RETHINKING CONSTRUCTION MANAGEMENT PRACTICES TO ATTAIN SUSTAINABLE DEVELOPMENT GOALS

(VOLUME - 1)

Chief Editor
Mohd Asim
Assistant Professor, Department of Civil Engineering, Integral University, Lucknow, Uttar Pradesh, India

Scripown Publications
New Delhi

Chief Editor: *Mohd Asim*
Edition: *1st*

Publication Year: *2023*

Pages: *201*

ISBN: *978-93-94375-70-3*

Price: *₹1200/-*

Scripown Publications
2nd Floor, 304 and 305, Pocket - 4,
Sector - 22, Rohini, North West Delhi,
Delhi, 110086, India

CONTENTS

CHAPTER 2

INTEGRATING VASTU PRINCIPLES WITH GRIHA IN CONSTRUCTION INDUSTRY TO ACHIEVE SUSTAINABLE DEVELOPMENT GOALS

Aditya Kumar Verma
M.Tech Research Scholar, Department of Civil Engineering, Integral University, Lucknow, Uttar Pradesh, India

Mohd Asim
Assistant Professor, Department of Civil Engineering, Integral University, Lucknow, Uttar Pradesh, India

Syed Aqeel Ahmad
Professor and Head, Department of Civil Engineering, Integral University, Lucknow, Uttar Pradesh, India

Abstract

The purpose of the study was to assess the application and utilization of the Vastu Shastra by the home dwellers in the construction of their houses. Vastu Shastra is ancient Indian Vedic and Shastra's knowledge for construction area. To achieve balance, harmony between Gods and nature and people there by paving the way of peace, prosperity, health, happiness and to avoid troubles. Knowledge of sun rays, earth magnetic poles, geoplathic zones (the place on the surface of the Earth, which can cause serious health problems for people who stay within them for long time) and concentric zones can be useful in designing building in complete harmony with the surrounding nature. Green Rating for Integrating Habitat Assessment. It is an India's national framework for the assessment of environmental impacts. "GRIHA is a rating system that allows users to assess the performance of their structures against a set of nationally recognized benchmarks". By thoroughly evaluating a structure's environmental performance throughout the course of its entire life cycle, it provides a clear description of what a "green building" is. This study examines how modern sustainable building rating system (GRIHA principles)

compare to Vastu shastra, an ancient science. Even though ancient texts make no mention of the technological developments that are mentioned in the present, passive design's ability to respond to the environment has been impressively demonstrated. To achieve the Sustainable Development Goals this study presents knowledge of GRIHA and Vastu's principles into practice.

Index Terms- Vastu, GRIHA, Sustainable construction, Green building

Introduction

Vastu, which means "to live," is based on the idea that the earth is a living organism from which other living organisms emerge. This vital energy is referred to as Vaastu Purusha. Vastu Shastra is applicable to a bounded premise, such as a house, building, industrial area, or shop. The primary goal is to achieve a balance between the outside and inside atmospheres. Vastu Shastra is based on the concept of using the five fundamental elements of earth, water, fire, air, and sky to create a comfortable environment. Vastu principles used in design promote prosperity, vitality, wealth, and good health while creating a calm and enlightened environment for living or working.

Vastu, which means "to live," is based on the idea that the earth is a living organism from which other living organisms emerge. This vital energy is referred to as Vaastu Purusha. Vastu Shastra is applicable to a bounded premise, such as a house, building, industrial area, or shop. The primary goal is to achieve a balance between the outside and inside atmospheres. The Indian science of space and architecture known as Vastu Shastra (or simply Vastu) teaches us how to design environments and spaces that promote both physical and spiritual well-being. It is more than just a science; it is a link between man and nature, teaching us the Art of Living. Just as every aspect of human life is governed by rules, regulations, and acts, nature has certain key factor principles for the smooth governance of its inhabitants, in which Vastu Shastra stands for the law of natural energies.

Green Rating for Integrating Habitat Assessment. It is an India's national framework for the assessment of environmental impacts.

"GRIHA is a rating system that allows users to assess the performance of their structures against a set of nationally recognized benchmarks".

By thoroughly evaluating a structure's environmental performance throughout the course of its entire life cycle, it provides a clear description of what a "green building" is.

Basic principles

Since we know that, the whole universe is a composition of five basic

elements: Fire, Air, Space, Earth and Water. Vastu Shastra is a complex science developed by seventeen sages. When constructing a house or a building, certain rules must be followed. For example, the underground water tank or well of the building should be oriented northeast. However, if the building has an overhead tank, it should be oriented southwest. Furthermore, more space should be left to the north and east of the building compound and less space to the south and west. Open space should be maintained around the building, and it is preferable if the plot has a road running east-north.

Fig 1: (Principle)

Source: Google

Locations as Per Vastu Shastra- For House Construction

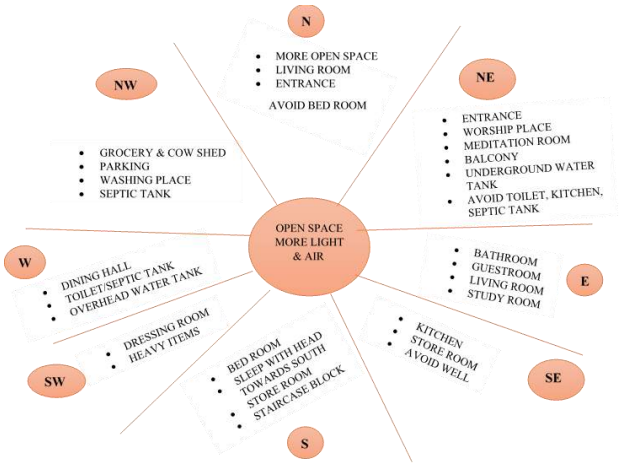


Fig 3: (Directions)

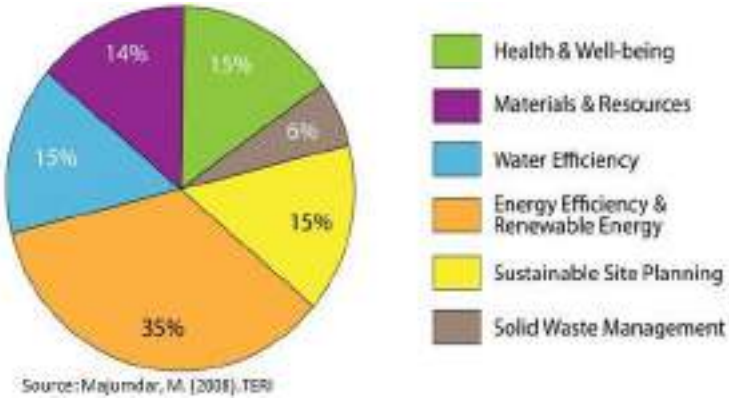
GRIHA makes an effort to keep a building's resource usage, waste production, and overall ecological impact within a set of benchmarks that are nationally accepted.

GRIHA Council, is mandated to promote development of buildings and habitats in India through GRIHA. GRIHA Council an independent platform for the interaction on scientific and administrative issues related to sustainable habitats in the Indian subcontinent. It was founded by TERI (The Energy and Resources Institute, New Delhi) with support from MNRE (Ministry of New and Renewable Energy, Government of India) along with a handful of experts in the sustainability of built environment from across the country (https://www.grihaindia.org/).

Aiming to quantify variables like energy consumption, waste creation, adoption of renewable energy sources, etc. in order to monitor, regulate, and reduce them as much as possible, GRIHA follows the adage "what gets measured, gets managed." When an office building complies with GRIHA standards, there is a 30% to 50% reduction in energy consumption compared to GRIHA benchmarks, a 40% to 65% reduction in building water consumption compared to GRIHA base case, and the implementation of good practices on site at no/minimal incremental cost. By 2015, it is anticipated that the GRIHA footprint will cover 25 million square meters of registered built-up area.

This will enable the installation of about 18.5 MW of renewable energy, the production of about 5000 kl of hot water through solar water heaters, full compliance with the Energy Conservation Building Code, and annual energy and water savings of about 40,000 million units, enough to supply 67,500 urban homes.

Weighting of various criteria as per GRIHA



On a larger scale, this system will help the community as a whole by improving the environment by reducing GHG (greenhouse gas) emissions, energy usage, and the strain on natural resources.

The organization's basic philosophy is to reduce the number of resources used by the buildings. Under specific restrictions and rating standards, it also seeks to lessen ecological consequences overall and waste generation.

GRIHA Supported New Income Tax Building, Lucknow

(**Source:** https://www.grihaindia.org/case-study)

Literature Review

The collective understanding of Vaastu shastra knowledge includes the concepts of instrumental understanding, sense understanding, theoretical understanding, and scientific understanding, each of which develops its own philosophical study (Mehul Hotwani and Ar. Priyanka Rastogi et.al, 2022). Vaastu Shastra has been disregarded and given insufficient attention over the years. This essay attempts to list different Vaastu shastra concepts as well as contemporary architectural methods. In the past 20 years, Vastu architecture, a traditional system that incorporates aspects not seen in other systems, has been studied and used in the West. Vastu architecture is a design paradigm for buildings that is intended to enhance mental and physical wellness (Jon Lipman, AIA and Lee Fergusson, 2022). This article critically assesses the philosophy and research of Maharshi Vastu architecture, a well-developed, conventional type of Vastu.

According to published research, implementing MVA concepts into buildings is associated with considerable gains in inhabitants' physical and

mental health as well as their quality of life, including better sleep, happier kids, a stronger sense of security, and less stress. Another social factor that is related to health is how frequently people commit burglaries.

Vastu Shastra depends on the movement of the Sun with relation to the construction. Depending on their capacity, each room was designed to get consistent light throughout the day. Vastu Shastra depends on the movement of the Sun with relation to the construction (Shanta Dash and Mahendra Joshi et.al, 2022). Depending on their capacity, each room was designed to get consistent light throughout the day. Technology has advanced to the point that building codes established by municipal government are no longer necessary. The concepts of Vastu Shastra and modern building techniques have similarities and contradictions.

Methodology

This study attempts to find out the similarities between Vastu principles and GRIHA principles. GRIHA rating assessment is the refinement of Indian ancient Vastu science and the mapping between them will benefit to achieve the Sustainable Development goals (SDGs) and fulfill the needs of sustainable design in building construction.

Discussions

Table 1 integrates GRIHA criteria's along with criteria numbers, maximum points that can be scored in that criteria with mapping of relevant Vastu principles. GRIHA makes an effort to keep a building's resource usage, waste production, and overall ecological impact within a set of benchmarks that are nationally accepted. Aiming to quantify variables like energy consumption, waste creation, adoption of renewable energy sources, etc. in order to monitor, regulate, and reduce them as much as possible, GRIHA follows "what gets measured, gets managed." This would become smooth by considering vastu in construction. Consequently, an attempt to attain multiple Sustainable Development Goals both play a critical role.

Table 1: Mapping of GRIHA criteria with principles of Vastu

Criteria No. (GRIHA)	Description of Criteria (GRIHA)	Points can be scored (GRIHA)	Vastu (Mapped principle)
6	Enhance outdoor lighting system efficiency and use of RE (Renewal Energy) system for meeting outdoor lighting requirement	3	Use Sun light and energy for day lighting

7	Plan utilities efficiently and optimize on site circulation and efficiency	3	For efficient positive energy place Toilet/Septic Tank in the west direction
13	Optimize building design to reduce conventional energy demand	6	North-East direction is best for natural lighting and positive energy
14	Optimize energy performance of building within specified comfort	12	Uses of passive energy in the building
18	Renewable energy utilization	5	Sufficient open space in middle for better natural lighting
23	Efficient waste segregation	2	Dhatu Restoration in Panchtatva
25	Resource recovery from waste	2	Energy conservation
27	Minimize Ozone depleting substances	3	Use of Natural resource in construction
33	Operations and Maintenance protocol for electrical and mechanical equipment	2	Less use of electrical and Mechanical equipment

Conclusion

The assessment of GRIHA criteria in consideration with Vastu enable users to restore harmony between the world and the home (the microcosm), using the powers of natural energies (the macrocosm) and to acknowledge the importance of using green practices in construction. For instance, the construction has highly influenced due to climate change that has spread throughout India in recent decades. A recent UN report provides a dark picture of the state of the environment, noting that the building industry was responsible for 37% of energy-related carbon dioxide emissions. According to projections, the construction industry in India would continue to expand gradually over the coming years. Therefore, the applications of green practices and solutions along with Vastu in construction cannot be understated.

References

1. Dash, S., & Joshi, M. (2022). Redefining Vastu Shastra Principles with Reference to the Contemporary Architectural Practices in India. Journal of Pharmaceutical Negative Results, 349-358.
2. Pusalkar, S. M. (2022). Understanding the Vastu shastra: city planning in walled city of Jaipur. EDA. ESEMPI DI ARCHITETTURA, 9(1), 61-71.
3. Chawla, S. (2020). Application of vastu shastra principles in house

construction by home dwellers.

4. Azam, S. R., & Roy, S. A Comparative Study on Green Building Concept and Vastu Shastra. JOURNAL OF ENGINEERING, SCIENCE & MANAGEMENT EDUCATION.
5. Saelee, C., Riyaprao, O., Komonjinda, S., & Sriboonrueang, K. (2021). An archaeoastronomical investigation of Vaastu Shastra principles (Vedic architecture) implemented in the city planning of ancient Chiang Mai. In Exploring the History of Southeast Asian Astronomy (pp. 461-485). Springer, Cham.
6. Lipman, J., Fergusson, L., Bonshek, A., & Schneider, R. H. (2022). Managing the Built Environment for Health Promotion and Disease Prevention with Maharishi Vastu Architecture: A Review. Global Advances in Health and Medicine, 11, 2164957X221077084.
7. Secrets of Vastushastra, By N. H. Sahastrabudhe and R.D. Mahatme. ISBN 81-207-20423
8. Journal of Indian Institute of Architects, Sep – 1995.
9. Bo Xia1; Jian Zuo; Martin Skitmore; Stephen Pullen; and Qing Chen "Green Star Points Obtained by Australian Building Projects." Journal of Architectural Engineering, Vol. 19, No. 4, December 1, 2013. ©ASCE, ISSN 1076-0431/2013/4-302–308
10. Peng wu and Sui pheng low "Project Management and Green Buildings: Lessons from the Rating Systems." Journal of Professional Issues in Engineering Education and Practice, Vol. 136, No. 2, April 1, 2010. ©ASCE, ISSN 1052-3928/2010/2-64–70
11. Gupta, R. (2016). Comparison of Vastu Shastra with modern building science. Int J Res Sci Innov, 3, 118-21.
12. Goodarzi, A., & Fazeli, H. (2014). Identifying the principles of traditional Iranian architecture in the light of Vastu Shastra, the traditional Indian wisdom. Journal of Design and Built Environment, 14(1).