Transformation of Smaller Cities as an Advent of Sprawling Development and Compacting Core: Change in Urban Life/Environment

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Abstract—*Cities can be referred as the quintessential paradigm of complexity. So far the hidden hand in the precinct that defines the city is the morphology, which is the outcome of the individual actions and collective response that builds together to build a whole. Cities has started to demonstrate basic themes such as global organization from local events, emerging morphology from mere spatial resolution, Individual decision making suggesting random change, Progress through evolution, variety , pressure and competition. The course of change from small town to core or neighborhood of the city is noticeable by the loss of distinctiveness, independence and amalgamation. It is the processes of amalgamation and integration until which one has to search to find evidence or clues of historical events or its structure.*

This paper is based on the illustration elaborated with an old historic core of two tier city called "Mahal" in Nagpur, Maharashtra, India. The area identified for demonstration is around 29acre which has been delineated as per the evolutionary stages mapped. Field survey, morphological study and physical appearance in terms of typology and its transformation over the years. The analysis which is an elaboration of the three themes namely pressure between the constantly changing systems, qualitative aspects of transformation and fundamental change based on emerging assets. The overview initiates with theories relevant to city transformation in terms of events, spatial pattern, defining the concept of quality of city. Further this analysis is supported by mapping the evolution/growth patterns in order to identify the old core and recent development taking place in an around the city. Secondly the quantitative analysis of the changing fabric, building use and typological which resulted in not only affected the historic core of the city but also the cultural identity of old core with loss of significant sites for the future generation. In conclusion the paper elaborates on some ideas/proposals to reduce pressure of transformation on the old city and maintain its significant identity for years to come.

1. INTRODUCTION

Aristotle once wrote that men come together in cities to live, but stay in them to live the good life. For the first time in human history, most of us live in urban settlements – from megacities of 10-20 million, of which there were 28 in 2014, to medium-sized cities of 1-5 million (417 in 2014), and smaller settlements (525 of between 500,000 and one million people in 2014). Eyeing future, the biggest progression will occur not in megacities but these small- and medium-sized cities. "Cities are now junctions in the flows of people, information, finance and freight….They're less and less places where people live and work" says Nigel Harris, a professor of development planning [7].

Cities or urban areas are constantly under pressure of change or transformation. This is due to several reasons such as Demographic changes, Rent gradient, growing affluence, economics of land assembly, Differences in government services and attitudes, transportation, Land use regulation, tax policy and topographic barriers [2]. Thus the direction of flow of transformation is multifaceted. This physical change in morphology is evident through evolutionary diagrammatic representation of any city. Where this expansion is observed as sprawl. The term "sprawl" was first used in 1937 by Earle Draper of the Tennessee Valley Authority in the context of a national conference of planners [10]. Sprawl was referred to as an unaesthetic and uneconomic settlement form. According to Wassmer (2002) the term "urban sprawl" was first used in the opening paragraph of an article by the sociologist William Whyte in Fortune magazine in 1958. Planners have since then used the term to categorize an urban development, generating undesired social effects [10]. For any sprawl to happen the origin/core always exist, which is precisely under pressure as the linkages begin from this part of the city as indicator or marker. There are numerous quantitative and qualitative aspects that reflect this dramatic change in the form of social impact, environmental impacts, land consumption, energy consumption, economic impacts, neighborhood quality and increased tax burden which directly impact the native residents of the core of the city thus becoming a victim of this phenomenon predominantly.

2. CASE BRIEF

Figure 1: Location of Mahal: Old historic Precinct of Nagpur. (Source: Google earth)

The illustration would be elaborated with a case of an old historic core called "Mahal" of a two tier city Nagpur, Maharashtra, India. The existence of the precinct is as old as the city which dates back around 18th century. Thus, this undoubtedly is the historic core of the city today. But there is remarkable change in the urban fabric of this precinct compared to other parts of the city. It could be characterized as having midrise and compact low rise structures with organically patterned narrow lanes which is evident from the density of the precinct which is 700-850pph[6].

2.1 Pressure of ceaselessly changing development traits

The changing fabric of the city due to urban development and unprecedented expansion leads pressure on existing infrastructure with extension / alterations in prevailing networks. Sprawl is directly identified with urban growth -as cities get bigger, they expand around their peripheries. The lessened space and increasing demand is leading to spread of cities towards the fringes of the settlements. This indeed led and termed as Urban Sprawl. But neither the term nor the phenomenon is new. It dates back to Roman times, first formally defined in the 1820s in England Sprawl is the spreading out of a city and its suburbs over more and more rural land at the periphery of an urban area. Critics of suburbia date from William Cobbett (1762-1835), author of Rural Rides. As early as the 1820s he declared, riding west from London, that "*all Middlesex is ugly*", *a sprawl of "showy, tea-garden-like houses*"; "*Need I speak to you of the wretched suburbs that sprawl all round our fairest and most ancient cities?*" William Morris, Art under Plutocracy, date unknown, between 1870 and 1896. Rapid increase of urban sprawl in many countries worldwide has become a major concern because of its detrimental effects on the environment. This result in making a settlement a town and a town a city, but the origin remains. The difference lies in the fact that it's called "old/historic core of the city" which has technically formed into a congested area in the land-use map today, which was initially a settlement in itself. As a land-use phenomenon, sprawl is typically characterized in the following way in American literatures:

- Excessive land consumption

- High densities centres rather than at peripheries

- Lack of choice in ways to travel

- Fragmented open space, Narrow gaps between development and scattered appearance

- Lack of choice in housing types and prices

- No separation of uses into distinct areas

- Repetitive one story development

- Commercial buildings with no parking and

- Lack of quality public spaces and compacted community centres.

2.2 Evolution of City

Nagpur became historically important from 18th century when one of the greatest Gond King named Bakht Buland Shah, made it the capital of his kingdom and he became the founder of the city. Its origin lies in eastern part of city, is now of historical importance and designated as traditional city center.

This portion of the city pattern suggests organic development [6] and now further growing in all directions, which shows the transformation pattern to be from organic to planned development. Topography of Nagpur is such that it is in west plateau formed in the western slopes of Satpura ranges. The area identified for demonstration is around 29 acres. Following are the maps showcasing the evolutionary stages of the city in different reigns and rules.
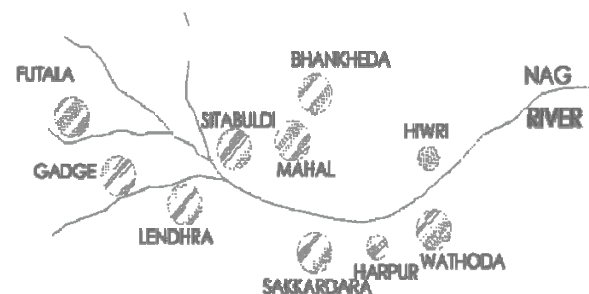

Figure 2: 1700 - Gond rule (Source: Author)
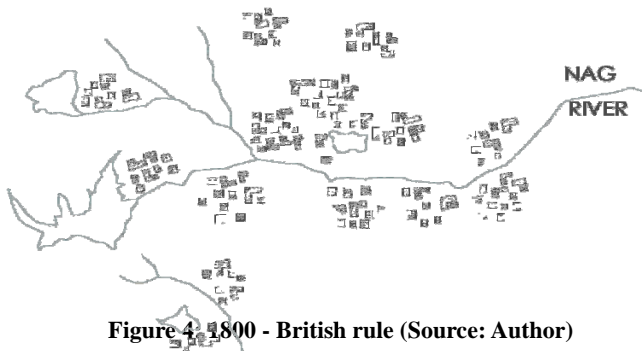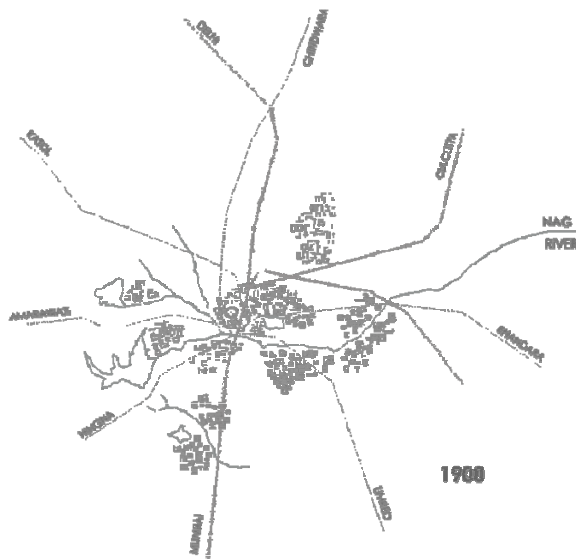

Figure 3: 1753 – Bhoslas Rule (Source: Author)

2.3 Events in radical changes in history of the city

To delve deeper, following are the major events that lead to morphological change of the city with respect to time line (Maharashtra state government Nagpur district gazetteer):

a) Establishment of a kingdom in Vidarbha by King Vidarbha.
b) Inclusion of Nagpur Region in the Dandak forest.
c) Nagpur, part of the Empire of Ashok.
d) Nagpur, mention of, in a 10th Century record of Rashtrakuta King Krishna III A.D. 940.
e) Nagpur under the Gonds of Devgad.
f) Nagpur City founded by Bakht Buland Shah.
g) Loot of Nagpur by Peshwa Madhav Rao in 1769.
h) Mount Stuart Elphinstone sent to Nagpur as the British Resident in 1803 and thus formulating west Nagpur.
i) Pendharis burn some wards of Nagpur City in 1811.
j) War between Mudhoji (Madhoji) II Bhonsale of Bhonsale dynasty also known as Appa Saheb and the English, round the Sita Buldi Fort which is still a marker as a center of city.
k) Nagpur Annexed by the British in 1853.
l) Lok Sabha established at Nagpur(Western Part) in 1866.
m) Congress Session at Nagpur in 1920.
n) Simon Commission visits Nagpur in 1929.
o) Nagpur forms part of the bilingual State of Bombay in 1956.
p) Nagpur forms part of the state of Maharashtra in 1960.

Urban evolution implies that change open-ended over the period of time passed. There is no set progress direction, change could be rapid or gradual and can take up any direction without unknowable optimal future city form [8]. In this case, political interventions impacted on the evolution of the place.Also the topography played a decisive role in making it the way it is now.

3. QUANTITATIVE EVIDENCES –DEMOGRAPHY, CONGESTION, WALKABILITY

Nagpur's as per 2011 census, Nagpur municipality had a population of 2.405,665 and the urban agglomeration had a population of 2,523,911. Looking at the population graph it is understood that accelerated population growth is also due to rapid urbanization thus leads to the promise of way towards growth engine of nations economy by the urban core demands more concentration on urban development. There is approximately $1/4^{th}$ increase in population number over a decade as per census data and the sprawl of the city is directly proportional. Wherein, the densification of core still prevails.
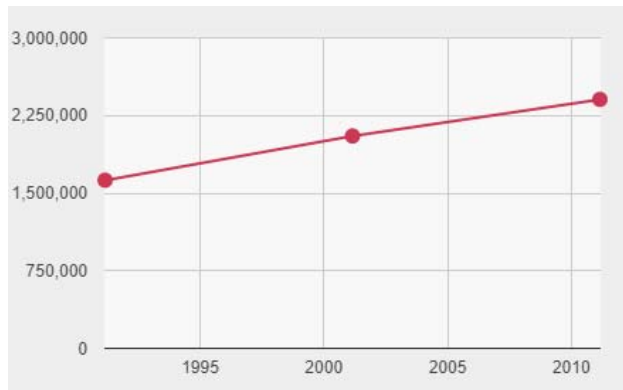

Figure 4: 1800 - British rule (Source: Author)

Figure 5: 1853 – British Rule (SOURCE: AUTHOR)

Figure 6: 1900 (Source: Author)

Figure 7: Nagpur city population graph.
(Source: Census data 2011)

Nagpur has more than 75% of its population residing within 5 km radius from identified CBD which is quite convincing (In urban areas, a distance of 5 km may be considered as short and can be covered by bicycle in about 15–20 min; and by bus or two-wheeler in about 10–15 min), as average travel distance in the city is approximately 4.6 km (Preparation of Master Plan/Perspective Plan for Transportation System of Nagpur City 2031). This in turn defines the congestion scenario of the city where the population density is 470 inhabitants per square kilometer. Thus, it is not dubious to say that with such large population and density and above mentioned fact that the case area being the center of gravity for the city pulls the major population for numerous reasons.

4. QUALITATIVE ASPECTS OF TRANSFORMATION

4.1 Changing typology of the place and Spatial pattern

As the figure 7, shows how the streets were a gathering social space, which assured social safety and security to residents. Also as it was their perceptual land ownership the hygiene is also taken care off. The building typology was more exclusive in nature. But in current scenario the as the typology involves more of inclusiveness, the street has become dead and prone to crime. The street network is still organic and the changing typology leads to several shady areas. Thus the solution cannot be a blanket rule but more contextual.

The spatial pattern which was more organic in nature due to changing built forms and emerging forms is leading to change in the character of place. The mixed use building which had owner's residence on first floor and commercial on ground floor had interdependency in terms of livelihood but now the complete typology is becoming commercial with formal setting. This disallows the precinct to function the way it used to and thus losing the essence of place. (Fig 7)
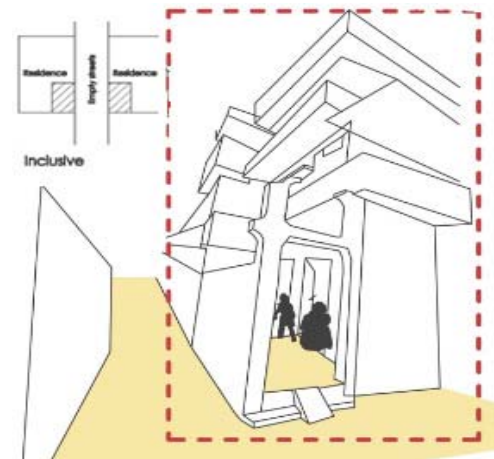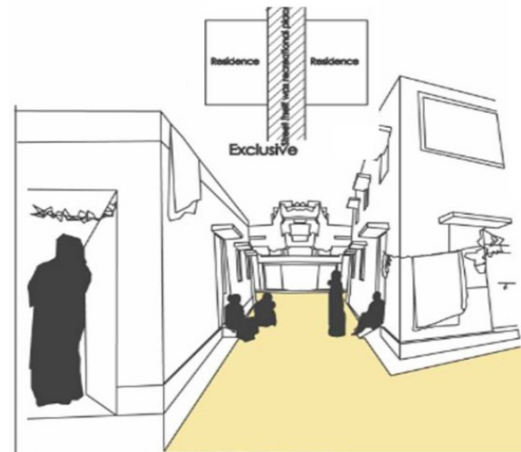

Figure 7: Changing Residential typology (Source: Author)

4.2. Changing identity

The urban traditional landscape in Indian cities reflects religiously buildings such as temples, mosques, centrally located market and residential precincts. Like most of the other towns development done by the Britisher's to administer marks a different type of morphological aspects. The figure below shows the variation in distinct parts of the city which is broadly divided into three categories: *Core city areas*, *planned layouts* and *unplanned areas*.

Identity of a place edifice the identity of residents, users or the people at large (Proshansky et al.,1995) and also its delineation parameters which are a part of urban design (Relph, 1996). The physical place or matter with human dimension plays a vital role in defining the identity of the place. Thus, places are inevitable when the self or group identity is in consideration (Anderson, 2005). Every place has a distinctive identity and character that defines these. To understand this character of place all the planners, designers should examine their process of evolution and existence.

To define the identity of place all the urban designers majorly focus on the physical characteristics for understanding of its appearance and imageability but falls short to consider sense of attachment as a parameter to identify the distinctiveness in places [4]. The urban pattern clearly reads that core areas are closely knit with narrow streets and un- plotted organic development. Also low rise and high density character makes the issues of infrastructural pressure more critical.

5. CONTRAST OF EMERGING TRENDS AND DEVELOPMENT POLICIES

When an area is delineated as congested area the corresponding bye laws and policies changes. There are several proposals presenting opportunities to local builders without paying any attention to the quality of life and the context of the place. As the blanket rule has been applied, the proposal emerging is also developed in way like any other place in the city lacking contextual consideration and conceptuality. For instance maximum FSI permitted is 1.5 for residential and may go up to 2 in case of mixed use and commercial building, on the other hand non- congested area has FSI one for residential building [3], which is more of builder driven policy than people driven. Thus, the ethnicity of the place is lost as this old historic traditional precinct is more or less becoming more congested as it is always in transition. Though, the permissible FSI is more the infrastructural pressure increases, and already densified area is becoming even denser and harried to vertical development. Therefore, it is assertive to take certain measures to be formulated to protect the threat of such unprecedented and non-considerate development in the core city precinct.

6. CONCLUSION

The Vermont Forum on Sprawl defines sprawl as - dispersed development outside of compact urban and village centers along highways and in rural countryside. In her report, Revisiting Sprawl: Lessons from the Past, Burgess (1998) defined sprawl as "...expanding physical development, at decreasing densities, in metropolitan regions, where the spatial growth exceeds population growth" (NC state, 2000). Thus, transformation of smaller cities with compacting urban core and sprawling development could largely be addressed in two major themes namely design strategy and design guidelines. This could be an attempt to retain the lifestyle and environment wherever required specifically in old core cities which is transforming drastically and affecting the whole urban precinct and native inhabitants.

6.1 Design Interventions

There are majorly three strategies that can allow the enhancement and maintain the environment and lifestyle of the old city core namely decongestion, Activating and animating spaces and insertion of contextual pauses.

6.1.1 Decongestion

The major criterion is to decongest the precinct which will help to resolve the issues regarding human comfort and dimension. Like several issues because of the traffic congestion and non-pedestrian friendly market precinct, unstructured city infrastructural needs and requirements. Pressurized commercial on the public place is another issue that destroys the quality of life.

6.1.2 Activating and Animating

To activate the street connecting the neighborhood spaces, through generation of pauses allowing interaction of city level to neighborhood level. The pressure areas with issue of street accessibility could be dealt through pedestrianizing and heavy vehicle restrictions on certain streets.

6.1.3 Contextual Pauses

To make the connection of the places more native to the place the contextual pauses becomes an important criterion. Reinforcing a place through everyday life of the neighborhood will allow the spaces to be vibrant and active at city, precinct and neighborhood level as a whole.

6.1.4 Policy Recommendations

Following are certain recommended guidelines could help in achieving all the three strategies holistically and reinforce public place in coherence to current urban scenario:

-   Recommendations in policy making should be formulated category wise/ congestion or activity wise hierarchy – Street level, Nodes, and block level
-   Specific regulations for vehicular and pedestrian streets.
-   Separate recommendations for redevelopment of plots in congested area for residential, historical, religious, institutional and commercial building should vary site with respect to consensus with local residents.

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