

Research/Technical Note

Conformance and Performance Evaluation of Land Use Plan of Yirba Town

Daniel Lirebo Sokido^{*}, Addisu Sherbeza Woldemariam

Department of Urban Planning and Development, College of Urban development and Engineering, Ethiopian Civil Service University, Addis Ababa, Ethiopia

Abstract

The purpose of the research is to examine the conformance and performance of land use plan of Yirba town. To get accurate and adequate information on the level of achievement of urban plan, primary and secondary data sources were used with respect to land use categories. Primary data sources such as land inventory and key informants interview were exhaustively employed. Land inventory was undertaken to have firsthand information on the existing situation of general as well as detail land use of the town. Key informants interview were conducted to gather data from experts Yirba municipality, and Sidama Region Urban planning Institute. Secondary data sources such as document reviews of basic plan and strategic Plan of Yirba town, urban development policy and other legal documents were used for investigation purpose. GIS, Microsoft office word, and excel were used to analyze the quantitative and qualitative data. The results of the analysis were presented in the form of maps, graph, chart, and tables. Descriptive and explanatory analysis research designs were employed. The results of analysis elucidates that conformance evaluation has vital contribution to avoid wastage of urban land and the best use of available space. The performance evaluation results make clear the overall achievement of urban plan for the stated town is low. Even though it is overlooked, the conformance evaluation that is conducted prior to the approval of the proposed plan and during implementation is crucial for preventing the wastage of urban land and significantly helps for proper implementation. A full-fledged performance evaluation is recommended before the commencement of new urban plan for the town. Conducting such performance evaluation helps identify the level of success or failure, and the gaps of the prior plan. Since action plans and phasing plans are tools for implementation, they must be developed in tandem with land use plans for the proper execution of urban plans. Urban planning is regarded to be a collaborative field. It necessitates cooperation of numerous teams or experts during the planning and execution stages.

Keywords

Conformance Evaluation, Performance Evaluation, Urban Plan Implementation

1. Introduction

One of the fundamental characteristics of human being is the ability to plan for the future [14]. Decisions over land use can transform cities from sites of overcrowding and conges-

tion into engines of national growth and prosperity [3]. Urban centers create value when they are well-planned and managed, which is the sum of all economic, social, environmental, and

^{*}Corresponding author: danlirsokido@gmail.com (Daniel Lirebo Sokido)

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intangible conditions [20]. Conversely, if poorly planned, and managed urban can become breeding grounds of poverty, inequality, and war [11]. This entails poor urban planning and management can have grave results for the urban economy, the environment and society [17].

Even the best urban plans have the risk of being underused if they don't accompany with financial and regulatory solutions for implementation [18]. Evaluation capacity, trustworthy institutions, and good urban government policy are all required for plan implementation [19]. Governments that properly plan and manage urbanization will reap the benefits that urbanization provides to society [1]. The implication is good planning is measured by the success and outcomes of its implementation [19]. This, in turn, implies to enhance the effectiveness of urban plans, a regular base evaluation is essential [13].

1.1. Conformance and Performance Approaches of Plan Evaluation

Evaluation of plan implementation is receiving more attention these days. However, in comparison to other domains of policy research, planning implementation assessment is less developed [8]. There are two conceptions of plan implementation in the planning evaluation literature: conformance-based and performance-based evaluations [14]. Performance-based approach emphasized the planning process, viewing a plan as a guide for future planning decisions rather than a blueprint [6]. When plans are viewed as visions, the performance method is frequently used, and it focuses on the role of plans in decision-making [12].

1.2. Conformance-based Evaluation

The success or failure of a plan is determined using set criteria in a conformance-based approach [6]. Plan conformity refers to whether or not the policies outlined in a plan are implemented [8]. Conformance-based evaluations are founded on the assumption that there are observable causal links between planning goals, activities, and outcomes, and they need well specified goals and objectives as well as well-implemented planning procedures [7]. As a result, conformance-oriented evaluation concentrates on achieving the urban planning goal. It focuses on the adoption of plan policies, permitting decisions, and land-use changes that have been observed [8]. Scholars compared the anticipated and actual land uses and densities, as well as the progress of the plan [7]. This technique is consistent with 'top-down' evaluation, in which a plan's/outputs policy's must precisely conform to its objectives [14].

To date, conformance approaches have become much more common, with research examining the acceptance of policies included in plans [8]. Conformity evaluation is carried out in accordance with technical procedures outlined in sectoral legislation [5]. The plan serves as a model for conformance

evaluation, which aims to uncover the plan's outcomes. Simply put, a conformance review examines if the plan's required steps were carried out. Did we establish a park here if we suggested one? [21]. The degree of conformity between a plan's outcomes and its set goals is used to determine whether a policy instrument is successful [14]. The conformance approaches views plans as blueprints whose requirements are finally mirrored in actual spatial development. As a result, the compliance method implies that plans are successfully implemented if the plan provisions are followed on the ground [12].

In general, the compliance technique is thought to be objective and simple to use, and it can immediately represent how well zoning maps have been implemented [15].

According to conformity evaluation, once adopted, plans are intended to be explicit guides to action. Outcomes must conform to the standards contained in the plan [2]. For instance by using the building permit as an indicator for plan implementation it is possible to measure the degree to which the plan conformed to their original design [2].

1.3. Performance-Based Evaluation

Comprehensive and strategic plans, which are considered as wide attempts to identify, design, and promote overall objectives and goals, are well suited for performance-based evaluation [7]. As a result, the effectiveness of plans is shown through their performance, which is considered a stronger sign of implementation than the exact match between objectives, actions, and outcomes [7]. Evaluation of plan performance has also been envisioned as being more in line with the concept of performance zoning, in which the focus is placed on tangible changes in community conditions rather than rigid adherence to use in decision-making scenarios for projects such as water quality protection, land-use patterns that support transit usage, hazard vulnerability reduction [8].

Plans are viewed as decision frameworks in the performance-based approach, which focuses on planning processes. In this approach, the plan serves as a guide for future decision-making rather than a blueprint [8]. When plans are viewed as visions, the performance method is frequently used, and it focuses on the role of plans in decision-making [12]. Performance-based approach emphasized the planning process, viewing a plan as a guide for future planning decisions rather than a blueprint [6].

In terms of time horizon, plan conformity review can begin soon after plan adoption and continue throughout the duration of the plan's intended horizon. Plan performance necessitates a longer observation period to observe the on-the-ground outcomes that occur from plan compliance actions [8].

Plan conformance refers to whether the principles or standards stated in a plan are implemented, whereas plan performance refers to whether a plan has an impact on the outcomes (e.g., increased pedestrian accessibility due to changes to land-use patterns or decreasing vulnerability to

natural hazards) [8].

1.4. The Debate on Plan Conformity and Performance

Plan performance is focusing on “whether the plan plays a role in those decision situations in which it was meant to be used [8]. Plan in the performance approach is a guide for the future decision-making process [14]. Plan conformance addresses whether the principles or standards proposed in a plan are carried out [8]. This denotes once adopted, the plan is supposed to be an unambiguous guide to action [4]. From conformance point of view any departure from the goals and objectives of the adopted plan would be considered a failure [2]. Arguments against the conformance approach hold that the evaluations overlook the unintended consequences of plans [21]. Depending solely on a conformity approach is rarely adequate [14] since conformance approach is characterized by an excessive dependence on idealized modeling [11]. It has the problem of uncertainty and rigidity [16]. In contrast, the performance method has its critics who argue that it minimizes the importance of urban planning and places too much focus on program achievements. Accordingly, performance approach stresses whether a plan has an impact on the outcomes [8]. This infers performance approach ignores the detailed prescriptions of the plan and instead attempts to evaluate the effectiveness of the plan along some dimension [21].

There are theoretical as well as practical problems with regard to conformance and performance evaluation and the determinants of urban plan implementation. Theoretical problems emanate from the view of scholars with the thinking that a well-designed urban plan will enhance the growth and development of the town. Theorists tended to plan making process and thus disregard the implementation of plan, which is a vital component of urban planning. The issues with empirical researches stem from the fact that scholars mostly used either the performance assessment or conformity approaches to examine the degree of urban plan implementation. There is a dearth of scholarly works that integrates performance and conformity approaches to assess urban plan and identify variables impacting their implementation. Combining plan conformance and performance techniques has the potential to help us better understand how and why plans and planning work or fail [8]. As a result, both plan conformity and performance methodologies are employed to assess the contribution of an urban plan to the growth and development of a small town in this research.

2. Materials and Method

The purpose of this study is to deeply examine the performance and conformance of land use of Yirba town. To get accurate and adequate information on achievement of urban plan, primary and secondary data sources are used for with respect to land use functions.

Primary data sources such as observation or land inventory and key informants interview were conducted. Land inventory activity was careful done to gain information on the existing situation of the general and specific land uses of the stated town. Key informants interviews were undertaken to gather data from experts Yirba municipality and Sidama Nation Regional State Urban Development and Construction Bureau, Urban planning Institute. Information related to number of land use changes made and revision activities so far made on the old land use plan (i.e. 2012) were collected from Sidama Nation Regional State Urban Development and Construction Bureau, Urban planning Institute. Key informants discussion with Yirba municipality was focusing on the implementation of the plan and the challenges faced while implementing the plan.

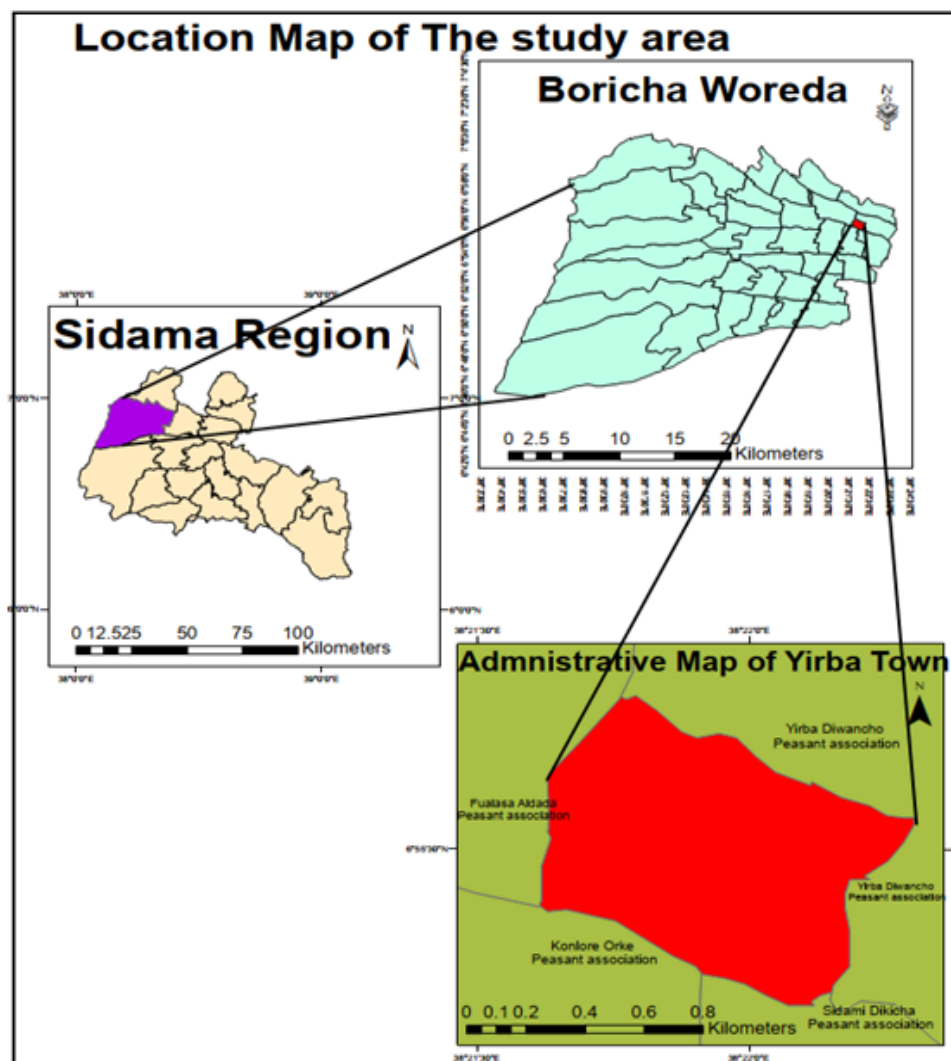
Secondary data such as document review such as basic plan and strategic plan of Yirba town used for investigation purpose. AUTOCAD data and related document of Yirba town were gathered from Sidama Nation Regional State Urban Development and Construction Bureau, Urban planning Institute. Moreover, Satellite imagery of 2022 was considered for performance evaluation for comparing the existing and the proposed road. Digitization of the existing road of Yirba town was made and tried to get accurate information the total area and the length of road by hierarchy.

Geographic Information System and Microsoft office word, and excel were used to analyze the quantitative and qualitative data. The results of the analysis were presented in the form of figure and table. Descriptive and analytic research designs were employed since the intension of the research is to assess the level of achievement of land use.

Description of the Study Area

Yirba town is situated 298 kilometers and 23 kilometers south of Addis Ababa and Hawassa respectively. Yirba town is found along Hawassa – Woliya Sodo asphalt road via Morocho. Currently the town is serving as administrative center of Boricha woreda.

Astronomically, Yirba town is located at 6° 55' North latitude and 38° 22' East longitudes.



Source: Personal GIS Computation

Figure 1. Location Map of the Study Area.

3. Result and Discussion

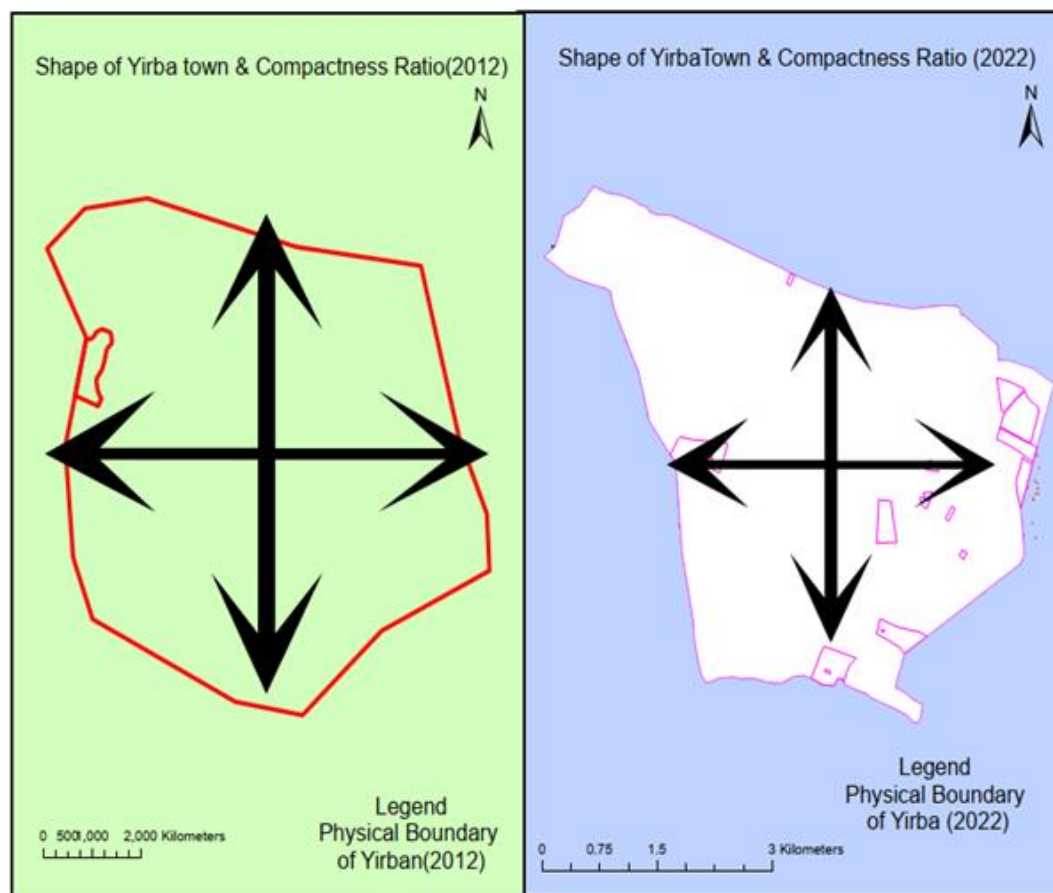
3.1. The Shape of the Town and Compactness Ratio

The shape of the town has vital importance for provision of infrastructure and to ensure fair service distribution. The shape of the town can be realized in terms of circular (compact), elongated and irregular. Compactness ratio measures the degree of deviation of an object (in this case map) from circle. Compact shaped towns are more preferable than elongated and irregular since in near circular shaped town, every corner is found at equidistance from the center and thus accessible for service and utilities. Moreover, for compact shaped town, the cost for provision of infrastructure is lower than the other two shapes. As far as the project town is concerned, to understand the shapes of two consecutive plans,

and calculation (compactness Ratio) are applied. The level of compactness can be found by observing one's necked eye. It is found by calculating the North- South and East- West – Distances are measured from the maps and thus divided. More compact or circular shape towns have compactness ratio closer to one (1) and deviation from one indicates elliptical shapes.

To measure compactness the area and the perimeter of the project town should be calculated from the map and thus by dividing the area and the perimeter as indicated below.

According to Ottensmann (2021) for more compact shape towns, the distances from the center of a circle to all points on the boundary are equal. Conversely, less compact and more irregular shape, will have variable distances from its center to various points on its periphery. A measure of that variation can be used as a measure of the compactness of the shape. The result of measure of ratio of distance is closer to one (1) for compact shape and deviation from one denotes elongation [10].



Source: Sidama Region Urban Planning Institute for AutoCAD & Personal GIS computation

Figure 2. Shape and compactness ratio.

To measure of distances of the two maps are indicated below:-

A Distances of the map of 2022 land use plan

North –South distance=7106 meter

East –west distance=4930meter

B Distances of the map of 2012 land use plan

North –South distance=5521 meter

East –west distance= 4690meter

$$\text{Compactness ratio for 2022 plan} = \frac{\text{East -west (m)}}{\text{North -South (m)}} = \frac{4930\text{m}}{7106\text{m}} = 0.69$$

$$\text{Compactness ratio for 2012 plan} = \frac{\text{East -west (m)}}{\text{North -South (m)}} = \frac{4930\text{m}}{5521\text{m}} = 0.82$$

As it is indicated on the above, the Compactness ratio land use of 2012 is 0.82 and Compactness ratio of 2022 is 0.69.

The results of the Compactness ratio calculation reveals that the shape of older plan land use plan (I.e.2012) with compactness ratio of 0.82 is more compact than that of land use plan of 2022.

3.2. Performance Evaluation of Land Use Plan

3.2.1. Residence and Mixed Land Use Functions

Existing housings are concentrated along with the main asphalt road (from Hawassa to Wolyita Soda via Morrocho).Densities of housing are also situated around the market. By 2012 the existing residence was 289,908 square meters. Additional residential area was further proposed to be 2,085,795 square meters (208.5hectares) by the stated period to serve for ten year (2012-2021). The total area allocated for residential land functions were 237.4 hectares of land.

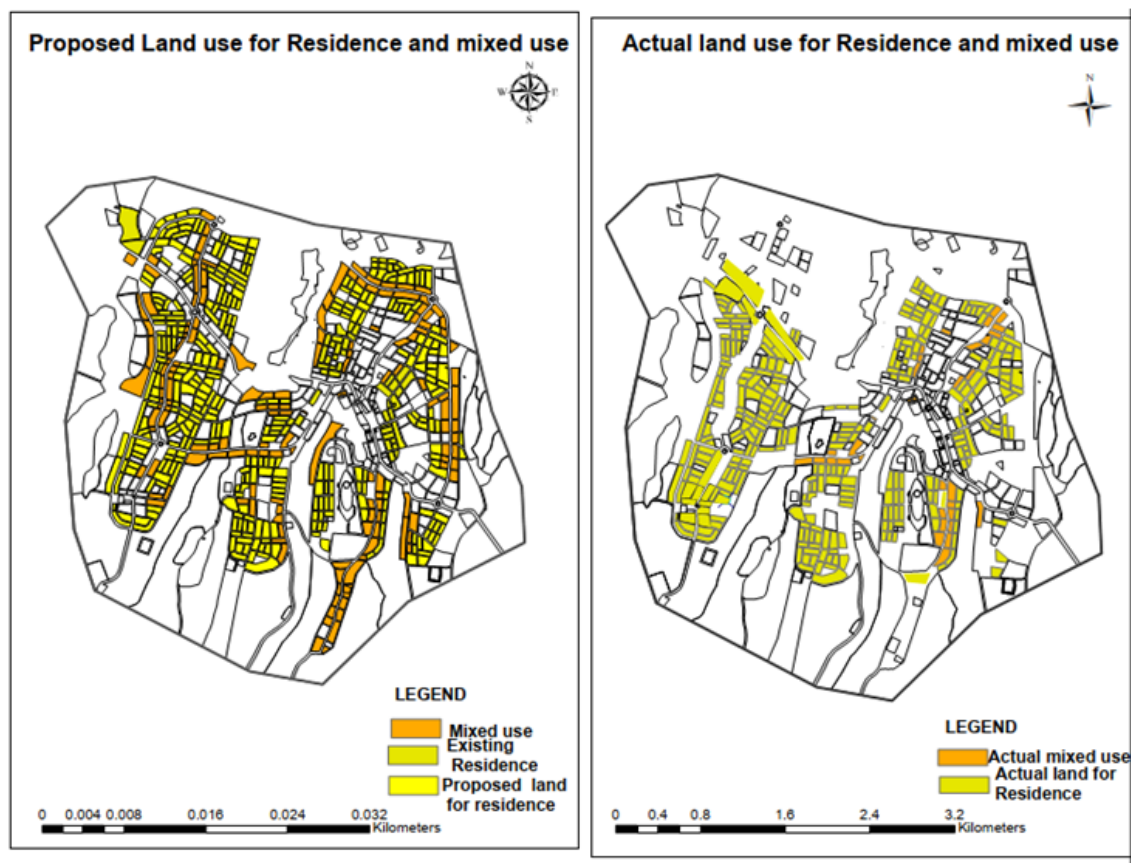
Regarding the level of achievement of residential land functions is concerned, within ten years (i.e. from 2012-2021), 117 hectares of residential land was implemented. In other words a total of 199 blocks were covered by residential land functions. About 49.4 percent of the total area reserved for residence was implemented. As it is depicted on the above before ten years (i.e. before 2012) the existing residential land use was 28.9 hectares. When 28.9 hectares of land was subtracted with 117 hectares of land the result figure is 89 hectares. Therefore, the actual implemented residential land

use within the past ten years (2012-2021) was 89 hectares of land.

As far spatial distribution is concerned, residential blocks were allocated in four directions in fair manner and the plan ensured the planning principle in that residential blocks are arranged next to mixed use.

Mixed uses of the project town are distributed along Sub Arterial Street and next to commercial land use in Principal Arterial Street. As far as the proportion is concerned,

1,289,993 square meters of land area or 128.9 hectares was allocated for mixed use by year 2012. At present areas occupied by mixed use is 53.4 hectares. A total of 68 blocks of the land use are covered by mixed use. About 41.7 percent of the total land area reserved for mixed use was implemented. Besides, most of land assigned to residential land use by 2012 around market, central area and closer to sub arterial streets was converted to mixed use within ten years.



Source: Sidama Region Urban Planning Institute and Personal GIS computation

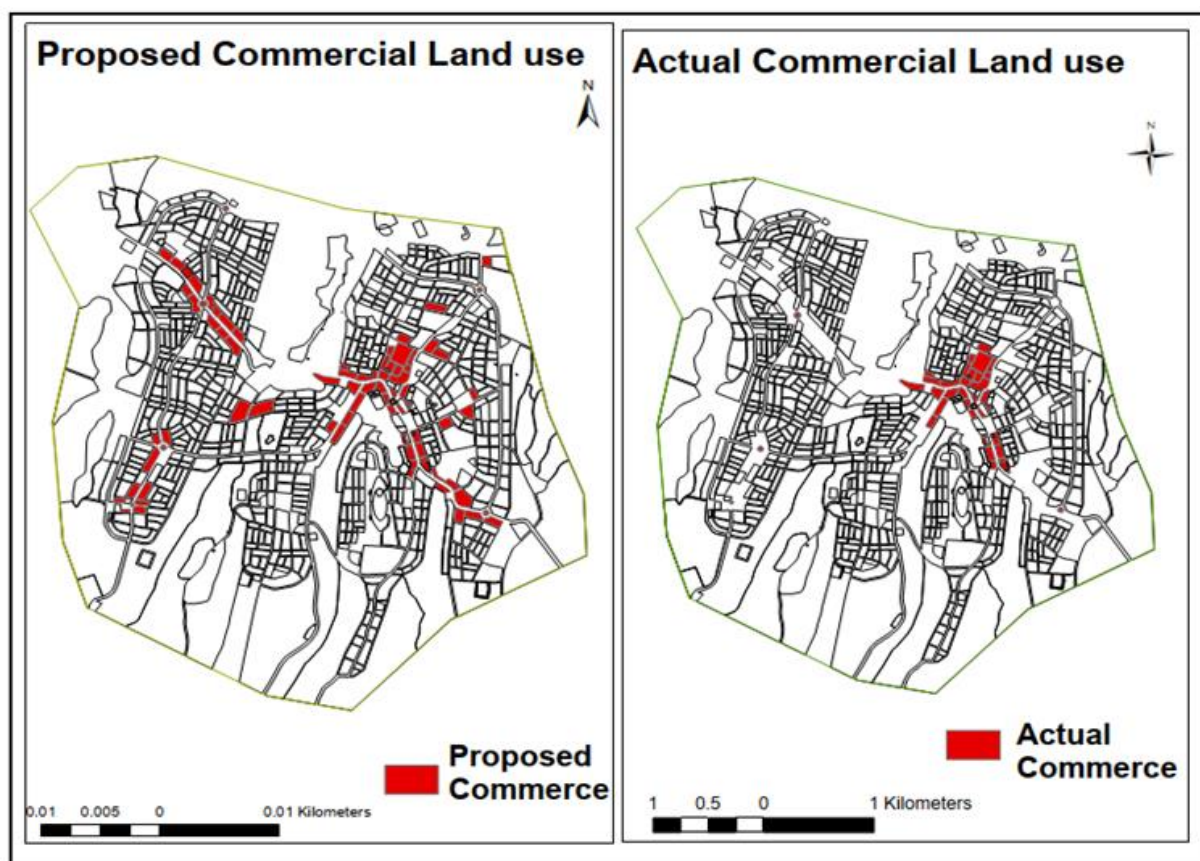
Figure 3. The difference between actual residence and mixed use, and proposed (2012GC).

3.2.2. The Proportion of Land for Commercial Activities

The drivers commercial Activities for towns like the project town consist of open market, livestock market, restaurants, hotels, shops, cafeteria and the like. The stated establishments are the engines for growth and development for town. As far as the existing land use of the project town is concerned, commerce and business activities concentrated around the main road bus terminal, open market and livestock market. Therefore from the view point of urban planning, such functions are usually assigned in a place closer to or

around bus terminal, open market and livestock market. Banks such as commercial bank of Ethiopia, Sidama Bank, etc are situated on the principal arterial streets.

580459 square meters of land was allocated for commerce and business activities to serve for 10 years during 2012. The total area covered by existing commerce and business activities on the ground is 30.2 hectares. Besides, a total of 47 blocks are currently serving for commerce and business activities. When compared to the proposal, the proportion of commercial land that is implemented accounts 52 percent.



Source: Sidama Region Urban Planning Institute and Personal GIS computation

Figure 4. The difference between actual commercial activities and proposed (2012GC).

As it is depicted in the figure 4 above, commerce and business activities were distributed along Principal Arterial Street and areas around the market. Those areas proposed for commerce and business away from the center are not implemented even if they are situated on Principal Arterial Street. Moreover, proposed for commerce and business in west of the town closer to mini market were not achieved as intended.

3.2.3. The Share of Land for Administration

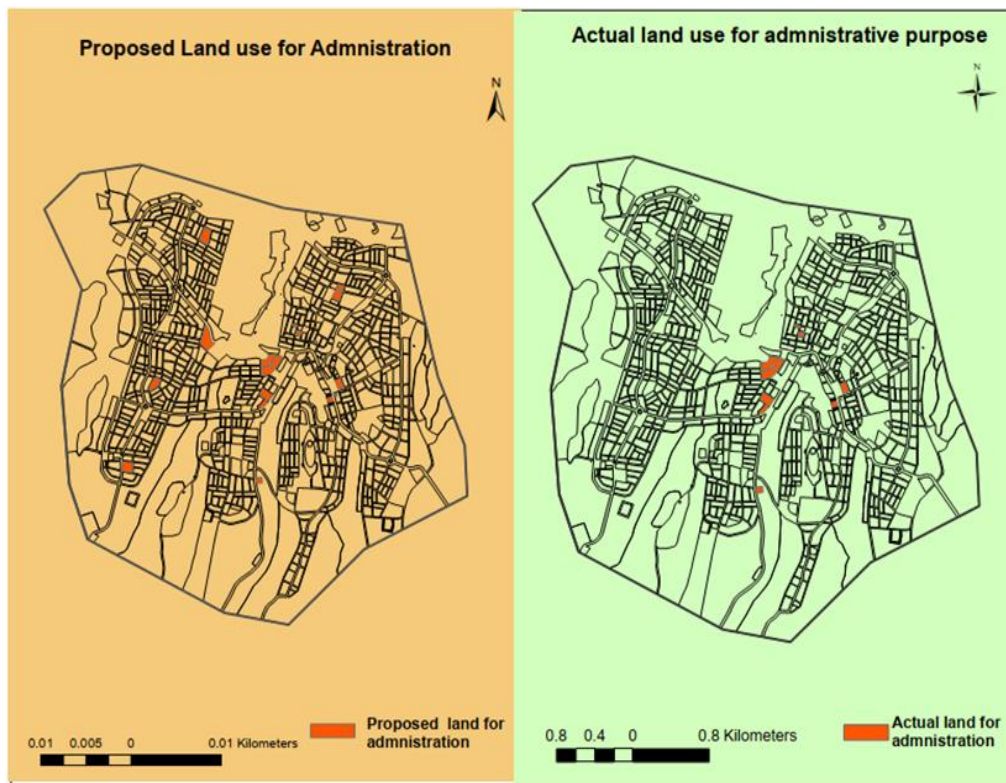
Administrative land use comprises of woreda administration, finance, water, health, agriculture, municipality and other governmental and non-governmental organizations. The land allotment for administrative purpose was 13.9 hectares. A total of 17 blocks were proposed for administrative purpose by 2012. The land inventory result indicates 5.9 hectares of land is presently covered with administrative purpose. Besides, 12 blocks were used for the stated service. This suggests that the proportion of implemented administrative land is below the midpoint (i.e. 42%).

As far as the spatial configuration of administrative functions is regarded, except few cases, administrative offices were planned to be far from central area and closer to resi-

dential area in the proposal. However, the existing condition on administrative office dictates that they are concentrated in the central part of the town relatively away from residential area.

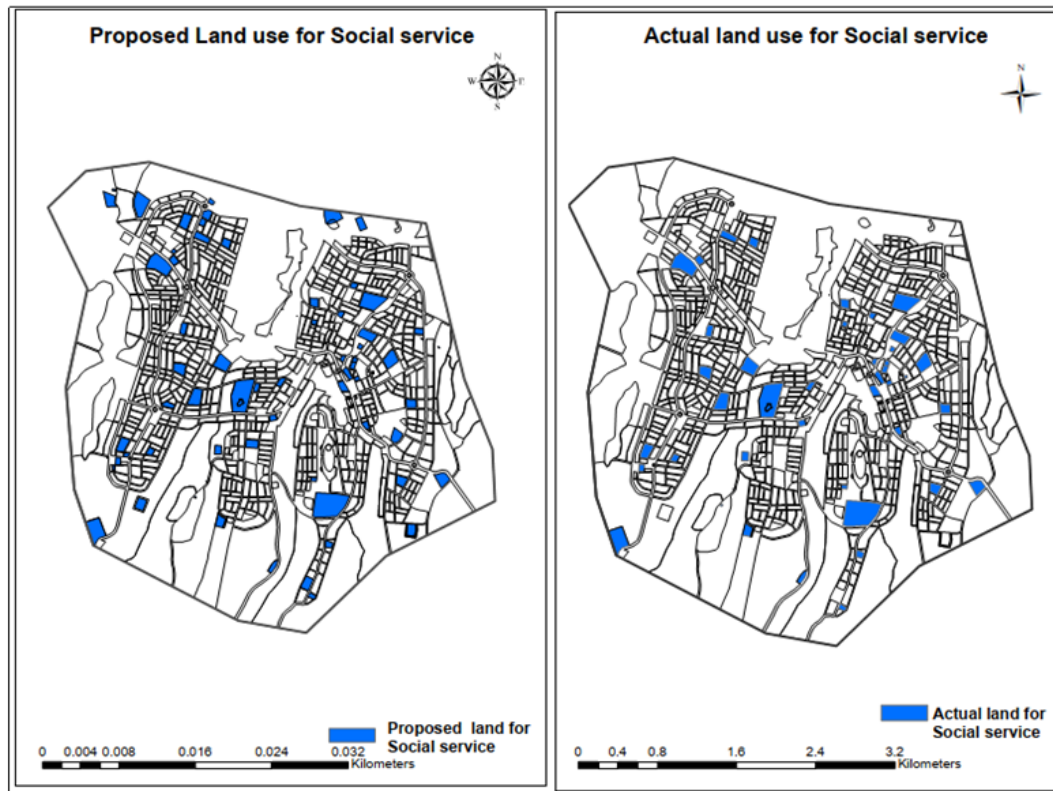
3.2.4. Social and Municipal Service

Social Service is among the fundamental domains of the urban society. Social service embraces schools, health institutions, religious organization and municipal services such as abattoir, sanitation and waste management etc. During 2012 a total of 1,388,525 square meters or 138 hectares of land were propose to social services. More than half of the proposed social services are implemented. A total of 75.4 hectares of land are covered by social service. The result of land inventory reveals that out of the total land covered by social service, religious institutions account 34 percent, educational institutions share 33 percent, municipal services comprise 29.7 percent and health institutions account the remaining 3 percent. When compared with the proposal, 55 percent of land for social service is found on the ground. This implies more than half of the proposed social services are implemented.



Source: Sidama Region Urban Planning Institute and Personal GIS computation

Figure 5. The difference between actual administrative use and proposed (2012GC).



Source: Sidama Region Urban Planning Institute and Personal GIS computation

Figure 6. The difference between actual social service and proposed (2012GC).

3.2.5. Proportion of land for Manufacturing and Storage

Manufacturing and storage function, among others, embraces Micro and small enterprises, warehouse, garages, fuel stations, and factories. There are coffee processing establishment in the northern tip of the town, fuel stations in south west following the road. The proposed land for Manufacturing and

storage was 29.8 hectares by the year 2012. The spatial distribution of land for manufacturing and storage was even and situated in peripheral area of the town. The actual land covered by manufacturing and storage is 6 hectares. The available manufacturing and storages are found in the central and northern part to the town. Fuel station (under construction) is situated in the southeastern tip of the town closer to the main asphalt.



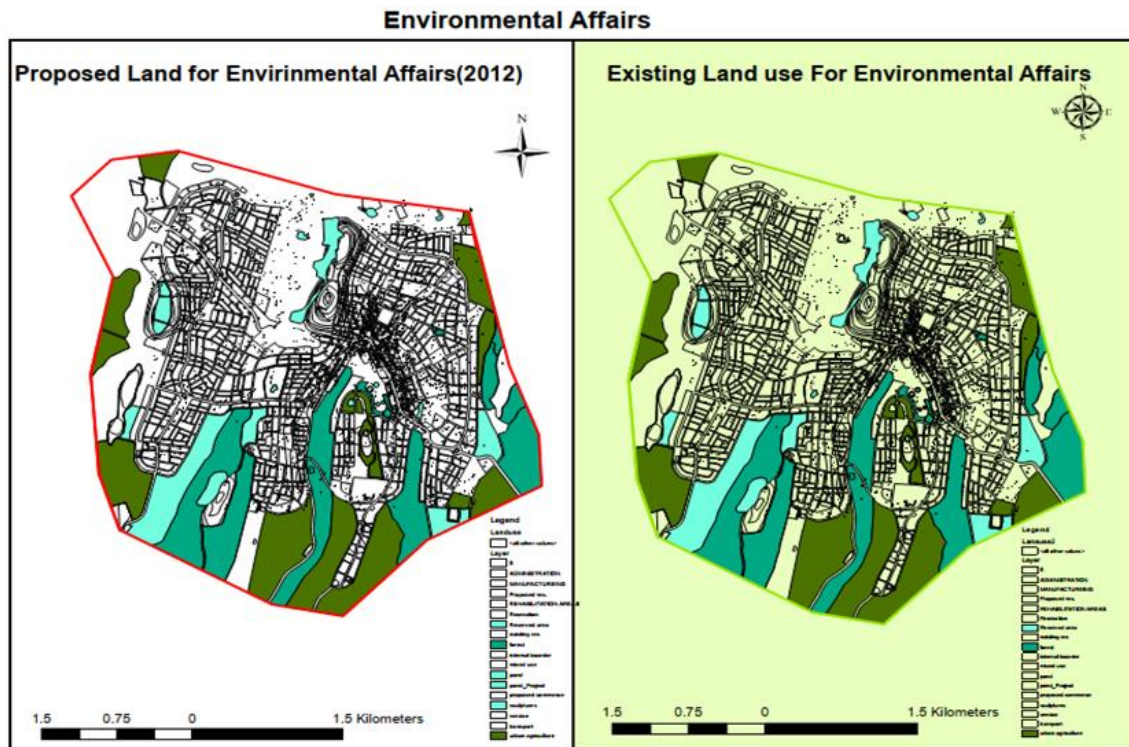
Source: Sidama Region Urban Planning Institute and Personal GIS computation

Figure 7. The difference between actual manufacturing establishment and proposed (2012GC).

3.2.6. The Proportion of Areas to Be Occupied By Green Development

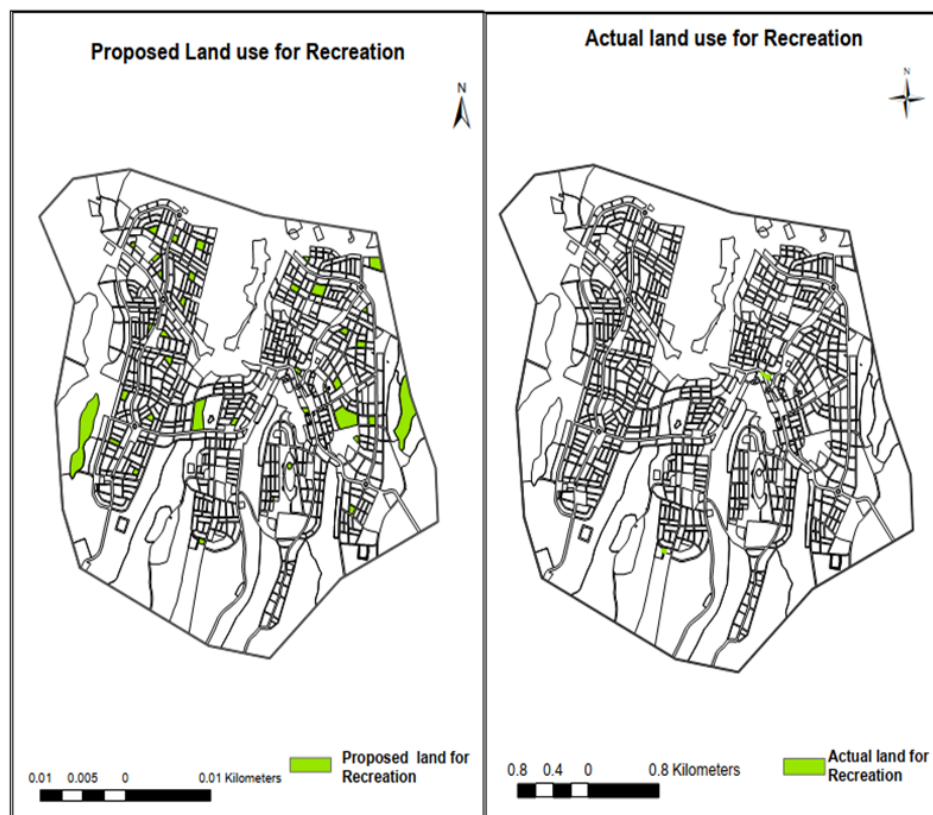
The proportion of land for green development was 558 hectares and out of which recreation and formal green accounts 40 hectares, forest and informal green 202.4 hectares, urban agriculture 203 hectares as well as areas to be covered by special function such as rehabilitated areas constitute 94 hectares. More specifically, the proposed land for recreation

purpose was 420,299 meters square. The land inventory on the existing recreational areas indicate that 9,731 meters square land is occupied by the stated land use and out of which there is one place for green area (traditionally called Gudumale) with the total area of 3,382 meters square and one open space or sport field which has the total area of 6,349 meters square. The proportion of land that is occupied by recreation accounts only 2 percent.



Source: Sidama Region Urban Planning Institute and Personal GIS computation

Figure 8. The difference between actual environmental affairs and proposed (2012GC).



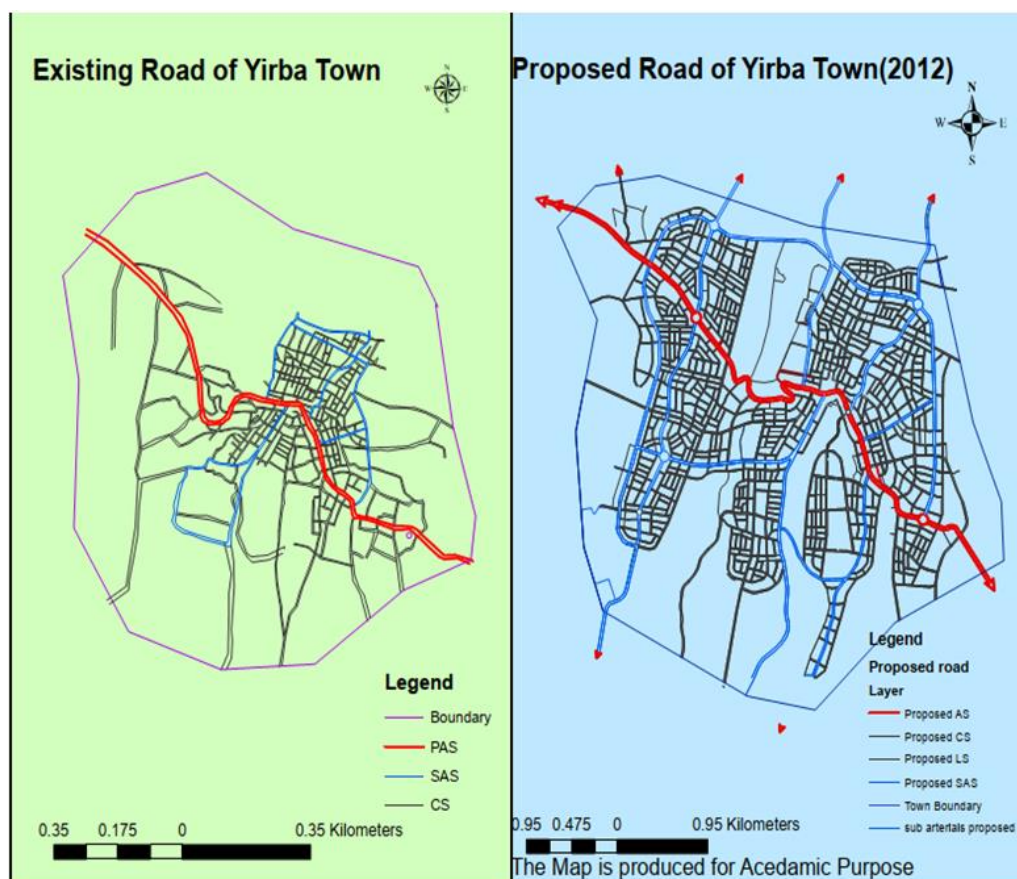
Source: Sidama Region Urban Planning Institute and Personal GIS computation

Figure 9. The difference between actual recreation and proposed (2012GC).

3.2.7. The Level of Performance Road

The road proposal of 2012 plan shows a total of 668,519 meter squares of road and out of which principal arterial street has the total of 29,275 meter squares, sub arterial streets has the total of 92,706 meter squares and collector streets has the total of 546,538 meter squares. On the other hand the actual implementation of the road shows a marked variation. A total of 36,111 meter squares of road is developed and out of which principal arterial street has the total of 3,141 meter squares,

sub arterial streets has the total of 4,785 meter squares and collector streets has the total of 28,185 meter squares. This denotes that the proportion of implementation of principal Arterial street, sub arterial streets and collector streets are 10.7 percent, 5.2 percent and 5.1 percent respectively. When compared to the proposal, aggregate implementation of road is 5.4 percent. The existing road of the project town to some extent follow irregular pattern. This is partly because of the ruggedness of the topography.



Source: Sidama Region Urban Planning Institute and Personal GIS computation

Figure 10. The difference between actual road and proposed (2012GC).

3.2.8. Proportion of Performance of Selected Land Use

There is variation among the major land use categories in terms of performance in area within ten years period. As indicated in [figure 11](#) below, residential land use takes the lion share with the achievement of 56 percent and followed by

social service, commerce, administration and mixed use with percentages of 55 percent, 52 percent, and 42 percent respectively. On the other hand, manufacturing, and recreation with area of 20 percent, 2 percent are among the least implemented land use functions in terms of proportion of performance.

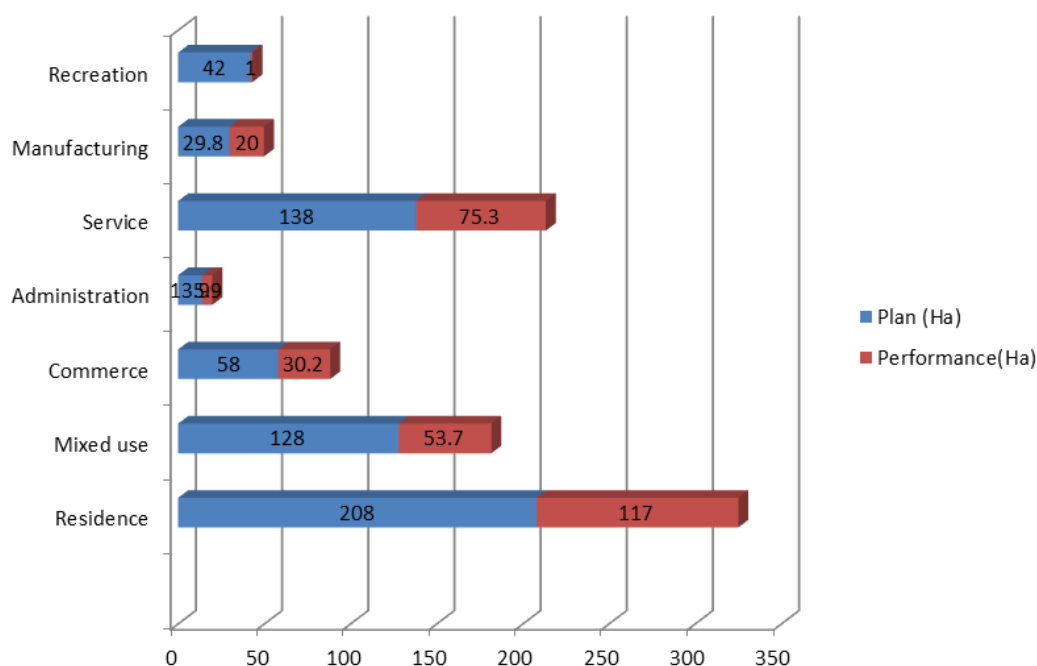


Figure 11. Proposed & Performance of selected Land use.

3.2.9. Comparison Between the Proposed Land & Performance of Selected Land Use

When comparison is made between the proposed land & Performance in terms of area, there is variation in level of achievement of major land use functions. As depicted in Figure 12 below, residential land use stands in the first posi-

tion with the achievement of 117 hectares and followed by social service, mixed use, commerce, and manufacturing with total areas of 75.4 hectares, 53.4 hectares, 30.2 hectares, and 52 hectares respectively. On the other hand, administration and recreation with total area of 5.9 hectares, and 1 hectares are among the least implemented land use functions in terms of area of performance.

Land use Categories Performance

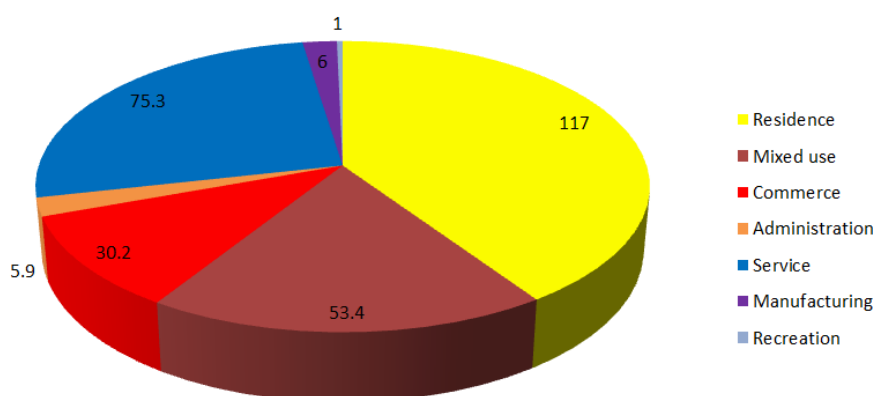


Figure 12. Performance comparison for different land uses in terms of Area (ha).

3.3. Thematic Analysis

Discussion with key informants of Yirba municipality pointed

out that the 2012 plan was not accompanied with action plan and phasing plan, the absence of complete evaluation and monitoring activity before conducting the new plan. The experts elaborated that it was difficult to implement the basic plan especially, there

were land use functions such as artificial pond (special function) in different places of the town. Due lack of information (action plan) on how and when to implement those artificial ponds, the municipality eventually changed the stated land uses to other uses. Similarly, key informants revealed that one of the bottlenecks for effective implementation of land use was that they had no information on the method clearing, developing, and making ready for the urban land for various purposes.

3.4. Examining the Conformity of Land Use Plan of Yirba Town Against Standards

3.4.1. Comparison of Proposed Land Uses and Standard

The purpose of comparison of the proposed plan of 2022 was used. An urban Planning standard, prepared by Ministry of Infrastructure and Urban Development by 2012 was employed for

comparing the land use function for medium town. Accordingly, the standard sets the proportion of areas in percent is indicated [Table 1](#) below. The proportion for Residence ranges from 55-60%, Commerce 3-10%, administration 2-5%, Social Service 5-10%, Manufacturing and Micro & small scale establishment 5-10%, Infrastructure, utilities and Transportation 15-25% and Green, recreation, sports and environmental issues 15-20%. The information concerning percentage composition for the major land uses was gathered from the socioeconomic text book of Sidama Regional Urban Planning Institute. Accordingly, Residence with mixed use ranges from 29%, Commerce 6.1%, administration 0.7%, Social Service 6.1%, Manufacturing and Micro & small scale establishment 5.8%, Infrastructure, utilities and Transportation 17.5% and Green, recreation, sports and environmental issues 33.4%. Four out of seven land uses categories are conformity with urban planning standards and three of them are non-conformity to the standard.

Table 1. Proportion of land use plan of Yirba Town (2022) against Urban Planning standards of Ethiopia.

Land use category		Ethiopian Urban Planning standards for Medium town (2012)	Proposed plan (Ha)	Percentage of Proposed plan (as compared from areas to be used for built up area)
1	Residence	55-60%	657.8	45%
2	Commerce And business	3-10%	135	9.3%
3	Administration	2-5%	15.5	1.1%
4	Social Service	5-10%	134.6	9.2%
5	Manufacturing & Storage	5-10%	129.2	8.9%
6	Infrastructure, utilities and Transportation	15-25%	385.8	26.5%
	Total area for construction (Built up Area)		1457.9	100
7	Green, recreation, sports and environmental sensitive area	15-20%	734.1	
7.1	Recreation, Greenery and Open space		162.3	22.1%
7.2	Forest and areas to be rehabilitated		219.6	29.9%
7.3	Urban Agriculture		262.3	35.7%
7.4	Reserve Area		89.9	12.2%
	Grand Total		2192	100

	Percentage of Proposed plan (as compared from grand total area)	Difference in percent against the standard (by taking the lower limit)	Difference in percent against the standard (as compared from grand total area)
1	29%	-10%	-26%
2	6.1%	Acceptable	Acceptable
3	0.7%	-1%	-1.3%
4	6.1%	Acceptable	Acceptable
5	5.8%	Acceptable	Acceptable

	Percentage of Proposed plan (as compared from grand total area)	Difference in percent against the standard (by taking the lower limit)	Difference in percent against the standard (as compared from grand total area)
6	17.5%	+1.5%	Acceptable
	66.6%		
7	33.4%	+14.4%	above from the higher limit
7.1	7.4%		
7.2	10%		
7.3	11.9%		
7.4	4.1%		

Source: Ministry of Infrastructure and Urban Development (MUDC, 2012) & Sidama Regional Urban Planning Institute (text)

From the major land use categories greater variation is observed for residence. According to the standard the minimum land use for residence is urged to be 55 percent. By multiplying the 55 percent by total area of the town (2192Ha), the area requirement for residence is found to be 1,205.6 hectares. The proposal for residence including mixed use for the town is 657.8 hectares. When compared with the standard and existing realty a total of 548 hectares or 26 percent of land is not included. This infers the proposed residence is intended to serve only 50 percent of the population. From the percentage composition set by Ministry of Infrastructure and Urban Development it is clearly indicated that new plan is prepared mainly to fill the housing demand and the standard urges more than half of the total area should be assigned for residence while making land use plan. Besides, the proportion of land for administration shows decrement as compared with standard. The percentage of land for administration is only 0.7% of the total area.

The proportion of land for Infrastructure, utilities and Transportation, exceed by 1.5 percent or 3.2 hectares of land.

Similarly, the percentage composition for Green, recreation, sports and environmental affairs constitute 33.4percent and when compared with standard the difference is 14.4percent or 306 hectares of land.

3.4.2. Plot Standard of Selected Land Uses for Medium Town

The plot standard of specific land uses from the general category are selected and analyzed against the land use planning standard. Open market and Livestock market are chosen from commercial land use category. Kindergarten, Primary education, Secondary education, TVET (post-secondary school) and College are selected from social service category. Football field (stadium) is selected from recreation category of 2022 land use plan. To evaluate the conformity of detail land uses, GIS is employed and the result of analysis of depicts that out of the eleven detail land use classifications only two land uses (i.e. TVET and Primary education) are prepared in accordance with the planning standard.

Table 2. Plot standard of selected specific land uses for Medium town (2022).

S/N	Component of selected land use/Level of service	Space requirement (Standard)	Proposed plot area of Yirba Town plan	Gap Analysis
1	Open market	0.25ha-0.5ha	1.9965ha	+1.4ha
2	TVET (post-secondary school)	2.5-6ha	4.4791ha	Accepted
3	Post-secondary school (College1)	2.5-6ha	14.8707ha	8.7ha
4	Post-secondary school (College2)	2.5-6ha	3.785ha	Accepted
5	Livestock market	0.62 ha.0.83ha	4ha	+3.48ha
6	Kindergarten	500m ² -3000m ²	5,191 m ²	+2191 m ²
7	Primary education	1.5ha-2.5ha	2.3883ha	Accepted
8	Secondary education	3ha -6ha	11.3131ha	+5.3131ha
9	Health center	2,000m ² -5000m ²	5,572 m ²	+572 m ²

S/N	Component of selected land use/Level of service	Space requirement (Standard)	Proposed plot area of Yirba Town plan	Gap Analysis
10	Primary hospital	5,000m ² -10,000m ²	15,027 m ²	+5,027 m ²
11	Woreda level football field	11,935 m ²	25,310 m ²	+13,325 m ²
	Total Gap & implication			21ha (210,000 m ²)

Source: Ministry of Infrastructure and Urban Development (2002) & GIS computation

In comparison to the standard for each specific land use, secondary school, the livestock market, and the open market have excess areas of 5.3 hectares, 3.48 hectares, and 1.4 hectares, respectively. There are 18.5 hectares of land area reserved for colleges.

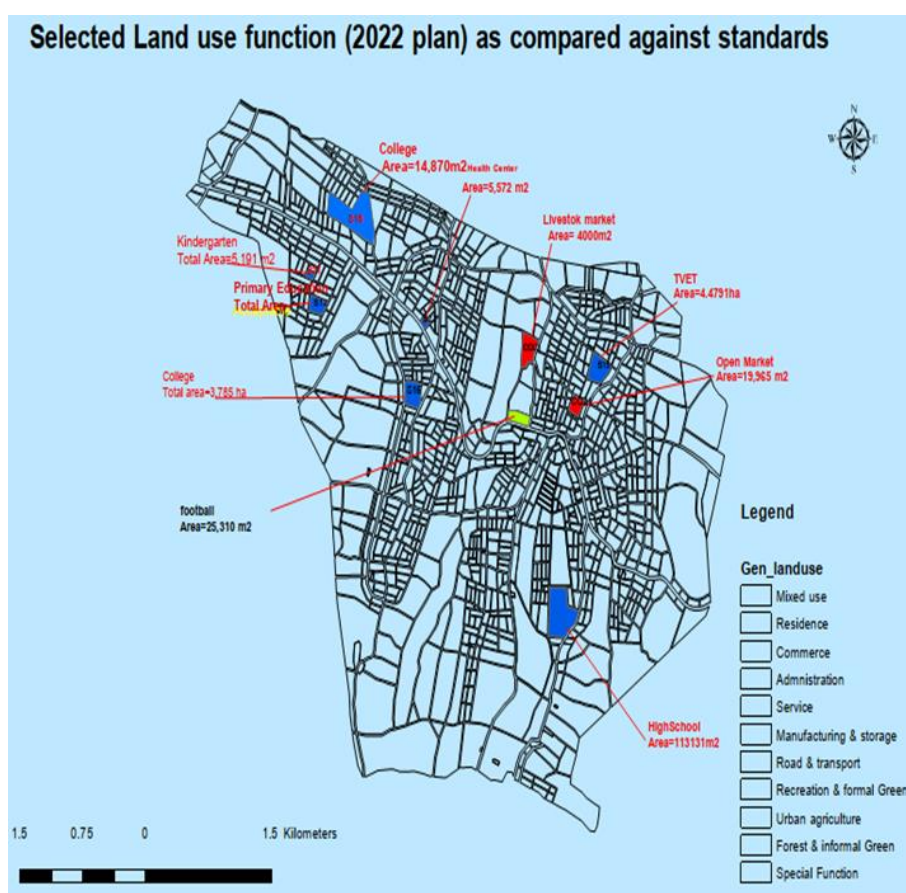


Figure 13. Total Areal Gap for observed from specific land uses (2022) & planning implications.

It is clear that the goal of urban planning is to make the best use possible of available space. Urban planning is characterized by the avoidance of waste in the distribution of land among different uses. This section's main goal is to draw attention to how much urban land (a resource) is wasted during the planning process. As indicated in table 3 below, an investigation revealed that 21 hectares of land had been wasted, which was not in compliance with the standards. 21.0

hectares (210,000 m²) of land, if used effectively, will be crucial to addressing the present urban problems. For example, with horizontal development, 21.0 hectares of land might provide enough space for 875 housing units in addition to the area needed for utilities. Additionally, the 21.0 hectares of land are sufficient to house 21 hospitals, 42 health centers, 8 primary schools, and 70 kindergartens.

Table 3. Total Areal Gap & planning implications.

S/N	Land budgeting of 310,000 m ²				
1	Residence	Kindergarten	Primary school	Health Center	Hospital
2	If a plot areal standard is 200m ² & 15% (31.05ha) is allocated for street & utility				
3	15*21.1ha=3.5ha	79	8	42	21
4	21-3.5ha=17.5h				
5	266,500 m ² %200=875				
6	875 housing units	70 Kindergartens	8 Primary school	42Health Center	21 Hospital

Source: own computation

The amount of land wasted during land use planning is seen in the above table. The major purpose of standards and norms is to direct the process of urban planning and implementation. Breaking from the norm entails using the limited urban land irresponsibly, which is the same as unplanned development.

3.4.3. Street Design and Standard

Urban planning standard denotes the Street Hierarchy, width as well as Design Speed of cars on the stated streets. The four street Hierarchies such as Principal Arterial streets,

Sub Arterial streets, Collector streets and Local streets are kept in land use plan of the project town. As far as the width of street is concerned, standard urges the width of Principal Arterial streets in core or central area to be 25 meter wide and in expansion area 30 meters. For Sub I Arterial streets in core area to be 20 meter wide and in expansion area 25 meters. For Collector streets the wide in core area to be 20 meter and in expansion area 25 meters. For Local streets the wide in core area to be up to 4 meter and in expansion area 12 meters.

Table 4. Proposed Street width of Yirba town against Standard (2022).

S/N	Street Hierarchy	Standard (m)	Proposed street width (m)	Difference of street width (meter) as compared to the standard	Design Speed (Km/hr) of car
1	Principal Arterial street (PAS)	25-30 (core & expansion area)	30	Acceptable	40-60
2	Sub Arterial street (SAS)	20-25	25	Acceptable	30
3	Collector street (CS)	11-20	15-20	Acceptable	20-30
4	Local street (LS)	4-12	10-12	Acceptable	Not Permitted

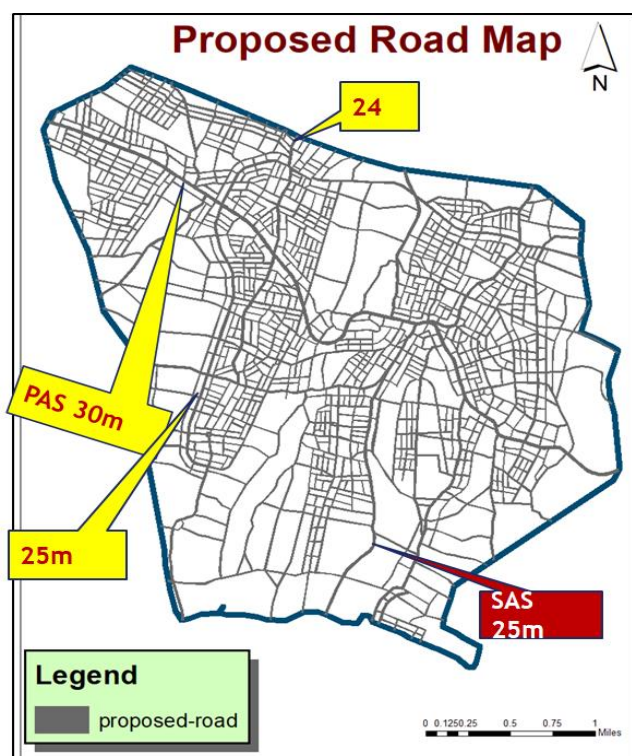
Source: Ministry of Infrastructure and Urban Development & GIS computation

As it is revealed on the table above, the four Street Hierarchies are kept while proposing the land use plan. Besides, the width of Principal Arterial streets, Sub Arterial streets, Collector streets and Local streets are designed in accordance to the standards set by Ministry of Infrastructure and Urban Development.

3.4.4. The Level of Consistence Between Socioeconomic Findings and Land Use Plan

The degree of coherence among the land use and socioeconomic teams is one measure of the quality of the plan. Urban planning is regarded to be a collaborative field. The outputs of

surveying and socioeconomic findings serve as an input for land use plan. The quality of land use planning is directly impacted by the socioeconomic study and base map quality. It may be inferred that a high degree of consistency between the land use planning, socioeconomic, and surveying teams enhances the likelihood that the output plan and its supporting documentation will be simple to implement.



Source: Sidama Region Urban planning Institutes (2022)

Figure 14. Proposed road for Yirba town.

To know the level of harmony between socioeconomic theme with that of land use plan certain basic issues are selected and crosschecked by using the text document of the project town (2022). Accordingly, the critical analysis findings denote there is variation between two themes in terms of the decision on the location and the number of open market, mini market, Primary school, Health center and Higher education. For instance changing the location of open market will completely shifts the economic growth direction of the town and affects the lives of the people residing in places closer to open market. On the other hand, decision of Higher education is one of the variations between two teams. Higher education demands relatively large space and is done based on government decision rather than land use planning. The implication here is before coming to decision on such issues there should be a number of discourses with the people. Besides, There should be an agreement between experts of socioeconomic and land use planner on the stated issues.

Table 5. The level of consistence between socioeconomic findings and land use plan.

S/N	Major Issues	Existing condition		Future requirement (up 2031)		
		Socioeconomic finding	Land use inventory	Socioeconomic recommendation	Land use recommendation	level of compatibility
1	Open market	1	1	Need to be relocated	No need of relocation	Inconsistence
2	Gulit (mini market)	1	Not stated	Additional mini market in central part of the town	Not stated/no need	inconsistence
3	Livestock market	1	1	Need relocation	Need relocation	consistence
4	Kindergarten	1	4	2 additional is needed	2	consistence
5	Primary school	3	9	1 is needed	No need	inconsistence
6	High school	1	1	1 is needed	1	consistence
7	TVET	Not stated	1	No need	No need	consistence
8	Higher education (college)	Not stated	Not stated	Not stated/ No need	1	inconsistence
9	Hospital	Not stated	1	Not stated/no need	No need	consistence
10	Health center	1	1	No need	1	inconsistence
11	Hospital	1	1	No need	No need	consistence
12	Slaughterhouse	1	1	No Need	No need	consistence
13	Waste disposal site	0	0	Appropriate site is recommended	New site is recommended	consistence
14	Youth center	Not stated	1	Need of reserving land	Additional recommended	consistence

S/N	Major Issues	Existing condition		Future requirement (up 2031)		
		Socioeconomic finding	Land use inventory	Socioeconomic recommendation	Land use recommendation	level of compatibility
15	Public libraries	Not stated	0	Need of reserving land	2	consistence
16	Public square	No	No	Need of reserving land	1	consistence
Level of consistency						11/16=68%

Sources: Sidama Region Plan institute Yirba Town Socioeconomic Document (2022) & own computation

The [table 5](#) above shows, there is agreement among socioeconomic and land use team experts regarding the spatial arrangement and number of facilities, including municipal services like waste disposal and livestock markets. Similarly, there is agreement regarding the need for social services like public squares, public libraries, youth centers, hospitals, TVET, kindergartens, and primary schools. On the other hand, there are differences in the location and quantity of services like higher education, elementary schools, minimarkets, open markets, and health centers between the socioeconomic and land use teams.

The level of consistence on selected Social and Municipal Services is 68 percent. This implies 11 out of 16 social and municipal services and utilities are compatible.

Urban planning aims to guide the town's overall growth and development while enhancing the quality of life for its residents. This objective is achieved through inclusive planning, which calls for the urban community to be invited to actively participate in the planning process and for community comments to be taken into account when creating proposals that adhere to established planning standards and norms. Moreover, because they are working with a shared outcome (a plan), the socioeconomic and land use planning specialists must collaborate closely.

3.5. Discussion on Performance and Conformance Evaluation

3.5.1. Discussion on Performance Evaluation

The result of the analysis reveals 117 hectares of land was implemented. In other words a total of 199 blocks were covered by residential land functions. About 49.4 percent of the total area reserved for residence was implemented. Before ten years (i.e. before 2012) the existing residential land use was 28.9 hectares. When 28.9 hectares of land was subtracted with 117 hectares of land the result figure is 89 hectares. Therefore, the actual implemented residential land use within the past ten years (2012-2021) was 89 hectares of land. The figure point out the achievement of residential land use is very small as compared to the proposal. The thematic analysis discloses the absence of full-fledged plan evaluation so far made before preparing new urban plan for the stated town. [\[21\]](#) Claims

planners rarely assess their plan, at least in a formal manner. [\[2\]](#) Argues new plans are accepted without any effort at evaluating how well they are working toward stated goals and objectives.

Areas occupied by mixed use are 53.4 hectares. A total of 68 blocks of the land use are covered by mixed use. About 41.7 percent of the total land area reserved for mixed use was implemented. The total area covered by existing commerce and business activities on the ground is 30.2 hectares. Besides, a total of 47 blocks are currently serving for commerce and business activities. When compared to the proposal, the proportion of commercial land that is implemented accounts 52 percent. The land inventory result indicates 5.9 hectares of land is presently covered with administrative purpose. Besides, 12 blocks were used for the stated service. This suggests that the proportion of implemented administrative land shares 42 percent. The proposed land for Manufacturing and storage was 29.8 hectares by the year 2012. The actual land covered by manufacturing and storage is 6 hectares. [\[13\]](#) acknowledged to enhancing the effectiveness of urban plans, a regular base evaluation is essential. [\[7\]](#) argued the effectiveness of plans needs to be indicated through their performance. [\[8\]](#) found that the focus of performance evaluation is to examine whether plan is playing its role.

A total of 75.4 hectares of land are covered by social service. When compared with the proposal, 55 percent of land for social service is translated on the ground. The result of land inventory revealed that out of the total land covered by social service such as religious institutions account 34 percent, educational institutions share 33 percent, municipal services comprise 29.7 percent and health institutions account the remaining 3 percent.

The land inventory on the existing recreational areas indicates that 9,731 meters square land is occupied by the stated land use. The proportion of land that is occupied by recreation accounts only 2 percent. One of the basic domains of Sustainable development in urban space is the consideration of environment such as recreational areas. Green development has dual role in urban space. One is balancing the local environment and biodiversity. It can also serve as a place for recreation, source for food, and integrate the connection of human being with the natural environment. Although. Open spaces and green areas are vital for urban, the actual propor-

tion of such service on the ground is very low for the town study town. [19] Argued good planning is measured by the success and outcomes of its implementation.

Thematic analysis pointed out that the plan was not accompanied with action plan and phasing plan. Action plan make clear in advance how much budget, personnel and technical equipment will be required to properly implement the project. Phasing plan determines the growth direction and the type of projects permitted for specified block of the town. Implementing land use plan without action plan and phasing plan is similar to sailing without a compass. To this end, [20] claimed that urban centers create value when they are well-planned and managed. The experts elaborated that it was difficult to implement the basic plan especially; there were land use functions such as artificial ponds in different places of the town. Due to lack of information on how and when to implement those artificial ponds, the municipality eventually changed the stated land uses to other uses.

3.5.2. Discussion on Conformance Evaluation

The thematic analysis section indicated the absence of conformance evaluation especially at the stage of plan preparation. Even though it is overlooked, the conformance evaluation that is conducted prior to the approval of the proposed plan is crucial for preventing the waste of urban land and significantly helps for proper implementation. [8] Contended crucial use for assessing plan execution at earlier stages is to evaluate the principles and other actions of a plan are well stated to enhance for future implementation. [4] Acknowledge the need for ex-anti evaluation of the proposed plan and revealed at this stage it's important to consider if the plan allows enough space for changes in the future and invites input from a variety of public segments.

The result of analysis section indicated that, from the total proposed land uses of the project town, the share of for residential use is 29%, commercial use is 6.1%, administrative purposes is 0.7%, social service is 6.1%, manufacturing and micro and small-scale establishments is 5.8%, infrastructure, utilities, and transportation is 17.5%, and for green space, sports, recreation, and environmental concerns is 33.4%. Three of the seven land use categories do not adhere to urban planning standard whereas four out of seven land uses categories are conformity with urban planning standard. This suggests that, other things being constant, the full implementation the stated land use functions will not achieve the ultimate goal of urban planning since it deviates from the criteria set for the town. [13] Argue that necessity of evaluation to determine whether a program is successful in achieving its ultimate goals. According to [16], Planning theory and empirical research should prioritize understanding the reasons behind planning successes and failures.

As far as the plot standard of is concerned, the result of analysis depicts that out of the eleven detail land use classifications, only two land uses (i.e. TVET and Primary education) are prepared in accordance with the planning standards.

Specific land uses such as secondary school, livestock market, and open market have excess areas of 5.3 hectares, 3.48 hectares, and 1.4 hectares, respectively. One primary goal of planning theory and empirical research should be to understand why planning fail or succeeds [17].

The results of the analysis show there is disagreement in the location and quantity of services like higher education, elementary schools, minimarkets, open markets, and health centers between the socioeconomic and land use teams. However, the existence of disagreement on the number and location of even in one of the service have great impact on the development trend of the town and fairness of service distribution. Conformance Evaluation determines how well the urban planning and implementation process meet the Urban Planning standard. This implies good achievement in allocation of plots of land for different functions may not be good from conformance point of view. [2] Contends any deviation from the adopted plan's goals and objectives would be viewed as a failure from the perspective of conformity.

An independent entity (which is not engaged in plan preparation team) that is responsible for technically evaluating the plan making process is advised to be functional to minimize the inconsistencies in relation to planning. The goal of this entity is crosschecking or assessing the conformity of the proposed plan with planning principles and standards. Practically such technical assessment is ignored. [19] agrees that trustworthy institution, among others, is essential for plan implementation. The urban plan preparation and implementation strategy of Ethiopia formulated by Ministry of Urban development and Construction (2014) supports the notion and states that the existing monitoring, evaluation and feedback system focused only on implementation of the plan.

4. Conclusions

The purpose of this study is to examine the performance and conformance of land use of the project town. To achieve the objective two consecutive land use plans were employed. The basic plan of 2012 was used to examine the performance evaluation while the strategic plan of 2022 was used for examining the conformity of plan preparation.

Performance evaluation result underlines the actual achievement of land use functions is very small when compared to the proposed basic plan of 2012. The proportion of land for residential land use, Social service, mixed use, commerce, manufacturing, administration, and road are 117 hectares, 75.5 hectares, 53.7 hectares, 30.2 hectares, 20 hectares, 5.9 hectares, 5.9 hectares and 36,111 meter square respectively. Besides, the land use plan was not accompanied with action plan and phasing plan. The basic plan was not accompanied with action plan and phasing plan. Implementing land use plan without action plan and phasing plan is similar to sailing without a compass.

Conformance evaluation findings elucidate three of the seven land use categories of 2022 strategic plan the pro-

ject town do not adhere to urban planning standard whereas four out of seven land uses categories are conformity with urban planning standard. Worst of all, the share of proposed residential land use is 29 %, which is less than the standards of 55%. This obviously denotes that the existence of non-conformity between proposed residential land use plan of the town and standards. With regard to the plot standard, the analysis's findings demonstrate that, of the eleven randomly chosen detail land use classifications, only two are constructed in accordance with the planning standards.

Urban planning is characterized by the avoidance of waste in the distribution of land among different uses. As mentioned in the preceding part, an investigation of plan making activity revealed that 21 hectares of land had been wasted, which was not in compliance with the standards. The thematic analysis an entity that is responsible for technically evaluating the plan making process is before the adoption of the plan is absent in planning organization.

One measure of the plan's quality is how well the land use and socioeconomic teams are coordinated. The process of plan preparation makes it evident that the existence of disagreement regarding the quantity and placement of services.

5. Recommendations

1. A full-fledged performance evaluation is recommended before the commencement of new urban plan for the town. Conducting such performance evaluation helps identify the level of success or failure, and the gaps of the prior plan.
2. Since action plans and phasing plans are tools for implementation, they must be developed in tandem with land use plans for the proper execution of urban plans.
3. The conformance evaluation that is conducted prior to the approval of the proposed plan is crucial for preventing the waste of urban land and significantly helps in its proper implementation.
4. Urban planning is regarded to be a collaborative field. It necessitates cooperation of numerous teams or experts during the planning and execution stages.

Abbreviations

AutoCAD	Computer-Aided Design Software Developed by the Company of Autodesk
GIS	Geographical Information System
SPSS	Statistical Packages for Social Scientist

Author Contributions

Daniel Lirebo Sokido Conceptualization, Data curation, Funding acquisition, Methodology, Software, Validation, Supervision, Writing – review & editing

Addisu Sherbeza Woldemariam: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Software, Validation, Writing – original draft

Conflicts of Interest

The authors declare no conflicts of interest.

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