CHAPTER -1

INTRODUCTION & RESEARCH METHODOLOGY
1.0. Introduction

The shelter comes to basic needs of human being after food and dress. It is related to the survival of the human being. Still housing is an issue irrespective of the economical and social status of every country. The talks are continuing, some attempts are ongoing but even in the most developed 21st century we cannot solve the housing issues in a sustainable manner, especially in the rural areas.

In India, especially in Kerala the traditional house construction is based on the principles of Vāstuvidya. It considers the astrological placement of the Sun, Earth, and other planets during the actual construction along with the location of the site, its shape, the proposed building’s shape, the facing direction of the building, the location of gates, entry doors, doors to each room, windows, and the general design of the building.

Traditional technology in house construction, based on locally available materials like wood, laterite, thatch and mud, has given way to modern technology based on cement, steel and burned brick in a comparably short period of time ranging from thirty to fifty years. Even though the modern materials are more expensive than traditional materials, their easy availability and popularity lead people to select.
1.1. **Vāstuvidya**

The ancient Indian Vāstuvidya has its own history from the very beginning of the habitation of human being. It evolved through centuries of observation and experimentation. The great Harappa and Mohanjadaro civilization placed in the frontline of the ancient world civilizations existed here was about 3000 years before the Christ. The townships existed in that era, the bricks used for the constructions, the architectural skills used in the constructions and their patterns etc. are the basic examples for the scientific and sustainable building techniques existed in those ages.

The word Vāstuvidya derived from the Sanskrit root *vas*¹, meaning to occupy. The place where morals and immortals are living are called *vāstu*². Vāstuvidya has its own theories and methodologies which are mainly focused on the local availability of raw materials and village technologies. It has evolved through centuries of observation and experimentation. Our great Ācāryās coordinated these for their successors through practices and their writings.

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¹ Amarakosam, purvagram, 38
² Mayamata Vol 1
The current scenario of the Vāstuvidyā is widely accepted and even the modern engineers seriously look to our traditional building science and incorporating the traits into their practices.

Vāstuvidyā has developed its own housing concepts from time immemorial which is unique in the sense that it is scientific, technical and adaptive to the environment.

1.2. Cost-effective building

Every owner wants a cost-effective building. In many respects the interpretation is influenced by an individual's interests and objectives, and how they define "cost-effective".

Cost is perhaps the most influential factor in the outcome of a product or service. More often than not, reducing cost is essential for survival. The concept which deals with effective budgeting and following of techniques which help in reducing the cost of construction through the use of locally available materials along with improved skills and technology without sacrificing the strength, performance and life of the structure can be considered as a cost-effective approach. Any field is increasingly required to improve its quality, flexibility, product variety, and novelty while consistently maintaining or reducing its costs. In short, everybody expects higher quality
at an ever-decreasing cost. Not surprisingly, cost-effective initiatives are essential within today’s construction scenario.

Alternative technologies and materials were introduced in Kerala, especially in rural housing, with the aim of finding affordable housing solutions. Affordable housing is a term used to describe dwelling units whose total housing cost are deemed “affordable” to a group of people within a specified income range\(^3\). But the present housing situation in the state reveals that sustainability of those alternatives has to be given more significance than affordability alone, since none of the options can be affordable (in the present as well as in the future) without being sustainable.

Thus cost-effective analysis of the traditional building technology gets significance in the current scenario of house construction.

1.3. **Statement of the problem**

The current issues of the rural housing in Kerala state are closely related to the status of the family in their particular society or class. Thus a house evolved into a status symbol and not merely considers as a shelter to meet their basic needs. The concept of a home becomes more meaningful than a shelter and it is closely related to the psychological well-being of the

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\(^3\) [www.wikipedia.com](http://www.wikipedia.com)
family. So a house which provides their sheltering need, also required to meet
the statuesque of the family. The required facilities in a home are also
redefined by the rural people and also given priority to the same.

The resources available to them are limited but the requirements are
above that. Here the innovations are required to fill the gaps. There are
attempts in this regard but still not yet developed into a sustainable model to
meet the housing issues. It is required to develop an alternative methods and
practices to solve the issues. There is a vast opportunity to incorporate the
traditional techniques for the construction of houses especially in the rural
area to reduce the cost of construction and improve the quality of living. This
is the basic hypothesis of this research.

This research attempted to asses traditional cost-effective techniques
and materials in the base of Vāstuidya in theoretical as well as practicing
alternatives to achieve the objectives of the research.

1.4. Title of the study

The title of the study is;

“Assessment of Traditional Cost-effective Techniques in Rural
Housing”.
1.5. **Aim and Objectives of the Study**

In general the aim of the research is to assess the traditional cost-effective techniques in the construction of rural houses both theoretical aspects and existing practices.

**The specific objectives of the study are:**

1. To find out the current scenario of rural housing in the Ernakulam District of Kerala state.

2. To list out and assess the locally available building raw materials and cost-effective techniques used in the rural house construction both recently constructed and traditional houses.

3. To assess the references of major traditional Vāstuvidyā writings on the cost-effective techniques of building construction.

4. To assess the cost-effective building materials based on the traditional Vāstuvidyā writings.

5. To develop suggestions for updating traditional techniques, local technology and modern engineering to develop sustainable cost-effective techniques in rural housing.
1.6. **Research Methodology**

The research uses the Explorative as well as Descriptive methodology to achieve the aim and objectives of the study.

1.6.1. *Universe and sample of the study*

The rural area of Ernakulam district is selected as the universe of the study.  5 samples each selected from the rural area of 7 Revenue Taluks of Ernakulam district and other 5 samples taken through purposive sampling method based on the relevance of the study.

1.6.2. *Tools and Sources of Data Collection*

**Primary Data**

Primary data collected through a structured interview schedule from

- 40 Rural house owners (those constructed the house after 2008)
- Local key persons, (Practitioners of *Vāstuvidya* and modern Engineering)
- Surveyed 40 existing rural houses built at least 30 years back.
Secondary Data

The secondary data collected through the review and analysis of related literatures such as traditional Vāstuvidya writings, previous studies, existing experiments and traditional practices.

1.6.3. Data analysis and Interpretation

The primary data collected were coded into a master chart and analysed using simple statistical methods such as percentage analysis, cross section analysis, charts etc. by using statistical software IBM SPSS Statistics version 20.

The secondary data also collected and analysed for the theoretical framework of traditional construction techniques.

1.7. Techniques of Assessment

In order to get a structure for the assessment there are various methods adopted by the researcher to reach the objective of the study. The method adopted to assess the current scenario done using the statistical methods and descriptive analysis. For assessing the cost-effectiveness of traditional houses the research uses survey of existing structures with the base of set of criteria developed as detailed below. The building may be viewed as a combination
(system) of options of various concepts of design principles. The results of these (selected) options vary in the nature and intensity, and at times contradict each other. The options may or may not be well knit or to be called a proper system. Evaluation of such a complex situation needs an effective technique of assessment. The formal techniques of assessment may be summarized as follows.

1.7.1. Descriptive Technique.

This technique describes the suitability or strength of the vāstu (building and plot) in spoken and written words. Such technique lays more emphasis on the literary quality of expression and therefore, has a high degree of subjectivity.

1.7.2. Pictorial Techniques.

An assessment with help of photograph and pictures, models or sketches, etc. come under this category. Captions or comments are added to the pictures. Though there is less subjectivity in this technique, it can be manipulated by over or under emphasizing certain aspects. Photographs are more reliable than sketches, as sketches may over emphasis or ignore certain aspects.
1.7.3. Analytical Technique.

This technique tries to study the objects in parts or stages on certain constant parameters. This has more scientific attitude because it compares on a common platform and hence is less subjective in nature. Since the object is studied in parts, it allows more precise and qualitative evaluation.

1.7.4. Comparative Analysis

By analyzing the observations and other data compared to the traditional and modern methods with providing certain parameters for comparison. Through which the researcher tried to get a major difference between traditional and modern techniques of construction and materials used.

1.7.5. Semantic Technique.

This method uses the value system of a society for comparison and assessment. Every object has pragmatic meaning and in the context of *vāstu*, such techniques are often used. The concepts and results are normally extended beyond logical understanding with help of rituals and symbols. These have a very high degree of subjectivity.

1.7.6. Statistical Technique.
Statistical analysis are the most commonly used assessment technique in research, this technique is more objective in nature than the other techniques. It quantifies the elements and presents them in the form of numerical analysis. It is more suitable to quantifiable variables, and is used for census of all countries. Though this technique leaves many things like visual (appearance), social and individualistic aspects to imagination, it is most effective for generalization and additive or deductive totality of the situation. Based on scientific analysis by quantification, this technique is regarded as most reliable even for qualitative analysis.

1.8. Chapterisation & Summary of the Chapters

The thesis is presented in six chapters. These chapters of the thesis are coordinated as follows;

1.8.1. Chapter 1 Introduction & Research Methodology

This chapter discussed the basic concept of the research with the variables using and relevance of the study. This chapter also covers the methodology part of the study which includes title of the study, statement of the problem, aims and objectives of the study, definitions of variables etc.
1.8.2. Chapter 2  Review of related literature

Review of related literature on Vāstuvidya, cost effective techniques, rural housing and related studies, modern engineering books and secondary data on the study issues.

1.8.3. Chapter 3  Current scenario of rural housing

This chapter analyses the primary data collected from the respondents and local key persons on current scenario of rural housing and locally available material and methods adopted in rural house construction.

1.8.4 Chapter 4  Survey of traditional rural houses with case studies

This chapter is an attempt to analyse the traditional rural houses built at least 30 years back with the focus to the traditional cost-effective techniques and materials used in the construction of rural houses.

1.8.5 Chapter 5  Assessment of cost effective techniques in Vāstuvidya

This chapter is the detailed analysis on the cost effective techniques in the traditional science broadly classified in to 2 sub sections such as;

1. Design methods & Techniques and;

2. Materials suggested for construction
1.8.6 Chapter 6  Findings, Suggestions and conclusion

This chapter discusses the major findings of the study, conclusion and suggestions on the cost-effective construction techniques for rural housing.

1.9. Limitations of the research

The study has its own limitations from many parts. The cost-effective practices of construction and materials are highly depended on the variations occurred by time to time. The level of satisfaction and status and concept of facilities etc. are also changing within a period of development. Thus the major limitation to the study is the changing trends and requirements of rural people towards the concept of a house. The changing trends in finishing materials and approach of house owner towards the changes affected much on the cost-effective concepts adopted or recommended.