

XXVIII International Seminar on Urban Form  
ISUF2021: URBAN FORM AND THE SUSTAINABLE AND PROSPEROUS CITIES  
29<sup>th</sup> June – 3<sup>rd</sup> July 2021, Glasgow

**The urban form analysis through the morphological transformation study of the urban villages and city integration in Indian context**

Ar. Swati Madhukar Bahale<sup>1</sup>

<sup>1</sup> PhD Student, SAID Lab, Department of Architecture, Sungkyunkwan University, South Korea

**Abstract**

*Urbanization is a continuous process. As city extends beyond its limit, the rural to urban transformation includes the various morphological, economic, social changes in peripheral area of the city. Villages and Peri-urban town around the city have their own morphological layout with their own functioning process and culture. The villages that included into the city are called urban villages and they are struggling for their existence. These villages are facing various challenges and transformation with its inclusion in city. New urban form is generated at the rural urban interface. The policies to regulate the urban transformation is still in evolving process and varies as per the context.*

*Indian urbanisation is very complex having the various layers of urbanism; strong historical values, diverse context varies as per place, culture, mixed of many religions, economy, unique ecological and weather conditions etc. Indian Urbanisation process is slow and late comparative to European and other East Asian countries. The great Leader of nationalist movement 'Mahatma Gandhi' once quoted that 'Future of India lies in its villages'. At present about more than 600,000 villages are in India. The Mumbai metropolitan area consist of the Greater Mumbai and entirely planned new satellite city Navi Mumbai. Many villages are now part of Mumbai metropolitan area. In a research paper, we will discuss about the morphological transformation of urban villages in Mumbai metropolitan area through visual analysis and various mapping techniques. Simultaneously, we will analyse the urban form of the area through the morphological transformation of urban villages. This study will help to analyse various issues caused due to morphological changes. It will provide the basis for the policy formulation and morphological interventions for the area.*

**Keyword:** Urban Village, Morphology, Urban form

**Introduction**

The morphology of the urban area is shaped by the location of the city, the influence of the historical events, climate, ecological features, and inclusion of existing rural areas into the city. The villages that included into the city are called 'Urban Villages' and they are struggling for their existence. With the inclusion in a city, these villages are facing various challenges and transformations in their morphology, economic and social life. New urban form is generated at the rural urban interface. In India, 'The Urban Villages' is the term first used in an official document in the Master plan of Delhi city in 1962. Initially, such areas are ignored by the development authorities of the city. They were identified with its distinctive character and organic urban form in the planned city. They became the ultimate part of the urban form of the city with its inclusion in the city limit. It is important to understand the differentiation between rural and urban villages. 'Rural Village' is a cluster of houses with settled boundaries where a small regulatory body called 'Gram panchayat' is the prime administrative and governing authority and most of the accommodated population involved in

agricultural or fishing occupation with the setting of agricultural land or sea around. The term ‘Urban village’ is used differently in the case of developed countries than in developing one. In America or in Europe the well-planned settlement on the edge of the city is called ‘Urban Village’. Whereas in Asian context an ‘Urban village’ can be defined as a village that has acquired urban characteristics due to reduction in its agricultural base by the process of acquisition of land holdings for a public purpose or by its transformation into residential or industrial colonies (Tyagi, 1982). In this research paper, we will discuss the phenomenon of formation and transformation of the morphological character of urban villages in the Indian context.

## Background

The city of Navi Mumbai situated along the Mumbai peninsula and based on the twin city concept with the notion of decentralization of Greater Mumbai city in order to avoid the congestion and to accommodate a migrated population of Mumbai. Mumbai city was designed based on the nodal development of 14 Self-sufficient townships called nodes (CIDCO 2021). Each node has neighborhoods called the ‘Sectors’ which are walkable, accessible, and connected to the suburban railway network. The planned city of Navi Mumbai accommodating around 95 villages. Figure 2 showing location of urban villages from Navi Mumbai. These 95 rural agglomerations have become part of Navi Mumbai's urban landscape and converted into urban villages.



**Figure 1.** Location of Navi Mumbai in Maharashtra state.

**Figure 2.** Location of urban villages (demarcated green dots) in Navi Mumbai city (NIUA, 2015).

**Figure 3.** Location of Vashi node (demarcated in yellow dot) and Ulwe node (Demarcated in red dot) in development plan of Navi Mumbai city

## Methodology

This study is based on the development plan of Navi Mumbai prepared by the City and industrial development authority (CIDCO), sectoral level map analysis, the data of urban villages received through the visual analysis based on actual site visits and analysis of chronological changes in villages documented through google maps and open-source ArcGIS tool. The urban villages in Navi Mumbai were identified through the unique low-rise morphology of the buildings, traditional building typology, narrow lanes for pedestrian movement, and smaller plotting layout mostly called ‘Gaathan’ (Village) area. Through this research, we have analysed the morphological transformation of the urban villages and their influence on the urban form of a city. Two urban villages from Navi Mumbai were taken for the analysis, one is completely transformed ( Vashi urban village)

and another one (Vahal urban village) is in the process of transformation. The various issues are caused due to the transformations. Some of the issues in urban villages are identified and through the analysis of issues, possible solutions to regulate transformation are suggested.

### Vashi Urban village study

Vashi node is the important commercial node in Navi Mumbai. It is known by name of Vashi village. The location of Vashi village within Vashi node is as demarcated in black dot in Figure 4. Vashi village land was given by the CIDCO to the inhabitants of the area for commercial and residential purposes. This land was given on behalf of the acquired land from the local inhabitants for the nodal development as part of compensation.



**Figure 4.** Map of Vashi Node and the location of Vashi Village (Demarcated in red circle)



**Figure 5.** Google Map showing the morphology of Vashi urban village (2003), Navi Mumbai

**Figure 6.** Google map showing the Transformed morphology of Vashi urban village (2021) Navi Mumbai

Initially, it has a traditional low rise, very fine grain footprint of buildings. The chronological map of the year 2009 demonstrates the typical layout of buildings with narrow lanes as shown in Figure 5. Transformation of Vashi village initiates with the development of Vashi node. The low-rise single or double-story buildings in the village were replaced by the four or five-story concrete buildings. Figure 6 demonstrates the transformation in Vashi village. Transformation takes place gradually as piecemeal redevelopment. The amalgamation of two or more very fine grain building footprints sometimes integrated to convert into the

midrise apartment blocks with four to five stories but the road layout of narrow lanes remains as it is. So, the sense of enclosure is change as the building height exceeds the width of the road leads to claustrophobia, especially during the night-time.

**Transformation in public spaces:** In a traditional Indian setting, the most vibrant pocket of public space around the village is use for the celebration of various festivals, community meetings, public events, etc. In Vashi Village, 'Gaodevi temple' or village goddess temple building is a low-rise religious building surrounded by residential apartment blocks. As seen in Figure 7 the public space around it just disappeared due to encroachment or the space around the temple is converted into public parking spaces for two-wheelers due to lack of parking space in the village.



**Figure 7.** Gaodevi temple, Vashi Village, Navi Mumbai. Temple is Parking spaces having narrow setback between surrounding building and temple.

**Figure 8.** Incidental Public spaces developed around the small daily need shops in Vashi Village, Navi Mumbai.

**Figure 9.** Exposed electrical services in Vashi Village, Navi Mumbai.

**Mixed used spaces:** Residential land use along the major street is transformed into commercial or the mixed-used built form where the daily need shops or other shops located at the ground level of the property. As the parking space around the building is insufficient for the users of commercial or mixed-use spaces, it leads to the chaotic parking situation created outside of mixed-used buildings as shown in Figure 8.

**Services issue:** The narrow street width and lack of proper drainage layout leads to the poor underground sanitation facilities. In Figure 9 we can see that the electrical and sanitation services are seen exposed which can be the threats to the kids playing on the street. It also affects the aesthetics of the area. The unhealthy situation is developed due to the poor services in the neighbourhood.

### Vahal urban village study

'Vahal' urban village is located in Ulwe node of Navi Mumbai as shown in Figure 10. Ulwe node is in the developing stage. Ulwe node is already attracting the upcoming population because of the proposed Navi Mumbai International Airport and Special Economic Zone (SEZ) which is located less than 2 km from this node. SEZ zone is dedicated to commercial, industrial, and port-based development which will create job

opportunities in this area. Also, the expansion plan of JNPT Port which is located about 12 km from this node will attract the investment and generate future jobs in area.



**Figure 10.** Map of Ulwe Node and the location of Vahal Urban Village (Demarcated in violet circle)

**Figure 10.** Map of Vahal village, Ulwe node, Navi Mumbai

**Land use, Typology, and Morphological Transformation:** ‘Vahal’ urban village is characterized by residential land use. Figure 12 shows some of the mix-use building typologies developed at the entrance of village. This village is in the developing stage and as the inhabitants were earlier farmers and they received monetary compensation on behalf of surrendering their land for nodal development. They utilized this money for constructing new floors on their existing building for rental housing or for selling to generate the source of income. Figure 13 demonstrates the transformations in Vahal urban village

**Transformations in public spaces:** Some of the villagers bought luxurious cars fascinated by the modern urban lifestyle. Due to the narrow lanes and insufficient parking space, they park their cars in public space like in front of temple, which resulted transformation of the central public space into an unauthorized parking space as shown in figure 16. It is also observed that the new public park developed at the entrance of the village. Nodal development leads to the new public space development on the edge of the village boundary.



**Figure 12.** Mixed used development at entrance of Vahal Village, Ulwe Node, Navi Mumbai.

**Figure 13.** Built form transformations in Vahal Urban Village, Ulwe Node, Navi Mumbai.



**Figure 14.** Incidental Public spaces developed in-between narrow street intersection in Vahal Village, Navi Mumbai.

**Figure 15.** New Public park is developed at the entrance of Vahal Urban Village, Ulwe Node, Navi Mumbai.

**Figure 16.** Public space in front of temple transformed into the parking space in Vahal Urban Village, Ulwe Node, Navi Mumbai.

The conditions of urban villages pointed out by inhabitants, policy makers and administrative officials also. Two schemes for the project affected persons (PAP) were formulated one was Gaothan (Village) expansion scheme and 12.5% scheme.

Gaothan (Village) expansion scheme was initiated in 1976. As per the scheme 10% of total acquired land from village was returned to villagers. Half of the land was allotted directly to project affected person and remaining half of the land was used to make infrastructure and social facilities for the benefit of villages. Project affected Person's (PAP's) were those who lost minimum of 100 sqm of land during acquisition process where he/she was living or running business on that land. This scheme provide scope for regularisation of unauthorised.

12.5% scheme was introduced in 1990 for the landowners in urban villages who registered to take benefit of scheme. As per this scheme, out of total land acquired 12.5% land ultimately returned to the villagers. Out of that 30% reserved for infrastructure and services, so the net allotment was 8.75% of total land acquired. The allotted land would be in residential landuse area only and can be used for residential purpose only. These two schemes majorly contributed for shaping the urban villages of Navi Mumbai

## Results and Discussions

From the analysis of the urban form of Vashi and Vahal urban village from Navi Mumbai, the transformations in the urban form of these villages not only contributed to the morphological changes but also affects the overall urban form of the nodal development. These villages are converted into congested patches within a planned node. The reasons for this congestion can be due to schemes offer to compensation for local inhabitants and lack of sense of belonging.

Gaothan (Village) expansion scheme and 12.5% scheme were formulated for the urban villages which affects the urban form of nodal development. Sector 17 of the Ulwe node is dedicated to the 12.5% scheme. Comparative analysis of 12.5% sector (sector 17) and other sectors demonstrate that the plotting layout was smaller in dimension in sector 17 compared to other sectors because the plots were allotted to the project

affected persons. In other sectors mostly the private developer regulated development took place on large plots. Gaothan (Village) expansion scheme contributed to the infrastructure development at certain extent.

While analysing the transformations in urban village it is observed that most of the owners rented their building blocks to the migrated workers who worked in the service sectors or as street vendors, household helpers in nodal development. Gentrification of the original population takes place and the area converted into a cheap rental housing area. Due to cheap rents, population involved in the informal economy or the poor population attracted towards such agglomerations. Population living on the rental basis lacks the sense of belonging about the buildings and neighbourhood both. Non-maintenance leads to the deterioration of the rental buildings. All these issues will lead to degradation of the quality of living within an area and over the period of time slums like condition developed in such areas. The village development is excluded from the nodal development to conserve the indigenous habitation area but this results in haphazard and unplanned growth of the urban villages.

**Various scenarios and approaches:** for transformation of urban villages can be worked out depend on the situation and context of the urban village.

**Restoration approach:** In this approach the existing infrastructure, public spaces, buildings in good conditions and heritage within village needs to be conserved. Unauthorised development for rental purpose or to gain profit needs to be regulated with monitoring mechanism development.

**Precautionary approach:** This approach can be adopted for transforming stage village. Analysis about the future projections of urban form and density, needs to be analysed with development pressure and infrastructural provisions are important in that. Accordingly prior to the development, the possible provisions for future infrastructural needs to be quantified.

**Redevelopment approach:** This approach can be adopted at any stage for urban village. Inclusive development methodology needs to be adopted. The village development proposal is prepared through the public participation method. Various levels of interventions can be suggested to regulate the development policies for the further development needs to be prepared and various experts and administrative officials should also be included.

In case of Vashi Village, the redevelopment approach will address the specific issues of village. The parameters for sustainable redevelopment of urban village needs to be identified through analysing the issues. Identification of parameters will be clearer through the public participation with the involvement of development authority, governing authority, Non-government organisation, and community representatives. Detail redevelopment plan of urban village to address these issues needs to be formulated. Construction process in the urban villages can be regulated through detailed development regulations and guideline formulation and implementation. As Vahal urban village is in transforming stage so the restoration

and precautionary approach will be more feasible to adopt. Scenarios for the densification with maximum development pressure can be generated with various urban design tools. Public spaces use should be specified in village development plan with the parallel mechanism for alternative parking spaces. Public spaces can be generated on behalf of the additional compensation by surrendering some areas from plot frontages. Identification of new public spaces, plot amalgamation, willing full land acquisition, integration of two or more plots, setback regulation needs to be adopted as urban design guideline.

## **Conclusion:**

This research demonstrate the morphological transformation study of urban village and its interface. Study of Urban villages from Navi Mumbai will help to understand exact conditions of the villages. Village development plan for each village within nodal development plan needs to be prepared instead of just excluding such areas from nodal development. Micro level approach with inclusion of village governing body, inhabitant's involvement in application of planning and regeneration approaches for such areas. Affordable housing for urban poor and affordable rental housing schemes with rent control mechanism is need of future sustainable development of villages. Accordingly the various scenarios for the further development can be generated and discussed with local inhabitant. Similarly most of the policies and guidelines are at documentation level. Implementation and monitoring mechanism needs to be formulated as pilot project for one or more villages, same model can be used for the other urban villages from Navi Mumbai city.

## **References**

1. Chatterjee, P. (2014) 'Urban Villages in Globalized India: Degenerative growth Processes in Navi Mumbai', *Inclusive:An International Journal of Kolkata Centre for Contemporary Studies(KCCS) Vol 1, Issue 5*.
2. City and Industrial Development Corporation of Maharashtra state (CIDCO 2021) [https://cidco.maharashtra.gov.in/navi\\_mumbai#developmentplans&qsc.tab=0](https://cidco.maharashtra.gov.in/navi_mumbai#developmentplans&qsc.tab=0)
3. Redevelopment of Urban villages(2015) [https://niua.org/cidco/redevelopment-of-urban-villages/\(NIUA\)](https://niua.org/cidco/redevelopment-of-urban-villages/(NIUA))
4. Tyagi, V.K. (1982) *Urban growth and Urban villages: A Case study of Delhi* (Kalyani Publishers).