

Research Article

The Practice of Urban Planning In Managing Urban Expansion: The Case of Level-I Towns in Southern Ethiopia

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Abstract

The world's urbanization continues to grow rapidly occurring in developing regions. The rapid pace of urbanization without equivalent economic growth causes uneven spatial dispersion, land speculation, urban sprawl, ecological damage, and socio-cultural chaos. Urban planning is a key tool in managing such urbanization and particularly urban expansion challenges through several strategies. The objective of this study is to evaluate the practice of urban planning in managing urban expansion by applying both quantitative and qualitative research approaches. The first-hand data was collected by a structured questionnaire survey, interview, and physical observation, whereas secondary data was analyzed from spatial and non-spatial data of the study towns, national urban policy and strategy documents, and the national urban development spatial plan. Descriptive analysis, principal factor analysis, spatial trend analysis, and content analysis techniques were applied with the help of the SPSS and GIS analysis tools to reach the findings. The practices of urban planning in managing the urban expansion of the study town were evaluated on the basis of factors including urban spatial growth management, community engagement, economic change, and peri-urban communities' understanding of urban planning. The major findings indicated that these variables are poorly practical, and their failure has been collectively posing significant obstacles to the effectiveness of urban planning. This implies that the urban planning practice in managing urban expansion was insignificant in the study towns. Therefore, it is best to use the alternative expansion area planning strategy, that promotes planned spatial growth, community inclusivity, mixed economic activity, environmental sustainability, and the community's awareness of expansion

Keywords

Urban Planning, Urban Planning Practice, Community Engagement, Urban Expansion Management, Peri-urban Community, First-level Towns, Ethiopia

1. Introduction

The rate of urbanization has increased dramatically in recent decades, sometimes doubling every 10 years. By 2050, there may be an additional 2.5 billion urban dwellers world-

wide, with about 90% of this growth taking place in Asia and Africa [1]. However, the integral benefits of urbanization have been threatened by the rapid pace of urbanization, in-

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equivalent economic growth, and uneven spatial patterns. This challenge and indeed urban management can be addressed through a planning tool [2]. In the era of rapid urbanization, expansion is inevitable [3], and unmanaged urbanization can significantly impact urban development in several ways [4]. This may prove to take measures to contain unmanaged urban expansion. Urban planning is a key tool in this regard in the urban development process because it plays a significant role in what and how developments will occur when and where they will occur [5]. It can manage overall urbanization and particularly urban expansion through several strategies whatever its rate is. Among others, effective land use planning, smart infrastructure and transportation planning, environmental management planning, community development strategies, and affordable housing provision and development approaches that realize sustainability in each aspect enable urban planning to manage urbanization, urban expansion, and their related challenges [6].

1.1. Urban Planning Practices

Natural population growth and rural-urban migration contribute to rapid population increases in secondary cities within developing nations. Consequently, these urban centers face massive urban expansion occurrence, disorderly development, inadequate infrastructure, and environmental challenges. In Sub-Saharan Africa, approximately 80% of residential areas developed over the past 25 years lack formal planning [7]. As in many other developing countries, in Ethiopia, effective urban land management is crucial. However, surprisingly, less than 25% of recognized urban centers have proper plans to guide their spatial development [8]. Though the number of urban centers with urban plans increasing, the limitation of the quality to respond to the growing urban challenges and promote urban sustainability still persists. According to an unpublished statistical abstract from the Ministry of Urban Development and Infrastructure of Ethiopia, among the 9,626 total urban centers at various levels, 8,929 towns have urban plans, whereas 6,98 towns have lacked guiding urban plans since 2023 [9]. Particularly, in smaller and medium urban centers including the case study towns, the existing urban plans have been inadequately addressing the current state of urbanization and the needs of residents [10]. To address this, implementing and embedding alternative planning in national urban policies and strategies can significantly enhance Ethiopia's ability to manage urban growth and expansion [8].

1.2. Management of Urban Expansion

Urban expansion is the process of physically extending the geographical footprints of towns, cities, and metropolitan regions into the neighboring rural areas, therefore incorporating nearby villages and towns. According to recent research, the urban development process is fragmented and occasionally even leapfrogs over unoccupied open areas. However, as

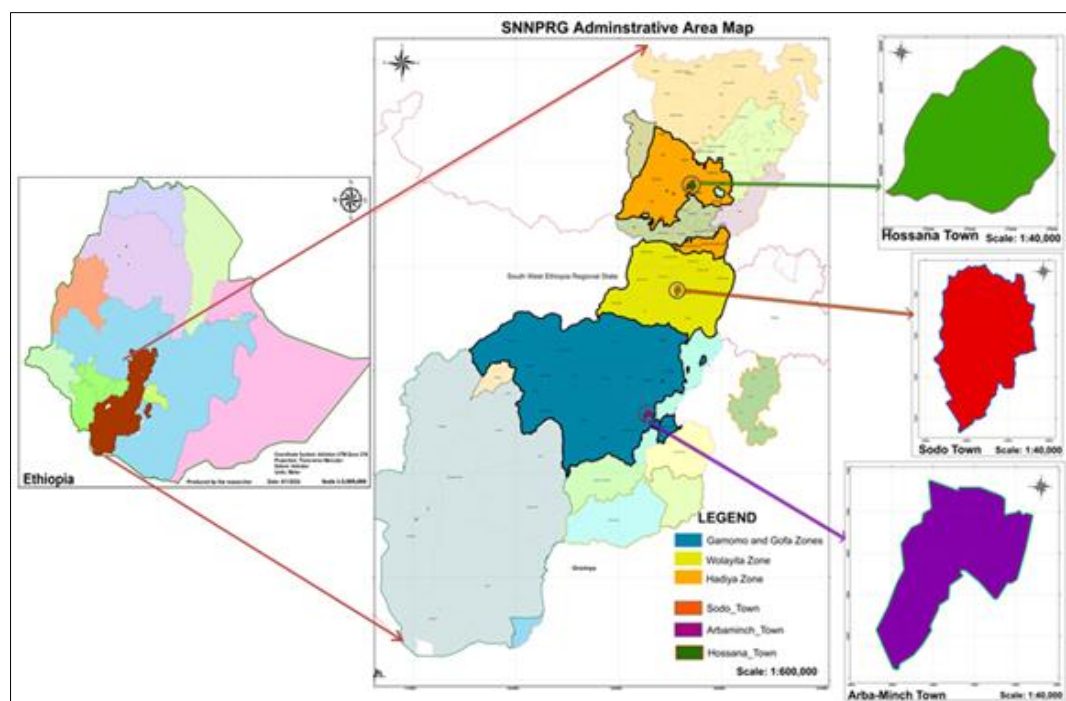
the expansion process proceeds outward, these vacant open spaces on the urban edge usually fill in gradually and convert rural land to urban use [11]. Urban expansion can occur in several spatial forms, however it typically occurs on the outskirts of cities. From the standpoint of spatial morphology, it appears that existing urban land is expanded to create new urban land. Because of this spatial relationship, two-dimensional space continuity characterizes urban growth. The most crucial component of a physical diffusion process is spatial continuity. Urban expansion occurs when non-urban land is changed into urban land. This one-way transformation is typically irreversible, making it challenging to revert urban land back to its original use. Thus, the process results in two spatial forms: urban and non-urban [12]. Urban expansion occurs whether or not it is adequately planned. However, the detrimental effects resulting from lack of planning are more severe for socioeconomic activities, environmental, cultural, local resources, and the city as a whole system [11]. Urban expansion in Ethiopia is driven by a combination of economic, social, and political factors, and is also influenced by the geography of urban centers. Key contributors include rapid increase in urban population, rural-urban migration, increased housing demand, decentralized urban governance, and infrastructure development. The cumulative impact of urban expansion includes informal economic activities, unplanned settlements, uneconomic use of land, boundary conflicts between landowners, illegal land holdings, and the abuse of public spaces such as green areas, leftover spaces, and buffer zones. These, in turn, result in socioeconomic chaos, and environmental degradation including surface and ground pollution, habitat damage, unplanned urban growth, and unsustainable overall urban development [13]. Despite this, the evaluation of urban planning effectiveness in managing urban expansion faces difficulties because of the lack of a solid theoretical foundation, empirical studies, and unsound evaluation techniques. Moreover, the practical impacts of land use plans remain inadequately captured by conformance evaluation [14]. Urban planning, as one of the most critical guidelines for managing urban growth, plays a vital role in controlling land use and guiding urban development. By coordinating development timelines, spatial layouts, and growth scales, urban planning aims to foster sustainable and rational city development. However, current urban planning practices exhibit several deficiencies in effectively guiding urban growth. In contemporary rapid urbanization, the alignment between urban planning and actual urban growth has become misplaced [15].

2. Statement of the Problem

Unmanaged expansion causes environmental degradation, damage to natural resources, economic hardship and social exclusion [13], and costs of service provision and leads to under or un-serviced urban areas, unequal access to service, haphazard conversion of peri-urban agricultural land, and

villages [4]. Urban dynamics whether planned or unplanned, can both cause changes to the structure, shape, and functions of built and non-built areas [16]. The multifaceted ups and downs of urban planning practices in most developing countries have been facing difficulties in managing rapid urbanization [14]. However, despite the rapidly growing urbanization, there have been no significant investments taking place in urban planning to manage rapid expansion, consequently, towns and cities are largely failing to manage such growth [17]. Ethiopia, as one of the rapidly urbanizing countries in Africa, these challenges have been practiced on the ground [18]. Such urbanization is intertwined with urban dispersion, urban sprawl or suburbanization, land speculation, and grabbing leading to unmanaged physical expansion with sole land urbanization [19]. Especially, smaller and secondary towns of Ethiopia are relatively growing faster in economic activity, population size, and socio-political aspects even than the primate city (Addis Ababa), but have less capacity to plan and manage urban development and promote sustainable employment opportunities and economic growth [10]. The prior empirical research verified that the towns under this study have been confronting the issues associated with rapid urbanization as well as the limitations of urban planning to address these issues. For instance, Hossana town has been facing major challenges in infrastructure provision, large numbers of rural to urban migrants, rapid expansion with informal settlements dominance, and increased demand for housing [20, 21]. A research conducted on urbanization, ur-

ban planning effectiveness, and related issues in Arba-Minch town found that the results of rapid urbanization such as the proliferation of informal settlements in different pockets of the town, poor vacant land management, loss of biodiversity, and failure of the existing urban plan to manage such challenges [22]. The scholars who studied urbanization-related issues in Wolaita-Sodo town revealed that rapid urbanization due to different causes has been affecting the socioeconomic and environmental development of the town. The high number of youth rural-urban migration, urban crime and violence, irregular and uncontrolled urban expansion, informal economic activities, and unemployment collectively challenge these phenomena [23-26]. In general, the researchers all argue that the towns have been practicing social, economic, and environmental challenges due to increasing unmanaged urban growth, rural-urban migration, scarce municipal service provision and weak administration, and ineffective urban plan preparation and implementation. As a result, the researchers recommended in various ways that a paradigm shift in urban planning and development is required to promote urban economic activities, manage the spread of informal settlements, ensure community participation, sustain a healthy urban environment, and maximize economic utilization of urban and peripheral resources. Therefore, the previously discussed theoretical and empirical considerations related to urban planning and urban expansion management issues form the foundation for undertaking this study.



Source: Ethiopia Zones' and Woredas' GIS shape files, produced by the researcher, 2023

Figure 1. Location of the study area.

3. Justification for the Selection of the Study Areas

Among four first-level towns in the former Southern Nation Nationalities and Peoples Region in Ethiopia, the three towns: Arba-Minch, Hossana, and Wolaita-Sodo were selected as case study towns. These towns are categorized as the first-level towns in the region next to Hawasa, which was the capital seat of the region. These towns are endowed with comparative and competitive advantages which are opportunities for future urban development. Though these towns are competitive urban centers in the region and even in the country, the empirical literature has found that they are experiencing alarmingly growing population, rural-urban migration, unemployment, urban sprawl, and other urban development challenges. These phenomena necessitate current research to develop an effective urban planning scenario that addresses the impacts of uncontrolled urban expansion and urban planning failures in the case study towns.

4. The Objective of the Research

Due to the various challenges arising from rapid urbanization, as disclosed in the preceding sections, this study aims to evaluate the practice of urban planning and identify its limitations in managing urban expansion in the selected study towns. As a result, this study seeks to recommend appropriate solutions to address these gaps.

5. Ethical Consideration

This section presents a set of principles and values that were followed while conducting this particular research. Ethiopian Civil Service University's Research Affairs Directorate has reviewed and approved that the research proposal was in accordance with the university guidelines and research ethics considerations. This made sure that no one acted in such a way that was harmful to the institutions, community, or an individual. There are the most important principles related to ethical considerations when conducting research [27]. Among others, the following principles are applied in this research. The researcher's identity, the research matter and its objective, and the participants' roles are explained before the data collection process. Respect for the dignity of research participants was maintained and full consent of the participants was obtained before the data collection. The privacy, anonymity, and confidentiality of research participants have been ensured. Moreover, any dishonesty, misleading information, biases, or exaggeration is avoided, and any type of communication in relation to the research is conducted honestly.

6. Materials and Methods

Because of its ability to incorporate elements of both qualitative and quantitative approaches, this specific research employed the mixed methods approach to conduct the whole procedure to attain the intended objective. A concurrent strategy of research approach was used to collect both forms of data simultaneously and analyze them separately, and the overall results were then interpreted and integrated to reach a meaningful result. Both qualitative and quantitative data were used and obtained from primary and secondary data sources. To assess the perceptions of experts in urban development sectors concerning the subject, the sampling was derived from 1193 urban development experts, representing the total population of the study towns, who are working in the municipalities and zonal urban development offices. The researcher applied Evan Morris' sample size formula of small populations, rather than applying the rules of thumb, and obtained 400 sample sizes and proportionally distributed to the three study towns. A cluster sampling method was used to select the respondents from each department maintaining a professional mix including urban planners, land administrators, environmentalists, economists, sociologists, etc. Key informants from academic institutions and consulting firms who are engaged in the urban development field participated in interviews to share their practices and views on the study theme. The physical observation was also conducted to collect firsthand spatial information of the study towns. To complement primary data sources, secondary data sources such as spatial and non-spatial urban planning documents; national urban development policy documents, national urban development spatial plan documents, and other related literature were reviewed. Thus, a written questionnaire for the survey, interview, and physical observation were the data collection instruments used in this research. Descriptive statistics and factor analysis were applied to analyze the data. The reliability and validity of indicators were tested accordingly, and finally, the result was presented in text, tables, and figures formats.

To achieve the intended objective, the researcher designed the indicators that can explain how urban planning has been managing urban expansion. The indicators were adopted based on the theoretical and practical concepts of the urban planning process such as community engagement, inclusiveness, practicability, urban planning goals, and the characteristics of urban expansion. This significantly complements the spatiotemporal analysis results. Therefore, eighteen items were designed to measure this phenomenon in the study area, and the survey was conducted to assess the perception of respondents concerning the issue, and practice of urban planning in managing urban expansion. The principal factor analysis technique was employed to reduce these multiple indicators into a smaller number of factors that extract maximum common variance from all variables and put them into a common score. As a result, by suppressing small coefficients,

less than 0.5, the analysis was conducted on only eleven items. Sampling adequacy was measured by Kaiser-Meyer-Olkin (KMO) test and the statistical significance of the correlation of variables was checked by Bartlett's Test of Sphericity and

correlation matrix. Moreover, the Pseudo-R-Square result indicated that the independent variables (indicators) perfectly explain the dependent variable.

Table 1. Sampling adequacy measure and variables correlation significance.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.835
	Approx. Chi-Square	6672.257
Bartlett's Test of Sphericity	df	55
	Sig.	.000

Source: Factor analysis result based on survey data

The result shows the sampling is adequate with KMO measure 0.835 which is highly acceptable and Bartlett's Test of Sphe-ricity also shows that it is significant, implying that the items are correlated to each to each other.

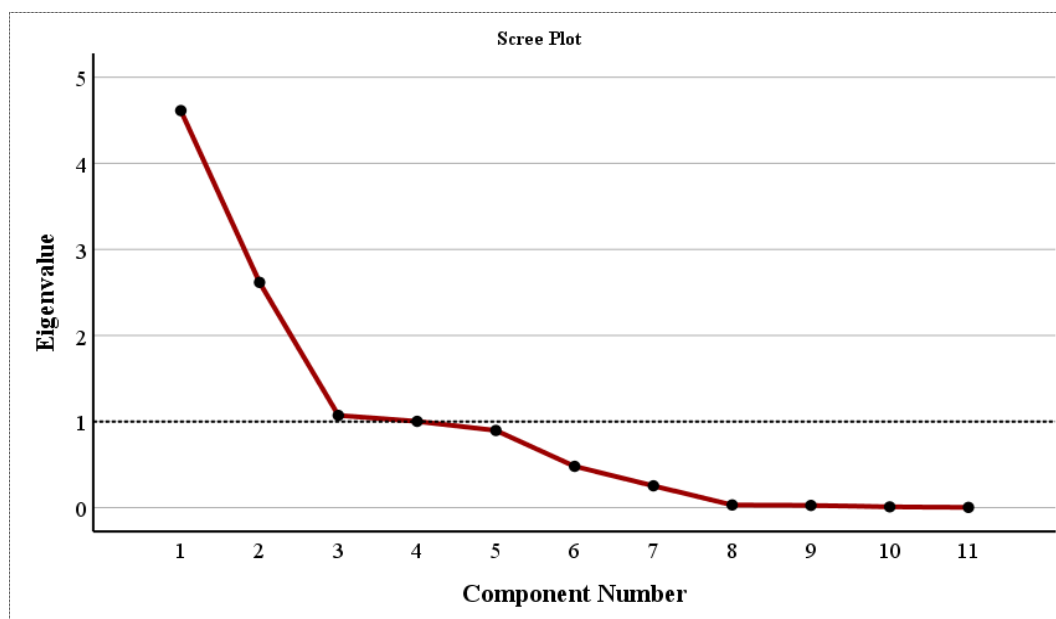
Table 2. The higher explaining constructs.

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.613	41.938	41.938	4.613	41.938	41.938	4.544	41.311	41.311
2	2.616	23.784	65.722	2.616	23.784	65.722	2.646	24.050	65.361
3	1.071	9.739	75.461	1.071	9.739	75.461	1.086	9.874	75.236
4	1.002	9.108	84.569	1.002	9.108	84.569	1.027	9.333	84.569
5	.896	8.149	92.717						
6	.480	4.361	97.079						
7	.254	2.306	99.385						
8	.030	.276	99.661						
9	.026	.235	99.896						
10	.009	.081	99.977						
11	.003	.023	100.000						

Extraction Method: Principal Component Analysis.

Source: Factor analysis result based on survey data, computed by the researcher, 2023

The analysis table indicates that the eleven indicators are reduced to four factors with Eigenvalues greater than 1.00. These factors explain 85 percent of the total original variables. The table and the screen plot also present the remaining seven indicators with an Eigenvalue of less than 1.00 and have explained only 15 percent of the total original predictors.



Source: Factor analysis result based on Survey data, computed by the researcher, 2023

Figure 2. Screen plot of Eigenvalues greater than 1.00 which explains with higher explaining indicators.

The higher the loading value, the more the factor is representative of the respective indicator. The naming of these factors is done in a way that best represents or encompasses the indicators associated with them. On this basis, the first factor was named ‘urban spatial growth management’, the

second factor was entitled ‘community engagement in urban planning’, the third factor was entitled ‘change in economic activities’, and the fourth was ‘peri-urban community acceptance of urban planning’.

Table 3. Indicators categorized to form a common factor

Rotated Component Matrix ^a				
Indicators	Component			
	1	2	3	4
Community members in expansion areas have engaged in urban planning and decision-making process		.970		
Community members have a clear knowledge of urban planning issues		.798		
Urban planning has ensured economic urban land use	.865			
Urban planning has protected urban environments	.988			
Urban planning has created an opportunity for formal urban housing	.968			
Urban planning has reduced informal settlement and haphazard growth	.989			
Urban planning has revitalized urban decay to efficient urban land utilization	.979			
Urban planning has maintained farmland in peri-urban areas	.985			
The urban planning process has been welcomed by the peri-urban community				.921
Urban planning has been accepted as guiding and binding urban laws				.865
Urban planning has promoted the interest of the community to experience an urban way of life in expansion areas			.677	

Rotated Component Matrix^a

Indicators	Component			
	1	2	3	4

Urban planning has shifted economic activities in expansion areas .782

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 4 iterations.

Source: Computed from survey data by the researcher, 2023

The first factor, urban spatial growth management, was adopted from the first component with the highest loading value of 0.989, which represents the indicators in this component. The second factor, community engagement in urban planning, was also derived from the second category of components with the highest loading value of 0.970, which is expected to represent the other indicator in this category. The third and fourth factors were adopted in the same method. These factors, which were adopted to measure ‘the practice of urban planning in managing urban expansion’ in the selected study towns in Ethiopia, align with the elements impacted by unplanned urban expansion in most of the Global South, as discussed by Angel in 2023. Thus, the central themes of this research unveiled for discussion are urban spatial growth management, community engagement in urban planning, change of economic activities, and peri-urban community acceptance of urban planning.

7. Results and Discussion

7.1. Results

The respondents’ perceptions were surveyed, an interview with key informants was conducted, and the physical urban expansion areas were observed to evaluate the practice of urban planning in managing urban expansion from the perspectives of these themes. The survey analysis results on the participants’ perceptions regarding the indicators that explain the trends of urban planning in managing urban expansion showed that the majority of respondents disagreed with the indicators of these trends. Hence, the failure to enhance the identified factors in the study towns depicts that urban planning has also failed to manage urban expansion.

Interviews conducted with key informants also ensured that urban planning in their town has been unable to manage urban expansion and development due to various reasons. These include the right person for a position, a healthy working environment, professional freedom in the urban planning and implementation process, financial capacity and logistics for the urban planning process, legal backing, and

political support. The physical observation actualized the urban planning limitations to manage urban expansion through expansion areas of the towns under the study. Urban sprawl, unplanned road networks and land uses, degraded urban environment, and insecure living and working environments are the characteristics of the expansion areas of the study towns.

Moreover, the spatiotemporal analysis of the case study towns was conducted using online geospatial data and the earlier and existing spatial plans of the case study towns. This was used to evaluate the built-up area and urban planning guidance. This also revealed that built-up areas of the last more than 30 years were not according to urban planning guidance. The built-up area analysis results from different periods did not match the land use budgets for built-up areas proposed in the urban plans for those respective periods. This significantly complements the analysis results obtained from interviews, surveys, and physical observation.

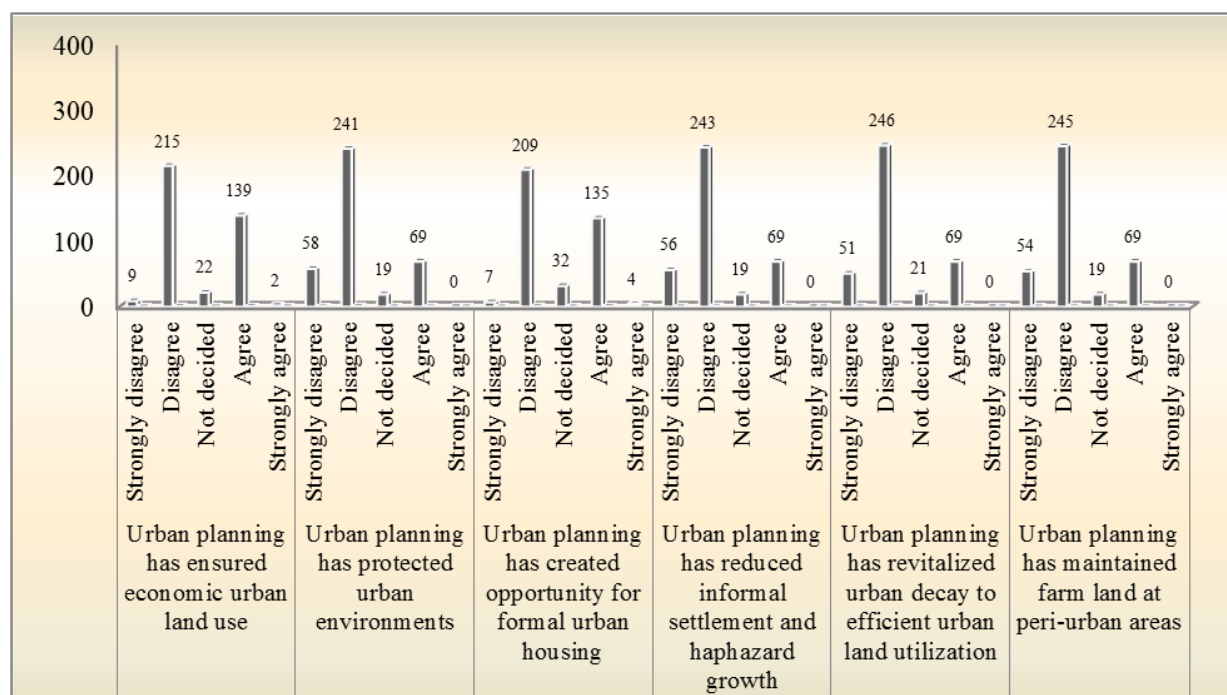
7.2. Discussion

7.2.1. Urban Spatial Growth Management

Effective urban planning is a tool that manages spatial growth by guiding and coordinating diverse factors by reducing urban sprawl. The items used to assess the perception of respondents which are close to explaining the factor ‘urban spatial growth management’ included, urban planning has ensured economic urban land use, urban planning has protected urban environments, urban planning has created an opportunity for formal urban housing, urban planning has reduced informal settlement and haphazard growth, urban planning has revitalized urban decay to efficient urban land utilization, and urban planning has maintained farmland at peri-urban areas.

The respondents’ perception was collected by Likert scale measurement of multiple options questionnaire varying from strongly disagree to strongly agree on the specified items. The underlying statistical analysis presents the respondents’ perception of the items that build ‘urban spatial growth management’ which is one of the manifestations of urban planning in

managing urban expansion in the urbanization process.



Source: Computed from survey data by the researcher, 2023

Figure 3. Respondents' perception of urban planning in urban spatial growth management.

The statistical report shows the varying respondents' perceptions concerning urban planning on urban spatial growth management in the case study towns. More than 80 percent disagreed on the items that explain how urban planning significantly manages urban spatial growth. A small number of respondents agree that urban planning has been playing an important role in economic urban land use, urban environment protection, formal urban housing opportunity, reducing informal settlement, revitalization of urban decay, and maintaining farmland in the case study towns. However, the overall analysis result reveals that the spatial growth of the town is not effectively managed in terms of the variables used to measure the effectiveness of urban planning in spatial growth management. It also indicates that the rapid spatial growth of the towns is the result of the limited guiding role of the urban plans. As a consequence, the town faces challenges related to social, economic, and ecological aspects, necessitating a more comprehensive urban planning and implementing approach to sustainable urban spatial development.

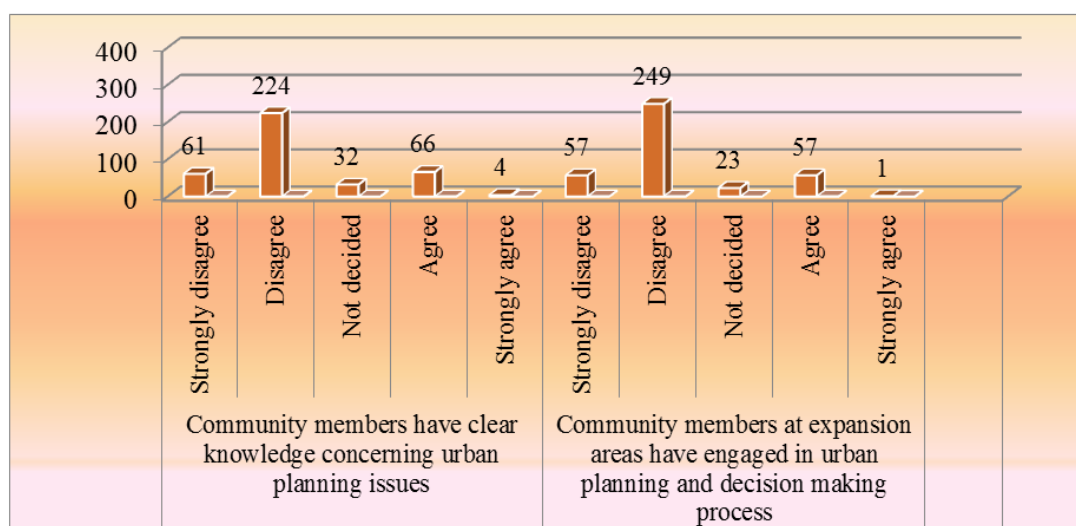
7.2.2. Community Engagement in Urban Planning

In urban development planning, greater inclusion of citi-

zens leads to a more equitable distribution of resources, helps to reduce inequalities, and makes urban plans implemented transparently and consistently. In relation to community engagement, the researcher conducted surveying to assess the respondents' perception of the issues focusing on their knowledge concerning urban planning issues and their engagement in urban planning and decision-making process. The result indicates that most respondents disagree with the community members' knowledge of urban plan issues and their decision-making in the urban planning and development process.

More than 73 percent of the respondents disagreed with the knowledge of community members concerning urban planning issues and 79 percent of them also disagreed on the issue of community engagement in decision-making during urban planning.

Besides the survey data analysis report, most farm landholders who participated in the interview ensured that they have no experience in participating urban planning process except for some information when the implementation process takes place and their land is required for public development purposes.



Source: Computed from survey data by the researcher, 2023

Figure 4. Respondents' perception concerning community engagement.

The implication is the urban community has minimal awareness concerning urban planning issues and limited engagement in urban planning and development decision-making process. The evidence shows that these are due to the limitations both from the community and urban governance side. The community's interest and commitment to engage in urban planning issues of their town has been in need to be advanced. Whereas, urban governance of the case study towns is also weak in furnishing the system to participate the community members at various corners of the town in various urban planning and development stages.

7.2.3. Change in Economic Activities

To ensure that land uses, housing growth, and infrastructure investments are all coordinated and integrated into ways that minimize environmental consequences and optimize sustainable economic and social development, clearly spatial plans are required to govern urban development. Having this fact, the researcher has surveyed the respondents' perception of the items that build 'economic change' which is one of the manifestations of urban planning in managing urban expansion. The analysis result indicates that, in the case study towns, urban planning has been playing an insignificant role in changing economic activities, particularly in expansion areas. 89 percent of the respondents disagreed with the ability of urban planning to shift economic activities and 82 percent of the respondents also disagreed with the ability of urban planning to promote the interest of the community to experience an urban way of life in expansion areas of the case study towns.

Table 4. The respondents' perception of urban planning on urban economic change.

Predicting questions	Responses	Count
Urban planning has shifted economic activities in expansion areas	Strongly disagree	53
	Disagree	291
	Not decided	1
	Agree	40
	Strongly agree	2
Urban planning has promoted the interest of the community in expansion areas to experience an urban way of life	Strongly disagree	49
	Disagree	269
	Not decided	28
	Agree	40
	Strongly agree	1

Source: Survey data computed by the researcher, 2023

It is a fact that urban planning presupposes and reshapes urban form, morphological structure, public space, building conditions, settlement compositions, municipal services, infrastructure, economic basis, and flows of people and economic activities across the urban region. However, analysis of survey data and physical observation reveals that such a complete set of urban planning has not been grounded to ensure urban economic change in the study towns, particularly in the expansion areas.

Moreover, interviews conducted with key informants (academicians and consultants) also ensured that urban planning in their town has been unable to manage urban expansion.

sion and development.

Interviewee A (academician): The role of urban planning in managing urban expansion is not only about the technical aspects of planning rather it is about the soft aspects of administration. This includes the right person for a position, a healthy working environment, professionalism in the urban planning and implementation process, financial capacity and logistics for the urban planning process, legal backing, and political support. These factors are the major challenges in such towns that have been obstructing the management of urban expansion and its negative consequences.

The proliferation of informality has also impacted the current urban planning role in managing urban planning.

Interviewee B (academician): "Urban planning of such towns is lagging behind rapid urbanization and uncontrolled expansion. One of the manifestations is the proliferation of informal settlements and growing far apart from the formal pace contributing to the prevalence of informal activities. The prevalence of informal settlement together with informal economic activities plays a great role in declining the applicability of formal urban planning, and in turn, this weakens the ability to manage urban expansion."

Massive rural-urban migration is another face that has been challenging urban planning to manage urban expansion in the case study towns.

Interviewee C: "Urban planning is not playing its leading role in managing the increasing unplanned urban expansion in my town, Wolaita-Sodo, due to massive rural-urban migration. Thus, these people practice urban economic development spontaneously, practicing miserable urban life in unhealthy environments, particularly in lower-level

community members in unplanned expansion areas of the town. In addition, basic municipal services, infrastructures, urban security issues, and formal administrative services are not accessible in informally expanded neighborhoods."

In general, the survey results, interviews, and physical observation conducted in the study towns have proved that urban planning has not been playing its leading role in managing unplanned urban expansion. This is mainly due to the influence of various obstructions from the planning side, technical issues, and administrative and political issues.

7.2.4. Peri-urban Community's Acceptance of Urban Planning

Urban planning is a tool and binding urban law that guides the overall urban development process in the urban system. Thus, the community's understanding of urban planning and being cooperative in urban plan preparation and implementation process are important issues for the integrated development of urban core and peri-urban areas. However, this study shows that the peri-urban community's perception of selected urban planning issues has not been supportive of urban development. The two survey questions forwarded for the respondents to examine the peri-urban community's perception were, whether the urban planning process has been welcomed by the peri-urban community or not and whether urban planning has been accepted as guiding and binding urban laws or not. The table below presents the percentage of responses reflecting the respondents' perception regarding the peri-urban community's welcoming to the urban planning process and their acceptance of urban planning as guiding and binding urban laws.

Table 5. The respondents' perception of the peri-urban community on urban planning issues.

Predicting questions	Responses	Percent
The urban planning process has been welcomed by the peri-urban community	Strongly disagree	11.9%
	Disagree	70.3%
	Not decided	4.1%
	Agree	13.4%
	Strongly agree	0.3%
Urban planning has been accepted as guiding and binding urban law	Strongly disagree	15.0%
	Disagree	62.3%
	Not decided	4.9%
	Agree	17.8%
	Strongly agree	0.0%

Source: Survey data computed by the researcher, 2023

More than 80 percent of the respondents disagreed that the urban planning process is welcomed by peri-urban community members. Whereas, about 77 percent of the respondents disagreed that urban planning has been accepted as a guiding and binding law. This result depicts that the urban planning process has been taking place without the wholehearted support of the peri-urban community. The message is; that the multifaceted limitations of urban plan implementation in peri-urban areas have been the result of a lack of cooperation between the plan-preparing body and this community. Likewise, the sense of belonging within the community in response to any development in these areas has not been productive. The implication also shows that planning urban expansion, providing infrastructures, and integrating urban centers with their periphery is not such an easy task to perform. Moreover, most respondents disagree that the community members in peri-urban areas accepted urban planning as guiding and binding urban laws. This explicitly indicates that the failure of the community to understand urban planning as a guiding and binding urban law innate the supremacy of informality and the decline of planned urbanization.

Besides the survey data collected from the experts, interviews were conducted with selected farmland holders from immediate-expansion areas of the case study towns. The overall result indicates that they have no clear understanding of urban planning and related issues. Most interviewees confirmed that they have never been a part of the urban plan preparation process of their town. They also explain that they have no idea regarding the urban planning process and related issues except they are forced not to build any permanent buildings otherwise the municipality gives them a permit to do so. But they know that this restriction has been executed due to the expansion of their town. They also confirm that they have no knowledge concerning urban planning is a guiding and binding urban law that guides all urban development in the town jurisdiction. Among other interviewees and discussions, the following interviewee statement explains the common practices of the case study towns, particularly in peri-urban areas.

Interviewee D: "We have benefited from the town structure in multiple ways such as selling our agricultural products at good prices; we also get better services of health, education, and manufactured goods from the town which are not accessible in rural Kebele. But we are always in fear of relocation due to the engulfing of the town expansion. Moreover, the municipality has been deterring our freedom on our property and does not give a guarantee to develop permanent property to cultivate, build, and transfer. We have been also facing challenges in administrative issues as we are at the fringe of both structures" (the farmer from the expansion area of Arba-Minch town).

In conclusion, the peri-urban community's understanding of the urban planning process and related issues has not been significant in supporting urban development in the case study towns. The implication is the community members as stake-

holders have failed to take part in the urban planning and development process to achieve inclusive and sustainable urban development. As a result, the urban plan of the study towns has hardly managed urban expansion by engaging, alerting, and empowering peri-urban community members.

7.2.5. Spatiotemporal Trend Analysis of Urban Expansion

Analyzing the spatiotemporal change of the built-up area of a particular urban landscape is an important method to understand the impacts of rapid urbanization on non-urban areas and its pace over time.

Thus, the spatiotemporal analysis of the case study town was conducted by using online geospatial data and the earlier and existing spatial plans of the case study towns. This supported the researcher to triangulate the results obtained from survey data, interviews, and physical observation. On the other side, the researcher examined whether the urban plans of the case study towns have been leading their physical growth. The built-up area of the study towns ranging from 1985 to 2015 was calculated by GIS software using the online geospatial data hosted by the Earth Observation Center (EOC) of the German Aerospace Center (DLR).

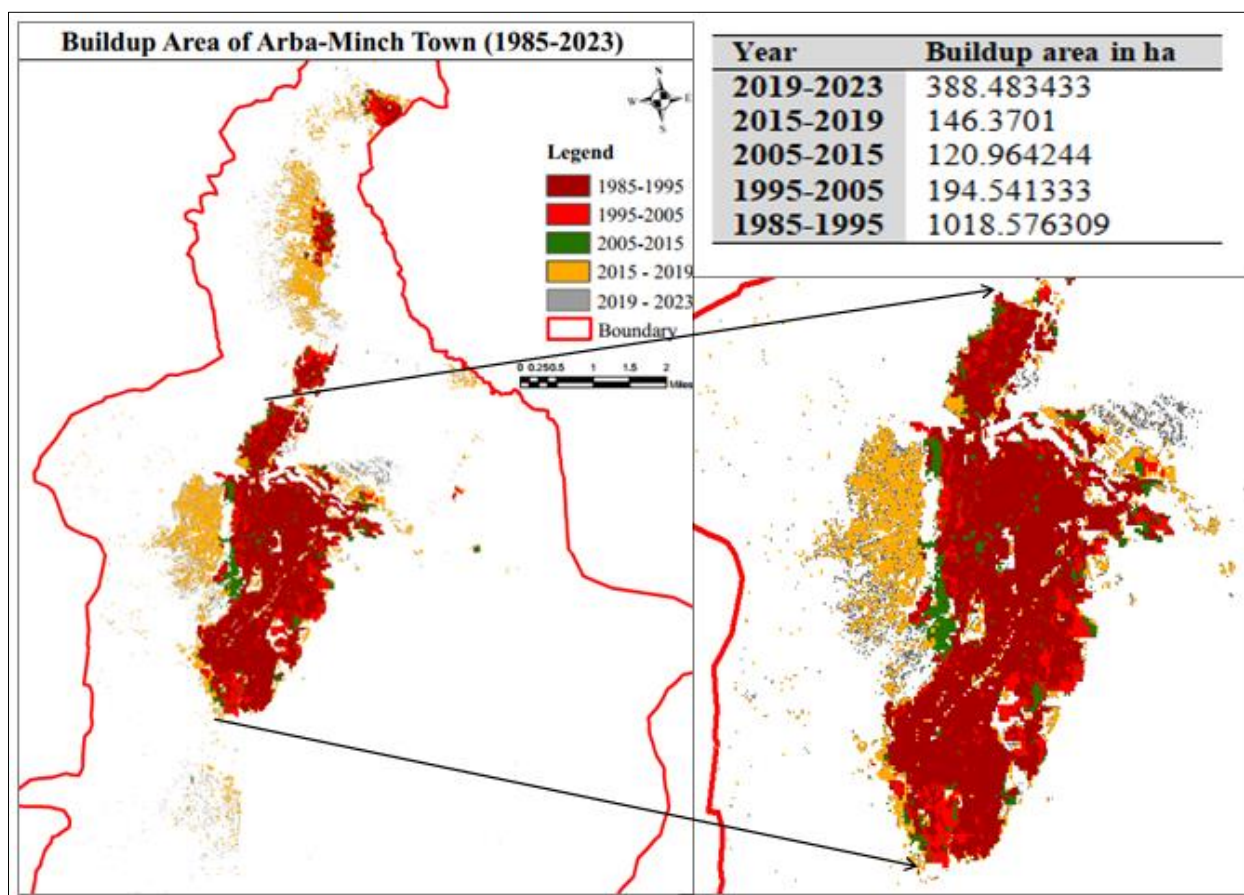
When the spatiotemporal analysis of buildup areas of the study towns compared to the planned spatial coverage of the towns, there has been a wide difference. The pace of the buildup area within the current administrative boundary of the towns has been expanding spontaneously beginning from their establishment. Whereas, the available urban planning documents show that the proposals for 20 or 10 years of planning periods for various urban functions including buildup, open spaces, and conserved areas did not match with the buildup areas occupied spontaneously. In some planning periods, planned spatial coverage was larger than the actual buildup areas, and in other planning periods, the unplanned buildup areas exceeded the planned urban jurisdictions.

For instance, Arba-Minch town occupied about 1018 ha of buildup areas since 1995, about 195 ha of additional area in 2005, and about 388 ha of buildup area was extracted in 2023 as shown in Figure 5. However, the buildup area of the town at the end of the first master planning period was 590 ha from the total 1095 ha planned area. Though the buildup areas of late plans of the town were not audited, the total planned area of the town in various planning periods was not proportional to the rate of spontaneous buildup areas in the town boundary. The 1985 development plan of the town covered 2190ha, the 2010 structure plan covered 5556 ha, and the 2022 strategic plan bounded 18757 ha of land for the next 10 years' planning periods.

The implication is urban planning of the town in various planning periods was not proactive in projecting the appropriate planned buildable land in the given planning periods to manage the spontaneous expansion of the town. In recent years, the buildup area analysis shows that, within four years,

2015-2019 and 2019-2023 on average 267 ha was become buildup areas spontaneously. Whereas, for instance, from the first master plan of the town only 590 ha (53.9%) of the total planned area was covered by buildup area in 20 years of planning period meant that an average of 118 ha in four years which was less than twice that of the spontaneous build-up

areas. From the 2010 structure plan which covered 5556 ha, only 2383.53ha (42.9%) was developed and 3173.09ha (57.10%) was undeveloped in the planning periods, implying that the planned build environment increased at a decreased percent compared to its earlier planning period.

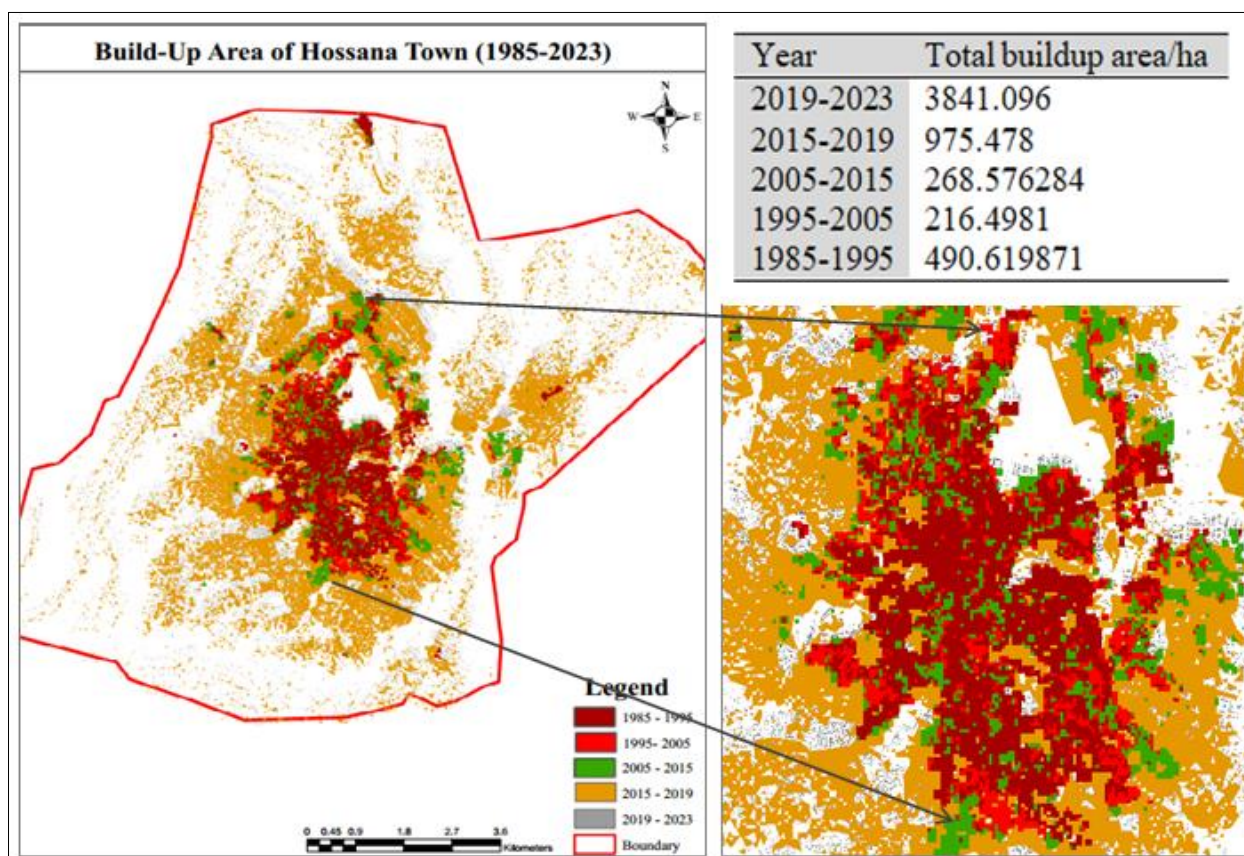


Source: EOC of the German Aerospace Center (DLR), executed by the researcher, 2023.

Figure 5. Buildup area of Arba-Minch Town (1985-2023).

Similarly, the buildup area analysis of the last more than 30 years of Hossana town was also examined parallel with the buildup area guided by the urban plan of the town. The result shows that the town within the existing administrative boundary has experienced very dense settlements and related building environments. The analysis indicates that, up to the early 1990s, there was only about 491ha of buildup area which was alarmingly grown to about 7880.77 ha at the beginning of 2023. During the establishment of the town, there was a manageable slowly growing built environment. At the end of the 20-year planning period of the 1967 first master

plan (at the end of the 1980s), 642.80 ha or 92.6% of the total planning boundary (693.64ha) was implemented and occupied by various urban functions including building environments. These figures show that urban plans are still not anticipatory to accommodate and guide such booming urban expansion, building revolution, and unseen future urban development demands. Recently, for the last two decades, urban plans of the town become severely handicapped to manage and guide spontaneously growing buildup areas in almost all directions of the town.



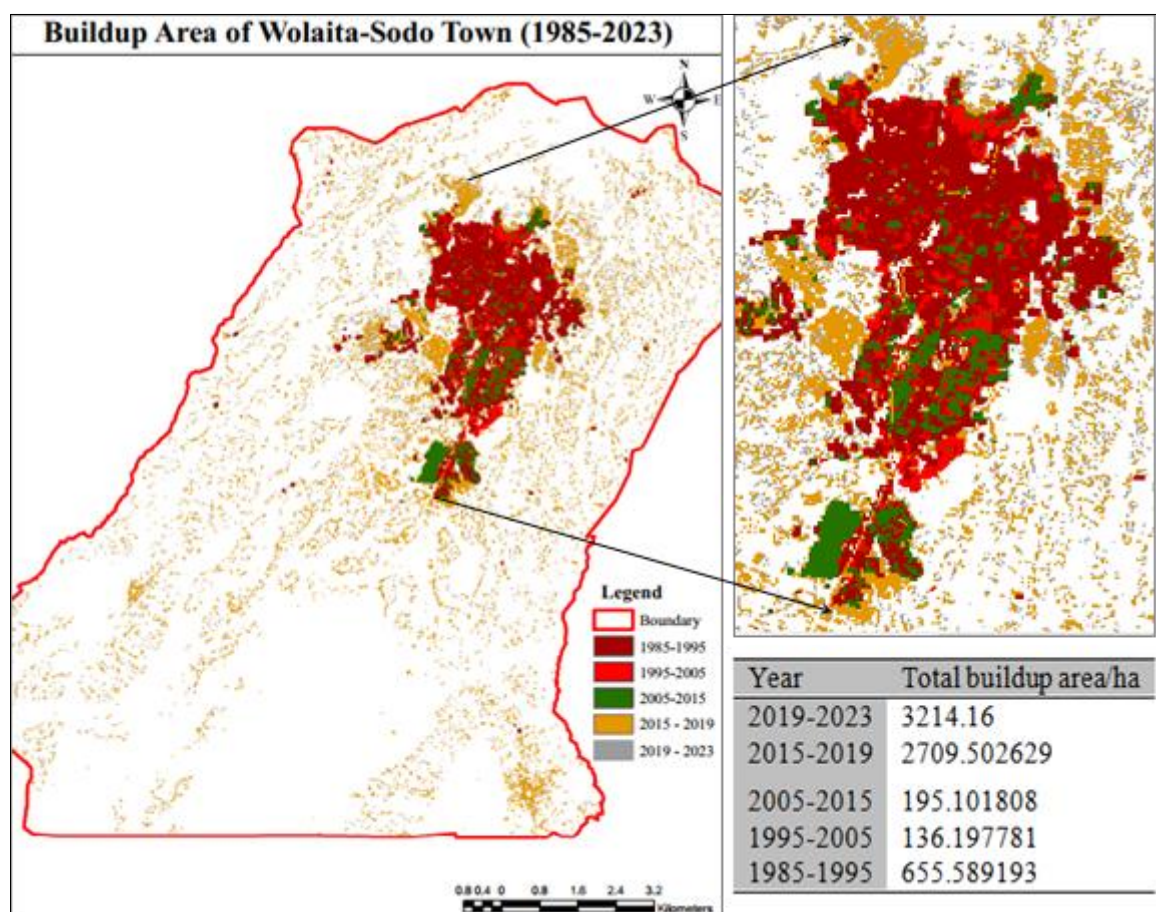
Source: EOC of the German Aerospace Center (DLR) and SP of the town, executed by the researcher, 2023.

Figure 6. Buildup area of Hossana Town (1985-2023).

Though the planning boundary of the 2000 development plan enclosed 1776.3 ha of land and the 2013 structure plan of the town contained 10028.14 hectares, most settlements, and building activities have been taking place out of the guidance of the respective urban plans. The existing planning boundary was almost occupied by various urban functions and most activities have spontaneously taken place. Since 2023, the buildup area alone accounts for 7880.77 ha which was 78.59 percent when compared to the planning area of the 2013 structure plan. The implication is that various urban functions including build environments foregoing urban plans of the town without maintaining the guiding role of authorized urban plans.

Finally, the same analysis was conducted to determine the buildup area of Wolaita-Sodo town to examine the guiding role of urban planning in managing spontaneous urban ex-

pansion. The analysis result shows that the town had a buildup area of not more than 1000 hectares until 2015. There was a slower rate of buildup area occupancy during these periods compared to the recent periods. Due to its zonal political and administrative seat and socioeconomic change, the town experienced an alarming expansion of settlement formally within the urban planning framework and informally without the guarantee of urban planning in the planning boundary and outside the planning boundary of the town. The buildup area analysis report confirms that during these periods there was a significant change in buildup area rating from 986.88 ha in 2015 to 3214.16 ha in 2023. Though the town had the first master plan in 1967 and the second in 1987, there was no recorded evidence to examine the managing role of these plans concerning the built environments of the town.



Source: EOC of the German Aerospace Center (DLR) and SP of the town, executed by the researcher, 2023.

Figure 7. Buildup area of Wolaita-Sodo Town (1985-2023).

The third and fourth plans of the town were structure plans prepared in 2007 and 2018 covering about 3200 and 16376 hectares respectively. The performance audit of the 2020 structure plan's half-planning period urban plan implementation, conducted by the Ministry of Urban and Infrastructure Development reveals that 5542.85 hectares (40.8%) of the proposal were implemented. According to the urban plan preparation and implementation strategy, 60 percent of the proposal is expected to be physical infrastructures and buildings (buildup environment), whereas, 40 percent of the proposal should be open spaces and greeneries. So, according to this performance audit report, 60 percent of the implemented proposal (assuming buildup area) corresponds to approximately 3325 hectares, which is equivalent to the buildup area analysis result of 2023.

An important finding from this discussion is that the built-up area of the town has been expanding at an increasing rate from year to year both in planned and unplanned areas. However, the unplanned spontaneous growth of the built environment has been challenging the managing role of urban planning. The implication is urban plans of the towns have failed to consider the current urban dynamics both nationally and locally. As a result, both formal and informal developments have preceded urban planning guidance re-

sulting in various social, economic, ecological, and spatial chaos and sustainable urban development challenges.

8. Conclusion

The objective of this research was to evaluate the practice of urban planning in managing urban expansion in the selected case study towns. The result was obtained by assessing the expertise's perception, key informants' interviews, physical observation, analyzing the past and existing urban plans, and trends of built-up areas of the towns. The way how urban planning has been managing urban expansion in the case study towns was measured by pre-designed indicators categorizing them into four factors.

The study result highlights urban planning's role in managing urban expansion is influenced by factors like improper staffing and unfavorable working conditions, urban plan abuses, scarcity of funding and logistics, and lack of legal and political support. Informal settlements and economic activity due to rural-urban migration result in unplanned urban activities, unhealthy living, inadequate infrastructure, security issues, and poor administration. In general, the triangulated analysis results confirmed that urban plans of the

study towns' executed in various periods had minimal impact in managing urban expansion. The major factors that affect the managing role of urban planning were summarized as poor urban spatial growth management, lack of community engagement in urban development processes and practices, weak economic advancement, and scarce understanding of peri-urban communities concerning urban planning's role in the urban development process. Therefore, the evaluation of the practice of urban planning in managing urban expansion in the case study towns indicates the need for appropriate solutions to bridge the gaps and ensure planned urban expansion.

9. Recommendations

To bridge the gaps and ensure the planned urban expansion of the study towns, the researcher recommends the following remedies.

- a) Enhancing community engagement practices through the inclusive planning process to manage uncontrolled spatial growth, advance local economic activities, and promote the peri-urban community's acceptance concerning urban planning and development issues.
- b) Adopting locally contextualized and integrated urban planning approach.
- c) Since the existing urban planning approach has not been significantly managing the existing rapidly growing urban expansion, this study recommends the alternative planning approach. To this end, the expansion area planning approach is proposed for the case study towns. This will promote planned spatial growth, community inclusivity in the expansion areas, mixed economic activity, environmental sustainability, and community awareness of expansion areas, all contributing to planned urban growth.

Abbreviations

EOC	Earth Observation Center
GIS	Geographic Information System
MUID	Ministry of Urban and Infrastructure Development
SNNPRG	Southern Nation Nationalities and Peoples Regional Government
SPSS	Statistical Packages for Social Scientists
SP	Structure Plan

Conflicts of Interests

The authors declare no conflicts of interest.

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