

## Conurbation and Urban Sprawl in Africa: The case of the City of Addis Ababa

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### Abstract

*This paper presents the current situation of conurbation and urban sprawl in Ethiopia highlighting on the city of Addis Ababa. The paper has a purpose to assess the situation, rate and nature of urban sprawl and its role for metropolitan linkage. With regard to both the rate and nature of conurbation and urban sprawl of the city, the high growth rate has been seen along Mojo outlet that stretches up to Dukem and Debre Zeit towns and Jimma outlet (Alem Gena town). The lesser extent is distinguished along Dessie, Gojam and Nekemte outlets. The factors for perceived rise or reduction of both conurbation and urban sprawl are the fact that of the presence of industry, population pressure, landscape and geographic advantage, and infrastructure access. The finding showed that, up to 2010, the city stretched averagely for about 1 kilo meter radius per year in all directions but in 2020 and onward the rise will show reduction by half (in 0.5 km) radius because of vertical growth. But the growth rate of the city has spread in double rate along main outlets than at all side. At present, the existing catchment of the city grows and expands in the radius of 30 km along the five highway routes, but the city on average expands about 15 km radius in all sides. Thus, the rate of both conurbation and urban sprawl along the five outlets doubles more than that found within all directions. The ideal strategy to bring formal growth in and around the city should need strong integrative work with the heads of sub-cities and proximate rural areas with timely and proper supervision to bring the required growth of the city as intended in the master plan.*

**Key terms:** Conurbation, Metropolis, Metropolitan Linkage, Corridor and Urban Sprawl

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## **Research Problem**

Various studies and dictionaries explore that *conurbation* connotes to a continuous network of urban communities. The Merriam Webster and Cambridge advanced dictionaries also define that conurbation is a large area that consists of cities or towns that have grown up and reduce very little room between them. It shares similar meaning to the phrase urban sprawl with slight difference. And a city is an area containing a large number of people, formed by various towns growing and joining together. It is also explained by Décio and Ugalde (2007) that conurbation refers to the structures of the parts which are grasped in the metropolitan structure. Pertaining to the type, both conurbation and urban sprawl can be noticed from diverse angles. Among these, the planned and unplanned one is the known one. Planned conurbation and urban sprawl are carried out by the plan and consent of government only. It is like State of Environment report (2003). Some cities in India are explored that it is commonly carried out on the place where the attention of the government is sighted. The unplanned type is observed on the place where former agricultural land is undertaken by the interest of individuals through purchasing the rural land from local farmers without legal procedure. However, the other writer also strengthens this idea, for example, Jaroslaw (2008) explains that it was profoundly practiced in spontaneous manner and also artificially accelerated. In some case, it is undertaken in overnight and within few off working days.

Andrea and Décio's (2009) study in Brazil confirm that the other type of conurbation and urban sprawl is international and national. The International one refers *the conurbation and urban sprawl to be formed by the cities which area grew along the border line between two or three countries*. The "national" one also increases their potential for innovation in metropolitan areas that combine critical mass and diversity of peoples in the nation. So, the theme of this study focuses on this type of conurbation and urban sprawl than the international one; it includes the conurbation and urban sprawl found between the regions, local areas, and nations. Even the industrial and non-industrial conurbation and urban sprawl is also identified by the sector. The industrial type of conurbation comes due to the spread of industry and the rate and amount of industries along the lines which are very high. Whereas, non-industrial one is practiced due to the availability of non-industrial activities in the area, including service sector, settlement pattern of peoples and others.

Décio and Ugalde (2007) also perceive that an intense industrial activity taking place in this territory is good for the significant occurrence of urban growth. Slowly, the urban areas in Brazil started to connect each other and formed a new space at another scale disregarding the administrative city limits. The Porto Alegre Metropolitan Area is also comprises 31 municipalities, from which 13 concentrate on the main conurbation. It goes in an inclusive manner and also invades the area. Andrea and Décio (2009) also narrate that the formation of conurbation and urban sprawl becomes visible beyond the geographic and landscape barriers, even in some cases where the conurbation has no geographical barrier, resembling one whole city. They are still treated (in political and urban planning) imputes such as the two isolated urban spaces, and social and cultural parameters of each national identity is easily perceived

on the urban configuration. Whereas, notion of conurbation cannot only glimpse from grown point of view but also it can go to downing manner, which refers shrinking conurbation.

*On the subject of cause and effect*, conurbation also ties with every aspect. The formation of conurbation has various causes and effects. Among these, conurbation has created mostly due to urbanization and industrialization, which are the strongest causes. It is also an indicator that urbanization is a consequence of significant transformations on the national economies and social expectations in both separated towns/cities. So, they have close and strong correlation with conurbation and urban sprawl (Andrea Da Costa Braga et al, 2012). In addition to urbanization, the geographic proximity of places and the plantation of industry have been as a factor for the formation of conurbation. *For instance*, Jaroslaw (2008) says that the Katowice conurbation is a classic mining conurbation in UK. It is associated not simply with mining ore but with mining industry. Rasul Shams (1988) describes that geographic proximity in developing countries is an essential factor for natural integration processes. It also gives additional stimulus to trade activity between the countries and sometimes preconditions for prevalence of dynamic growth. The geographic proximity is an essential factor for both internal and international integration of neighborhood cities or towns and also countries. It is also due to the natural integration that is carried out around a pivot area.

The main factor for making and expanding of conurbation and urban sprawl is the fact of population pressure and settlement pattern. The United Nations report (2004) indicated that half of the global population lives in cities and estimated that this will rise to sixty percentages by 2030. In Nigeria and other developing countries, population in cities is projected to increase from 1.9 billion in 2000 to 3.9 billion in 2030. This is principally due to rural-to-urban migration which is consequent upon the dichotomous planning and development. In Africa, estimates have shown that between 1990 and 2020, half a billion people will be added to the already overcrowded urban conurbations, it is against the less-than 200 million people in north America and Europe (Population Centre (2000) as cited in Abdullahi et al (2009).

However, population growth does not mean the only issue of third world countries but also the first and second worlds as well. For instance, the population of Great Britain also grew by about one and a half million people, or 2.7% of its 1991 population, between 1991 and 2001. The population of the cities are taken together, and also grew by 244,000, a 1% growth rate (i.e. less than half the growth rate of Great Britain as a whole). However, this figure makes important difference among cities. London grew very rapidly, especially the inner London which is shown the fastest growing district type in the country. The capital gained just under half a million people (479,000) in the 1990s, a 7% gain (Lee Boon Thong, 2005).

The other agents for an acceleration of conurbation and urban sprawl are the accessibility of transport service and connectivity of roads. Werner and Erhard (2003) confirm that the settlement pattern of once area also takes place subsequent to the road system. However, often overlooking shows that the significant conurbation features are undertaken by the travel over short distance. It is for the sake of work, education, shopping, personal business, leisure and others activities. This feature can also be observed in everywhere including Ethiopia.

With regard to the consequences of conurbation, it has various effects on both the place of invaders and the invaded. It opens job opportunity for local or indigenous people of the localities. According to Lee Boon Thong (2005) described the effect of conurbation in Nigeria. He narrates that the word indigenous as “sons of the soils” towards the urban centers to be absorbed into urban-based employment in order to eliminate the economic differentiation between the Malays and the non-Malays. Lastly, it carries out in agglomeration process as well.

This study sought to find the reality to provide a global portrait and relevance that insight into the condition and nature of both conurbation and urban sprawl in Africa and Ethiopia. As the experience of the nations as a whole, the nature and formation of both aspects are often ignored, and when recognized, it is often maligned for several centuries. Therefore, the researcher wanted to fill this gap and tried to investigate the rate and nature of both conurbation and urban sprawl in Addis Ababa. This study attempted to bridge this gap by focusing on comprehensive analysis of the main issues together with some remedies in Africa at large and Ethiopia in particular.

### **Objectives and Methodology**

The general objective of this study was to assess the condition and nature of both conurbation and urban sprawl in the city of Addis Ababa. The specific ones were to assess the trend, rate and situations of conurbation and urban sprawl in the City; and describe the physical expansion and area coverage of the City. Therefore, the following methodological procedures were also carried out. Among the approaches, the qualitative approach had high weight than the quantitative one. The qualitative approaches were used via document, and content analysis was carried out by using thick description on the issue. The interview and standardized observation schedules were also applied. The primary sources were obtained via structured interview from selected informants which were used to distinguish some information related with the trends, condition and nature, the physical expansion and area coverage of the City. And it also focus on the effect of conurbation and urban sprawl. It was principally collected from the key government officials from Mayor Office and head of the sub-cities who were currently working in different positions. And also, the rate and effect of conurbation and urban sprawl was also collected from the experts selected from Mayor Offices in the nearby places of the city (i.e. Debrezeit and Dukem, and Sebeta towns). They were selected by using convenient sampling because of their busy nature and difficulty to get them at their office. Besides this, the observation was also guided by check-list that focused on the overwhelming situation of the city growth at the outlets. The focus group discussions were made on the user at the periphery sites, comprising 4 or 5 targeted participants. The other data were also gathered by phone interview. The other technique of data analysis was made by using GIS and Google earth softwares.

## **Results and Discussions**

### *The Trend, Rate and Situations of Conurbation and Urban Sprawl in the City*

The observation that was perceived on the time of field trip and by the help of softwares like Google earth showed that the rate and nature of urban sprawl is relatively going on in rising manner around the main outlets of the city, but the rate and condition of conurbation are seen only within the central areas of the city. For instance, the peculiar urban sprawl and fewer conurbations are also seen along the Debrezeit (Mojo outlet), towards South Eastern, and Jimma outlets to South West direction.

However, the researcher observed that there is better conurbation and urban sprawl which is perceived only along Mojo outlets. At the time of this study, it was highly observed along Dukem town (37kms), and it also gets in touch with Debrezeit town (47kms) (fig 1 e and fig 2). Even though, it will probably go up within the radius of the whole areas in certain kilometers in near future. The type and nature of urban sprawl along this outlet is relatively very high when compared with the other outlets. Thus, one can conclude that it will try to pledge to the Mojo town, located around 73 kms far from the center.

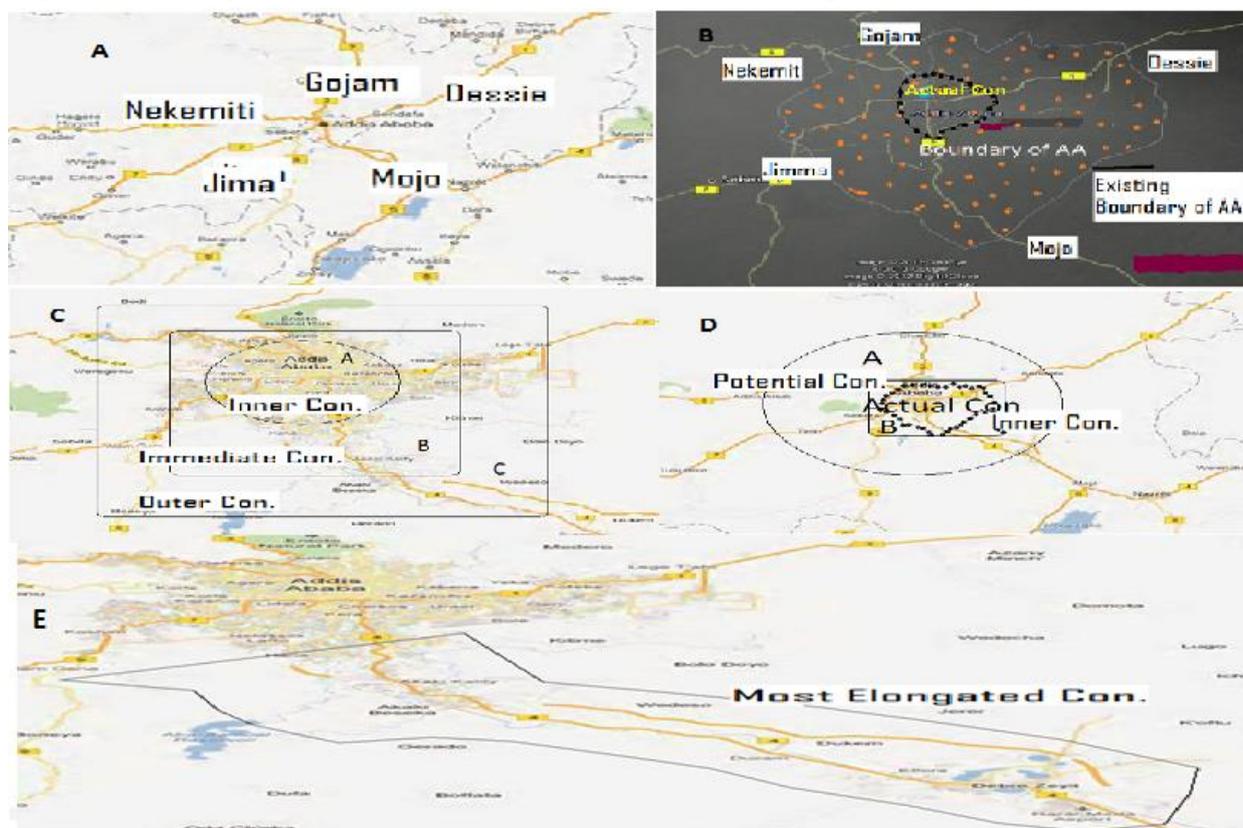
The unique rise of conurbation and urban sprawl on this outlet is also due to various rationales. It is accelerated the facts of the presence of industry, landscape and geographic advantage and infrastructure access. The route has also better transport facility than other outlets of the nation; up to recent, the line acquires the only rail transport facility than others outlets. Up to now, this route is the only one that connects the nation with abroad. It is a way to make global integration with the other neighborhood countries like Somali, Djibouti, and Kenya. Lastly, the other contributing factor for making of the existing conurbation and urban sprawl is again the fact that of geographic suitability of the line that has comparatively plateau nature of the place than other outlets. It is found that the landscape and geographic suitability by itself opens better ground for settlement.

The other most decisive factor for the rise of urban sprawl and conurbation is the presence of transport facility. For instance, this outlet is getting the city bus service from metropolis (Addis Ababa) that interlinks Debre Zeit and Dukem towns. These all have had a big role for the settlement of peoples for the formation of both conurbation and urban sprawl as well. However, there is also high conurbation and urban sprawl along Dukem (Mojo) routes is elongated types in its nature (fig 1 (e)). In short, one can infer that it will spread it into this line averagely by 47 kilometers distance radiating from the center (table 1). Thus, the corridor has high ties of the peoples along the lines.

However, the writer tried to illustrate it by observing the availability of the gaps, access to school, nature of settlement, housing types, availability of market, job and other related criteria to determine conurbation (Fig 1 and 2, and table 1). Whereas, Fig. 2 shows that the total area within the central part of the city is too low because of lack of rooms to make invasion to the nearby rural areas. It is already occupied by previous settlers and no rooms for recent creation of urban sprawl, but it requires vertical upgrading on the areas of slums in the inner part of the

city. For instance, Fig. 1 (a & b) and Fig. 2 explain that the condition of inner conurbation of the city is already completed one. With regard to the potential conurbation, it also has very high landmass and it consumes large areas of the city and the adjacent towns. The study depicts (Fig. 1, c) that the rate of conurbation of the city is very high in region 'A'. It consists relatively of the most conurbated part of the city, and the actual conurbation also exists. And within the near future, it is going to engulf the other areas in the region 'B'. It will extend into the immediate nearby areas. Then after, it will goes to 'C'.

**Figure1:** The major outlets and area of conurbation and urban sprawl of the city



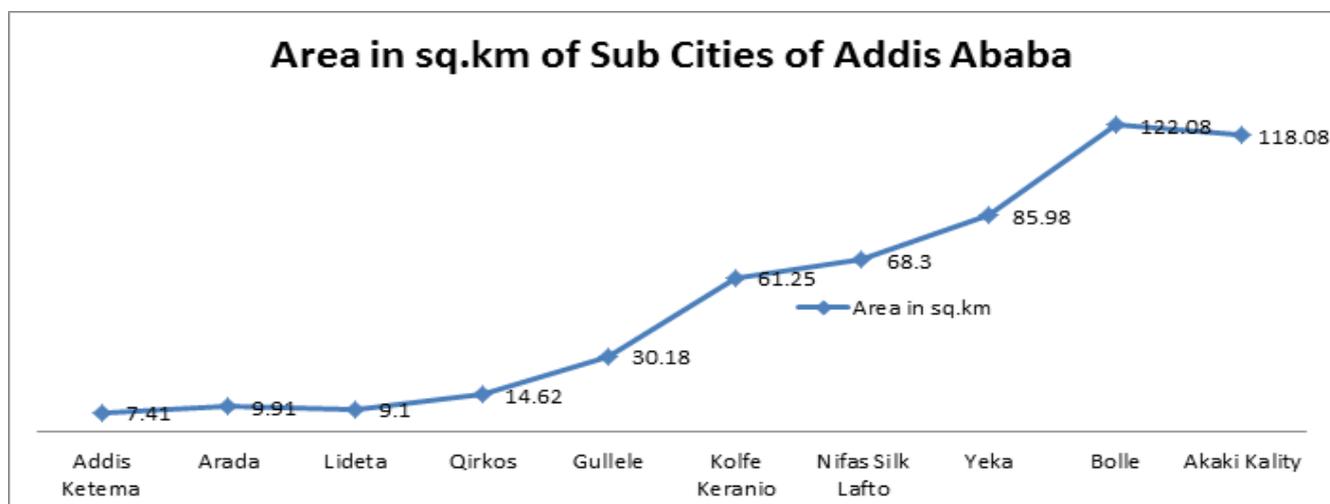
**Source:** Adapted from Google Earth, 2013

Next to Mojo outlet, the other outlet that has relative conurbation and urban sprawl is seen along Jimma line. It has explored strong conurbation and urban sprawl that is seen up to Alem Gena town, located around 19 kms towards South Western direction like Dukem. The special feature observed on Jimma outlet is the rate of both urban sprawl and conurbation that will stretch into two ways: one to Sebeta town (24 kms) along the route to Jimma town, and the other to Boneya town (34 kms) along the route crossing Hossaina town. In short, one can infer that it will spread averagely by 30 kilometers distance that radiates from the centre. Thus, the rate of conurbation and urban sprawl is highly observed because of the road access and certain industry (table 1).

In fact, this study indicates that the lesser extent of both conurbation and urban sprawl is distinguished along Desie, Gojam and Nekemite outlets at the outskirts along North, North western and Western lines. So far, the finding expresses that the nature and rate of conurbation

in the city is not as such simple to explain in figurative ways. However, the undented reality is also perceived both conurbation and urban sprawl in these lines.

**Figure 2:** Areas in square kilometer of the sub cities



**Source:** CSA 2007

The empirical data revealed that some sort of conurbation and urban sprawl is noticed along Gojam, Dessie and Nekemit lines. Specifically, along Gojam line, it reaches Sululta area (25kms) outlets; it has been less likely to spread because of geographic factors that impede more on the growth along the outlets. It also has the availability of mountains, forests, parks and water bodies along the outlet which contribute a lot for the reduction of the rate of both conurbation and urban sprawl and it also would rise of the gap between towns. In general, it is going on in dribs and drabs in small amounts. In the future, it will subscribe the place of detour point of Debir and Chancho towns that are located around 39kms and 40kms distance respectively.

However, along Nekemt and Dessie lines, there was also observed to be a relative symptom of conurbation and urban sprawl. Along Nekemite line, the feature of conurbation and urban sprawl is also seen between Addis Ababa and Menagesha (30kms) town. For the future, it will also try to subscribe the Addis Alem town that is located around 39 kms distance from the center. However, similar cases are also seen up to Menagesha town that is undertaken because of the presence of industry and infrastructure access.

On the way to Dessie line, it also stretches up to Sendafa (39kms) town. The other contributing factor for making of the existing conurbation and urban sprawl is the relative geographic suitability of the line that is comparatively plateau nature of the place than that of Gojam outlets along Sululta route. It has shown simple and literal conurbation and strong urban sprawl. Comparatively, it is due to less socio-economic ties with the surrounding areas, less population interest to settle, and the availability of less access of industry, geographic unsuitability and others.

**Table 1:** the existing and future rate of urban sprawl in the city

Sn	Main outlets of the city	Nearby towns to the city		Expansion towns along outlet		Remark
		Name	Distance in km from Addis Ababa	Name	Distance in km from Addis Ababa	
1	Mojo	Dukem	37	Debre Zeit	47	Kenya, Djibouti and Somalia
2	Dessie	Sendafa	39	Chancho	40	Eritrea
3	Jimma	Alemgena	19	Sebeta	24	Kenya
4	Gojam	Sululta	25	Chancho	39	South & North Sudan
5	Nekemte	Menagesha	30	Addis Alem	30	South Sudan
	Average		30		38	

**Source:** Own field survey in 2011 and 2012

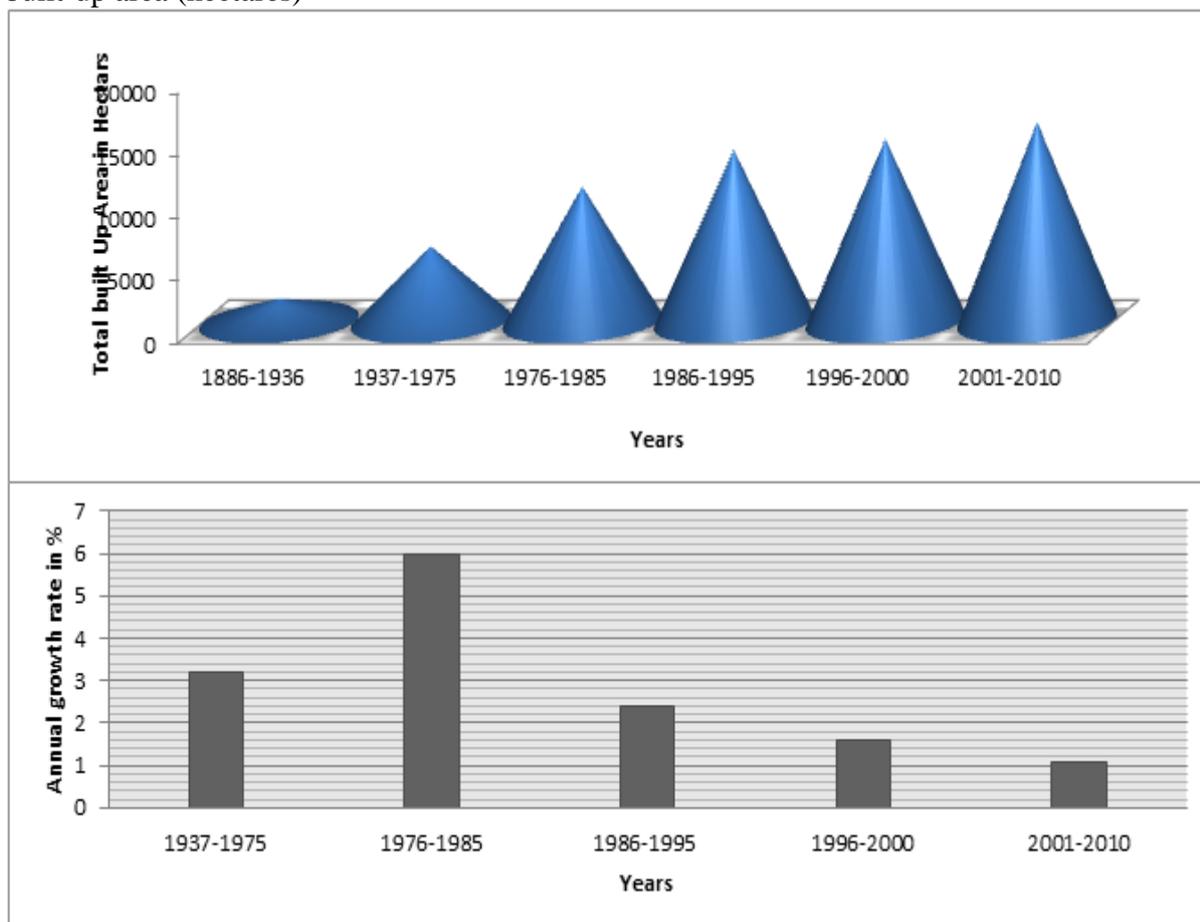
As several respondents indicated, the study area pertains that it is undertaken informally. This implies that it is high contribution for the formation of unplanned or unhealthy conurbation and urban sprawl in the city. It is also practiced in jeopardized way. However, in simple and clear wording, it has been seen seemingly conurbation or artificial one. But, very less conurbation is created due to formal or planned or legal system. It is mainly created along the nearby agricultural land which is utilized as a residential land as per stated in the master plan of the city are often sub divided- based on the concern of city administration. The other recent phenomena for the rise of conurbation and urban sprawl around and in the city are the prevalence of condominium houses and real state housing schemes. It is found that there is a clear reflection of planned or formal conurbation and urban sprawl. For instance, along the CMC areas, Meri sites, and Jommo sites at Geriji and along Jimma road are the best justifications.

#### *Physical Expansion and Area Coverage of the City*

Historically, the city was settled in 1886 within specific places. Horizontally, within 1886-1936, it expanded on average of 1,863 hectares. In this fifty years of interval, the city elasticized for about 1,863 hectares. Table 3 displays that the growth rate was very climax in 1976 to 1985; it shows 6% growth. It indicates high rise within the last 100 years, but it began to decline in 1986 to 1995 in 2.4%. And finally, it also shows very low growth. From this trend of growth rate of the city, the future horizontal growth of the city will reach zero. However, the horizontal stretch of the city in the last 126 years has been the total-built-up area (hectares) of about 16,000. However, whatever rate of growth has been recorded, the formal urban sprawl is going to be low and the informal squatting is also increasing. Again, on Figure. 2 and 3, Table 2, it has been shown that the early development of the city shown from 1886 to 1936 was commonly

characterized by fragmented settlements. Following Italian occupation in 1937, the process of physical development of Addis Ababa was characterized by infill development and consolidation of the former fragmented settlements (ORAAMP, 1999:6 and Mesfin, 2009). The physical expansion of the built-up area of the city during the period 1937 to 1975 was characterized by a compact type of development. From 1976 to 1985, the built-up area was amplified by 4788 hectares, thus increasing the cumulative total to 10,838 hectares.

**Figure 3:** the growth trend of total built up areas and the Annual growth rate (%) of Total-built-up area (hectares)



Source: ORAAMP, 1999 and 2001, CSA, 2007 & Mesfin, 2009

The next period of physical expansion of the city was between 1986 and 1995, when the built-up area expanded by 2925.3 hectares, increasing the cumulative total reach to 13,763.3 hectares. Simultaneously, the horizontal expansion also took place in all peripheral areas of the city, where both legal and squatter settlements are established. Then after, it showed declining growth, the rate of squatting in the city is reduced due to the strong supervision of the government. The other reasons are that the government laid a restriction by law that lessens the occupying of farmland which also impedes the growth rate of squatting in the city. And also, it is due to the fact that the city has begun to show a vertical growth than a horizontal one. The government gives high attention to make sure that the growth of the city has joined into vertical aspects. The central part of the city has totally changed into vertical upgrading. It is because of new development initiation of the government that has made policy of urban demolition of the

slum areas. And it has also laid restriction in the horizontal expansion at the peripheral part of the city. In a lesser case, it also because of the provision of condominium house provision by the government.. However, the total-built-up area of the city shows rise in an average of 1 % per year. Out of the total 94,135 housing units built in the city between 1984 and 1994, 15.7% (14,794 housing units) were built by squatters (ORAAMP, 2001:6). Thus, it contributes more for both urban sprawl and conurbation.

Figure 4 and Table 3 show the trend of area coverage of the city in Square km that displays the horizontal growth of the city. In 1920, or before 100 years, the city had planted in very small places (33 km<sup>2</sup>). The total area coverage of the town was not more than 3 football field. But, after 1990 to 2010 it reached to about 60 football fields (on average 600 kms). This implies the growth of the city has gone in maximum rise. And in the future, the area catchment of the city will raise more and reach more than 900 square kilometers in 2050. However, the horizontal stretch of the city in last 126 years has been the total-built-up area (hectare) reaching about 16,000. However, whatever rate of growth might be recorded, the formal urban sprawl is going to be low and the informal squatting is on the contrary increasing.

**Table 2:** Area Coverage of the city in km<sup>2</sup>

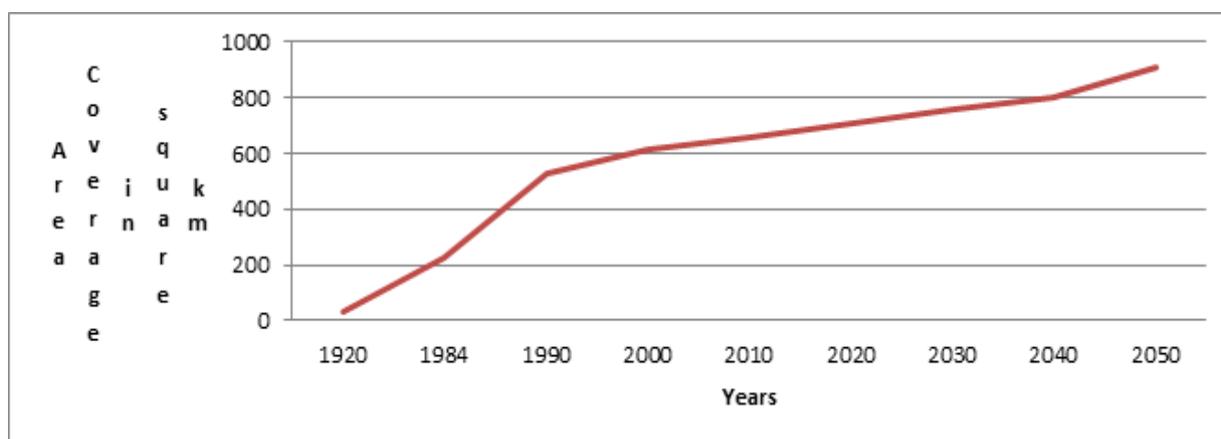
Year	Area Coverage of the city in Square km	Average Radius from centre in km		Change of radius	Remark
		In all sides	At major 5 outlets		
1920	33	R=3.25	6.5	-	CSA, 2007
1984	224	R=8.49	17	5.24	CSA, 2007
1990	530	R=13	26	4.51	CSA, 2007
2000	615.44	R=14	28	1	Projected
2010	660.185	R=15	30	1	Projected
2020	706.5	R=15.5	31	0.5	Projected
2030	754.385	R= 16	32	0.5	Projected
2040	803.84	R=16.5	33	0.5	Projected
2050	907.46	R=17	34	0.5	Projected

**Source:** CSA 2007 and Projection calculated by using the formula of Circle because the shape of the country is the compact one.  $A = \pi \cdot r^2 = \frac{1}{4} \cdot \pi \cdot d^2$  (Area of the circle is equal to pie times square of radius). Or one-fourth multiplied by Pie also multiplied by square of diameter. Where A, is denote Area of the circle,  $\pi$  (pie) denotes 3.14 and r denotes radius.

And the city in general has shown high rise of total built-up areas in the city in years. The data in Fig. 3 and 4 and Table 2 evidently explore the existing area coverage and total catchment of the city. The city has shown an extensive physical growth over the years. In the 1920s, the area of the city was estimated to be only 33 km<sup>2</sup> which grew to 224 km<sup>2</sup> in 1984 and by 1990; it was estimated to reach 530 km<sup>2</sup>. At the same time, as ERA (2005) estimated, Addis Ababa had an area of 530.14 square kilometers (204.69 sq mi) (CSA, 2007). In 1920, the scope of the city

was bounded averagely within the radius of 3.25 kilometers. And after 60 years in 1984, it was stretched averagely below the radius of about 1 kilo meter per decades. In combination, the catchment extends by the radius of 5.24 kilometers. It is found that the rate of urban growth was seen in the interior of 1984 to 1990, it also stretched its catchment by about 5 kilometers radius. This implies that the growth of the city is stretched by 1 kilometer from every corner per annum. But unprecedented change of the city occurred within 1984 to 1990, it also stretched by the radius of 4.5 kilometers distance within six years. In this case, it is shown that less than 1km radius was seen per annum per all direction and 2 kms per major outlets. However, the growth rate of urban sprawl is seen mostly on every corner of the city. Thus, the spread of conurbation and urban sprawl at major outlet is double of other part of the nation.

**Figure 3:** The trend of Area Coverage of the city in Square kilo meter in years



**Source:** CSA 2007 and Projection calculated by using the formula of Circle

In general, recently, the rate and condition of both conurbation and urban sprawl in all outlets of the nation are expected to be practiced averagely by the radius of 15 km and double (30 Kms) distance especially on the five major lines. This does not mean that the City grows and expands its catchment in the radius of 30 kms in all directions. But, it expands within every direction regardless of main outlets about the radius of half of the main outlets (15 km). As Fig 2 and Table 2 also denote, holistically, the city growth also stretched its catchment averagely for about 1 km in 2010 at all directions and 2 kms per major outlets. And from 2020 onward, it will go in 0.5 km intervals; it is the fact that the city may have developed in vertical than horizontal expansion. However, in the future, it will also stretch averagely up to 40 kms interval along the major outlets, and applicability which goes in 20 kms radius in all directions is reduced by half of the value along the major outlets.

As tables 2 and 3 show, the population of Addis Ababa increases annually by about 6%. This is partly attributed to the natural population growth of around 2.4% and high migration from the villages of a nation to the city. In 2005, the population in the capital itself already counted approximately to 3.7 million. Because of demographic uncertainties, such as high net migration and natural population increment, the exact number of inhabitants is not really known. However, until 2015 Addis Ababa is expected to host about 6-7 million inhabitants (Ignis,

2008). Addis Ababa is not only the largest city in Ethiopia but also a textbook example of a primate city, as it is at least 14 times as large as Dire Dawa, which is the second largest city in the country. However, this primacy has been going on the decline in the recent past, partly because of increased capital expenditure flows to regional capitals and other major cities in the nation. As a result, Addis Ababa's share of the total urban population has dropped from 30 % in 1984 to 26 % in 2000 (Ignis, 2008).

**Table 3:** Total and Estimated Population of Addis Ababa, between 1910- 2015

<b>Year</b>	<b>Total Population</b>	<b>Average annual Growth Rate (%)</b>	<b>Source</b>
1910	65000	-	ORAAMP, 1999
1935	100,000	1.72	-
1952	317,925	6.8	ORAAMP, 1999
1961	443,728	3.7	ORAAMP, 1999
1970	750,530	5.84	-
1976	1,099,851	6.37	-
1984	1,423,111	3.22	CSA, 1994
1994	2,112,737	3.95	CSA, 2007
2000	2,495,000	2.77	CSA, 2007
2004	2,805,000	2.93	ORAAMP, 1999
2005	3.7	-	Ignis, 2008)
2010	4,568,000	-	<a href="http://www.citym">http://www.citym</a>
2015	6-7 million	-	Ignis, 2008)

**Source:** ORAAMP, 1999 and CSA, 2007 and 2010, Andrew Adam-Bradford et al, 2010 and Ignis, 2008 <http://www.citymayors.com/statistics/>

As it is shown in Table 3, Addis Ababa's population growth pattern has been irregular during the greater part of its history, largely due to changes in the country's social, economic and political conditions. The official statistics shows that the city today is experiencing one of slowest-ever growth rates, just slightly below 3 % per annum. Even with this low growth rate, the capital continues to attract 90,000 to 120,000 new residents every year.

In general, it appears that much of this growth (probably up to 70 % of the total) takes place in the slums and squatter settlements at the periphery of the city (ORAAMP, 1999). It is worth highlighting that the greater part of this growth is more to net immigration (1.69 % per annum) than to natural increase (1.21 % per annum). It is not clear why, unlike most other major cities

in the developing world, Addis Ababa has such a low rate of natural increase (UNHSP, 2007). Thus, the population growth also contributes more for urban sprawl and less for conurbation.

#### *Contribution of Metropolitan Linkage for the Formation of Conurbation and Urban Sprawl*

In this study, the road has pioneer facts for the growth of the city. And it also contributes more for metropolitan linkage primarily between the nearby hinterlands with the metropolis. In this study, the prevalence of Highway Road has unique case for the making of linkage between towns that contribute for both conurbation and urban sprawl along the major outlets. The metropolitan growth is seen in terms of quantity and expands the territory of the city. It also embarks on the fact of availability and expansion of industry, infrastructure, and housing. The urban sprawl is similar to the flow of water-like flood. It simply needs the way to make flow. Therefore, metropolitan linkage contributes more for the creation of conurbation and urban sprawl.

However, the nature and type of conurbation around Addis Ababa is seen along the main highways of the nation. It interlinks the separated towns that were formerly settled within certain distance intervals that join the older one. It is clear that some places have full coverage of settlement along the bank of the highway roads. The settlement type observed around the major outlets is similar to that of linear pattern; it has developed on both sides of the road. Even in some cases, the settlement also takes place along two sides of the road. Its growth prevails not in circular way in all corners of the city but also along the high way road only. It is also worthy to note that the conurbation and urban sprawl in Ethiopia has gone in elongated pattern by following the road access. But, it does not occur in a circular way or all corners of the city (fig 1 (e)). Thus, the road contributes a lot for the rise of urban sprawl than conurbation.

With regard to its catchment, the elongated nature of urban growth comes in light of metropolitan linkage due to road. In this study, the sprawl and conurbation along the outlets of the city averagely lies, perhaps, on about 300 to 500 meters intervals from the main road. The catchment rises very high (more than 500 meters) when it reaches to the towns and less when it leaves the towns. In other wording, when such relatively huge area coverage has been seized on built up areas, it is only near to the city/towns. However, in selected lines, its catchment also has perceived below 300 meters. Even at the end of the outskirts of the city, it doesn't have such features along two sides of the main road. Thus, in light of this finding, the nature and style of conurbation and urban sprawl that prevail in Ethiopia and study area have been an emerging one. But they are not completed and sophisticated as such like those noticed in developed countries. However, the potential areas of linkages that are ranked mainly in two directions (i.e. along Mojo and Jima routes) correspondingly, while relatively less linkage emerging along Dessie, Nekemt and Gojam lines in that order. In general, the highway road at the major outlets contributes more for both conurbation and urban sprawl.

## **Conclusions and Recommendations**

### *Conclusion*

The conclusion of this section focuses on the objectives, methodology and findings. This paper has attempted to describe the current situation of conurbation and urban sprawl in Ethiopia highlights on the city of Addis Ababa. The study has pledged to the major outlets located in south eastern direction towards Dukem, Debrezeit and Mojo around 37, 47 and 73 km far from the center. This corridor has high spread of both conurbation and urban sprawl than other outlets. The main factors for these conurbation and urban sprawl were the socioeconomic wellbeing of the peoples along the lines, the attraction of the nearby towns, the road access and presence of industry. The physical expansion of the city also grows on average covered (hectares) is going down. However, the total-built-up area of the city shows rise in an average of 1 % per year. The spread of conurbation and urban sprawl at major outlet is double of other parts of the nation. Among others factors, the population growth also contributes more for urban sprawl and less for conurbation. But, the rest factors might contribute more for both urban sprawl and conurbation. Thus, in light of this finding, the nature and style of conurbation and urban sprawl that prevailed in Ethiopia and study area is an emerging one. Thus, the rate of both conurbation and urban sprawl along the major outlets doubles that found in all directions.

### *Recommendations*

Based on the preceding discussion, the following key points are provided as possible suggestions to improve the overall growth of the city and the rate and situation of conurbation and urban sprawl. The following remedial strategies are forwarded:

Strong integrative work is needed with the heads of sub-cities and proximate rural areas to timely and proper supervision to bring the required growth of the city.

The government should make LDP (Local Development Plan) to upgrade along the outlets accordingly.

Strong, dedicated and furious political bodies should administer the city. The Mayor, head of different offices at the city and sub-cities should have a knowledge and qualification on urban and urban related studies.

Long sighted preparation and implementation of master plan with timely and proper amendment are needed.

Government is expected to think ahead of the society towards in the areas of high squatting.

An integrated master plan of Addis Ababa Develop should be developed with the surrounding Oromia towns. Then after, it needs to spread into regional capitals of the nation to integrate with the surrounding towns, proper and timely data handling is required at all mayor and sub-cities level.

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