the environment. After the end of the life of the building it rejoin to the earth as a part of the nature. There is no remaining of the building. Then the land can be reused for other purpose or can be reused by the next generations. Most of the residential buildings were temporary structures, because very few of these ruins have survived. But *Stupa*, *Viharas* and palaces were built as permanent structures. From these remaining one can gather some ideas of the technical skills in the construction of our ancestors.

Considering the construction of middle age period it can be identified that all the buildings were done so as to get their material separately to reuse them for other construction. Because the material used in the building can be separated very easily. Brick wall and "*Sakka Bemma*" can easily be separated because they were bonded by mud mortar or lime mortar. Thus, the materials, which are not perishable, can be reused for the new construction of this age.

But it is very difficult to break down the building into materials in the present construction system. These imperishable materials cannot be reused after ending the life of the building and accumulation of these imperishable materials will create great environmental problems.

It is thus very important to avoid such conditions in the construction field. There are several new construction methods available to avoid these waste and environmental degradation. One method is that the "lock built block" wall that requires no mortar to bond the wall and it can easily be separated into blocks after its construction. Further mud-constructed bricks will be good solution for the imperishable problem. Prestressed concrete can also be assembled and separated easily.

These methods will lead principle of reuse to survive again in the present construction, as it is required permanency and quick construction. It has been identified two method of Material reuse there is direct material reuse and indirect material reuse and also tangible material reused and intangible material reuse.

### (1) Direct Reuse of Material

It is the reuse of materials directly from the old building for the same purpose as it was in the previous building. In this method, bricks of the old building are use for brick of new building. Timber member which are used in the old buildings are used to fulfil the timber requirement of the new construction.



Plate: 2.15

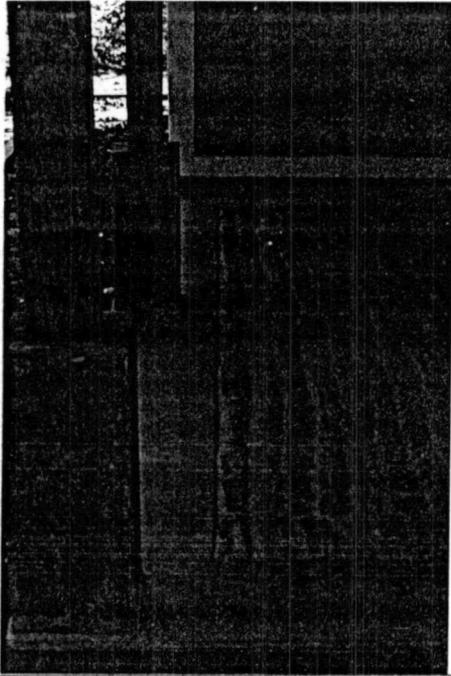
"kabook" block reuse for boundary wall.

It is a belief that "kabook" is a traditional building material. Due to this traditional value people tend to reuse it for the new construction. "Kabook" block, which are taken old building, are used to build boundary wall and front walls of the building without plastering since they are interested in old building material (Plate: 2.15). Further people could build their own building more economically by this direct reuse of material.

### (2) Indirect Reuse of Materials.

Some materials can be Indirectly reused for other purpose. Although there are limited kinds of Materials, which can be indirectly reused, people tend to reuse them as a way of saving resources and the special preference for these materials. Novel ways of

construction methods can be achieved by the indirect use of building element. (Plate: 2.16)



Half round tile has been used as a floor finish and it gives new impression of the house.

Plate: 2.16

Half round tile used as a floor finish at the entrance  
These old columns also reuse

The residence of Mr. Janaka de Silva

## 2.5 PRINCIPALE FOUR: WASTE REUSE



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"They think of pollution as a rather nasty habit indulged in by careless or greedy people who, as it were, throw their rubbish over the fence into the neighbour's garden. A more civilized behavior, they realize, would incur some extra cost, and therefore we need a faster rate of economic growth to be able to pay for it. From now on, they say, we should use at least some of the fruits of our ever-increasing productivity to improve 'the quality of life' and not merely to increase the quantity of consumption. All this is fair enough, but it touches only the outer fringe of the problem".  
Schumacher, E.F 1973:14

Our mass consumption society is a mass throw away society and this throw away of huge disposal will create great environmental problems.

Waste is a big problem not only in building construction or maintenance but every activity of life. It causes a aggressive environmental problem also. Since few years. building industry is an industry which makes the largest amount of waste around the

world and there are may be organic as well as non-organic waste. Waste can be taken as a material for construction by reuse or adding another substance to the waste.

For example waste paper can be turned into insulating materials and materials for ceiling and soon, by adding suitable substances.



Other example for paper built structures that the paper cylinders will be used for the Japanese pavilion at Expo 2000 in Hanover, Germany. Japanese architect Ban Shigeru decided to build thing with cylinders made of recycled paper (Plate: 2.17).

Plate: 2.17

Ban Shigeru holding a model of a paper pillar for the Expo 2000, Japanese pavilion in Hannover, Germany

Source: NIPPONIA Discovering Japan



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Waste materials such as bottles, cans, wrapping parts can be used to construct walls fences and so on.

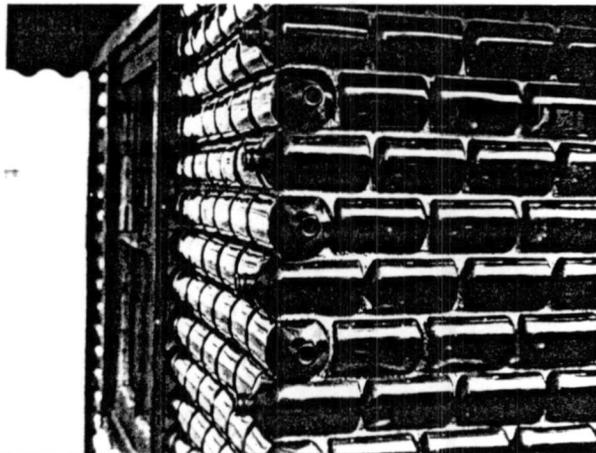


Plate: 2.18

A house, wall constructed by beer bottles.

Source: Green Architecture

Considering these examples it can be proved any waste or throw away material can be used to construct buildings. That is Rails, rail sleepers, light posts, marbles and tiles are some of these throwaway materials and waste, which can be used for the construction.



Plate: 2.18

Cartwheel is used for windows,  
House at Pothuhara,  
Kurunegala.

Sometime they tend to build their own house as temporary structure due poor economic condition and scarcity of resources. There are also some people use to built temporary structure due to illegal building works and some people tend to built hurriedly built dwellings to remove them in a flooding season.

They're several categories that can be identified in non-architectural works. Like is slums, shanties, and low cost permanent dwellings.

In the city areas the removed light posts and telephone posts are used to build building like garages etc. In these ways people could build their houses to a certain lower costs and could fulfil their need reusing waste materials. This shows that concept of reuse came as a habit from their remote time.

## 2.5 CONCLUSION

Due to rapid development of the world man's needs also get increased. This results the concept of reuse to re-exist. They had to reuse even the waste due to the great problem of scarcity of resources. Therefore the concept of reuse is given various faces to fulfil these needs. These methods of reuse can be discussed under several principles. It can also be identified the application of this concept with these principle in architecture of Sri Lankan history as well as in contemporary architecture.

Creativity in architecture spaces does not just come from aesthetic beauty and form. Creative use of materials and innovative use of new materials too form a large part of its creativity our effort is to show some innovative use of material and to suggests so ourselves.





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## **CHAPTER THREE**

### **REUSE CONCEPT IN CONTEMPORARY ARCHITECTURE OF SRI LANKA**

## CHAPTER THREE

### 3 REUSE CONCEPT IN CONTEMPORARY ARCHITECTURE OF SRI LANKA

#### 3.1 THE CONCEPTS OF REUSE USED IN HISTORY OF SRI LANKA AND ITS EVOLUTION WITH THE CHANGING CONTEXT.

The concept of reuse is not a thing that is fallen from the sky to the contemporary architecture of Sri Lanka. It has a long history and an evolution throughout this history. We the Asian people were born and bread under the Buddhist religious background. Therefore, the Buddhism, which moulded our way of life, describes the concept of reuse as an essential component of this life cycle. According to the Buddha's teaching there are three worlds the past, present and future and establishes the fact that all of them are inter-related. The past lives in the present and the present in the future. The concept of reuse always harmonize with present need and future aspirations.

In our history it is a prominent feature that the habit of less consumption. Because they used the resources in a manner, which based of limited consumption a rest is saved for the sake of future generation. This character was also becomes as a major concept in architecture. Important building such as *vihara*, *devalas*, palaces and *ambalams* are constructed as permanent structures and rest of the building as houses were built as temporary structure with temporary materials. All the materials were directly taken from the nature. Dayarathna, R. in his article titled Vernacular Settlement in describes as follows.

Raw materials come from the woodlands. Earth is use for construction of walls with cow dung and earth is used for surface finishing. Therefore, the technology is simple. Since the construction is simple and raw materials did not undergo complex process of transformation, the decay of buildings produce no indestructible building wastes. Because mud walls return to earth and the wood could easily be used for making support frames for vegetables plots, for firewood or fencing.

“As a principle, no materials would go directly from a single use to waste. Instead, when a certain use has weakened the material, it is put to another use, and another afterwards until it reached a state of waste that could nourish the ground.” Dayaratne, R 1999: 185

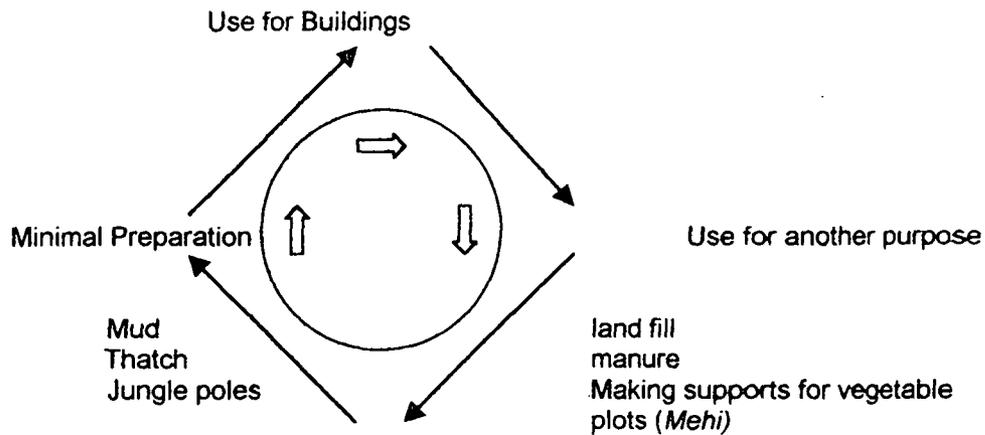


Fig: 3.1

Source: Dayaratne, R 1999:185

### 3.1.1 The Concept of Tangible Reuse in The History Sri Lanka and it Evolutionary Pattern

In this evolutionary process the use of re-use concept can be identified in various time duration of our history. According to the history, in the period of Polonnaruwa the king Nissanka Malla has used some stone carvings from other palace to build his audience hall called "Nissanka Saba Mandapaya". It is proved that he had re-used the stone carving to have more elaborate quality for his audience hall. Because there may not such an excellence stone craftsman in that period.

There are several evidences that proved the concept of re-use had been used in Kandyan period. It is a good example that "Malwatta Pansaia" was partly constructed from the remains of a palace at Mapanavaura (Plate: 3.1) (Plate: 3.2), and two door frames from the same palace has been used in the relic room of Dalada Maligawa (Fig: 3.2) (Fig: 3.3).

"The story I have heard about that three days previous to the day fixed for its occupation by the king a kabargoya entered the intended royal bedchamber. On hearing this, the king, taking it as an ill-omen, abandoned his intention of residing in it.

Some years after King Kirti Sri caused it to be pulled down, removed the materials to Kandy, and built the Malwatte monastery (for the Siamese

monks, who brought the Upasampada ordination), With the exception of the two doors and frames of the royal bedchamber, which were used in building the Dalada relic room of the Maligawa". Lawrie, A. C 1898: 532

Malwatta Pansala is a storehouse of 18<sup>th</sup> Century and latter it was converted into a vihara complex of Dalada Maligawa.

"The Malwatta pansala is a storehouse of eighteenth century wood and metal work, mostly constructed by Kirti Sri Raja Simha. Coomaraswamy A K, 1956:119

In this way the material, building and building elements has been reused in Kandiyani period.



Plate: 3.1

Entrance door of Degaldoruwa Pansala, which is taken from Mapanawatura Palace, Malwatta monastery complex.



Plate: 3.2

Columns, belongs to kandy era, of Degaldoruwa Pansala which is taken from Mapanawatura Palace, Malwatta monastery complex.

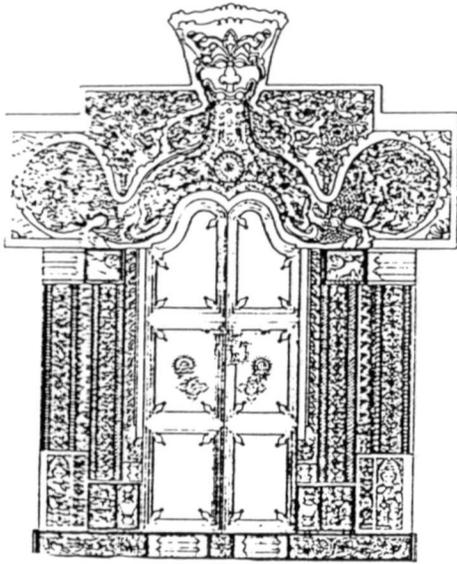


Fig: 3.2

Stone Door frame at Dalada Maligawa

Source:

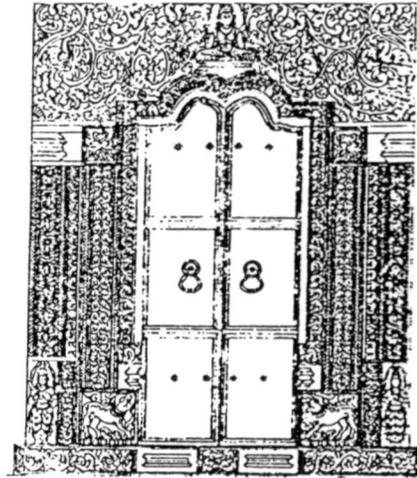


Fig: 3.3

Stone Door frame at Dalada Maligawa

Dalada Maligawa Which is Destroyed by Potugees at 17<sup>th</sup> Century was situated at the kitchen of existing. Dalada Maligawa. King Veer Parakkama Narendha reused Stone base of previous Dalada Maligawa as the base for new Dalada Maligawa in 1707. Senaviruvan, M. 1998: 12. (Sinhala book)

There is also, evidence that it had been used the reuse of spaces or the reuse of buildings during this periods. The audience hall of the king is now used as a courthouse. (Plate: 2.6)

"Of the palace in Kandy, only a part now remains, consisting of several buildings, some of massive construction, adjoining the Maligawa. Of these buildings, a part forms the Government Agent's residence; part the Kandian Museum; while the Audience Hall built for the last king is now a law-court. The meda vahala or middle palace is "perhaps the only real Kandyan building left intact in Kandy, and not spoiled by adaptation to material requirements of the British Government at the time of the occupation of Kandy or subsequently." (Address to Sir Henry Blake, Governor, on the opening of the Kandyan Art Museum in the Meda Vahala, November, 1905.) Coomaraswamy, A. K. 1956: 115

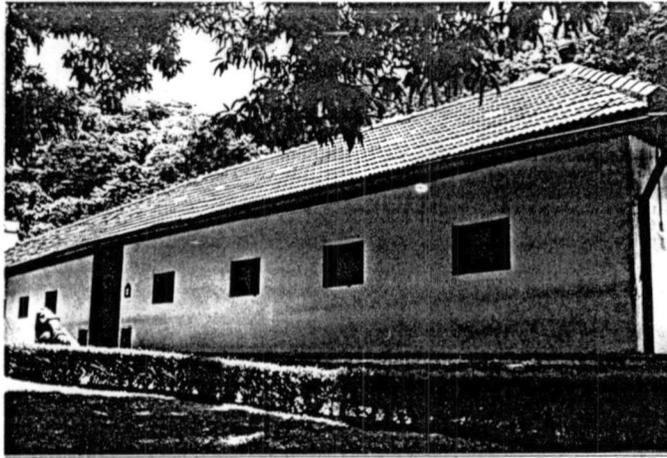


Plate: 3.3

The 'meda vahala' or middle palace is used as the Museum, Kandy

These evidences provide enough information to prove how the concept of reuse has been used in the history of Sri Lanka.

Above mention examples are the basic information to prove the reuse of material, buildings and element that belongs tangible or the Physical categories of reuse in our history and through out its evolution.

### 3.1.2 The concept of Intangible Reuse in The History Sri Lanka and it's Evolutionary Pattern.

It can be further identified traditional building concept and buildings are reused in our history and can be identified the evolutionary pattern of this concept. This Form of reuse comes under category of intangible reuse.

#### The Peasant House

Robert Knox and it was described by as follows.

"There house are small", "low, thatched cottages built with sticks, daubed with clay, he wall made very smooth. For their not permitted to built their houses above one storey high, neither many other over with tiles, nor white with lime, but there is a clay with is as white, and they used sometimes. They employ nor carpenters or house-builders."... Knox, R 1966:162



Peasants house the typical house form in our history.

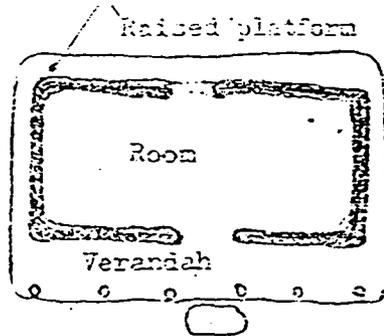


Fig: 3.4

Plan from of Peasant House

Source :Basnayaka, N. V. W 1980

Outward looking house with an open verendah to the front as the outer living is the most general plan type central space converted by the wall and the verendah are two basic spaces in the house.

### Yeoman House

Ananda Coomarswamy describes Yeoman's house as "the house itself was built on stone and mud foundation raised above the ground level; This foundation, smoothly plastered and cow dunged, formed the floor and inner verendah, and projected outside the a walls as a narrow ledge or outer verendah (*pila*), used to sleep or sit on it. The houses of great persons only differed from those of lesser man by having more rooms and courtyards, better, timber, the beam ends and verendah pillars and their brackets sometime carved, in a very few cases only, a tiled roof. Fig. 3.5 Shows the house of a small cultivator or yeoman, having tow rooms besides the inner verendah, and granary (*atuva*) on stone pillars: Such a house may have been built in the eighteenth or early nineteenth century; few if any houses older than the eighteenth century survive.

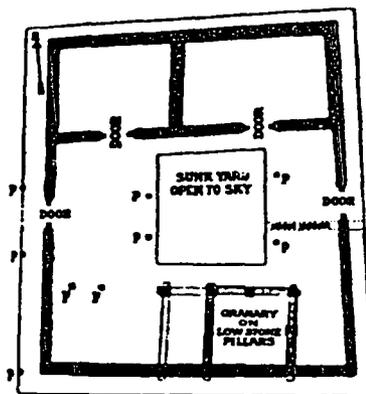


Fig: 3.5

Plan of small Yeoman's house. p.p. wood pillars: Thatched roof over all, except open yard.

Source: Coomarswamy, A 1976.

Yeoman house can be identified as an evolution of peasant house. This inward looking house type was consisted of one courtyard; the rooms were located and entered through the verendah that was found around the courtyard.

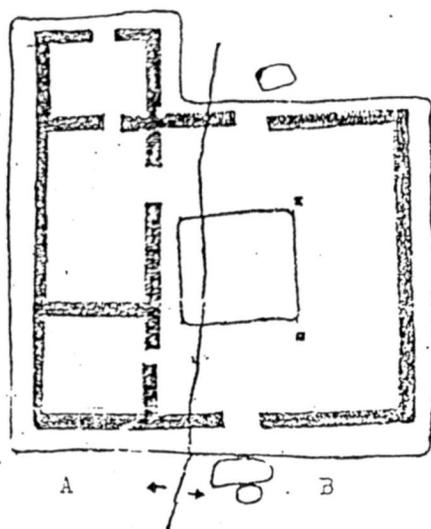


Fig: 3.6

Plan Yeman's House

Source: Basnayaka, N. V. W 1980

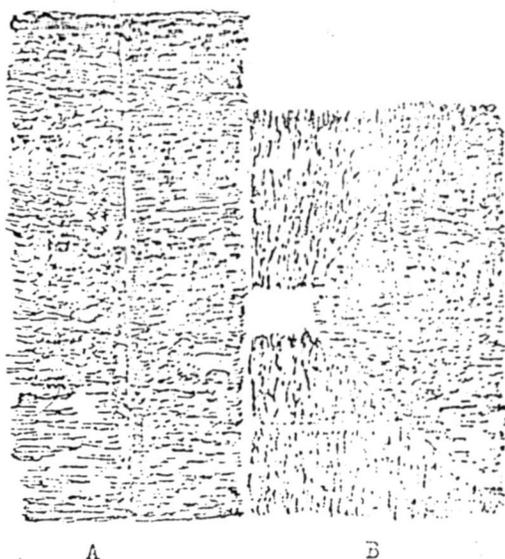


Fig: 3.7

Roof Plan Yeman's House

Source: Basnayaka, N. V. W 1980

This figure shows that the yeoman house is the development of peasant house. Further this evolution has been clearly described in the Dissertation of Basnakaka, N, V, W 1980: 12-15. The Fig: 3.6 show the typical plan of the Yeoman's house in the Dullewa village. "A" shows the part taken directly from the peasant house. The roof plan emphasises this idea more clearly. (Fig: 3.7) Part A has a separate roof with gutters to join the rest of the roof. Section "B" of the plan consist no room. It serves the same function as peasant house external verandah.

The traditional "Hathara adi geya" and the traditional "Wallauwa" type house can be considered an enlargement Yeoman house. (Fig: 3.8)"Dullewa Wallauwa" can be considered as series of Yeoman's house joined together. There has three courtyards joined together in a row. As in the Yeoman's house the rooms are constructed round the courtyard with verandah.

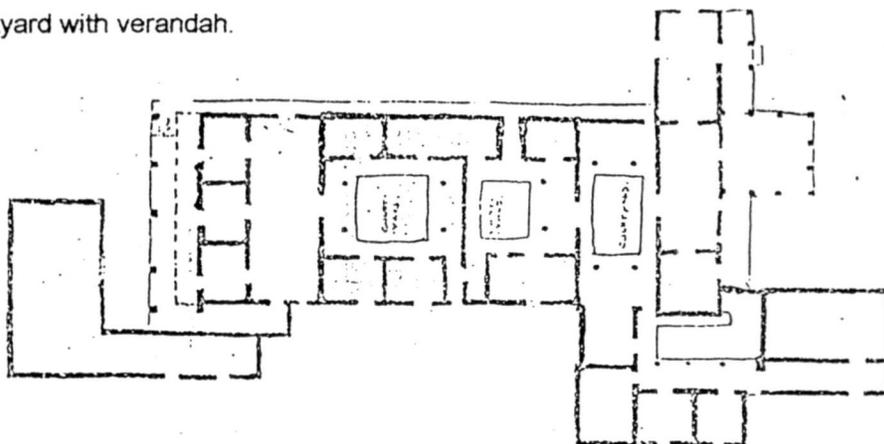


Fig: 3.8

Plan of "Dullewa Wallauwa" Dullewa, Mathale

It is the traditional concept to live in and around the open areas of the house and it was the most suitable for Sri Lanka climatic conditions.

Therefore their traditional concepts are reused in the present architecture our country since it is required by the climate.

Thus the essence of our traditional building like plan form, form, elevation, long eaves and other feature are reused in the modern context due to various environmental conditions. It has been reused that the form of traditional "*Hatara adi geya*" and in the modern urban house.

There may be houses, which are located beside the main road due to the urban context. In such situation it is very difficult to use verandahs towards the road. Therefore the verandahs are located around the in courtyard like in the traditional "*Hatara adi geya*" giving introverted quality to the house.

Blank front elevation is also a main feature in traditional "*Hatara adi geya*" and only the main door is located at the front. It is the demarcation of privacy and the separation between house and the outer surrounding. This traditional blank elevation is also used in modern urban house so as to get the privacy from the urban situation. (Fig: 3.9) (Fig: 3.10)



Fig: 3.9  
Elevation of "*hatara adi geya*", Menikdiwela  
Source: The Architecture of an Island

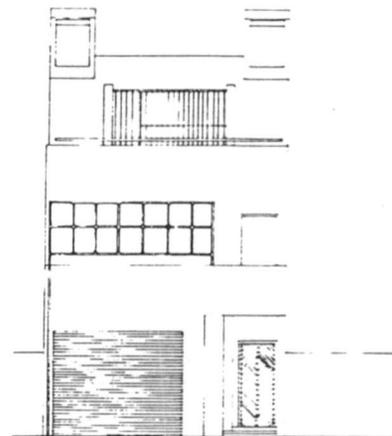


Fig: 3.10  
Elevation of Archt. Pramathilaka  
house  
Source: The Urban Asian House

Therefore it is clearly reuse the concept and the qualities of tradition houses in modern contemporary architecture.

Therefore, these historical evidences proved that they also reuse this less consume materials or the limited used materials. Although there was an abandoned in resources in those days, they lived with a habit of limited using resources. Because all the actives done within the limits of nature.

Change has become most prominent future after the industrial revolution new materials develop, social paten's after very quickly and culture it self is changing faster than ever before. History of our country get changed and much affected by this changing process. It has been started to use cement, brick, and tiles in all the work of building industry. It leads the people to embrace the western ideas and attitudes ignoring our traditional concept and ideas. The government of the country also encourages this new trend.

"In 1868, Mr. Russell, Government Agent at Jaffna, wrote to Government regarding the preservation of ancient buildings, observing at same time, "The study of such works might possibly produce a beneficial effect on the draughts men of the public works Department, Who appear to me to have much to learn in respect of adapting a building to the use for which it is intended and to the condition of climate under which it must be occupied." But the Government remains equally blind to the artistic and the practical value of the traditional crafts; and the Europeanised Singhalese are, if possible, more ignorant and deluded." Coomaraswamy. A. K. 1956:132

They tend to seek quickly way to earn money. This attitudes lead them to used more resources and lager consumption of resources create scarcity and they have to be paid more money. Therefore people tend to seek for alternative materials. This effort results again the reuse concept. Because they seek for remains, disposed material from other activities for lesser value and quality.

More machine power came to exist and the help of machine does all the works. If create poor craftsmen ship within the people. Due to poor craftsmanship, they were enabling to have good carving and mould. Therefore, they tend to buy old building elements, old woodcarvings, and old stone carvings.

In this way, they started to re-use old building elements and other features. Therefore in contemporary architecture the concept of reuse has been used in several ways.

### 3.2 ARCHITECT DESIGN WORKS.

In contemporary architecture, it has been tried to use the concept of reuse very consciously by involving architects. There are various ways of using this concept such as reuse of form, reuse of space, reuse of material.

#### 3.2.1 Example One:

Stanley De Saram House, Colombo.

Architect Geoffrey Bawa, 1972, designed this house. Mr. Saram has a large collection of bought and inherited antiques, which are mainly, belong to sixteenth and seventeenth century. Thus, he wanted a space to exhibit this collection of antiques. Interior design is the main feature in the architecture, because it has been considered antiques as the main character in designing the interiors. Mainly the interior is designed as the space for these elements, because it has been provided suitable space or the suitable environment to place these antiques.

It can be seen as a special character that the reuse of the form of house. The form has been influenced by the Kandyan courtyard house (*Hathara adi geya*). Therefore, the architect has thought that this traditional form is the best form to create the suitable environment for that purpose. Plan form, elevation and the arrangement of spaces are similar to those in traditional '*Hathara adi geya*'.

Huge building wall with few openings will not give any impression to the out lookers. But this huge wall had well separate the house from the external city environment (Fig: 3.12). Because it has given prime considerations to both Privacy and security from this wall, which has been made well, set back from the roadway.

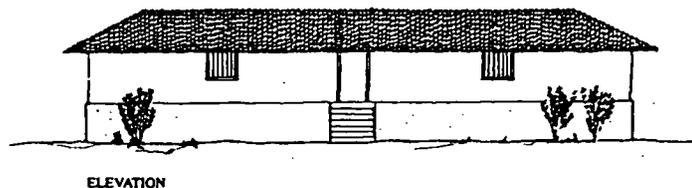


Fig: 3.11 Elevation of the traditional '*Hathara adi geya*'.

Source: *The Architecture of an Island*

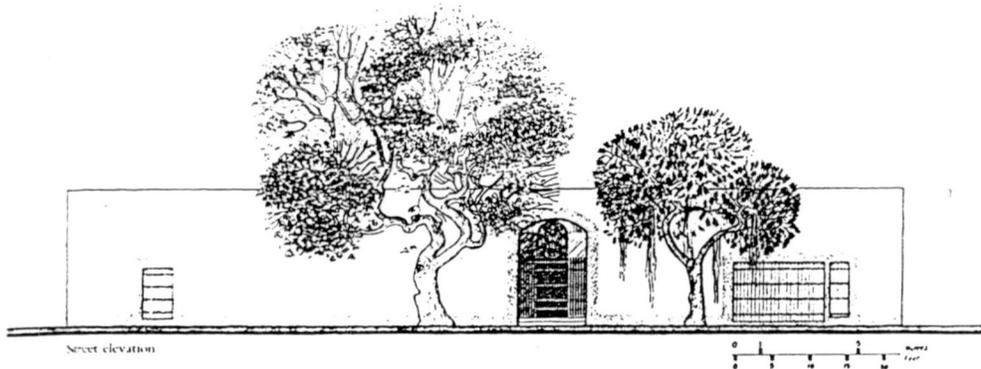


Fig: 3.12 Street elevation of the De Saram house

Source: Geoffrey Bawa

Although it has been constructed in highly urban context, its elevation has a similarity with that of a traditional "*Hathara adi geya*" (Fig: 3. 11). Because this blind front elevation had been a feature of traditional "*Hathra di geya*".



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This Plan form of house also a like to that of traditional "*Hathara adi deya*".

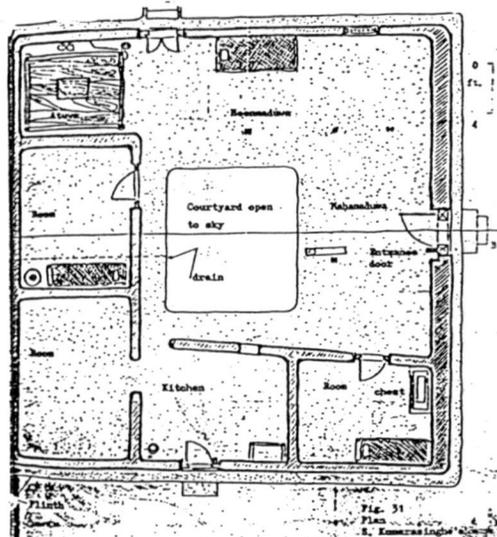


Fig: 3.13 Plan of Sujatha kumariham's House, Dullawa

Source: Basnayaka, N.V.W. 1980

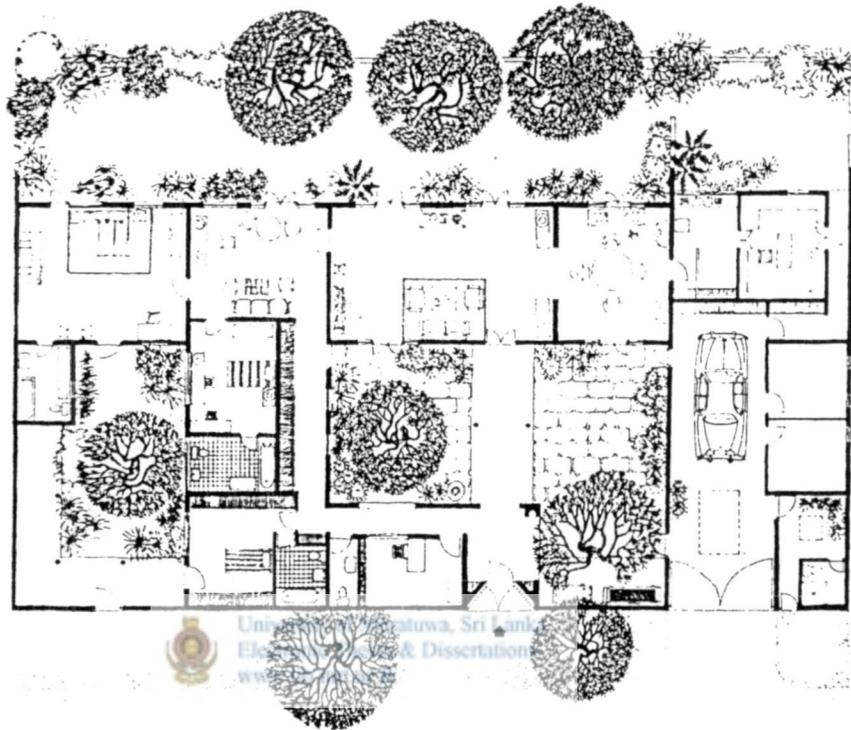


Fig: 3.14 Plan of De Saram House

Source: Geoffrey Bawa

All the public spaces are arranged around the main courtyard and other private spaces are arranged around secondary courtyards (Fig: 3.14). This shows that it was directly influenced by the form of traditional courtyard house (Fig: 3. 13).

The spaces around the main courtyard that is entry and the opposite space to the entry are designed as public spaces. Other two sides are allocated for semi public and private activities.

Living room gives a little separation from the main courtyard by its wall facing the main courtyard. It has been used because of that urban environment, because this little separation has been used to avoid the exposing of the whole house to the entry.

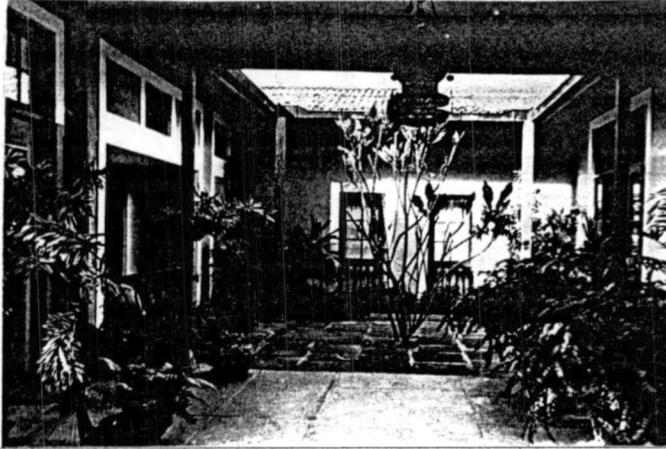


Plate: 3.4

Inner courtyard of De Saram House.

Source: Geoffrey Bawa

Although the form is reused, it is not reused any other material or building in the construction of building and other spaces. It is built using cement, brick and steel. The huge wall covering the house does not say any thing to the out lookers. But the internally it was designed as our traditional house. The modern material used in the old furniture and other elements (Plate: 3.4).

The concept of reuse has been used in the designing of this house because it many required by the client. He may want to show that he owned this collection, which is belonging to his generation. Therefore he may get designed this spaces by the architect, as he required. Thus the architect may select this form of the traditional courtyard house as the suitable form to create the environment that required by the client.

Whatever the reason behind the concept that it is very much suitable to our climate and environment. Because the courtyard house will be given such cool environment which is having natural light and cross ventilation Therefore it is important to mention the reuse of the traditional form is very much suitable for tropical country like Sri Lanka.

### 3.2.2 Example Two:

#### Lunuganga, Archt. Geoffrey Bawa's Private Home and Garden

In the north-western corner of the Southern province of Sri Lanka-Where the Bentota River cuts through a sandbar and reaches the sea- is a lagoon called Dedduwa Lake. When Geoffrey Bawa bought the promontory, it had a dwelling that became the core of the present house, which continues to receive additions.

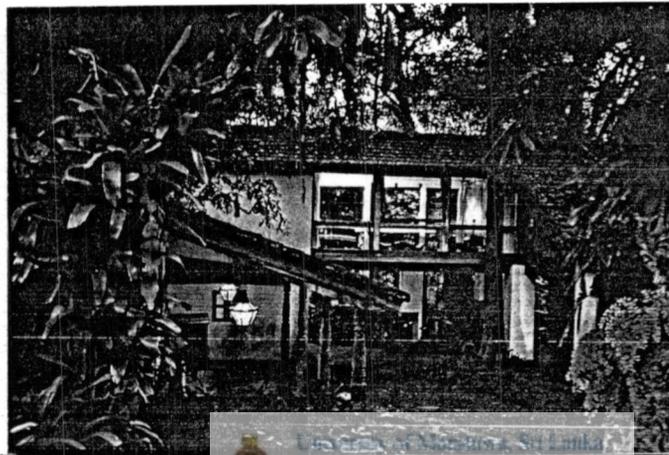


Plate: 3.5

The guest room lies on a bridge above the entrance loggia.

Source: Living Architecture.



The pavilion and the gallery are the extension to an old building. The garden Lunuganga had an old dwelling that become the core of the present house and the present building can be considered as and continuation of that old building.

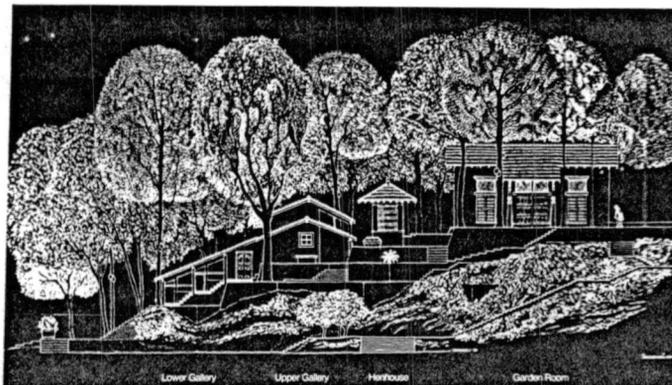


Plate: 3.6

Lower Gallery, upper Gallery, Henhouse and Pavilion, Lunuganga

Source: Living Architecture



Plate: 3.7

Lower Gallery, upper Gallery, and the Henhouse

Source: Living Architecture

Mostly it had been reused old building elements and materials for the construction of new building. Because of the Architect wanted to continue to character of the old building. He may also interest in romantic quality of such works and the value of such elements. It is very difficult to have the texture, colour etc of old building elements in the

present construction. Because of this reason he had reused old building elements and material from previous construction. As an extension to on existing building traditional quality of the old building have been well captured by this present pavilion. It has not been used only structural element and decorative element but also old buildings. furniture, door and windows.



Plate: 3.8

Texture, colour, of old timber column at Lunuganga .

Source: Living Architecture

There are some elements, which are indirectly reused as discussed in a previous chapter. There is a balcony railing, which is made with old door shahs. This balcony also similar to an old attic in our traditional house. Because it has been constructed by using old timber beams and old the detailing of the balcony are the same as traditional timber detailing. This timber detailing adds very lightweight quality of this huge balcony (plate: 3.9).





Plate: 3.9

Interior of the pavilion.

The two-storey pavilion has a wooden balcony level.

Balcony railing, which is made with old door shahs.

Source: Living Architecture

The furniture like "pettagama" adds more grace to the interior spaces (Plate: 3.9) (Plate:3.11 ).

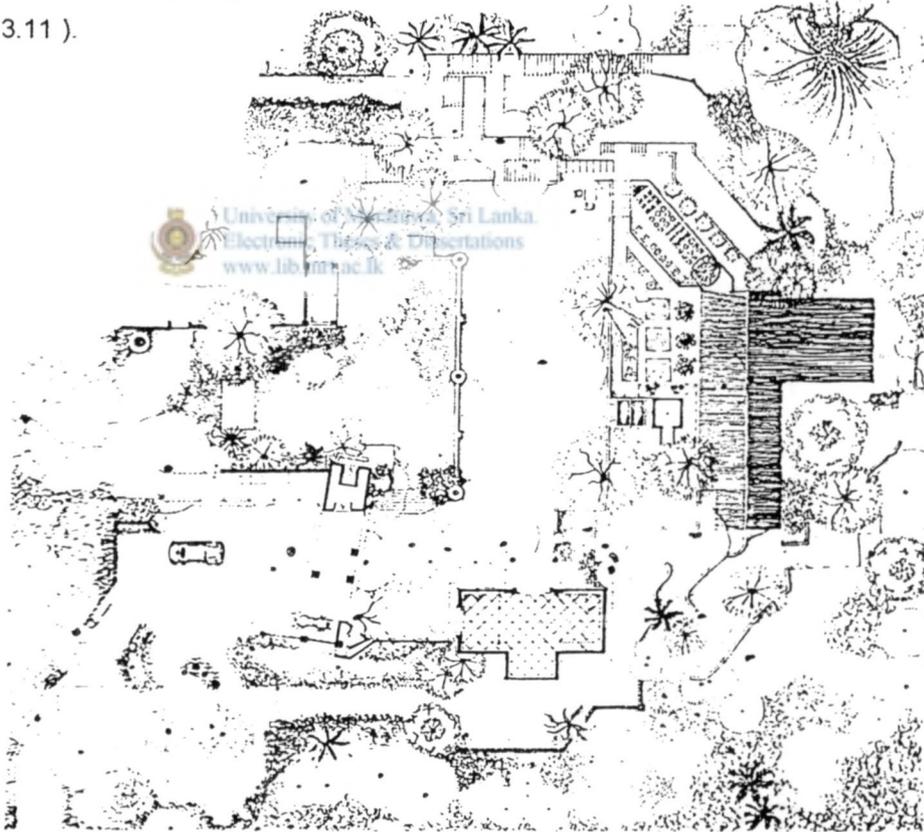


Fig: 3.15

Plan of the pavilion and henhouse, roof plan of galleries.

Source: Geoffrey Bawa

It can be identified the similarity between our traditional houses and this pavilion in the plan form. There are some elements, which are away from the main house. They are small pavilion, gatehouse and the hen house. The hen house has a resembles with our traditional "*Tampita Viharaya*" or "*vi- bissa*" (granary). It can be considered as a reuse of the form of our traditional granary.

The guest lies on the bridge above the entrance loggia. The slab of the bridge of guest room can be considered as a good example intangible reuse. Although concrete has been used for the slab, the slab does not express the rigidity of the concrete. Because the fair face concrete slab remains the texture of the formwork and recall the timber attic in the pavilion. (Plate: 3.10).

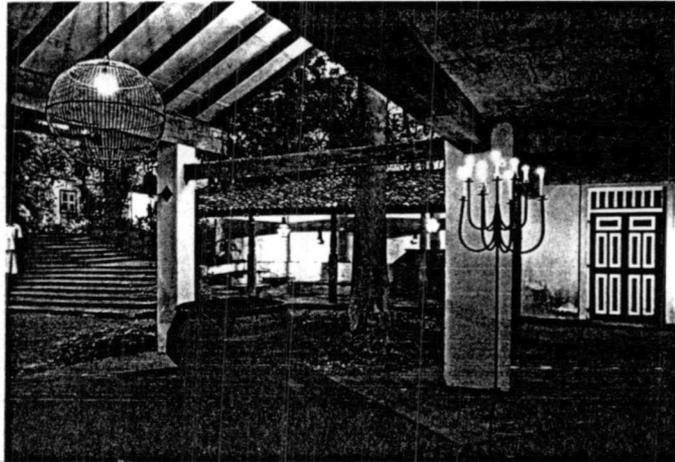


Plate: 3.10

Intangible reuse of concrete as a timber attic.

concrete slab, above the guest room.

Source: Living Architecture



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Plate: 3.11

Timber attic in the pavilion.  
View from the Pavilion toward  
the guest room.

Source: Living Architecture

The upper and the lower galleries are examples of the many buildings added to the original building complex. The galleries seem surprisingly modern in their materials and form idioms without departing from the unity of the scheme.

Although there are modern buildings, they remind their traditional qualities by reusing old building materials, elements etc.. In tower galleries are tradition and modern building elements are used so as to have good combination in this environment. It also shows a good contrast between these two different elements.

The old column has been used as a handrail and thin steel rods bare it. Thus the quality of the timber column be enhanced and it gives romantic moods for the space.

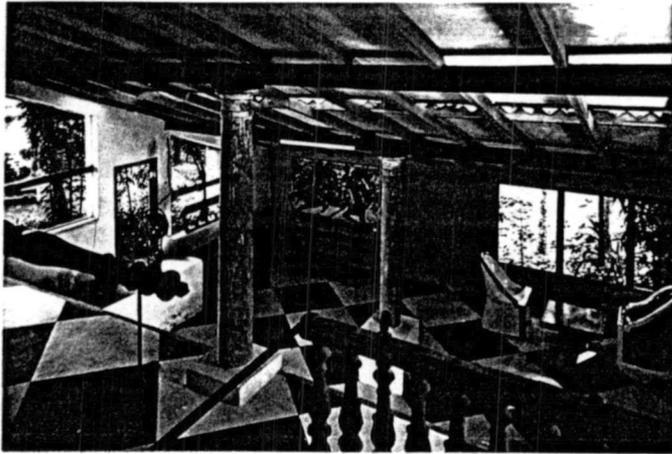


Plate: 3.12

Lower gallery

The galleries seem surprisingly modern in their materials and form idiom without departing from the unity of the scheme.

Source: Living Architecture

Also the timber columns and the timber railing are directly reused in this lower gallery (Plate: 3.12)



Plate:3.13

The interior of the upper Gallery.

Source: Living Architecture

The old timber column is used as a king post on an old timber beam. The floor is finished by exposed brick paving. This rough texture of the floor and the old building elements will enhanced the quality of the space (Plate: 3.13).

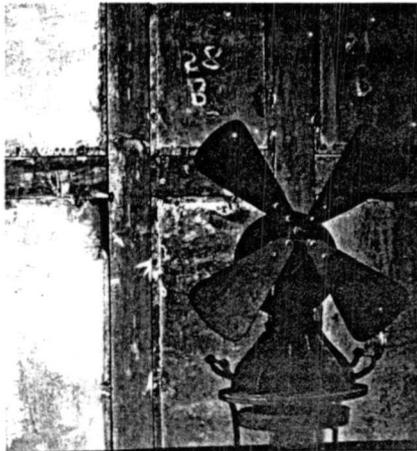


Plate: 3.14

Bawa has a passion for antique mechanical fans.

Source: Living Architecture

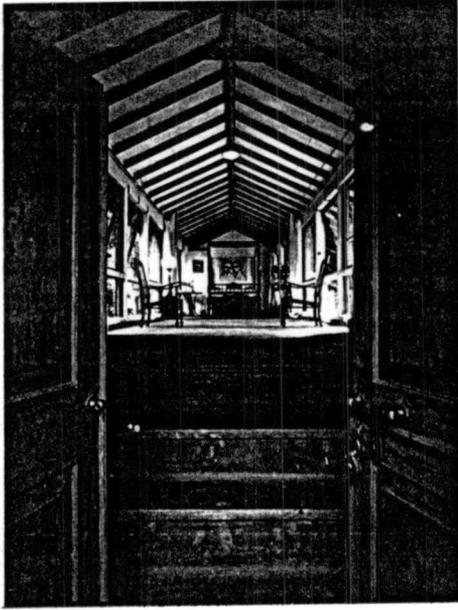


Plate: 3.15

The guest room lies on a bridge above the entrance loggia.

Source: Living Architecture

Lunuganga as a masterpiece of Geoffrey Bawa contributes a lot in the concept of reuse.



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### 3.2.3 Example Three: Cinaman Hill House

This building (1993) is a small guesthouse that is built on Cinamanmon Hill at Lunuganga by Geoffery Bawa. Designed as an artists' retreat as well as a guest residence, the Loggia faces the lake and bordering terraces.



Elevation to lake



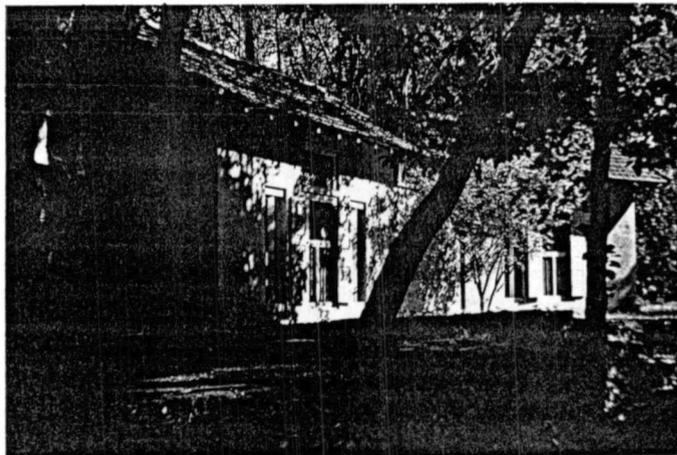
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Fig: 3.16

Elevation to lake

Source: Royal Institute of Australia

Cinaman Hill house is a good example for both tangible and intangible methods of reuse. The concept behind the design is the traditional concept of peasant house and the most of the materials and elements are also taken from previous constructions. Further



it can be consider as a good combination of traditional and modern materials.

Plate: 3.16

External view of Master bedroom and 18<sup>th</sup> century window.

Source: Tropical Asian House

Reuse of two antiques windows (Plate: 3.16) and the large antique doorframe (Plate: 3.18) are the three main elements incorporated with this design. The architect had applied the concept of reuse very simply in this design. The site previously occupied by

a small outhouse in ruins. Thus the site, which was occupied by this old building, has been reused for this present house.

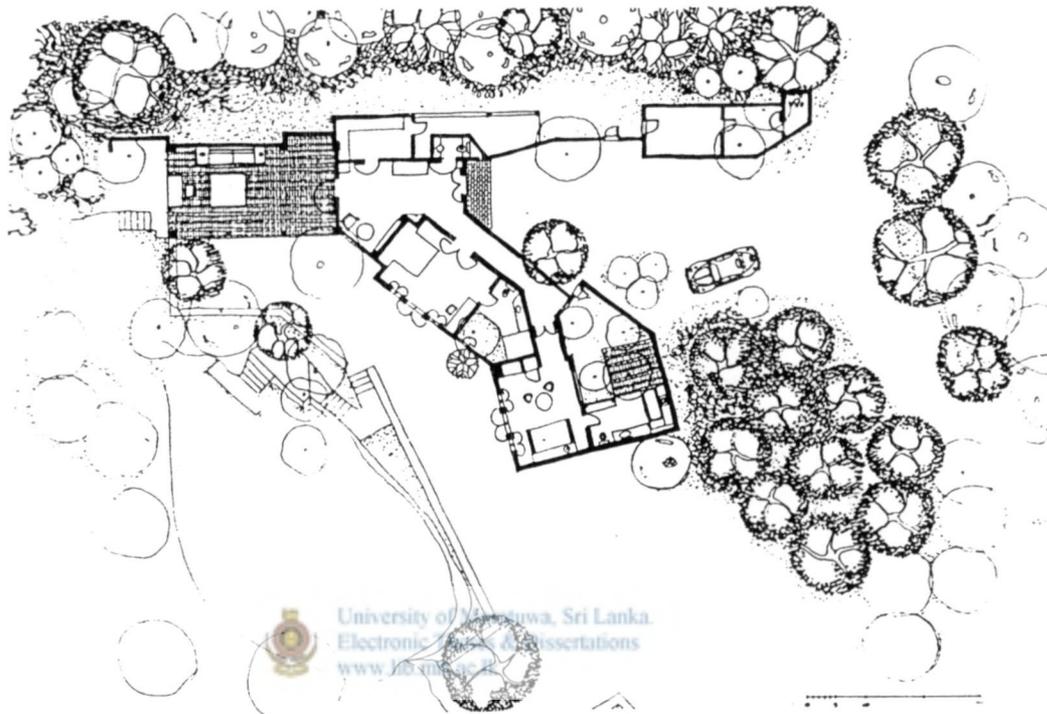


Fig: 3.17

Plan of Cinaman Hill House

Source: Geoffrey Bawa

It has been simply design this house according to its existing context or suitable to the environment. The house is designed with a simple "L" shaped plan and the three major rooms each are with independent high gable roof. Simple form of the present house has been use to so as to give the maximum view of the surrounding environment with a lake. Varendahs in peasant house has been used in a newly manner. Because this open living room has been used to get the maximum view for the house. He had also tried to give maximum view, while giving the maximum privacy to the house (Fig: 3.16), (Fig: 3.17) and (Plate: 3.18).

Entrance door the main feature in the front facade and there is no other elements to decorate this front facade. It has a similarity with the front elevation of the traditional Yeoman house (Fig: 3.11). The windows, which can be considered belonged to Dutch period, give wood special qualities the bedroom for their interior space as well as exterior space



Plate: 3.17

The entrance door approached through a glade

Source: Tropical Asian House

Architect has created good incorporation with old element and the house by reusing those three main old elements. It could add well out look and well proportional quality to the building. It also renews the old quality of this element by this new building.



The reuse of old doorframes in the living room cannot be considered as a direct reuse. Because it is not enhance the purpose of the doorframe but it gives a meaning for that space. It gives a frame view of the environment while giving sense of enclosure for such open living room.

Plate: 3.18

Open Living Room.

Old doorframe gives a frame view of the environment.

Source: Tropical Asian House

Further the building seat in the living room can be considered as a form of reuse. The similar railing of the building seat has been made using old timber railings. These timber railings are also used as the bed head in guest rooms.

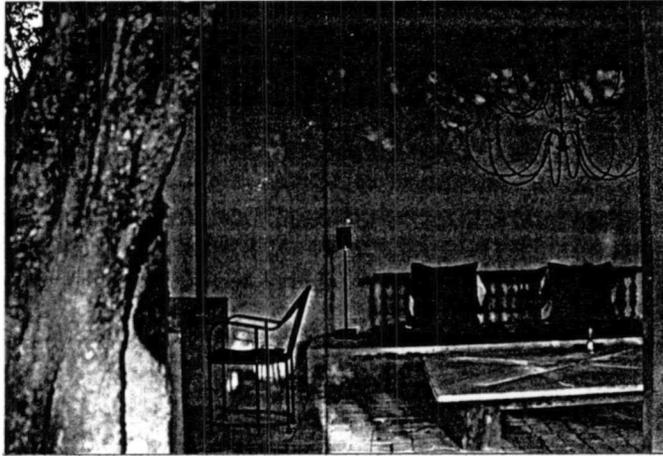


Plate: 3.19

Detail of the living room.

The heart of the house: a convivial space which is in harmony with nature.

Source: Tropical Asian House

The exposed bricks in the floor of living room also taken from a previous construction. This exposed earthily work will create close link between built environment and the natural environment (plate: 3. 19).

The concepts of traditional peasant house have been used to suit the existing context of the site. The house is considered with three main buildings, which are designed according to the simple traditional form of the house. The new concept was to link these buildings by flat concrete slabs and these linkage will create courtyard meaningful the passages create by these linkages will fulfil the purpose of the varendah in peasant

house. Thus it can be considered as modifications of the concept so as to suit with the existing context



Plate: 3.20

Courtyard. link with bedroom.

Existing tree, which is retained in the open to sky.

Source: Tropical Asian House



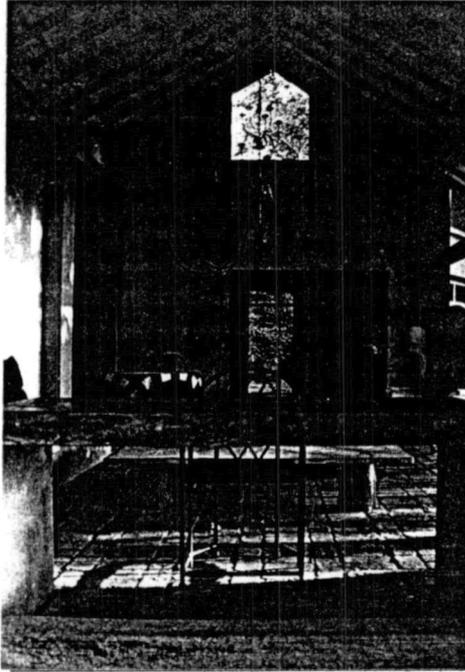


Plate: 3.21

Living Room leading to entrance door through study area.  
Morning sunlight penetrates through the trees

Source: Geoffrey Bawa

Therefore this example shows how our traditional concept has been used meaningfully in the present construction. It also shows how to reuse old materials and building element beautifully and meaningfully in the new construction works.



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### 3.2.4 Example Four:

#### Lidia Gunasekera House, Bentota

Architect Geoffrey Bawa, 1978, re-designed this house. This house represents a marvellous exercise in adaptive reuse of traditional space. Previously there were two houses, which are built facing immediately onto the Colombo-Galle road in Bentota. This two house on this site were originally built in 1720 and 1740. One of them was on the present site, the other on the other side of the road.



Section A-A;

In elevation of old house

In section of new house

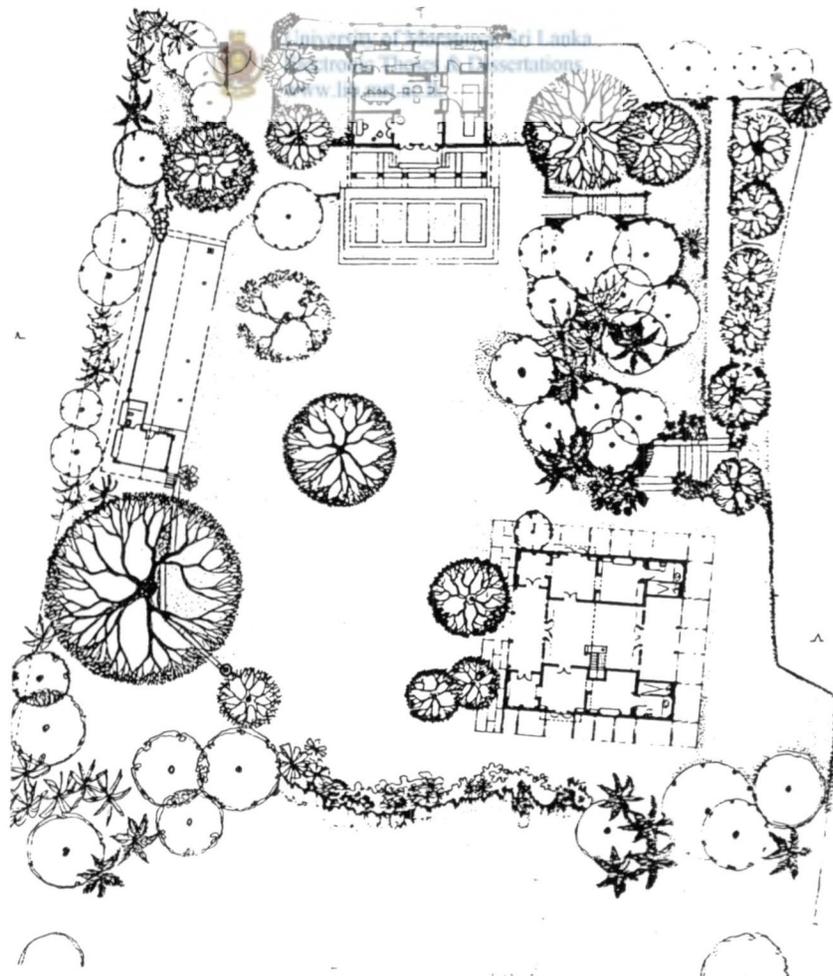


Fig: 3.18

Ground floor plan and section of the house

Source: Geoffrey Bawa



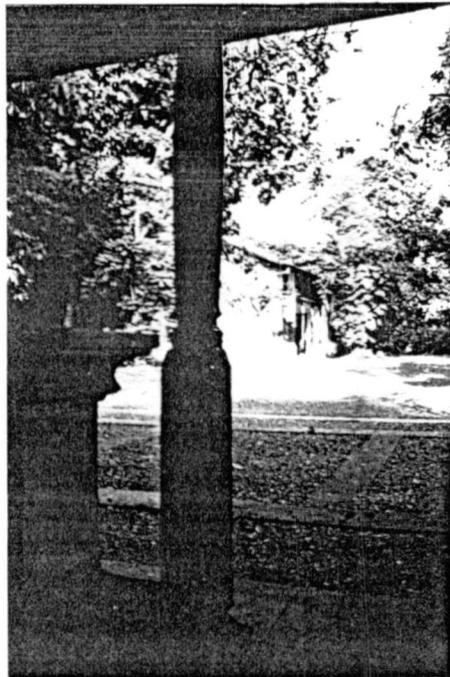
Section B-B :

In section of old house

In elevation of new house

Due to the development of the road previous context has to be changed. Previously there may be good interconnection between these houses due to the low scale house cart road. Because of the enlargement of the road, the privacy given to the house was disturbed. But the interconnection between these two houses has to be continued. Therefore it has to be changed in several ways.

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Interconnection created by two verandahs facing each other gets disturbed. Therefore the first house was turned back from the road. Further front wall was changed as a blind wall to have the privacy to the house. The front verandah added to the east and a blind wall built along the full length of the property as presented to the roadway. Therefore the position of the front doorway changed.

Plate: 3.22

The old verandah was re-position to east from front side  
View of the compound interior from old building verandah.

Source: Geoffrey Bawa



Therefore the traditional verandah concept was reuse to suit the existing context. Elements and materials from the previous verandah are reuse for the construction of new verandah (Plate: 3.23) (Plate: 3.24).

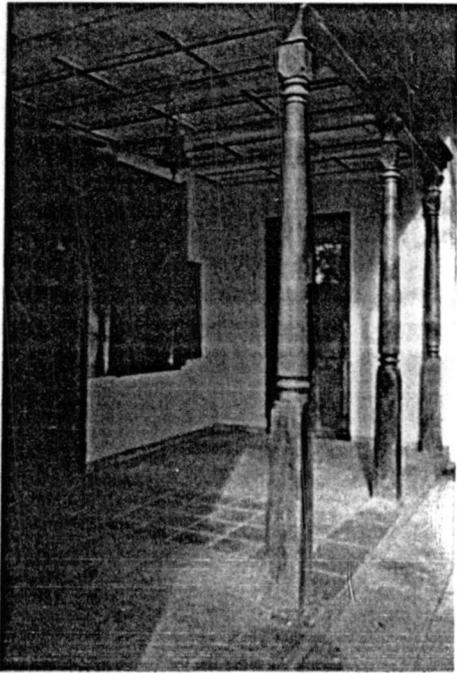


Plate: 3.23

Verandah of the new house

Source: Geoffrey Bawa

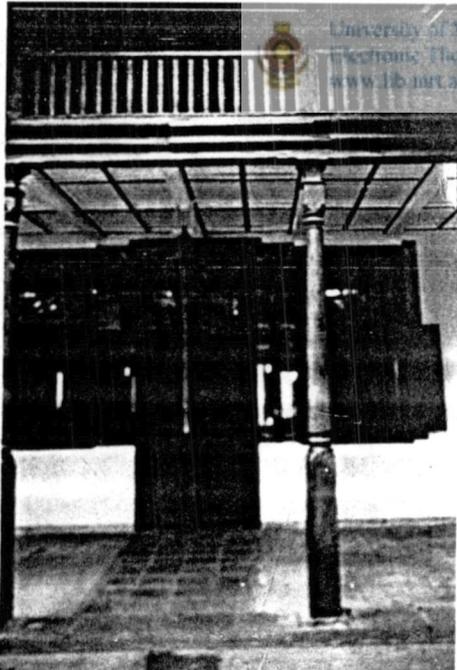


Plate: 3.24

Verandah and upper gallery.

Source: Geoffrey Bawa



Plate: 3.25

View from the new house across the garden



The other house opposite was removed to rebuild to regain the previous interconnection. It is similar to "Purana gama" where the entire houses were formed to face each other to have such interconnection (Fig: 3.19). Therefore architect wanted to continue this idea so as to have that quality in this context. Thus the other house was demolished with care. Since the wall were built of random stonework set in lime mortar, it was not difficult to remove and upper floor wooden columns without damage as they were required for the purpose of reuse in rebuilt of this house several changes had to be done according to the existing situation without disturbing the original character of the house.

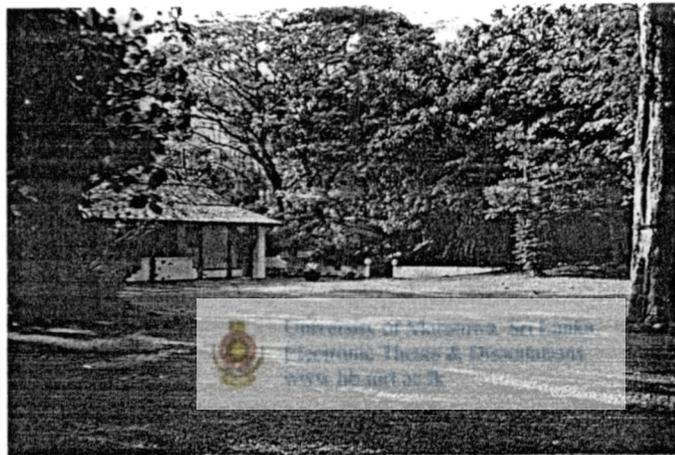


Plate: 3.26

East façade of the old house across the garden.

This verandah was re-position to east.

Source: Geoffrey Bawa

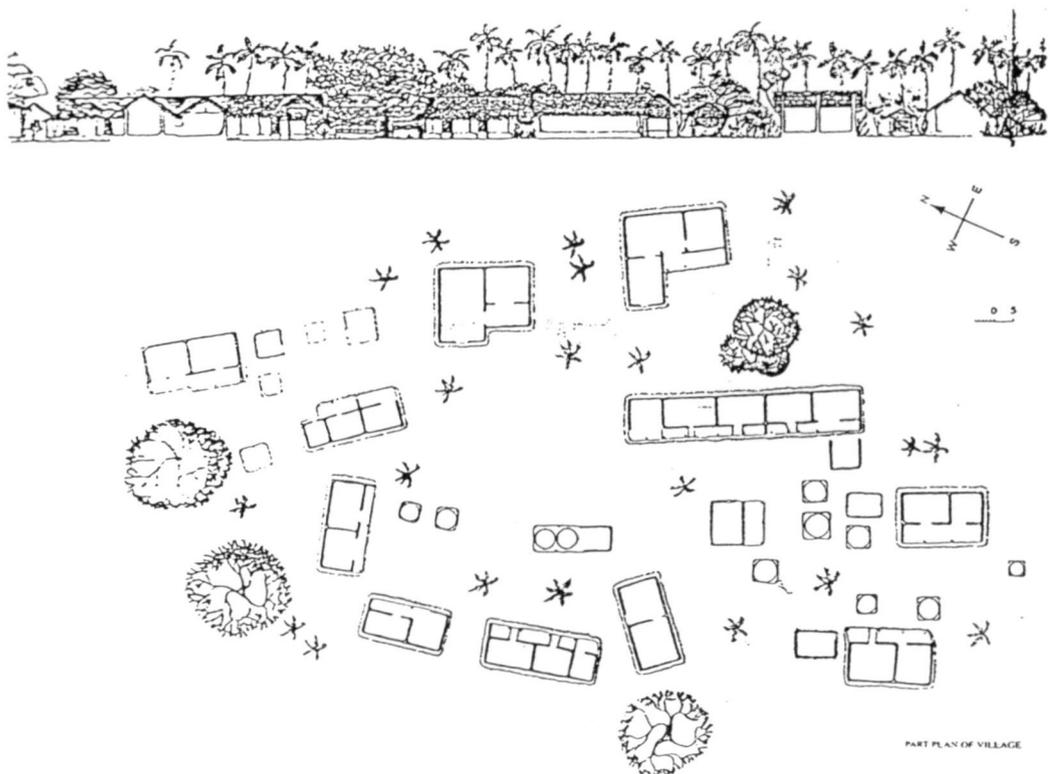


Fig: 3.19 The Sinhalese Village of Mahakirinda, Kurunegala

Source: The Architecture of an Island

This example can be considered as a good example, which could recapture the traditional qualities and character of the building by reusing its old traditional concept, traditional forms and traditional material and element.

### 3.2.5 EXAMPLE FIVE; Jayakody House at Colombo

Architect Geoffrey Bawa, 1995; Designed this urban house is much different from the previous houses, because the concept of reuse has been applied in different way. It has been used old doors, windows, timber Columbus and other building element

There may be several reasons for reusing these building elements. One reason that there may not be available such creative craftsmanship during this day due to machinery works. Because these traditional elements are move valuable and enriched by a fine finished. There may be a personal attitude of the client behind this reuse of traditional elements. Because he may want to tell that he is coming from such generation, which is bequeath that type of houses with traditional elements. It traditionally these house where considered as "Walawe" in the village. But it is difficult express in Colombo that he is owned such things. Therefore using their traditional element, he has such family background.

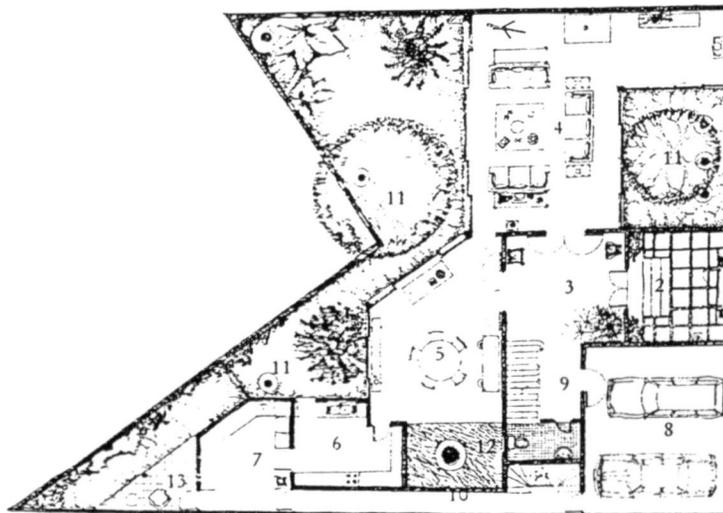


Fig. 3.30 Ground Floor Plan of Jayakody House Source: Tropical Urban House





Plate: 3.27

The Street Elevation is modest and restrained

The blank wall, like elevation of "*hatara adi gaya*", covering the house does not say any thing to out lookers.

This old door acts as an entrance gate.

Source: Tropical Urban House

Incorporated in the entrance hall of the house are four tall green painted doors with peacock fanlights. The doors came from great 18<sup>th</sup> century house.



Plate: 3 28

Beyond the entrance gate is a high walled courtyard. The house is entered from a narrow street into a high walled courtyard.

This old door similar as entrance gate

Source: Tropical Urban House



Plate: 3.29

Front courtyard from living room.

Front small garden, covered by front blank wall, therefore it act as a courtyard of living room.

The principal room are wonderfully, naturally ventilated spaces with surprisingly efficient cross breezes moving through the house from the peripheral courtyards.

The sensual paterens of sunlight and shadow play upon the internal

walls of the house.



Plate: 3.30  
Rear courtyard

Rear small garden, covered by boundary wall, act as a courtyard of living room.

A tall mature tree casts delicate shadows on the yellow ochre wall of the rear courtyard.

Source: Tropical Urban House



Plate: 3.31

View from the light well across the dining room

The slow movement of the sun across the courtyard wall is magical.

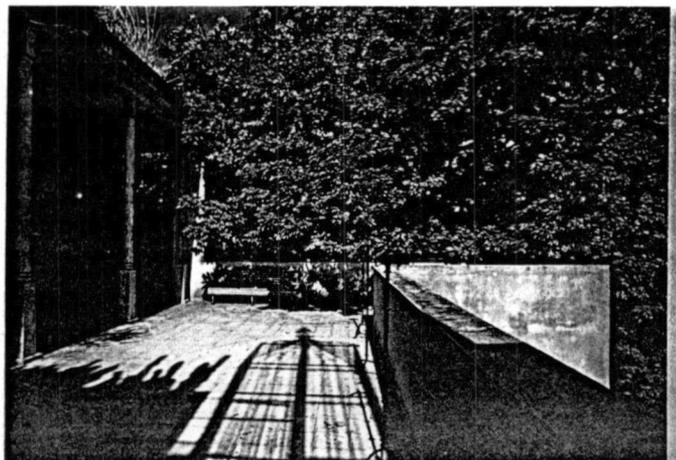


Plate: 3.32

Roof terrace and Verandah.

The roof terrace is a different world, a retreat from the noise and dust of the city.

In urban context, roof top use as a garden. This roof-terrace for adapting to tropical climate.

The verandah demarcate by these old column, the roof of which is supported on columns salvaged from a demolished mosque.

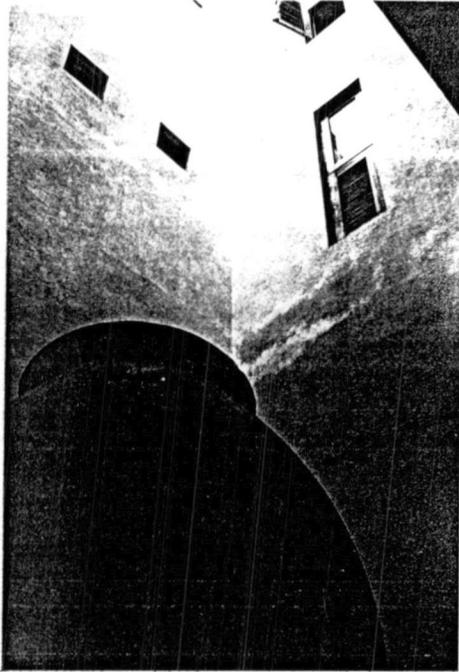


Plate: 3 33

Tall, narrow light well

Tall light well, painted in cobalt blue, that permits sunlight to tumble into the dining room throwing a huge clay wine amphorae, that stands at it's base, into stark silhouette.

Whatever the personal attitude behind this design, it can consider as the concept of reuse in contemporary architecture.



## Discussion

Example are selected to show how the concept of reuse has been in contemporary architecture. Because it was clear that this concept has existed in our traditional architecture up to recent past and transferred its valuable solution from generation to generation.

Although some of them exist in contemporary practice, most of the buildings are done without given any condition to this concept. Most of the buildings are mere imitation of building in western countries. Therefore these building may not suit to tropical countries like Sri Lanka. Concept of reuse and the principle of sustainable architecture were existed in our traditional architecture since they are needed by the climate of our country. The disregarding of these concepts creates great problems in our architecture. Traditional courtyard house was a good solution for the outdoor living need by the tropical climate. But most of the modern buildings are fully enclosed with large glazing. This create huge problem in ventilation and heating. People have to go for air conditioning of their buildings and will results other environmental problems. In this way people have to face various problems with the bad effects of the abundance of these concepts.

Since the Sri Lankan people enriched by the set well developed traditional concepts could generate new concepts to suit them for modern context by the incorporating those traditional concepts. It could get meaningful modern buildings in contemporary architecture by reusing these concepts. Thus it could establish our own architectural language which is consisting an identify as Sri Lankan architecture.

It is thus important to revitalizing these concepts as a major role in our contemporary architecture.



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## Conclusion



## Conclusion

"Tao the way-the basic Chinese belief in order and harmony in nature. This grand concept originated in remote time from observation of the heavens and of nature- the rising and setting of the sun, moon and stars. The cycle of day and night and the rotation of the seasons suggesting the existence of laws of nature. A sort of divine legislation that regulated the Patten in the heavens and on earth. Its worth noting that the original purpose of rituals was to order the life of the community in harmony with forces of nature (Tao), on which subsistence and well being depended". Mai-mai Sze: Quoted by Simons, 1983

Ancient man honours the nature by taking it to a spiritual level or giving divinity to the nature. They are natural resources as a Devine gift and save it for the sake of future generation. This less consumption lead them to reuse the resources, it is thus the concept of the reuse had its early root from the primitive time.

Environment, however does not determine history since the man himself is the dynamic factor in history. Although the nature plays a grate part in the man's history and influence the man's life, the revolution caused by the development changed the man completely from the primitive man

Because of this rapid development, human requirement for the existence also get increased. People had go for mass consumption to fulfil these unlimited needs. The mass consumption society had created mass throwaway society and it was unavoidable to have the problem of scarcity. To be solved this problem must come to terms with their tradition. It had lead the reborn of the concept of reuse and the concept of sustainable development. Therefore the people have to go for less consumption of resources and get maximum use of that consumption.

Therefore the concept of reuse comes to exist in the built environment or in architecture because of that rapid development. In the context of increasing in the need of the concept of reuse, this study was oriented to emphasize the importance of the use of this concept in the built environment and the way its applicability in Sri Lankan traditional architecture practice and contemporary practice. This study was done assign the concept of reuse in architecture.

To achieve the above intention this study will be compiled with three chapters

Searching the concept of reuse started this study and its evolutionary process as a concept. It was cleared that the concept of reuse was not a new and has existed since the stone age of the history. It is also apparent this concept was developed with philosophical and cultural background. Chapter one would thus give a theoretical base for the study.

After establishing idea of the reuse as a concept, chapter two will seek for the analysing of this concept under several Principles. The concept was summarized and arranged into a framework to evaluate the applicability in architectural practice. Therefore chapter two becomes as the connection between chapter one and chapter two that is theoretical base and the practical situation.

Chapter three was an attempt to analyse the applicability of this concept in the local context. It was discussed firstly the concept of reuse in the traditional architecture of Sri Lanka, Then its applicability in the contemporary situation,

According to analysis of traditional Sri Lankan architectural practice and contemporary practice, it was clearly that the concept of reuse has existed in Sri Lankan traditional architecture up to recent past till some of them exist in contemporary practice also. Traditional architecture practice of in Sri Lanka therefore can be identified as the best architectural practice, which is suitable for tropical climate, and also it has transferred its valuable architectural solution from generation to generation.

Contemporary architectural practice has banded the concept of reuse or the most of the great solution in traditional practice and faces an uncertain future. The need for re-existing of the concept has been highlighted in the study by showing the importance by several examples for future architecture of Sri Lanka. The examples are selected to manifest how the concept of reuse has been used in contemporary architecture and the importance or suitability of it for the local situation. Evolution of this concept through the history in our traditional architecture can be discussed deeply with examples considering vernacular pattern. Thus it can be given as a separate study. Therefore Chapter three can be studied as a separate study.

The study area of the concept of reuse is so vast and the contribution and the time for a complete research will require more time and effort, than the present exercise. This study is confined to the need to make awareness about concept of reuse in architecture

and to emphasise the importance of applicability of this concept in contemporary architecture. Therefore this study has analysed the local situation only and has not analysed the situation on other countries in depth. The study can be extended further by orientating it towards the western countries with their architectural solution. Since the study area is so vast this study can be considered as a stimulance for the concept of reuse in architecture.



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