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# SRILANKAN VERNACULAR ARCHITECTURE AS AN APPROPRIATE RESPONSE TO THE BASIC FORCES IN BUILT ENVIRONMENT.

A CASE STUDY ON VERNACULAR ARCHITECTURE IN  
RATHNAPURA DISTRICT

A dissertation submitted to the University of Moratuwa  
As a partial fulfillment of the requirement for the  
Degree of Master of Science in Architecture

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# INTRODUCTION

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## INTRODUCTION

It is widely achieved that the built environment is made as a resulting of three basic forces; namely social technological and environmental. This has the conformed by the well-known researcher Amost Rapoport too. Early people built their living space as response to the basic forces in built environment. They lived in vernacular houses, which were very close to the nature. Building materials used were not harmful to the dwellers. Vernacular architecture in sri lanka indicates regional pattern and type which were created in different basic forces of respective regions. This study is on attempt to understanding vernacular architecture as a response to the basic forces.

Building orientation

Building forms

Use of materials



Will be studied in depth. The vernacular architecture is not only a response only to basic forces, but also a masterpiece of beauty and physical and social functionary.

## JUSTIFICATION OF THE TOPIC

Current situation in Sri Lanka is seems to be developing past in terms of the built environment. When we consider this most aspects are not good in related to the human comfort in living environment. This is worst in case of Rathnapura district. Especially according to gem industry more new buildings are immerging. Also in terms of government building projects more and more construction is taking place.(Eg. **Ruwanpura national collage of education, New Bus stands at rathnapura** etc.) But all of these buildings are not good in considering conditions, which related to the human comfort. Because these are not fully responded to

the basic forces in built environment. Even though we can find very good examples in this area with good conditions of living environment, these are buildings belonging to the vernacular period therefore it is very essential to do an analytical study of vernacular building about how to response to the basic forces. The vernacular can provide new models by reworking traditional forms, to live with nature.

### **OBJECTIVES**

Several research works on Sri Lankan vernacular architecture have been carried out, but all most all of that have failed to contribute towards improve the local architecture. This is worst in case of rathnapura district. When no informal at all over available. The objectives of this study are to investigate the vernacular architecture of rathnapura district in depth, with emphasis on the primory forces. And see in possibility adopting any of case in modern context to improve living environment. Rathnapura district which has divers climatic environment and technological conditions is an ideal model for a study of this nature

### **METHODOLOGY**

1. Understand regional variations and principles of vernacular in rathnapura district by examine following

Selected case studies from different region

Literature and document review

Understand the change and development take place during the recent past.

2. Obtaining first has owners of vernacular houses and gets information from knowledgeable persons.

3. Examination of the construction projects and design proposals availability of vernacular elements in progress.



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# CHAPTER ONE

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## CHAPTER ONE

### THE VERNACULAR ARCHITECTURE AND HOUSE FORM

When we talk about the built environment, we are referring to something a great deal broader than the environment defined by the buildings, for we have built around us a world controlled by our system. We have transformed it with systems of irrigation and flood control, systems of communication and transportation, systems of land management of agriculture human settlement, and systems of *defense*. Although many animals build complex and wonderful shelters for themselves, the human race has distinguished itself by building on a vast scale and by building more than what is necessary for survival

Human endeavors in the built environment have been governed by two distinct traditions, which have existed side by side since the beginnings of civilization. Each tradition can be identified and understood by its own unique priorities and design principles. The two historical ones are now recognized as vernacular and the high style traditions the first has served ordinary people in their daily lives; the second has belonged to the elite, to governments, religious cult institutions.

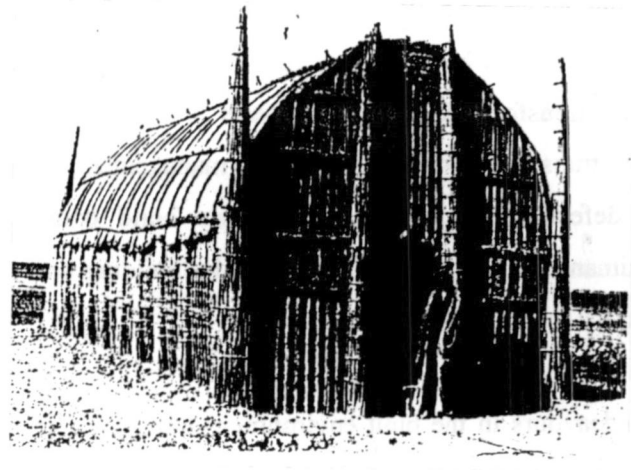
#### 1.1. The Vernacular Tradition

The physical environment of man, especially the built environment has not been and still is not controlled by the designer. This environment is the result of vernacular (or folk or popular) architecture and it has been largely ignored in architectural history and theory. The first artifacts and human shelters were made materials found close at hand. Through a long process of trial and experimentation, designs were developed to serve the users as efficiently as possible. They were shaped according to their purpose, and their form changed only if a refinement in design or a new approach made a significant improvement in their performance. They followed the principles of vernacular tradition, which links the present with a distant past. Early forms of tools and shelter provide excellent examples of human ingenuity and resourcefulness within the tradition.

They show how locally available materials could be exploited to make sound dwellings, well adapted to site and climate and pleasing to the eye.

Another determinant of vernacular traditions is the way of life of the people. Obviously, fisher folk have different needs from farmers, and animal herders have different patterns of settlement from those who raise crops, nomadic people have developed highly specialized portable buildings that they can carry with them. Although vernacular traditions can be explained in terms of their response to material needs practical opportunities, these factors alone cannot explain the rich variety of form. Many types of arts and dwellings and their details can only be understood as symbols of diverse cultures. Ritual and ceremony have been of great importance in determining the organization and design of buildings. The value systems and social hierarchies of the owners are often clearly expressed. For example, in many African villages, the design of a family compound will clearly show how many wives the head of the family has, the status of children, and whether cattle are more important than grain. Sometimes the forms of dwellings can only be explained by tracing them to an earlier phase in the history of the group now inhabiting them. House types can be surviving even though prevailing conditions change. An outstanding example of such survival is the kiva, the ceremonial space of the Anasazi Indians of Colorado and New Mexico. The origin of this subterranean space is to be found in the ancient dwellings of Siberia. There, the sunken pit central hearth, covered with a thick insulated layer of turf over a wooden roof, was a response to a hostile climate. (Source-*The built environment...*)

Fig. 1.1  
Dwellings  
Of  
Marsh  
Arabs



### 1.1.1. Characteristics of vernacular tradition

- a) Vernacular building and crafts are the province of ordinary people. The buildings or makers generally the owners, or specialists within the immediate community
- b) Materials used are found close at hand and therefore designs have strong local or regional character.
- c) Designs are utilitarian. They are made for their purpose, fitting to proven functional patterns.
- d) Building and village design is well adapted to climate, solving problems by the use of natural systems.
- e) Changes in design are slow to develop. Craftspeople are conservative and prefer to make use of experience of previous generations. The quality of work is sound and capable but often rough and unrefined.
- f) *Cultural symbolism, ceremony, and ritual* also play part as influences in design. Sometimes practical needs are overruled by the desire for symbolic elements.



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Vernacular is also characterized by the greater importance and significance of relationship between element and the manner in which these relationships are achieved, rather than by the nature of the elements themselves.

### 1.2. Architecture as an Evolutionary Process

Everything in the universe is subject to the phenomenon of change. They are moving and changing from moment to moment. What ever we did a moment ago was past and later it will be future. The reality is that itself is eternally and constantly in movement and all things are in a state of flux, and the movement mean a succession of linked events originated with symptom and projected towards and ultimately goal. Buddhism describes this cycle of process with life and defined life as a changing and flowing experience on which nothing could be permanently held and that it is evolving in a cycle.

***“Our experience of life is evolutionary. Evolution is the death of one, a rebirth of another in momentary continuity”***

*(Coomaraswamy A.K. 1981. page, 20)*

The above process can be applicable to architecture too. Changes has become the most characteristics phenomenon of our age, new materials develop all the time, social patterns alter quickly and culture itself is changing past than ever before.

***“ Architecture is also connected to the past. It is a great having creative spirit which proceed from generation to generation and also from age to age and creates according to man and his circumstances as they change”***

*(Wright F.L.1974)*

What we do today is not only a part of history but also a part of the time. This is the transition from old to new from traditional to modernity and in a simplistic way from the problems of the past of the solution of the future. The process of change in architectural forms is more intense rapid than ever before. These changes is built form are always inter connected with changes from one place to the other. This cumulative process repeated over and over again and experienced over generations will established traditions. Tradition is living and always fresh and changes with time and the changing needs of the society.

***“Anything that was not acceptable to the society was gradually rejected only what was proved useful for people were retained and adopted and developed well fitting built forms”***

*(de Silva T.K.N.P.1990, page 2)*

### **1.2.1. Formation of Rural Vernacular Architecture**

#### **(From Primitive to Vernacular)**

We all build, we design and build our lives from one experience to another. They areas many reasons to design and built as there are objects of the built environment is constructed to fulfill human purposes. The built environment consists of several traditions, which help people to change from one era to another. Among those there were significant traditions, which are different from



each other, but are like together to serve the peoples needs, known as "primitive and vernacular". The frequently used terms "primitive", "vernacular", and "popular" are by no means equivalent. "Primitive" refers to cultures and cultural products that are essentially different from our technologically less advanced than those of the western countries and the great civilization of the orient. "Vernacular" is usually taken to comprise all architecture thought of as uncultivated-without a conscious style and unrelated to what we think as "official" architecture in each spectrum of regional variants.

*(Source, primitive architecture)*

Before going any further it is necessary to define the term vernacular with reference to houses to its here being thought of as a social as well as an architecture phenomenon. In its context it's generally used with three distinct but related meanings. First vernacular houses are of traditional form, are built in traditional ways, with traditional materials and use traditional ornaments. Secondly they are common within and peculiar to one more limited parts of the country. Thirdly they are small and mean in comparison with some of their neighbors. The concept of vernacular but forward hears is not in conflict with any of these and in a way implies all of them. It is this, vernacular buildings are those which belong to a type that is common in a given area at a given time.

It follows that a kind of building may at any one time be vernacular in one area and non-vernacular in another and in any one area may change in the course of time from non-vernacular to vernacular. In other words no building is, or is not, vernacular for its own qualities but if so by virtue of those which it shares with many others and the identification of vernacular building is very much a matter of relative numbers *(source, British vernacular house)*

When considering the building of folk society, were more closely related to the people and the tradition of the locality. It is a result of unselfconscious translation of human needs in to built form and most simply refers to that produce by people for people in the locality of community of people, for primitive man the relationship with the site was personal there were no sharp distinction between the man and nature. The materials available were no simply objects but were full

of life. Built according to their own style and imagination, making was considered as a spiritual a

***“Primitive forms are as good as a result of process of gradual adaptation that over many countries such forms have gradually been fitted to their cultures by an intermittent through persistent series of corrections”***

*(Alexander C. 1967)*

Also these persist for very long time and with this persistent the form is finally adjusted until it satisfies most of the cultural, physical and other requirements. The recognition of these local building forms altering with the climate, social and other changing needs has led to the use of the term vernacular architecture to identify them.

#### **1.2.1.1. Souci - Cultural Factors**

Culture of a society can be described as the attitude of a society or may be a collection of attitudes of individual members of that particular society. Although an individual may retain certain taste and values his type of life is greatly dictated by the tasted and values society. This is more due to the society looking down upon persons who seem to be out of step with them. This tendency to be the in the correct vogue has a great influence even in the house form. Even so traditional and cultural patterns of behavior of each community or of each community or of nation have their impact too on the form of the house. It is quite evident that the diversity of design and form of houses are due to different value systems, attitudes, Cultural back grounds, society and the social statues of the inhabitance in each community or nation.

#### **i) Society**

##### **a) Man and Family.**

Family, the smallest unit of the society has collective expressions of old members within it. Social groups are forms by persons engaged in smaller action plan having common interests. Therefore they have similar life patterns. Each individual has the set of habits in action. Though reactions. He has identifiable details like his habit of speech, behavior, the clothes he selects etc. what as the member of the family he has a role to play.

A specific social group could be distinguishing in terms of their roles prestige power and occupation and also a certain degree of organization of such activities specific unite. For the existence of the group the role-played by the members (Families) involve more or less. Enduring patterns of co- operative action among them. Number of family units with common attitudes and interests make a social group and a collection of those Social groups bond to together by common needs, goals, patterns of interactions and interrelationships make a unit that is society.

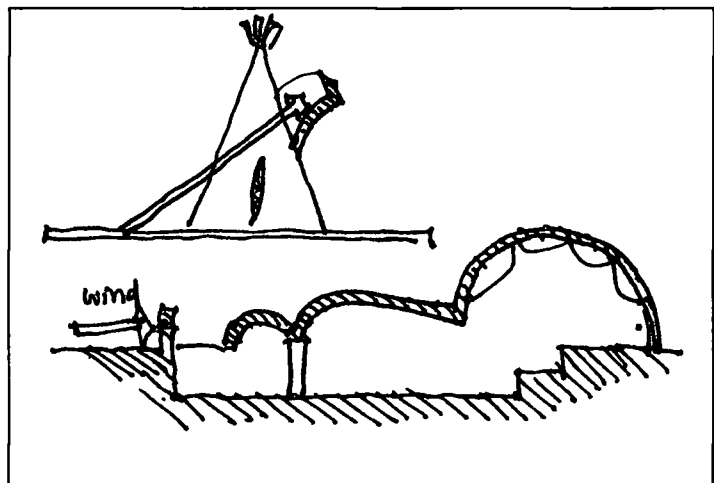
#### b) House and Society

The house is one of the most prime importances of the society. Form of the house, materials, and planning reveals, and the living patterns of the members are importance of that particular society.

***"Most simply expressed, a house is a form of shelter. At different times in different places it appears in a variant in form. The teepee, igloo and cottage are all Varsity of the same thing a universal container of man's domestic activities. Houses are of various type of adapted to social and cultural needs..."***

(King Anthony.)

Fig. 1.2.  
Igloo  
And  
Teepee  
House



The form of house is effected by many factors such as level of Economy, climate, and technology etc. and also very with the time. Different Social groups had their own type of houses, which were different, form the others in form, materials, and planning.

## ii) Caste and Family

The cast structure being a major social force especially in the societies, which are tradition oriented, has made its impact clearly visible in the house form. The social hierarchy was primarily based on caste. Certain people who were originally grouped together follow a certain art, function or vocation came afterwards to be territorial divisions of various caste, groups in the village.

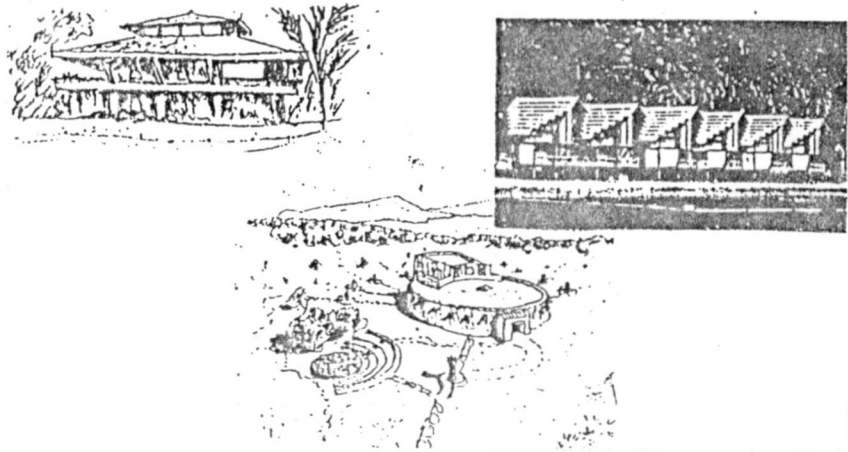
Family structure as that of caste clearly affects the form, space organization and their relationship. Many examples with relation to family structure could be used to show its impact on house forms. One such example is that in the traditional African house, in a polygamous situation, the man has no real house and visit his wives each of women has her own house in different days. In the case of a monogamous situation, although the same features are found the arrangement is different from the above.

## iii) Culture

A culture can be defined as the total equipment of ideas and institutions and conventionalized activities of people. In a more simple way culture may be thought of as a way of life of a community. Culture is another source, which socially determines architecture, which is indigenous and rooted in the location and its culture, will express the sense of belonging that will restore life and soul, which is vital for our development as human beings. In order to understand culture and its relation to building from the intellectual encounter with man in all his varieties is needed. In each country and area people have their own identity and it can be changed according to their needs and thoughts without any damage. When we neglect any of our cultural elements a vacuum takes place



and this vacuum is then filled with inspired or imitative elements, which are totally unsuitable.



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*Fig.1.3. Different house forms, in different culture.*

But all people have two sets of cultures known as inner and outer. Inner cannot be changed but the outer may be, thus to various reasons. All these changes and the reasons can be represented by architecturally or as in another art form. In fact all the variations from culture to culture the form of buildings may be determined by the people according to their needs. So it can be clearly understood that the change in the form of has different methods culture exists within a context of surroundings.

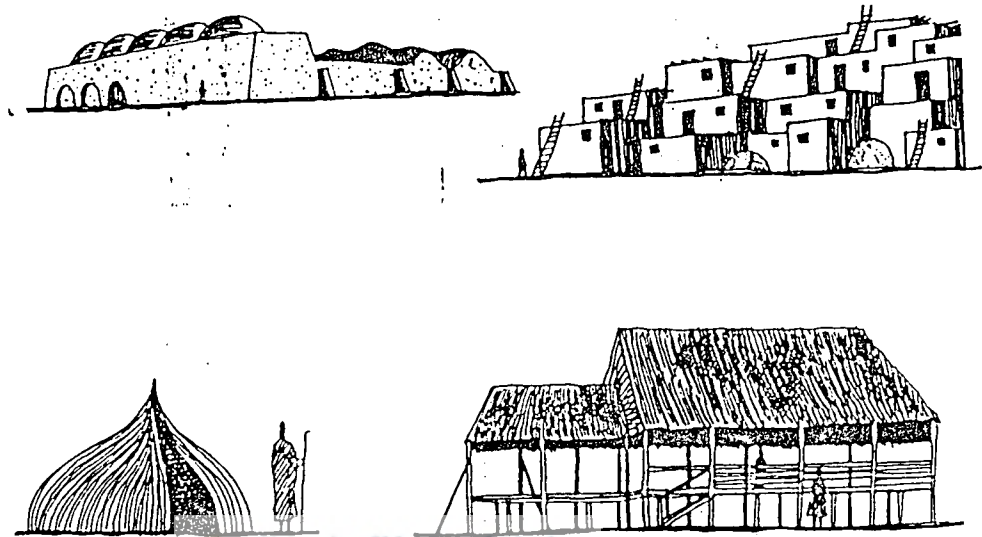
#### 1.2.1.2. Climate

According to Rapoport, climate as a modifying factor has been widely accepted in built form as well as cultural geography. It is an important aspect of the **form generating forces** and has major effects of the house forms many may



wish to create to themselves. From very ancient time to survive man has learnt a lot from the nature how to protect himself against weather conditions.

- A) Sun
- B) Wind
- C) Rain
- D) Humidity
- E) Topography



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Fig.1.4. House forms differ with climate - (foreign)

The primitive and vernacular builder had to create their house with very limited sources to respond successfully to the climate conditions. They have learnt to solve their problems by collaborating with nature. Also in response to the climate is an utterly important factor within the various functions that are performed in the house. In Sri Lanka also in different areas like **Kandy**, **Kurunagala**, **Jafna**, **Hambantota** and **Rathnapura** the form of the houses were changed due to various climatic factors.

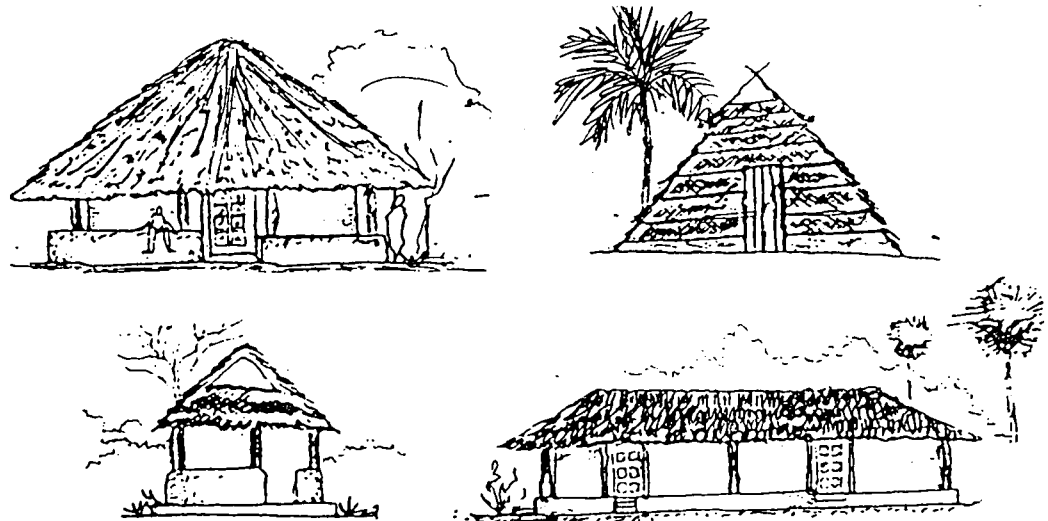


Fig.1.5. Different house forms varying with climatic conditions in Sri Lanka.

Also the courtyard houses are examples where several climatic aspects can be served. However many houses to day have such adjuncts more to improve the appearance of the house rather than to serve any basic needs.



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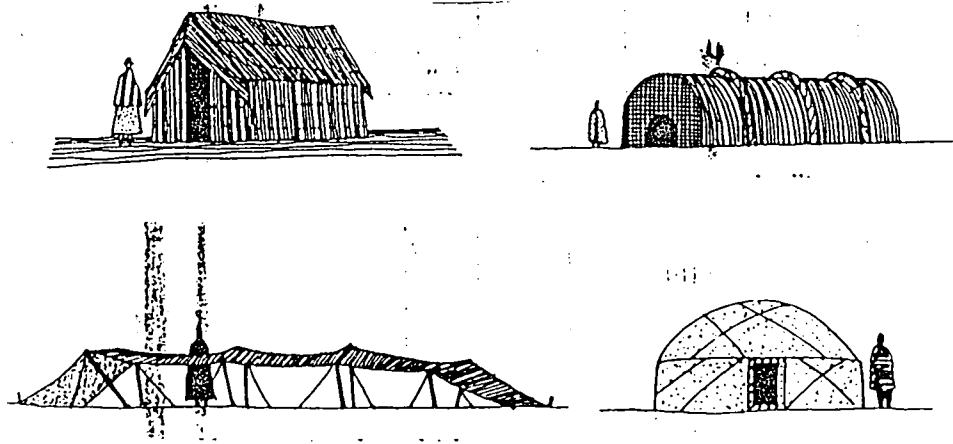
### 1.2.1.3. Material, Construction and Technology

Building materials used and the technology play a very important role in any building venture. The house forms and their spatial arrangement are all identified by some to be governed by these factors of materials, construction and technology. But this aspect is given scant respect. In ancient religious buildings and royal palaces such as stupas, Sigiriya water and rock gardens clearly reveal a very high degree of proficiency in terms of construction and technology. While in domestic architecture of the same period depicting merely a rudimentary approach towards construction and technology.

***“The reasons why construction (which of course involve technology) and materials are best regarded as modifying factors in spite of their fundamental nature, is that they do not determine form”***

*(Rapoport A. 1969, page.104)*

Therefore materials, construction and technology are best treated modifying factors because they decide neither what is to be built nor its form. Hence the social attitudes and aspirations are the guiding factors in the selection of materials and their uses. The same can be seen in the technology used in construction and thus the form of the house is not decided upon available technology but the technology is used to execute the decided form.



*Fig.1.6. Different house forms using same materials*

#### 1.3.1.4. Economy

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Economic has been widely used to explain the building form and its importance is indeed is great. The financial capabilities of the owner are often executed to govern the house form to very great. But even such expectation doses not appear to be of much valid in reality. People in similar economic levels will have economic needs, similar ways of life and similar problems. But the fact is that they have different moral system and worldviews and the expression of the house is greatly subjected to this fact, although the financial aspects do exert an appreciable influence.





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## CHAPTER TWO

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## CHAPTER TWO

# ARCHITECTURAL TRADITION IN SRILANKAN DOMESTIC BUILDINGS AND HOW TO THERE RELATIONSHIP WITH NATURE.

### 2.1. Early Traditional Sri Lanka domestic buildings

The relationship of the early traditional domestic buildings with basic forces in built environment have directed to issue in finding its roots and the coherent evolution in order to comprehend its validity in the future manifestations. There fore the segment of the study will venerate the earlier traditional approaches to the most recent ones in order to comprehend its consequent evolution and the future possibilities. Consequently the early traditional buildings are comprehend in an elementary analysis.

*Fig.2.1  
Maximum  
Degree  
Of responstation  
To the  
Natural  
Environment.*



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The island of Srilanka is mealy like a great droplet falling from the Indian Ocean. In reality, it s probably one of the most beautiful and varied countries of the tropics. Built forms were in someway in harmony with the strong natural elements.

The longstanding architectural tradition in Sri Lanka grew from the time to ancient kings through colonial eras and it projects a wide range of influences from the latter. Anyhow it is observed that the essence of the early. Architectural traditions have been closely oriented to support the natural environment to a maximum degree.



" The basic Architecture of the country the simple habitation of it s peasant communities have. However long since despaired from simple mud and thatched dwellings which still house a greater part of the Srilanka people today. Just as the domestic economy and culture of the modern peasant is not fundamentally different from that of his ancestors "

S. Bandaranayake.1974. P.2.

Simply it is observed that the simple dwellings of the early traditional folk florae has been remaining in certain settlements unchanged with time. The elements of those simple houses have represented the simple but allegiant lifestyle of the Srilanka and they further projects the logical resolutions made in them to suite the changing environments.

## 2.2. Architectural elements of early traditional domestic buildings and methods of there response to the basic forces in built environment.

### 2.2.1. Elements are early traditional house.

#### 2.2.1.1.Plinth.



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All the simple structures were built on an elevated mud platform with formed the basic foundation. It affords protection against damp, reptiles and worming etc. And serves a built in sitting place, As well it defines the building edges clearly by rising the building above the surrounding ground and provides a solid counter balance for the sloping roof.



Fig.2.2.  
High  
Plinth  
For protect  
From  
Dampness  
And  
Inserts  
Attach.

### 2.2.1.2. Roof

For obvious climatic reasons the main feature in any structure is the roof. The simplest buildings consist only a roof on wooden posts, relatively height and supported by a timber frame work and pillars. The roof is always rectangular and sloping.



Fig.2.3. *Roof is a very dominating element in traditional house*

The materials used in the early roofs were thatched, but Arab traders introduced the half round clay tiles of the Mediterranean to Srilanka. The roof built in Srilanka with the very more steeply pitched against the heavy rain and direct sun.

The sub frame of the roofs was of timber. Invariably round, cut from the neighboring jungle. While the large establishments use whole trees made rectangular by shaving the surface with an axe. The roof covering was made entire kadjan, straw, grass etc. or use in combination.

### 2.2.1.3. Central Courtyard.

Entertaining for visitors and family gatherings took place around this central light pool possessing as a live space.



Fig.2.4.  
Center  
Courtyard.  
A successful  
Design  
In  
Vernacular  
Architecture.



#### 2.2.1.4. Verandah

The earliest and simple form house was one room hut with a verandah in front. This consequently has become the common space where the master of the house greater his quests. In the later periods folk-dwellings contained two verandahs at the front and the rear. The rear verandah and garden were used for food preparation and belonged to the women. The verandah also provides the needed shade for interior against sun



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Fig.2.5.  
Verandah  
As  
A  
Transitional  
space



#### 2.2.1.5. Use of natural elements as walls, roofs and furniture.

The maximum usage of natural elements can be seen in traditional Architecture. The boulders are generally used as natural elements. It covered the part of the house and it in times has acted either as a roof a wall or furniture. As an example it is shown clearly in cave architecture.

### 2.2.1.6. Scale

Another principle to importance was the scale of traditional buildings. Scale is relative in size. The size of something relative to something else. The earliest and simple dwellings built by people closely related to the scale of man. This is the main vehicle of the intimate quality of the space, which makes man reachable and tangible. Most of the traditional houses built by responding to man is demonstrated by the proportion of these buildings in terms of length.



Fig. 2.6. Human scale built form makes the quality of reachable and tangible

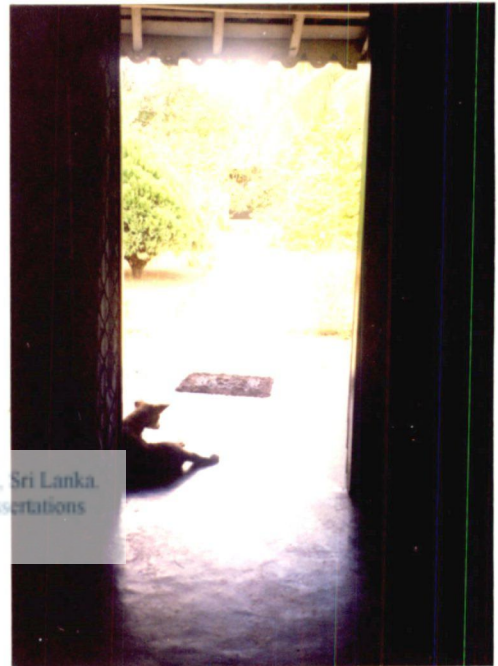
Width and height, it was the law scale building, which is very familiar to the human scale. Down to the earth quality was always maintained and it was well fitted with the surrounding nature.

### 2.2.2. Early traditional houses and there response with nature.

The traditional concept of " house" in Srilanka has existed for over two thousand years and therefore is representative of the strong philosophy of Buddhist life. This nations has invariably helped the built form to harmonize with the ecological environment. The house was essentially apart and partial of nature. Consequently materials were borrowed and latter returned to the mother nature. This was the pure reflection of the simplicity and impermanence of life, which is the essence of Buddhist philosophy.

Still and all the buildings and there construction were deeply related with the nature. Each of the fore-said were done in great concern with the other. The tradition those folk used the nature and its resources with great respect and care in order to preserve those for their successive generations. Consequently four (4) major principles in energy conservation could be highlighted to describe the coherent traditional strategies in Eco-sensitivity. The foresaid have been manipulated through the proclaimed elements of the traditional house and they could be comprehended in varying degrees.

*Fig.2.7.  
vernacular  
Building  
Deeply  
Related  
With  
Nature*



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*Fig.2.8  
Living  
With  
Nature.*



## 2.2.2. BUILDING ELEMENTS RESPONSE TO THE PRIMORY FORCES IN BUILT ENVIRONMENT.

### 2.2.2.1. PLINTH.

The plinth “Pila” is created when the building is raised above the ground level. The plinth is also constructed with the earth. They used recyclable materials for the construction and, the surface was renewable by applying cow-dong or mud mortar. These materials have high insulation capacity and the high level of heat gaining factor. The plinth prevents the conductivity of the heat and therefore keep the cool in side environment. therefore the plinth itself acts as cooling elemant for the entire house.

*Fig.2.9.  
Plinth  
As  
a energy  
conserve  
element  
in  
traditional  
built form.*



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Due to the hot humid climatic conditions the plinth act as a thermal barior and it prevents the dampness of the earth from rising in to the building. it prevent the increasment of humidity level in the internal environment. that cause uncomfortable settings. it prevents the conduction heat coming in to the building and reduced the internal temprature level. therefore no need of extra michanical energy for cooling the internal environment.

The building process of the plinth was completely by human labour, due to the simple disign and construction techniques. there was no need for mass



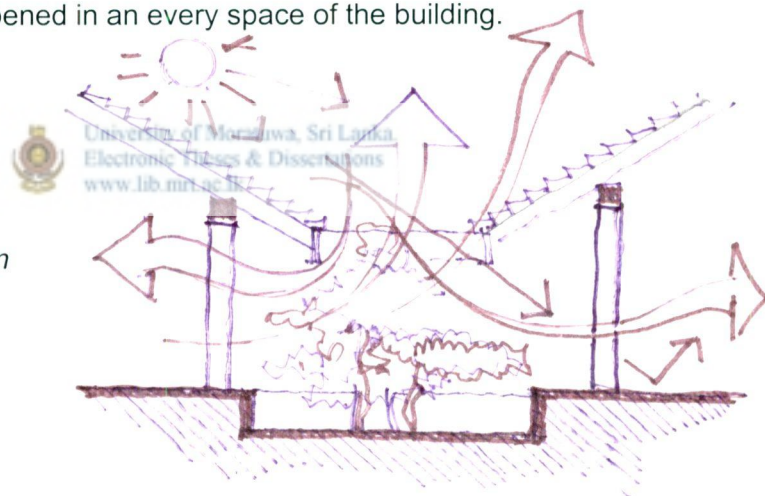
construction and machinery which in turn maximized the energy efficiency. The materials that were used were completely local materials and have been used with the minimum modifications. Therefore it saved the energy that was needed to modify the materials. It has the high level heat gaining factor thus minimizing the heat absorption. Then it is clearly evident that the plinth is more conducive for energy saving.

## central courtyard

### A successful design technique for the energy conservation.

The central courtyard commonly known as "MEDA MIDULA" is the open space created in the centre of the house. The other living spaces are located around the courtyard. They had used geometrical shapes for the courtyard and it was square in most places. It was used as a technique for getting good cross ventilation happened in every space of the building.

Fig.2.10  
Takes  
the  
natural ventilation  
and  
light  
in to the house  
through  
the courtyard.



The surface of the courtyard was covered with grass and it prevented the solar radiation coming in to the building thus it reduced the internal temperature. Normally a large tree was placed in the courtyard to add coolness to air. The cooler air that was produced in between the levels of the tree as a by-product of the photosynthesis. The atmospheric air temperature was reduced due to the absorption done by the trapped cool air. Consequently reduced the internal temperature as the cool air flowed through the internal spaces of the house. The

courtyard was well shaded by extended roof eaves. they cut away the direct sunlight and excessive radiant heat and thereby low temperature was maintained in the courtyard. therefore the temperature inside the building has also been reduced. The building which was around the courtyard act as a thermal buffer and the temperature level of the courtyard has been reduced. which had good effect on the internal environment of the building. because it was opened to the sky and solar radiation was also reflected upwards. because of the well shaded tree canopies and long eaves the excessive glare has also been cut down. It has become a natural resource for obtaining natural light and ventilation. in to the building thus not wasting extra energy for providing artificial light and ventilation. It creates a cool environment in the courtyard and therefore the internal temperature also reduced due to the cross ventilation through the courtyard. The central courtyard promotes the cross ventilation due to frequent air changes occur. thus reducing internal temperature.

## **THE ROOF**

The roof is a very significant in the traditional built form. it has been constructed of porous materials with a breathing nature. the traditional roof has a good thickness and a good insulator to heat. It was covered with raw materials like straw or cadjan and it has a stack effect. therefore it also act as a hot air outlet.

A high roof pitch was used to reduce the area exposed to direct sun and vulnerable to heat. the used local materials in natural form for the construction have been recyclable. The materials itself has heat gaining capacity and the roof covering was renewable by adding a new layer over to the old one. Therefore it has several layers and thus increases insulation capacity. The simple design and construction techniques of the roof required material consumption and there was no need of modified materials. all the materials were found from the immediate surrounding and was weather resistance. Long eaves protect the buildings from driving rain and radiant heat to the interior. the whole roof is very simply worked out and the construction methods have been all human oriented. thus the energy consumption is reduced to the minimum.

Fig.2.11.  
High  
pitch  
of the  
roof  
reduces  
the possibility  
to heat.



## VERANDAH

Verandah was used as a transitional space. It has acted as a thermal buffer for the internal space. Verandahs are used as outdoor living spaces as well as thermal barriers which cut down solar radiation. Due to this thermal barrier, the heat was not transferred through the verandah, therefore the indoor temperature was increased and thus maintained the cooler indoor environment.



Fig. 2.12. Verandah.

The verandah was the outdoor living space and men occupied it. Therefore, heat produced by people who gathered in the verandah and by cross ventilation reduced the heat. So that the indoor cooler environment can be maintained.

Verandahs have helped to maintain the energy efficiency of the traditional built form. Its reduction of indoor temperature has avoided the need for extra energy to achieve a comfortable environment. Because of this low scale of the house, the internal elements are well protected from the natural elements like



sun and rain. Therefore it reduced heating the building element and thus created the comfortable inside environment.

### **Traditional buildings and vegetation**

When comparing the traditional building with the vegetation of the surrounding nature is very smaller. Due to this low scale of built form it was covered by the vegetation. Therefore it cut down the direct sun rays falling on it and it reduces the temperature level.

*Fig.2.13.  
Traditional  
building,  
fully covered  
by the  
surrounding  
vegetation*



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### **TRADITIONAL BUILDINGS RESPONSE WITH NATURAL ELEMENTS.**

The maximum usage of natural elements can be seen in traditional architecture and the boulders are very heat absorption element. But because of its mass it has the good insulation capacity. Because the heat absorption quality it reduced the temperature level of the immediate surrounding and made comfortability. The high thermal capacity of the boulders keep the heat inside without transferring the heat in to the building.

### **PREPARATION OF THE MATERIALS**

The materials that they were used were very sensitive for conserving energy there are several ways that materials can relate with the energy such as processing materials transportation installation and recycling process. The two categories of materials were used and those were organic and inorganic. Through the practice of traditional architecture most widely used building

Fig.2.14.

Stone

Clay

Mud

timber



materials are stone, sand, clay, mud, timber, straw, cadjan and so on with there various combinations. The all of this materials have high insulated capacity and low heat gain factor. So it helps to prevent conduction heat coming in to the building and keep the cooler inside environment. The thickness of the walls is very high and it also reduced the conductivity of the heat. So no need of extra energy to achive the comfortability in it.

The preparation of materials were not energy concuming is very important for energy saving. The most of traditional construction materials were in natural forms and feve of them were lewss modified. But the preparation of burnt brick only need more energy than that of above mentioned materials and it was not much popular. Therefore energy consumption for the preparation of the materials was very much less than now. They used completely local materials supplied from the immidiate surrounding. So the transportation was not needed and so has been a lesser energy concuming exercise. The energy for erection was minimized and the most of the materials that they were used are naturally degradabewithout using excessive energy.



Fig.2.15. Openings were placed so as to cut down the solar radiation coming in to the building

## ORIENTATION OF THE BUILDINGS

The maximum use of **natural light and ventilation** can be seen in a traditional built form. Sunlight was taken in to the building using doors and windows on external walls. The openings were placed in higher levels to prevent the inside from reflected solar radiation.

The orientation of the buildings according to the sun path has given a big support in this regard-most of the large openings were placed on north-south facing walls while having small openings on well facing direct sun light to avoid excessive heat coming in to the building.

The orientation was used to achieve the better cross ventilation to building. The building was opened except the sleeping areas to provide good ventilation. The building elements also used for encouraging the cross ventilation and verandahs, colonaded areas, half walled open areas are examples of it.

Traditional building in srilankan vernacular architecture had a great flexibility to change or add new parts to them. It was specially needed in houses when the family expanded in number. The simple rectangular or square plan form provided this facility. Roof was always as a gable or hipped form and it also a facility for expansion. Therefore it is clear that the energy consumption was maximized in traditional built form in Sri Lanka.

### 2.2.2.2. response to the climate

the hot humid climate in and the heavy seasonal raining have been features in the Sri Lankan context. The plinth responded well to the heavy seasonal raining and it has prevented the rise of dampness and the conduction of heat. Therefore it well responddation with the existing climate.

The court yard is the prominent element used to achive the climatic responsiveness of the early built form. It has very good characters for responding to the climatic conditions and well protected from the axcessive heat coming in to the building. It protects the interiors of the building from heavy rains coming with the fast winds.



Fig.2.16 Highly responded built form to the existing climatic conditions

Most of the houses did not have deep spaces/rooms. When such deeper areas requard court yards where incorporated and rooms and other spaces where placed around this court yard. Court yard was kept open to the sky and activated air flow through the house while providing liting to interior.court yard played a major role on creating good spaces in traditional houses while providing good respond to climate conditions withing building.

Fig.2.17.  
The  
Roof is  
significant  
climatic



*element  
in the  
traditional  
built form.*



The roof is the most prominent climatic element of the traditional built form and it has responded well to the climatic conditions. The high pitched roof prevented heavy rains and winds from entering the interior space. The long eaves helped to prevent moisture and solar radiation penetrating the interior.

The verandah also has helped to prevent heavy rains and radiant and conduction heat from entering the building interior. Therefore it has been good climatically responded element in the traditional built form.

The natural element like boulders have high degree of weather resistant quality. They are very sensitive for their climatic conditions the building which was built using these natural elements. Automatically highly responded to the existing climatic conditions.

Buildings have designed so as to responding to the available climatic condition withing the surrounding. The orientation of the buildings was given the primary consideration to make comfortable internal environment. Heavy clay/mud walls avoided external heat going in to the interior. Excessive heat coming in to the interior was controlled by having large opening on walls which on facing north south direction avoiding direct sunlight. The porous quality given by cadjan straw or palm leaves. Air halls as well as air gap between roof and the wall helped to good air circulation inside the house. Cross ventilation and stack effect also helped to make good air circulation. The porous quality fibrous material on roof covering absorbed water in the rainy days, and it evaporated when sun's heat falls on to it.

The heat needed to evaporate the water in the fibrous materials was absorbed from the materials and the resulted drop of air pressure has extracted the hot air in the rooms through the roof covering. Roof covering was effective as a cover from heat radiation from sun. the proportions and scales of the building is very suitable for the existing climatic conditions.



*Fig.2.18  
The  
gap  
between  
roof and the  
wall provides  
the good  
air circulation.*



The traditional low scale built form is well responded to the existing climatic conditions. **Srilanka has heavy rains and the fast vind in monsoon and normally in hot humid conditions.** Because of the low scale built form it reduce the area of exposure to the climatic elements and have possibilities to achive the maximum comfortability.

### **2.2.2.3. RESOURCE UTILIZATION**

Resource utilization in traditional architecture is very significant caractor in the history. This was achived by several ways such as material usage which are re-cyclable, biodegradable and re-usable materials and use of resources were at a minimum amount for perticular need. For example the use of stone for walls can be re-use for such a perpose. Clay can be re-cycledback in to its original position. Timber also could be re-cycled because it is bio-degradable. Clay was used as a material usage is was minimized. The usage of timber as a building materials has not became a problem because the use of timber was in a planned way for essential purposes and people planted trees for the future use. The usage also had at a minimum level.

The materioals cunsumption of the building was reduced using low scales of the bilt form. Minimum hights and minimum lenthns were used and the simplistic attiudes were caused to it. Because of using natural elements like boulders. It covered the major part of the building, so the material cunsumption was minimized with using these elements.

Fig.2.19  
Material  
consumption  
was minimized  
with using  
natural  
elements.



Most of the buildings were used by adding new parts to them instead of new erections. They had enough flexibilities of the desinges for alterations of additions. Therefore the new reasources that gose in to new buildings, were minimized by certain extent. Further the materials which could be hazardous to the environments were not used in traditional architecture. All the materials were in congruence, with the natural environment.



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### 2.2.2.3. RESPECT FOR SITE.

The vernacular architecture of sri lanka has been created with simplicity. The simple design techniques and the construction techniques have been used and simplicity was acheved in the whole design prosess. From the site cleaning to completion of building all works have been done by human labour, with small man made tools. Because of the simple construction methods. Large excavations and heavy machinores were not needed.

Fig2.20.  
Touching  
the earth  
lightly  
using  
human  
labour,  
unlike today.



Vernacular  
building  
constructed  
with  
nature.



Today using heavy machinery, built against with natural environment.

Wattle and doub “varichchi bami” and kabock or unburned bricks were the construction methods that were used and they were done with simple applications. Therefore it was a way of touching the earth lightly.

The plinth was constructed with a minimum touch to the earth and it is very sustainable for earth. It always followed the existing topography and the materials were gathered by excavating a pit in the immediate surrounding and ultimately. This pit became a gabage storage. Therefore minimum energy was used even the pit excavated to collect earth was re-used.



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### Responced with existing vegetation

Traditional architecture was mostly in tune with the surrounding landscape of a particular location. It was sligly carried in individual plots of lands to cluster houses in vilages. The design of the house was according to the existin vegetation and the construction also happened with minimizing of hazardness to the surrounding nature. Eny of the construction method used in vernacular architecture has not used eny deep excavation or removing of soil startas.

The principle of tuching the earth lightly was the theme of venacular architecture in construction of buildings and methods. For example “**warichchi biththi**” can be taken and the timber poles collected from the jungle was planted on theground first and then walls were filled by clay or mud with the help of small timber subframe,constructed between main timber poles. Still and all the total built form was related gracefully with the environment and has been covered with environmentally frendly materia

## THE CHANGE IN VERNACULAR ARCHITECTURE AS A NEGATIVE RESPONSE TO BASIC FORCES IN BUILT ENVIRONMENT.

Change has become the most characteristic phenomenon of our age. With time all tangible and intangible bodies have gone through a changing process and today it has been faster than ever before. Architecture and it is intangible have also corresponded with such transition and have reflected its variation from the past to present through their virtual features.

The process of change in architectural forms are more intense and rapid than ever before. These changes in architectural forms are evident in two extremes. One being the abrupt changes and the other opposed to it as evolutionary changes.

The earlier mentioned abrupt changes have progressed from one thing to a totally new thing. These changes have looked their responses of being incidents in the long pageants of an architecture of a country and the value of continuity with the past was neglected. Thus the rejection of past and its continuity has bound in developing "alien models"



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***When a man loses his contacts with the past he loses his soul. If we deny the architectural past then our buildings also lose their soul....***

*(Prince of Wales. 1989.17)*

Consequently the introduction of new materials and new architectural trends were highly appreciated by the commercialized world. The fundamental values of the vernacular have been deeply affected as a result and man has become more in touch with the sleek modernity.

***Spirit of criticism and innovation affected architectural thinking but found itself conforming with a unique tradition.***

*(Bovelo; 1971;23)*

The post colonial self-denigration too affected the vernacular to be faded. Even though some remarkable influences were inherited from England, Holland and India people were more enthusiastic in simulating western styles and attitudes of

those cultures. Ensuingly The past attachment and the respect for nature has been abundant and was replaced by various artificial materials that were insubordinate to nature. Most materials were permanent and were unable to undergo the processes in recycling. The advanced construction methods although were remarkable for the modern building trends, consumed more fossil fuel and energy. Their exhausted waste and fumes have always been a hazard to the environment.

Most modern buildings have been oriented strongly to a specific purpose. Thus their unconventional nature has forced in reconstruction replacing the more Eco-sensitive reuse. The used new materials also have not corresponded to the natural bio-cycle due to their non-recyclable nature. Still and all it could be said that the sudden change of vernaculars has affected the earlier deeply. Thus have induced negative responses to the Eco-sensitivity and the endangered future is greatly in need of a reference book and fourth to the past and to the present day.





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## CHAPTER THREE

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## CHAPTER THREE

### THE ORIGIN OF THE NAME OF SABARAGAMUWA AND ITS HISTORICAL BACKGROUND OF THE EARLY TRADITIONAL VERNACULAR HOUSES IN RATHNAPURA DISTRICT.

When we consider the aborigines of Mesopotamia and Mohenjodaro Harappa, Sri Lanka also has a superior position among those civilizations. The sudden finding during excavation fossils stone age man of Sri Lanka, has initiated it. The first Sri Lankan inhabitants were living in this particular region gives superiority exclusively for this region. They lived in stone caves the period beyond 50000-10000 years is considered as the Stone Age.

Dr. P.E. P. Deraniyagala has done investigation regarding the cave man in certain areas in the Rathnapura district that are called.



1. Lunugalge at Panana close to Balangoda.
2. Udupiyan galge located two miles away from Diyainna. (Balangoda)
3. Batadombalena located 4 miles away from Kuruvita.
4. Batathotalena located 5 miles away from Kuruvita.

He has done researches excavating the surface soil layers of the entirely covered areas within those caves. Certain elements have been found as tools namely Thirivana gal (stone), oyster shells, parts of crabs, bones of pigs, jaws of monkeys, bones of deer, teeth of squirrel's, bones of birds and fish, seeds of kekuna wood and burned wood remains of pots and pans termed as coros

1. the founded tools are considered to be of the animals which were killed by early man for food.

Certain factors have been elaborated by the histories gaining of the name "Sabaragamuwa" in early Sri Lanka. "Naga" people inhabited Jafna and Kelani coastal areas. "Veddas" inhabited certain coastal areas as Kalmunai. Northern region of the Kaluganga was abounded by "demons" and in Kothmale and Uva, "Veddas" also inhabited Sabaragamuwa regions. 2



After the arrival of wijaya, yaksa and naga group mixed and formed different nations. But the veddas with their own heritage remain as a powerful nation in certain areas. For the warfare activities in the kingdom originated by the king wijaya were indulged. 3

They still observed their own old concepts. Then no projects were to be seen. But the graduate generated ones in dambana area and their follower can be seen even now a day. In these early days at the veddas has were abounding here. It caused the area to be termed as "**Sabaragamuwa**".

The second concept Sri Lanka was popular among the Greeks for its precious stone (Gem) and tasks and cinnamon. Then they came in search of those



things. Early Fahein records mention that. Wealthy sobians lived in Anuradhapura in the 4<sup>th</sup> century BC. In Greek language there is a word called "supphirose" this has derive from the Greek language. [Hebrew =sapis (sappir), Latin = Sapphiras, English = Sapphire]. This came from the Hebrew language to the Greek language. 4 . The mostly found Gem is the "**sapphire**". This justified the above statement.

This area is known as Rathnapura (Ruwanpura) among Sri Lankan. The Sinhalese as "sapara" has used the name sapphire (Suthirose). Then they added "Gama" with indicates village. Then these formed to derive name "Saparagamuwa". In our historical documents, the present Rathnapura is known as "Sabaragamuwa". 5

Before wijaya came here Lord Buddha has come here (to put "Siripathula" on the hill of Samanthakutha). And deliver a discuss of Dhamma to the residing people of this area. From that onward up to the Kotte period this was a developed area therefore it cannot be accepted the only residing people were Vaddas. The residing Vaddas were not conformed only to this area. 6

But there presence in the rest part of this country also threfore any were cannot prove that Rathnapura was inhabited only with Vaddas. So the above-mentioned facts become falsified utterances it is just to take that Sabaragamuwa has the origin from sappire.

As the Gem industry was in full suing in this region lings collaborations and the sponsorship was received highly. Royal security was employed exclusively for this area. "**Lashmana maha Saman Devala**" is evidence to prove King Parakramabahu his collaboration to the gem industry.

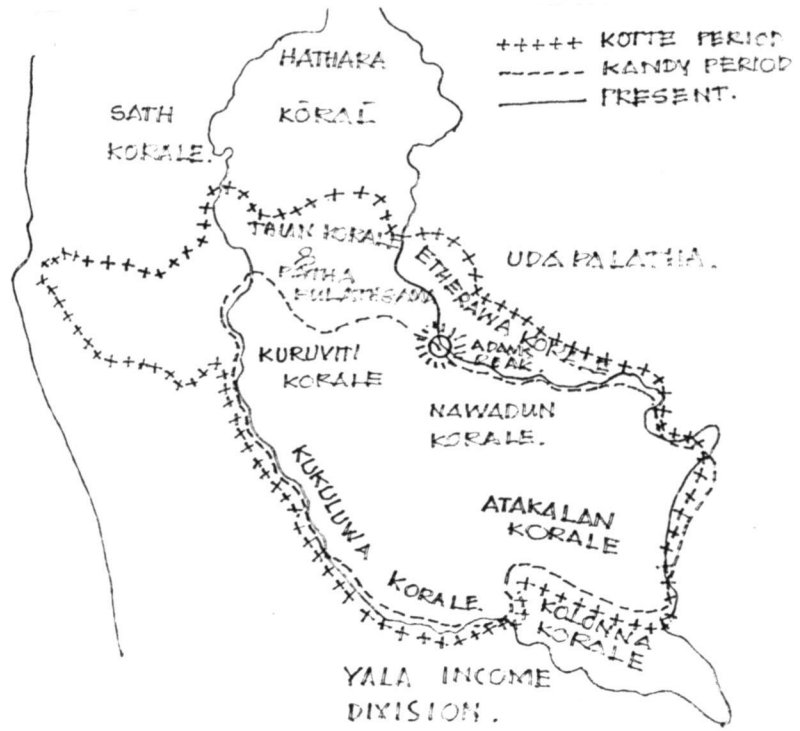


Fig.3.1. Study area.



Fig.3.2. Sabaragamuwa province.



("Sabaragamu maha Samandevalaya" is one of the most valuable vernacular buildings in Sri Lanka). The king Parakramabahu VI unified the country and divided the territory as following to ease the administrative purposes, dividing to Yapapatuna, Sathkorale etc. and assigned his coordinators to the representative of the king to rule those areas. Then the king kept the sabaragamuwa region under his rules only. As this area is abounding in a variety of Gems.

According to the "**Saman Dewala Sellipiya**" thesabaragamuwa area is in the extent of "Nawayodun". The area which stretched up to denawaka bambarakotuwa, connected to be the Rathnapura District. The present Sabaragamuwa province consist s of Kegalle and Rathnapura Districts. Rathnapura district has been divided in to seven colonies as follows.



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1. Kuruviti Korale.
2. Nawadun Korale.
3. Kukulu Korale.
4. Atakalan Korale.
5. Kadawathu Korale.
6. Meda Korale.
7. Kolnna Korale.

We can found very good examples for a Sri Lankan early traditional vernacular building within the above seven colonies which is belongs to the Rathnapura district. Some of these mentioned as bellow.

1. Kuruviti Korale.

**Eknaligoda walawwa.**

Belongs to the deraniyagala family.

(P.E.P. Deraniyagala, Dr. Shiran Deraniyagala, are well-known archeologist in Sri Lanka).

2. Nawadun Korale.

**Rathnapura Maha Saman Dewala.**

**Ehelepola Walawwa.**

Present museum building in Rathnapura.

**Giliemale Walawwa.**

3. Kukulu Korale.

**Kukuluwa Raja Maha Vihara** at kukulegama.

**Harischandra Walawwa.** At Udakarawita.

4. Atakalan Korale.

**Jayasundara Walawwa** at Madampe Atakalanpanna.

**Elaatha Walawwa.** At Alpitiya Godakawela.

**Ametiyagoda Walawwa.** At Ametiyagoda Godakawela.

**Hiramadagama Walawwa.** At Hiramadagama kahawatthe.

**Mahagamuga Pahalagadara** at Kawduwawa.

**Mr. Samarasekara house** at Kawduwawa. Atakalanpanna.

5. Meda Korale.

**Kottimbulwala Rajamaha Vihara** at Weligepola, Balangoda.

Mahaswalathenna Walawwa.

6. Kolonna Korale.

Maduwanwela Walawwa.

Sabaragamuwa mahasaman dewalaya, Bolthumbe Saman Dewalaya, Eknaltgoda Walawwa and Maduwanwela Walawwa are some of the famous early traditional vernacular buildings in Sri Lanka. Those buildings are always subjected to the various studies. Therefore this study is concentrate to the Atakalan Korale. Largest amount of the land extent covered by the Atakalan Korale in Rathnapura District. Other special thing is large amount of most valuable buildings which were belongs to early traditional vernacular period situated in this area.



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## CASE STUDIES

Example one.

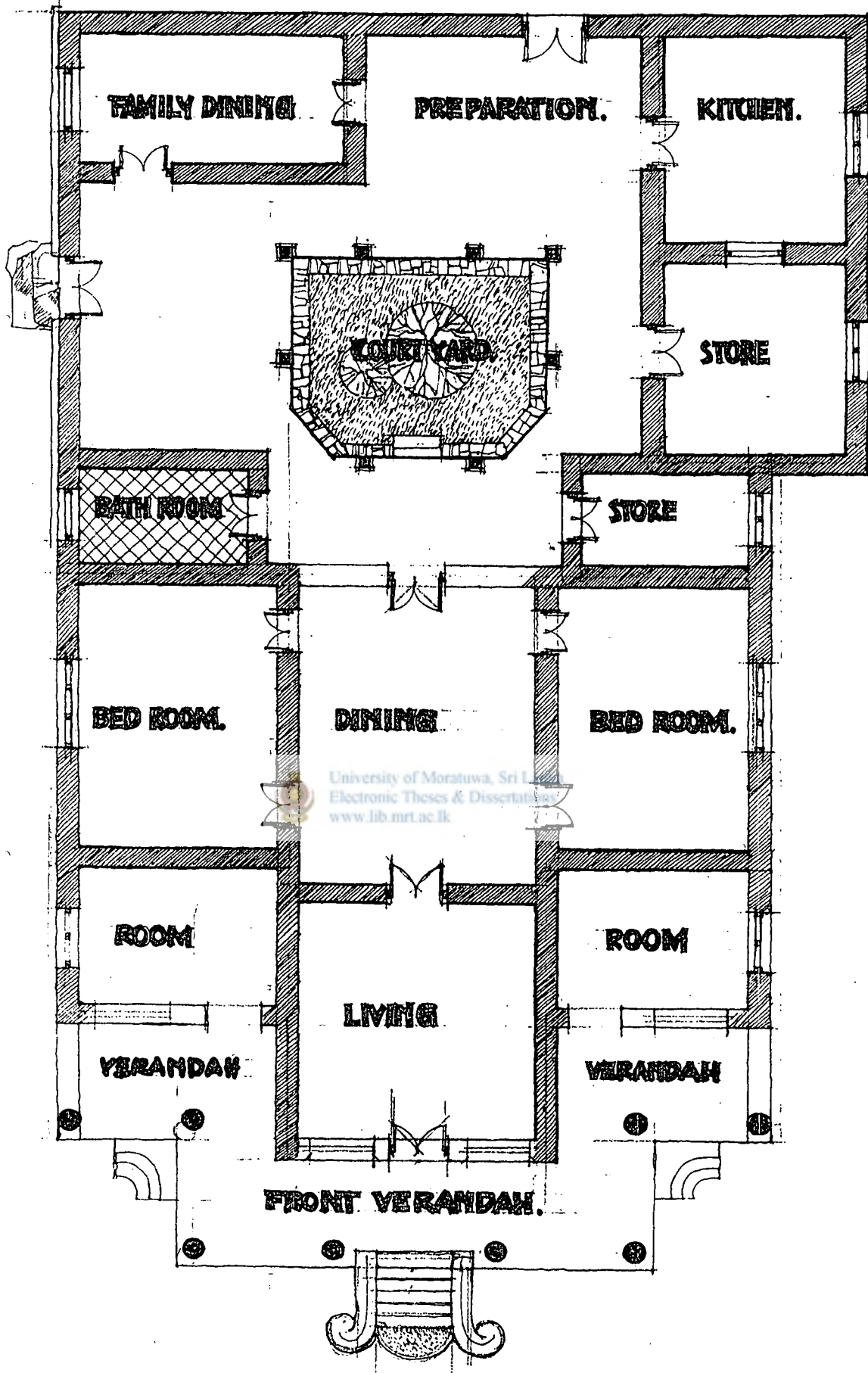
### JAYASUNDARA WALAWWA

At Madampe (walawkade) Atakalanpanna.

This house falls in to the category of **feudal** land owners” house, which is commonly known as “walawwa”. This belonged to “Jayasundara rate mahaththaya” some years ago. This is one of the most valuable and beautiful early traditional vernacular building in this area.

*“ The houses of great persons only differed from those of lesser men by having more rooms and courtyards. Better timber, the beam-ends, carved wooden. Verandas pillars and their brackets sometime carved and in a very few cases only a tiled roof... (Knox, Robert, 1966)*





PLAN, JAYASUNDARA WALAWWA  
SCALE 1:100,

Fig.3.3.

Jayasundara

Walawwa.

From some distance.



### SITE SELECTION..

This walawwa is situated very closely to the left side of the Rathnapura Rakwana main road, about 2-Km away from madampe junction. The site is almost flat but with small slope towards the road. Beautiful paddy field located at the other side of the main road. It is lower leveled than the site, which is situated of this building. Beautiful mountain range is located the surrounding area some distance away from the site. Then this site (land) is most suitable for the residence.

Fig.3.4.

Entrance

Path,

From verandah.

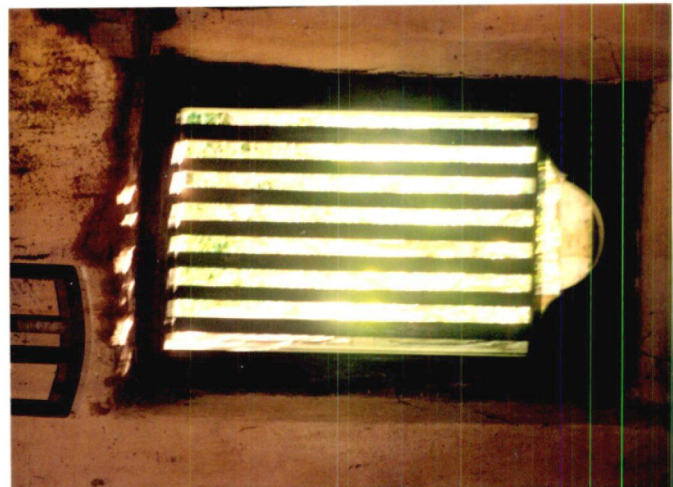


## OREANTATION.

The orientation of the building according to the sun path has given a big support prevented from direct sun. Most of the large openings were placing on north-south facing walls while having small opening on wall facing direct sunlight to avoid excessive heat coming in to the building. This Walawwa was

Fig.3.5.

*Small opening on  
East side wall.*



Orientated to the NORTH-SOUTH direction. Main entrance located from north side. Large openings also used the north south direction. For avoid from direct sunlight. But only small windows were located in east west direction for get the maximum natural lighting and maximum cross ventilation while minimizing the coming of direct sunrays in to the building.

Fig.3.6.

*Front verandah  
"Living with nature"*





## PLANFORM.

Early traditional vernacular house forms in Sri Lanka was very simple, square shape. This walawwa also has a simple square shape plan form. But house is very large with large hip roof. This house is consisting with two parts. Front open colonnaded verandah and middle living and dining rooms with two no. Of bedrooms are located both side of the living and dining area. And two office rooms also located near the front verandah. That is the front part of the house. Then the back part of the house is consist with preparation and

*Fig.3.7*  
*Successful*  
*Center*  
*Courtyard.*



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*Fig.3.8.*  
*Harvest paddy*  
*Stored at higher*  
*Level from ground*  
*To protect from*  
*Dampness.*



Storage area, with beautiful and successful courtyard in the middle of the back part of the house. Two no. Of store rooms, family dining room, preparation area and kitchen are located surrounding the courtyard. Three main doors are located in one line, from front verandah up to courtyard through the dining and living area. Above all spaces are connecting with together by that main doors then good air circulation are there.

*Fig.3.9.*  
*Openings of the*  
*Kitchen, Preparation,*  
*And stores are kept*  
*Towards the courtyard*



## **USE OF MATERIALS**

Vernacular houses built during earlier days made maximum use of the environment. The building materials used were from the immediate environment and they were so environment friendly, thus causing no problems to the environment or the people who lived in that environment. Even of those houses collapse to the ground after long years it did not cause any adverse effects to the environment where it once stood. Therefore a strong link between the natural environment and the built environment can be seen.

All foundations are height about 3ft, from ground level. Made by using rubble and used “mud” as the bonding material when constructed the foundation in

*Fig.3.10.*

*All foundations are height*

*About 3 Ft. from ground level*

*To protect from dampness*

*And*

*Termites attach.*

*Made by using rubble and using*

*Mud as a bonding material and*

*Surface covered by using*

*Cement*

*To protects from rain.*



this house. Plinth covered by the using cement sand mortar. Front verandah is the colonnaded open space with eight (8) No, of round shaped columns constructed by using rubble with smooth lime finish. All walls are thick about 18” and made by using rubble with mud mortar as a bonding material and with lime sand plaster used for the smooth wall finishes. Eight (8) No, of decorated timber columns are located around the courtyard. Smooth cement floor finishes in this house. Create cooler environment around the courtyard in this building. Because three No of very large open spaces are around this courtyard. Maximum usages of the natural materials are increasing the living comfort of inside the house. Up stair (soldaraya) was constructed by using timber planks. With decorated timber staircase. During the earlier time this up stair was used as a shrine room. Small Buddha statue was there. But now this

place is abandoned. Using half round tiles made hip roof. The roof structure is jack timber.

Example two.

### **MAHAGAMUGE PAHALAGEDARA.**

At Kawduwawa, Atakalanpanna

This house is the oldest house in this area. It being perished, roof walls and all the parts of this house prove it. But still it prevent according to the vernacular experts. All the walls are constructed by using rubble with mud mortar as a bonding material. According to that reason people who living in and surrounding this area called “Galge” to this house.

This house located very closely to the left side of the Rathnapura-Embilipitiya main road in Kawduwawa village.



*Fig.3.11.*

*Mahagamuge*

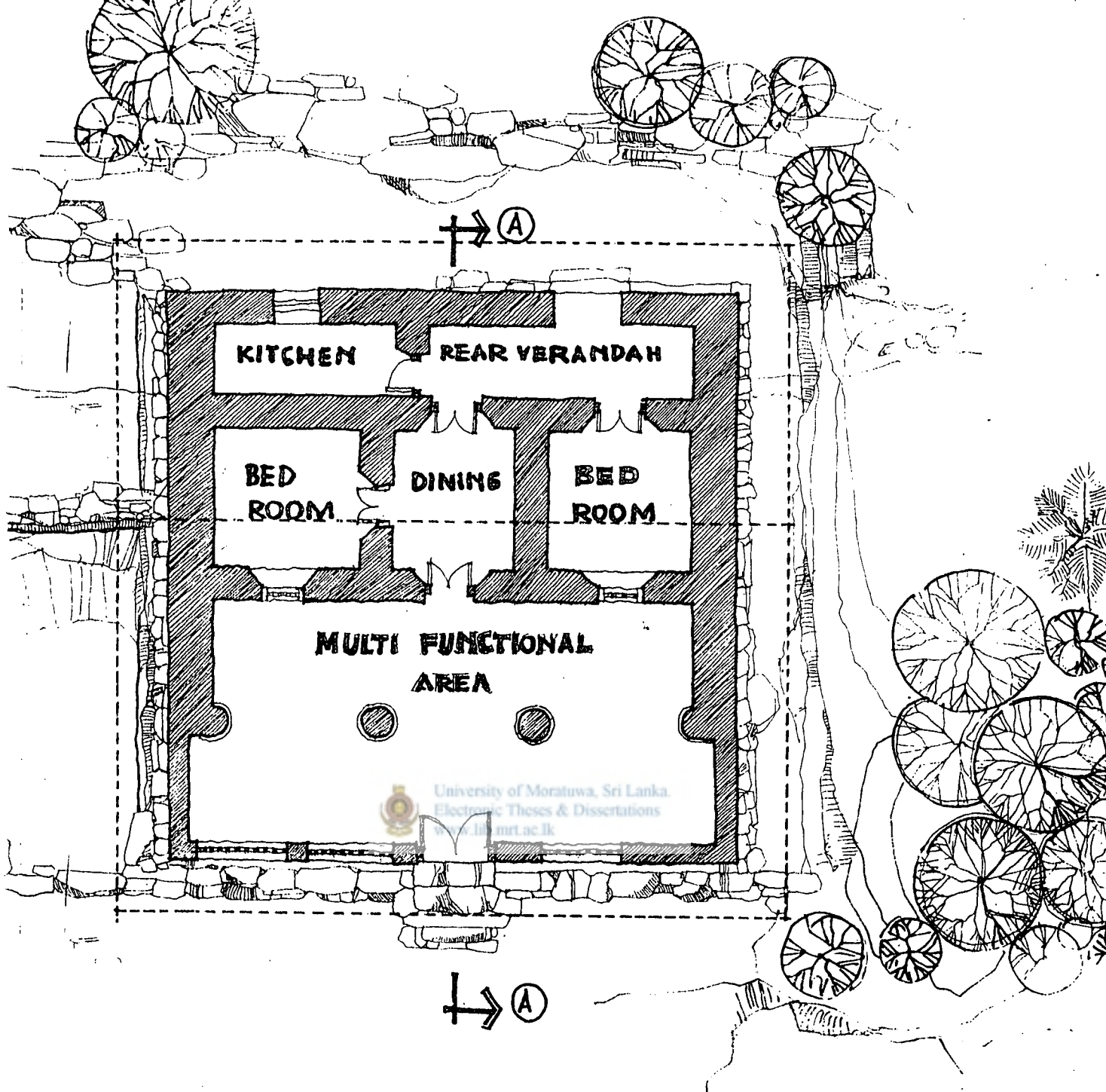
*Pahalagedara*

*“galge”*

*Front elevation.*

### **SITE SELECTION**

Site is almost slope from north to south direction. Sloping angle about 25 degrees. Considerable vegetation is all around the house. It creates a very



cooler environment even outside the house. Therefore internal spaces of this house are dark even daytime. Large and small No, of boulders are there in this site.

### **OREANTATION**

Orientation of this house is to the north-south direction. All doors, windows and other openings are faced only with above direction on external walls. No any opening on the east and west sidewalls for extremely protect from direct sunlight. This house has a gabled roof. The gabled end of this house also faced with east west direction.

*Fig.3.12.*

*No any openings*

*On the East and West*

*Sidewalls for extremely*

*Protect from*

*Direct sunlight*

*And*

*Horizontal rain.*



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### **USE OF MATERIALS.**

All walls of this house were built by using rubble with mud mortar as a bonding material. All walls are thick about 2ft. and foundation was about 3ft. in height from ground level. For prevent from dampness and insert attach.

Roof constructed by the using of very large timber sections taken from neighboring jungle. Half round tiles used as roof cover. Large timber sections also used as door, windows frames about 10" thick. Cove dung was used as floor finishes. It creates very comfortable cooler environment in internal spaces of the house. These natural materials are very close to the nature unlike today.

*Fig.3.13.*

*Used*

*Environmental*

*Friendly*

*Materials*

*In order to*

*Highlight*

*Living With nature.*



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*Fig.3.14.*

*Used*

*Very*

*Large*

*Timber*

*Sections.*



Fig.3.15.  
Walls (2Ft thick)  
Made  
By using  
Rubble  
With mud  
As bonding  
Material.



Fig.3.16.  
Round  
Columns  
In the  
Middle  
Of the  
Front  
Verandah.



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Fig.3.17.  
Up stair  
"Soldaraya"  
Entrance  
From front  
Verandah.





## PLAN FORM

Very simple square shaped plan form with this house. Entrance is located from south side direction. Front verandah function as a multi purpose hall.

*Fig.3.18.*

*Entrance*

*Is located*

*South*

*Side*

*Direction.*



Living, gathering and functions like entertainment was occurred here. There is no living room or dining room in this house. Therefore front verandah was covered during the later period for used as a multi functional area. One small

*Fig.3.19.*

*See Through*

*The building*

*Three doors*

*Located in one*

*Line.*



common room has a middle of this house for connected all spaces with together. Two bedrooms are here in both side of this common room. Rear

verandah connected with kitchen. The rear verandah is the only open space in this house.

*Fig.3.20.*

*Foundation*

*3 Ft. in*

*Height*

*From ground*

*Level*

*To protect*

*From*

*Dampness and*

*Inserts attach.*



Example three.

**Mr. SAMARASEKARA HOUSE**



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At Maragahayata, Kawduwawa, Atakalanpann

This house is situated at very closely to the left side of the Rathnapura-Embilipitiya main road. Mr. B.M.Lokumahathmaya built this house during the years of 1900-1905. He was the “liyanamahaththaya” of Elapatha Rate Mahaththaya, during this period. He also worked as **assessor** in the Electorate of Rakvana during this period. After that this house owned by Mr.B.M.Samarasekara he was one of son of Mr. Lokumahaththaya. Today this house occupied by the forth generation of that family. But still this house is well-functioned and no any cracks or any damage, because it is well maintained.

## SITE SELECTION

This site is small hillock. Very good sceneries are surrounding. The garden consists with coconut cultivation and top of the hill located this house. Main road is located at lower level of the house. This site is well lighted during the daytime, then very good situation for the residence.

*Fig.3.21.  
Front  
Verandah  
Create a  
Calm and  
Quite  
Environment.*



*Fig.3.22.  
Small  
Opening  
From east  
To prevent  
From glair  
While getting  
The natural  
Lighting.*



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## OREANTATION

This house orientated with north-south direction. Because prevent from the direct sunlight. Small windows are only opening which is located at east-west sidewalls of this house. This house has a gable roof with long eaves and the directional to east west direction. Gabled walls are situated in east and west

sides for prevent the direct sunlight and heavy monsoon rain. Rain is the biggest problem in the considerable area.

### **PLAN FORM.**

Very simple squire shaped plan form with this house. Have front and rear verandahs. One side of verandas opened to the surrounding environment. Front and entrance from the north side of the house. There is a room function as office, called "Isthoppu Kamaraya" at the left side of the front verandah.

*Fig.3.23.  
Get the  
Maximum  
Natural lighting  
From  
East side  
Wall.*



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Four No. of decorated round pillars are also here. Main door from front verandah opened to the living room. There is a bedroom at the left side of the living room. Living room mainly connected with dining room. There is other bedroom opened to the dining area. Finally dining room open out to the rear verandah. Rear verandah used as multifunctional area. Also this verandah used as the link path to the kitchen. Kitchen is totally separated from the main house.

## USE OF MATERIALS

All walls are constructed by the using of rubble in main house. But walls of the kitchen constructed by the using of wattle and doubt. The plinth is raised to about 2ft. to 4ft. is done mainly to protect the house from the effects of dampness and termite attacks. The roof of the house is gabled using half round tiles has a steep slope of about 40 degree. The form being to quacked the flow of rainwater. The floor finishes is this house are excellent. Used clay tiles as floor finishing material for spaces of living dining and bed rooms for get the maximum comfortable from natural environment.

Fig.3.24.

Used clay tiles as



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Floor finishing

Material

For get the maximum

Comfortable

From natural

Environment.



### EXAMPLE FOUR.

Mr. RATHNAYAKE HOUSE.

**“KADEWATHTHE GEDARA”**

At Aththalawaththa , Atakalanpanna.

This house is located at aththalawaththa village in rathnapura district. This house earlier known to have belonged to Mr. R.L. Rathnayake, of aththalawaththa village he was a famous teacher about carpenter teaching. The garden was studded with trees was no vehicular access during early period. This was a typical vernacular house form with hipped roof. Using the technique of wattle and doubt makes all walls. The house was surrounded by a “veli midula” where there is no trees planted. The front verandah covered by the using of timber trelliswork. It’s played an important role in giving light and ventilation in to the living area.

Fig.3.25.  
View  
Of  
The  
Old  
House.



Fig.3.26.  
View of  
the  
new  
house.



The original house discussed above and which belonged to Mr. Rathnayake protected hands over the years. The present owner is Mrs. Sunethra Rathnayake, a teacher who is employed away from the village.

The original old house is still protected, but new house was constructed later from very close distance to the old house. The old house used as kitchen for

*Fig.3.27.*

*Old  
house  
use  
as a  
store.*



the special functions and storeroom to store harvested paddy, coconut etc. the old "veli midula" still functions, the only notable difference being the vehicular access to the present house. There is a marked difference in the raw materials used in the old and the new house. The former was constructed using raw materials available in the immediate neighborhood, while the latter was constructed using bricks, cement, calicut tiles and glasses.

*Fig.3.28.*

*no  
any  
openings  
on  
east-west  
sides  
walls.*



The plinth is raised to about 12" from the ground compared to the old house where it is raised to a height of 3'6" rising of the plinth is done mainly to protect the house from the effects of dampness and termite attacks.

Fig.3.29.  
Plinth  
Of the old  
House and new  
House from  
Rear.



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The walls of the old house was made out of wattle and daub and is about 13" thick, while the wall of the new house is made of bricks and is 9" and 4 1/2"

fig.3.30.  
materials  
used for old roof,  
rafters- round  
shaped timber.  
Reapers- "veraniya  
Kotu"





thick using cement and sand mortar and plastered with lime, sand mixture and finished smooth. The roof of the old house is hipped using half round tiles

Fig.3.31.  
Wattle and doubt  
Wall construction  
Old house.  
High  
Plinth against  
Dampness.



(sinhala ulu) on the timber frame, taken from neighboring jungle ( veraniya kotu used as reepers) has a steep slope of about 40 degree whereas tiled roof of the new house has a less steeper slope. The former to speeded the flow of rainwater. One consolation as far as this house in concerned is that they have adhered to the old location and the orientation of the house, which stays unchanged to obtain maximum benefits from the climatic conditions. The ventilation system of the new house is weak.

Fig.3.32.  
Small  
Opening  
On considerable above  
Ground level.  
Only for  
Ventilation.  
(Old house)



*Fig.3.33.*  
*Extra*  
*elements*  
*required*  
*to prevent*  
*from*  
*direct sunlight*  
*falling from*  
*east side.*  
*( new house)*



**Changes of valuable points that belong to the vernacular houses about appropriate response with basic forces in built environment with the development.**



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House is a basic built fabric of family unit, and a family is the basic unit of the society. Therefore we can name the house as the basic built fabric of the society. Hence every house depicts different profiles of the family and the society. In the presence of the above factors a house, be it traditional or modern falls in to different categories, and all housing needs to achieve 4 objective in order to be successful.

1. It needs to be socially and culturally valid.
2. It should be sufficiently economical to ensure that the greatest number can afford it.
3. It should ensure the maintenance of the health of the occupants.
4. There should be a minimum of maintenance over the life of the building.



A house, which has the above qualities, is conducive to its occupants, irrespective of the period during which it was built. These include every dwelling from primitive caves to modern houses. It does not mean that house form should remain same over generations. With time it is likely to face constant changes to suit different periods, as it should. A house form should undergo changes to suite different social requirements. Therefore the house should develop with the developing society. **But should maintain the traditional techniques which belongs to increase the living comfortable in house.** Basic factors, which affect the changing forms, are as follows.

#### **Social changes.**

The linkage of few individuals forms a family. The strength of this bond shows the stability of the family. Though these individuals live in the form of a family, their individual needs and attitudes and thinking differed. Yet the family unit of the ancient society was strongly bonded. The individuals of their society always toiled together to earn a living and to satisfy the basic sociological needs. They always worked as on to shoulder all responsibilities and did not on any occasion tried to fulfill their individual needs or aspirations.

The security of their family and the village was considered their responsibility. The villages were planned accordingly. The houses faced each other forming a settlement. A cleared common space in the center of the settlement was reserved as their gathering space and the forest around the outer border acted as the fence to this settlement. Therefore the need never arose to have individual security.

As the members of the family unit increased in number, the house started undergoing rapid changes in the form of extended units to accommodate

them. With the development of country, started the development of individuals. This started having adverse effects on the family unit. Then they thought living as separately. Then new buildings constructions are increased in all over the area.

Fig.3.34.  
New construction  
Near the  
**samarasekara**  
house



When comparing these new constructions with early traditional vernacular buildings found more differences about appropriate response with nature. With the development of technology, various materials are available in the market. Most of these materials are not good for the human comfort.

Fig.3.35.  
Using  
Uncomfortable  
Materials



Site selection for the building construction is unlike earlier period. Main problem is lack of land. Then they built houses even very dangerous places.

This mainly affected to the environmental pollution.

Fig.3.36.

*Built*

*Against*

*With*

*Environment*



Example, five

### **RUWANPURA NATIONAL COLLEGE OF EDUCATION**

At Kahawaththa

With increasing of population several institutional buildings also constructed.

The building complex of the “**Ruwanpura National collage of education**” is one of the new building which done in considerable time of period in this study. This is on of the large-scale project. But there are several problems. Those are highlighted when compare with the early traditional vernacular buildings in this area. No properly responded to the climate, is the main problem in this building complex.

Fig.3.37.

*Ruwanpura*

*National*

*College of*

*Education.At*

*Kahawaththa*



When considering the climate in this area not clearly belongs to the wet zone. There are heavy rains in rathnapura area but kahawaththa consist with considerable dry season. There is intermediate climatic condition in kahawaththa. Then this buildings are subjected to the more heat and more cool during time to time. Roof is the main element, which subjected to the climate.

**“Micro concrete tiles”** which used as roofing material is the main problem in this building. Because now it is get the “cracks” according to the variations of the climate.

Fig.3.38.

Micro concrete  
Tiles  
Not suitable for  
Climatic  
Variations.



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Fig.3.39

Corridors  
Open to the  
Outside.  
Subjected to the  
Horizontal  
Rain.



Fig .3.40.

Entrance lobby  
From main road  
Opened to  
Natural environment,  
No comfortable to the  
Eye according to the  
Glazed floor finish.

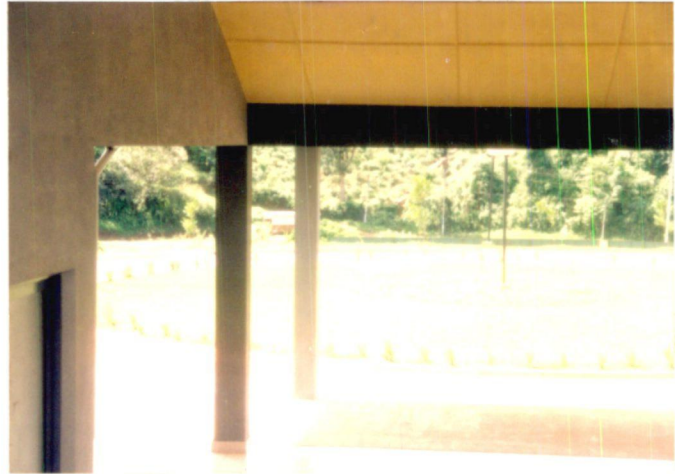


Fig.3.41

Corridor of the  
Main lecture room.  
Glare reflected from  
Tiled floor finish.



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Fig.3.42.

All window  
Sashes are  
Covered with  
Sheets of  
Newspapers.  
The girls hostel.  
"Wrong orientation"



### **Factors, which help to modify responding, pattern.**

If one looks at the house form, it is clearly seen that the changing pattern of the form is influenced by social, environmental and technical elements. Apart from that these elements have been strengthening by various ideas put forward by people has further developed the house form, which can be called as norms and beliefs. In addition to above the house form is affected by their inspiration.

### **NORMS AND BELIEFS**

As a rule, from early days to present period, people use to locate their houses with the long façade facing North-South direction. This way they could obtain maximum light and sunshine as in tropics received solar radiation from North and South.

***“ It is possible to orient a building or a house with it is long façade facing north and South and to use windowless short walls East and West.”*** (Cowan, Henry J. Smith and Peter R. 1983, page 40)

Another practice which people observe from early days to present period is drawing a grid (pada) on the land before locating the house. This is more of an astrological practice than anything else. In the “**Mayamathaya**” the building site has been classified into four divisions, the outer most sector is known as “perethapada” (area of spirits), next is “manushyapada” (area of the human beings), next is called “devapada” (area of gods) and the inner most is known as “Brahmapada” ( area of Brahmins). The outer most and the innermost sections which are known as “perethapada” and “Brahmapada” are considered unsuitable area for building construction. Therefore the location of the building will not be at the center of the corner of the site. This applies most



in yeoman's houses. Extent of the site as seen today seems to have changed from the original, because of the subdivision of the land among the people.

### **Inspiration**

Drawing inspiration what you see is a normal thing. But if one wants to bring about changes ones own house; he should do it carefully. Without disturbing the identity of the house. This may be due to the faith they had to their religious place or otherwise to be highlighted among the others. But this had not effect the form of the house at all. It has given a pride to the building. But in most cases people do exactly the opposite. These days' most rural people work in urban areas. They tend to copy every thing they see in urban areas and make ad hoc changes in their own houses whether it suits the environment this type of living. So this can be traced as bad practice.

The main cause for bringing unplanned changes to buildings could be attributed to loss of sense of identity, lack of application and lack of appreciation of traditional house forms. It is very sad that one cannot appreciate the old house forms of ones ancestral house. It is heartening to note that there are people who appreciate the old house forms and does inevitable changes without disturbing its form with the help the knowledge. if one can do changes without disturbing the old form and respondation methods and built using traditional valuable systems it may help to preserve the vernacular house forms from an untimely death.



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# CONCLUSION

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## CONCLUSION

Ever since "Homo Sapiens" appeared in this world, they sought shelter to protect themselves from the threats of nature and wild animals. First, it was in the form of treetops, then caves. The first house form was in the shape of a simple hut with a circular base and the conical roof made out of leaves of trees which, over the past thousands of years developed in to the present form, which is described as the ultra-modern dwelling houses.

This evolution took place all over the world. The very first hut erected by man anywhere in the world could be classified as vernacular, but each house form differed from country to country province to province as well. Like wise in Sri Lanka too there was indigenous house type which Differed from a certain part of the country to another.

This dissertation discusses "**Sri Lankan vernacular Architecture as an appropriate response to the basic forces in built environment, a case study on vernacular houses in Rathnapura district.**" Six houses depicting a typical cross section of vernacular housing **Rathnapura** district were studied. Practically all the houses were well over 100 years old. The vernacular houses that were studied fall in to two categories, namely "yeoman" and "feudal" house. The study reveals that out of the two categories, "yeoman" houses have undergone a considerable amount of changes about responses with regard to house form. The original traditional look is absent in some cases studied. For reasons unknown, in all cases a part of the old house is kept intact. The main reasons for the changes occurred in the house form could be attributed to socio-economic changes took place in there society. For example, the children of the peasant parent no more wanted to continue framing traditions that there parents valued. Instead, they went in search of **white-collar** jobs in urban areas, some times far away from their villages. This prompted them to stay in urban areas when working and return to the villages occasionally to see their parents. Unlike during their farming days, when money was hard to come by, they had money with them now. Their priorities in life started changing. The first priority was a house similar to the once they saw in urban areas, instead of their rural house which now they feel is old, small, out of fashion and in dilapidated form.

At this point, may be certain parent's objects to the renovations proposed by their children. Because they valued their ancestral house very much. The


traditional look of the house was kept alive by annual white washing, attending to the roofing and flooring, by them. These things are done mostly, on the eve of the **“sinhala aluth aurudda”**. When these parents any longer cannot tolerate the pressure from their children for renovation. Especially when the children get married, allocates section or sections as the case may be to them. From this point onwards they start adding units to their section of the house making it look like a faithful copy of an urban house. This could be attributed to the inspiration drawn from urban house they saw and lived while staying in cities. To change with the ever-changing world is well and good. But the fact remains that there aren't similar types of vernacular houses else where in the world. One must consider that it is our heritage, at which we look back proudly. Hence when making changes it must be done without harming the traditional systems of response with nature while making it modern, functional wise.

In comparison walawwas or the houses of the feudals discussed in the study display a different approach all together. For them the word “walawwa” synonymous with the social status they enjoyed in the society. Therefore their vernacular houses designed in and elaborate way. Most of these houses had more than one “Meda midula” (courtyard) and were highly influence by the Dutch Architecture, which became a hallmark of the walawwas built during the past 100 to 150 years. These houses still display an elegant appearance on the outside as well as inside. When asked the reasons why they still maintain the traditional house form, the answer comes that the appearance of the “walawwas” in its vernacular form depicts the status of the occupier. In this way they could draw the respect of the villagers.

The house form that started from the primitive caveman has evolved to the present day modern or ultra-modern house. This clearly shows that we need to move away from an insular attitude and draw inspiration from what is going on in the world. Social needs too played an important role in this regard. The house form change from country to country. Vernacular houses the world over changed their form to from time to time, but kept their traditional responding methods intact wherever possible; otherwise it leads to stagnation and loss of vitality and creativeness. So whatever we do must be done without losing the essential characteristic we have valued for centuries.



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