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Comparative Analysis of Planning Principles of Vastu Sastra of Traditional Indian Architectural Texts for the Residential built Environment

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Abstract: Traditional Indian Architectural treatises were established with meticulous principles governing the various aspects of planning and construction process of building. Wellbeing of the inhabitants as a primary objective, these texts had laid down systematic principles not only for the construction of Monumental buildings like temple etc., also for the residential buildings. These principles are aimed at developing a built environment, compatible for the inhabitants, believed to extract maximum benefits and perpetual wellbeing. This study attempts to explore the principles of planning and design stated for residential buildings in 5 primary traditional Indian architectural texts established in different geographical regions. The principles include aspects such as Sthana vinyasa (Zoning), Aayadi (Building Formulae), Yoni (Orientation) and Dwara (Door openings). The texts taken for the study are authentic translation made on 1. Manasara 2. Mayamatam 3. Samarangana Suthradhara 4. Manushyalaya Chandrika and 5. Manai adi Sastram. A comparative analysis of above principles stated in the said texts has been discussed to understand the compliance and conflict between them.

Keywords: Traditional Indian Architecture, Vastu, Wellbeing, Padavinyasa, Mandala and Sthana Vinyasa

1. Introduction

Experience being the primordial essence of life, as Hindu philosophy insists the architectural experience always provide us with abundant knowledge and clues about the people and culture of that period. As architecture evidently represents the belief and cultural system of the respective society, traditional Indian Architecture holds immense knowledge and experience through the various layers of spatial elements and styles evolved by the stringent architectural principles lay in ancient times.

The architectural legacy of India is normally understood through the building of monumental scale i.e temples, palaces, forts, stupas etc. Elaborate principles such as site planning, building proportion, detailing of various elements for the construction of these monumental buildings, were stated meticulously in the traditional texts. The principles regarding the construction of residential house and housing were also equally mentioned in many of those texts however these have received less scholarly attention. These collective principles are typically classified as *Vastu Sastra*. PK Acharya says “In the *Vastu Sastra* the term architecture is taken in its broadest sense and implies what is built and constructed. Thus it covers all kinds of buildings, town planning, sculptures, articles of furniture and

ornaments”. This study attempts to explore the principles of planning and design of residential buildings stated in popular traditional Indian Architectural texts and make a comparative analysis across the selected texts.

2. An overview of Vastu Sastra in traditional Indian Texts

2.1. Architectural References in ancient texts

The subject of *Vastu Sastra* [1] had been rigorously dealt across various ancient texts covering diverse subjects of literature. It ranges from Vedic literature to agamas, puranas, sutras, samhitas, epics and other treatises. These encyclopedic works on Architecture said to be written in various stages and Technical manuals developed by *Sthapatis* – a Master Architect, together forms the body of knowledge on *Vastu Sastra*.

As discussed by Dr. T P Battacharya [2] the earliest reference to the application of Vastu sastra may said to be in the construction of vedic altar rituals. The mention of ‘*Vastospati*’ a deity presiding over the site and building, can be found in two chapters in seventh Mandala of Rig Veda. It deals entirely with the invocation of Vastospati (Rig Veda VII 54 55) and the associated rituals. Occasional references on honouring the Agni (I 67 5), Identifying Vastospati with Indra (Rig

Veda VII verses 3), the carpenter *tvastar* (Rig Veda V 41 8), worship of doors and sacrificial posts (Rig Veda III 8) were also found in Rig Veda.

The later *White Yajurveda* (Ch. 35) gives the description of the construction of *Smasana – a funeral mound*. The Black Yajur veda contains many hymns related the construction of *Yupa – a sacrificial stake*⁴. The Adharva veda (II 12, IX 3) refers to the rituals connected with the hymns recited during the building of a house⁵. The *Satapatha Brahmana* (III 6.4.27) and *Aitreya Brahmana* (VI I) refers to the octagonal *Yupa* used while invoking the Indra on the occasion of building a new dwelling⁶. *Sankhayana Grihya Sutra* (III 3 2 9) explains the benefits of adhering to the proper dimension during the construction [2].

Apart from Vedas and Brahmanas, Puranas are also possessing useful information on Vastu Sastra. The *Matsya Purana* has eight comprehensive chapters (Ch. 252 – 259) covering various aspects of architecture and sculpture. The *Skanda Purana* contains three chapters devoted to architecture on which one refers to the planning of large city. The *Agni purana* (Ch.21- 106, 263, 272 and 317 – 326) of its sixteen chapters three were dealing with architecture and thirteen with sculpture. The buildings name, number, types and other details referred in *Bhavishya purana* has been found identical with the treatises of *Manasara* and *Brihat Samhita* [2].

The *Brihat Samhita* [3] of Varahamihira an astrological treatise had devoted two chapters (Ch. 53 and Ch. 55) on Architecture and Temples. In this, Chapter 53 deals with various aspect of Architecture which includes definition of architecture, site selection, soil condition, and general plan, comparative measures of storeys, doors and carvings. Chapter 55 covers the aspects of Temple construction.

The *Agamas* are also classical treatises dealing with diversified subjects. Some of the agamas contain valuable information on architectural principles. *Kamika Agama* devotes sixty chapters out of seventy chapters on architecture and sculpture [4]. Apart from *Kamika agama*, *Pancaratra*, *Purva kamikaagama* also features materials on Vastu sastra and allied topics. Like puranas to North India and Agamas are for South India. *Artha sastra* of Kaudilya also possess valuable information on house construction and town planning. The custom of erecting *Topes of sand* a primitive method of construction of *Stupa*¹⁹ finds reference not only in *White Yajurveda* (Ch.35) also in the stories of *Jataka Tales* (No.352, No.438). [2]

Tamil *Sangam Literatures* (Tol. Por. I 5) provide us with abundant information on the classification of *Five Regions* based on the type of geographical zone, the

culture of people and their respective deity [5]. It could reasonably be claimed as one the earliest idea of land use classification and planning the developments according to the resources available in that region [6]. The information on, street formation, palace, fort constructions and market place could be found in various poems of *Agam and Puram* [5]

2.2. Comprehensive Architectural Texts

Apart from the references in ancient texts, treatises like *Manasara – the essence of measurement*, *mana* means measurement and *sara* means essence, a monumental work deals exclusively on the various aspects of architecture in all its 70 chapters. [7] A technical treatise contains description on the type of measurements, site selection method for temples and house construction, determination of orientations, planning and design of several types of villages, towns and cities, types of temples, its ornamentations, mandapas, gateways, types of houses and various details for all the elements of a buildings and furniture. It is considered as one of the most perfect text available on architecture. [8]

Mayamatam said to be written by sage Mayamuni, *Samarangana Sutradhara* of Bhojadeva and *Aparajita prccha* are the other equally major technical treatises containing elaborate descriptions on the aspects of architecture.

Manushyalaya Chandrika, *Silparatnam*, *Sri Lalitha Manaiadi Sastram*, *Citralakshana*, *Manai Adi Sastram* are the manuals developed in later period prescribing the established regional traditions of building and strongly reflect this, not just in their content and use of technology but also in language.[9]

2.3. Dating of the Texts

It is very difficult to establish the original authors of the above texts mentioned and the dates in which they were composed because of the various overlay of previous styles and content in the later written texts making it difficult to identify which one is original. Still scholars were able to securely date some of the texts in reference to the social, political and regional context indicated within the texts. The chronological list of traditional Architectural text is given in the Table No.1.

Table 1: List of Traditional Indian Architectural Texts

S.No	Text	Period	Region
1.	Rig, Yajur and Atharva Veda	17th Cen. BCE – 12th Cen. BCE	Kuru
2.	Agamas	12th Cent. BCE	South India
3.	Brahmanas and Sutras	7th Cent. BCE	North India
4.	Artha Sastra	4th Cent. BCE	North India

5.	Puranas	3rd Cent BCE–10 th Cent. CE	North India
6.	Sangam Tamil Literature	3rd Cent. BCE– 3rd Cent. CE	Tamil Nadu
7.	Brihat Samhita	5th Cent.CE	North India
8.	Manasara	6th cent.CE	South India
9.	Mayamatam	9th Cent. CE	South India
10.	Samarangana Sutradhara	11th Cent.CE	Gujarat
11.	Aparajita Prchcha	12th Cent.CE	Rajasthan
12.	Raja Vallabha	15th Cent. CE	Central India
13.	Vishwa Karma Vastu Sastra	16th Cent. CE	North India
14.	Silparatna	16th Cent. CE	Kerala
15.	Manushyalaya Chandrika	16th Cent.CE	Kerala
16.	Sri Lalitha Manai adi Sastram	1914	Tamil Nadu
17.	Manai Adi Sastram	1915	Tamil Nadu

2.4. Documentation and Research in Traditional Indian Architecture

Owing to the continuous changes in the dynasties and various invasions a new set of buildings especially in Islamic and British style had started coming up amidst the traditional built environment from 16th cent.CE. The new buildings were intended for different activities and they never confirmed to the native traditional texts. Rapid development of such new architecture naturally imposed threat on the native traditional architecture. It was in this context a resurrection in reviving the traditional architecture happened through research and documentation of the traditional texts especially on theoretical side.

The first Indian attempt to understand and document the principles of traditional Indian architecture is by Ramraz (1812). His work titled 'Essays on the Architecture of Hindus' (1834) was a path breaking research on Indian Architecture posthumously published [8]. Later many scholars started involving in the translation of traditional Architectural texts and documenting the ancient buildings. Dr. PK Acharya has dedicated almost two decades in translating and developing Graphic transcriptions on the written texts of Manasara. The works were published as *Indian Architecture of Manasara* in number of volumes from 1927 – 1946.[7] Dr. D.N. Shukla has selected the treatise *Samarangana Sutradhara* for his Indian architectural research and published the book in 1960. [10] It can be noted that Mayamatam was also a pioneer

work equaling Manasara and the prescription said were rigorously followed by the *Sthapatis* of South India especially in Tamil Nadu. Dr. Sudharshan Kumar Sharma has also translated the treatise *Samarangana Sutradhara* and published the book *Samarangana Sutradhara of Bhoja Deva* in 2012. [11]

Other notable scholars who have worked in the documentation and theory of traditional Indian Architecture were James Fergusson (1840), Sir Bannister Fletcher (1890), Ananda Coomaraswamy (1905) E.B. Havell (1910), Percy Brown (1940), Stella Kramrich (1946) who brought a new insight into the concepts of Hindu Temple Architecture and Adam Hardy (1990) on Kannada Temple Architecture. Dr. Bruno Dagen in 1984 has published the book *Mayamatam – A Treatise of Housing, Architecture and Iconography* by translating the ancient architectural text *Mayamatam*. [12] Apart from the above, regional Texts like *Sri Lalitha Manaiadi Satram* by Gopla Iyer in 1914 and *Sarvartha Chirpa Chinthamani* (Manaiadi Sastram) by Veerasamy Mudhaliar in 1915 [13] were also be written in Tamilnadu prescribing the cosmic aspects of building construction. Both of them very closely follow the prescriptions said in the *Mayamatam*. *Manushyalaya Chandrika* written by *Thirumangalath Neelakndan Musat* in 16th century CE was a compilation of principles prevalent in Kerala region. It prescribes unique style of architecture responding to the contextual significance in terms of climate and geography.

From the above said texts, the treatises selected for the purpose of study are the translation work done on

1. Manasara by PK Acharya (1927) [7]
2. Mayamatam by Bruno Dagens (1984) [12]
3. Samarangana Sutradhara by Sudharshan Kumar Sharma (2012)[11]
4. Manushyalaya Chandrika Bashyam by Dr. A.Achytan & Dr. Balagopal T S Prabhu [14] and
5. Manaiadi Sastram by Veerasmy mudhaliar (1915) [13]

The texts are selected based on representation of different region, written in different period of time, popular among the practitioners' and contains sufficient prescription on the architectural planning principles. The study is focused only on the principles related to the planning of houses.

3. Prescription of Architectural planning principles in the texts

Generic architectural principles laid in the texts can collectively be ordered as follows.

1. Examination and Selection of Site - *Bhu Pariksha*
2. Determining the Orientation - *Dik Nirnaya*
3. Building measurement Test - *Aayadi Gananam*
4. Vastu Purusha Mandala - *Padavinyasa*
5. Zoning - *Griha Vinyasa/Sthana Vinyasa*

6. Door openings - *Dwara Sthana*
7. Proportion of the building - *Bhulamba vidhanam*

3.1. Examination and Selection of Site - *bhupariksha*

Texts have prescribed unique method of testing the site, before it is selected for the construction. The soil has to be examined for its shape, contour, odour, colour, features (*sallyam*), taste and touch. The level of the ground and the vegetation all around was also discussed elaborately. Chapter IV & V of *Manasara*, Chapter III of *Mayamatam*, Chapter 8 of *Samarangana Sutradhara*, Chapter 1 V30-33 of *Manushyalaya Chandrika*, Verses 13-15 of *Manai adi sastram* discusses in detail about the *bhu pariksha*. The prescription given in the texts are listed in Table No: 2

Table 2: Examination of Site

S. No.	Parameter	Preference	Unfit
1.	Shape of Site	Rectangular	Irregular
2.	Contour of land	Elevated West and South	Elevated East and North
3.	Color of Soil	White	Black
4.	Odor of soil	Fragrance of Jasmine, Lotus	Pungent smell
5.	Touch of soil	Compact and Smooth	Loose and Hard
6.	Taste	Sweet	Bitter

Apart from the above, the site is to be rejected if the thorn trees are grown, large trees in the four corners, with husks, ashes and gravels. The site should also be free from pebbles, worms, ants, charcoal, stumps, any sharp objects, sludge and cavities. (*Mayamatam* C3 V7-10). Sending the cows first into the site as ritual and flower test before the possession of the site are prescribed in the texts. *Manaiadi Sastram* gives only a little account on the testing methods whereas other selected texts prescribe elaborate methods. They also concur on the parameters discussed above.

3.2. Determination of Orientation – *Dik Nirnaya*

Manasara (Ch.6 V87 – 88), *Samaranganasutradhara* (Ch.15) and *Manushyalaya Chandrika* (Ch 3 V23) prefers East as the most auspicious direction for benefic results. In all the texts west seems to be the least

preferred direction. By and large the Cardinal directions are preferred more than the ordinal directions.

3.3. Building Measurement Test – *Aaydi Gananam*

All the measures were done by selecting a type of measuring rod - *kol* measured in *Hastha* 9 system of measurement. “*If something is complete in itself, perfection, nothing is left over, there is an end of it. If there is a remainder there is no end to it. So the remainder is the germ and the material cause for what subsists.*” as Stella Kramrich [15] insists on the importance residue in the progress, *Aayadi Shadvarga* calculation, a computation method to select the appropriate dimension for the building, follows the theory of remainder. *Shadvarga* is a group of six formulae to determine the dimensional conformance of a building. *Aya*, *Vyaya*, *Yoni*, *Riksha*, *Vara* and *Thithi* are the six formulae where *Aya* and *Riksha* are used for the determination of length, *Yoni* and *Vyaya* for breadth and *Vara* and *Thithi* for height or circumference. The remainder obtained using this formulae provides the gain or loss, compatibility of constellations, solar day and lunar day. [16] The prime dimension to be considered for the computation varies from text to text. *Manasara* suggests width, *Mayamatam*, *Manushyalaya Chandrika* and *Manaiadi Sastram* prescribes perimeter as the prime dimension. However the *Aayadi* formulae remains almost same in all texts. *Manasara* (Ch. IX V 63 – 90), *Mayamatam* (Ch 9 V18,19,21, Ch. 32 V24, Ch 33 V51), *Manushyalaya Chandrika* (Ch. 3 V 32-43) and *Manaiadi Sastram* (P 67 – 72) prescribes meticulously on the *Aayadi Shadvarga* test. *Samarangana Sutradhara* lacks the elaborate methods of *Aayadi* Calculations compared to other texts indicates essentially it as a South Indian School of Thinking. The list of *Aayadi Shadvarga* calculation prescribed in the texts are given in Table No: 3

For *Aya* and *Vyaya* a no remainder is considered to be more auspicious. It is prosperous to have greater *Aya* than the *Vyaya* and defective when the *Aya* is lesser than the *Vyaya*. For *Riksha* formula all the remainder showing odd Nakshatras is auspicious and even Nakshatras are inauspicious. The Nakshatras considered are as per the asterism in Astrology).

Table 3: Aayadi Shadvarga calculation

Dimension	Shadvarga	Meaning	Manasara	Mayamatam	Manushyalaya Chandrika	Manaiadi Sastram
Length	<i>Aya</i>	Profit	P 8/12	P 8/12	P 8/12	P 8/12
	<i>Riksha</i>	Star/Nakshatra	P 8/27	P 8/27	P 8/27	P 8/27
Width	<i>Vyaya</i>	Expenditure	P 9/10	P 9/10	P 9/10	P 9/10
	<i>Yoni</i>	Direction	P 3/8	P 3/8	P 3/8	P 3/8
Circ./Height	<i>Vara</i>	Solar Day	P 9/7	P 8/30	P 8/7	P 9/7
	<i>Thithi</i>	Lunar Day	P 9/30	P 9/30	P 8/30	P 4/30

Regarding the *Yoni*, odd remainders are auspicious and even remainders are inauspicious. (Yoni directions 1- East, 2 – South East, 3- South, 4 – South West, 5 – West, 6 – North West, 7 – North and 8 – North East). In *Vara* formula if the remainder shows 2,4,5 and 6 are auspicious and 1,3 and 7 are inauspicious where 1- 7 indicates the solar days starting from Sunday. In the formula of *Thithi* 1-15 shows the thithis from New moon day to Full moon day (Shukla Paksha) and 16-30 shows the thithis from Full moon day to New moon day (Krishna Paksha). Out of these 1, 8, 9, 23 and 24 (Amavasy - New Moon Day, Astami – eighth day after new moon or full moon day and Navami – 9th day after new moon or full moon day. A variation in the *Vara* and *Thithi* in Manushyalaya Chandrika and Manaiadi Sastram would have been to accommodate the finer reforms made in the measuring rod by the later *silpis* – the architects.

The formulas introduced were appear to be mainly to first get the approximate measure and then check its suitability with the units of their Constructional rod used. However, the *Ayadi* calculation remains as a highly technical tool for the *Silpis* to arrive at the appropriate building measure.

3.4. Vastu Purusha Mandala – Padavinyasa

All the texts recognize Site where the building is to be constructed as the body of a demon named Vastu Purusha. Manasara (Ch. VII), Mayamatam (Ch. 7), Samaraganana Sutradhara (Ch. 11 and 14), Manushyalaya Chandrika (Ch. II V 11- 31), and Manai adi Sastram(p -64). The reference to the custom of worshipping Vastu Purusha can even be found in Rig Veda and Grihya Sutra [3]. The evil demon which has been supposedly laid down by the Gods on the ground is not allowed to wake throughout the year, except on Vastu worshipping day.

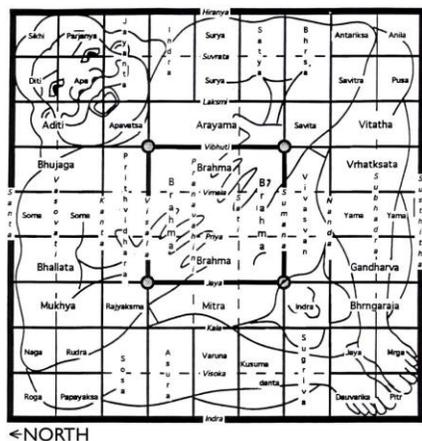


Fig 1 Vastu purusha mandala as per Manushyalaya Chandrika

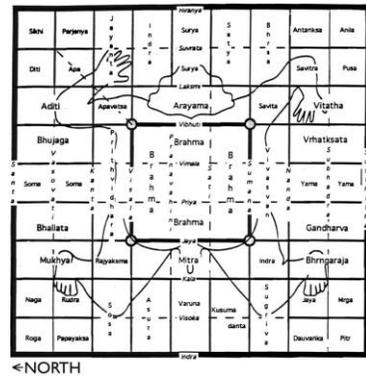


Fig 2 Vastu purusha mandala as per Mayamatam

Pada vinyasa Is the process in which the site is divided into various numbers of squares. The number of squares varies from Single Square (1x1 grid) to 32x32 (1084) squares, where each square is referred to be as *pada*. *Pada devatas* are assigned to the divided squares and is named after the deity assigned. The activity zoning in the house are to be assigned based on the location of deity. Out of 32 types of, *Manduka* which divides the site into 64 squares and *Paramasaiyn* divides the site into 81 squares were recommended by all the texts for all the purpose of building activities [7]. Fig 1 and Fig 2 shows the different imagery of the way in which the Vastu Purusha being held on ground.

Marmas as shown in Fig.3 are the intersection points between the lines drawn in cardinal direction and ordinal directions. The *marmas* are to be categorically avoided for any construction. Stella Kramrich [15] had given new insights in to the various aspects of Vastu purusha mandala, its *pada devatas*, and the symbolism attached.

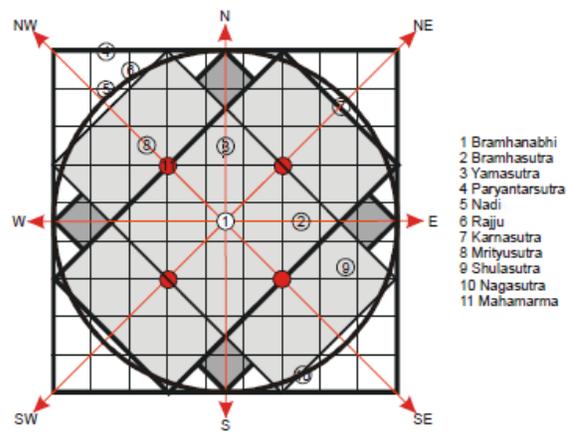


Fig 3 Marma points as described in the Texts

She was able to establish hitherto mysterious deities to significant elements of Vedic cosmological conception carefully assigned in the grid. It was she who brought

new perception to the *Vastu purusha Mandala*, as the word “*mandala*” has not appearing in either PK Acharya’s translation of Manasara or Dr. Bruno Dagens translation work of *Mayamatam*. Through systematic analysis, she was able to bring out a connection between pada vinyasa and *Vastu purusha mandala* that claimed to be a generative idea for not only all architectural production and also a sanctifying tool for the built structure [9].

In the 9x9 *Paramasayin* grid out of 64 squares central 9 squares are assigned to *Brahma* – the God of Creation and other 41 gods were arranged in the remaining squares in a sequential order. Only a little variation found in the selected texts in term of allocation of deities in the respective location. According to Sonit

Bafna [9] the imposition of Gods on the grid seems to be later addition to the already existing practice of using Grid System for the building construction. However these Mandala forms the base for all the further building activities.

3.5. Zoning - Griha Vidhana or Sthana Vinyasa

The text describes the zoning of various functional activities of a house being allotted through the names of the Gods in the Vastu Purusha Mandala. Manasara (Ch. 36), *Mayamatam* (Ch.27), *Samarangana Sutradhara* (Ch. 15, 19, 20 & 21), *Manushyalaya Chandrika* (Ch. 7 V31-43) and *Manaiadi Sastram* (p 4 & 5) deals elaborately on the zoning aspects of a house.

Table 4: Allotment of activities (Zoning) in various padas

S. No.	Activities/ Rooms	Manasara		Mayamatam		Samarangana Sutradhara		Manushyalaya Chandrika		Manaiadi Sastram	
		pa.dev.	Ori.	pa.dev.	Ori.	pa.dev.	Ori.	pa.dev.	Ori.	pa.dev.	Ori.
1.	Bed	<i>Gandh./Antar/Brin.</i>	SW/S	<i>Yama</i>	S	<i>Yama/Pitri</i>	S/SW	<i>Graha.</i>	S	<i>Isa/Yama</i>	W/S/NE
2.	Kitchen	<i>Agni/Parjan</i>	SE/NE	<i>Antarik.Brsta, Sat.</i>	SE/E	<i>Agni</i>	SE	<i>Agni/Parjan.</i>	SE/NE/NW	<i>Agni</i>	SE
3.	Living	<i>Varuna</i>	W	<i>Soma/Bhallata</i>	N/NW	<i>Mitra</i>	W	<i>Mitra/Vayu</i>	W/NW	-----	-----
4.	Dining	<i>Yama</i>	S/SW/NE	<i>Vitatha</i>	S	<i>Pusan</i>	S	<i>Varuna</i>	W	<i>Varuna</i>	W
5.	Pooja / Temple	<i>Isa/Aditi</i>	NE	<i>Isa Parjan.</i>	NE	<i>Isa</i>	NE	<i>Isa</i>	NE	<i>Isa</i>	NE
6.	Bath	<i>Aditi</i>	NE	<i>Uditi</i>	NE	<i>Apavasta</i>	NE	<i>Parjan.</i>	NE/E	<i>Mahen.</i>	E
7.	Treasure/ Store	<i>Soma/Mrga</i>	N/SW	<i>Budhara</i>	N	<i>Rudra</i>	NW	<i>Nrriti/Pitri</i>	SE	<i>Kubera/Nrriti</i>	N/SW

Dr. TP Battacharya [2] was of the impression that this system of dividing the Ground Plan helped the architects/ silpis in calculating the proportion of the different parts of the building and other parts. All the texts concurs on leaving the Central *Brhama sthana* to be open without any construction as it was considered to be the link between the house and the cosmos. From fig.4 we can understand the number grids allotted for each *devatas*.

Among the texts *Mayamatam* classifies four types of house for the four different *Varna*- a social hierarchical order established at that point of time. Subsequently the design aspects also fall according to the same classification. The zoning referred in the selected texts are given in the Table No: 4

The above table shows the spatial allocation in *Vastu purusha Mandala* for various activities of a house and the respective orientation across the selected texts. Out

of the Seven activities taken all the texts are conforming placement of *Pooja* in North East and *Kitchen* in South East. Apart from *Manaiadi Sastram* other texts conforms the allotment of the bath in North East. As *Living* vary from North and predominantly West, *Dining* vary from South and West.

Regarding the *Bed Room* location though other texts conforming the South West and South, *Manai adi Sastram* peculiarly specifies on North East. Barring *Manushyalaya Chandrika* other Texts suggests treasure/ Store to be in North. From the table coherence in the spatial planning may be noted across the texts.

3.6. Door Openings – Dwara

As far as the Main door location is concern all the text prescribes the same. The auspicious door location referred in the texts are given in the Table No: 5

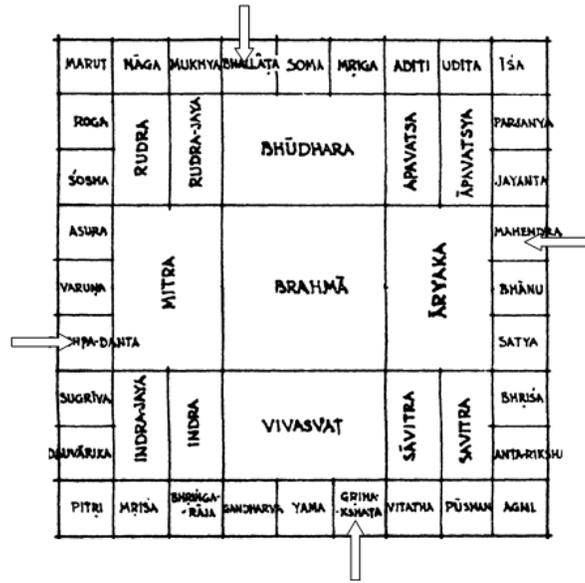


Fig 4 Main Door - Dwara location for four directions

Table 4: Main Door – Dwara location

Direction of Main Door	Manasara	Mayamatam	Samarangana Sutradhara	Manushyalaya Chandrika	Manaiadi Sastram
East	Mahendra	Mahendra	Mahendra	Parjanya/Bhursa	Isa to Mahendra
South	Grahaksata	Raksasa	Grahaksata	Pusavu/Bringa	Agni to Grahaksata
West	Pushpa danta	Pushpadanta	Pushpa danta	Dvarapala/Sosan	Pitr to Pushpadanda
North	Bhallata	Bhallata	Bhallata	Naga/Aditi	Vayu to Bhallata

Manasara (Ch. 38), Mayamatam(Ch.30), Samarangana Sutradhara (Ch.24), Manushyalaya Chandrika (Ch.7 V25) and Manaiadi Sastram(p-29) deals elaborately on the position of Main door . From the above table though the pada devatas names have little variation the auspicious location of Main door exactly remains the same in all directions across all the texts. It can be understood that it is preferred to locate the main door on the immediate right of the median line on the respective direction.

3.7. Proportion – Bhulambamana

For the aesthetics of the building the relationship between Length to Breadth to Height is very important. The ancient Silpis had duly addressed this issue with meticulous proportioning system to determine the measure of the building. As earlier discussed through the Aayadi Computation appropriate dimensions are arrived to produce something noble and sublime. The Hindu Silpis appear to have strived for this ideal and set the principles of proportion. Manasara (Ch. 35 V21-25), Mayamatam (Ch. 11 V8-9) and Samarangana Sutradhara(Ch 28& Ch.29) deals elaborately on the proportioning system. Manasara and Mayamatam

suggests 5 Generic types of proportioning system relating the width to height ratio

1. Shantika - 1W:1H
2. Paustika - 1W:1 1/4 H
3. Jayada - 1W:1 1/2 H
4. Dhanada - 1W:1 3/4 H
5. Adbhuta - 1W:2H

The measure for the various elements within the building was computed according the fundamental presumption of the proportion system selected. The variations shown by the texts in the measures for the smaller elements of the building and details indicates regional choices in term of the prevailing style followed and the availability of construction material and techniques.

4. Discussion

From the Bhupariksha to Proportioning System the study of Vastu Sastra Principles across Five texts provides us with valuable information on architectural planning and design. This comparative analysis reveals certain concrete facts on the planning principles.

1. From the study it can be inferred that in spite of variation in geographical origin and the time written almost spanning for a period of 1200 years, the texts shows a tremendous similarity in the planning principles especially related to Bhupariksha, Dik Nirnaya and Dwara
2. Among the South Indian Treatises the Aayadi calculation remains predominantly similar.
3. Regarding the allotment of activities in the Mandala, though a little variation on the *padadevatas* for a certain given activity was found, predominantly the orientation seems to remain in the same quarter indicating the sustenance of the system over the millennia. There seems to be a congruent agreement among the Shilpis that the Griha Vidhana principles being prescribed in the texts brings perpetual wellbeing to the inhabitants. Hence minimum interventions have been made in the principles to accommodate the local and regional variations. Otherwise these principles appear to be universal.
4. It was also noted in the study that the ill effects of not adhering to the individual principles have been discussed relatively more in Manaiadi Sastram, Samarangana Sutradhara and Manushyalaya Chandrika when compared to Manasara and Mayamatam. Both Manasara and Mayamatam which are the earlier texts only prescribe generic Penalty Clause for defective construction whereas the other three later texts insists elaborately on the types of ill effects for every principle. This later inclusion of ill effects seems to bring enough confusion over practitioners and created the situations that the original objective of producing perfect architecture has been overshadowed by the imposed superstition.

5. Conclusion

Based on the available source the study made on the comparative analysis of Vastu Sastra principles, shows the relevance and flexibility of principles for the changing dynamics. The study also open further research options on the positive applicability of those principles for the modern context. It brings immense hope to the humanity that the wealth architectural of knowledge of the past can very well be applicable for the changing dynamics of the society and technology with appropriate minimum modifications and without affecting the fundamental ideology.

References

- [1] K.Vasudeva Sastry, *Viswakarma Vastu Sastram*, Vani Vilas Press, Srirangam, 1958.
- [2] Dr. T P Battacharya, *The Canons of Indian Art*, 2nd Edition, Inland Printing Works, Calcutta, 1963
- [3] M. Ramakrishna Bhat, *Varahamihira's Brihat Samhita*, Rev. Edition, Vol. I & II, MLBT Publishers, Calcutta, 2003
- [4] N.Murugesu Mudhaliar, *Kamika Agamam*, South Indian Archagars Association, 1977.
- [5] P.T. Srinivasa Iyengar, *History of Tamils*, Asian educational Services, 1995
- [6] C P Venkatarama Iyer, *Ancient Town Planning In early South India*, Mittal publication, 2004
- [7] P K Acharya, *Architcture of Manasara*, Oxford university press, 1933
- [8] Ramraz, *Essay on the Architecture of Hindus*, Indological Book House, 1972
- [9] Sonit Bafna, "On the Idea of the Mandala as a Governing Device in Indian Architectural Tradition", Journal of the Society of Art historians, Vol. 59, No.1, University of California Press, March 2000.
- [10] D N Sukla, *Translation of Samarangana Sutradhara*, 1960
- [11] Dr. Sudharshan Kumar Sharma, *Samarangana Sutradhara of Bhoja Deva*, Piramal Publications, Delhi, 2012.
- [12] Bruno Dagens, *Mayamatam – Traetise of Hoousing, Architecture and Iconography*, IGNC Publications, New Delhi, 1994
- [13] Veerasmy Mudhaliar, *Sarvartha Sirpa chintamani (Manaiadi Sastra)*, B . Rathna Naicker and Sons, 1915.
- [14] Dr. A.Achyutan & Dr. Balagopal T S Prabhu, *Manushyalaya Chandrika Bashyam*,
- [15] Stella Kramrisch, *The Hindu Temple Vol I*, MLBT Publications, Calcutta, 2002