



EXPLORING VERNACULAR RESIDENTIAL TYPOLOGIES FOR SUSTAINABLE DEVELOPMENT

Authors & affiliation:

Ar. Rohini Iyengar
Assistant Professor
BMS College of Architecture
Email: rohini.iyengar89@gmail.com

Ar. Anushree Bhagat
Associate Professor
BMS College of Architecture
Email: bhagat.anushree@gmail.com

DOI: 10.48047/ecb/2023.12.si4.1746

ABSTRACT

Understanding the existing vernacular housing & settlement typology along with functionalities of spaces and using the same as guiding principles for future residential development of Varuna village near Mysuru. Varuna village is located on T.Narsipura road at a distance of 13.3 km from the heritage city- Mysuru. The village is located right opposite the Varuna lake which is one of the oldest lakes of Mysuru district, and the T.narasipura road is a bund road dividing the village settlement and the lake. The village has a compact residential settlement with temples as a trigger and community gathering space. The village has a distinct housing typology of the “Thotti mane” or the courtyard house. This Vernacular housing typology is characterized by the use of local materials and building knowledge to achieve simple, practical, climate responsive built form. The vernacular built environment is based upon local needs; defined by the availability of particular materials that are available in the region; and reflects local traditions, cultural practices and daily life of the people. This is a very efficient residential typology due to the various spaces created and their multi-faceted functions. These housing typologies are flexible and cater to the various temporal social activities of the existing residential communities. These typologies are also climate responsive with the kind of materials used and construction techniques. As the residential component of any new master plan occupies maximum area, we need to be sensitive towards the kind of development that we allow. To ensure appropriate development, an incremental nature needs to be adopted to avoid distinction between the already existing settlement & new development. It also becomes necessary to incorporate appropriate byelaws, regulations and guiding principles to achieve controlled, planned & uniform growth. We need to be sensitive towards the existing climate and topography and promote the use of locally available materials and techniques of construction. This paper attempts to detail out the existing vernacular residential features and take away the effective features as strategies that can be incorporated as overarching bye laws and guiding principles for future residential development leading us towards a sustainable model.

Keywords— vernacular, sustainable, typology, Incremental, future development.

INTRODUCTION

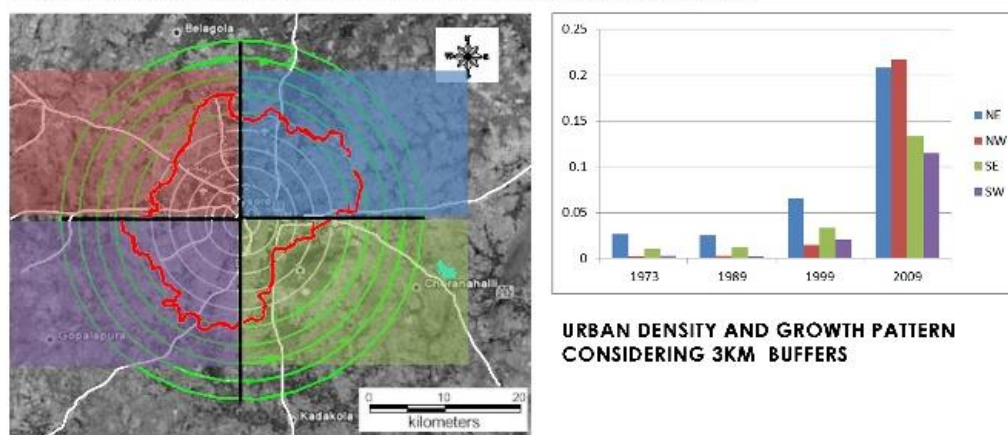
Mysuru is a city in the southern state of Karnataka, India. Mysuru is located approximately 145.2 km southwest of Bangalore, at the foot of the Chamundi Hills and covers an area of 155 sq km. In older times, Mysuru was the capital kingdom of the Karnataka state for nearly six centuries from 1399 until 1956. Today, the city of Mysuru is known for both its tangible and intangible heritage such as palace complexes, festivals, kitchens and textiles. Tourism is a major industry along with traditional trade-based industries such as silk weaving, wooden toy making and agriculture that still thrive in the small villages around the city. Mysore has a tropical savannah climate bordering on a hot semi-arid region according to the Köppen climate classification. The main seasons are summer from March to May, monsoon season from June to October and winter from November to February. Municipal administration of the city is administered by the Mysuru Municipal Corporation, which was

established as a municipality in 1888 and incorporated in 1977. The growth and expansion of the city is managed by the Mysuru Urban Development Authority (MUDA). His activities include the development of new floor plans and roads, urban planning and land acquisition. Public transport in the city center of Mysuru includes trains, buses and planes. Mysuru's water comes from the Kaveri and Kabini rivers. The city of Mysuru has a strong historical presence, but is her second largest city in Karnataka. The town is surrounded on all sides by numerous traditional settlements.

GROWTH PATTERNS OF MYSURU CITY

Over time most of the villages surrounding Mysuru City are getting agglomerated into the local planning area (LPA) boundary of Mysuru. Today Mysuru is experiencing growth in all directions, the Northeast has seen maximum growth after the establishment of Infosys IT campus. Nanjangudu is towards the south which has grown to become an independent satellite town for Mysuru city. There are many industries being established along the Transit corridor between Mysuru & Nanjangudu as well. Towards the Southeast of the city lies The Chamundi hills, further leading to T. Narasipura, being a strong heritage & pilgrimage site.

UNDERSTANDING GROWTH PATTERN OF MYSURU CITY OUTSKIRTS



-FROM 1973 ONWARDS MYSURU CITY IS EXPERIENCING RISE IN POPULATION AND URBAN DENSITY.
 -THE ABOVE GRAPH SHOWS THE URBAN DENSITY GROWTH PATTERN OF MYSURU IN WHICH WE CAN OBSERVE THAT THERE IS CONSISTANT GROWTH SEEN TOWARDS **SE** OF THE CITY
 -**NW** EXTENSIONS ARE MAXIMUM OVER THE PAST DECADE DUE TO THE INFOSYS CAMPUS

Source: MUDA 2031 MP report

SITE SELECTION & PROJECT SCOPE

The greenfield site selected for study lies on the south eastern extension of Mysuru towards T. Narasipura and Kollegal further leading out towards Trichy and Tamil Nadu. The study area selected consists of three villages namely, Chikkalli, Choranahalli & Varuna. The first two villages have been included into the local planning area (LPA) limits of district 33 & district 34 of the proposed Mysuru 2031 master plan. Varuna village lies just outside of the local planning area (LPA) abutting the other 2 villages. The Proposal is directed towards including the Varuna village into the local planning area (LPA) limits, for which a meticulously planned approach needs to be adopted in order to integrate the existing systems, traditional occupations, daily activities, House form & settlement pattern.

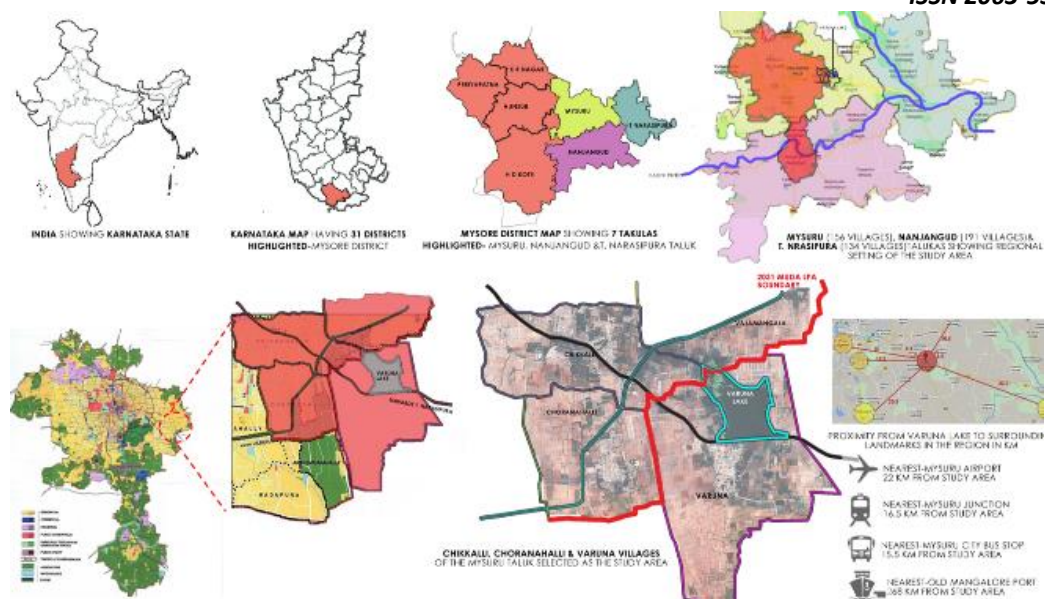


Figure 2: Location details of Varuna Village
Source: google earth & google maps

EXISTING FEATURES AROUND VARUNA VILLAGE



Figure 3: Images showing existing features in and around the village
Source: Primary site survey documentation & analysis

Varuna village is located on T.Narsipura road at a distance of 13.3 km from Mysuru. The road from Mysuru to T.Narsipura forks at Varuna junction. The left deviation continues to T.Narsipura and

Somanathpur. Varuna has a total population of 2,350 people in 529 families as per the 2011 census. The literacy rate is 62%. Varuna village was initially a settlement developed on the banks of the Varuna Lake. The Bund road- which is a highway connecting Mysuru to T.Narsipura was constructed as a road dividing the village and the settlement. The bund road which was built helps control the flooding of the agricultural land surrounding the village. The village is secluded, and functions based on its traditional occupation of agriculture. Currently the lake & Village settlement are surrounded by many private developments & residential layouts which are posing a threat to the village & the lake both socially & environmentally.

EXISTING SETTLEMENT PATTERN & HOUSING TYPOLOGY IN VARUNA VILLAGE

The traditional village settlement of Varuna village follows a very distinct play of spaces. Through the Site study & analysis we can observe that the temple is one of the main driving factors around which the settlement has developed in due course of time. The temple front also acts as a congregational community space for the village inhabitants. The main Water source for the village till today remains to be from the Varuna Lake itself, which is fed by one of the tributaries of the Varuna Canal. The Varuna canal is a manmade canal with tributaries, connecting the Kaveri river in the north to the Kabini river in the south. The Varuna village settlement is an organically developed system that has a direct distinction of class segregation, activity nodes and community spaces. The Settlement pattern is seen to have grown organically over time. The layout of this type of village reflects historical circumstances, the nature of the land, Topography, Water systems, economic conditions, and local cultural characteristics.

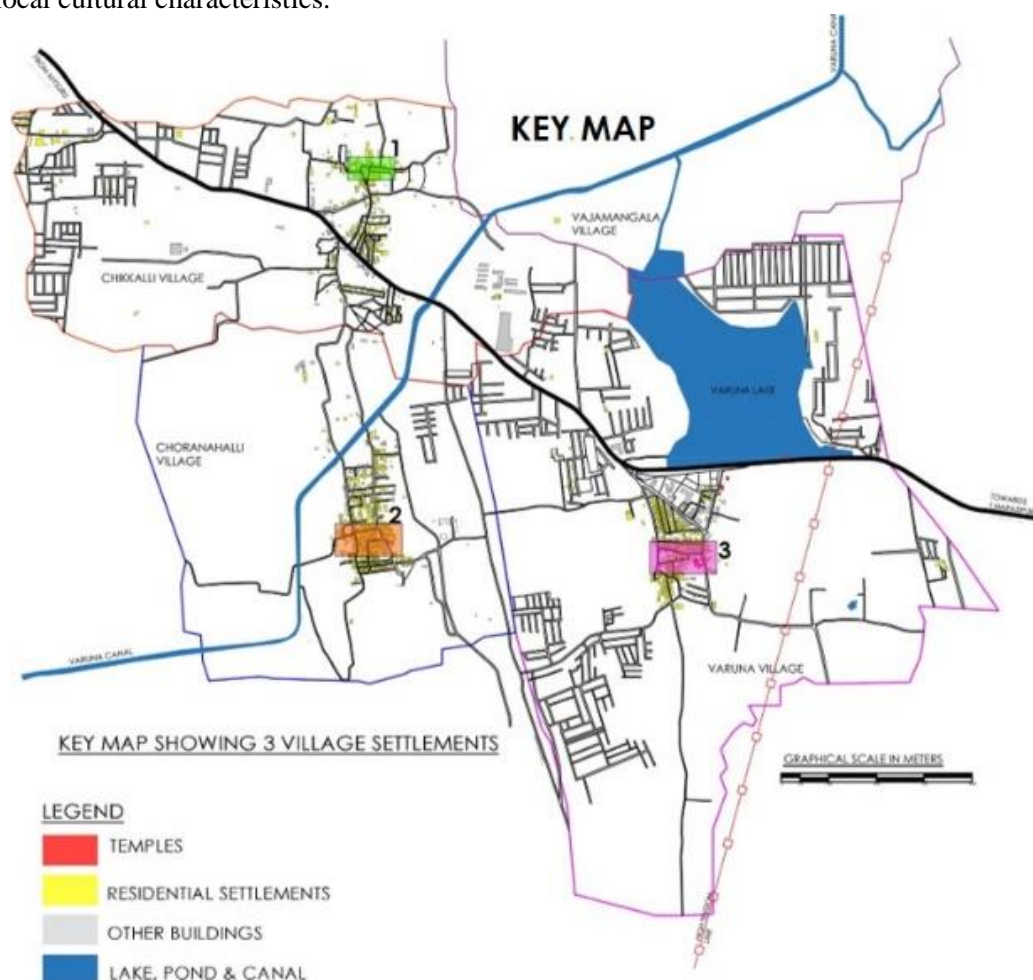


Figure 4: Key map showing the settlements in the 3 villages of the study area
Source: Primary survey documentation & analysis.

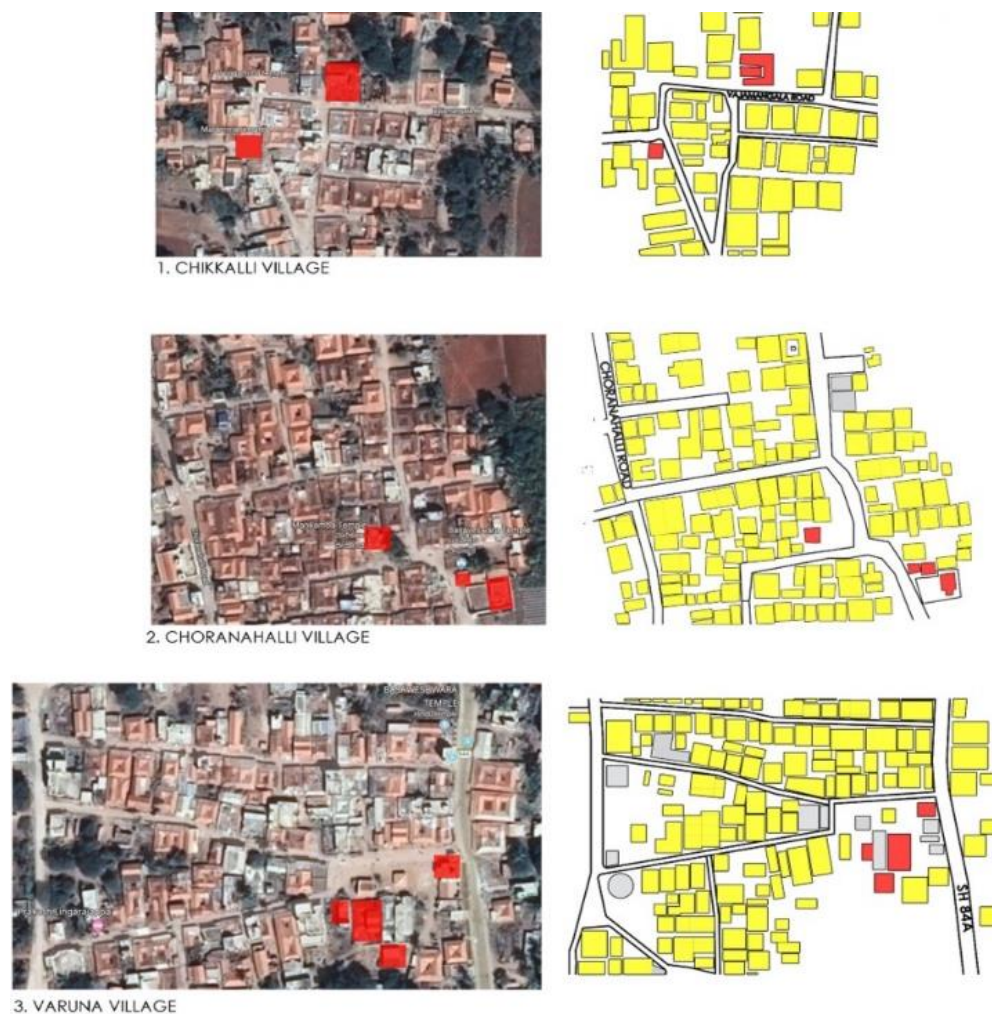


Figure 5: Maps showing the traditional Thotti mane settlements located around the temples in all 3 villages of study area. Red colour indicates the temples, Yellow is the traditional houses.

Source: Google maps & Primary survey documentation & analysis.

The Varuna village is located below the varuna lake which consists the traditional settlement of “Thotti manes”. Most of the older parts of the village settlements have temples located in very close proximity. The older settlements are organic in nature and form clusters with the villages. The older houses have distinct typology of courtyards or the traditional Thotti mane with the frontage towards the road along with smaller elements such as the Jagali and front porch. All of the houses are equipped with cow sheds towards the rear end alongside the bath areas. The Toilets are placed outside and towards the rear end other houses.

Vernacular housing typology is characterized by the use of local materials and building knowledge to achieve simple, practical, climate responsive built form. Vernacular built envelope can be described as a built environment that is based upon local needs; defined by the availability of particular materials that are available in a particular region; and reflects local traditions, cultural practices and daily life of a particular region. In the case of Varuna village, the housing typologies are derived based on the daily activities of the villagers and the houses only change in shape and size but the spaces within them are consistently seen in all the houses.

In due course of time the village is losing its essence due to modernization, the initial houses used to be bigger due to joint families residing in them. But as the families are splitting up to become nuclear families, the traditional house form of Thotti mane is also morphing to become partitioned inside to accommodate the nuclear families. Also, as a part of future development the village settlement will grow, and the challenge will then be to integrate new residential developments with the traditional village settlement. Hence as a step towards sustainability, we need to take certain measures to integrate this traditional housing typology into the future residential development to achieve uniformity and a wholistic sense of planning.

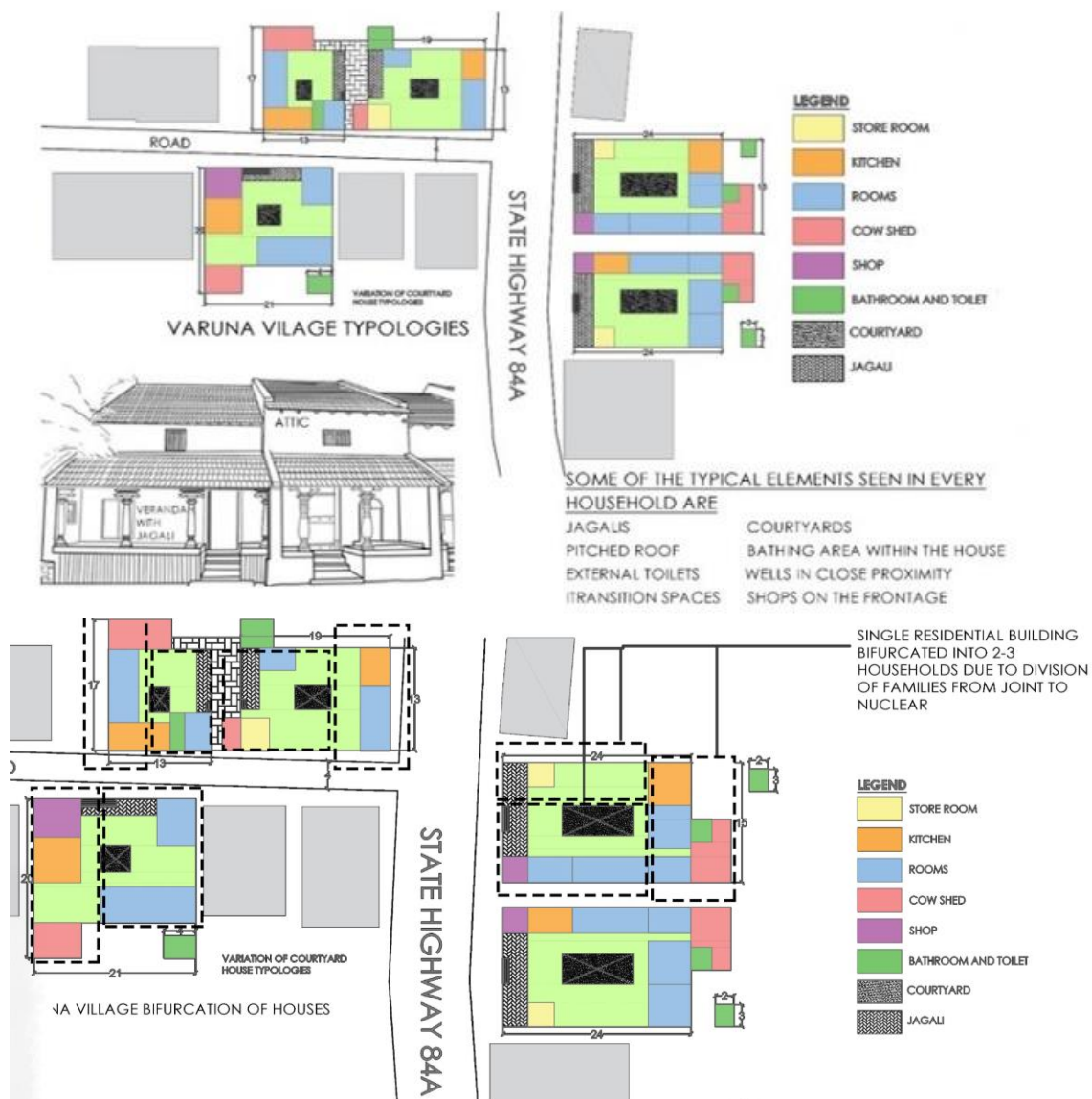


Figure 6: Maps showing the spatial organisation of the Thotti Mane and their Morphology over time
Source: Primary survey documentation & analysis.

ISSUES & CHALLENGES

The main issue in the case of Varuna village is how do we prepare towards future development & integration of the village within the local planning area (LPA) limits of Mysuru city without disrupting the existing Village settlement, the community & their traditional occupations.

The other challenges that exist are:

- Integration of the existing settlement with surrounding upcoming private residential developments.
- Retention of traditional house form & settlement pattern
- Inclusiveness of the community with the fast-growing trends of land use transformation.
- Retention of traditional occupation & other traditional systems that exist within the community.

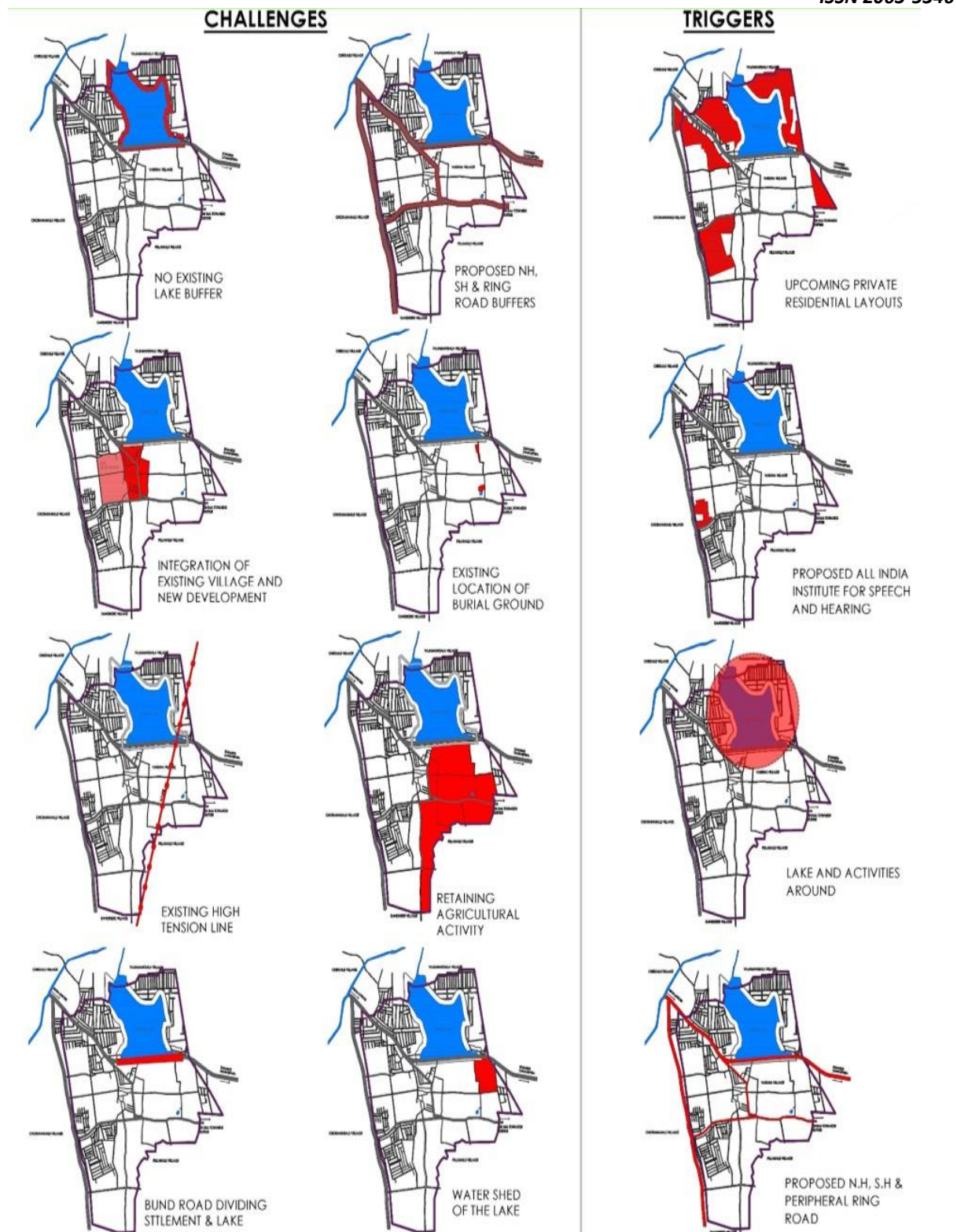


Figure 7: Maps showing the Triggers & Challenges
Source: Primary survey documentation & analysis.



Figure 8: Maps showing the SWOT analysis
Source: Primary survey documentation & analysis.

In order to address the challenges, we must look towards a phase wise development planned to cater to all the stakeholders involved. The vision statement must focus on **integrated Rur-ban development** of varuna village where in there is a rural component existing within the futuristic urban development which revolves around the agriculture based traditional occupation. The only way forward is taking a sustainable wholistic approach in order to ensure that there is a circular metabolism that gets maintained through the entire process.

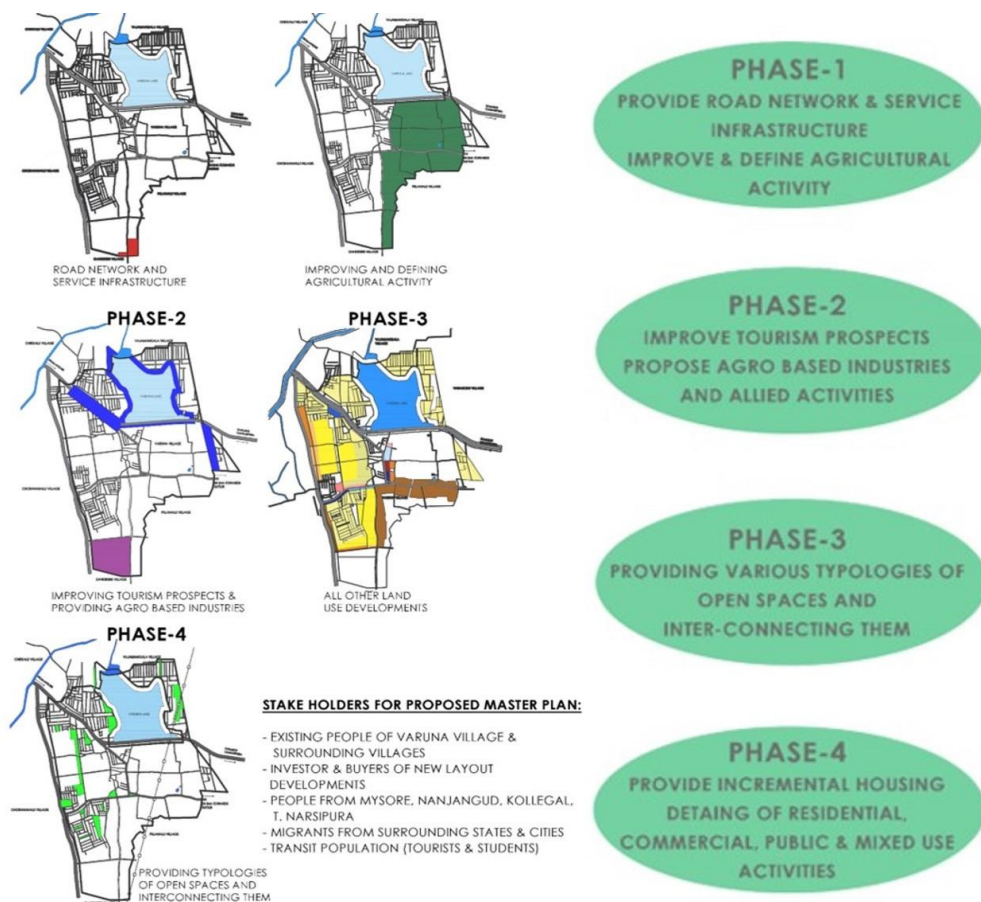


Figure 9: Maps showing the Futuristic planning and vision for the RURBAN development of Varuna village
Source: Primary survey documentation & analysis.

STRATEGIES & SOLUTIONS PROPOSED FOR FUTURE HOUSING WITHIN VARUNA VILLAGE

Within the proposed new master plan for the Varuna village, the residential component of the land use occupies maximum area. Therefore, we need to be extremely thoughtful in the way we plan the future of the housing aspects wherein we need to integrate the existing village settlement to the upcoming new private residential layouts in and around the village. To ensure appropriate development, an incremental nature needs to be adopted to avoid distinction between the already existing settlement & new development. At a broader level where in we can plan our approach towards the integration by using certain guiding principles as listed below:

- Incremental housing can be defined as a step-by-step process in which building components are added or improved by builders depending on money, time, or time. Incremental home building is a building method used by millions of private households worldwide. Although various terms are used in the literature to describe housing construction methods, they basically have the character of self-construction of housing by households. We can talk about "self-help housing", "self-help housing construction support", self-managed housing, and "incremental housing construction". This allows you to reduce the cost of housing construction. Incremental housing requires flexible, relatively small, short-term goals that address intermittent housing needs. Equipment for those who want to finish their home themselves.
- Mixed housing projects for various stakeholders within one district.
- Lowering the construction costs & costs of the land.
- Building services, basic infrastructures etc. required for building construction to be provided in advance.
- Provide for growing-houses within the structure or frame of the constructed building.
- Focus on sustainable building methods and -sustainable building materials that are locally available.
- Transfer of technical local vernacular knowledge, to the residents and other local communities. incorporating the same in the new constructions.

The Thotti mane is currently a response to the daily life and activity patterns of the villagers. When we are trying to integrate new residential development with traditional village settlement, we have to keep in mind the various aspects at play. In order to maintain the continuity, it becomes important to apply certain common design elements across the new developments. This can only be done using certain guiding principles.

The guiding principles that can be adopted for the new developments of Varuna village are listed below:

- using the locally available materials (Stone, Wood, Mud & sand) for construction of houses
- retaining the "Thotti Mane" concept. That is to utilize the courtyards in individual residential plots (above 1200Sft) as well as apartment complexes.
- utilizing green & open spaces as transition spaces to integrate both the old and new settlements.
- creating recreational pockets to merge communities.

The area available for incremental cluster housing is 158 acres:

The plot sizes are derived from the vernacular residential existing in the village. The average of 300 sqm is considered the base for deriving the various plot sizes. The plot sizes used for incremental housing are- 60ft X 40ft, 30ft X 40ft & 25ft X 40ft.

The clusters are made with centralized gardens and dedicated parking spaces. The bigger plots are arranged towards the main roads and have direct access to parks and other amenities. The smaller plots are more inward. The clusters have all plots arranged in a cluster to become inclusive.

The mandate is also to follow certain vernacular typological methods such as sloped roofing, use of locally available materials, creation of functional spaces in residences, etc. That is a takeaway from the local vernacular residential typology of the Thotti Mane.

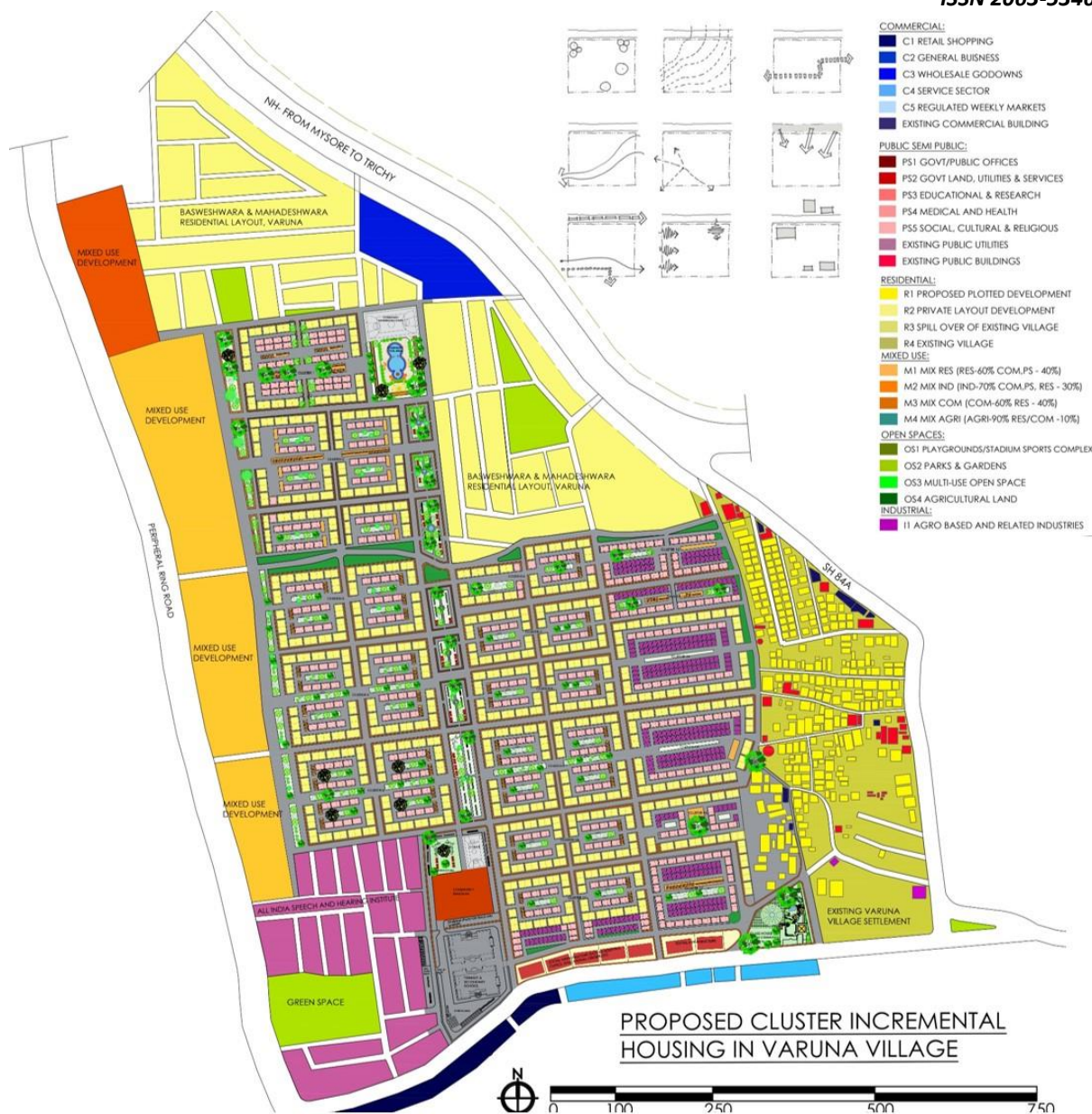


Figure 10: Maps showing the Proposed strategies being implemented
Source: Primary survey documentation & analysis.

CONCLUSION:

Post the Primary survey documentation & analysis, the proposed housing developments at Varuna village need to integrate the following objectives in order to become wholistic & inclusive.

Sustainability: Prioritize sustainable development practices that minimize environmental impact and promote long-term resource conservation. This includes integrating renewable energy sources, implementing waste management systems, and promoting eco-friendly construction techniques.

Community Engagement: Foster a sense of community ownership and participation in decision-making processes. Encourage regular community meetings, solicit feedback from residents, and involve them in planning and implementation of development projects.

Infrastructure and Connectivity: Improve the village's infrastructure to enhance connectivity and accessibility. Develop well-planned road networks, reliable public transportation systems, and provide access to basic amenities such as water, electricity, healthcare facilities, and educational institutions.

Preserving Local Culture and Heritage: Respect and preserve the unique cultural heritage and traditions of Varuna village. Encourage the revival of traditional arts, crafts, and local industries. Promote cultural festivals and events that showcase the village's identity and history.

Green Spaces and Recreation: Allocate sufficient land for parks, gardens, and recreational areas. Emphasize the importance of green spaces for the well-being of residents and create opportunities for outdoor activities and leisure pursuits.

Economic Development: Foster economic growth and diversification by supporting local businesses and entrepreneurship. Encourage the establishment of small-scale industries that align with the village's resources and capabilities, creating employment opportunities for residents.

Education and Skill Development: Focus on improving educational facilities and promoting skill development programs to empower the youth of Varuna village. Collaborate with educational institutions and organizations to provide quality education and vocational training.

Digital Connectivity: Bridge the digital divide by providing reliable internet connectivity and digital infrastructure. Enable access to online services, e-commerce platforms, and digital education to enhance economic opportunities and improve the quality of life.

Health and Well-being: Prioritize healthcare services and facilities, including clinics and hospitals, to ensure access to quality healthcare for all residents. Promote wellness programs, encourage healthy lifestyles, and support preventive healthcare initiatives.

Resilience and Disaster Preparedness: Develop infrastructure and strategies to mitigate the risks associated with natural disasters. Implement early warning systems, emergency response plans, and community training programs to enhance resilience and preparedness.

these principles should serve as a starting point and can be customized and expanded based on the specific needs and aspirations of Varuna Village and its residents.

BIBLIOGRAPHY & REFERENCES:

The data collected for the research are from various government and private departments, which have been listed below:

- 1) For history and heritage-related data-
Karnataka State Archaeological Department
(Mysore Ancient and Historical Department)
- 2) For tourism-related data-
Karnataka State Tourism Department (KSTD)
Mysore Tourism Department
- 3) For data with respect to natural systems, lakes, and canals-
Cauvery Neerarani Nigamaa (CNN)
Mid-Major Irrigation Department South Mysore
- 5) For data with respect to vegetation and land cover-
Karnataka State Forest Department
Horticulture Department
- 6) For data with respect to topography and land forms-
National Bureau of Soil Survey and Land Use Planning (NBSSLUP)
- 7) For data with respect to physical infrastructure-
 - Road Networks
 - National Highway
 - State Highway
 - Other RoadsNational And State Highway Authority of India
Public Works Department Mysore Circle (PWD)
- 8) For data with respect to service infrastructure
 - Water Supply Sanitation, Electricity/ Gram Panchayat Office Varuna Village
- 9) For data with respect to demography-
 - Population, Literacy, Migration Trends

- Economic Study
- Land Records
Taluk Head Office/ Gram Panchayat Office Varuna Village

5) For data with respect to social infrastructure
- Education, Health Care, Religious, etc.
Taluk Head Office/ Gram Panchayat Office Varuna Village