DYNAMICS OF URBAN SPRAWL IN THE PERI-URBAN AREA OF PUNE, INDIA

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ABSTRACT

As contemporary cities grow, a global concern is how to manage agricultural land and resources for urban development. With social, economic, and environmental implications, this topic is of particular concern in India, where cities are rapidly expanding due to the country's already massive population growth. Pune city is a major education and IT hub, and its growth has a significant impact on the peri-urban area. This paper attempts to address the gap by studying both physical and social implications of agricultural land loss in the peri-urban area of Pune. The study employs a qualitative research design, relying on an ethnographic approach, with a mix of GIS mapping, direct observation and semi-structured interviews with peri-urban residents, and meetings with key informants. The results show that although agricultural land loss due to urban growth has been gradual in the past, it's expected to rise in the future as the populations grow. The research also looks into investigating the possibility of reorienting urban growth trajectories in an agriculture cohesive direction. The author proposes that effective land use management strategies are essential for preserving prime agricultural land.

Key words: *Urbanisation, Urban sprawl, Farmland loss, Peri-urban, Integrated*

1. INTRODUCTION

The rural–urban interfaces around the world are undergoing tremendous alterations. In the developing world, urbanization has emerged as a major driver of agricultural transformations, with conflicting results on production landscapes and livelihoods. By 2030, urbanization is expected to result in a loss of 1.8 to 2.4 percent of global cropland, with 80 percent of this loss occurring in Asia and Africa (Patil, 2018). Urbanization causes cities to sprawl over the surrounding hinterland. 'Sprawl' refers to any type of development that has an impact on open space, agricultural land and ecologically sensitive habitats. Simply put, as the population increases in an area or a city expands to accommodate growth, this expansion is considered as 'sprawl' (Khare, 2016). Land-use changes are especially noticeable in areas adjacent to shifting urban boundaries, which are variously referred to as urban fringes, peri-urban interfaces, or rural-urban interfaces (Patil, 2018).

Within Asian countries, India, which has a predominantly agrarian economy, is experiencing rapid urbanization. Combined with significant economic and industrial development, this has driven major urban expansion in India over the last few decades. According to the Census 2011, India's urbanization has accelerated faster than expected. Since Independence, for the first time, the total increase in urban population has out-paced that of the rural population. There are currently 53 million or more cities, accounting for 43% of the urban population. This has far-reaching implications for urban infrastructure and other civic amenities. Residential and commercial development is rapidly displacing agriculture and other undeveloped lands around them. The issues like urban sprawl, loss of vegetation and a decline in environmental quality can be attributed to rising population density, which concentrates more people on less land even as total land devoted to urbanization expands (Dutta, 2012).

The United Nations estimates that between 2010 and 2050, India's urban population would grow by about 500 million people. Urban land expansion due to urban population increase has put a strain on many countries' agricultural resources. Agricultural land is under threat from intensification, abandonment and extensive degradation, in addition to conversion to urban uses. From 9.36 million hectares in 1951 to 22.97 million hectares in 2001, the area of land used for non-agricultural purposes has more than doubled (Pandey, 2014). According to data from the agriculture ministry, it's evident that India's agricultural land has been shrinking. The data shows that 20 states recorded a 790,000 hectare decline in cultivable land in the four years between 2007-08 and 2010-11. Since 1995-96, the average size of a land holding has declined from 1.41 to 1.15 hectares (Koul, 2017).

Furthermore, Bhartendu Pandey's (2014) research gathers compelling evidence about the impact of urbanization on agricultural loss at the national level. According to him, through spatio-temporal patterns, farmland loss is significant in a few states. He characterized the spatio-temporal variation between states after estimating agricultural land loss for each year. The loss of farmland was concentrated in seven states, with Maharashtra suffering the greatest losses. The district level analysis shows that agricultural land conversion to urban uses is focused in some districts and states. During the period 2001-2010, the author found numerous areas that encompassed relatively tiny but fast developing cities that consumed prime agricultural fields. This includes the districts of Nagpur, Pune and Thane (Maharashtra), Lucknow and Kanpur (Uttar Pradesh), Jaipur (Rajasthan), Ludhiana (Punjab) and others. These findings suggest that agricultural land transformation is focused primarily on states with strong economic growth. Indeed, states with a higher percentage of total GDP contributed by the service sector, or the combined service and manufacturing sectors experienced greater agricultural land loss due to urbanization.

One such city in Maharashtra is Pune, which has been experiencing rapid urbanization. The factors causing urban sprawl in Pune are high rates of urbanization, low prices of land outside city limits, unplanned land development, lower taxes, availability of uncultivated land, and so on. Pune has grown incrementally with the need for housing and other services being organically met by local developers and residents. There is an urgent need to regulate the urban sprawl that has characterized Pune's growth. Nevertheless, many researchers have attempted to answer the question of urbanization and farmland loss through either the geo-informatics approach or social survey approach. The author strives for a holistic approach that includes a technical method as well as public opinion. The present study aims to investigate the physical and social implications of farmland loss due to Pune city sprawl.

2. PUNE

Pune, the second major city in Maharashtra after Mumbai, has a population of around 5 million people and is located 163 kilometres or approximately 100 miles east of Mumbai. Pune is a thriving centre for higher education and also a manufacturing powerhouse. In recent decades, the city has witnessed a high rate of urbanization, coinciding with its emergence as a regional and national hub for information technology and biotechnology, while maintaining strong ties to agriculture. (Sami, 2013). In recent times farmers in Pune have been important players in the city's real estate development industry.

National economic liberalisation policies, which started in the early 1990s, have resulted in several multinational corporations seeking a foothold in the Indian market. They found Pune to be an appealing location due to its proximity to Mumbai and a ready pool of highly skilled labor. Demand for housing and office space skyrocketed, and the city government, which had planned for urban infrastructure and development in Pune, was unable to keep up. This led to the perfect opportunity for the private sector to fill the void (Sami, 2013) (see figure 1).

To comprehend the overall urbanisation of Pune, one must first understand the catalyst for growth. Looking at the overall growth of the city from the pre-independence period to recent times many influences led to this growth. In the year 1820, Pune was the capital city with the Peshwas and wadas as dominant characters. The city was divided into 18 peths, which is termed the core city. In 1924, a new bridge across the river in front of Shaniwar Wada accelerated development across the river. When the villages of Erandwane and Bhamburda were incorporated into the city limits in the same year, the move across the river became official and planned development took place (Mundhe, 2017).

Mundhe (2017) further explains that the catastrophic flood of July 12, 1961, had a critical impact on Pune's development. The Panshet and Khadakwasla dams broke and their waters flooded the city, destroying most of the older part of the city. The flood washed away up to 75% of the houses, bridges, and green areas near the river. Many people relocated from flood-affected areas to safer wards such as Kothrud, Erandavana, and Shivajinagar, contributing to the city's physical growth. The pattern of means of transportation, such as railways and highways, had a significant influence on post-independence industrial and residential growth. Pune began to attract foreign capital in 1990. The greatest growth occurred following the IT boom and the establishment of two major IT parks, Hinjewadi and Magarpatta.

Adding to this, recently the state government approved the proposal for the merger of 23 villages within the Pune municipal limits, which took place in 2017, incorporating 11 villages. Experts, however, have questioned the need for the merger, referring to the fact that the Pune Metropolitan Regional Development

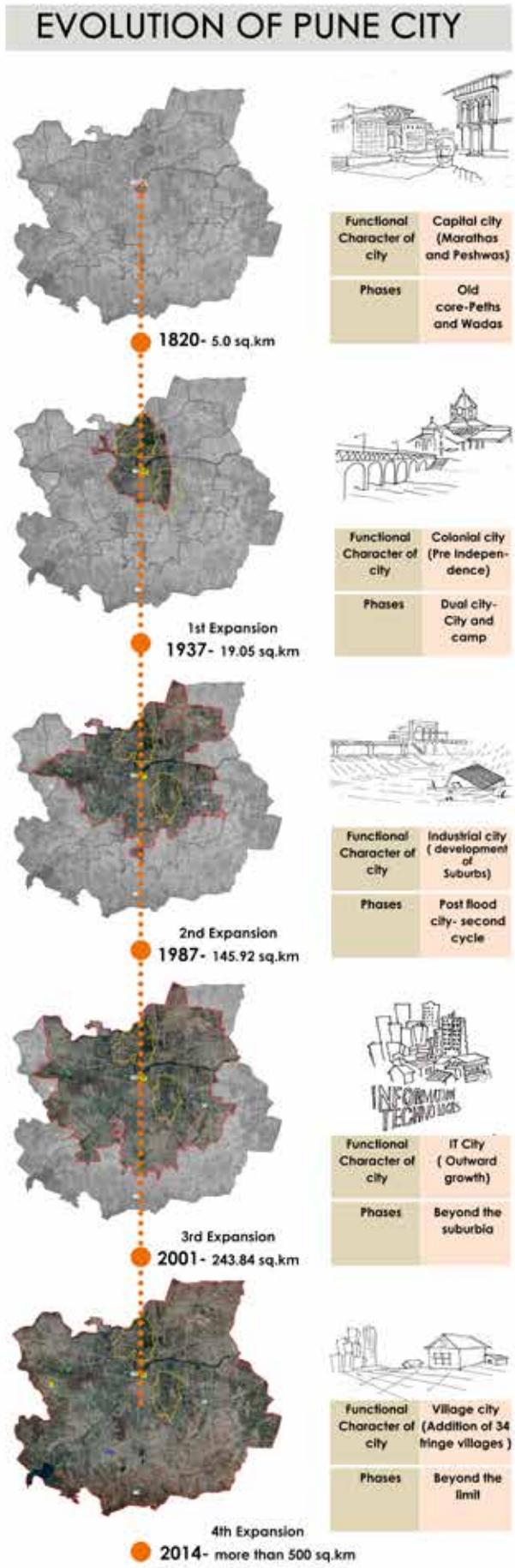

Figure 1: Evolution of Pune city *(Source: Author)*

Authority is managing the peripheral areas. The merger will only add toPune Municipal Corporation's (PMC) already-heavy burden of managing the current area and population with inadequate resources and manpower. In addition, PMC will need to find funds to develop essential amenities in the merged areas. These 23 villages are currently experiencing haphazard development. There are illegal structures everywhere, and farmlands are being encroached upon due to poor supervision and stringent regulations (TOI, 18 Dec. 2020).

The two main characteristics of a city's urbanization are urban sprawl and population growth. The population of Pune city as per provisional figures of Census India, 2011 is more than 3 million. The city's population has increased more than sixfold in the last 60 years, from 0.48 million in 1951 to 3.11 million in 2011; this is attributed to advanced economic activities. (Pune Municipal Corporation, 2012) Like many other cities, Pune is experiencing considerable growth due to migration as well as natural increases. The decade trend of population growth of Pune Municipal Corporation from 1991 to 2021 is shown in Table 1.

Pune's population in 1991 was 15.66 lakhs, and 38 villages were added to the old PMC area in 1997. In 2001, the population was 25.38 lakhs. The key contributors to population growth were natural growth, moderate migration and territorial expansion. The urban core population is likely to decline in the future, while the suburban and urban fringe populations are expected to grow faster (Pune Municipal Corporation, 2013). The graph of Pune city's demographic growth trend shows a steep decline from 50.08 percent decadal growth rate in 1991-2001 to 22.73 percent decadal growth rate in 2001-11, which may be attributed to the development of Pimpri-Chinchwad Municipal Corporation (PCMC) as an industrial centre. Pimpri-Chinchwad could be considered an emerging counter magnet to Pune city. (Pune Municipal Corporation, 2012). Through urban growth studies, it's easy to anticipate and forecast future changes or trends in development and understand the impacts of future development. This study includes demographic growth, urban sprawl, economic hubs, infrastructure, industries and proximity to resources and basic amenities (see figure 2).

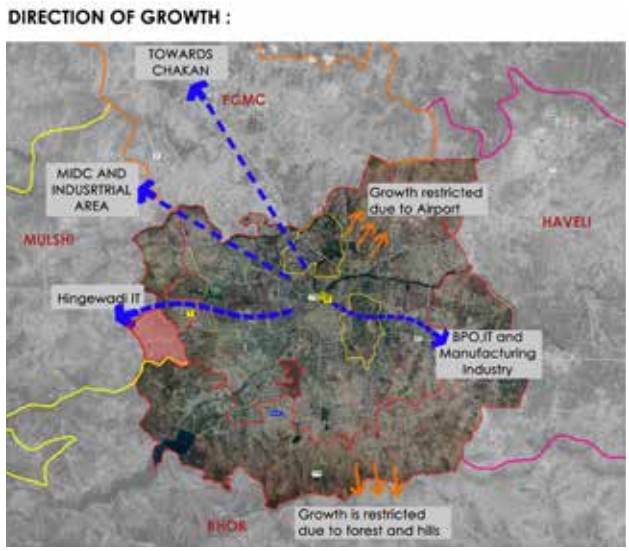

Figure 2: Growth Direction of Pune city
(Source: Pune Municipal Corporation, 2012)

Primary causes of urbanization are population eruption, migration from other places, industries, economy and proximity to resources and basic amenities. These characteristics gave different directions of growth such as the IT park and industries that have led to major growth toward the area of Hinjewadi, MIDC, Chakan and Magarpatta. The growth is restricted in the northeast owing to the airport causing height restriction and in the south due to ecological factors like forest and hilly terrain. Based on evidence an intense urban growth being visible along the northwest corridor in recent decades. Hence, Bhugaon a small village, located on a similar growth corridor is analyzed to understand the prevailing situation of farmland loss.

3. STUDY AREA

Bhugaon lies in the Mulshi taluka of the Pune district of Maharshtra. It is located west of Pune, 3 kilometres from Kothrud. The rapid growth of the city's IT industry has resulted in increased demand for homes across all parts of Pune. The majority of the IT hubs are located in areas such as Hinjewadi, Hadapsar, Aundh, Kharadi and Phursungi, and as an outcome of this growth, the demand for home seekers has rapidly increased. Because of the large IT sector in the Hinjewadi area, the outskirts have changed their appearance and adopted the growth

Table 1: **Population of Pune city**
(Source: (Pune Municipal Corporation, 2012))

Year	Population	Area under city (sq.km)	Decadal growth rate (%)
1950	488419	125.00	
1960	606777	125.00	24.23%
1970	856105	138.05	41.09%
1980	1203363	145.92	40.56%
1990	1691430	146.00	40.56%
2000	2538473	243.84	50.08%
2010	3,124,458	243.84	22.73%
2021*	43,70,721	Approx. 331	39.8%

Figure 3a: Plan and sections of study area: Bhugaon, Pune
(Source: Author on map base from Google Earth Pro 7.3.4 -version)

culture. Nearby areas such as Wakad, Bavdhan, Pashan, Sus, and Bhugaon have created a demand for real estate home seekers. Bhugaon is currently one of Pune's most appealing investment hotspots. Over the last two years, contemporary residential structures have mushroomed in the area due to its proximity to major economic hubs and city. Many high-end developers have entered the Bhugaon and introduced new gated community projects (Squareyards.com, 2017).

The village is located on the fringes of Pune within commuting distance from the heart of Pune city. A base map showing the boundary demarcated by the Bhugaon gram panchayat and other existing components (see figure 3). The images represent the research area, which includes a lake, a river, an old gaothan area, a built-up zone, farmlands, a forest area and road networks. The section of the study zone showcases the change in the skyline with high-rise buildings mushrooming in between the farmlands. Therefore, Bhugaon as a study area would be beneficial in analysing agro-ecological transformations because it is a perfect combination of lush agricultural land and new development. (see figure 4).

Figure 3b: Plan and sections of study area: Bhugaon, Pune
(Source: Author on map base from Google Earth Pro 7.3.4 -version)

Figure 4: Study area: Bhugaon, Pune
(Source: Author)

4. METHODOLOGY

The study employs a qualitative research design, relying on an ethnographic approach, with a mix of GIS mapping, direct observation and semi-structured interviews with peri-urban residents, and meetings with key informants. The primary goal of the research is to investigate the implication of urban sprawl on farmlands and develop a model for the sustainable growth of the city. Hence, the study discusses the relationship between the physical environment and the social aspect of the individuals involved. Through the physical environment, the author implies studying the ecology and built-form of Bhugaon. Under ecology, the author aims to study different land use changes, and especially agriculture cover change is mapped for around 10-year intervals. Bhugaon is witnessing major growth in the housing sector. Hence, the built-form aspect looks into the morphological transformation in the form of building use and heights. Lastly, the social aspect deals with interviews with different stakeholders involved in the process of farmland loss.

The first half of the study is based on remotely sensed data (aerial photographs and satellite images) combined with extensive field checks and surveys. The practice of GIS and remote sensing for urban studies has been valued greatly in various studies, as it is very useful for collecting data on suburban attributes with their spatial and temporal extents (Dutta, 2012). As the urban areas are dynamic and complex in nature, traditional data collection methods are incapable of coping with the numerous changes that occur over very short periods. Both aerial photography and satellite imagery are appropriate for evaluating rapid growth in urbanization. Aerial photographs can be expensive and difficult to obtain at times, making timely updates and monitoring difficult. Thus, satellite imagery is often the better option (Fazal, 2000). Satellite pictures from 2000, 2010 and 2020 are used for evaluating urban growth in terms of land-use changes.

Adding to this, the key informants were interviewed to gauge information on crucial aspects of the village profile and transition in the peri-urban area. This group of people included farmers, developers, local residents and experts. Farmers, who have played a crucial role in the loss of agricultural land were interviewed to understand the ground reality. The question included the reasons behind the selling of land, utilization of money and whether the step of selling their land more profitable. The next important stakeholder are the developers because they are the main drivers of the urbanization process. They were interviewed concerning the land value in and nearby Bhugaon, selection of the site in the peri-urban area, the land acquisition procedure, the base for compensation and the process of sanctioning and implementation of the project.

Peri-urban residents are the migrated population to the area in search of new residents. It is also important to note that common people may have different perspectives on farmland loss than farmers, politicians or developers. They would be an important source of information like people's awareness about farmland loss, farm produce, the significance of farming and social initiatives. Finally, the experts like town planners, urban planners and some activists were interviewed to understand their perspectives on the urban sprawl. Also, interventions and policies to plan systematic growth of the city were examined. This method is an effective tool that can be applied not only to monitor a region's current growth and development but also to build and apply models to meet a sustainable development objective in the future.

5. RESULTS AND DISCUSSION

5.1. Ecological Study

Agriculture is one of the contributors to the conservation and growth of ecology. But this arable land is decreasing day by day as unplanned development is encroaching on areas of Bhugaon. The rapid growth of population, unplanned urbanization, industrialization and agricultural modernization in Bhugaon has created pressure on the farm land and as well as environment. The area has been experiencing hasty alterations in land use patterns, especially the agricultural land decreasing rapidly and various environmental problems occurred (Isalm, 2013). The change in land cover and land use for the period of two decades was analysed by using satellite images at around 10-year intervals in 2000, 2010 and 2020 from the internet. After scanning the topographical map of the study region, it was georeferenced using QGIS 2.14.9 software. Addition to the software mapping was combined with extensive field checks and surveys (See figure 5).

It is evident through the mapping that Bhugaon has undergone a significant change within a span of two decades. Assets like good connectivity, proximity to the economic centres along with ample land available to fulfilling the housing demand have led to rapid urbanisation. This has triggered a major depletion in

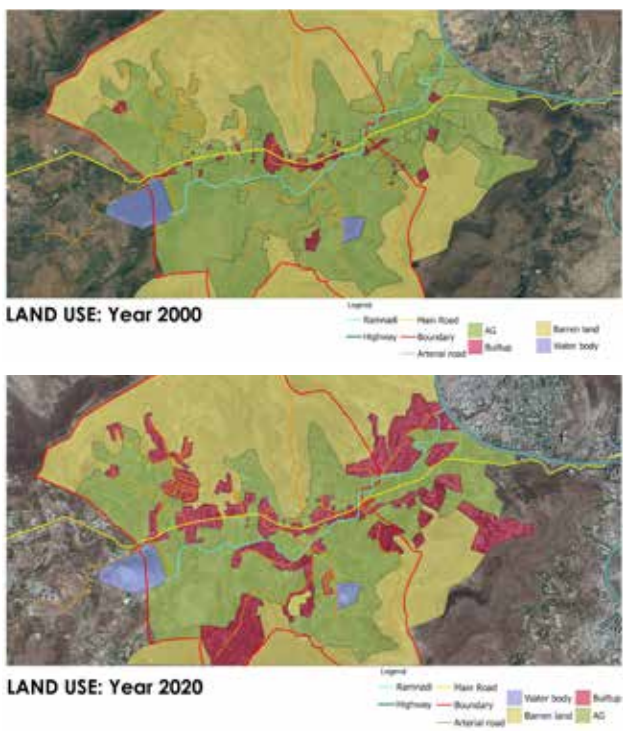

Figure 5: Land use change of Bhugaon for year 2002 and 2018
(Source: Adapted by Author through QGIS 2.14.9- version on map base from Google Earth Pro 7.3.4 -version)

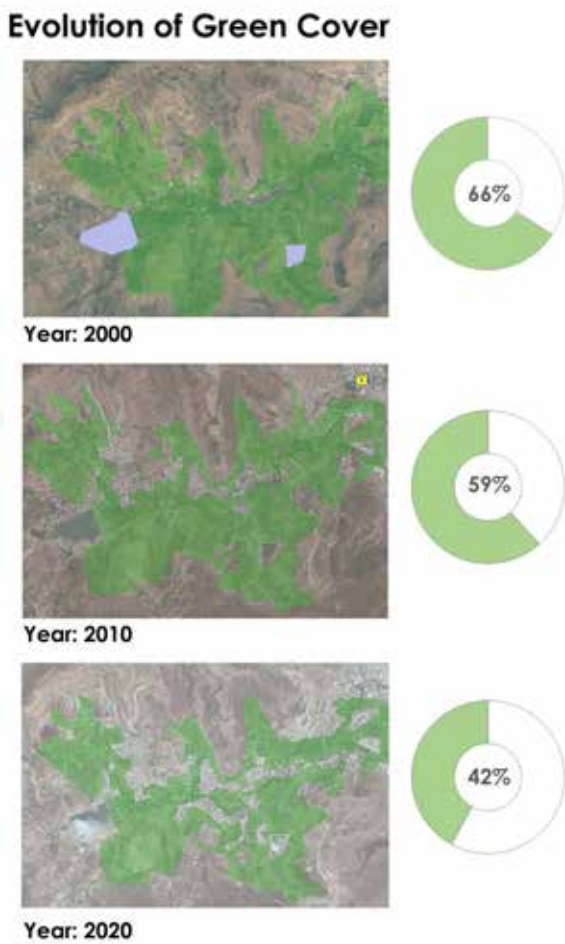

Figure 6: Agriculture land use transformation *(Source: Adapted by Author on map base from base from Google Earth Pro 7.3.4 -version)*

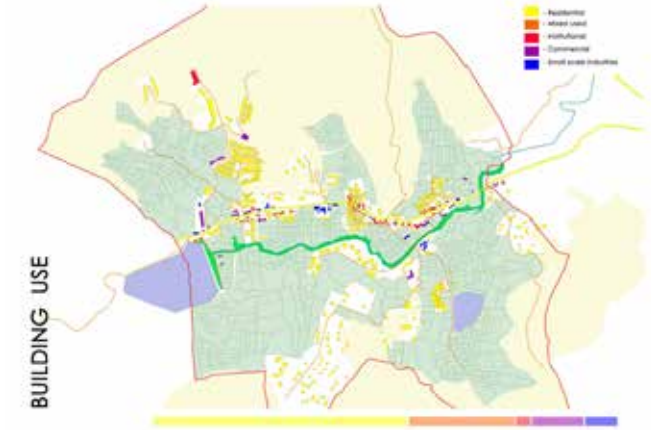

Figure 7: Building use plan for Bhugaon *(Source: Survey by Author on map base from base from Google Earth Pro 7.3.4 -version)*

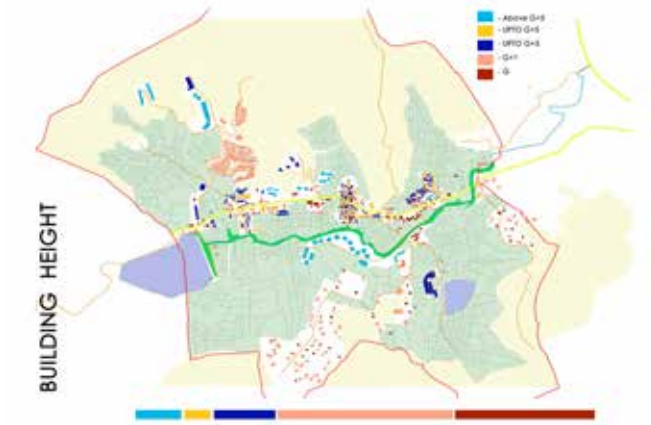

Figure 8: Building height plan for Bhugaon *(Source: Survey by Author on map base from base from Google Earth Pro 7.3.4 -version)*

agricultural land in Bhugaon. The land use between the years 2002 and 2018 have been compared (see figure 5). The changes can be mainly observed in farmland and built-up area land uses. Over a period of twenty years, there has been a steady but profound increase in the built component (See figure 6).

The main focus of the study is agricultural land loss. Figure 6 shows the agricultural land cover for over 10-year intervals from 2000 to 2020. Statistics show that in 2000, agricultural land counts for 66% of the total boundary. In 2010, a slight loss in agriculture cover is noticed, which occupy up to 59% of the study area. In the recent phase, 42% of farmland is available within the study area. It has been observed that agricultural land loss is a gradual process rather than a sudden one, which may pose a significant problem in the future. It is evident that a major agriculture loss in the recent time is due to real estate increase in the area. A lot of agriculture and fallow lands are predominantly now under high-rise housing, commercial uses, small scale industries and roads.

5.2. Morphology Study

According to the previous study, it is seen that development has caught up with arable lands on the fringes of Bhugaon village and its environs. Human activities and development are encroaching vast swathes of agricultural land on the fringes of cities at alarming rates. Many arable lands have been converted into built-up areas, with significant value added to housing production to meet the immediate housing demand (see Figure 7).

Farmlands and farmers on the rural outskirts continue to lose their farmlands to various development projects with less compensation or concerns for their livelihoods or food production. As a result of the government's failure to respond to the unplanned city growth, peri-urban farmers are left vulnerable to the adverse shock of urbanisation. The morphology of Bhugaon is rationalise through concrete evidence. In the peri-urban zone, agricultural, residential and other land uses are intermixed. These fragmented farmlands are under major pressure from real estate development. According to the village panchayat, the amenities planned are in reference to the original village population. However, every individual builder nowadays tends to get the basic amenities to their plots without any planning. The basic civic infrastructure like solid waste management, sewage disposal and water and electricity supply is not in conjunction with the existing population. This sudden burden on the infrastructure has to lead further mishaps like disposal of waste on roadsides, waterlogging in monsoons and shortage in the water and electricity supply. Hence the current study would enable in making of strategic decisions regarding infrastructure and civic amenities in line with the population growth (See figure 8).

The change in the skyline in peri-urban regions is visible through analysing the spatio-temporal patterns of three-dimensional urban forms, especially building height. The building height mapping was conducted by recording videos through the study area and then marking the heights on satellite images. Correlating the building use to building heights, one can understand that the new residential development is not a small-scale farmhouse anymore, but multi-storeyed residential buildings. It is evident from the research that the proportion of high-rise buildings is lesser compared to ground and G+1 structures, as shown in figure 8. But these lands under high-rise buildings display higher density leading to transformation which is neither completely rural nor urban. These transitional spaces are undergoing gradual but continuous changes regarding social systems, population characteristics and land use.

5.3. Social study

In the course of the loss of farmland, different actors like farmers, developers/ builders, local residents and experts/ architects are involved. In-depth interviews and meetings were conducted to better understand their viewpoint. Most of these were scheduled, while some were chance encounters. Following are the findings from the interviews with different stalk holders:

Farmers: When asked about their views on farming as a profession, they stated that it is passed down through families, but the younger generation prefers a more profitable, stable and respectable career path. They claim that the cause is the decline in agricultural output over time, the degradation of the water supply and the significant impact of climate change. In further discussions, it was noticed that the productivity of the farmland is not taken into account when determining compensation. Agriculture land is a lifelong earnings source for farmers- whereas the compensation received for the land provides no long-term financial benefit to the farmers. As the farmers are not good at finance management the money received is utilized for buying homes, cars, or other liabilities. Hence to sustain themselves, most farmers are working in small-scale industries or construction sites at low wages. Government initiatives do not help them much as they don't work in the sync with growing economy and lifestyle. When questioned about the reason for selling the land, the answer was simply 'the need of the time'. The root problem encountered by the local farmers remains that they are not given the recognition they deserve.

Developers/ Builders: According to developers, they don't see any problem in construction in the peri-urban region, whereas according to them they boost the economy by providing employment and houses to stay. For builders, a vast tract of agricultural lands is available for the development of gated communities. The home-seekers are also showing major interest in such projects because of their proximity to the city and affordability. But the developers tend to get the amenities and services onto their land parcel which leads to the haphazard and directionless development of the city. When asked about land prices, developers typically base the value of the land on the market price. But in the provision of farmland, the productivity of land and future yield should be considered.

Peri-urban residents: The growing urbanization has led to an increase in home-seekers investing in Bhuagon. These migrant residents living in the new residential societies are interviewed to understand their ideologies about farmlands. These peri-urban residents understand the importance of farmers, but they do not work in an approach that helps farmers. They tend to exploit farmers by buying imported products over local produce. Dumping the waste on the boundaries of the farmlands and contaminating water bodies add to the problems. If these residents who are more literate and economically stable, planned on supporting farmers by holding farmer's markets, agro-tourism and social drives for clean-ups, these would be of great support.

Experts/ Architects: According to the experts, construction in the outskirts has its repercussion since the resources, water and energy that were previously available to the locals will be now be diverted for the construction work resulting in water shortage and power failure. Construction work not only impacts the site but also damages 30-40% of the surroundings due to the building of roads, power stations, sewage plants and services. The answer to all problems is a sustainable development of the site.

Taking into account the above, the urban planners from Pune also held that the loss of farmland would create heat islands. Farmlands mitigate carbon footprints and help in reducing pollution. Increasing urbanisation will create the situation of a decreasing percentage of food producers and food consumers. The large-scale import is the consequence of the increase in food demand. Some urban planners also suggested that agricultural land use should be identified as separate land use rather than demarcated as a green zone. And a bottom-up approach should be adopted while formulating the policies for protecting agricultural land. This methodology has proven to offer a framework that may help policymakers, urban and regional planners, and researchers working in developing countries to understand the dynamics of urban growth in the peri-urban area.

6. Conclusions: Towards Alternative Approaches

With physical and social implications of farmland loss, it is imperative to examine urbanization in fast-growing agglomerations like Pune holistically. The findings of this research are based on the synthesis of remotely sensed data with the interviews of key informants. In the research area, there is now a noticeable increase in unplanned residential and commercial buildings. The pace at which the number of developers are investing in the area is faster than the way local authority is planning the expansion of utilities, services and recreational facilities. There are no specific rules and regulations that have been laid on the development of urban form. This need-based expansion is the cause of haphazard expansion.

Figure 9: Strategies for integrated urban development **(a)** Efficient connectivity **(b)** Balanced land uses **(c)** New activities
(Source: Author)

There has also been a shift in perception of framers for agricultural land, such that it has gone from being a source of livelihood to merely a commodity for income, which has led to a significant transformation. The amount of fallow land has increased as landowners' anticipation of increased land values as urban development expands. Subsequently, negative externalities in terms of traffic congestion, parking, pollution, water supply, sanitation problems, solid waste disposal and lack of open space will emerge in time. The river is now encroached upon and is used for the disposal of garbage and waste. In a broader view, they have to acknowledge the fact that this would lead to food security issues in the future. This process will continue in the absence of proper intervention and strict planning measures, and it will have an adverse effect on the quality of life of urban and peri-urban dwellers (see figure 9).

Finally, although urban expansion cannot be ceased, with proper management and planning it can be restricted and directed in a desirable and sustainable way, protecting fertile agricultural lands. However, to achieve this the author recommends three key strategies which include efficient connectivity, balanced land uses, and new activities, as seen in figure:

i) Firstly, having efficient connectivity would lead to better access to each land parcel. This would result in proper service distribution and, eventually support no haphazard development.
ii) Balanced land use signifies that rather than preserving a single belt of agricultural land they may decide based on the productivity which land should be preserved or utilized for other purposes. Land productivity mapping would help the planning authority to achieve the optimal balance development.
iii) Finally to boost the economy by preserving the agricultural land the authority may come up with efficient schemes for farmers, developers, and migrated residents. Giving incentives to developers for perceiving urban agriculture practices like hydroponic farming, vertical or terrace farming, or small kitchen gardens within plot limit.

Other proposals may include community farming, farmers markets, agro-tourism, farm-to-plate restaurants, and small-scale industries. Also promoting agriculture training and education would encourage the new generation to consider farming as a career. An inclusive model that integrates employment opportunities with a variety of residential services, promoting a less reliant and more sustainable lifestyle.

Moreover, they need to have an integrated approach where the farmlands are a distinguishing feature of the city's growth rather than a barrier. This may help in changing the trend of development. Such development would not just create change physically but also integrate the people socially. Land use planners and policymakers can use this model of urban growth to anticipate and plan for future spatial expansion to ensure growth along the lines of city development plans and enabling infrastructure. It is also necessary to strictly enforce agricultural land conversion laws, which may encourage farmers to continue farming activities. Hence, the author advocates not only policy-level intervention but also an on-the-ground physical intervention that aims to rethink urban sprawl rather than cease it. In a country where farmland is being lost at an alarming rate in the name of development, smart and inclusive planning is critical for future growth.

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