

RE-IMAGINING TRADITIONAL INDIAN PLANNING CONCEPTS IN CONTEMPORARY SETTINGS: A CASE OF TIRUCHIRAPALLI, INDIA

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Abstract

A country with pre-urban Vedic literatures dating back to 1500-1000BCE that speaks about grama(village) the primary category of habitation, about its characteristics decades before Clarence A Perry devised his concept of neighbourhood in 1929 (Basant, 2018) .This Traditional knowledge is documented as texts of Vastu Shilpa Shastras (Chandrashekhar, 2023) as well as oral knowledge and skills which continue to be a living practice generally known as the vernacular or folk idiom of building (Saxena & Bedi, 2015) .Influencing over planning of different cities from different time periods and even over distances, like ancient cities of Harappa and Mohenjodaro in 3000 BCE (Hotwani & Rastogi, 2022) early medieval towns of Srirangam in 3rd century BCE (R & B, 2011) and Sadasivapet in Medak District during 1680-1692 both in 'Sarvatobhadra' concept (Balmoori, 2012),the first planned city of modern India 'the walled city of Jaipur' found by Sawai Jai Singh II in 1727 AD (Patel, 2019), (Pusalkar, 2022), even post independent planned city of India ,the Chandigarh on 1950 by Le Corbusier have influence of Vaastu Shastra (Patra R. T., 2014) ,over distance the planning of ancient city of Chiang Mai (1296 BC) in Thailand (Saelee, Riyaprao, Komonjinda, & Sriboonrueang, 2021) ,even ancient Iranian houses of Kashan is said to have influenced by Vaastu Shastra (Goodarzi & Fazeli, 2014). The paper explores using ancient Indian planning principles like Vaastu Shastra and Manasara for modern liveability and sustainability, emphasizing their integration focusing on a development project in vicinity of the temple town of Srirangam.

Keywords: Urbanization, Urban Centres, Traditional Indian Planning Concepts, Sustainable Neighbourhood, Liveability, Vedic architecture.

1.Introduction-URBANIZATION AND INDIA

1.1. History

India boasts a rich historical legacy spanning over 2000 years, characterized by diverse civilizations and associated systems, particularly notable for their town planning. Scholars have extensively studied this historical narrative, revealing that city planning in India traces back to Vedic times. Cities like Pataliputra, Varanasi, and Nalanda were meticulously designed based on thoughtful plans. Ancient Indian Architects and Engineers, drawing insights from experience, natural phenomena, and societal and cultural considerations, formulated principles of architecture and construction (Rayjada & Chauhan, 2016). These principles aimed to create a built environment harmonious for inhabitants and leveraged the benefits of nature. The indigenous planning models, crafted with an overarching focus on sustainability (physical, social, economic, and environmental), have proven resilient over time. Today, these indigenous principles remain relevant and can serve as valuable guidelines for contemporary planning. (Raina & Madapur, 2018)

As Beatley and Manning (1997: 9) note, 'cities and towns of the past had a strong public dimension to their physical design and layout' and are vital lessons for their counterpart, the modern city, which 'carries with it a distinct neglect of many important aspects of the public realm - aspects that are critical to the creation of functional, sustainable communities' (Narayanan Y. , 2015). R. Redfield and M.B. Singer maintain that generally speaking

Indian cities emerged out of political, administrative, and cultural concerns and their commercial and industrial functions were 'insignificant' (IGNOU, 2018).

Let's start by gaining an overview of urbanization in Ancient and Medieval India before delving into a focused study on the town planning schemes of Srirangam, highlighting India's ancient town planning. The first phase of urbanization in India, characterized by the Indus Valley Civilization (Nai, 2018) and subsequent empires like the Maurya and Gupta, witnessed advanced urban planning and flourishing trade. These ancient cities, such as Mohenjo-Daro and Pataliputra, served as political, administrative, and cultural centres, laying the foundation for India's classical age. The second phase, influenced by medieval kingdoms (Sharma, Kumar, Singh, & Mazhari, 2019) and British colonialism (Tharoor, 2017), brought about significant urban growth and transformation. Islamic and regional kingdoms contributed to urban development, while British colonial rule introduced railways, modern infrastructure, and Western influences. However, challenges such as economic exploitation and disparities, uneven urban development, and cultural transformations accompanied these phases, leaving a lasting impact on the present urban landscape of India.

Urbanization in ancient and medieval India was marked by the emergence and growth of various urban centres, each contributing to the socio-economic and cultural fabric of the region (Thakur R. , 2002). Here's an overview of urbanization during these periods:

Ancient Urbanization:

1. Indus Valley Civilization (3300–1300 BCE):

- One of the earliest urban civilizations, the IVC had well-planned cities like Mohenjo-Daro and Harappa.
- Advanced urban planning with well-organized streets, drainage systems, and multi-story buildings.
- Indications of trade with other cultures, suggesting economic and cultural exchange.

The three significant settlements are strategically positioned within the Harappan territory, with Ganwariwala serving as a central point between Mohenjo-daro and Harappa. This arrangement suggests the emergence of a two-tiered Harappan settlement pattern, indicating the development of three regional centers or "capitals" during the evolving Urban Phase (Possehl, 1990), this proves the role of urban centres in ancient India.

2. Maurya and Gupta Empires (322 BCE–550 CE):

- Urban centres like Pataliputra (modern-day Patna) during the Mauryan period served as political and administrative capitals.
- Trade flourished along the Gangetic plains and the Silk Road, contributing to urban growth.
- Gupta period witnessed advancements in art, science, and literature, with urban centres like Mathura and Varanasi playing significant roles.

The Vedic period, dating back to the 6th century B.C., witnessed the emergence of cities primarily situated along the Ganga and its major tributaries, serving as communication channels. These early urban centers mostly functioned as political hubs and capitals of early monarchical kingdoms, characterized by unplanned settlements with some having mud ramparts and earthen embankments. Initial archaeological excavations at these sites yielded limited evidence of early monuments. Monumental architecture only became prominent during the Mauryan period when the capital shifted from Rajagriha to Pataliputra. Urbanization gained momentum in the post-Mauryan era, marked by an increased number of cities that amalgamated political and commercial roles. Brick became more prevalent in residential structures, fortifications, and public buildings. Notably, this period saw the construction and adornment of significant religious monuments

The social landscape during the Post-Gupta era witnessed the rise of distinct regional identities. Starting from the Gupta period and particularly pronounced in the post-Gupta era, the development and evolution of states, previously concentrated in the upper and middle valleys of the Ganga, expanded to encompass various regions across the subcontinent. This expansion was accompanied by a significant shift towards agrarian practices in peripheral areas, initiating diverse patterns in regional economies. In eastern India, despite sub-regional differences, a cultural identity emerged, characterized by a distinctive cultural expression that can be considered unique to the region (Kumar, 2005)

Medieval Urbanization:

Understanding early medieval urbanization primarily relies on epigraphic and textual sources. These include inscriptions detailing towns, trade hubs, and commercial networks, as well as literary works such as travel accounts, kavya literature, and secular texts that often offer vivid city descriptions. Archaeology, less helpful due to limited excavations in early medieval sites, contrasts with textual richness. Previous studies addressing urban centers heavily leaned on sources like Arab Geographers' accounts, Alberuni's evidence, and normative treatises like Manasara, Mayamata, or Samarangasutradhara to assess the presence or absence of urban centers in early medieval India (Ghosh S.)

The rise of servitude and the intricate nature of early medieval development underscore the relevance of the Indian feudalism model as an analytical tool. This is strongly implied by the characteristics of the contemporary urban economy. In the Indian context, the emerging economic pattern around 500 A.D. exhibited features such as trade contraction, qualitative and quantitative shortcomings in towns, a feeble monetary system, and dominance of local agrarian units bordering on self-sufficiency, marking the feudal mode of production. Some interpretations exaggerate these changes, aiming to undermine the significance of the evolving early medieval economy. However, a serious characterization of feudalism doesn't imply a total disappearance of urban economy, but rather its marginal relevance to contemporary production relations. The analysis should consider limited trade, regional variations, and insights into mercantile activities. In India, vastness prevents a standardized pattern, and while areas like the West coast had localized commercial links, they had limited impact on the overall economic trend. Uniform diffusion of feudal economy assumptions disregards the reality of self-sufficient production units with sporadic trade, alongside remnants of earlier exchange patterns in certain regions (Thakur V. K., 1986).

1. Islamic Invasions and Delhi Sultanate (1206–1526):

- The establishment of the Delhi Sultanate led to the development of Delhi as a major urban centre.
- The construction of monumental structures such as the Qutub Minar and the expansion of markets and trade.

2. Vijayanagara and Bahmani Kingdoms (1336–1646):

- The city of Vijayanagara was a major centre in the Deccan, known for its grand architecture, markets, and cultural activities.
- Bahmani Sultanate had Bidar, Gulbarga, and Bijapur as important urban centres.

3. Mughal Empire (1526–1857):

- The Mughals developed cities like Agra, Delhi, and Fatehpur Sikri, showcasing remarkable architecture.
- Akbar's Fatehpur Sikri is a notable example of urban planning and architecture.
- Trade and commerce flourished, and cities became vibrant centers of cultural exchange.

4. Regional Kingdoms and Trade Centers:

- Various regional kingdoms like the Cholas, Cheras, and Pandyas of the south, and the Rajputs in the north, had their own urban centres.
- Coastal regions like Gujarat and Malabar were hubs of maritime trade with the Middle East and Southeast Asia.

Common Features:

- 1. Trade and Commerce:**
 - Urban centres served as hubs for trade, with markets and bazaars facilitating economic activities.
 - The Silk Road and maritime routes contributed to the exchange of goods and ideas.
- 2. Cultural and Religious Centres:**
 - Cities often housed significant religious and cultural institutions, promoting art, literature, and education.
- 3. Architectural Achievements:**
 - Urbanization was often accompanied by remarkable architectural developments, exemplified by temples, mosques, palaces, and forts.
- 4. Administrative Centres:**
 - Capitals of empires and powerful kingdoms served as administrative and political hubs.

The varied urbanization patterns in ancient and medieval India significantly influenced the historical, cultural, and economic fabric of the subcontinent. Indian cities planned by Britishers laboured under serious internal contradictions. Britain governed India as a colonial power primarily for its own advantages. Simultaneously, it had to grapple with typical challenges related to urban administration, including the regulation of space, water supply, sewage, road infrastructure, street lighting, and law enforcement. The British frequently interpreted Indian issues based on their own experiences during Britain's initial period of rapid industrialization, urban growth, and the establishment of democratic practices. Nevertheless, India's unique conditions, marked by vast size and diversity, led to the implementation of varied policies in different regions and at different points in time (SPODEK H. , 2013).

The British invasion and subsequent colonization of India had a profound impact on various aspects of Indian society, including urbanization. Here's an overview of the British role in urbanization in India:

Initial Impact:

- 1. Administrative Centres:**
 - The British established administrative centres such as Calcutta, Bombay, and Madras, which later became major urban hubs. These cities served as administrative, commercial, and military centres for the British East India Company.
- 2. Railways and Infrastructure:**
 - The British introduced railways and modern infrastructure, connecting different parts of the country. This facilitated the movement of goods, people, and capital, contributing to urban growth.
- 3. Commercial Development:**
 - The British promoted commercial activities and trade, leading to the growth of port such as Mumbai (formerly Bombay), Kolkata (formerly Calcutta), and Chennai (formerly Madras). These cities became crucial for trade and commerce.

Urban Planning and Architecture:

- 1. British-Style Architecture:**
 - British colonial architecture left a lasting impact on urban landscapes. Cities developed European-style buildings, government offices, and residential areas, often reflecting Victorian and Gothic architectural styles.
- 2. Cantonments and Civil Lines:**
 - The British established cantonments and civil lines for military and administrative purposes. These areas had well-planned layouts and amenities, influencing the development of urban spaces.

Economic Changes:

1. Commercialization and Industrialization:

- The British introduced commercial agriculture and industries, leading to the growth of industrial towns. Cities like Manchester of India (Ahmedabad) and Jamshedpur emerged as industrial centres.

2. Railway Towns:

- The construction of railways led to the development of railway towns. These towns, often located along railway lines, became important centres for trade, transportation, and administration.

Social and Cultural Changes:

1. Education and Institutions:

- The British established educational institutions in urban areas, contributing to the spread of Western education. Cities became centres for learning and cultural exchange.

2. Westernization of Lifestyle:

- The British influence brought about changes in lifestyle and social norms. Urban centres became hubs of Westernized culture, fashion, and social practices.

Challenges and Resistance:

1. Economic Exploitation:

- The economic policies of the British, such as the drain of wealth, had detrimental effects on the economic well-being of the Indian population.

2. Urban Disparities:

- Urbanization was uneven, with significant disparities between British-designed areas and indigenous settlements. This contributed to socio-economic inequalities.

Legacy:

1. Post-Independence Urbanization:

- The urbanization patterns initiated during the British colonial period continued to influence post-independence India. Cities remained key centres of economic, political, and cultural activities.

2. Infrastructure Challenges:

- Some argue that the focus on certain urban centres during the colonial period contributed to the neglect of other regions, leading to long-term infrastructure challenges.

The British played a pivotal role in shaping the urban landscape of India, introducing new economic, administrative, and cultural elements (SPODEK H. , 2013). While their contributions to infrastructure and certain aspects of urban planning were significant, the colonial period also brought about challenges and inequalities that continued to influence India's urban development post-independence. As per Professor Dr. Gadgil, the majority of towns in India originated due to one of three primary factors: (i) serving as pilgrimage sites, (ii) functioning as the seat of a court, or (iii) operating as commercial depots. (Rahman, 2018)

Scholars have interpreted urbanization through their individual perspectives and beliefs, defining it as a phenomenon linked to social mobility. On the basis of western experiences, characterizes urbanization as the dismantling of traditional social institutions and values (R S Sandhu in DAS, 2007). In the Indian context, R S Sandhu anticipates a shift from the caste system to a class system, the emergence of nuclear families from joint ones, and a heightened secularization of religion. V.S. D'Souza (2003) views urbanization as a significant force that brings about distinct changes and restructuring in social reality, accompanied by unique social problems. Sudha Kaldate (2003), from a sociological standpoint, defines urbanization as a process that greatly fosters city development. Additionally, she suggests that urbanization, beyond reflecting technological advancements, introduces a new economic organization and way of life. The result is a breaking of cultural uniformity and traditional behavioural patterns, accelerating social change (Patra B. , 2019). With such fundamental contrasts

existing between the economic and political institutions of the developed West and the developing third World, it is not rational to equate the experiences of urbanization of two worlds (Kundu, 1983)

1.2. The present condition of urbanization in India

The rapid and extensive urbanization in India is unique on a global level and has far-reaching consequences internationally (Chadchan & Shankar, 2012). The influence of culture on urban living plays a crucial role in shaping all facets of sustainability in Indian cities (Narayanan, Janamani, & Mahanty, 2021), a factor frequently neglected in the creation of policies for sustainable urban development. Despite urban areas in India currently accommodating less than 30% of the total population, this proportion is anticipated to increase to 40.7% by 2030. The relatively low current figure is, in part, due to the strict definition of "urban" in India, which excludes peri-urban areas. Even with such a definition, urbanites will reach around 590 million by the year 2030. (Martine, 2007). In this era of rapid urbanisation, in developing countries like India, poverty, social inequality and environmental degradation is becoming a common urban phenomenon. Careful insertion of cultural and traditional identity in these modern urbanisation settings might help to bring in social sustainability.

In 1951, only 5 Indian cities had populations surpassing 1 million, and merely 41 cities had populations exceeding 0.1 million. Despite this, a significant portion of India's population resided in approximately 0.56 million villages. Fast forward to 2011, where the scenario changed, featuring 3 cities with populations surpassing 10 million and 53 cities with populations greater than 1 million. At that time, over 833 million Indians inhabited around 0.64 million villages, while 377 million lived in roughly 8,000 urban centres. India is undergoing a significant transformation and is poised to become the world's most populous nation. It is projected to exceed China's population in the next few years, reaching around 1.4 billion by 2024 (Anand & Luis, 2019). An essential query arises regarding the number of Indians residing in medium and small towns, acting as a transitional link between a transforming rural and urban India. (Meena, Raghav, & Meena, 2016)

2. Understanding Ancient Indian Planning systems

2.1. The settings

Viewed within the context of Asia's physical map, the Indian subcontinent stands out as a distinct triangular peninsula, bordered on two sides by the ocean and separated from the rest of Asia by three intersecting mountain ranges. Positioned approximately between latitudes 5 and 35 north of the equator, a significant portion of the peninsula lies in the tropics. The region displays considerable climatic diversity, ranging from humid tropical conditions and residual tropical forests in the south, southwest, and east to the arid deserts of the northwest. The varied topography includes mountains, rocky hills, plateaux, dry forests, savannas, and fertile alluvial plains, some of which rely heavily on irrigation. The subcontinent's major rivers have played crucial roles in the early development of cities. South Asia experiences substantial erosion and deposition, a natural process in the arid tropics intensified by the rapid uplift of the Himalayas, a result of the ongoing collision between the Indian peninsula and mainland Asia. This collision, part of the broader process of plate tectonics, has been ongoing for millions of years, leading to the formation of young mountain ranges such as the Himalayas, Karakoram, and Hindu Kush. The powerful rivers originating from these mountains constantly down-cut to maintain their levels and deposit vast amounts of material in the plains, forming extensive alluvial plains, great deltas, and fertile enclaves in various parts of the subcontinent. The interplay of forces mentioned earlier, combined with a monsoon climate characterized by extended dry spells alternating with intense seasonal rains, creates a precarious situation. Typically, sudden and heavy floods follow prolonged dry periods, and monsoon failures leading to severe droughts are not unusual. Major rivers consistently deposit large amounts of silt on their floodplains, ensuring constant soil rejuvenation and apparent fertility. However, these same rivers are prone to changing their courses, sometimes causing catastrophic consequences. Geological and geomorphological evidence indicates that such events have occurred periodically over many millennia due to natural factors. Human activities like deforestation have increasingly exacerbated the impacts of erosion and droughts. It is crucial to consider these factors when examining the environmental conditions of the past and reconstructing the settings in which the cities of the second urbanization phase emerged.

The ancestral roots of Indus urbanism appear to be in the western borderlands of the Indus region, in Baluchistan, where an unbroken line of development can be traced from the earliest settlements, dating to the sixth or even seventh millennium BC at Mehrgarh, at the head of the Kachi plain where the Bolan river emerges from the Baluchi mountains. So far, no such early roots have been traced on the southeastern margin of the Indus plains, nor to the northeast in association with its major tributaries. The earliest cities of the Indus region have much in common with those of ancient Egypt and Mesopotamia: in each case they were associated with a major perennial river flowing through a desert, and were rooted in the local cultures of their own region. Where the Indus situation differs is in what follows. The cities of the Indus plains, after five thousand years of continuous development, and several periods of more rapid and radical change, seem to peter out from approximately BC 1700 onward: they are neither maintained nor replaced by cities on nearby sites, as sometimes happens elsewhere. When cities reappear up to a thousand years later it is on the Ganges- Yamuna (Jamuna) system several hundred miles to the east, and in a very different environmental region. Why the process of city development in the Indian subcontinent should be arrested, and then restart in another part of the subcontinent, is not at present clear. (Allchin, 1995)

Cities of the second phase of urbanization are situated across diverse regions, all sharing a common crucial factor: fertile soil and high agricultural potential. To summarize briefly, these cities are dispersed across the northwestern borderlands, featuring significant Iron Age urban centres like Kandahar, Charade, and Taxila. The vast expanse of the central Ganges plain is adorned with numerous cities that stretch from the Ganges-Yamuna Doab in the west to the Bengal frontier in the east. These cities give rise to interconnected networks of smaller settlements, creating hierarchical patterns across the region. In the Ganges-Brahmaputra delta, Iron Age cities strategically occupy stable older alluvium. The western coastal plain hosts at least two major Iron Age city sites in its northern section. The east coast features great deltas, including the Mahanadi, Krishna, and Kaveri, each with their own cities and settlement hierarchies. In central and peninsular India, Iron Age cities occupy fertile interior regions, some enhancing productivity through dams or bunds for local irrigation. Even in Sri Lanka, cities like Anuradhapura, Tissa Maharaja, and Manta occupy agriculturally rich regions, benefiting from early irrigation practices. Srirangam, emerging as a medieval Indian town, finds its origin deeply rooted in the worship of Lord Ranganatha, surrounded by myth and legend. Through the medieval period under the patronage of Chola and Vijayanagar dynasties, Srirangam experienced substantial urbanization. The Sri Ranganatha Swamy Temple, a quintessential example of medieval Indian architecture, flourished with contributions from these rulers. Characterized by ornate carvings, sprawling temple complexes, and towering entrance towers, the architectural elements reflect the vibrant cultural and religious atmosphere of medieval India. The town's growth, centered around the temple, underscores the fusion of spiritual devotion, urban development, and architectural excellence during this historical period.

The focus of the colonial powers on economic priorities introduced a novel dimension to the urbanization of India from the Western perspective. This influence manifested in various forms, such as the establishment of exclusive civil amenities by British officials, Europeans, and local elites. These amenities encompassed features like piped water, drainage systems, well-planned residential areas, paved roads, and other exclusive facilities. The diverse needs of these colonial entities either gave rise to new structures or reshaped existing ones. The urban development took on distinct characteristics, including administrative tiers (sub-divisional, district, commissioner-level urban centres), commercial aspects (including industrial zones and cantonments for military deployment, segregated from the local populace), and railway colonies. Additionally, there were provisions for vacation and recuperation, contributing to a pattern that still endures in India and other former British colonies. It is not surprising that Lord Rippon's initiative in 1882 exhibited an urban bias, leading to the establishment of urban-centric governance in multiple cities. (Mehra, 2016)

2.2. Urban Centres-Emergence

Medieval urban centers in India can be characterized by their roles as market hubs, where a substantial population earned their livelihood through non-agricultural means. Historical Persian accounts distinguish between large and small towns, using terms like *balda/shahr* for cities and *qasba* for small towns or townships. This distinction is mirrored in the identification of major ports as *bandar* and smaller ones as *bara*. A similar hierarchical arrangement of towns is observed in South India, where Pattinam functioned as bustling trade centers or 'emporia,' while *valarpuram* stood out as prosperous coastal towns. In the midst of these, *nagarams* existed, exhibiting features

akin to the qasbas found in the northern and Deccan regions, albeit with some distinctive characteristics (IGNOU, 2018).

To comprehend the urbanization progression in early medieval India, it is crucial to examine the notable growth in agriculture, enabling the support of a non-agricultural populace. Diligent endeavours were undertaken to expand farming activities, accommodating an increasing population on the existing land. This rural expansion gained momentum through land grants, the establishment of brahmadeyas and agraharas, and the rise of temple centers during the early medieval period. Extensive agricultural activities in southern India led to similar advancements. Trading hubs emerged as central points within groups of rural settlements. The urban centers established a more interconnected relationship with their surrounding areas in the early medieval period. Nagarams not only served as local trade hubs but also evolved into focal points for interregional trade. These were connected at a local level to rural units and at a broader level to major centers like puttana, erivirapattinam, and managaram. They fostered connections with other nagarams and evolved into specialized trade centers, maintaining horizontal links. (Thakur R. , 2002)

The attainment of independence and the subsequent partition in India posed the significant challenge of resettling millions of refugees. As a majority opted to settle in urban areas, the resettlement efforts were primarily concentrated on creating rehabilitation colonies and sub-towns in cities like Delhi, Mumbai, Ahmedabad, Uttar Pradesh, and Calcutta. Recognizing the pressing need for housing, the Union Government formed an Environmental Hygiene Committee in June 1948, estimating a shortfall of 1.84 million urban houses in addition to the one million required for refugee resettlement. Consequently, the focus of urban planning in the post-independence decade was to establish temporary shelters for refugees, evolving over time into permanent residential neighbourhoods. The initiation of planned economic development in 1950, marked by the establishment of the Planning Commission, underscored the importance of housing. The First Five Year Plan (1951-56) prioritized housing and the swift spatial and occupational rehabilitation of refugees. Simultaneously, the Union Government created a Ministry of Works and Housing. The Second Five Year Plan, emphasizing industrialization, led to the establishment of various industrial cities from 1956 onwards, including Rourkela, Durgapur, Bhilai, Bokaro, Barauni, Noonmati, Haldia, Ankleshwar, Sindri, Mitrapur, Naya Nangal, Namrup, Kandla, Paradeep, Korba, and Ratnagiri. Despite being largely planned, these industrial cities became magnets for rural migrants seeking employment, resulting in the emergence of slums. (Mehra, 2016)

The temple at Srirangam became an important center for religion and education in about the sixth century AD along with other famous temples at Madurakanchi and Vengdar. It was rebuilt by the Pallavas, who ruled Tamilnadu from the sixth to ninth centuries AD, and was again rebuilt by the Cholas who extended their kingdom to this area from the tenth to twelfth centuries AD. They also rebuilt the gopurams and walls of the town. The urban form and pattern of this historic Indian town were primarily shaped by a dedicated adherence to the traditional temple design, as outlined in the Silpasastra, an ancient Hindu guide on architecture and urban planning. Additionally, each ruler aimed to surpass their predecessor by constructing taller gopurams and walls (Ghosh B. &., 1974).

2.3. The Planning

Considering the ancient settlements “Another striking feature of both Harappan and Early Historic cities is their adoption of rigid cardinal grid plans (Wheeler 1968, 27; Auboyer 1969, 118). Many scholars have illustrated the close regularity of internal planning of the Harappan sites of Harappa, Mohenjo-daro, Kalibangan, Lothal and Surkotada (Allchin & Allchin 1986, 171-6). Similar regularity has been identified at Sisupalgarh (Lal 1949) and Bhita (Marshall 1912).” (Allchin, 1995). The ancient Indian town planning, rooted in the four Vedas, encompasses diverse treatises. These documents classify settlements based on their purpose, location, and activities. Additionally, they elaborate on the shape, components, and design parameters, drawing inspiration from the principles of the Vastu Purusha Mandala (Makkar & Gangwar, 2023).

Indian traditional planning concepts draw from ancient architectural treatises, and one of the significant texts is the "Manasara." The Manasara is a Sanskrit treatise on traditional Indian architecture and town planning,

providing guidelines for the construction of temples, palaces, and cities. Its importance lies in shaping the principles of Vastu Shastra, the traditional Indian science of architecture. Vastu Shastra, also known as Vastuvidya or Ancient Indian Architecture, boasts a history as ancient as the development of human civilization. This idea of individual interest is well articulated in Sanskrit literature dating back to the early Vedic period. Influential texts such as Atharvaveda, Matsya Purana, Brihat-samhita, Vastu-vidya, Manasara, Mayamata, and various inscriptions collectively provide a clear and vivid portrayal of Ancient Indian Architecture. (Deshpande, 2015)

As per Manasara, the science of Architecture, or Vastu Shastra, has been passed down from Shiva to Brahma. From the four faces of Lord Brahma, the celestial architect Visvakarma, Maya, Sthapatya, and Manu have originated, as stated in different treatises and inscriptions, offering profound insights into the world of Ancient Indian Architecture.

Manasara principles, the treatise has undoubtedly influenced the architectural and planning concepts of the time. The principles of Manasara, along with other Vastu Shastra guidelines, were integral to the planning and construction of various medieval Indian towns and cities. Here are a few examples where these principles likely played a role:

1. Vijayanagara:

Certainly, the overall design of Vijayanagara does not seem to adhere strictly to the principles of a shastric urban mandala, as indicated by Fritz in 1985. However, certain elements of the capital's layout may align with theoretical guidelines. According to the Krityakalpataru (referenced in Inden 1978:53), a fortified capital was recommended to feature a grid pattern of nine by nine squares, with the central square housing the temple containing the king's die. The spatial organization of the royal center distinguishes between the terrestrial and celestial domains, creating a profound separation in the realms of royal authority. This separation is accentuated by a defining wall, along an axis, separating the terrestrial manifestation of the hero-king and the celestial authority. The boundary established by this wall reflects symbolic contrasts, such as the distinctions between the "inner" world and the "outer" world, as well as the differentiation between private and public behavior, and the delineation between rest and activity, akin to the symbolic distinctions between east and west. (Fritz, 1986)

- The city of Vijayanagara, the capital of the Vijayanagara Empire (14th to 17th centuries), is believed to have incorporated Vastu Shastra principles in its planning.
- The Hampi ruins, part of the Vijayanagara site, reveal a systematic layout, with temples, markets, and residential areas following geometric patterns.

2. Fatehpur Sikri:

- Although more commonly associated with the Mughals, Fatehpur Sikri (constructed in the late 16th century) was influenced by traditional Indian planning principles.
- The integration of Mughal and Indian architectural styles at Fatehpur Sikri, including courtyards and gardens, reflects a blend of cultural and planning concepts.

3. Ahmedabad:

- Founded in the 15th century by Sultan Ahmed Shah, Ahmedabad in Gujarat may have incorporated Vastu Shastra principles in its planning.
- The old city of Ahmedabad is known for its organized chowks (squares) and pols (traditional housing clusters) that might reflect traditional planning ideas.

4. Bidar:

- The town of Bidar in Karnataka, which served as the capital of the Bahmani Sultanate in the medieval period, might have incorporated traditional Indian planning concepts.

- The city's layout, including the Bidar Fort and its surroundings, may have considered Vastu principles in its design.
5. Madurai:
- Madurai, with its historic Meenakshi Amman Temple, could have integrated Vastu principles into its urban layout.
 - The temple complex itself, with its mandapams and towering gopurams, reflects architectural elements in line with traditional Indian planning concepts.

While it's challenging to attribute the planning of specific medieval Indian towns exclusively to Manasara principles, these examples highlight the broader influence of traditional Indian architectural treatises on urban planning during the medieval period. The integration of sacred geometry, spatial organization, and symbolic significance in these towns suggests the enduring impact of Vastu Shastra principles.

2.3.1. Traditional town models of Manasara Shilp Shastra

The ancient Indian guide to urban planning, known as Vastushastra, is extensively covered in Manasara, a work authored by the wise Mansara, forming one of the five key documents on Vastu Sasthram. This comprehensive book delves into the intricacies of building construction and town planning, emphasizing the selection of suitable locations based on cosmological beliefs. The traditional city creation, guided by holy geometry concepts like the Mandala (Kaur, Babu, & Priyadarshini, 2023) for Vaastu Purush, incorporated four types of settlements in forts: Janabhavanas for the common mass, Rajbhavanas for the ruling class, Devabhavanas for religious shrines, and public buildings like rest houses and gardens. Manasara suggests choosing city locations based on sensory attributes like fragrance, taste, shape, direction, sound, and touch. The book emphasizes ideal city conditions involving abundant greenery, a flowing river in specific directions, and a deep water table. Failure to meet these criteria would lead to the rejection of the land. Manasara also introduces eight town design plans (fig. 1), each with unique characteristics. These include Dandaka, Sarvathobhadra, Nandyavarta, Padmaka, Swastika, Prastara, Karmuka, and Chaturmukha designs, each suited to different geographical and social contexts.

“The city was enclosed in walls and there were four gateways at cardinal points. For example, the city of Jaipur.

1. *KARMUKHA: The shape of the city resembled a bow. The city had wall enclosure in the form of a bow having two main gates on the North and South sides. It had one main road lying in the North- South direction. Outside the city wall was a moat (deep and wide water filled ditch) for defence.*
2. *NANDYAVARTA: This plan was in the pattern of flower petals. This was known as the abode of happiness. This plan was intended to accommodate a population of mixed social grades. Nandyavarta type of village contained a great number of shrines dedicated to various deities for location of which Mansara has given directions. There were bazaars placed on outer blocks near gates.*
3. *SARVATOBHADRA: at the centre of village was a temple of Shiva, Vishnu or Brahma. The village had two streets crossing each other at the middle. Rest houses for pilgrims and educational buildings were at the outer rings of village.”* (Nagaich, 2017)

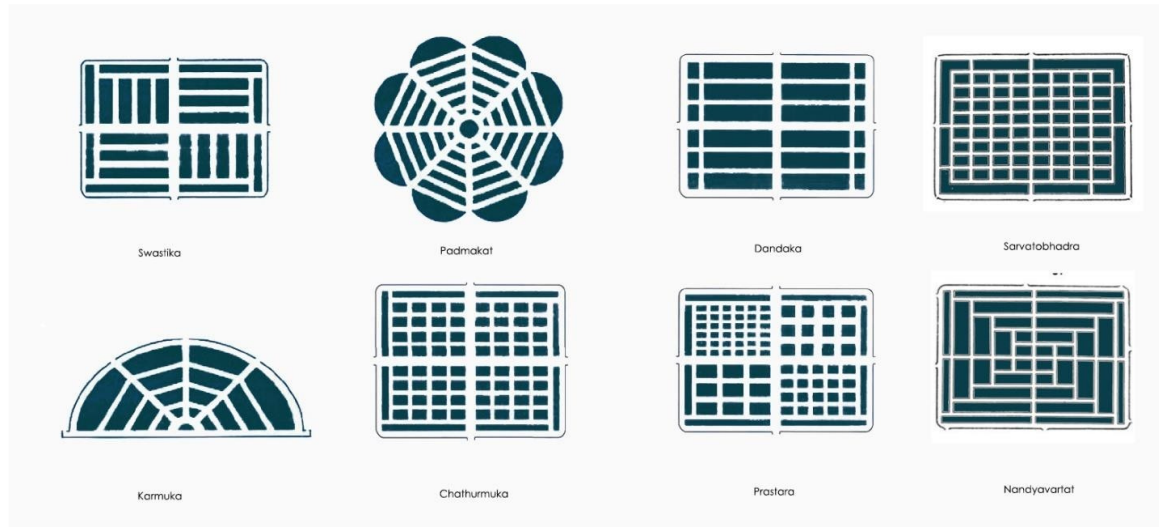


Fig.1: Traditional Indian Village Patterns depicted in Manasara.
Ashik S.

The meaning of Shilp Shastra translates to the “Science of Sculptures”. It is one of the most ancient texts in Indian history dating back sometime in the 1st millennium B.C., covering a wide range of design principles for subjects such as arts, crafts, sculptures, and architecture. Various aspects that were required for designing any new building or settlement were included in that varying from macro to micro level of detailing. Some of them included site selection parameters, the defence mechanism of the city (including features like types of fortification, classes of forts, designing of moats, city gates design parameters), construction parameters applied according to the caste, categorization of roads and their respective widths, classification according to their shapes and development criteria for artificial water bodies and water gates. Arthashastra defines the objective behind constructing any town based on its end users and how its planning characteristics will be determined accordingly, old towns of Rajasthan are also classified primarily on their purpose of use (Khadgata)

Apart from the well-developed urban centres in the Harappan sites, and the frequent Vedic references to forts and towns, it is for certain that flourishing cities/townships existed much prior to the start of the Common Era. Megasthenes notes that the extensive city of Pataliputra stretched over a distance exceeding 9 miles. Contrary to being spontaneous creations, cities during the Mauryan era, such as Pataliputra, were part of an ongoing urban culture with a well-established history, as indicated by various texts and early reliefs (further discussed below). Insights from Vedic texts emphasize the writers' familiarity with features like fortifications, villages, towns, forts, carved stones, stone-built houses, and brick structures. The basics of architecture were already in, which were handed over from generation to generation most likely through oral traditions of memorizing knowledge and facts. (Dey, 2020)

The chapter 9 of Manasara Script describes the grama, the villages and how it should be planned in a systematic manner. And it also specifies the types and purposes of each type of these villages.

“1. I shall now briefly describe in order the planning of villages (grāma) in this science (of architecture).

2-4. [Dandaka](#), [Sarvatobhadra](#), [Nandyāvarta](#), [Padmaka](#), [Svastika](#), [Prastara](#), [Kārmuka](#), and [Caturmukha](#): these are the eight kinds of villages defined according to their shapes.

5-8. A village should be measured first, secondly, the ground-plan should be marked, thirdly, the sacrificial offerings should be made, fourthly, the village-planning should be carried out, fifthly, the house-plans should be designed and their foundations should be laid, and in the sixth place, the first entry into the house should be considered.

8-9. *Of these, the measurement (of the village) will be stated now (below); the wise (architect) should measure with the rod of Dhanurgraha (i.e., 27 aṅgula) cubits.*

10-14. *The thirty-nine varieties of breadth begin with twenty-five rods, and end at one hundred and one rods, the increment being by two rods; this is said to be (the breadth of) the Daṇḍaka (village). Its length is described here: it is twice the breadth, the increment being by two rods; of these (measures) there may be one rod more or less in consideration of the auspicious measure under the āya rule.*

16. *This smallest type of the Daṇḍaka village is said to be fit for the retired life (vanaprastha).*

16-18. *The forty-two kinds of breadth (of the middle type of the Daṇḍaka) begin with thirty-one rods, and end at one hundred and seven (thirteen) rods, the increment being by two rods; and the length should be made as said above; this is the intermediate type of the Daṇḍaka (village).*

19-22. *The forty-five kinds of breadth of the large type of Daṇḍaka begin with thirty-seven rods and end at one hundred and twenty-five, the increment being by two. This type of Daṇḍaka is said to be fit for the gods of the world (i.e., the Brahmins).*

23-24. *The seventy-six kinds of breadth begin with fifty rods and end at two hundred rods, the increment being by two.*

25-26. *The one hundred and twenty-seven kinds of breadth begin with sixty-one rods and end at three hundred and thirteen rods, the increment being by two; (thus) both by odd and even number of rods the Sarvatobhadra (village) is measured: these are the length and breadth of the Sarvatobhadra (village), (which is) fit for the Brahmins and gods.*

From Chapter 9 of the Manasara (English translation): an encyclopaedic work dealing with the science of Indian architecture and sculptures by Prasanna Kumar Acharya, 1933." (Acharya, 1933)

2.4. Srirangam

In many ways, Srirangam represents a unique example of town planning in ancient India, where the temple formed the focus for a deeply religious community. The findings indicate that the Hindu religion and the rites and rituals relating thereto were the dynamic factors for the growth of the town, all other factors remaining subservient. As a result, the social matrix was of a simple homogeneous nature and physically the town has retained, even today, all the characteristics of a temple town. That the form follows the function is evident here. It is found that the disposition of almost every element in the town is in accordance with the stipulations of Manasara. Srirangam is probably one of the few ancient towns in India where town building has followed the classic theories of town planning, and many of these practices and theories are valid even today (Ghosh B. &, 1974)

With slight deviations, the plan of Srirangam is close to the Sarvatobhadra of Manasara (fig.2)(fig.3). The salient features of Sarvatobhadra are the following:

- oblong or square in shape;
- a temple dedicated to either Brahma, Vishnu or Shiva located in the center;
- streets inhabited by the Brahmins and those performing sacrifices and austerities;
- boulevards (1 to 5) along the ramparts;

- internal streets lined with a single row of houses and outer streets with houses on both sides; • streets planned for four major divisions (Brahma , Daiva , Manushya, Paishacha) with pilgrims' pavilions, rest houses, colleges and halls located to the southeast with other tanks and reservoirs to the south or east or in intermediate areas;
- town or its parts surrounded by ramparts and temple of Chamundy close to the eastern rampart. Srirangam is oblong in shape with the Vishnu temple in the center and it has three main streets. The Surya- Pushkarni tank is to the southeast. The town and its parts are secured by the ramparts with four gates in the cardinal directions. But there is no ditch along the rampart and the Chamundy temple envisaged in Sarvatobhadra is absent. (Ghosh B. &., 1974). Tiruchirappalli is an area in the vicinity of Srirangam.

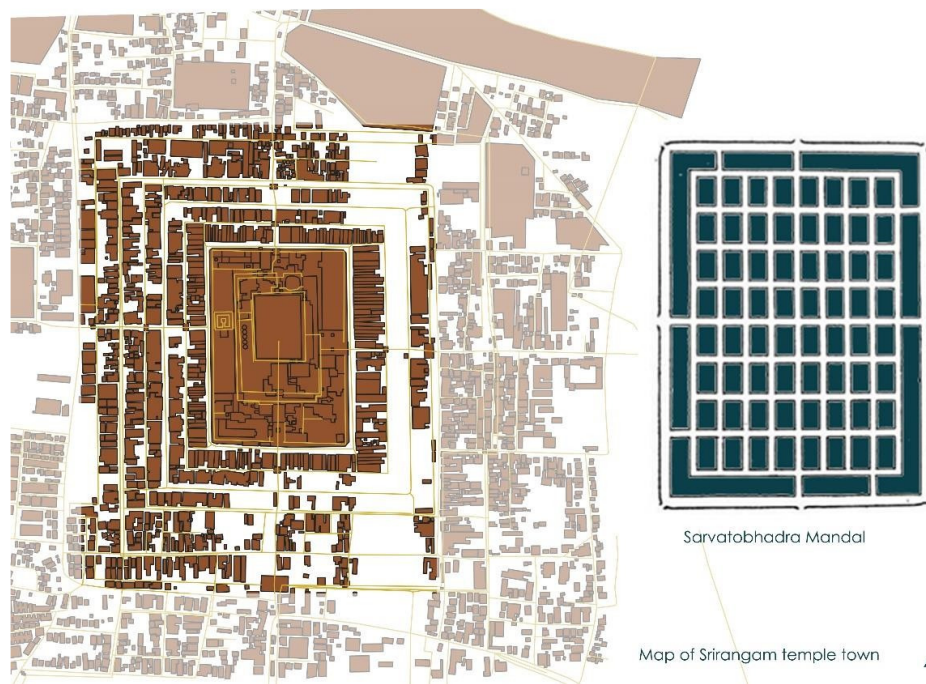


Fig.2: Srirangam temple town built map compared with Sarvatobhadra Mandal of Manasara. Generated[map] by [Ashik S]{generated December 4,2023};using openstreet map and QGIS. not to scale

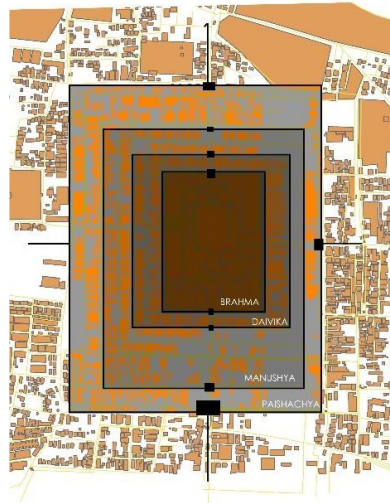
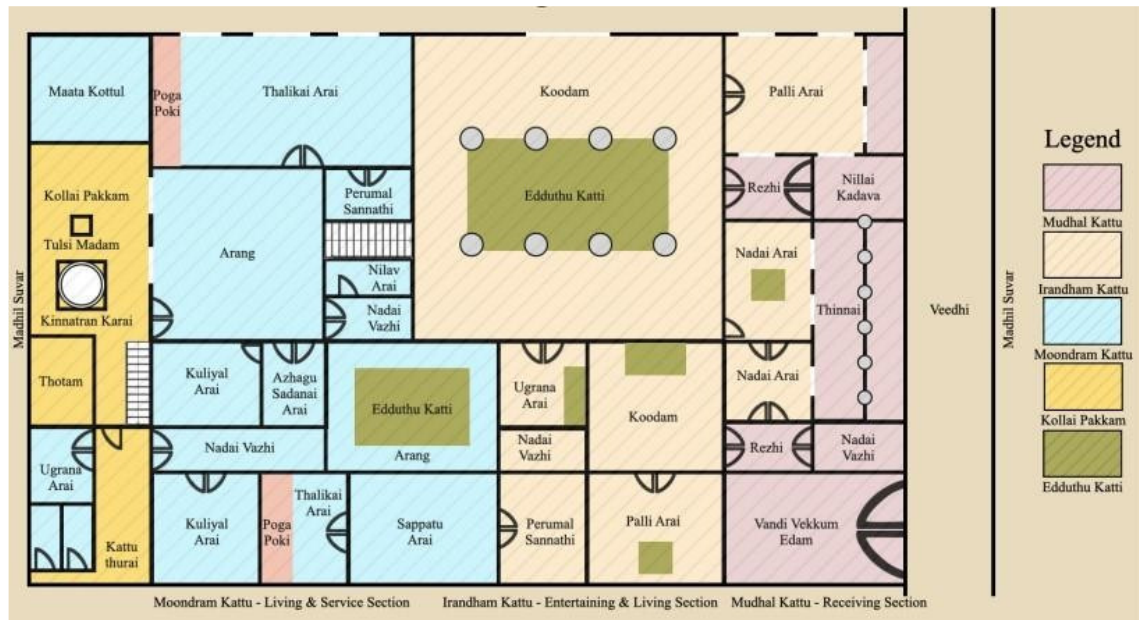


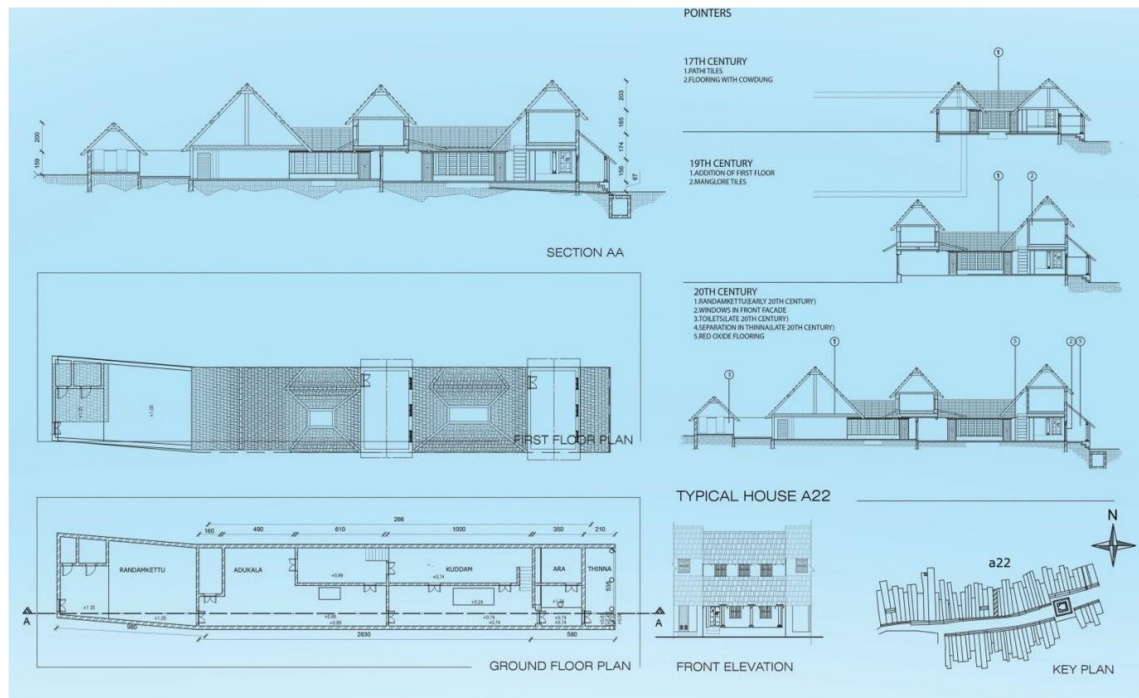
Fig.3: Analysing Srirangam temple town with Sarvatobhadra Mandal of Manasara. Generated[map] by [Ashik S]{{generated December 4,2023}};using openstreet map and QGIS.not to scale

A street in Srirangam is primarily a processional route or a movement channel. The streets leading towards the main temple through a series of gopurams have created concentric enclosures. They have also determined the movement pattern as well as the urban pattern. As one enters an enclosure, one's view is always screened by some structure, guiding one's movement always to the left. The Agraharam streets are built gradually sloping towards the centre, which is the temple. Given that the town is situated on a river island, this prevented the inner settlements & the temple from flooding. The streets inside the Agraharam also slightly slant down from the vertices to the Gopuram exits, this ensured the continuous flow of rainwater to the drains under the Gopurams. This kept the streets clean and free from puddles of water. The fortified citadel is a stronghold which guards its residents from both, the dangers men & nature. It always served as an oasis of security and prosperity to its inhabitants, withstanding the various tides of time. (R R. , 2022)

The design of dwellings in Srirangam offers a unique solution for thermal comfort. The microclimatic characteristics demand that people should be protected from the direct sun and there should be frequent movement of air. This explains the deep row houses which are protected on two sides from direct exposure to the sun while the remaining sides are adequately provided with windows for cross ventilation. The front of all the houses is controlled architecturally for a harmonious picture, there is ample scope for each individual unit to grow freely toward the back yard[fig4]. This is a very ingenious solution to the problem of architectural control and flexibility, with every house enjoying a small rear open space often abutting the rampart. (R R. , 2022). Dwellings of old temple towns of India has similar row house patterns [fig 5].



{ fig 4: A grand agraharam plan of Srirangam.Source. (R R , 2022) }



{ fig 5: Typical agraharam plan of cheriyagramam ,a temple town in Palakkadu,Kerala. Ashik.S [Academic documentation]}

3. Contemporary Development Projects-New Urban Centres

The project that aims to establish organizations, networks, and tools that foster synergy and contribute to the development of communities, sectors, regions, and beyond. By initiating this developmental project, we aspire to catalyse the inception of additional projects, bringing together diverse stakeholders to collaborate towards a shared and impactful goal.

The concept of small-scale development strongly ties to the ideas on dispersion than centrality. To facilitate a clearer grasp of the intricacies and complexities of settlement patterns, let's begin by elucidating the distinctions among concentration, dispersion, and diffusion within the spatial context.

Concentration can be understood as a method of spatial organisation of activities, that still operate under principles of central planning. Its spatial manifestation is pronounced concentration of activities in larger urban centres and hierarchical organisation of settlements in the settlement system.

As its opposite we deal with diffusion, meaning total restructuring of built structures. Activities are not concentrated in one spot, but particular cores are equally distributed in space. It implies a completely different organisation of growingly complex structures based on principles of self-direction. (Zavodnik, 1998)

The intermediate state between the two described extremes is dispersion, occurring when various activities move from centres outwards. Thus, the level of centrality of a certain

settlement diminishes, spatial structures self-organise following momentary needs and demands.

3.1. Decentralised Small Scale Development Projects.

Small scale development projects are a part of idea of diffusive settlement patterns.

The starting point for explaining settlement was extracted from definitions on settlement systems by V. Kokole. We conceptualize settlements as a collection of inhabited areas interconnected within settlement networks. This term encompasses specific spatial arrangements of settlements, their attributes, and the functional relationships among different types, reflecting various forms and spatial configurations of interactions. These interactions originate from a spectrum of activities, including work, residence, and recreation.

The urban landscape comprises various settlement patterns, each characterized by distinct features and developmental dynamics. These patterns include:

1. Compact City and Urban Centres:

- Defined by closed urban structures with organized streets, squares, and parks. These areas, often historic urban cores, host diverse activities, providing daily and occasional services for inhabitants and the broader hinterland.

2. Suburban Areas:

- Emerging from the core of urban settlements, suburban areas expand outward due to evolving activities and population migration. These regions are predominantly characterized by mono-functional zones, such as residential blocks, industry, manufacturing, and commerce.

3. Growth around Other Urban Centres:

- Similar to larger urban centres, this model features outward expansion, with the periphery exhibiting rural characteristics in terms of image and function.

4. Patterns Tied to Compact Settlements:

- Representing the second layer of settlements, these areas exhibit more dynamic development tied to rural ways of life. They include settlements with preserved historical shapes and those that have changed their structure due to development.

5. Spilling of Structures Along Communication Routes:

- An extreme growth variety where settlements join along roads due to the development of particular objects between them, leading to a loss of distinctions between former settlements.

6. Patterns of Individual Objects and Hamlets:

- Found mainly in hilly areas where natural-geographic limitations prevent densening, featuring hamlet patterns formed by smaller, developmental hamlets and individual objects like farms.

7. Settlement Patterns Above the Boundary of Permanent Settlement (800 m):

- Exceptions above the permanent settlement boundary include shepherd settlements, hunters' lodges, tourist areas, and other observation posts, facing pressures from occasional or constant user activities.

The presentation categorizes these settlement patterns into groups, including areas of urban settlement growth, homogenous settlements, areas tied to homogenous patterns of smaller settlements, and areas of dispersed built structures, further subdivided into densely or thinly dispersed settlement patterns. Small scale projects fall in line with the above discussed settlement patterns except compact city.

Many urban planners express a preference for small-scale development, yet there is a need for a more comprehensive set of arguments outlining why a specific scale is crucial. This research offers empirical support, demonstrating that small-scale urbanism can yield measurable advantages, including a substantial increase in square footage, enhanced pedestrian quality, and greater diversity in unit types.

Small-scale settlement projects play a crucial role in larger development efforts, contributing significantly to various aspects of community growth and overall development. Here are key importance and contributions of small-scale settlement projects in the broader developmental context:

1. Community Empowerment:

- Small-scale settlement projects empower local communities by involving them in the planning and decision-making processes. This fosters a sense of ownership and pride, leading to sustainable development.

2. Local Economic Development:

- These projects often stimulate local economic activities, creating job opportunities and supporting small businesses. The economic vibrancy generated at the community level contributes to the overall development of the region.

3. Cultural Preservation:

- Small-scale settlements often focus on preserving local culture, heritage, and traditions. By integrating cultural elements into development projects, there is a recognition and celebration of the community's unique identity.

4. Infrastructure Development:

- While large-scale developments focus on major infrastructure, small-scale settlement projects address localized needs. They contribute to the development of essential facilities like roads, schools, healthcare centres, and community spaces.

5. Social Inclusion and Cohesion:

- Small-scale settlements foster a sense of community and social cohesion. The projects provide spaces for social interactions, communal activities, and the development of supportive networks, enhancing the overall well-being of residents.

6. Environmental Sustainability:

- Smaller projects often emphasize sustainable practices, including green building initiatives, waste management, and energy efficiency. This contributes to environmental conservation and resilience at the community level.

7. Innovation and Creativity:

- Small-scale settlement projects offer a platform for innovation and creativity. Localized initiatives can experiment with new ideas, design concepts, and community-driven solutions, contributing to a culture of continuous improvement.

8. Incremental Growth and Adaptability:

- Small-scale development allows for incremental growth and adaptability to changing needs. Communities can evolve organically, responding to emerging challenges and opportunities without disrupting the overall development trajectory.

9. Housing Diversity:

- Small-scale settlements contribute to housing diversity by accommodating a range of housing types and sizes. This inclusivity addresses the varied needs of the community, promoting social and economic diversity.

10. Rural-Urban Linkages:

- Small-scale settlements serve as vital links between rural and urban areas. They facilitate the flow of goods, services, and cultural exchanges, fostering a more integrated and balanced regional development.

11. Risk Reduction and Resilience:

- By focusing on localized development, small-scale projects can enhance resilience to natural disasters and other risks. Community-based initiatives often incorporate measures to reduce vulnerability and enhance adaptive capacity.

In essence, the importance of small-scale settlement projects lies in their ability to create sustainable, inclusive, and resilient communities, contributing significantly to the broader spectrum of regional and national development goals.

4. Quality of development projects- Liveability

Environmental quality is sometimes thought to be reserved for the elite, something that should be expected only in upscale environments. However, the quality of the environment should be of concern for the city as a whole, not just the wealthy districts. Simple environments should provide a public living environment that is just as rewarding as more prosperous environments. Amidst growing challenges like traffic congestion, uninspiring urban development, threats to natural ecosystems, and an overall deterioration in public spaces, numerous urban plans are now focused on enhancing the quality of life in neighbourhoods and the entire city. The term "liveability," although widely accepted, often lacks a precise operational definition, posing difficulties in policy formulation. Yet, upon closer examination, various tangible and measurable dimensions of liveability emerge. Defining a liveable city involves a nuanced understanding, encapsulating aspects such as the city's functionality for residents and the overall comfort and enjoyment experienced in both neighbourhoods and the city at large (Southworth, 2003)

In order to have a real impact on the quality of the built environment, policies and improvements ideally would be spread over the entire city to improve the everyday environment for all citizens. All scales of urban form affect liveability, from the design of individual home sites, to neighbourhood streets and parks, to citywide systems of arterial streets and open space. A highly liveable city works at each scale. Some problems are citywide and are not limited to single districts or sites. (Southworth, 2003)

4.1. Elements of a neighbourhood with good liveability

All structure plans for new housing developments in grants approval for all structure plans related to new housing developments. In the Liveable Neighbourhood trial phase, structure plans created according to the Liveable Neighbourhoods Community Design Code underwent a distinct review process. Developments that incorporated most, but not all, Liveable Neighbourhood elements were categorized as 'hybrid' developments.

Characteristic Conventional Liveable Neighbourhoods

Diversification of land use is expressed through both single-use, mainly residential areas, and integrated mixed-use neighbourhoods. The latter consists of designated zones with clustered retail, combining residential, retail, commercial, and segregated service industrial areas. The street pattern exhibits a curvilinear and hierarchical structure, evolving from district interconnected networks to a flatter hierarchy, including distributors, collectors, access streets, and traffic-dispersed cul-de-sacs. The predominant retail types vary between regional 'big box' shopping centres and chain stores in contrast to neighbourhood-independent retailers. The overarching planning goals shift from creating comfortable housing to fostering community, ensuring affordability in housing, and containing job opportunities within the designated areas (E, 7(2):38-43).

Thus, we can conclude, good movement network, good segregation, safety and comfort are the basic elements of a liveable neighbourhood.

5.Importance of Traditional planning, examining, liveability.

The prioritization of sustainable urban development has become crucial in Indian urban planning. However, Narayanan (2015) emphasizes in her book that blindly implementing planning policies in developing nations like India, without considering their socio-cultural and historical diversities, poses a significant risk of failure or exacerbating existing social and environmental inequalities. To create effective planning policies that encompass the social, cultural, political, and environmental needs of current cities, it is essential to recognize and incorporate a localized sense of place (as mentioned in Narayanan, 2014). The study concludes that the physical, societal, and economic aspects cannot be viewed in isolation, and it is nearly impossible to separate the past from the future. If "smart" and "sustainable" are the key concepts for future cities, it is imperative to acknowledge and integrate old and historical principles by combining heritage and technology. The future research scope could involve enhancing the inherent layers of sustainability in these settlements towards smart urbanization (Mani Dhingra, 2016).

Focusing on the ecological and humanistic aspects of urban environments, the concept of sustainable cities holds significant importance. However, applying this concept without thoughtful consideration of the socio-cultural and historical variations in developing countries like India can lead to the risk of failure or exacerbation of existing social and environmental injustices. For instance, the adoption of modernist planning in India, aimed at promoting accelerated economic growth and efficiency through a monofunctional approach to space use, resulted in the creation of new inequalities within the urban social context. The zoning methods introduced by British colonizers prioritized motorized vehicles in densely populated Indian cities, establishing a rigid socio-spatial segregation previously unseen even in caste-based Indian society (United Nations Human Settlements Programme 2009). Ricky Burdett, Director of the Urban Age program, points out that modern cities, shaped by outdated western planning models emphasizing separation over inclusion, have been imposed on the delicate urban conditions of rapidly expanding cities in the global south. Consequently, there is an urgent need to carefully rethink and adapt development concepts when implementing them in cultural contexts different from their original conception (Narayanan Y. , 2015).

Exploring sustainable urban development in India's ancient cities by examining elements like religion and both tangible and intangible religious heritage offers valuable opportunities to devise novel frameworks for urban planning applicable to both historical and contemporary urban settings in India. Initially, the Old City serves as a crucial reference point for comparing with other overlooked historic cities (Gandhi 2011). Cities like Delhi, Jaipur, Agra, Lucknow, and Amritsar share similarities, having evolved under various religious royal sponsorships yet exhibiting comparable patterns of movement and mobility related to trade, leisure, and labor. The planning and design characteristics, along with the outward focus of ancient cities, provide essential insights for creating inclusive communities in the context of the increasingly privatized, gated, and segregated spatial layout of modern cities (Narayanan Y. , 2015).

5.1. Analysing liveability of traditional planning concepts, case of Srirangam.

In a related study conducted by Mani Dhingra and Subrata Chattopadhyay, focusing on traditional towns in India and the Middle East, they reached the following conclusion: The historical neighborhoods of Alwar city showcase a well-planned and socially cohesive development. These areas prioritize pedestrians and consider local climatic

conditions, not only improving walkability but also enhancing energy efficiency in these ancient settlements. Community discussions and participation thrived at crucial junctions or chowks. Natural water management techniques, such as old wells and tanks, were employed, and a natural drainage pattern, following the natural contours, prevented water logging in the walled city and its old neighborhoods. Overall, these traditional settlements reflect a comprehensive and intuitive planning ideology, guided by spiritual values and social beliefs that fostered a sustainable and inclusive society (Mani Dhingra, 2016).

Along with very efficient hierarchical movement and circulations, relief from heat and humidity in Srirangam is achieved through thoughtful urban planning. The town's layout utilizes natural elements like wind and shade to enhance environmental comfort. The concentric rectangular pattern (fig.6), fortified by ramparts, not only defines each enclosure but also offers shade to pedestrians and shields the town from cyclonic winds and dust. Monumental gopurams along a cardinal axis create a continuous wind draft, and smaller openings induce a "venturi-effect," increasing wind speed for cooling. The town's architecture, with deep and narrow houses of stone and white plaster, minimizes sun exposure by reflecting sunlight. Vasantha mandapam, Chandra and Surya pushkarnis, and strategically placed water bodies contribute to cooling. Within the temple, high ceilings provide shade, and the kitchen is positioned to allow the east wind to carry smoke away from the sacred space. The combination of these elements showcases a holistic approach to climate-sensitive urban and architectural design in Srirangam.

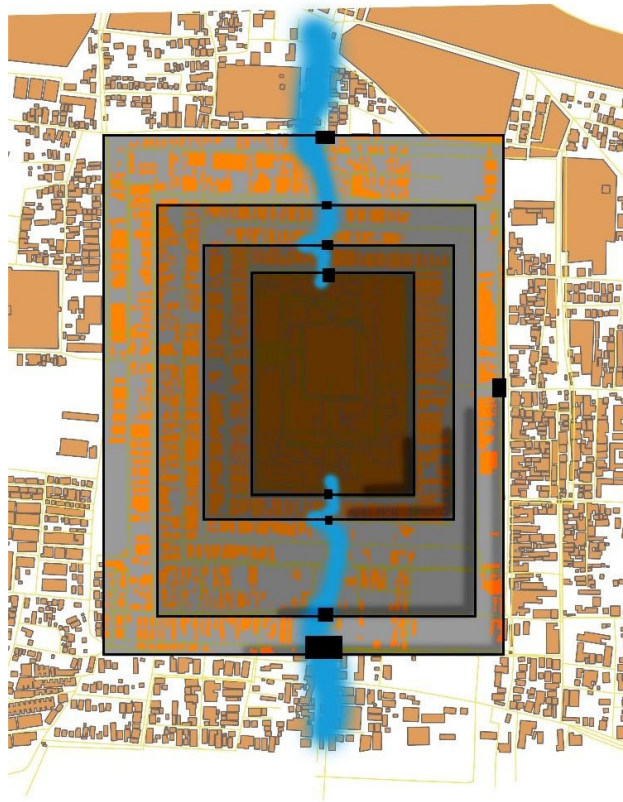


Fig.6: Analysing the climatic influence of the Srirangam town planning. Generated[map] by [Ashik S]{generated December 4,2023};using openstreet map and QGIS.not to scale

5.2. Cases of incorporation of traditional planning methods.

Many attempts are going around the globe in incorporating respective traditional architectural or planning concepts in the modern development projects with an intention of both revival and better efficiency. As study on “Yaruba traditional architecture” states the importance of integrating traditional planning methods for achieving better functionality, unity, aesthetics, social services and environmental adoption. (Adedokun, 2014).

Sushama S. Dhepe and Dr. Sheeba Valsson conducted a case study aiming to identify how traditional architectural principles seamlessly transition into contemporary architecture. The research focused on the Peshawa period's traditional architecture in Pune, revealing that its features and characteristics have been successfully incorporated into modern architectural practices. The study highlighted that contemporary architecture commonly embraces traditions, irrespective of the materials used. The integration of traditional elements, styles, and expressions is evident in various aspects, including spatial elements like courtyards and verandas, as well as visual elements like doors, windows, ceilings, columns, and roofs. The research concluded that the continuity of traditional architecture in the present day is achieved through stylistic integration and the incorporation of specific elements, creating a visual representation of Peshawa Architecture in contemporary designs (Sushama S. Dhepe, 2017).

These cases of different scales provides and affirmation towards adopting the traditional planning concepts into contemporary projects for more advancement and efficiency.

5.3. Challenges faced in contemporary settings.

City planners often view the ancient cores of historic cities in developing nations, such as the walled imperial cities, in a similar light as slum settlements—labelling them as 'blight' and obstacles to modernization (Lingawi 1988: 36). These areas are considered stagnant due to their inability to support modernist development, given their outdated built environments and infrastructure. Lingawi's examination of Islamic heritage and the evolution of old Middle Eastern cities reveals that heritage is often deemed incompatible with contemporary urban development for several reasons, such as narrow streets unsuitable for automobiles, the absence of modern sewer systems, and challenges in incorporating modern appliances into traditional structures (Lingawi 1988: 36). In the Middle East, efforts to 'modernize' the old Islamic core involve creating wider avenues to accommodate motorized transport, even though narrow lanes are crucial in desert cities for providing shade and relief from intense sunlight (Lingawi 1988: 36). Kuwait City serves as an extreme example where a Western-style Central Business District (CBD) has completely replaced the Islamic-style residential and trade areas (Narayanan Y. , 2015).

6. Conclusion

Development projects and upcoming neighbourhood planning whether in vicinity to a heritage town or not, incorporation of regional planning concepts to it will bring in harmony, social sustainability, an element of humanness along with benefits of comfort, safety and functionality without compromising the identity of the city. Challenges in traditional planning systems like rigid planning, lack of motorable roads, modern sewer systems and missing provisions for modern equipment should be approached with idea of adaptability rather than completely replacing the traditional concepts with modern ideas.

Focusing on Tiruchirappalli, which is city with complex layers of history and identity is in vicinity to one of the medieval marvels of India, the temple town of Srirangam. Srirangam is one of the strictly planned cities of India based on authenticity, in every scale from town layout to individual dwellings the town of Srirangam tells the story of culture and heritage. Planning a new neighbourhood in Tiruchirappalli thereby demands a huge attention on this history and its incorporation to the project.

For example, designating and incorporating roads with designs responding to specific functions will help to bring in the passive climatic and thermal comfort offered by traditional planning systems along with contemporary functionality. Some of these adapting considerations as an overlay of traditional planning are discusses in Fig.7.

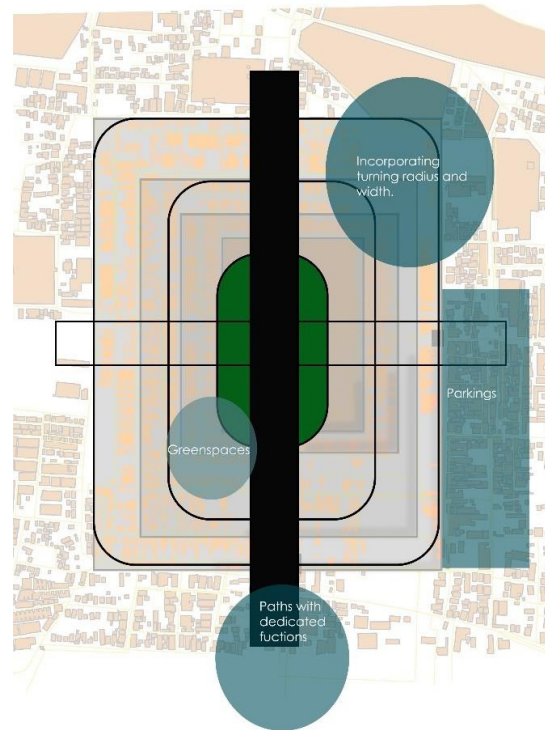


Fig.7: Adapting considerations as an overlay of traditional planning. Created by Ashik S using photoshop {December 5 ,2023 }

Neighbourhoods planned in contemporary settings by flexibly incorporating modern segregation and functionality [fig8], not only in the overall planning but also even in individual dwellings[fig9] could generate a design that posses unique identity that will help the project to attain an element of belongingness to the place.



Fig.8: Adapting considerations of traditional planning over contemporary neighbourhoods a sample. Created by Ashik S using sketch-up {December 6 ,2023 }



Fig.9: Traditional influence on individual dwellings, a sample. Created by Ashik S using sketch-up {December 6 ,2023 }

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