Chapter 1

INTRODUCTION

1.1 PREAMBLE

India was a host to several cultures of the world since ancient times all of which added to the richness of her architectural heritage by suitable adaptation to the climate, building materials and craft skills the place offered. In the middle of the 20th century, modern international style of architecture developed in the industrialized western countries and influenced architecture globally. It is observed that this new development changed the prevailing traditional approaches of architectural design in the form of ‘replacement’ rather than ‘adaptation’ of design systems. Thus, architectural details and forms that were evolved in response to local climate, physical and cultural attributes of the people for centuries were neglected.

In independent India, contemporary architectural education which is primarily based upon Western perception of design methods has ignored the rich and complex heritage of design systems prevalent in the country since history. This study attempts to underscore the neglect and forward the need to recognize the adaptive and re-established use of this heritage in architectural design.

By far the majority of buildings are dwellings, and in much of the world these are still built by their owners, by communities that pool resources, or by local specialized builders and craftsmen [Oliver, 1997]. Generally unknown and until recently, little studied, these builders have shaped much of man’s built environment.

Studies of houses in different geographical regions reveal how indigenous technologies evolved to create human comfort conditions in a sustainable manner. Yet, in the modern world, residential built forms are guzzlers of energy for creating comfort conditions suitable for conduct of human activities.
Analytical studies of traditional residential built forms of different regions reveal a level of highly instructive and sophisticated design and detailing system developed over generations of application of ideas and evaluation of their performance. Such built forms can also be studied and understood in terms of their various elements, worth considering as linkages from the traditional to modern design systems. What is required is an understanding of the basic scientific background involved and a process \[\text{[Krishan, 2001]}\] by which the building can be designed by articulating the building into its various elements. In this context and for all times to come, is relevant, Christopher Alexander’s observation in his book The Timeless Way of Building, “The people can shape buildings for themselves, and have done it for centuries, by using languages which I call pattern languages. A pattern language gives each person who uses it the power to create an infinite variety of new and unique buildings, just as his ordinary language gives him the power to create an infinite variety of sentences.”

1.2 BACKGROUND

The traditional house forms in each climatic region of the world used to survive for years together, accommodating several generations of families. The detailing of these built forms generated spatial characteristics that offered each generation the possibility of adhering to its own customary patterns of living of family and social habits and interactions, and a way of life that provided the society an identity of its own. Reminiscent of the impact of climate, environment, available building materials and the lifestyle of the people of the region, their visual appearance is also marked by uniqueness as shown in Figure 1.1.

![Figure 1.1: Traditional Residential Built Forms in Kerala, India](image-url)
In post-independent India, since 1950s, change in architecture from prevalent traditional practices to modern happened rapidly. Replacement of traditional systems with modern ones was preferred over adaptation, unlike the preceding colonial era, when architectural development happened with adaptation of prevailing local systems.

The mechanism of the architectural change from one style to another involves two parallel actions: foundational and developmental [Behsh, 1993]. The first leads to the appearance of new architectural aspects, whereas the second leads to an increase in the functional efficiency of the old architectural aspects. Foundational actions affect the time-adaptive aspects of architecture whereas developmental actions affect its place-adaptive aspects.

Architectural change through a sequence of cultural periods can be studied on the basis of foundational actions and developmental actions. In India, if a sequence of three cultural periods is taken as pre-colonial, colonial and modern, then it is observed that there were indigenous systems in place which controlled the developmental actions during the pre-colonial days (Figure 1.2). Traditional built forms of this period have survived to this day.

Figure 1.2: Architectural change through cultural periods

Colonial era saw the development of public buildings for administrative functions and the bungalow as a built form which was a result of foundational actions. A study
Identifying and Establishing Linkages in Architecture: Traditional to Modern

[Bandyopadhyay, 2004] explores how ‘alien’ colonial and ‘traditional’ Indian ideas are incorporated in spatial organization of residences made during the colonial period, and how spatial organizations of modern residences are similar to or different from the colonial ones. Bandyopadhyay observes the changes in spatial organization that have taken place by comparing houses of both the periods. Yet in the modern period in India space systems are governed more by the numerical standards desired, related floor space index and the real estate worth of the same.

Impact of modernism created a state of neglect in both education and practice of architecture, ignoring architectural forms and systems which had responded to the cultural and physical needs of the people of a variety of climatic and geographic regions of India for several centuries. One such example is that of the architecture of Kerala, a southwestern state in India, where the local architectural heritage is replaced by a diversity of styles, borrowed from developments in northern India and the middle-east gulf countries. And in our time “the languages have broken down, no longer shared, and the processes which keep them deep have broken down; and it is therefore virtually impossible for anybody, in our time, to make a building live.”

Many scholars and organizations have emphasized the necessity of searching for an appropriate architectural design strategy that has its roots in the traditional systems. In the past how man succeeded in controlling the qualities of the indoor environment through design and detailing with limited resources, and knowledge available locally, are worth examining especially in regions where a large number of traditional built forms still exist and ancient texts and documents are available.

Developing alternative architectural methodology to design and construct buildings more adapted to human and environmental realities through appropriate continuity of traditional design systems is an alternative method to strike a balance between energy needs and environmental depletion. The heating, cooling and lighting of buildings now consumes nearly one quarter of the worlds annual energy supplies, and approximately two-thirds of this is derived directly or indirectly from oil and natural gas [Flavin, 1980]. Modern buildings have until recently been constructed with little heed paid to their energy efficiency or lifetime fuel costs. The lack of attention to
climate sensitive design or construction techniques, combined with energy intensive heating, air conditioning, lighting system, has proved costly.

With the current trend of globalization of culture, economy and lifestyle, the neglect and destruction of the traditional built environment in Kerala and elsewhere is gaining momentum and better solutions are required, to overcome the problems created, both from the academic and professional world. The modern academic world of architecture does not emphasize the value of investigating and applying concepts scientifically and, therefore, has no respect for vernacular architecture \[\text{vii}[\text{Fathy, 1986}].\] Now is the time to bridge the gap between widely different approaches by evaluating traditional approaches scientifically before they are discarded or substitutes proposed.

Beyond the best technical and performance intelligence are the local needs, regional resources and comparative social values that require recognition and visibility within decisions about the built environment \[\text{viii}[\text{Cook, 2001}].\] In its new necessity, 'design with climate' now has become 'designing with place' as a much more profound matrix of performance expectations that matches international expertise with local resources.

1.3 BROAD GOAL AND OBJECTIVES

In India the region comprising the state of Kerala is a place where traditional built forms and design systems have survived the impact of modernization. This research work aims at evolving an architectural design methodology by studying traditional systems of design in Kerala.

The broad goal of the study is to devise an architectural design methodology to design modern houses, more adapted to human and environmental realities, through appropriate continuity and adaptation of traditional design systems and details as linkages from past to retain the distinct architectural identity.

Towards this goal the main objectives of the research are:
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- To **identify** historical concepts as linkages from traditional systems of design adaptable for design of modern houses that respect the built form character of the place where they are located.
- To **assess** relevance of the linkages as continuity of traditional systems of design by designing and constructing residences as primary in-situ studies by the researcher for earmarking an adaptation of such linkages from traditional systems in modern materials and construction systems.

### 1.4 SCOPE AND LIMITATIONS OF THE STUDY

At the outset the scope and limitations of the present study is being delineated.

The **scope** of this research is to **assess** the relevance of continuity of traditional systems of design as **linkages**, for adaptation in contemporary design practices. 

The scope is **limited** to study of traditional residential built forms and **adaptation** of identified linkages in the design of modern residential built forms and **assessment** of the effectiveness of such linkages in maintaining **place adaptive qualities** in a ‘**post-traditional**’ built form that is **designed and constructed** by the author of this thesis.

The information collected for the purpose of the study is through wide travel and photo documentation of traditional architecture in the area of study where many deviations from the traditional ways of designing and construction of houses are noticed. This documentation is included in the appendix.

The literature review encompasses study and inferences from available texts on traditional systems of design and opinions of experts and other researchers on relevance of continuity of traditional systems.

In modern times it is observed that there are many deviations from the traditional ways of designing and construction of houses by architects. But clients and users often demand compliance with traditional systems of design, more based on certain beliefs than the elements of design in the traditional systems.

For the present research, the traditional architectural design systems of Kerala, a state of India in the southwestern region is taken into consideration, where the knowledge
base for design and construction of traditional houses have survived along with large number of 100 to 400 years old residential built forms.

Space, material and construction systems of these built forms are studied to identify physical design elements and space system based linkages that can be adapted to be applied in the design of residences in Kerala. The linkages identified are used to design and construct a residence as ‘post- traditional’ model built form.

Due to limitations of time and other resources the impact of adaptation of traditional design linkages is being studied as a response survey with visitors, whereas comfort conditions achieved in the ‘post- traditional’ model built form is assessed by comparing data collected on variations in temperature, illumination and ventilation in the ‘post- traditional’ built form with that in one traditional and one modern built form.

1.5 CHOICE OF STUDY AREA

Kerala, a state of Indian Union situated along the southwest coastline of the country, has been selected as the study area. The state has many ports that were the contact points for the country with the rest of the world since ancient times. Kerala state was formed in post independent India in 1957. Today it is one of the most densely populated states, getting rapidly urbanized, though with less industrialization compared to other states. Malayalam is the language of the people of this most advanced state in India, with highest literacy and lowest birth rate.

The climate of Kerala is warm-humid with a heavy monsoon that has two spells, the southwest monsoon from mid May to August, followed by the northeast monsoon during October-November. With the monsoons as the major climatic determinant, temperature varies from 22ºC to 33ºC and high humidity.

The land area has three different forms- the coastline, the plain midland and the high ranges of the Western Ghats. Owing to the geographic location Kerala has been relatively unaffected by the various changes and upheavals the northern part of India had to undergo through historic eras, due to invasion, migrations and cultural changes.
In Kerala, even today several built forms of traditional construction and detailing are well preserved and in use both by families and society in general. The indigenous architecture of Kerala has variety of residential types, religious and cultural institutional buildings. All traditional built forms are made with timber as a dominant material along with laterite stone. They are between 100 to 400 years old, depicting an enriched grammar of design and construction, embellished with craft and art skills.

The traditional arts, crafts and architecture in Kerala represent a homogenous socio-cultural arrangement of which buildings were a product. From the northern Malabar region to the southern Thiruvithaamkoor area of Kerala, there is an unusual homogeneity and continuity in the traditional architecture with sophisticated articulation in construction methods and techniques, use of materials, roofing system and craftsmanship.

With modern materials and technology of construction the outlook of the craftsmen community has changed over a period of time and with globalization this aspect is going to see further transformation. Yet a regional architectural language exists with its own intonations and symbols of unique aesthetic experience.

The availability of specimens of traditional architecture, featuring specifications of treatises spread over a thousand year, made Kerala a unique laboratory for the study intended (Refer Appendix A- Photo Documentation of Traditional Architecture of Kerala). There are many practitioners of traditional construction systems locally called asari, and few renowned scholars who practice traditional skills in planning and constructing buildings and keep this as a living art. The author is familiar with the study area and the language of the craftsmen to establish easy communication.
1.6 STRUCTURE OF THE THESIS

The thesis consists of six chapters.

Chapter 1 – Introduction

In Chapter 1 an overview of the research work with details of the background, the objectives of the research, scope and limitations of the study and information about the choice of study area have been highlighted.

Chapter 2 – Literature Review

In Chapter 2 literature review of historical aspects of domestic architecture in Kerala and the region, encompassing study and inferences from available texts on traditional systems of design and opinions of experts and other researchers on relevance of continuity of traditional design systems are highlighted.

Chapter 3 – Methodology

In Chapter 3 the methodology followed for identifying linkages from traditional design systems for adapting in the design and construction of a ‘post-traditional’ built form as an experimental set up, especially for this research, is explained along with a schematic chart.

Chapter 4 – Experiment and Evaluation through Design and Construction of a ‘Post –Traditional’ House

In Chapter 4 the process of design and construction of a ‘Post-Traditional’ house as an experimental set up, by application of identified linkages from traditional design systems, is discussed with illustrations and evaluation done through experiments.

The results of evaluation done through experiments related to comfort conditions in the ‘post-traditional’ built form, their comparisons and nature of response survey conducted are discussed.
Chapter 5 – Conclusions

Chapter 5 is the concluding chapter in which general findings, conclusions, utility of the research and scope for further research are discussed.

1.7 NEED FOR REVIEW OF LITERATURE

It is important to understand the historical background of traditional systems of design of the region where Kerala is situated and the nature of related domestic architectural built form to understand the character of the built forms of the region.

It is equally important to look into the impacts of the modern movement in architecture and how these factors have affected the traditional systems of design.

To select a suitable method for identifying linkages for adaptation from the space systems it is necessary to understand the various components of the Space-Material-Construction matrix of the traditional system.

The next chapter deals with the literature review of views of various experts on the importance of study of traditional systems by architects. The review and inferences thereof are followed by a study of the domestic architecture of the region and of Kerala, India, various components of the domestic built form and relevance of certain components as linkages.
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The encyclopedia is the first authoritative compilation of wide variety of typologies of vernacular built forms from all over the world, especially of the residential kind, along with theories and principles behind them. Paul Oliver observes that in the order of 800 million dwellings come within this immense but largely unrecognized phenomenon… it is a peculiar characteristic of vernacular architecture that each tradition is intimately related to social and economic imperatives…


This design handbook for energy efficient buildings re-creates the process by way of which buildings and entire habitats can be designed to respond to nature with climate as the basic parameter of design.

3 Behsh, M. Basham; “Towards Housing in Harmony with Place”, Department of Architecture and Development Studies, Lund University, Sweden, 1993, pp 72

In this thesis work Behsh argues that the process of change took place in accordance with modernism, as a revolution against the Past and the seeking a new Present in line with the conception “devastate-and-rebuild”, resulting in cultural destruction… such a break and with the past is an abnormal phenomena in architecture and bridging the ensuing gap is of critical importance… a practical solution lies in the idea of creating a true integration between the traditional and the modern.


In this study spatial organizations of houses built during and after the colonial period in the Eastern part of India are analysed through case studies to understand the patterns of change in planning of spaces.

5 Alexander, Christopher, The Timeless Way of Building, Oxford University Press, 1979

