

The ancient Indian Science of Vaastu Shastra & Climate responsive buildings in 21st Century

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Abstract

a scientific relation between vaastu and the globally accepted climatologically principles for residential building as well as i have try to relate it to the green concepts of the present day need. basically the overview of my study is dependent on 2 very important vairables that are:

- ⊙ Climate responsive vaastu
- ⊙ Orientation of site.

Its importance, need and outcome if we consider vastu shastra before or while designing and analyse how vastu favors or conflicts in designing of any residence's to understand that how Vastu plays a crucial role in construction of a building and ensuring dimensional and character features of rooms in terms of length, sizes and breadths, together with ensuring that the property utilizes harmonious cosmic energy to its fullest. How Vastu is effective when construction of a building follows both traditional and modern perspectives incorporating correct direction principles as suggested in vastu science. Considering application of vastu is unavoidable based on useful benefits it provides.. At the same time, it is noteworthy that several other elements such as heavenly bodies, nature and supernatural forces all exert their influence on us. The only prudent way out is to strike a chord of harmony with these forces so as to ensure a pleasant living. Vaastu Shastra is that Indian ancient science that provides guidelines to design and maintain a harmonious living condition in the buildings. It therefore becomes imperative to understand and assimilate the Vaastu ideas into modern architecture. With the help of the case studies, the research article is intended to understand and emphasize the role of Vaastu Shastra and its practical applications.

Keywords: Vaastu Shastra, Science , Climate responsive buildings, Energy ,modern architecture

1. Introduction

The origin of Vaastu Shastra is found in the Sthapatya Veda, which is a subdivision of the Atharva Veda. Indian culture lays immense emphasis on spirituality and obtaining divine blessings. It is believed to be of great value for the well being, health and happiness of the people. However, in the modern times the role of our ancient wisdom of designing is not prioritized. Architecture, when focused completely only on the comfort creation taking the site, bye-laws and client's requirements as well as fancies as standards for consideration somewhere adopts a narrow picture. The fact that heavenly bodies are constantly exerting their magnetic and gravitational force on us is a proven reality. Furthermore, earth itself possesses a magnetic aura of its own. It is thus quite logical to argue that these magnetic forces will have their impact on our mind and therefore on our lives. Vaastu Shastra is that science of building design and planning that deals with the study and practice of the inter-relationship of the forces of nature, heavenly bodies and supernatural elements in the cosmos. Man is regarded as a cosmic being who must survive in harmony with the other cosmic elements.

2. Historical Background

According to the Indian scriptures, there once existed a demon known as Andhakasura. Due to his evil deeds Lord Shiva, who is regarded as the greatest of all Gods (Devon ke Dev Mahadeva) exterminated the demon. During the event, drops of sweat from the forehead of Lord Shiva fell down on earth. As these drops touched the surface of earth, a creature with a dangerous face was formed. Right after his formation he drank the blood of Andhakasura. But still he could not satiate his thirst. He then started strict meditation of Lord Shiva. After years of meditation, Lord Shiva got pleased by him and asked him to ask for a wish. The creature asked Lord Shiva to grant him the ability to be able to swallow all three regions (Heaven, Earth and Hell) of the universe. After obtaining the blessing she started to block the three regions and fell down on the earth. At this, the Gods got scared and turned him into a statue then and there itself. The creature was facing downwards. It is believed that the Gods permanently started residing on the respective organs where the Gods were touching him. It is due to the reason that every God resided in him that the name

3. Vaastu Purusha

3.1 The Origin of Vastu

The origin of Vaastu shastra may have taken place well over thousands of years ago. The learned men of those days may not have lived in houses themselves but they most definitely dedicated their lives to the development of the science "Vaastu shastra" or "Vaastu", as it is popularly known today.

The principles of the science laid down during those days were based purely on the effect of sunrays during different times of the day. The observations and corrections made were noted and concluded only after in-depth screening of the situation.

Vastu is a part of Vedas, which are believed to be four to five thousand years old. Through penance and meditation yogis of that period acquired answers believed to have come from the cosmic mind itself to their questions. Hence Vedas are heeded with divine knowledge. The art of Vastu originates in the Stapatya Veda, a part of the Atharva Veda.

It used to be a purely technical subject and it was only confined to architects (Sthapatis) and handed over to their heirs. The principles of construction, architecture, sculpture etc., as enunciated in the epics and treatise on temple architecture, have been incorporated in the science of vastu. Its description is there in epics like Mataysya Purana, Skanda Purana, Agni Purana, Garuda Purana, and Vishnu Purana. There are some other ancient shastras that pass over the knowledge of vastu shastra to next generation, like Vishvakarma Prakash, Samraangan Sutradhar, Kashyap Shilpshastra, Vrihad Sanhita, and Praman Manjaree.

In the Mahabharata it is said a number of houses were built for the kings who were invited to the city Indraprastha for the Rajasuya Yagna of King Yuddhistira. Sage Vyasa says that these houses were as high as the peaks of Kailasa mountains, perhaps meaning that they stood tall and majestic. The houses were free from obstructions, had compounds with high walls and their doors were of uniform height and inlaid with numerous metal ornaments. It is said that the site plan of Ayodhya, the city of Lord Rama was similar to the plan found in the great architectural text Manasara. References are also to be found in Buddhist literature, of buildings constructed on the basis of Vastu. They contain references to individual buildings. Lord Buddha is said to have delivered discourses on architecture and even told his disciples that supervising the construction of a building was one of the duties of the order. Mention is made of monasteries (Viharas) or temples, buildings which are partly residential and partly religious (Ardhayogas), residential storeyed buildings (Prasadas), multi-storeyed buildings (harmyas) and Guhas or residential buildings for middle class people.

3.2 A Logical basis of vastupurush

In ancient time there was absence of instruments to prove the things to make the people understand as present time. Every intellectual work is done by thinking, perception, imagination, and experience and followed by the people automatically on the sake of religion so the story of its emergence from lord Shiva was came into being. In siddha shaiv tradition nama shivaya is considered as pancha bhutas tatva of lord shiva and universal oneness of five elements, "NA" sound represent –Earth (Prathvi), "MA" sounds represents-Water (Jal), "SI" sound represents-Fire (Agni), "VA" sound represents – Air (Pran Vayu), "YA" sound represents –Sky (Space, Akasha) . Its total meaning is that "Universal Consciousness is Hindu Mythology describes the positive (favourable) and negative (unfavourable) as God and devil, it similar to that, in day today life that all human being, place and thing are called by names.

Apart from it Hindu mythology describes God or supreme or universal energy by two forms i.e.; one saakar swaroopa and another one is niraakar swaroopa. saakar swaroopa (unsubtle) is one which can be given some form and description and niraakar swaroopa-(subtle)-one which is beyond from form and description" (a soul or a form of invisible energy). Now from the above point of view it is clear that the vastu purush is the reflected form of energy of lord shiva (nature) as explained by intellectual people or sages to make the process of designing and understanding easier. They gave the name as demi-god and explained by taking the saakar swaroopa of God(nature), as if satisfied as per the guidelines of vastu-shastra behave in a favourable manner for the occupants of the building by creating comfortable living conditions otherwise make the building worst to live. As mentioned in _section 2_ the 45 deities are nothing but the positive forces on a plot(or on earth) which are capable of stopping the negative forces, otherwise these negative forces can eat or destroy everything on earth in the form of weird personality of vastupurush

4. Types of vastu purush

4.1 Sthira vastu - It is the representation of the rotation of earth in its axis. The flow of electromagnetic field on earth, the directions, rise and set of sun. (Solar cycle)

4.2 Nitya vastu – it represent the daily movement of sun, the relationship of human beings with sun, arrangement of spaces in a building as per their need throughout the day along with health benefits of sun.



Table1- special arrangement as per Vastushatra

Spaces	Directional arrangement.
Bed room	South, as human head behave as north-pole, as the attraction of opposite poles. Otherwise it creates blood pressure related problems.
Kitchen	South-east, morning rays are healing, its ultraviolet rays work as a disinfect and exposure of body to morning sun, the skin produces vitamin D
Veranda	Provide veranda-in north and east (allows undisturbed electromagnetic flow from north-east) Provide Aangan (courtyard) which is open to sky in the centre (generates stack effect).
w.c	Provide in south, southwest
Bathroom	East as it is hygienic due to falling of morning sunrays
Puja room/ Meditation room	Provide in northeast, presence of electromagnetic of earth and healing properties of sun, gives better results of mantra chanting and of meditation as additive energy
Dining room	Provide in west, setting sun generally is red in colour which the colour of muladhar chakra (first energy channel of the body manifestation of energy of earth, directly affected by the setting of sun in a positive manner the vibration of colour of setting sun work as a chromo therapy for this chakra. Indirectly food is also the form of earth energy.)
Drawing room	Provide in north or northwest or east-north
Study room	Provide in west and southwest, presence of sun light in the evening hours

Apart from earth’s magnetic and movement of sun Vastu shastra have given consideration to wind direction to provide the openings like window and door. The ideal direction of windows as per vastu shastra is north towards northeast, east towards northeast and west towards northwest as shown in figure.

4.3- Chara vastu-

It represents the yearly movement of sun and importance of summer and winter solstice; people in ancient time prefer to do the important work during summer solstice, because the duration of sun light is more.

By giving importance to Chara vastu they had incorporated the passive solar design in the buildings. Passive solar design uses the predictable movements of the sun to utilize its energy within the building’s overall design both heating and cooling purposes.

5. Elements of vastu

Vastu is a science of direction that combines the five elements of nature and cosmos, ultimately balancing with man and the material. This mysterious science unifying the five elements called 'Panchbhootas'- earth, fire, water, sky and space and paving a way for enlightenment, happiness and prosperity.

Five elements

According to Vastu, the cosmos is full of beneficial energies which we must learn to tack as well as keep in balance if we wish to experience a state of well-being. Energy is essentially emanated by two forces- the five elements and the electro-magnetic energy generated by the rotation of earth. Earth is a third planet among the nine planets and the only place where life exist due to the presence of panchbhootas. Sun, air and space are universally available and can be moulded in accordance with human needs by the act of design. To thoroughly understand the act of design with these five elements we need to discuss all these elements briefly in a separate manner:

Earth-The first and foremost element of nature which exerts maximum energy. It is necessary to consult the land you are purchasing, as plot's soil, area everything matters in Vastu. The selection of site is considered very important in Vastu element. A detailed inspection of soil, plot, site, shape and size has to be done before commencing the construction. Earth (prithvi) is the most important element in Vastu and influence human lives in every way.

Water-Water (jal) is present on earth in the form of rain, ocean, sea and rivers. It is the second foremost element considered in Vastu. Vastu provides proper directions for the placement of water sources. Water is an element of north-east. As far as the flow of domestic water is concerned, it should be drained out of north-east only. The water bodies such as swimming pool and aquarium etc need to be made in north-east, this direction is auspicious and suitable for water

Fire-Fire (Agni) is considered as an element of south-east. In a house kitchen fire or electrical gadgets shall be place in south-east. Light is the essence of life, and sun is the natural light giver. Fire is the basis of all sources of energy including thermal power and atomic power. There should be proper ventilation for sunlight being necessary and natural source of light for human beings.

Air-Air (vayu) is a necessary thing for all of us living on this earth. In Vastu air is another important element which is considered before applying it. Air is an element of north-east. Air consists of various gases on earth like oxygen, nitrogen, helium, carbon dioxide etc. A balanced percentage of different gases, atmospheric pressure and humidity level are important for living beings on this earth. There are important directions for windows and doors in Vastu so as to receive a good amount of air.

Space-Sky is never ending and our space is full of constellations, galaxies, star, moon, sun and all the nine planets. It is also called universe which is known as 'Brahamand'- the place of god. Space has a very important place in our lives and Vastu gives different directions for better space. Indian houses used to have open space in the centre of the house. Akash is a brahmasthan which should be an open place, any disturbance related to space in house would lead to detrimental results.

Why One Should Follow Vastu ?

Vastushastra is an ancient building science which covers the philosophy and theory of Architectural works to construct any building and as well as living style of people. Vastushastra is based on various natural energies, which is available free cost in atmosphere like:

Solar Energy from Sun.

Lunar Energy from Moon

Earth Energy

Sky Energy

Electric Energy

Magnetic Energy

Thermal Energy

Wind Energy

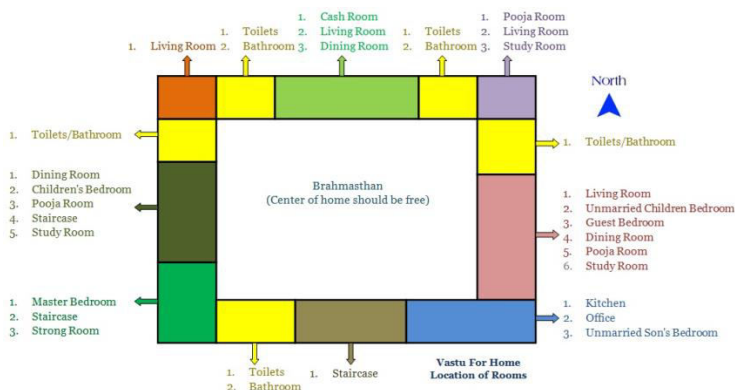
Light Energy

Cosmic Energy

Utilization of such energies gives us pleasure peace, prosperity and money etc in our life. Now a days we are having National Building code, which gives us certain regulations to construct building, whereas in past our ancestors were having Vastu Shastra as a religious & rigorist code. As per shastra Vastu Purush is god of building science, hence let us pray.

Thus Vastu is rational, as it is scientific, it is permanent as it is based on directions and directions are unchangeable. It is beneficial as it is a bridge between man, material and nature and above all it is practical, as it is very simple to follow. Build your house according to the guidelines provided by vaastu and lead a healthy and happy life. Sun indicates light (illumination) will power, generosity, solar system, luck or fate, mobility and in body. It rules over bone, eye, heart, spinalcord, blood circulation and soul etc. Hence east direction is auspicious; it belongs to lord Indra. North is considered auspicious since magnetic lines of forced moves from North to South, thus origin of all the life. There are three forces in action to create harmony. Wind, water and fire or, vaayu, jal and Agni. If these forces are kept in their appropriate places, then there will be no disturbance. But if water is put in place of fire and wind in place of water or in any other combination, the forces will start acting accordingly and create disharmony and unpeacefulness.

6. Sense of direction in vaastu shastra



Directions and orientations have great prominence in Vaastu.

There are 6 directions and each of these covers 35 degrees of area. These directions are dictated by sunrise and sunset or Uttarayan and Dakshinayan

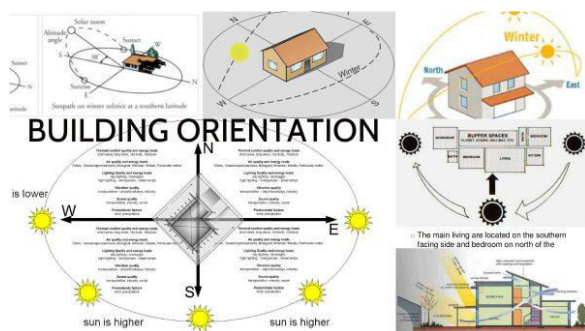
.In the eastern side, it is suitable to construct mainentrance, well, waterfountain, verandah, store-house, garden, basement. This side must be kept at a lower level. The central segment, Brahmsthan is best kept vacant or lightly occupied. Care must be taken to ensure that no stale or dirty things are placed in this part of the house [8].In the south-east corner of the house, agneya kona it is advisable to plan the kitchen. Adjacent to this corner activities connected to cooking can be planned. This side must be kept ata higher level. At the southern side of the building, master bedroom can be placed along with the bathroom placed at the south-west. This side must be kept at a higher level. Study room can be given at the south-west side. To the western end, dining room, well, staircase and gardens areappropriate. This side must be kept at a higher level. At the north-west side, food storage, animal home, toilet, water-fountain can be provided. This side must be kept ata higher level. To the northern side, main gate, verandah, staircase, well, water pump, water storage, property storage, garden, temple, store, chest can be provided. This side must be kept at a lower level. At the north-eastern end, medicine store can be planned. Further, temple, well, water storage, water pump, storage and gardens can be placed. This side must be kept at a lower level. Understanding vastu Guidelines for residence

7. Scientific Vastu Guidelines For Selecting The Right Site: is very important since the Site represents a fixed form, that will radiate positive as well as negative energies depending on its location, orientation, shape, slope and soil quality. Listed here are the five most important factors to be considered while selecting a Site.

Given a chance to select among North, South, East or West facing houses, most people will tend to choose the North or East facing ones because they are considered the most auspicious. However, not every North or East facing house is ideal. The placement of the entrance dictates whether a House is auspicious according to Vastu Shastra Principles and has been explained here:

8. Scientific Vastu Shastra Principles For A House: are a guide for designing and planning a proportionate, aesthetic and beautiful building with the right measurements and are very similar to the principles of Architecture taught in Architectural colleges all over the world today. Listed here are five important Vastu principles that can help elevate the appearance of your house.

9. Scientific Vastu Plan of A House: Vastu Shastra lays down guidelines on the ‘design, location, direction and disposition of the Interior and Exterior spaces of a House’ so that the inmates derive maximum benefit from the natural elements and are protected from their harmful effects. Listed here are the Vastu guidelines for all the interior rooms and exterior spaces that encompass a house.



10. Vastu guidelines for plot shape

Proper guidelines have been put in Vastu Shastra for the Selection of a plot. As Vastu is a science, there is logic and reasoning behind every guideline. As a Vastu Expert I have made an attempt to explain these guidelines rationally and scientifically. It is up to you to decide what you want to follow and what you don't.

10.1 What is the best location of a plot?

Peaceful, calm place with lot of greenery and good water source with good soil, for obvious reasons. The fertile soil is an indication of good soil for construction.

While purchasing a piece of land, it is a good idea to stand on the land and feel its vibration for a few moments. If you feel positive about it, consider buying the land. If not, it is probably not good for you. The Reasoning is that it is always advisable to trust your instinct but make sure you are not influenced by anything or anyone else, for good reasons.

Check the Plot history; it should be a good history. It is best to buy land where happy and successful people have lived. The natural reasoning behind the concept is totally psychologically, you will feel that a land where people were happy and prosperous; has good vibes or energy. Check for the road adjacent to the plot. Plot with pathways on all four sides is considered the best. It ensures health, wealth, prosperity and happiness. The natural reasoning for the logic is because a Plot with roads on all four sides is not abutting any body's property and hence one can derive maximum lighting and ventilation from all four sides. The next best option is a Plot with roads on the North or East. The reasoning I understand for it is that more light and air can enter from these sides in the mornings.

11. Interpretation of vastu principles in terms of Green building concepts and climatological aspects of 21 century

The interpretation of vastu is based on the following grounds: vastu-is it a science or a myth? Has it got any relevance with the climatological aspects of a place? Vastu varies from country to country. Has it got anything to do with the climatic zones of the world? Are vastu principles laid down keeping in view the wind directions and the human comfort levels? Can we relate the vastu prescribed guidelines in terms of the green building concepts of energy efficiency, building envelope and water bodies? The vastu varies from place to place as well as the building typology as well. The vastu guidelines are mainly laid for the tropical regions of the Asian Sub-continent. Where as the climatological principles are based on the different climatic zones of the world.

In this paper, I would like to derive a scientific relation between vastu and the globally accepted climatological principles for residential building as well as relate it to the green concepts of the present day need. I will list out each principle of vastu and derive a scientific interpretation in terms climatology or green concepts wherever applicable

An Ancient Science lost in time?

Vaastu is being widely used in Asian countries of China ,Tibet and the Indian subcontinent over the ages.Though it varies from country to country ,the main principles over which it is based are the same i.e.,the five elements of nature namely the earth,sky,fire,air and water.However the scientific reason underlying the variations is the same.Now let us see the one by one list of the vaastu principles and their interpretation in scientific terms on various grounds of planning ,location of openings, permissible slab-cuts in each direction, landscape and water bodies ,set -backs of the building in the plot.

11.1 Planning principles:

In a vaastu based design ,courtyard housing is the best recommended option with doors opening in four directions i.e north ,south, east ,west on the external walls with a central courtyard(figure-2).The main entrance to the house would be in the north or eastern direction.The hall or the main living would be in the north or east,kitchen in the south east,master’s bedroom in the south- west,guest room in the north-west,puja room in the north-east.In this system, the courtyard allows the hot air to escape upwards and outside an the lower openings pull in the cool air thus creating a stack effect.The placing of the washrooms should be in the south or west.

Now let us analyse these principles in terms of climatological aspects.Considering the sunpath over the tropical region the path is from east tilted towards south and sets in the west.In summer ,the horizon is high whereas it is low in winters(figure1) .

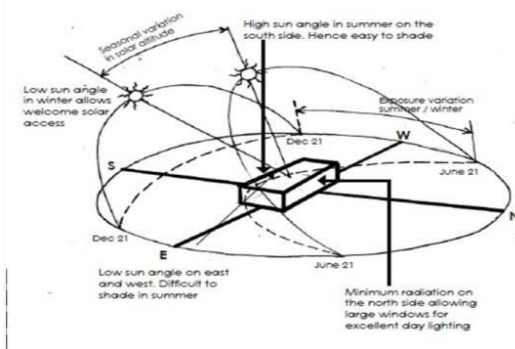


Figure1: showing the sun path

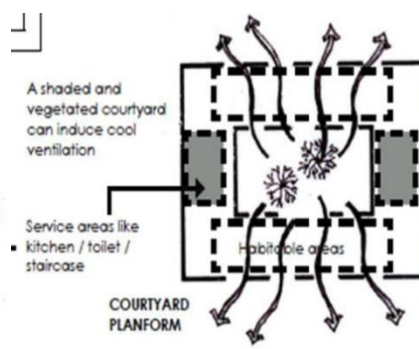


figure 2: Showing the courtyard plan form

Depending on the sun path the sunlight received in each direction can be described as follows:

Table 1: Percentage of direct sunlight received in each direction Ref:Garden web, feb2012.

Direction	summer	winter
East (semi shade)	25%	15%
South(sun)	70%	50%
West(semi sun)	50%	30%
North(shade)	Diffused light	

As per the sunpath south east direction receives50% of direct sunlight in the morning(table1) which is good for health and the heat is optimum to keep the food materials both cooked and uncooked in a fresh condition at room temperature.Excessive heat or cold which intern leads to moisture in the tropics is not an ideal condition for food storage as it leads to contamination.

South-west , west and north west,which are the less inhibited areas during theday receive maximum solar heat .The heat gets dissipated by night and is replaced by cool winds.This location is ideal for night occupancy i.e is the bedrooms.And the place allotted for the toilets is also on the south and west walls so as to facilitate the drying up of these areas which are otherwise damp and may lead to the development of unhygienic conditions.

North receives the diffused sunlight throughout the day which is the exact requirement for living areas.North east receives the morning rays which are believed to contain positive cosmic energy as per hindu mythology and justifies the placement of the puja room at this corner(figure3).

The staircase and the cupboards /wardrobes inside the house should be located on the south or west walls which act as a buffer for the conductive heat entering the house from the external walls from these sides.

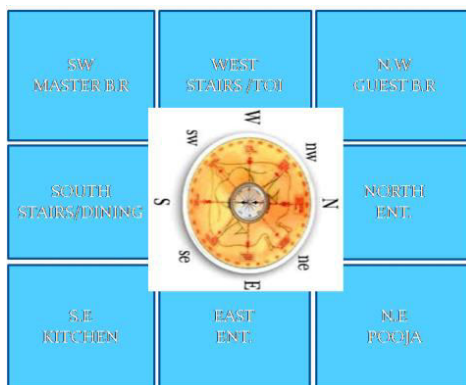


Figure 3:vaastu mandala and spatial arrangements(ref:imaginary image as perGuru Griha vaastu,2002)

11.2 Location of openings:

According to the vaastu principles ,all the openings in the house should be in alignment witheach other i.e,the doors and windows.This demonstrates the linear ventilation method which was used before the concept of cross ventilation was introduced.All the openings had ventilators above them facilitating the reduction of heat pond effect at ceiling level(figure4).The shutters of all openings were made out of wood,which is an insulating material maintaining the interior temperature intact unlike glass.

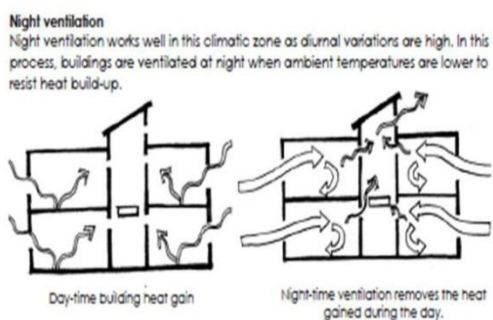


Figure 4:dissipation of heat through higher openings(ref: IGD booklet,2013).

11.3 Slab-Cuts:Vaastu prescribes the permissible slab-cuts in each direction as follows:

Table 2: Permissible slab-cut in each direction (ref:Gouru Griha vaastu,2002) .

Direction	permissibility
East	Allowed
South-east	Not allowed
South	Not allowed
South-west	Not allowed
West	Not allowed
North-west	Not allowed
North	Allowed
North- east	Allowed

From the above data one could easily make out that the slab cut indicates the increase in the surface area of that respective direction which intern leads to maximisation of solar heat gain(figure5).South, west,and their respective corners are likely to increase the heat inflow to the building,hence avoided.

Whereas north, east and their common corner helps increased surface area capturing the cool winds besides diffused north-light.The slab heights are also prescribed as :south-west part highest and the north-east lowest.That implies that the roof should slope from SW to NE minimising the exposure of the roof to direct solar radiation and the south wall which receives max heat is protected by the deciduous trees on that side.

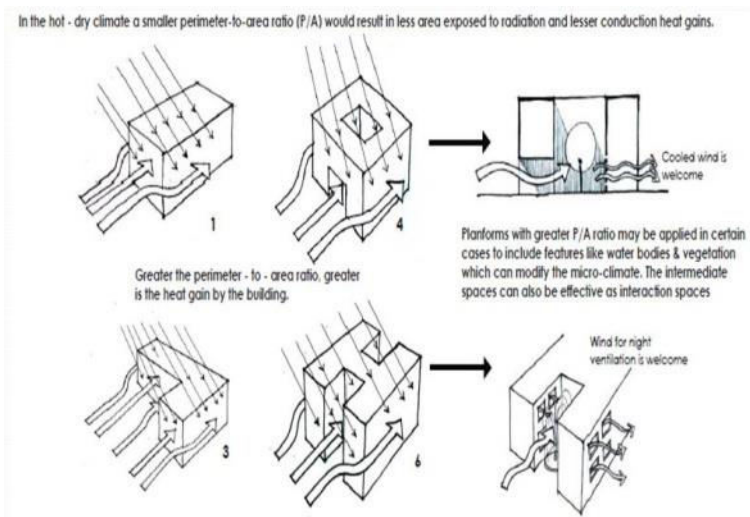
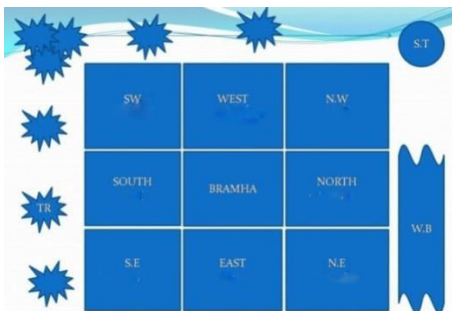


Figure 5: illustrations showing the conductive heat gain and wind capture depending on form.

11.4 Landscape and water bodies:

It is specifically mentioned that huge trees like banyan, peepal, amla, tamarind should be got removed if present in the site as they are un-auspicious, the reason behind this belief being the presence of such trees would damage the foundation and the structure because of its strong root system. The water in north will lower the temperature of the wind blowing from north and east into the building (figure 7)

The placement of the water body in any other direction would lead to excessive evaporation in turn building up humidity in the site. Another concept behind this guideline is that water gets heated and slowly than land. Supposing a water body in south or west, the water gets heated up throughout the day and will heat up the surroundings while dissipating the heat during night, i.e. the bedrooms in this direction would become uncomfortable for the occupants.



TR---tree S.T---septic tank W.B---water body

Figure 6 : location of trees and water bodies around the building.

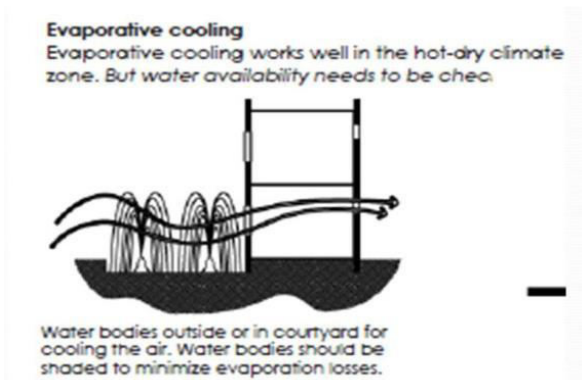


Figure 7 dry air collecting moisture while passing over a water body

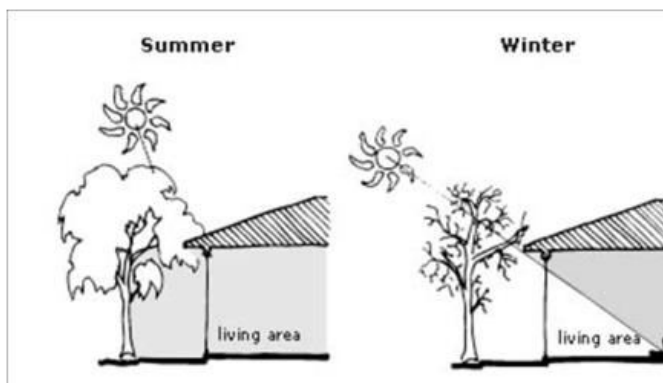


Figure 8: deciduous trees provide shade in summer and warmth in winter

11.5 Building setbacks:

The guidelines for building set backs as per vastu are:less on south and west,more on north and east.The scientific reason behind this guideline is that the building is closely placed to the trees on the south and west boundary wall providing shade to the openings as well as the external wall surfaces from the harsh radiation in these directions.

CONCLUSION :

I have tried to unveil the green building concepts in vastu which may be the actual scientific reason behind the vastu principles.This is only an attempt made to eliminate the superstitious practices of vastu and various misinterpretations regarding an ancient science.The public should follow vastu on the scientific grounds with proper reasons but not involve in any beliefs which do not have a proper reasoning.It should be kept in mind that vastu principles vary from region to region depending upon the climatic conditions and are not to be blindly followed or are applicable to all the regions in a similar manner.Follow vastu as a science but not as a myth- which if violated will lead to the ill being of the occupants .

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