Urbanization and Factors Affecting It: A Case of Arsi Robe Town, Southeastern Ethiopia Using Retrospective and Survey Designs (1994/95-2020/21)

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Abstract

Urbanization is one of the oldest & most pervasive processes of change that has helped shape societies around the world. The degree of urbanization classifies the urban settings into various classes & it is affected by a number of factors. However, the degree of urbanization of Arsi Robe town and its determinants are not documented so far. Thus, the paper aimed to determine levels of urbanization of Arsi Robe town & factors either positively or negatively affecting it from 1994/95 up to 2019/20. The study was conducted from May 1-31, 2021 in Arsi Robe town which is located in Arsi Zone, Southeastern Ethiopia. Descriptive survey & retrospective designs were employed. Measurements & remotely sensed satellite imageries data were employed in determining the urbanization of the town. Both primary & secondary data were utilized. Survey participants were selected using systematic random sampling technique. Data was collected using semi-structured questionnaires, remote sensing, GIS & archival materials analyses. Descriptive statistical methods were utilized to describe variables of the study while multiple linear regressions were employed to evaluate factors affecting the level of urbanization of the town. Annual rate of urbanization of Arsi Robe town was 6.322 percent between 1994/95 & 2019/20 while the rates of its urbanization were 3.019%, 6.428%, 4.814%, 12.291% & 5.059% between 1994/95 &1999/00, 1999/00 & 2004/05, 2004/05 & 2009/10, 2009/10 & 2014/15, & 2014/15 & 2019/20 respectively. Using the agglomeration index of determining urbanization rate of the town, Arsi Robe town was rural area town in 1994/95 while it was dense urban cluster starting from 1999/00 up to 2019/20 based on the population density per km². Government support & related factors made the impact of 24.80%, infrastructure, facility & related factors made the impact of 24.90%, economic growth & related factors made the impact of 32.20%, and log of population density made the impact of 35.50% on the level of urbanization Arsi Robe town. Based on the multiple linear regression model, GSRF, IFRF, EGRF, AOF & LogPden contributed positively towards the level of urbanization of the town. They had accounted for 69.30 percent of the determined level of urbanization of this town. In conclusion, several determinants had contributed positively towards the level of urbanization of Arsi Robe town. So that several factors had affected level of urbanization of the town. It is recommended that variables that are not addressed in the paper have to be included in developing more profound regression model that help in forecasting the level of urbanization of the town by other interested researchers.

1. Introduction

The world has experienced unprecedented urban growth in recent decades. In 2000, about 47 percent of the world's population lived in urban areas & there are 411 cities with over one million inhabitants. It is expected that 60 percent of the world population will be urban by 2030, & that most urban growth will occur in less developed countries (Population Reference Bureau, 2004).

Urbanization is one of the oldest & most pervasive processes of change that has helped shape societies around the world. Urban growth, which caused spatial land use & land cover changes, has affected various physical environment, social & economic activities. Urbanization is among the most significant process that has shaped land use activities & has drawn a great deal of attention throughout the world. It is estimated that urban population will rise from 3.57 billion in 2010 to 6.34 billion in 2050 where almost 70 percent the world population is expected to live in the cities (United Nations, 2014). This immense figure is mainly due to migration from rural to city in search of better quality of life generated by urban activities & services (Deng, Huang, Rozelle & Uchida, 2010).

The degree of urbanization classifies the entire territory of a country into three classes; namely, cities, towns & semi-dense areas, & rural areas. It has two extensions. The first extensions identify cities, towns, suburban or peri-urban areas, villages, dispersed rural areas & mostly uninhabited areas. The second extension adds a commuting zone around each city to create a functional urban area or metropolitan area (Balasubramanian & Choi, n.y.).

Forty years ago, Gamst characterize Ethiopian civilization as "Peasantries & Elites without Urbanism". He was referring to a presence of a social organization & high culture civilization in which cities were absent (Gamst, 1970). Thirty years later, researchers were still talking about "urban deserts" in Ethiopia, despite the acceleration of urbanization, with an average growth rate between 4.4 & 5.6 percent a year (Golini, 2001). A recent urbanization study that used an agglomeration index as a methodology concluded that "a large share of the population still resides more than 10 hours travel time from an urban center" (Schmidt & Kedir, 2009).

Examining the factors affecting urbanization in rural area towns such as Arsi Robe town is an important issue of consideration for rural towns to achieve their desired level of urbanization, expansion & development as a whole. However, these thematic issues in Arsi Robe town are not documented so far. Also, the patterns of urbanization of Arsi Robe town in the past twenty-five years are not addressed & properly documented yet for the specific study settings. Therefore, in the absence of well-articulated & documented empirical evidences & findings, it is hardly possible to design & implement strategies that help curb the adverse impacts of factors affecting urbanization of Arsi Robe town & to promote its urbanization as much as possible. Scholars argue that towns which have well-articulated & documented factors affecting their urbanization level & patterns of their urbanization are capable of properly tackling the adverse impacts of those factors in such ways to facilitate the attainment of their anticipated levels & patterns of urbanization within foreseeable time frame (Hussain & Imitiyaz, 2018) as there are direct positive relationships among factors conducive for urbanization & higher levels of urbanizations of those towns in rural areas & the vice versa.

There are a number of factors affecting urbanization in rural area towns based on the findings of several scholars & researchers. The most important factors that affect urbanization in rural area towns included population growth, accessibility, topography, & economic & legal factors (Salem, Tsurusaki, Divigalpitiya & Osman, 2018); & distance to public amenities e.g. school, university, etc., distance to workplace, proximity to area that support new & growing business, distance to public amenities, distance to health center e.g. public, hospital, public clinic, etc., distance to main road or highway, distance to commercial or industrial area, proximity to parks & natural features, distance to city center, cheap housing price & population density or neighborhood are among factors that are important determinants of urbanization of rural areas (Mahamud, Samat & Noor, 2016). Other researchers also found that proximity to population centers which is residential area have been weighted as lowest influences factors when modeling industrial activities in urban growth model (Samat *et al*., 2011). This may be due to people were not comfortable to live in surroundings near to industrial area & at the same time people prefer to live in an environment free from commercial or industrial waste which can affect health of nearby communities. Another reason that may have contributed to the finding is that more efficient road network will shorten travelling time, thus distance to city Centre becomes less important in promoting urban development.

However, there was no reported empirical study done to assess factors affecting urbanization in rural area towns like Arsi Robe town as far as the knowledge of the researcher was concerned. Thus, in order to fill these identified knowledge gaps, this study aimed to assess the factors affecting Arsi Robe town's urbanization & its patterns of urbanization in the past 25 years. Thus, the study intended to answer the following research questions; i.e., what are the patterns of urbanization of Arsi Robe town from 1994/95 to 2020/21 fiscal years; what factors affect urbanization of Arsi Robe town; what factors have significant influences on its urbanization; & what general model of urbanization will explain about Arsi Robe town's urbanization? The purpose of this study was to assess factors affecting urbanization of towns in rural areas such as Arsi Robe town. The specific objectives of the study were to determine patterns of urbanization of Arsi Robe town from 1994/95 to 2020/21 fiscal years, to identify factors affecting urbanization of Arsi Robe town, to rank factors that has significant influence on its urbanization, & to develop Arsi Robe town's general model of urbanization that would explain the main factors affecting its urbanization & aid in forecasting the level of its urbanization in the future.

Findings of the study would help better understanding on the levels of A/Robe urbanization, patterns & factors affecting urbanizations of towns established in rural areas. They would help identify bottlenecks & problems of urbanization opportunities of towns established in rural areas. Also, they would help identify which factors would exert greater influence on levels & patterns of urbanization of Arsi Robe town. Again, they would be used as a guideline to facilitate a more open & transparent communication & cooperation among urban planners,

mayors & managers committed to accelerate & promote urbanization of this town. Moreover, they would contribute to narrow the gap in the literature on the thematic issues of factors affecting urbanization of towns in rural areas. Still, they would serve as the baseline evidences for researchers who are interested to undertake deeper & broader investigation into the thematic issues of the study. Furthermore, they would be believed to enrich existing empirical literature on the thematic issues & would help broaden the existing literature in the area.

In order to guide the undertakings of the study, the conceptual framework was developed based on the reviewed empirical study findings & the variables of the study. The dependent variable was level of urbanization of Arsi Robe town & the independent variables of the study included government support, availability & accessibility of infrastructure & facilities, economic growths, & other factors. As evident from the schematized conceptual framework, levels of urbanization of Arsi Robe town were influenced by sets of independent factors illustrated in the figure below (Figure 1).
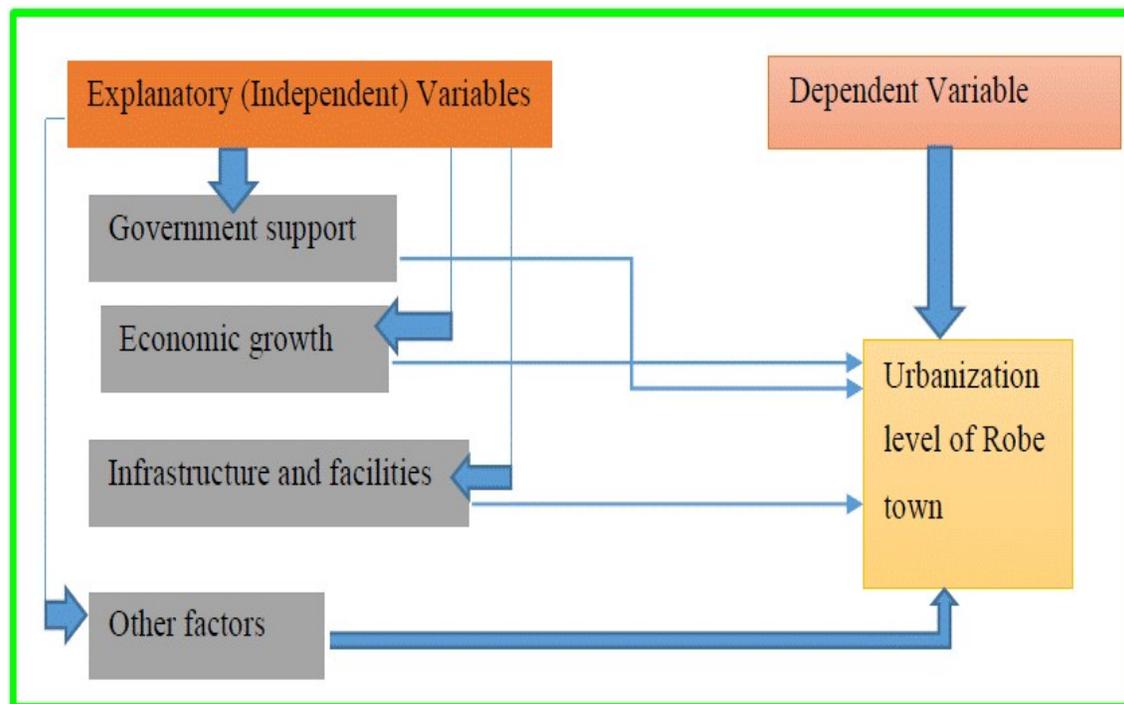

Figure 1: Conceptual framework for factors affecting urbanization of Arsi Robe town
Source: Self-developed based on reviewed literature

2. Method & Materials
2.1. The Study Area, Period & Study Design
A community-based cross-sectional descriptive & observational study designs were The study was conducted from May 1-31, 2021 in Arsi Robe town which is located in Arsi Zone, Southeastern Ethiopia. Arsi Robe town is the capital town of Robe Woreda & it is located about 225 km far away from Addis Ababa city in the south eastern direction & at & about 99.1 km from the zonal capital town-Asella. Robe town is situated in Ataba Robe Kebele & is bordered in small percentage by Akiya Ayifla peasant association Kebele & in predominant proportion by Ataba Robe peasant association Kebele. Arsi Robe town was established in 1914 E. C. (1923/24) & got legal recognition in 1945 E. C. (1953/54). It is found in the south eastern Oromia Regional State between 7°50'11.33''-7°53'35.98'' North latitude & between 39°36'43.37''-39°38'57.02'' East. It is located at 2423 meters above sea level. The town had two urban Kebeles, 10 zones, 285 got & 1443 developmental agents.

Agroclimatically, it is located in the Woina Dega climate. The mean annual temperature & rainfall of the town are about 21°C & 1875mm respectively. Arsi Robe town could be considered as the Mesopotamia of the Arsi Zone in general & Robe *Woreda* in particular as it is sandwiched by two perennial rivers, namely Robe River & Kechino River. According to the 2108/19 report of Robe Woreda Agricultural & Rural LAND Office's, there are 678 households that have been living in the town for at least 25 years (Unpublished Report of Robe town, 2018/19). The study was conducted from May 1st to 31st, 2021.
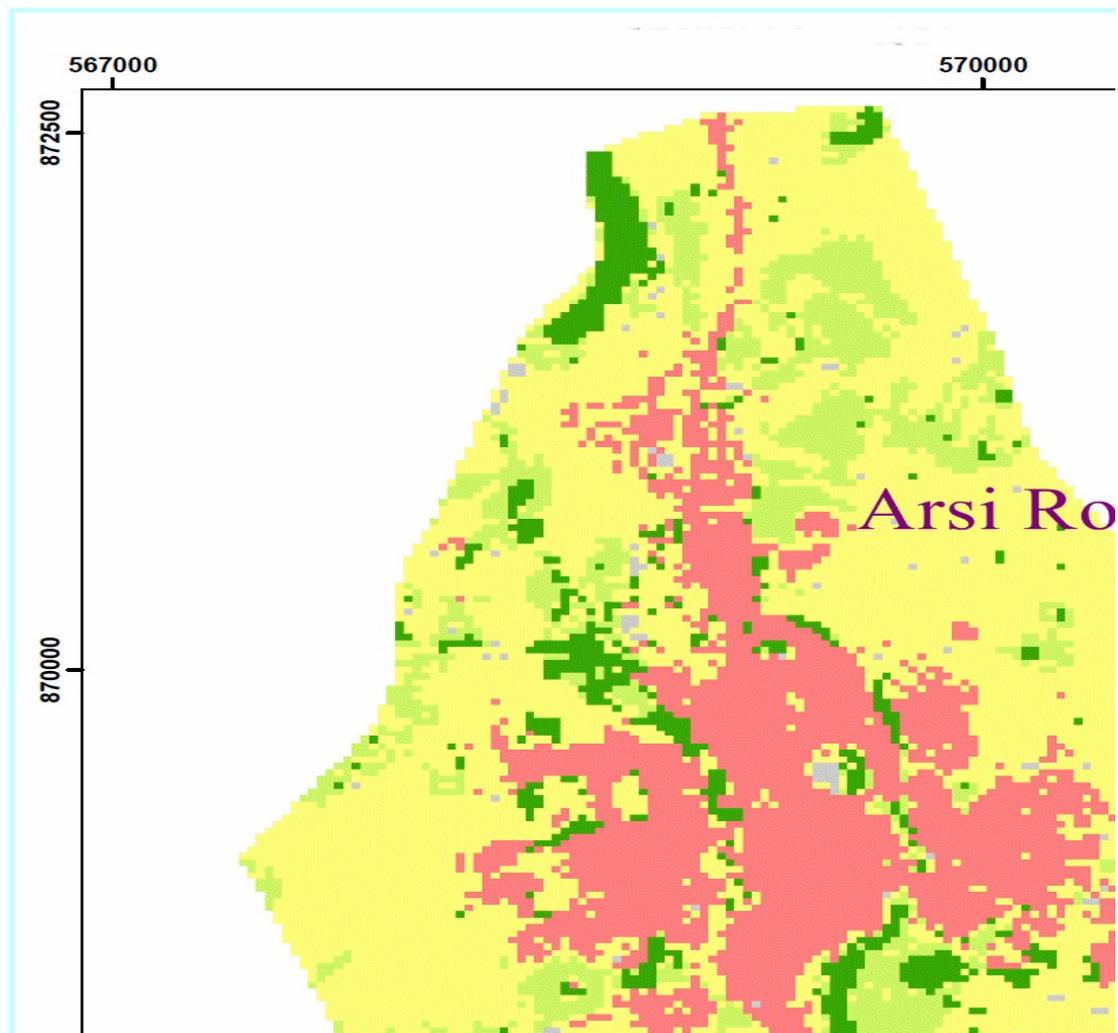
Figure 2: Map of Arsi Robe town
Source: ArcGIS processed satellite imagery data

This study employed both retrospective and cross-sectional descriptive survey designs. It was retrospective as it utilized past data retrieved from satellite imagery while it was survey study as it used survey data collected from the respondents. Thus, the data used in the study was quantitative in nature and was collected from primary sources. In addition, the study was also said to be correlational in approach because there was the intent to establish the relationship between dependent & independent variables of the study.

Both primary & secondary data were utilized for the entire analysis of this study. The information was gathered through questionnaire from the selected sample of respondents living in Arsi Robe town. According to Creswell (2007), primary data was the information that the researcher finds out by him/herself regarding a specific topic. The main advantage with this type of data is that it was collected with the research's purpose in mind. It implied that the information resulting from it is more consistent with the research questions & objectives. Moreover, secondary data was collected through analysis of archival materials.

2.2. Sample Size Determination & Sampling Techniques
The target populations were heads of households living in Arsi Robe town for at least the past 25 years so that they were familiar with patterns of its urbanization & might have better know-how on factors affecting its urbanization. In order to get more representative population & accurate data, the selection of sample size should be done by caution. Therefore, the researcher determined the sample size in the study by using the formula of Yemane Taro (1967).

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n= Sample size of heads of households (HHs)

N= Overall number of HHs' heads have been living in the town for at least 25 years

e= Level of precision or sampling error (5%)

Thus, substituting the corresponding values in the above formula, the sample size became:

$$n = \frac{678}{1 + 678 * 0.05^2} = 251.$$

Hence, the total sample size was 251. Since the number of HHs' heads have been living in the town for at least 25 years are not the same or equal for the two urban Kebeles of the town, computed sample size was distributed proportionately for the four targeted groups to their total numbers per the tax center:

$$n_i = \frac{N_i}{N_t} * n_{calculated}.$$

Where,

n_i = Proportionate sample size per Kebele,

N_i = Total numbers of populations for the corresponding Kebele,

N_t = Overall total population size which is equal to 678, &

$n = n_{calculated}$ = Computed sample size of the study which was equal to 251.

For the purpose of this study, systematic random sampling technique was applied.

Table 1: Numbers of populations by Kebeles & their corresponding sample sizes

SN	Kebeles	Number of HHs	Sample sizes of HHs	Allocations
1	Kebele 01	353	131	$n_1 = (353/678) * 251 = 131$
2	Kebele 02	325	120	$n_2 = (3253/678) * 251 = 120$
3	**Total**	678	251	

2.3. Variables of the Study

2.3.1. Dependent Variable

The dependent variable of the study was level of urbanization of Arsi Robe town from 1994/95 to 2020/21.

2.3.2. Independent Variables

The independent variables included populations & population density of Arsi Robe town, & the four dimensionalized factors the either positively or negatively contributed towards the level of urbanization of the town during the periods covered in the study.

2.4. Instruments

A quantitative methodology involving a close-ended questionnaire was used as the measuring instrument. Standard questionnaire was used to collect the necessary information regarding the study & the standard questionnaire was adapted from the work of Salem, Tsurusaki, Divigalpitiya & Osman (2018), Mahamud, Samat & Noor (2016), & Tsegaye Tegenu (2010). Five-point Likert-type scale was used as the range of responses: 'strongly disagree=1', 'disagree=2', 'Neutral=3', 'Agree=4', & 'Strongly Agree=5', with numeric equivalents respectively. As Neuman (2003) hypothesize, it is a process of asking many people the same questions & examining their answers.

The survey questionnaire consisted of three parts. Part one of the questionnaires consisted of six items & was used to gather data on the socio-demographic characteristics of the respondents. Part two of the instrument contained two basic questions comprising of five items & was employed to collect data on patterns of Arsi Robe town urbanization. The third part of the instrument was utilized to gather data on factors affecting urbanization in rural area towns such as Arsi Robe town & comprised of 30 items. Therefore, the survey questionnaire contained forty items. In addition to the survey questionnaire, archival materials analysis form was used to gather data on population sizes of the town in the past twenty-five years; i.e., from 1994/95 to 2020/21 & contained two items. Thus, two types of data collection instruments were employed in this study.

2.5. Validity & Reliability of the Instruments

The study applied content validity because it assesses how well a set of scale items matches with the relevant content domain of the construct that it is trying to assess. The reliability analysis was conducted to test the internal consistency of the instrument. A reliability estimate that is 0.70 or higher suggests good reliability

whereas reliability between 0.60 & 0.70 may be acceptable provided that other indicators of a model's construct validity are good. Nevertheless, the lowest acceptable limit for Cronbach's coefficient (α) is 0.70 (McMillan & Schumacher, 2010). Since the calculated values of reliabilities of the instruments per parts, dimensions & overall were greater than 0.70, the items of the questionnaires were reliable.

Table 2: Reliability of the administered semi-structured questionnaire items

SN	Questionnaire & its parts	n_i	Cronbach α	Reliabilities
1	Socio-demographic	6	0.937	They are reliable
2	Pattern of Arsi Robe town	14	0.674	They are acceptable
3	Pattern of Arsi Robe town	30	0.947	They are reliable
4	**Overall Items**	50	0.915	They are reliable

Source: Own Survey Data (2021)

2.6. Data Analysis

Gathered data was checked, edited & processed; & then entered to SPSS Version 21 for Windows. Descriptive statistics were used to describe the findings. The other inferential statistical methods utilized were correlations, single- & multiple- linear regressions. Single linear regression was computed to analyze the effect of each variable on the outcome variable. In order to assess the relationship between level of urbanization of Arsi Robe town (dependent variable) & factors affecting its level of urbanization (independent variables), the Spearman's paired ranked correlation test was run. To evaluate the levels of significance of the existing associations among the variables of interest specified in the formulated hypotheses, multiple regressions were conducted to find out which independent variables have more influence on the level of urbanization of Arsi Robe town.

Multicollinearity test was carried out to see the correlation between independent variables using standard error & one of the independent variable was dropped for those with standard error of > 2. All the assumptions for normality of continuous variable & multi-collinearity of categorical independent variables were checked by using the appropriate methods. Multicollinearity of variables was assessed by calculating Variance Inflation Factor (VIF). Results & findings of the study were presented using tables, charts & verbal descriptions to facilitate easy understandings. Moreover, the findings of the study were compared & contrasted with the findings of other researchers on the thematic topic of the study; & were also interpreted & inferred.

3. Results & Discussion

3.1. Socio-Demographic Characteristics of the Respondents

All 251 selected & sampled heads of the respondents participated in the study so that resulting in the response rate of 100 percent. Majority (142, 56.57%) was female headed households while the rest was male headed HHs (109, 43.43%). The mean age of the respondents was 38.25 years [mean±standard deviation = 38.25±11.926]. Age category of most (27.89%) respondents belonged to the age category ranging from 30 to 39 years & followed by those whose age categories belonged to 20 to 29 years (26.69%) & 40 to 49 years (23.90%), respectively. Majority (105, 41.83%) of the respondents were in marital relations followed by singles (58, 23.11%) & divorced/divorceé (48, 19.12%), respectively. Education wise, most (81, 32.27%) attained secondary level of education while 65(25.10%) were certificate holders. In terms of current occupations of the respondents, majority (59, 23.51%) & 55(21.91%) of them were self-employed & governmental employees consecutively. Non-agricultural activities (233, 92.83%) were the predominant socio-economic activities of the respondents (Table 3).

Table 3: Socio-demographic features of the respondents

Variables	Indicators	Responses in		
		Freq.	**Percent**	**Cum. Percent**
Sex of respondent	Female	142	56.57	56.57
	Male	109	43.43	100
	Total	251	100	
Age classes of respondents	Less than 20 years	5	1.99	1.99
	20 to 29 years	67	26.69	28.69
	30 to 39 years	70	27.89	56.57
	40 to 49 years	60	23.9	80.48
	50 to 59 years	38	15.14	95.62

	60 to 69 years	11	4.38	100
	Total	251	100	
Marital status of the respondents	Single	58	23.11	23.11
	Married	105	41.83	64.94
	Divorced	48	19.12	84.06
	Widow	17	6.77	90.84
	Co-habiting or living together	22	8.76	99.60
	Others	1	0.40	100.0
	Total	251	100.0	
Educational status of the respondents	Illiterate	7	2.79	2.79
	Read & Write	26	10.36	13.15
	Primary	27	10.76	23.90
	Secondary	81	32.27	56.18
	Certificate	63	25.10	81.27
	Diploma & higher	47	18.73	100.0
	Total	251	100.0	
Respondent's current occupations	Non-employed house wife	14	5.58	5.58
	Daily Laborer	29	11.55	17.13
	Student	27	10.76	27.89
	Others	46	18.33	46.22
	Self employed	59	23.51	69.72
	Governmental employee	55	21.91	91.63
	NGO's employee	21	8.37	100.0
	Total	251	100.0	
Major economic activities of participants	Agricultural	18	7.17	7.17
	Non-agricultural	233	92.83	100
	Total	251	100	

Source: Author Survey Data (2021)

3.2. Correlations among Factors & Dependent (Outcome) Variables

Correlation analysis is a statistical analysis to measure the strength of a relationship between the variables of the study. In this study, the researcher used Pearson Product Moment Correlation coefficient (r) to determine the strength & direction of the relationships between the two continuous variables; namely, dependent & independent (explanatory) variables. Pearson Correlation coefficient (r) can take values from -1 to +1 & size of the value of the coefficient indicates the strength of the relationship & (- or +) indicates the directions of the relationships. If the correlation coefficient is 0, there is no relationship between the variables.

As clearly observable from Table 4 below, government support & related factors (r = 0.446; p-value = 0.000), infrastructure & facility & related factors (r = 0.707; p-value = 0.000), economic growth & related factors (r = 0.521; p-value = 0.000), all other factors (r = 0.038; p-value = 0.548), pooled overall factors (r = 0.720; p-value = 0.000), & log of population density (r = 0.702; p-value = 0.000) had statistically significant positive correlation with the level of urbanization of Arsi Robe town. The Pearson's values of product moment correlation coefficients among the different variables of considerations & the level of urbanization of Arsi Robe town are detailed in the table (Table 4).

Table 4: Correlations among the explanatory & dependent variables of the study

Explanatory variables	Statistics	LOUART[1]
Government Support & Related Factors	Correlation Coefficient	0.446**
	Sig. (2-tailed)	0.000
	N	251

Infrastructure & Facility & Related Factors	Correlation Coefficient	0.707**
	Sig. (2-tailed)	0.000
	N	251
Economic Growth & Related Factors	Correlation Coefficient	0.521**
	Sig. (2-tailed)	0.000
	N	251
All other factors	Correlation Coefficient	0.038
	Sig. (2-tailed)	0.548
	N	251
Pooled overall factors	Correlation Coefficient	0.720**
	Sig. (2-tailed)	0.000
	N	251
Log of population density	Correlation Coefficient	0.702**
	Sig. (2-tailed)	0.000
	N	251

Source: Own Survey Data (2023); **LOUART**[1]=Level of urbanization of Arsi Robe town

Table 4 shows the significant values for the explanatory variables on the level of urbanization of Arsi Robe town that were categorized into four dimensions (government support & related factors, infrastructure & facility & related factors, economic growth & related factors, & all other factors) & log of population density. If these are less than 0.01, the relationship between the explanatory variables & the level of urbanization of Arsi Robe town as significant; otherwise insignificant. If the Pearson correlation value had plus value (p = +0.*xxx*), there was a positive relationship between the variables &; if its value was negative (p = -0.*xxx*), there was a negative relationship between the variables. The significant values were 0.000 for all of the dimensionalized explanatory variables as whole that were addressed in the study. Therefore, there were strong positive correlations between the first three dimensions (government support & related factors, infrastructure & facility & related factors, & economic growth & related factors) as well as log of population density, & level of urbanization of Arsi Robe town.

Based on the above findings, it is possible to infer that there were direct & positive correlations between the three dimensions (government support & related factors, infrastructure & facility & related factors, & economic growth & related factors), & the pooled overall factors for the four categorized dimensions & log of population density, & level of urbanization of Arsi Robe town. Therefore, the higher the influences of the three dimensions (government support & related factors, infrastructure & facility & related factors, & economic growth & related factors), & the pooled overall factors for the four categorized dimensions & log of population density, the higher the level of urbanization of Arsi Robe town.

3.3. Urbanization Rates & Pattern of Arsi Robe Town

Table 5 reflected patterns & levels of urbanization of Arsi Robe town from 1994/95 to 2020/21 fiscal years based on respondent's ratings. Of the total 251 respondents, 130(51.79%) rated it as semi-urban town before 20 years ago while 69(27.49%) & 43(17.13%) rated it as rural village & rural settlement consecutively. Again, responses of the participants indicated that it was semi-urban (42.63%) & as suburban or suburb (33.86%) ten years ago respectively. However, majorities (42.63% & 52.19%) of the respondents rated it as urban prior to fivers ago & currently respectively. Regarding the rate of Arsi Robe town's urbanization, out of the total respondents, 107(42.63%) & 74(29.48%) ranked its urbanization rate as faster & fast respectively while 58(23.11%) ranked its rate of urbanization as moderate accordingly (Table 5).

Table 5: Patterns & levels of urbanization of Arsi Robe town based on respondents

Items	Options	Responses in		
		Freq.	**Percent**	**Cum. percent**
How do you classify Arsi Robe town:				
20 years ago?	Rural village	69	27.49	27.49
	Rural settlement	43	17.13	44.62
	Suburban or suburb	7	2.79	47.41

	Semi-urban	130	51.79	99.20
	Urban	2	0.80	100.0
	Total	251	100.0	
10 years ago?	Rural village	10	3.98	3.98
	Rural settlement	39	15.54	19.52
	Suburban or suburb	85	33.86	53.39
	Semi-urban	107	42.63	96.02
	Urban	10	3.98	100.0
	Total	251	100.0	
5 years ago?	Rural village	3	1.20	1.20
	Rural settlement	9	3.59	4.78
	Suburban or suburb	58	23.11	27.89
	Semi-urban	74	29.48	57.37
	Urban	107	42.63	100
	Total	251	100	
Currently or now	Rural village	0	0.00	0.00
	Rural settlement	0	0.00	0.00
	Suburban or suburb	17	6.77	6.77
	Semi-urban	103	41.04	47.81
	Urban	131	52.19	100
	Total	251	100	
Rated level of urbanization of Arsi Robe in the past 5 years?	Slower	3	1.20	1.20
	Slow	9	3.59	4.78
	Moderate	58	23.11	27.89
	Fast	74	29.48	57.37
	Faster	107	42.63	100
	Total	251	100	

Source: Author Survey Data (2021)

From the above findings, it is possible to infer that the patterns & levels of urbanization of Arsi Robe town from 1994/95 to 2020/21 match with the rates of urbanizations of most towns located in rural areas of the country. Still, the findings imply that the town grew from almost semi-urban to urban type of town. These findings are consistent with the previously reported findings of Tsegaye Tegenu (2010) that showed that there was modest increase in the urban population in 1994 recording 88.9 percent variation, but this modest increase declined to 55 percent in 2008; & again rose by 113 percent from 2009-2015.

However, the rate of urbanization depends on the definition of urban areas. The standard approach in measuring urbanization is the definition of settlement concentration, economic activity criteria & administrative classification (boundary of administrative unit) used by CSA. An urban center includes, regardless of the number of inhabitants, "all capitals of regions, zones & Woredas (districts), & localities with urban dwellers association (Kebeles) whose inhabitants are primarily engaged in non-agricultural activities"; it also includes "settlements with more than 2000 inhabitants". This approach has problems if the three criteria (administrative, nature of economic activity & settlement concentration) are used inconsistently over time. There can be over or under counting of townships. The other option put forwarded is agglomeration index, which is based on three factors, population density, the population of a "large" urban center, & travel time to that large urban center. This approach assumes that "a city with a population size of 100,000 or more & a population density of less than 150 people per square kilometer does not exist".

The rate of change in urbanization of Arsi Robe town was calculated by the following formula (Puyravaud, 2003).

$$P = \frac{100}{(t_2 - t_1)} * ln\left(\frac{A_2}{A_1}\right)$$

where, P is percentage or rate of Arsi Robe town urbanization per five years & A_1 & A_2 are the areas of the town at time t_1 & t_2, respectively. Accordingly, annual rate of urbanization of Arsi Robe town was 6.322 percent while the rates of its urbanization per the consecutive five years were 3.019%, 6.428%, 4.814%, 12.291% & 5.059% between 1994/95 & 1999/00, 1999/00 & 2004/05, 2004/05 & 2009/10, 2009/10 & 2014/15 & 2014/15 &

2019/20 respectively (Table 6). Again, using the second approach or the agglomeration index of determining urbanization rate of the town that was based on Balasubramanian & Choi (n.y.), Arsi Robe town was rural area town in 1994/95 while it was dense urban cluster starting from 1999/00 up to 2019/20 based on the population density per km^2.

Table 6: Patterns & levels of urbanization of Arsi Robe town by population sizes

Fiscal years	Total area (km^2)	Population Sizes	Population density/km^2	Rate of urbanization
1994/95	0.45875	3599	7845.19	Base year
1999/00	0.53350	6251	11673.20	3.019
2004/05	0.73574	9144	12428.39	6.428
2009/10	0.93597	15678	16750.53	4.814
2014/15	1.73045	34325	19835.87	12.291
2019/20	2.22852	52840	23710.86	5.059

Source: Author Survey Data (2021)

From the above findings that was based on the agglomeration index which was based on population density, it is possible to infer that Arsi Robe town could be classified as dense urban cluster at large & the fastest rate of urbanization of the town occurred between 2009/10 & 2014/15. These patterns & levels of urbanization of Arsi Robe town from 1994/95 to 2020/21 overlap with the patterns & levels of urbanization of Ethiopian towns & cities situated in rural areas of the country. Still, the findings imply that the town grew from almost rural cluster to dense urban cluster type of town. These findings are consistent with the previously reported findings of Tsegaye Tegenu (2010) that showed that there was modest increase in the urban population in 1994 recording 88.9 percent variation but this modest increase declined to 55 percent in 2008; & again rose by 113 percent from 2009-2015. Although the level of urbanization in developing countries is low, its rate of urbanization is one of the fastest when compared & contrasted with similar towns located in rural areas of Ethiopia.

Figure 3 depicted below illustrates rates of urbanization of Arsi Robe town between 1994/65 & 2019/20. As easily observed from the Figure, rates of urbanization of the town between 1994/95 & 2009/10 was characterized by steady increase while the rates increased sharply between 2009/10 & 2019/20 (Figure 3).

According to the World Urbanization Prospects reported by the United Nations (UN, 2012), from 1965 to 2010, the global population increased from 3.3 billion to 6.9 billion, & the total amount of population will exceed 9.3 billion by 2050. Along with the population growth, more & more people chose to live in urban areas. The percentage of the world's population residing in urban areas increased from 35.5% in 1965 to 51.6% in 2010 & this number will reach at 67% in 2015 (UN, 2012). However, the percent of urban residents in Robe Didea district was by far lower than UN's projected figure for 2015 as compared to 67 percent since only about 15.52% were urban dwellers in 2021.
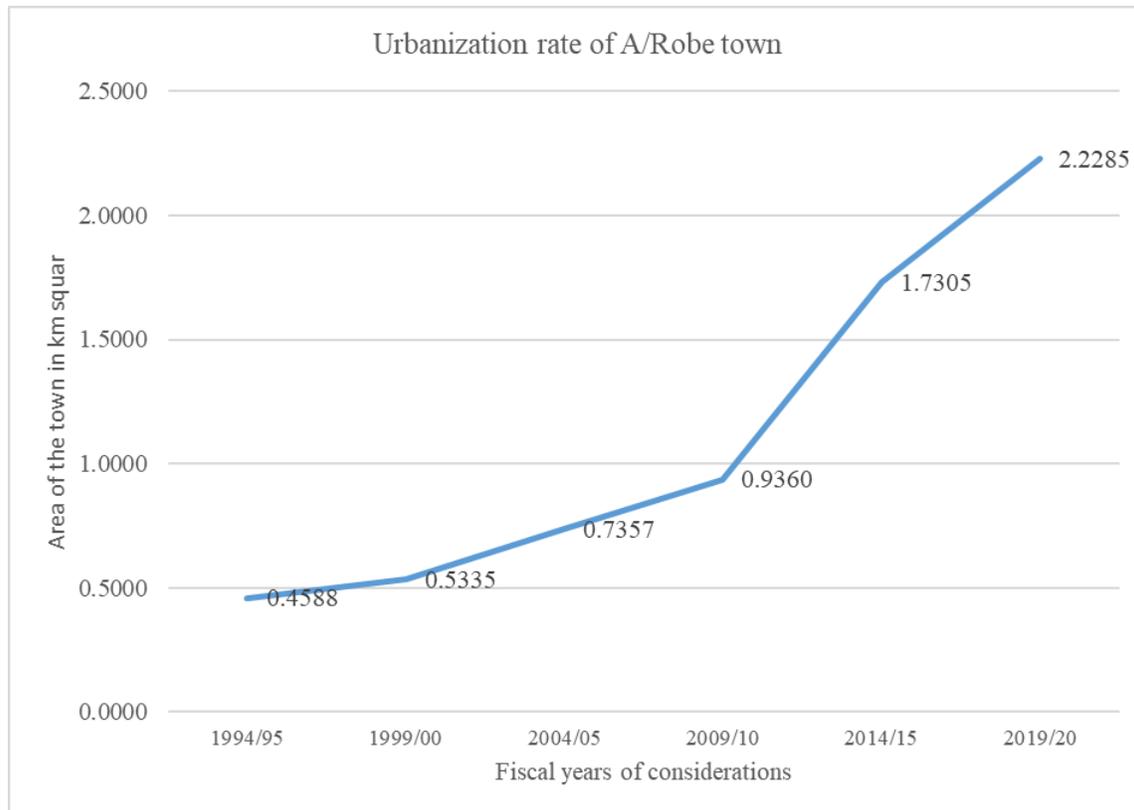
Figure: 3: Rates of changes in the areas of Arsi Robe town or its urbanization pattern
Source: Own Survey Data (2021)

3.4. Factors Affecting Urbanization of Arsi Robe

All predictor variables were quantitative & the outcome variable must be quantitative, continuous & unbounded; the predictors had non-zero variation in value (i.e. they do not have variances of 0); there was no perfect multicollinearity as there was no strong correlation between two or more predictors in a regression model; the predictors were not correlated with 'external variables'; homoscedasticity assumption was met at each level of the predictor variable(s), the variance of the residual terms were constant; the residuals were independent; the residuals in the model were random or normally distributed variables with a mean of 0; all of the values of the outcome variable were independent (in other words, each value of the outcome variable comes from a separate entity); & the mean values of the outcome variable for each increment of the predictor(s) lie along a straight line. The model function that relate factors affecting rate of urbanization of Arsi Robe town is given in the mathematical expression below; i.e.,

$$A/Robe_{Expansion} = \beta_0 + \beta_1 GSRF + \beta_2 IFRF + \beta_3 EGRF + \beta_4 AOF + \beta_5 LOGPOPD + \varepsilon_i,$$

Where,

β_0 = Constant, β_1 = Coefficient of government support & related factors, β_2 = Coefficient of infrastructure & facility related factors, β_3 = Coefficient of economic growth & related factors,

β_4 = Coefficient of all other factors, β_5 = Coefficient of log of population density, & ε_i = Sum of residual errors, GSRF= Government support & related factors, IFRF= Infrastructure & facility, & related factors, EGRF= Economic growth & related factors, AOF= All other factors, & LOGPOPD = Log of the population density.

Or

$$A/Robe_{Expansion} = \beta_0 + \beta_1 Overall\ factors + \beta_2 LOGPOPD + \varepsilon_i$$

Where,

β_0 = Constant, β_1 = Coefficient of pooled four dimensionalized factors, β_2 = Coefficient of Coefficient of log of population density, & LOGPOPD = Log of the population density

3.4.1. Test of Hypotheses

The regression analyses were used to identify the effect of explanatory variables (the four dimensions of affecting factors of urbanization of the town & the log of the population density of Arsi Robe town) on the dependent variable (level of urbanization of Arsi Robe town). Simple regression analysis was used to analyze how far the government support & related factors, infrastructure & facility & related factors, economic growth & related factors, all other factors, overall weighted composite factors & log of population density could positively &/or negatively affected the level of urbanization of Arsi Robe town during the specified 25 years of period.

The following were the major hypotheses addressed & tested in this study. These were:

Testing the effect of government support & related factors on urbanization of Arsi Robe town

H_{01}: There is no significant effect of government support & related factors on urbanization of Arsi Robe town.

Ha_1: There is significant association between government support & related factors & urbanization of Arsi Robe town.

Testing the effect of infrastructure & facility & related factors on urbanization of Arsi Robe town

H_{02}: There is no significant effect of infrastructure & facility, & related factors on urbanization of Arsi Robe town.

Ha_2: There is significant effect of infrastructure & facility, & related factors on urbanization of Arsi Robe town.

Testing the effect of economic growth & related factors on urbanization of Arsi Robe town

H_{03}: There is no significant effect of economic growth & related factors on urbanization of Arsi Robe town.

Ha_3: There is significant effect of economic growth & related factors on urbanization of Arsi Robe town.

Testing the effect of all other factors on urbanization of Arsi Robe town

H_{04}: There is no significant effect of all other factors on urbanization of Arsi Robe town.

Ha_4: There is significant effect of all other factors on urbanization of Arsi Robe town.

Table 7: Regression analysis for factors & urbanization level of Arsi Robe town

Model Summary[b]										
Model	R	R^2	Adj. R^2	SE Estimate	Change Statistics					Durbin-Watson
					R^2 Change	F Change	df1	df2	Sig. F Change	
1	0.501[a]	0.251	0.248	0.825	0.251	83.397	1	249	0.000	0.347
2	0.694[a]	0.481	0.479	0.686	0.481	230.780	1	249	0.000	0.297
3	0.570[a]	0.325	0.322	0.783	0.325	119.772	1	249	0.000	0.347
4	0.046[a]	0.002	-0.002	0.952	0.002	0.539	1	249	0.464	0.019
5	0.598[a]	0.357	0.355	0.764	0.357	138.423	1	249	0.000	0.077
All	0.836[a]	0.699	0.693	0.527	0.699	113.678	5	245	0.000	0.616
1	a. Predictors: (Constant), Government Support Related Factors									
	b. Dependent Variable: Level of urbanization of Arsi Robe town									
2	a. Predictors: (Constant), Infrastructure & Facility Related Factors									
	b. Dependent Variable: Level of urbanization of Arsi Robe town									
3	a. Predictors: (Constant), Economic Growth Related Factors									
	b. Dependent Variable: Level of urbanization of Arsi Robe town									
4	a. Predictors: (Constant), Other Factors like demography & the likes									
	b. Dependent Variable: Level of urbanization of Arsi Robe town									
5	a. Predictors: (Constant), Log of the population density									
	b. Dependent Variable: Level of urbanization of Arsi Robe town									
All	a. Predictors: (Constant), Log of the population density, other factors, government support related factors, economic growth related factors, infrastructure & facility related factors									
	b. Dependent Variable: Level of urbanization of Arsi Robe town									

Source: Author Survey Data (2021)

The above table shows that adjusted R square value for government support related factors was 0.248 which meant that government support related factors made the impact of 24.80% on the level of urbanization Arsi Robe town. So that government support related factors had statistically significant positive effect on the level of urbanization Arsi Robe town by 50.10% (B= 0.501, t = 9.132, p-value = 0.000) (Tables 7 & 11). Therefore, null hypothesis (H_0) is rejected; & alternative hypothesis (H_a) is accepted.

Again, the adjusted R^2 value for infrastructure & facility related factors was 0.479 which meant that infrastructure & facility related factors made the impact of 24.90% on the level of urbanization Arsi Robe town. So that infrastructure & facility related factors had statistically significant positive effect on the level of urbanization Arsi Robe town by 69.40% (B= 0.694, t = 15.191, p-value = 0.000) (Tables 7 & 11). Therefore, null hypothesis (H_0) is rejected; & alternative hypothesis (H_a) is accepted.

Moreover, the adjusted R^2 value for economic growth related factors was 0.322 which meant that economic growth related factors made the impact of 32.20% on the level of urbanization Arsi Robe town. So that economic growth related factors had statistically significant positive effect on the level of urbanization Arsi Robe town by 57% (B= 0.570, t = 10.944, p-value = 0.000) (Tables 7 & 11). Therefore, null hypothesis (H_0) is rejected; & alternative hypothesis (H_a) is accepted.

Still, the adjusted R^2 for other all factors value was negative 0.002 which meant that other all factors made the impact of negative 0.20% on the level of urbanization Arsi Robe town. So that other all factors had statistically insignificant positive effect on the level of urbanization Arsi Robe town by 4.60% (B= 0.046, t = 0.734, p-value = 0.464) (Tables 7 & 11). Therefore, null hypothesis is accepted.

Finally, the adjusted R^2 for log of population density value was 0.355 which meant that log of population density made the impact of 35.50% on the level of urbanization Arsi Robe town. So that log of population density had statistically significant positive effect on the level of urbanization Arsi Robe town by 59.80% (B= 0.598, t = 11.765, p-value = 0.000) (Tables 7 & 11). Therefore, null hypothesis (H_0) is rejected; & alternative hypothesis (H_a) is accepted.

Still, from the ANOVA table presented below for regression analysis, it is possible to infer that the four dimensions of affecting factors & log of the population density had statistically significant effect on level of urbanization of Arsi Robe town ($F_{5,245}$ = 113.678; p-value = 0.000) (Table 8).

Table 8: Impact of explanatory variables on urbanization of A/Robe using one-way ANOVA

ANOVA[a]						
Model		SS	df	MS	F	Sig.
1	Regression	56.721	1	56.721	83.397	0.000[b]
	Residual	169.351	249	0.680		
	Total	226.072	250			
2	Regression	108.743	1	108.743	230.780	0.000[b]
	Residual	117.328	249	0.471		
	Total	226.072	250			
3	Regression	73.425	1	73.425	119.772	0.000[b]
	Residual	152.647	249	0.613		
	Total	226.072	250			
4	Regression	0.488	1	0.488	0.539	0.464[b]
	Residual	225.584	249	0.906		
	Total	226.072	250			
5	Regression	80.773	1	80.773	138.423	0.000[b]
	Residual	145.298	249	0.584		
	Total	226.072	250			
All	Regression	157.977	5	31.595	113.678	0.000[b]
	Residual	68.095	245	0.278		
	Total	226.072	250			
1	a. Dependent Variable: Level of urbanization of Arsi Robe town					
	b. Predictors: (Constant), Government Support Related Factors					
2	a. Dependent Variable: Level of urbanization of Arsi Robe town					
	b. Predictors: (Constant), Infrastructure & Facility Related Factors					
3	a. Dependent Variable: Level of urbanization of Arsi Robe town					
	b. Predictors: (Constant), Economic Growth Related Factors					

4	a. Dependent Variable: Level of urbanization of Arsi Robe town	
	b. Predictors: (Constant), Other Factors like demography & the likes	
5	a. Dependent Variable: Level of urbanization of Arsi Robe town	
	b. Predictors: (Constant), Log of the population density	
All	a. Dependent Variable: Level of urbanization of Arsi Robe town	
	b. Predictors: (Constant), Log of the population density, other factors, government support related factors, economic growth related factors, infrastructure & facility related factors	

Source: Author Survey Data (2021)

Testing the effect of overall factors on level of urbanization of Arsi Robe town
H_{01}: There is no significant effect of overall factors on level of urbanization of Arsi Robe town.
Ha_1: There is significant association between overall factors & level of urbanization of Arsi Robe town.
Testing the effect of log of population density on level of urbanization of Arsi Robe town
H_{02}: There is no significant effect of log of population density on level of urbanization of Arsi Robe town.
Ha_2: There is significant association between log of population density & level of urbanization of Arsi Robe town.

Table 9: Model summary for weighted overall factors & log of population density

Model Summary[b]										
Model	R	R^2	Adj. R^2	SE of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	0.749[a]	0.561	0.560	0.631	0.561	318.621	1	249	0.000	1.496
2	0.598[a]	0.357	0.355	0.764	0.357	138.423	1	249	0.000	1.658
All	0.815[a]	0.664	0.661	0.553	0.664	245.211	2	248	0.000	0.644
1	a. Predictors: (Constant), Pooled overall factors affecting urbanization of Arsi Robe town									
	b. Dependent Variable: Level of urbanization of Arsi Robe town									
2	a. Predictors: (Constant), LOGDEN									
	b. Dependent Variable: Level of urbanization of Arsi Robe town									
All	a. Predictors: (Constant), Log of the population density, pooled overall factors									
	b. Dependent Variable: Level of urbanization of Arsi Robe town									

Source: Author Survey Data (2021)

The adjusted R^2 value for all weighted potential factors was 0.560 which meant that all weighted potential factors had the impact of 56% on level of urbanization of Arsi Robe town. So that overall factors had statistically significant positive impact on level of urbanization of Arsi Robe town by 74.90% (B= 0.749, t = 17.850, p-value = 0.000) (Tables 9 & 12). Therefore, null hypothesis (H_0) is rejected; so that an alternative hypothesis (H_6) is accepted.

The adjusted R^2 value for log of population density was 0.560 which meant that log of population density had the impact of 35.50% on level of urbanization of Arsi Robe town. So that log of population density had statistically significant positive impact on level of urbanization of Arsi Robe town by 59.80% (B= 0.598, t = 11.765, p-value = 0.000) (Tables 9 & 12). Therefore, null hypothesis (H_0) is rejected; so that an alternative hypothesis (H_6) is accepted.

The ANOVA table presented below for regression analysis, it is possible to infer that overall factors had statistically significant effect on level of urbanization of Arsi Robe town ($F_{2,248} = 245.211$; p-value = 0.000) (Table 10).

Table 10: Fisher's test on effect of overall factors & LOGDEN on urbanization of A/Robe town

ANOVA[a]						
Model		SS	df	MS	F	Sig.
1	Regression	126.900	1	126.900	318.621	0.000[b]
	Residual	99.172	249	0.398		
	Total	226.072	250			

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2	Regression	80.773	1	80.773	138.423	0.000[b]
	Residual	145.298	249	0.584		
	Total	226.072	250			
All	Regression	150.145	2	75.073	245.211	0.000[b]
	Residual	75.926	248	0.306		
	Total	226.072	250			
1	a. Dependent Variable: Level of urbanization of Arsi Robe town					
	b. Predictors: (Constant), Pooled overall factors affecting urbanization of Arsi Robe					
2	a. Dependent Variable: Level of urbanization of Arsi Robe town					
	b. Predictors: (Constant), LOGDEN					
All	a. Dependent Variable: Level of urbanization of Arsi Robe town					
	b. Predictors: (Constant), Log of the population density, Pooled overall factors					

Source: Author Survey Data (2021)

3.4.2. Regression Analyses

Table 11: Coefficients of the seven constructed factors & their constant

		Coefficients[a]									
Model	Variables in the equations	Unstand. Coeffs.		Stand. Coeffs.	t	Sig.	95.0% CI for B		Collinearity Statistics		
		B	SE	Beta			LB	UB	Toler.	VIF	
1	(Constant)	2.183	0.215		10.159	0.000	1.760	2.607			
	GSRF	0.694	0.076	0.501	9.132	0.000	0.545	0.844	1.000	1.000	
2	(Constant)	-1.051	0.341		-3.083	0.002	-1.723	-0.380			
	IFRF	1.569	0.103	0.694	15.191	0.000	1.365	1.772	1.000	1.000	
3	(Constant)	-0.250	0.399		-0.625	0.533	-1.036	0.537			
	EGRF	1.361	0.124	0.570	10.944	0.000	1.116	1.606	1.000	1.000	
4	(Constant)	3.754	0.459		8.188	0.000	2.851	4.657			
	AOF	0.105	0.143	0.046	0.734	0.464	-0.176	0.385	1.000	1.000	
5	(Constant)	-12.071	1.374		-8.784	0.000	-14.778	-9.364			
	LOGDEN	3.833	0.326	0.598	11.765	0.000	3.192	4.475	1.000	1.000	
All	(Constant)	-9.617	1.054		-9.124	0.000	-11.693	-7.541			
	GSRF	0.449	0.051	0.324	8.835	0.000	0.349	0.550	0.913	1.095	
	IFRF	0.716	.109	0.317	6.559	0.000	0.501	0.931	0.528	1.894	
	EGRF	0.599	0.097	0.251	6.157	0.000	0.407	0.790	0.742	1.347	
	AOF	0.154	0.079	0.068	1.945	0.053	0-.002	0.311	0.991	1.009	
	LOGDEN	1.833	0.281	0.286	6.517	0.000	1.279	2.387	0.639	1.565	
1	a. Dependent Variable: Level of urbanization of Arsi Robe town										
2	a. Dependent Variable: Level of urbanization of Arsi Robe town										
3	a. Dependent Variable: Level of urbanization of Arsi Robe town										
4	a. Dependent Variable: Level of urbanization of Arsi Robe town										
5	a. Dependent Variable: Level of urbanization of Arsi Robe town										
All	a. Dependent Variable: Level of urbanization of Arsi Robe town										

Source: Author Survey Data (2021)

$$A/Robe_{Expansion} = \beta_0 + \beta_1 GSRF + \beta_2 IFRF + \beta_3 EGRF + \beta_4 AOF + \beta_5 LogPDen + \varepsilon_i,$$

$$A/Robe_{Expansion} = -9.617 + 0.449 GSRF + 0.716 IFRF + 0.599 EGRF + 0.154 AOF + 1.833 LOGPDen$$

Based on the above model, GSRF, IFRF, EGRF, AOF & LogPden contributed positively towards the level of urbanization of Arsi Robe town by 69.30 percent (Tables 8 & 11).

Table 12: Coefficients of overall weighted & log of population density effects

Model	Variables in equations	Unstand. Coeffs		Stand. Coeffs	t	Sig.	95.0% CI for B		Collinearity Statistics	
		B	SE	Beta			LB	UB	Toler.	VIF
1	(Constant)	-3.424	.423		-8.100	0.000	-4.257	-2.592		
	Pooled	2.424	.136	0.749	17.850	0.000	2.157	2.692	1.000	1.000
2	(Constant)	-12.071	1.374		-8.784	0.000	-14.778	-9.364		
	LOGDEN	3.833	.326	0.598	11.765	0.000	3.192	4.475	1.000	1.000
All	(Constant)	-11.481	.996		-	0.000	-13.444	-9.519		
	Pooled	1.962	.130	0.606	15.053	0.000	1.705	2.219	0.834	1.198
	LOGDEN	2.251	.258	0.351	8.714	0.000	1.742	2.760	0.834	1.198
a. Dependent Variable: Level of urbanization of Arsi Robe town										
a. Dependent Variable: Level of urbanization of Arsi Robe town										
a. Dependent Variable: Level of urbanization of Arsi Robe town										

Source: Author Survey Data (2021)

The constant value is -11.481 for overall factors & the coefficient for overall weighted factors was 1.962 & that of log of population density was 2.251 at 66.10 percent. Accordingly, the model fitted.

Thus, $A/Robe_{Expansion} = \beta_0 + \beta_1 Overall\ factors + \beta_2 LOGPOPD + \varepsilon_i$

$A/Robe_{Expansion} = -11.481 + 1.962\ Overall\ factors + 2.251 LOGDEN$

Where, $A/Robe_{Expansion}$ = Level of urbanization of Arsi Robe town, OAF = Overall factors' weighted values & LOGDEN = Log of the population density of the town

As per the above table, the overall weighted factors & log of the population density contributed towards the level of urbanization of Arsi Robe town by 66.10 percent.

4. Conclusions & Recommendations

4.1. Conclusions

Based on the areas of the town, the annual rate of urbanization of Arsi Robe town was 6.322 percent from 1994/95 up to 2019/20 while the rates of its urbanization were 3.019%, 6.428%, 4.814%, 12.291% & 5.059% between 1994/95 & 1999/00, 1999/00 & 2004/05, 2004/05 & 2009/10, 2009/10 & 2014/15 & 2014/15 & 2019/20 respectively. Again, using the second approach or the agglomeration index of determining urbanization rate of the town, Arsi Robe town was rural area town in 1994/95 while it was dense urban cluster starting from 1999/00 up to 2019/20 based on the population density per km^2.

Survey results revealed that high expenditure of government on town infrastructure & services at the expense of rural areas, government supporting of minimum wage rates & employment protection, presence of government subsidizing industries & governmental food & housing provision to registered urban dwellers had relatively contributed least towards urbanization of Arsi Robe town while accessibility & availability of infrastructure, facilities & related had contributed at larger extent towards urbanization of Arsi Robe town. In general, government support related factors, infrastructure & facility related factors, economic growth related factors, other factors like demography & the likes & overall weighted composite factors had contributed towards urbanization of Arsi Robe town in varying magnitudes & extents.

Government support related factors made the impact of 24.80% on the level of urbanization Arsi Robe town so that government support related factors had statistically significant positive effect on the level of urbanization Arsi Robe town by 50.10%. Infrastructure & facility and related factors made the impact of 24.90% on the level of urbanization Arsi Robe town so that infrastructure & facility and related factors had statistically significant positive effect on the level of urbanization Arsi Robe town by 69.40%. Economic growth related factors made the impact of 32.20% on the level of urbanization Arsi Robe town so that economic growth related factors had statistically significant positive effect on the level of urbanization Arsi Robe town by 57%. Log of population density made the impact of 35.50% on the level of urbanization Arsi Robe town so that log of population density had statistically significant positive effect on the level of urbanization Arsi Robe town by 59.80%. Thus, it is possible to infer that the four dimensions of affecting factors & log of the population density had statistically

significant effect on level of urbanization of Arsi Robe town. Based on the above model, GSRF, IFRF, EGRF, AOF & LogPden contributed positively towards the level of urbanization of Arsi Robe town by 69.30 percent. Weighted effect of composite overall factors had the impact of 56% on level of urbanization of Arsi Robe town so that overall factors had statistically significant positive impact on level of urbanization of Arsi Robe town by 74.90%. Log of population density had the impact of 35.50% on level of urbanization of Arsi Robe town so that log of population density had statistically significant positive impact on level of urbanization of Arsi Robe town by 59.80%. Thus, it is possible to infer that overall factors had statistically significant effect on level of urbanization of Arsi Robe town. As per this model, overall weighted composite value for the four dimensional factors & log of the population density contributed positively towards the level of urbanization of Arsi Robe town by 66.10 percent.

4.2. Recommendations

Based on the major findings of the study, the article forwarded the following recommendations. In order to accelerate & promote urbanization of Arsi Robe towns factors adversely contributing towards the same ends should be manipulated by the municipality, mayor & stakeholders of the town, & since there is no equivocally agreed upon criteria of classifying towns as urban centers or not among scholars, caution should be taken in interpreting & generalizing factors affecting urbanization of towns situated in rural areas such as Arsi Robe town. Moreover, it is better if further variables/factors that are not addressed in the paper such as GDP, industrialization level, trade, political stability, income per capita, degree of democracy & other are included in developing more profound regression model that help in forecasting the level of urbanization of the town by other interested researchers.

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Biography of Dereje Demissie Shasho

Mr. Dereje Demissie Shasho (Burka Ulu in Gura-Haricho Kebele of Lode Hetosa district, Arsi Zone, 1973GC). I attended my elementary school education in Ligeba elementary school from 1979/80 to 1984'85 and my secondary school education in Huruta senior secondary school from 1985/86 to 1987/88 from grade nine up to grade eleven; and in Asella Comprehensive secondary school in 1988/89. In 1989/90, I joined Addis Ababa University, Faculty of Natural Sciences and studied applied biology from 1989/90 up to November 1993 including six months' military training (spell) at Bilate in 1990/91 and four months' closure of the University in 1993. I received bachelor degree of sciences (B. Sc.) from AAU, Addis Ababa, Ethiopia, on 13 November 1993. In September 1995, I joined School of Graduate Studies of AAU and studied applied microbiology. I received master's degree of sciences (M. Sc.) from AAU, School of Graduate Studies, Addis Ababa, Ethiopia in January 2000.