ISSN 0974-763X

SOUTH ASIAN JOURNAL OF MANAGEMENT RESEARCH (SAJMR)

Volume 14, No. 2 March, 2024

SPECIAL ISSUE

Chhatrapati Shahu Institute of Business Education & Research (CSIBER)
(An Autonomous Institute)
University Road, Kolhapur-416004, Maharashtra State, India.
E-mail : editorsajmr@siberindia.edu.in
Website : www.siberindia.edu.in

SOUTH ASIAN JOURNAL OF MANGEMENT RESEARCH (SAJMR)

ISSN 0974-763X

(An International Peer Reviewed Research Journal)

Published by

CSIBER Press, Central Library Building

Chhatrapati Shahu Institute of Business Education & Research (CSIBER)

University Road, Kolhapur - 416 004, Maharashtra, India

Phone : 0231-2535706, 2535707. Fax : 0231-2535708

www.siberindia.edu.in, E-mail : editorsajmr@siberindia.edu.in

Chhatrapati Shahu Institute of Business Education and Research (CSIBER)

South Asian Journal of Management Research (SAJMR)

Volume 14, No. 2, March 2024

Editor: Dr. Pooja M. Patil

Publisher

CSIBER Press

Central Library Building

Chhatrapati Shahu Institute of
Business Education & Research (CSIBER)
University Road, Kolhapur – 416004, Maharashtra, India.
Phone: 91-231-2535706/07, Fax: 91-231-2535708,
Website: www.siberindia.edu.in
Email: csiberpress@siberindia.edu.in
Editor Email: editorsajmr@siberindia.edu.in

Address:
CSIBER Press
Central Library Building
Chhatrapati Shahu Institute of Business Education and Research (CSIBER),
University Road Kolhapur, Maharashtra - 416004, India.

ISSN 0974-763X

Price: INR 1,200/-

Editor:Dr. Pooja M. Patil

Publisher

CSIBER Press

Central Library Building

Chhatrapati Shahu Institute of
Business Education & Research (CSIBER)
University Road, Kolhapur – 416004, Maharashtra, India.
Phone: 91-231-2535706/07, Fax: 91-231-2535708,
Website: www.siberindia.edu.in
Email: csiberpress@siberindia.edu.in
Editor Email: editorsajmr@siberindia.edu.in

Editorial Note

South Asian Journal of Management Research (SAJMR), is a scholarly journal that publishes scientific research on the theory and practice of management. All management, computer science, environmental science related issues relating to strategy, entrepreneurship, innovation, technology, and organizations are covered by the journal, along with all business-related functional areas like accounting, finance, information systems, marketing, and operations. The research presented in these articles contributes to our understanding of critical issues and offers valuable insights for policymakers, practitioners, and researchers. Authors are invited to publish novel, original, empirical, and high quality research work pertaining to the recent developments & practices in all areas and disciplined.

Cross-functional, multidisciplinary research that reflects the diversity of the management science professions is also encouraged, the articles are generally based on the core disciplines of computer science, economics, environmental science, mathematics, psychology, sociology, and statistics. The journal's focus includes managerial issues in a variety of organizational contexts, including for profit and nonprofit businesses, organizations from the public and private sectors, and formal and informal networks of people. Theoretical, experimental (in the field or the lab), and empirical contributions are all welcome.The journal will continue to disseminate knowledge and publish high-quality research so that we may all benefit from it.

Dr. Pooja M. Patil
Editor

South Asian Journal of Management Research
(SAJMR)

Volume 14, No. 2 **March, 2024**

C O N T E N T S

Morphological Transformation and Emerging Mixed Use Built Forms in Town, Ethiopia, the Case of Gombora Corridor.

Daniel Lirebo Sokido
College of Urban Development and Engineering,
Ethiopian Civil Service University, Addis Ababa, Ethiopia

Abstract

Towns and cities are constantly changing and rearranging their diverse components, whether naturally formed or deliberately designed in response to socio-economic and political conditions. Hosanna, a large town in the Central Ethiopia Region, is one of the oldest secondary towns. Over time, Hosanna has grown to be more than four times the size it was in the 1990s. Throughout history, different parts of Hosanna have undergone morphological and functional transformations to accommodate changing economic needs, socio-cultural values, and spatial conditions. The planned residential areas have been particularly affected by this process. This transformation has also impacted the physical attributes of the urban form, resulting in incremental changes in plot configuration and built forms with increased density and intensity. The Gombora residential area as case study area has experienced significant transformation, especially along the corridor. The restructuring and intensification of land use along this road have created complex dynamics in the study area. Therefore, the objective of this study is to analyze the characteristics and processes of morphological transformation and the emerging residential built forms in the Gombora corridor. To achieve this objective, a case study strategy was employed, as it is best suited for descriptive and explanatory analysis. Out of the 291 plots along the corridor, 58 plots were selected for analysis of the morphological transformation, with 25% of these plots randomly selected for in-depth case studies. In general, the study used quantitative and qualitative methods to examine the extent and depth of the challenges. The findings indicate that the fundamental physical elements of urban morphology in the Gombora corridor are continuously affected by this transformation process. Furthermore, this transformation has led to the concentration of various functional activities along this route, enhancing the importance of this area and transforming the economic base. The unique pattern of morphological transformation observed along the Gombora corridor is evidenced by the emergence of a commercial sub-center in this area. Finally, the study provides recommendations for future urban planning.

Keywords: urban morphology, Commercial-area, transformation, Built-form. Hossana, Gombora corridor

Introduction

Background

Cities and towns are constantly evolving, as they consist of various local activities at different scales. This leads to changes and growth. The growth of towns can be seen as the result of two interconnected processes: formal planning and urban design, and independent developer actions. The morphology of a town is determined by allowing variation and competition from numerous influences. While cities typically have a formal or informal pattern of initial settlement, change is always inevitable. In many developing countries, rapid population growth and economic change, including globalization, have accelerated the process of urbanization. Africa, in particular, has a low level of urbanization compared to developed continents like Europe and North America. However, it is projected that by 2030, about half of the African population will be concentrated in urban areas. Cities offer a wide range of advantages, such as work opportunities, educational facilities, better health services, improved living conditions, and increased financial capability, which have always attracted people to urban areas.

Ethiopia, with a population of over 120 million, is one of the least urbanized countries in the world. Currently, only 25% of the population is urban. However, it is expected that Ethiopia's urban population will triple over

the next two decades, with a rapid annual growth rate of more than 5%. As a result, the urban population is predicted to increase by an average of 3.98% over the next forty years, and the percentage of people living in urban areas is expected to rise to 42.1% by 2050. In recent years, Hossana has experienced a higher rate of growth due to rural-to-urban migration and other factors. In a decade, the population of Hossana doubled, going from 69,959 people in 2006 to 133,764 in 2015. The population density of Hossana town in 2014/15 was estimated to be 3,305.3 inhabitants per square kilometer, higher than the national capital with a population density of 2,655 inhabitants per square kilometer.

Furthermore, the town of Hosanna has undergone significant structural changes and rapid development over the past 15 years. It is in a constant state of flux, continuously unfolding and differentiating. This is influenced by significant demographic changes, as well as economic, social, and technological modernization, resulting in a rapid and dramatic transformation of the urban fabric. Therefore, planning must be an ongoing process to ensure the continuity of the urban fabric under changing conditions. Additionally, conducting research and having a comprehensive understanding of towns as dynamic entities is crucial for effective planning proposals.

Problem Statement

These days, Africa is experiencing rapid urbanization. In many cases, informal settlements are the main drivers of urbanization in cities (ARUP, 2016). National-level assessments indicate that Ethiopia's urban population will significantly increase between 2010 and 2040. Preliminary projections at the city level show that many of Ethiopia's large urban areas will multiply dramatically by 2040 (UN-Habitat, 2010). Urban areas have undergone significant changes in size, density, demography, and economy in recent decades. With rapid urbanization and globalization of trade and employment, the impact of these changes is even more evident in many rapidly developing Ethiopian cities and towns. Urbanization in and around Hosanna has been steadily increasing in recent years due to rural-urban migration (Solomon, 2008).

Hosanna, the capital city of Central Ethiopia Regional State and Hadiya zone, has a complex morphological pattern that is rapidly changing due to various interconnected forces of urbanization. Over the past fifteen years, the city has seen intensive restructuring of land use and land value patterns, particularly in planned residential areas. Due to unplanned changes in land use, these residential areas are becoming disorganized. The most significant changes are the growth of retail activities and other commercial developments. Retail stores have spontaneously emerged within residential areas to meet the demands of the growing population. Residential areas are gradually being transformed into commercial zones with different spatial characteristics, without proper planning. Densification is also occurring through the subdivision of large residential plots. This automated restructuring for high-density residential areas reflects the housing preferences of residents. Another unexpected phenomenon in these residential areas is the transformation of large plots into smaller subdivisions, resulting in the loss of the original design characteristics. This gradual shift from residential to commercial activities puts excessive strain on infrastructure, environmental resources, and social aspects, ultimately degrading the living conditions in the Gombora residential area. Therefore, there is a significant gap in establishing appropriate and coherent urban planning strategies, and the forces of urban change have contributed to the uncontrolled development of these areas. Most buildings in these areas are observed to violate building design regulations, leading to the transformation of their original features. The spontaneous growth of retail and other commercial activities disrupts the peaceful residential environment.

Planned residential areas are typically designed to provide a healthy atmosphere with essential service facilities, community amenities, and infrastructure. Supporting facilities, such as an elementary school, grocery stores, pharmacies, and medical clinics, are usually provided in appropriate numbers based on the population of the neighborhood. Unfortunately, in this residential area of Hosanna town, there are no supporting facilities. Consequently, small-scale commercial ventures, such as grocery stores, laundries, warehouse, stationery shops, and pharmacies, have emerged without proper planning. As landowners expanded their commercial activities in violation of existing rules and regulations, these activities were later legalized by paying conversion fees to the town municipality and the town development authority. These changes in land use were approved without conducting a thorough **study of the site**, utility schemes, and the needs of the residents.

Aim of the Research

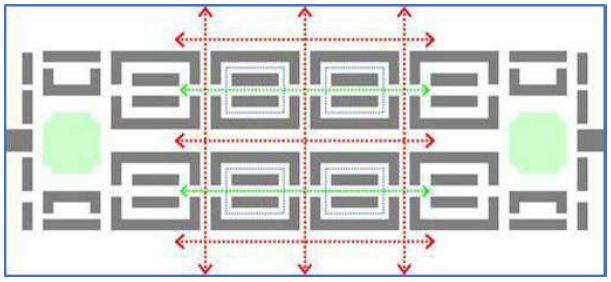
With the background of study and problem statement mentioned above, the aim of this research is to analyze the characteristics and process of morphological transformation, as well as its impact on residential built forms in the study area, from the perspective of urban design and planning. Therefore, it is important to investigate the impact of morphological transformation and its emerging commercial built forms on the quality of urban form and sustainability within the Gombora corridor in Hosanna.

Empirical Literature

Urban morphology, a dynamic artifact, reflects the past and conceals a city's future development potential. Analyzing the morphological transformation over a historical period and gaining fundamental insights into socio-cultural change and contextual growth can help identify the problems that arise during urban development (Ling, X. 2015). This section aims to establish the theoretical basis for understanding the morphological transformation process and the functional aspects of a city's spatial structure. It will explain how society's functional forces impact the physical and spatial characteristics of an urban area. This theoretical framework will guide the conceptualization of the complex transformation process, its impact on urban area functionality, and the resulting built form. The review will also explore the potential of Space Syntax as a tool and its various measures for analyzing the morphological transformation of a planned area and its urban setting.

Morphological and Visual Dimensions of Urban Design

Morphological urban design focuses on the structure of form and space in an urban environment, as well as the connection between spatial patterns of infrastructure. According to Carmona (2010), there are two types of urban space systems: one where buildings define space and the other where buildings are objects within space. Coznen (1990) identifies four primary morphological elements that illustrate how interconnected layers form morphological formations. Coznen explains that land uses are relatively temporary compared to



plot divisions, street patterns, and buildings. Changes in land use can involve the emergence of new uses and the departure of current ones. New uses often lead to the construction of new buildings, plot amalgamations or subdivisions, and sometimes changes to the street layout due to redevelopment. Each plot follows a recognizable cycle of building development. Buildings that remain in use for extended periods can accommodate various land uses or intensities as they age. For example, a building may transition from a high-end single-family dwelling to an office space, and eventually become on-campus student housing.

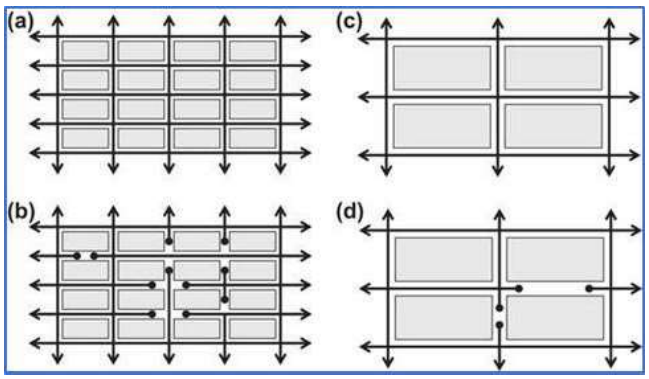
Cadastral units, also known as urban blocks, are typically divided into plots or lots (Figure 1). These plots may have frontages on main streets or circulation routes and share a common boundary at the rear. Some plots face the main roadway, while others have back service alleyways. Over time, plots may deteriorate, be sold or purchased, and experience changes in boundaries. Large plots may be subdivided, with the original owner retaining one part and selling or leasing the other. Conversely, multiple plots may be combined to create a larger development site and allow for the construction of larger buildings.

Street Pattern

A cadastral street pattern describes the arrangement of urban blocks and the movement channels that are publicly accessible between those blocks. The public space network is comprised of the spaces between the blocks.

The Visual Dimension

The visual–aesthetic character of the urban environment is derived from a mix of its spatial (volumetric) and visual aspects and the artifacts in those areas and their relationships. Architecture and urban design have been considered as unavoidable types of public art (Nasar 1998). "In many arts, an audience member may choose without significant consequence to engage and disengage with the work. We can buy and then put down a book or go to a movie and walk out. These arts have voluntary audiences. Similarly, the owners of built places are voluntary audiences. However, buildings, landscapes and public works also have significant involuntary audiences (Childs 2009)."

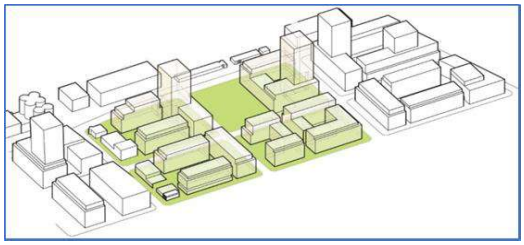


The **visual** and kinesthetic enjoyment of the urban environment primarily characterizes a town's aesthetics (through movement). According to Jack Nasar (1998) states determined the attributes of the general public's preferred environments, which included the following: Naturalness - Those habitats which have a greater abundance of natural elements than of constructed elements. Upkeep/Civilities - areas that seem to be maintained and looked after. Openness and defined space - an interesting and delightful combination of open space with panoramic views and scenic components, Historical significance/content-environments that make memories more pleasant, Order-cohesion, congruency, readability and clarity According to Walter Benjamin observation, most intervention in an urban environment influence on the urban form. However, concentrate on enhancing elements of the environment to increase the visual coherence, order, and harmony. As suggested by Smith (1980), there are four primary elements of aesthetic appreciation that transcend time and culture.

Urban Morphology and Its Components

The analysis of the body and spatial patterning of built forms allows a viable assessment of cities as networks and complex bodies, establishing hyperlinks between any agreement's spatial shape and functioning (Batty & Longley, 1994). Urban morphology studies a city's body structure, consisting of road patterns and forms, urban design, the building of sizes and shapes, architecture, population density, and residential, commercial, industrial, and distinct patterns, among other items. Urban morphologists discuss the concentration on buildings and their surrounding spaces, several parcels, and streets, analyzed at one of a kind degree of judgment and strongly emphasizing historical context. The three essential city morphological research elements are form, decision, and time (Moudon, 1997).

Three essential physical elements characterize urban form in urban morphology: **the buildings and associated open spaces, plots or lots, and streets**. 'Plan Units' or 'tissue' is defined by Conzen as groups of houses, open spaces, lot, and streets that form a cohesive whole either because they have all been constructed at the same time or because they have been undergoing a typical phase of transformation (Moudon, 1997). The smallest factor is the lot, which determines the initial construction or creation's territorial limits and then transforms the constructed space. The lot or the plot has a spatial and urban component. The second aspect consists of the building and its open space in the third dimension. The arrangement usually sits on its lot, each owned by a social body that owns and uses the lots. They are the fundamental unit of urban space. The third element is the street block that group lots and buildings into the next spatial level. Cycles of building works and transformation are essential for urban and real estate planning and development (Moudon, 1997)



Therefore we will have ideas into the urban fabric's distinctive aspects and its specific formation process through its morphological analysis. The street block set a group of lots' spatial frontiers. These borders, in most cases, define the street space. Hence, the street blocks have segregated the private space from the collective public and the traffic area. Lot and buildings can also be used as a street space module.

Causes of Morphological Transformation

The Physical and Spatial Components

Urban Morphology involves a variety of forms, land use, and density. In turn, each of these has connotations of the shape, configuration, structure, pattern, and organization of land use and the system of relations between them (Batty & Longley, 1994). There are transformation rules that dictate the structure's change over time, and that structure and development are not random but comply with the law. According to urban morphology, the street pattern is the most enduring artifact in every urban settlement (Conzen, 1990). Additionally, buildings and their corresponding land use are the least resilient components. The same building may have several uses. Many occupancies and the same plot may be occupied by many buildings over time, while the relationship between the plot and the streets remains consistent.

However, this tends to happen within the context of existing street patterns (Conzen, 1990). Urban buildings can also change over time. They can be extended, vacated, recycled, and replaced by other constructions, which can influence the form of the settlement. The shifting character of building use becomes the primary mechanism of urban system change within the relatively fixed nature of the road network (Erickson & Lloyd-Jones, 1997). The spatial network plays an essential role in the change process. The city's spatial structure plays a crucial role in the growth of the demand for urban properties. The city's complexity is represented as a mixture of busy mixed areas and more homogeneous and quiet residential areas. The layout of the urban grid is, therefore, a significant factor in urban movement. This relationship is strongly affected by the effect on urban elements: land use pattern, building densities, the combination of uses in urban areas, and a part of the urban structure. This has a substantial impact on cities since it has significant implications for both form and function (Hillier, 1996).

The spatial structure that creates attraction together accounts for urban movement. Movement has an impact on the long-term evolution of the urban surface due to its impact on accessibility. Restructuring of land use patterns and land value patterns is often connected to changes in the pattern of accessibility (Desyllas, 1997). Street width and continuity of the streets are essential determinants of these changes. Urban morphology studies the urban form and its transformation bi-directionally in the spatial and physical dimensions. It refers to several causes and forces that transform it, but it is also a force by itself. Economic and political factors, on the other hand, have determined urban development function only within the constraints and limits imposed by this spatially driven process. Thus, the transformation process dynamics affect the different urban morphology elements and bring changes in the city's overall configuration. To understand the process of morphological transformation of an urban area, we must investigate the relation between its spatial and functional dynamics and how the socio-economic reality of urban societies drives these changes.

The Socioeconomic Drivers

The urban environment consists of a variety of activities carried out by individuals and groups, which are regulated by cultural norms and influenced by social and economic powers (Mondon, 1997). The city is primarily shaped by socio-economic forces, particularly the relationship between movement and the urban grid

structure. Economic forces play a crucial role in both short-term shifts and long-term development in urban areas. Activities of a similar nature tend to cluster together, while external economic benefits attract complementary companies and activities. The increased demand for housing leads to the construction of taller buildings and higher land prices. The rapid transformation of the urban region is evident in the changing spatial patterns of places, the intensity of land use, and land prices (Goodall, 1979). To understand the process of morphological transformation, it is important to consider all the factors that contribute to the shaping of the built-up environment. This includes analyzing the spatial and physical elements of the urban area, such as buildings, building plots, open areas, and streets, as well as the economic and political factors that ultimately guide the morphological transformation process.

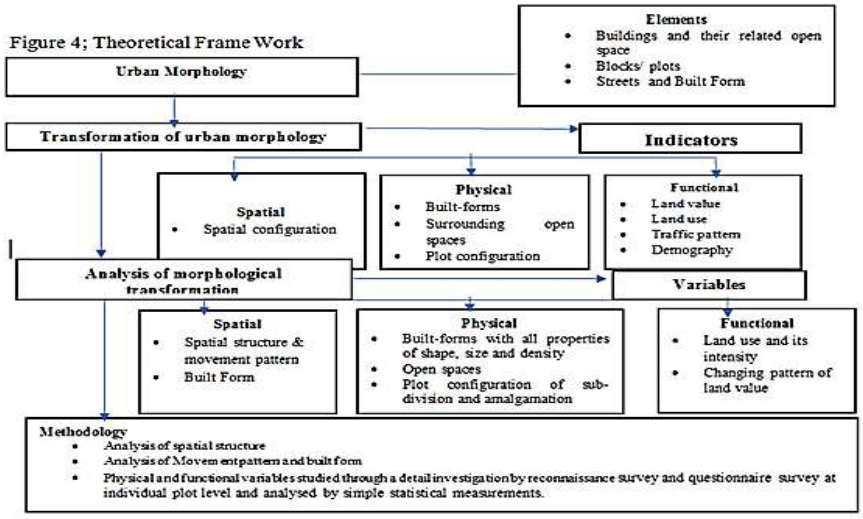
The Relation between Built Form and Function

Cities are physical structures consisting of a continuous network of space and usable sites linked to specific land use. Therefore, the city can be defined as a combination of two spatial systems (Erickson, 1997). Networks enable movement and access, supporting and connecting buildings and their various uses, which are referred to as form. Additionally, distinct spaces associated with individual ownership and uses, or a set of uses, are referred to as function.

When considering the shape and function of each spatial structure, the space itself represents the shape, while the activities conducted within it represent the function. The primary connection between the form of space and its use suggests that space is presented to us as a fixed potential, and we as individuals and collectives exploit this potential through the use of space. This allows for the analysis and prediction of the space-function relationship to some extent.

The pattern of road networks is one of the most enduring features of a city (Rossi, 1982). The relationship between plots of land and streets generally remains consistent. Sometimes, plots are subdivided by adjusting to the existing street pattern (Conzen, 1990). Furthermore, the changing nature of building use within the street network becomes the primary mechanism for morphological transformation in the urban system. Hillier and Penn (1993) describe this as a movement economy, where the distribution of functions or activities within the urban structure is regulated. All movements within the network occur between functional position pairs. The total movement is influenced not only by the total origin and destination but also by the system configuration and how it facilitates movement. While the distribution of functions may change over time, it will impact the physical configuration of the street network.

Figure 4; Theoretical Frame Work



Source:

Compiled by Author, 2023

Materials and Methods

This section addresses the author's selection of research methods that best match the research questions and investigate the research issues. It discusses the various methods used in this study, including data collection and interpretation techniques, case selection criteria, sampling, and research design. For this study, a mixed-method approach that incorporates both qualitative and quantitative approaches is chosen to investigate the depth and breadth of the problems. The case study approach is used because it is more appropriate for analyzing descriptive, causal, or explanatory topics (Yin, 2009). The author used three main methods: qualitative, quantitative, and mixed-methods to explore ideas. These methods include case studies, self-reporting, surveys, and interviews. A combination of qualitative and quantitative methods is used to assess the characteristics of the problem and estimate its magnitude. The qualitative method allows for the exploration of settlement characteristics and morphological transformations. Therefore, using questionnaires, measurements, observations, or other tools in a case study helps clarify these phenomena.

This study has employed both quantitative and qualitative data. Quantitative data was gathered through structured interviews, measurements, mapping, direct observation, photogrammetry, structured observations, and secondary sources. Qualitative data collection was done using methods such as semi-structured techniques or unstructured ones. Some standard methods include direct or participatory observations, photography, focus group discussions, video recording, profound interviews, and review of documents, mapping, and sketching. The gathered data was analyzed using charts, tables, and figures. Synchronic analysis, diachronic analysis, and life story analysis were used for qualitative data.

Results and Discussion

Cities and towns are the largest and most complex structures created by people. They do not occur naturally, but rather develop and change over long periods of time, sometimes spanning tens, hundreds, or even thousands of years. While some ideas, plans, methods, or projects may persist for a while, they are often replaced, reorganized, or improved upon in subsequent centuries. The unique contexts, histories, populations, political systems, and economies of each city or town distinguish them from one another, as will be explained in this review. Towns exhibit various patterns of development, both formal and informal, which shape their physical structures over time. Therefore, it is important to understand the morphological forms and spatial transformations that define towns with thousands of years of urban evolution. This understanding helps explain the changes in residential areas that occur as part of a town's development. This section focuses on the growth process and significant spatial transformations of Hosanna town on a global scale, in order to examine how the town's overall framework influences the development of the planned residential areas being studied. Thus, this section explores the changes that have occurred along the Gombora corridor, specifically looking at the transformation of built structures and their functions, as well as the emergence of new and unique buildings. The analysis has also examined the development of buildings and their surrounding spaces over time, documenting changes in land use intensity and overall land use patterns.

Physical Growth of Hosanna Town

Hosanna is one of the oldest towns in Ethiopia, officially established in 1904 during the reign of Emperor Menelik II. The town was originally called "Sech Duna" by the local people. Later, in 1904, the name was given by Ras Abate, the governor of Lemo and Kembata Awraja.

During the Imperial regimes, the town served as the seat of Kembata and Hadiya province. In 1949, the town was established as a municipal administration in the Central Ethiopia Regional State. Currently, it is one of the 22 reform towns in CERS and one of the cluster secondary urban centers of the Central Ethiopian Regional State. It is also the capital city of Hadiya Zone, which previously consisted of three sub-cities (Kifle Ketema) and eight kebeles but is now compressed to six kebeles. Hosanna is located in a strategic location, almost in the middle of seven zones, including Yem, Gurage, Selti, Halaba, Kembata, and Hadiya zone. This advantageous location has allowed the town to benefit from various physical, economic, and social advantages, contributing to its continuous expansion. In recent years, the town has experienced further growth due to factors such as overpopulated and underdeveloped rural areas surrounding it, concentrated capital investments, and changes in the economic order. Additionally, the town has access roads connecting it to Addis Ababa, Butajira, Durame,

Welkite, and the woreda towns of the Hadiya zone, where the Gombora corridor is located, which serves as a case study area for research.

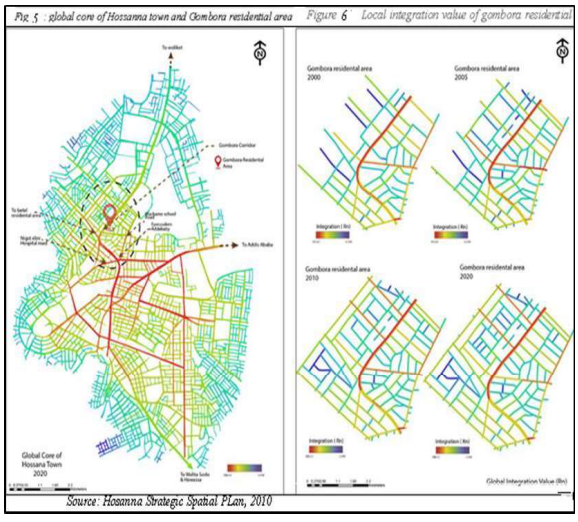
The Physical and Functional Analysis of Study Area

The study of the vertical expansion of buildings, the rise in housing density, the decrease in open spaces, and the unique patterns of demolition and survival of structures are all part of the analysis of urban evolution. This analysis is initiated by the interaction between building, land use, and other factors associated with the dynamics of urban growth. The Gombora residential area exhibits a process of morphological transformation and changes in its original land use pattern, the intensity of land use, land value, and other functional aspects of socioeconomic status. The plots along the Gombora corridor seem to be more open to this process. Therefore, only the plots along this corridor are considered for this study of morphological transformation. For this study, only one plot deep along the entire length of the road is considered, excluding the plots designated for commercial use. This decision is based on the fact that the concerned authority has permitted only these plots on either side of the Gombora Corridor land-use conversion, as illustrated in Figures 5 and 6 below. These plots are marked in red along the entire length of the Gombora corridor.

Spatial Character of Gombora residential area

The analysis results reveal that the global core of Hosanna town is gradually expanding, both physically and functionally. Over time, the planned residential districts have been morphologically transformed, with emerging commercial built forms such as the Gombora corridor. As a result, the functional core has become closer to the planned area, following the global core of the city (Fig. 6). According to Space Syntax theory, the spatial structure of a city can provide insights into the urban fabric and its integration with urban functions, such as movement and land use. Additionally, the spatial structure has been highly suggestive of the functional and present accessibility of the area, as demonstrated by a syntactic study of the Gombora Corridor. The analysis results also reveal that the Gombora residential neighborhood has maintained a similar morphology throughout its history, with buildings, streets, plots, and blocks dispersed across the region and minimal modifications during its growth period as an autonomous system (fig 6).

The entire residential area of the Gombora Corridor is virtually divided into three segments by intersecting roads and road patterns. For the sake of easy reference, these segments are named the east zone, west zone, and north zone in this study. The east zone covers the portion of Gombora starting from Eyerusalem circle to Wachemo high school, the west zone constitutes the area between Gulet water tank and Gorgwade residential area road, and the north zone defines the part of Gombora from Gorgwade road up to the northern end of this area. These divisions are illustrated in Figures 5 and 6. The figures also depict the plots of different sizes with their plot numbers along the case study corridor, with the east zone containing the longest part and the most transformed area of the Gombora Corridor. The maximum numbers of plots selected for the case study were located in this zone.



Built-Form and Morphological Transformation Analysis
Land Use & Its Intensity

Figure 7 below illustrates that land-use patterns are a critical component of urban design and are directly linked to the transformation of residential areas into emerging commercial forms. It is widely believed that two-dimensional plans are established first, followed by the use of three-dimensional spaces and activities to demonstrate the morphological transformation of the built environment. However, the Gombora residential area was initially planned solely for residential use. In the initial phase, commercial functions were limited, only confirmed within certain areas, such as the Eyerusalem nodal point. As the study area expanded, it became increasingly important within the overall urban grid, resulting in a new global integration pattern that significantly impacted accessibility and centrality. This led to a new configuration of functional activities and a transformation in the spatial form and structure.

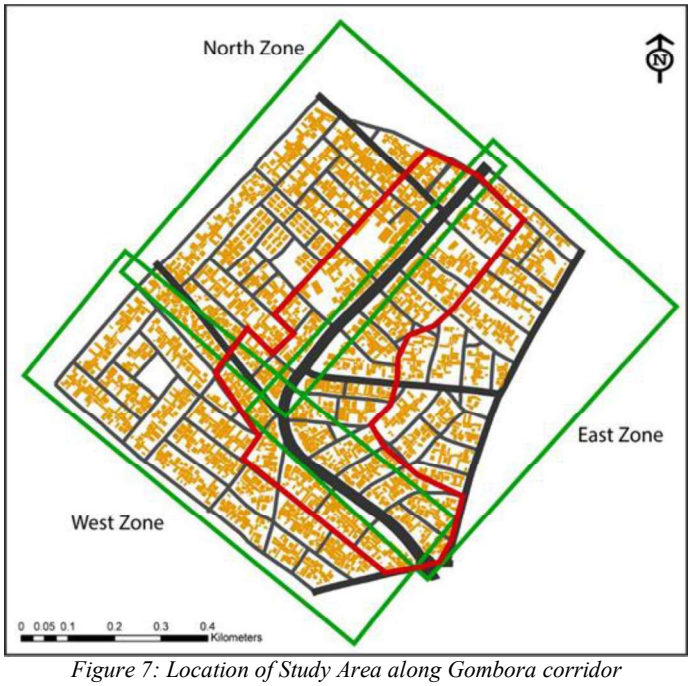


Figure 7: Location of Study Area along Gombora corridor

Furthermore, the unique characteristics of urban growth and structures have also been influenced by changes in the urban economic basis. The growth has encouraged the emergence of new activities and the expansion of existing ones, leading to organizational changes within the area. The analysis results clearly indicate that the Gombora residential area, initially designated for residential use, gradually transformed into other land uses in later phases. This transformation began when private property owners started leasing out their land for commercial or business services, such as warehouses, stores, restaurants, or guest houses, to benefit the surrounding neighborhood. This gradual intrusion of commercial use, followed by the development of large commercial buildings along the Gombora corridor, significantly changed the overall structure of the built environment. The development of commercial forms along this corridor was inevitable, as it is a principal arterial street with easy accessibility and large usable parcels of land on both sides of the block. These emerging commercial forms serve as a clear demonstration of the morphological transformation of the study corridor.

On the other hand, the analysis results reveal that the land-use conversion of the Gombora corridor began in the early 2000s. Information sources also indicate that detailed land-use information was not available earlier along the Gombora corridor. This study focuses on examining how land use is changing from residential to commercial in 2023, based on a field survey conducted at this location. In this study, land use is categorized into two main components: residential and commercial. The various commercial land uses along this corridor, such as retail, restaurants, warehouses, stores, health facilities, banks, and mixed-use buildings, are classified under a single category. The conversion of land use is an influential factor in the morphological transformation

and aids in the data collection process. The information collected through the reconnaissance survey is recorded for three separate zones of the Gombora area. The study-built forms are classified into four classes: A) original built-form retained with original use, B) original built-form renovated for commercial use, C) new buildings constructed for commercial use, and D) new buildings with residential use. The term "original built-form" refers to the first phase of building construction for single-family residential use, while "original use" refers to residential use.

Table 2: Summary of Different Category of Built-form

	East Zone	West Zone	North Zone	Total	Percent
No. of plots including sub-division	159	53	79	291	
No. of A type	58	28	30	116	39.86%
No. of B type	65	12	29	106	36.43%
No. of C type	27	7	15	49	16.84%
No. of D type	9	6	5	20	6.87%

Source: Field Survey, 2023

Table 2 above depicts the number of plots with old buildings that are still being used for residential purposes, as determined by type A. Type B in the table also indicates the number of plots where existing residential structures have been partially or completely changed to fit new commercial use, reflecting the conversion of land use. Type C records the number of plots in which old residential buildings have been demolished to construct new buildings for commercial use, showing changes in both built form and land use. This category alone signifies a complete transformation of the plots. Type D records the number of plots with new construction that have a higher density or are used for residential purposes. Adding the values of type A and type D gives the total number of plots used for residential purposes, which accounts for about 47% of the total number of plots (291 plots). Adding the values of type B and type C shows the total number of plots that have allowed the change in land use from residential to commercial, regardless of the type of built form (old or new). Counting the total of type C and type D categories provides information on the transformation of built form, regardless of their use, along the Gombora corridor.

Table 3: Transformation along Gombora corridor

	East Zone	**West Zone**	**North Zone**
Transformation of land use (type B + type C)	57.86%	35.85%	55.70%
Complete transformation of plots (changes in built form & land use, type C)	16.98%	13.21%	18.99%
Transformation of built form (type C + type D)	22.64%	24.53%	25.32%

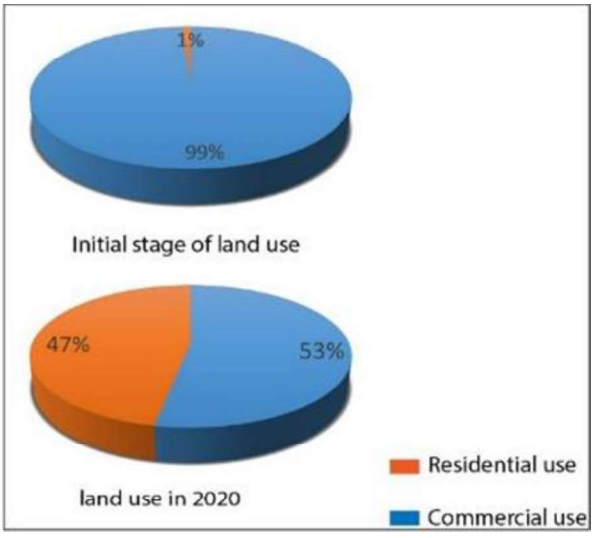
Source: Field Survey, 2023

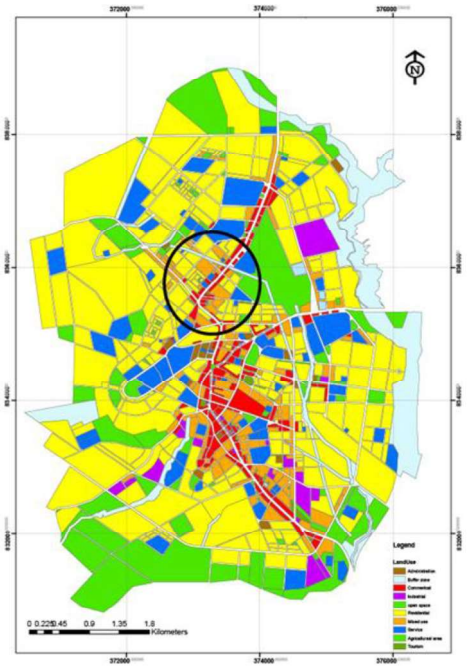
Table 3 above depicts different categories of transformation patterns recorded along the Gombora corridor in three zones. The data has been recorded for three separate zones of the Gombora residential area to understand how the transformation process has affected the different segments along the corridor. The table also shows that the East Zone of the Gombora area exhibits the highest value, with 57.86% of the plots in that zone undergoing land-use conversion. In the North zone, 25.32% of the plots had their original residential buildings demolished or partially demolished, and new buildings were constructed on subdivided land. In comparison, 25.32% of the plots underwent complete transformation, where old buildings were demolished and new buildings with commercial use appeared. These results are aggregated in Table 4, which reveals that a total of 17% of the plots along the entire length of the Gombora corridor allowed for a complete transformation of both built-form and land use. Additionally, 53% of the plots out of the total number of 291 plots along this road featured land-use changes solely, whether they maintained the same building or utilized a new premise. Furthermore, 24% of the plots in the general area had new buildings. As a result, land use is the most prominent aspect along the Gombora corridor, with 53% of the plots transitioning from residential to commercial use. The transformation of the functional aspect along the corridor is witnessed as a distinctive aspect.

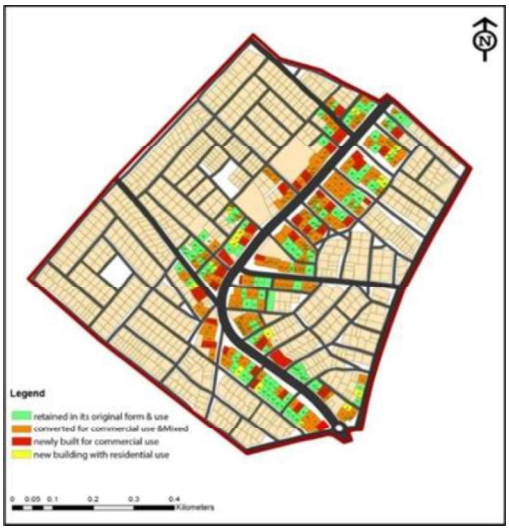
The transformation of land use along the Gombora corridor is shown by a pie chart in Figure 9, depicting the increasing rate of commercial use of plots. Figure 10 shows the different categories of built-forms with their use type along the Gombora corridor. The transformation of land use is an important indicator of morphological transformation because the change in one plot seems to trigger changes in adjacent plots. These data support the observation made in the discussion on the spatial structure of the Gombora area. The Gombora corridor offers greater accessibility, which appears to be attracting non-residential applications along this route, altering the functional pattern of this area. This shift in land use from residential to commercial means that each plot is being used more intensively than before, as the increased demand for commercial space has made multi-storey buildings profitable. Hence, most of these new commercial buildings have essentially become multi-story structures.

Commercial Use nature of Gombora Corridor

In addition to spatial forces, economic forces also play a role in determining land use types and transforming land use in urban areas. Economic factors are primarily influenced by the relationship between mobility and the structure of the urban grid. The Appendix provides a description of the commercial activities taking place along the Gombora corridor, including banking services (such as Awash bank, Abyssinia bank, Birhan bank, and Commercial bank), restaurants, shops, cafes, offices, telecommunication network services (such as Ethio telecom), and other private sector firms. This shows a shift in the principal business activity towards this area. Table 3 indicates that 53 percent of the transformed land use in the entire area has been calculated. It appears that economic activities have gradually led to this transformation. In the functional context of Hossana town, the Gombora area has developed into a sub-center. This is due to the urban growth of Hossana town in the past decade, coupled with the globalization of the country's economy, which has resulted in the need for economic activities to occupy prestigious and valuable urban areas, as the existing central business district (CBD) could not accommodate all these activities. The development of the Gombora corridor as a commercial sub-center can be attributed to this factor. The concentration of these economic activities will further influence other complementary and competitive activities in this area. Therefore, the spatial force of transformation, along with its impact on accessibility, is further strengthened by the economic force of transformation. The interaction between these two forces seems to be responsible for the development of functional areas along the Gombora corridor.





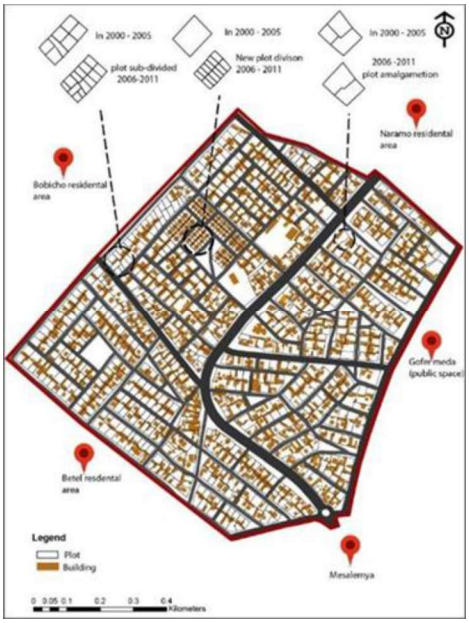


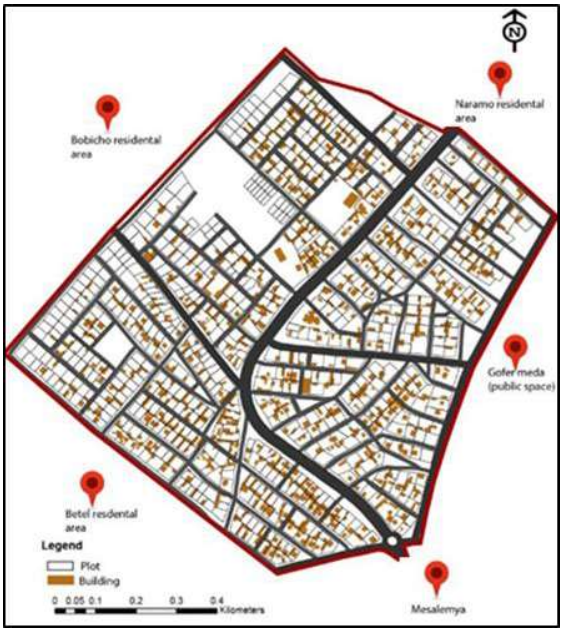
The Land Use Change Practice along the Corridor of Gombora

During a study of users and developers, it was discovered that there are certain irregularities in the process of land-use change of properties along the Gombora corridor. In early 2010, the owners started to create pressure for land use conversion. Since it was not approved by the Hossanna town municipality (HTM, 2010), many residential buildings along the corridor were illegally occupied by commercial uses. Building regulations were not effectively applied to control such activities. The building plan was approved as residential, allowing commercial use of plots without any legal ground. Many landowners and developers took advantage of this loophole in the construction rule. Since the Hosanna town municipality was not concerned about the changes made in the internal layout of buildings, building use conversion was preferred over land use conversion. The building height was permanently restricted up to 7 stories. This rule was not publicly announced. As it is not a reflection of legal practice, the owners and developers refused to provide the detailed floor plans of these buildings. This study shows that the illegal occupancy of residential buildings by commercial users, violation of building construction law, exploitation of building rules along administrative loopholes, misunderstanding between different authorities, lack of strong government control, and improper use of political power are all responsible for these differing practices along the Gombora corridor

Plot Configuration with the Pattern of Sub-Division and Amalgamation

According to Shirvani (1980), the primary characteristic of cities and towns is their unique spatial character. Both planned and unplanned settlements typically have simple patterns of streets and blocks, with town blocks as the fundamental element. In the Gombora residential area, blocks were initially laid out in a simple rectangular grid pattern with a major access road running through the middle. The blocks were designed with large plots of varying sizes, some of which were later subdivided. It is known from theory that the initial block size and lot layout in an urban area have predictable effects on subsequent development patterns (Schbeer & Ferdelman, 2001). Therefore, this study first identifies the earliest block shapes and plots in the Gombora residential neighborhood. It then examines the evolution process and identifies the critical periods of development, studying how these plots reacted to changing conditions. To get a general idea about this variable, the plots along the entire length of the Gombora area are studied, assessing different phases of development. A more detailed survey is then conducted through a case study to capture the transformation of plot configuration. The different phases of the transformation process are studied based on land survey maps that show individual property lines, boundaries, and building footprints. The criteria for determining the periods of different phases are discussed at the beginning of this chapter.





Phase 1 (2000-2005): The first phase of development in the Gombora residential area is evident from the map dated 2000-2005 (Fig: 12). The design of large blocks can be seen here, with plot sizes ranging from 1500m2 to 500m2. During this period, there was a low demand for plots in this area. These plots were later subdivided into larger plots in the northern and northwest sections of the area. Land subdivision in this case served as a way to provide urban land directly to the general population. Some landlords occupied large plots, while others extensively subdivided their blocks, creating plots of various sizes to distribute among others. Many blocks on Gombora Street had two rows of plots on opposite sides of the street, while others had large plots lined up on one side of the street. However, these plots had the advantage of a secondary entry from the access road at the back.

Phase 2 (2006-2011): Investigation of the map from 2006 to 2011 (Fig: 13) reveals the second phase of urban development. During this period, several blocks underwent modifications. Some large blocks along the Gombora corridor were fragmented with revised plot divisions. In some cases, two or more plots were merged to create a larger plot for potential commercial buildings, based on speculation. Additionally, many large areas were split into two or three different properties. By lanes were provided where necessary to allow access to the plots at the back. As a result, a dense urban structure began to emerge from these divisions. The population expansion and the widespread availability of remittance led to the subdivision of plots into smaller ones. The Diasporas persuaded landowners to either sell their lands entirely or subdivide them. This was a significant and symbolic phenomenon. In this phase, the commercial plots around the corridor appeared to be poorly defined, lacking clear delineation of the commercial zone limits. Although some plots along the corridor were observed to have subdivisions with a small amount of commercial invasion, the average size of these subdivided plots ranged from 500m2 to 250m2. This subdivision of land into segments and streets had a noticeable effect on the future expansion and redevelopment of the corridor, as seen in phase 3.

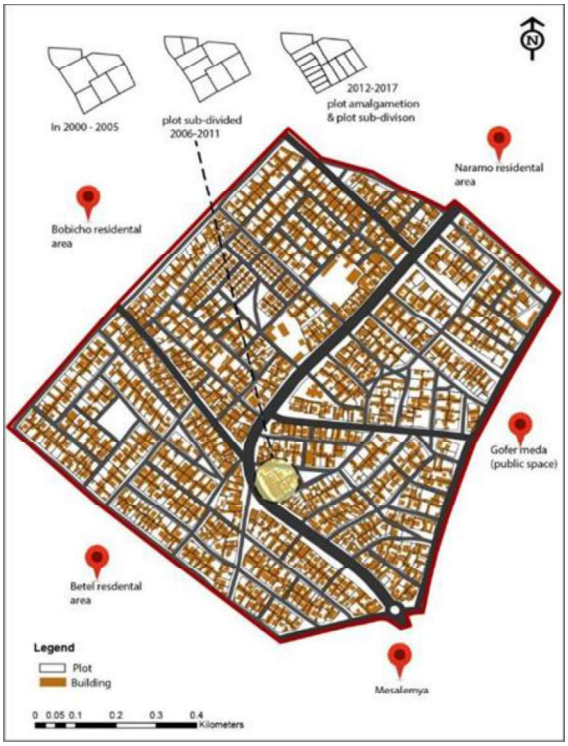


Figure 14: Gombora residential area from 2012 – 2017(phase 3)

Phase 3 (2012-2017): The surveyed area layout map started in 2012 and was completed in 2017. Upon closer examination, the maps show more dramatic changes in the configuration of plots compared to older maps. During this phase, the consecutive division of plots occurred at a faster pace, as subdividing a plot causes nearby plots to reorganize into a higher plot ratio. Combining the results of earlier subdivisions allowed specific formerly subdivided plots to be shown as merged again (Fig: 14). Therefore, plots were subdivided in one phase and amalgamated again in the next phase to accommodate the changing land use according to the users' preferences. Thus, both the physical and functional transformations continued to coexist. Land values increased for corridor plots due to their economic importance and high value potential.

Phase 4 (2018-2023): Based on available information, distinctive morphological alterations can be observed along the Gombora corridor plots (Fig 15). Throughout several stages, many properties were subdivided into smaller plots. These plots remained valuable for commercial development. Originally, these plots were not intended to become high-density urban areas. They were long and had only one side facing the main road, usually the narrow side. However, these plots now have the potential for higher land-use intensity, allowing for multi-story buildings and increased land coverage. The problem is exacerbated by land speculation and unclear urban planning regulations. A study found significant restructuring of plots along the Gombora corridor during the transformation period. Subdividing the original plots into smaller ones systematically leads to more intense land usage. It is believed that larger plots, such as case study plots numbers 21, 39, and 45,120, were more susceptible to this process. Additionally, there was a growing demand for large plots of land for commercial development along the Gombora principal road, which accelerated the transformation along this corridor.

Between 2000 and 2005, there were 195 residential plots (excluding those designated for commercial use) along the Gombora corridor. In phase 2, from 2006 to 2011, the number of plots increased to 221, surpassing the previous phase by 14%. From 2012 to 2017, the number of plots increased to 251, a 29% increase from the initial 195. **By 2023**, the number of plots had increased by almost 50% (table 4). The undivided plots in the initial phase were larger, ranging from 500m2 to 1000m2, compared to the subdivided plots along the Gombora corridor. This information can be used to conduct a detailed examination of a case study to support the plot configuration transformation process.

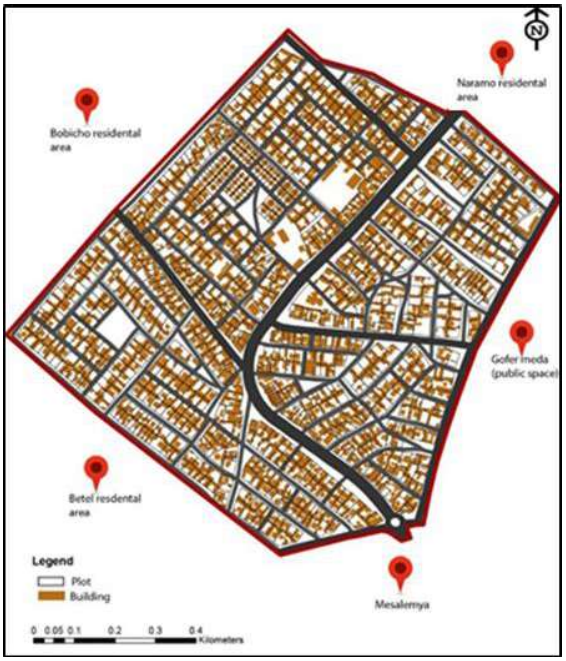


Figure 15: Gombora residential area in 2023(phase 4)

Table 4: Total number of plots along Gombora corridor (excluding commercially designated plots)

A different phase of development	Total no. of plots (after sub-division & amalgamation)
From 2000 - 2005	195
From 2006 - 2011	221
From 2012 - 2017	251
Year 2018 - 2023	291

Source: Field Survey, 2023

Figures 14 and 15 above illustrate that some plots, such as cases no. 3 and 9 in table 5, remained vacant during phase 1, and the first development of the site only took place after small built-forms emerged. In case 4 (an area of 970m2), some large plots were subdivided into four parts. In case no. 13, a large plot underwent building demolition twice in two successive periods and was finally developed in 2023 with a large commercial building. Case numbers 5 and 6 show that some plots also underwent building demolition twice within a very short interval. Some plots were subdivided in one phase and later amalgamated to accommodate a commercial building. This phenomenon highlights that initial subdivision of large plots was observed, and in later phases, some of these subdivided plots were amalgamated to accommodate commercial buildings.

Therefore, emerging commercial buildings require ample floor space for their use. Consequently, the analysis results reveal a growing demand for large-sized plots along the Gombora corridor. The development of multi-story commercial structures on large plots took precedence over residential use, shaping the morphological transformation. The division and merging of plots appear to demonstrate adaptability to shifting needs in order to maximize landowners' profits. Table 5 presents the record of the land area of the selected case studies along the Gombora corridor. Based on the data shown in the table, plots ranging from at least 400m2 to 1000m2 in size dominated the early phase, but in later periods of subdivision, the space decreased to between 150 and 500 square meters. The process of transformation along the Gombora corridor, therefore, involves changes in plot patterns (subdivision or merger of initial plots), resulting from increased building density and changes in land use.

Table 5: Survey of the Plot area of selected case study along Gombora corridor

Case	Phase 1 (2000-2005)			Phase 4 (2018 - 2023)	
no.	Plot no.	Total land area	No. of sub-divided	New plot no.	Area of land
1	21	715m^2	2	21a	350m^2
				21b	365m^2
2	39	600m^2	2	39a	250m^2
				39b	350m^2
3	85	500m^2	0		485m^2
4	114	400m^2	0		400m^2
5	204	900m^2	2	204a	500m^2
				204b	400m^2
6	263	590m^2	2	263a	270m^2
				263b	320m^2
7	159	925m^2	0		925m^2
8	150	620m^2	2	150a	290m^2
				150b	330m^2
9	138	600m^2	0		600m^2
10	97	735m^2	2	97a	290m^2
				97b	446m^2
11	120	525m^2	3	120a	160m^2
				120b	210m^2
				120c	155m^2
12	275	925m^2	2	275a	595m^2
				275b	330m^2
13	170	490m^2	2	170a	350m^2
				170b	140m^2

Source: Field Survey, 2023

Built-Form with Their Morphological Properties

An urban area consists of various elements that people have chosen to construct physical structures. During the transformation period (2000-2023), the Gombora corridor witnessed the emergence of new built forms, which provided visible evidence of change through the reorganization or demolition of residences and the construction of modern commercial structures. Buildings are the prominent components of urban blocks, which in turn serve to connect different types of land uses and contribute to the overall morphology of the area. By using urban blocks as a spatial unit, morphological analysis can link the socio-economic characteristics of urban areas to examine their functions, particularly the evaluation of economic activities within them. Through measuring and analyzing the morphological characteristics of the built forms, it is possible to develop a quantitative understanding of plot size, land use, and the overall morphology. In this analysis, the author identified several morphological features of the built forms, including the area occupied by buildings (built-up area), the unbuilt area, and the ratio of building size to plot size. These properties were calculated for each phase of development in order to facilitate quantitative comparisons. To determine the building to land ratio, the area occupied by the buildings was divided by the plot area of each parcel, as shown in Figure 17. The average value of these parameters was considered representative of the entire Gombora corridor. The nature of the emerging built forms was illustrated through case studies conducted on selected plots (Figure 17)

Survey of built forms selected case study

The morphological properties of the case studies in Figures 16 and 17 were analyzed to represent intensive land use and the process of transformation. The changes in built form, unbuilt area, and the ratio of building to land area of the selected case study are documented in the table above, throughout different phases of transformation along the Gombora corridor. These morphological changes indicate the transformation process, as explained in the literature in the previous section. A detailed examination of these characteristics will result in a vivid

illustration of the morphological transformation along the Gombora corridor. Tables 7-10 provide a detailed study of the built forms, including their physical properties and plot configuration, throughout the different phases of development. The analytical measurements are mainly based on information provided by available maps and satellite images, except for 2023, when a field survey was conducted. The author has observed that these changes have influenced the morphological characteristics of the built forms in terms of land size and land use restructuring.

Cases	Phase 1 (2000_ 2005)	Phase 2 (2006_ 2011)	Phase 3 (2012_ 2017)	Phase 4 (2018-2023)
5	G+0 building Land Area: 400m² Land Use: residential Built-up Area: 45m² Unbuilt-up Area:88.75%	G+0 building Land Area: 400m² Land Use: residential Built-up Area: 45m² Unbuilt-up Area:88.75%	G+0 building Land Area: 400m² Land Use: Mixed Built-up Area: 145m² Unbuilt-up Area:63%	G+0 building Land Area: 400m² Land Use: Commercial Built-up Area: 330m² Unbuilt-up Area:18%
6	G+0 building Land Area: 900m² Land Use: residential Built-up Area: 180m² Unbuilt-up Area:80%	G+0 building Land Area: 900m² Land Use: residential Built-up Area: 270m² Unbuilt-up Area:70%	G+3 (plot a) Land Area: 500m² Use: Commercial | G+0(plot b) Land Area: 400m² Use: Commercial Built-up Area: 494m² Unbuilt-up Area:45%	G+3(plot a) Land Area: 500m² Use: Commercial | G+0(plot b) Land Area: 400m² Use: Commercial Built-up Area: 743m² Unbuilt-up Area:17.4%
7	G+0 building Land Area: 590m² Land Use: residential Built-up Area: 149m² Unbuilt-up Area:75%	G+0 building Land Area: 590m² Land Use: residential Built-up Area: 213m² Unbuilt-up Area:64%	G+0 building Land Area: 590m² Land Use: Mixed Built-up Area: 320m² Unbuilt-up Area:45.5%	G+2(plot b) Land Area: 320m² Use: Commercial | G+0(plot a) Land Area: 270m² Use: Mixed Built-up Area: 492m² Unbuilt-up Area:17%
8	G+0 building Land Area: 925m² Land Use: residential Built-up Area: 190m² Unbuilt-up Area:79.4%	G+0 building Land Area: 925m² Land Use: residential Built-up Area: 286m² Unbuilt-up Area:69%	G+0 building Land Area: 925m² Land Use: Mixed Built-up Area: 395m² Unbuilt-up Area:57%	G+1 building Land Area: 925m² Land Use: Commercial Built-up Area: 800m² Unbuilt-up Area:13.5%

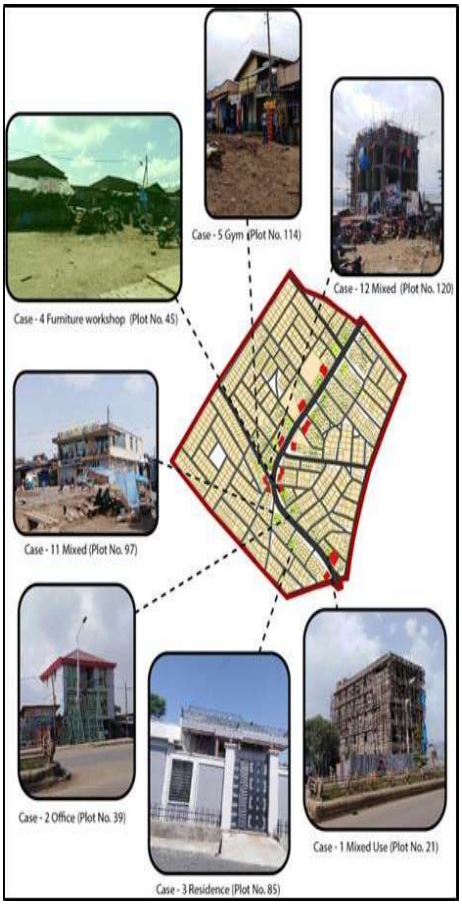


Table 7: Phase-1 Built-forms (2000-2005)

Case No.	Plot No.	Land use Type	No. of story	Ground floor area	Built area each floor	Total built area	Unbuilt area %
1	21	Residence	G+0	151	151	151	79%
2	39	Residence	G+0	130	130	130	78%
4	45	Residence	G+0	230	230	230	76%
5	114	Residence	G+0	45	45	45	88.75%
6	204	Residence	G+0	180	180	180	80%
7	263	Residence	G+0	149	149	149	75%
8	159	Residence	G+0	190	190	190	79.4%
9	150	Residence	vacant				
10	138	Residence	G+0	126	126	126	79%
11	97	Residence	G+0	74	74	74	89.8%
12	120	Residence	G+0	90	90	90	82.8%
13	275	Residence	G+0	100	100	100	89%
14	170	Residence	G+0	75	75	75	84%

Source: Field Survey, 2023

Table 8: Phase-2 Built-forms (2006-2011)

Case No.	Plot No.	Land use Type	No. of story	Ground floor area	Built area each floor	Total built area	Unbuilt area %
1	21	Residence	G+0	344	344	344	52%
2	39	Residence	G+0	257	257	257	58%
3	85	Residence	G+0	146	146	146	70%
4	45	Residence	G+0	314	314	314	67.6%
5	114	Residence	G+0	45	45	45	88.75%
6	204	Residence	G+0	270	270	270	70%
7	263	Residence	G+0	213	213	213	64%
8	159	Residence	G+0	286	286	286	69%
9	150	Residence	G+0	182	182	182	70%
10	138	Residence	G+0	210	210	210	65%
11	97	Residence	G+0	52	52	52	93%
12	120	Residence	G+0	135	135	135	74%
13	275	Residence	G+0	180	180	180	80%
14	170	Residence	G+0	120	120	120	75.5%

Source: Field Survey, 2023

Table 9: Phase-3 Built-forms (2012-2017)

Case No.	Plot No.		Land use Type	No. of story	Ground floor area	Built area each floor	Total built area	Unbuilt area %
1	21	21a	Residence	G+0	220m^2	220m^2	220m^2	44%
		21b	Residence	G+0	180 m^2	180 m^2	180 m^2	
2	39	39a	Residence	G+0	130 m^2	130 m^2	130 m^2	41%
		39b	Commercial	G+2	226 m^2	226 m^2	678m^2	
3	85		Residence	G+0	242 m^2	242 m^2	242 m^2	51.6%
4	45	45a	Commercial	G+0	209 m^2	209 m^2	209 m^2	57.5%
		45b	Commercial	G+0	120 m^2	120 m^2	120 m^2	
		45c	Mixed	G+0	83 m^2	83 m^2	83 m^2	

5	114		Mixed	G+0	114 m^2	114 m^2	114 m^2	63%
6	204	204a	Commercial	G+3	365 m^2	365 m^2	1460 m^2	45%
		204b	Commercial	G+0	130 m^2	130 m^2	130 m^2	
7	263		Mixed	G+0	320 m^2	320 m^2	320 m^2	45.5%
8	159		Mixed	G+0	395 m^2	395 m^2	395 m^2	57%
9	150	150a	Commercial	G+0	134 m^2	134 m^2	134 m^2	59%
		150b	Commercial	G+0	120 m^2	120 m^2	120 m^2	
10	138		Mixed	G+0	302 m^2	302 m2	302 m^2	50%
11	97		Residence	G+0	347 m^2	347 m^2	347 m^2	52%
12	120	120a	Residence	G+0	230 m^2	230 m^2	230 m^2	42%
		120b	Mixed	G+0	76 m^2	76 m^2	76 m^2	
13	275	275a	Mixed	G+0	204 m^2	204 m^2	204 m^2	68%
		275b	Commercial	G+0	90 m^2	90 m^2	90 m^2	

Source: Field Survey, 2023

Table 10: phase-4 Built-forms (2023)

Case No.	Plot No.		Land use Type	No. of story	Ground floor area	Built area each floor	Total built area	Unbuilt area %
1	21	21a	Commercial	G+0	351m^2	351m^2	351m^2	13%
		21b	Mixed	G+0	276 m^2	276 m^2	276 m^2	
2	39	39a	Commercial	G+0	326m^2	326m^2	326m^2	14.8%
		39b	Commercial	G+2	185 m^2	185 m^2	555m^2	
3	85		Residence	G+2	320 m^2	320 m^2	960 m^2	34%
4	45	45a	Commercial	G+0	130 m^2	130 m^2	130 m^2	16%
		45b	Commercial	G+0	160 m^2	160 m^2	160 m^2	
		45c	Commercial	G+0	140 m^2	140 m^2	140 m^2	
		45d	Mixed	G+0	381m^2	381m^2	381m^2	
5	114		Commercial	G+0	330 m^2	330 m^2	330 m^2	18%
6	204	204a	Commercial	G+3	420 m^2	420 m^2	1260 m^2	17.4%
		204b	Commercial	G+0	323 m^2	323 m^2	323 m^2	
7	263	263a	Mixed	G+0	229 m^2	229 m^2	229 m^2	17%
		263b	Commercial	G+2	263 m^2	263 m^2	526 m^2	
8	159		Commercial	G+1	800 m^2	800 m^2	1400 m^2	13.5%
9	150	150a	Commercial	G+0	230 m^2	230 m^2	230 m^2	19%
		150b	Commercial	G+0	270 m^2	270 m^2	270 m^2	
10	138		Commercial	G+0	490 m^2	490 m^2	490 m^2	18%
11	97	97a	Commercial	G+2	390 m^2	390 m^2	780 m^2	15%
		97b	Commercial	G+0	240 m^2	240 m^2	240 m^2	
12	120	120a	Commercial	G+0	130 m^2	130 m^2	130 m^2	14%
		120b	Commercial	G+4	190 m^2	190 m^2	570 m^2	
		120c	Commercial	G+4	130 m^2	130 m^2	390 m^2	
13	275	275a	Commercial	G+5	490 m^2	490 m^2	2450 m^2	13.5%
		275b	Commercial	G+0	300 m^2	300 m^2	300 m^2	
14	170	170a	Residence	G+0	290 m^2	290 m^2	290 m^2	19%
		170b	Commercial	G+0	110m^2	110m^2	110m^2	

Source: Field Survey, 2023

Table 7 above shows that only a few plots in the study area were developed with small residential buildings. This means that at least 80% of the plot remains unbuilt, which is referred to as phase 1 (see figure 17). On the other hand, Table 8 indicates that the plots along the Gombora corridor started to see substantial development, marking phase 2. New residential buildings were constructed, but the surrounding open areas were left untouched. A few subdivided plots emerged, resulting in an increase in built-up area. Moving on to Table 9, it reveals that plot subdivisions were highly prevalent in the study area during phase 3. This led to a decrease in the percentage of unbuilt area, while the amount of built-up area and volume increased. Additionally, there was

a significant influx of commercial developments during this phase. This trend continued in phase 4, as shown in Table 10, where most plots were built with commercial buildings. This resulted in high-density areas and a decrease in open spaces. It is worth noting that some of these plots underwent building demolitions twice before reaching their current state. Overall, commercial built forms seem to characterize this urban area.

Building to land ratio and unbuilt area ratio

Currently, most plots are occupied by commercial buildings, with a building to land ratio ranging from 70% to 90%. In comparison to the earlier stage, the value of the unbuilt area has decreased by 13% to 34% (see table 11 below). In the first phase, the building to land ratio averaged 20%, but it has now risen to 83% in the current phase (2023). The unbuilt area in the initial stage was 80% and has now decreased to 17%. As the development of a dense, compact spatial structure occurs through morphological transformation, the rate of open land reduction indicates intense urban expansion. The higher value of the building to land ratio suggests an increased demand for accommodation in this location over time or in different stages of development. This transformation has naturally occurred through changes in land use. To maximize the economic potential of individual plots, commercial buildings have replaced buildings from the first phase. Multi-story and high-density built forms have been prioritized over low-rise residential buildings to meet economic requirements and specific needs. As a result, the horizontal or vertical extension of built forms has been influenced by land use transformation and changes in land use demands on individual plots.

Table 11: Comparison Building to land ratio of to open area ratio

Case No.	Plot Nos.		Initial stage				Current stage		
			Total Land Area	Building foot print area	Building to land ratio (%)	Unbuilt Area (%)	Building foot print area	Building to land ratio (%)	Unbuilt Area (%)
1	21	21a	715m^2	151 m^2	21%	79%	627 m^2	87%	13%
2	39	39a	600m^2	130 m^2	22%	78%	511 m^2	85.2%	14.8%
3	85		500m^2	0 m^2	0%	100%	321 m^2	66%	34%
4	45	45a	970m^2	230 m^2	24%	76%	812 m^2	84%	16%
5	114		400m^2	45 m^2	11.25%	88.75%	330 m^2	82%	18%
6	204	204a	900m^2	180 m^2	20%	80%	743 m^2	82.6%	17.4%
7	263	263a	590m^2	149 m^2	25%	75%	492 m^2	83%	17%
8	159		925m^2	190 m^2	20.6%	79.4%	800 m^2	86.5%	13.5%
9	150	150a	620m^2	0 m^2	0%	100%	500 m^2	81%	19%
10	138		600m^2	126 m^2	21%	79%	490 m^2	82%	18%
11	97	97a	735m^2	74 m^2	10.2%	89.8%	630 m^2	85%	15%
12	120	120a	525m^2	90 m^2	17.2%	82.8%	450 m^2	86%	14%
13	275	275a	925m^2	100 m^2	11%	89%	800 m^2	86.5%	13.5%
14	170	170a	490m^2	75 m^2	16%	84%	400 m^2	81%	19%

Average ratio	Initial stage		Current stage	
	Building to land ratio (%)	Unbuilt Area (%)	Building to land ratio (%)	Unbuilt Area (%)
	20%	80%	83%	17%

Source: Field Survey, 2023

Figure-Ground Relationship

A physical demonstration of this spatial property is possible with the help of the technique known as figure-ground. Figure 18 shows the historical sequence of building footprints, represented as the structures' floor-plates, to highlight constructed forms and spaces. It displays a selected portion of the Gombora corridor with plots aligned on each side from three different periods of development. The diagram highlights the layout of the Gombora area and shows how open spaces are filled by gradually expanding construction areas, ultimately resulting in a congested urban environment. Increasing density involves constructing multi-story buildings on these plots, which is necessary due to economic demand and changes in land usage. Therefore, this figure reflects the impact of urban development during the transformation period along the Gombora corridor. It depicts the transformation of the spatial character of the Gombora area through the development of a high-

density spatial form from a low-density area and changes in land use patterns. This aspect, along with the socio-economic base transformation in this area, is responsible for the morphological transformation along the Gombora corridor.

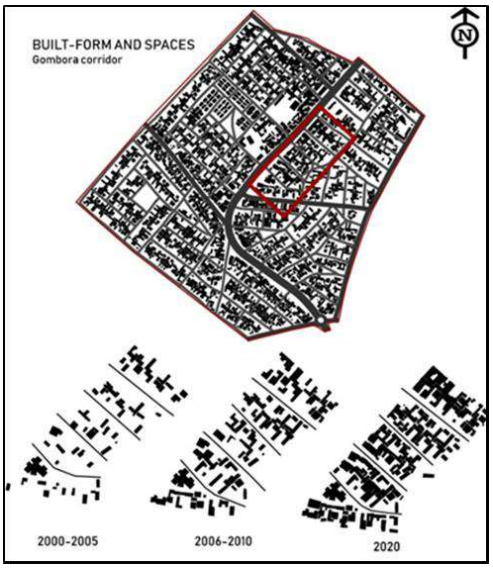


Figure 18: Figure-ground of Part of Gombora Area

CONCLUSION AND RECOMMENDATION

Conclusion

Residential areas have undergone numerous changes over several decades of occupancy. These changes, particularly in policy decisions regarding town development, can have both positive and negative effects. The results of this research show the transformation of the Gombora corridor into a commercial sub-center. The study examines the spatial, physical, and functional patterns that illustrate the growth of Gombora as a commercial sub-center. This case is unique and cannot be compared to any other. In this area, residential conditions have changed significantly, with commercial usage encroaching on homes along the road's strip line, and commercial areas expanding rapidly. As a result of increasing land prices and ownership, open spaces, green areas, and other facilities have greatly diminished. This study demonstrates that morphological transition is a complex interplay between various spatial and physical aspects of urban form and dynamic forces of transformation. The following section provides a brief overview of observations and analysis of several factors related to morphological changes along the Gombora corridor.

Cause and characteristics of transformations

The findings of this study confirm the existence of multiple factors that influence the morphological transformation of an area. These factors include land use, economy, population, built forms, plot configuration, and land value. Additionally, in specific cases, social factors such as remittance and political situations play a primary role in spatial transformations within urban areas. This provides further insight for future study, suggesting that physical factors are more responsible for the initial formation of an area, while social factors are more responsible for subsequent transformations.

The Economic Aspect

The Gombora area, which was partially segregated from the busy center of town, has been developed as a residential area. Due to the small population, large plots were arranged in a regular pattern for the development of houses. However, with the rapid urban growth of Hossana town and economic changes in recent decades,

there has been a dynamic shift in the choice of urban land use. There is now an increased demand for larger plots in areas that are more accessible, in order to accommodate higher-order economic activities. The Gombora area, with its strategic location in relation to the whole town, offers large usable plots along the Gombora corridor. As a result, the economic demand has further stimulated the spatial force that has led to the development of functional activities along this highly accessible road. This transformation has turned the once good residential area into a prestigious commercial area.

Land use

There is a strong relationship between the spatial structure of an urban area and land use. The movements created by the morphology of the urban grid benefit everyone, especially those located near areas with specific land uses. The transformation of the spatial configuration of the Gombora residential area has resulted in increased accessibility along the Gombora corridor. This transformation has also had an impact on the entire neighborhood, leading to a phenomenon of commercialization. The most significant change along the Gombora corridor is the shift in land use, with 53% of the 291 plots being transformed from residential to commercial use. There is also a noticeable transformation in the functional aspect of the corridor. This change in land use is accommodated either within existing buildings or through the construction of new commercial structures. Approximately 17% of the plots in the corridor have undergone a complete transformation, including both land-use conversion and changes to the physical structures. This shift from residential to commercial land use suggests that each plot is now being utilized more intensively than before. The demand for commercial space, particularly multi-storied structures, has increased, making higher structures more profitable.

Plot Configuration

On the plots along each side of the Gombora corridor and within the neighborhood development area, there has been a prioritization of multi-story commercial structures over residential use, which has shaped the morphological transformation of the area. As part of this transformation, the larger plots along this corridor (ranging from 400m2 to 1000m2) have been observed to be subdivided and amalgamated in order to meet the changing demand. Occasionally, these plots are divided into two or three sections to increase building density or improve land usage. The average size of these subdivided plots ranges from 150m2 to 500m2. Additionally, plots are sometimes combined (amalgamated) to create larger blocks of land for the construction of large-scale commercial structures. This is an effort to maximize the economic benefits for landowners and users. Currently, the total number of plots has increased to 291, which is approximately 40% more than the initial number of 195. The subdivision and merger (amalgamation) of plots are responses to changing conditions, and this unique pattern has influenced the emerging built-forms in the area.

Built-Forms

Land use conversion along the Gombora corridor, which occurred as a natural consequence of the transformation of spatial aspects and the economic base of this urban area, has had a dynamic impact on the built form along the Gombora corridor. The emergence of large, multi-story buildings that dominate the streetscape of this road reflects the value of commercial patronage and economic investments. The concentration of higher-order economic activity along this road has created a demand for multi-story buildings that cover the maximum allowable floor area of the land. In order to maximize economic benefits from each plot, higher intensity of activities is required. As a result, a high-density spatial form has developed in this urban area, transforming the spatial character of the Gombora area.

Currently, in all the cases studied regarding the transformation of land use and built forms, land plots are occupied by large commercial structures with a building-to-land ratio (BTL) ranging from 74% to 90%, while the open area has decreased to between 13% and 25% of the initial stage. In the initial stage, the BTL was on average 20%, but it has now risen to 83% in the current stage (2023), with an average of 17% open area remaining. The reduction in open area signifies a more urbanized area that has experienced significant expansion in built-up space through morphological changes, resulting in a high-density spatial structure. Based on this data, it has been analyzed that the BTL has increased by 75% and the open area has decreased by 79% in these cases, from the initial phase of development to the present.

Land Value

Land value is directly related to the nature of land use. Additionally, the transformation of the economic base of an urban area affects the land value in that location. Changes in land use and economic factors have significantly impacted the land value along the Gombora area. Throughout this transformation, the market price of plots along the Gombora corridor has gradually increased. Currently, with the growing acceptance of commercialization of these plots, there has been a dramatic change in the market price, which is now 5,000,000 per 200m2 compared to the non-government rate. Notably, the land value of plots along the Gombora corridor has nearly doubled during the evolution of this area. The higher land value at present requires intensive land use to justify its economic worth.

Furthermore, it has been concluded that land use changes may have more flexibility despite governmental policies. Additionally, due to a lack of enforcement and the potential for land use permissions through the space design policy, unregulated growth leads to changes in land use, resulting in an increase in illegal growth. Beyond the Gombora Corridor, land-use changes are occurring throughout the residential neighborhood of Gombora. Many residential land uses are being transformed into commercial use. One significant factor influencing the morphological transformation of the Gombora area is plot size. The majority of people have large plots of land with extra space after building their residences. In terms of accessibility, the function of roads has a substantial influence on land use and holds the highest value index in commercial land use, as profitability is a significant factor driving commercial land-use changes in the study area.

Recommendations

The role of Government

When it comes to planning business locations in residential areas, we should consider both the design of infrastructure and service capacity, as well as population growth demands. Changes in the use of urban space are responsible for issues such as infrastructure strain, insufficient parking, and legal irregularities. The Hossana town municipality and the Council of Local Government will be responsible for helping alleviate these issues by preparing new Integrated Development Plans (IDPs) and Local Area Plans. These strategies will serve as a reference for areas, particularly in land use planning. Additionally, it is important to develop Strategic Spatial Planning, as creating a strategic spatial vision can help address complex geographical challenges and generate new spatial identities. This is intended to maintain a high quality of life, social well-being, and settlement stability in the neighborhood. This study indicates that effective neighborhood income creation requires strong governmental participation, the presence of local development plans, and consideration of the overall socioeconomic status of the population. The government perceives Hosanna as a part of this problem; however, it must receive strong support in the context of neighborhood renewal.

Land use transformation and controls

It is essential for the Hossana town municipality to act as an advisor and share information with institutions that provide services in this area, especially those on the technical committee that handles and approves changes of use. This ensures that these institutions are part of the committee and receive accurate information regarding property applications for change of use, as well as identify complementary and suitable land uses in specific areas.

The suggested system of social control and social awareness, which encourages active involvement in commercial management activities, is a way to improve the quality of life for everyone. More effort should be invested in enhancing the function of community organizations, as the results have shown to be successful. To preserve and protect the excellent quality of norms and social interaction while enhancing the role of the residential sector, it is necessary to retain the community's active involvement in this management issue. A regulatory framework is proposed to enhance the role of local government in controlling commercial areas. They should exercise stricter control and spread awareness of the mechanisms through regulation. In order to meet societal needs and fulfill legal obligations, the instruments and controls should be established correctly. It is important to note that treating the Gombora area with respect and sensitivity is critical in this instance. The Hosanna Municipality has an urgent requirement to conduct frequent field inspections to ensure effective

development management. The Geographical Information System (GIS) is required to update property records for the Hossana Municipality, which have **undergone urban morphological transformation.** This is a great way to facilitate coordination of morphological transformation in the town.

REFERENCES

Agago, S., Ersawo, B., Worku, T. and Shafi, H., (2016). Hadiya Zone Socio-Economic and Geo-Spatial Data Statistical

ARUP, (2016). Future Proofing Cities: Ethiopia - Regional Cities. London: FCA.

Batty, M & Longley, P (1994). 'Fractal Cities: A Geometry of Form and Function.' London, Academic Press.

Bourne, L.S. (1967). 'Private Redevelopment of the Central City" University of Chicago, Department of Geography Research Paper No.112

Carmona, M., (2010). Contemporary public space, part two: classification. Journal of urban design, 15(2), pp.157-173

Chapin, F. Stuart, (1992). Land use Planning, Umana, Chicago, University of Illinois press, London

Chen, F., (2014). Urban morphology and citizens' life.

Conzen, M. P. (1990). Town Plan Analysis in an American Setting; Slater T R, ed.; The built form of Western cities; Leicester University Press; London.

CSA, (2008). Summary and Statistical Report of the 2007 Population and Housing Census: Population Size by Age and Sex. Addis Ababa: UNFPA (United Nations Population Fund).

CSA, (2015). National Population Abstract: Population Projection for the year 2015, based on the 2007 National population and Housing Census of Ethiopia. Addis Ababa: Centeral statistical Authority.

Živković, J, (2020). Urban form and function Climate action, 862-871