Urbanization Level and Tempo (Speed) in Tigray Regional State, Ethiopia

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Research Article

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Abstract

The study attempts to study the level and tempo or speed of urbanization in the Tigray regional state based on census data from 1994-2013 in Ethiopia. The level of urbanization at the regional level was found in 1994, 2007, and 2020 at 14.9%, 21.7%, and 27.7% respectively. Whereas the level of urbanization varies among the zones of the region, the higher level of urbanization was recorded in the Eastern zone followed by the Western, Southern Zone and Central zone of Tigray. The tempo or speed of urbanization was determined to be 0.49 percent per year at the regional level, with the Eastern area of Tigray showing the greatest tempo or speed of urbanization. The unbalanced urbanization among the zones results in socio-economic challenges. The study recommends several policy interventions given in the conclusion part aimed at judicious urbanization suitable for sustainable development.

1. Introduction

There has been a rapid growth of urban centers in Ethiopia and the resulting challenges such as urban poverty, environmental degradation, and social inequalities. Tarekegn (2020) discusses the potential benefits of urbanization such as economic growth, improved access to social services, and increased opportunities for employment. The author concludes that effective urban planning and management policies are needed to address the challenges of urbanization and promote sustainable urban development in Ethiopia.

Urbanization is a long-term continuous process. It is the progressive concentration of the population in urban units (Datta, 2007). Urban is the growth of towns and cities in the country (Kadi, & Nelavigi, 2015). Towns and cities are a place with a vast number of people who are clustered. Urbanization proceeds in 2 ways: the multiplication of points of concentration and the increase in size of points of concentration (Tegenu, 2010). The fast pace of urbanization can be attributed to many factors such as rural to urban migration, re-classification of cities, and natural growth rate of urban population (Rani & Tripathi, 2016).

In recent years, most of the developing countries in the world are experiencing rapid urbanization compared to the developed countries. As per the United Nation's report, by 2050 around 64% of the developing world and 86% of the developed world will get urbanized Rapid urbanization is one of the most important factors that are counted upon to promote urban lead economic growth in India in the days to come (Rani & Tripathi, 2016).

In developing countries the rate of urbanization is very fast and it is not accompanied by industrialization but rapid growth of the service sector in the economies (Helen Macbeth & Paul Collinson, 2002).

The study of urbanization in Tigray, or any region for that matter, can provide important insights into the economic, social, and environmental changes that are taking place in the area. Urbanization refers to the process by which cities and towns grow in size and importance as people migrate from rural areas to urban areas in search of economic opportunities, better living standards, and improved social services.

Many scholars have studied the urbanisation in Tigray as Zenebe and Mohammed examined the relationship between urbanization and environmental degradation in Tigray Region (2019). Tadesse, Suryabhagavan, and Bhattacharyya provided an overview of urbanization trends and challenges in Ethiopia, including in Tigray (2019). Gebreslassie et al. studied the impacts of urbanization on soil degradation in Tigray Region (2018). Tsega analyzed urban land use and land cover change in the city of Adwa, Tigray (2020). Zerai and Gebrehiwot investigated the relationship between urbanization and land use change in Mekelle City (2019). Tadesse and Gebre-Eyesus explored the impact of urbanization on the livelihoods of urban and peri-urban residents in Tigray (2015). Yonas et al. assessed the health effects of urbanization in Tigray and found a positive correlation between urbanization and child health outcomes (2018). Tekle and Mohammed analyzed urbanization patterns and their impact on water resources in Tigray Region (2019). Guesh and Fereke investigated the impact of urbanization on land use and land cover change in Axum, Tigray (2019). Hailemariam et al. studied the impact of urbanization on urban green space in Mekelle City and found a decline in green space cover (2020).

Studying urbanization in Tigray can provide valuable information on a range of issues, including:
Economic development: Urbanization can be a key driver of economic growth, as it creates new opportunities for businesses, jobs, and investment. Studying urbanization in Tigray can help to identify the sectors and industries that are driving economic growth in the region and the factors that are hindering it.

Social change: Urbanization can lead to significant social changes, including changes in family structures, gender roles, and cultural practices. Studying urbanization in Tigray can help to identify the social changes that are taking place in the region and the ways in which they are affecting people's lives.

Environmental impacts: Urbanization can have significant environmental impacts, including increased pollution, habitat destruction, and pressure on natural resources. Studying urbanization in Tigray can help to identify the environmental impacts of urbanization in the region and the strategies that can be used to mitigate them.

So, the study of urbanization in Tigray is important because it can provide insights into the complex social, economic, and environmental changes that are taking place in the region, and can help policymakers and researchers to develop strategies to address the challenges and opportunities presented by urbanization.

2. Methodology

2.1 Study Area

The State of Tigray is located at the northern part of Ethiopia, with a total area of 54,593 km$^2$. The latitudinal and longitudinal location stretches from 12°19'47.678"N up-to 14°52'26.73"N and 36°28'0.465"E up-to 39°32'44.831"E respectively. The region shares common borders with Eritrea in the north, the State of Afar in the east, the State of Amhara in the south, and the Republic of the Sudan in the west.

The Tigray regional state has diversified landscape ranging from 600-2,700 m above sea level. The climate of the region is characterized as "Kolla" (semi-arid) 39%, "Woina Dega" (warm temperate) 49%, and "Dega" (temperate) 12%. The average annual rainfall is between 450-980 mm. According the population census conducted in 1994, and 2007 the total population of this region was 3136267 and 4,314,456 respectively (CSA, 1994 and CSA, 2007). Currently the population is expected to reach 6149199.

2.2 Data Source

The study is based on the census conducted in 1994, 2007 and 2013. Population censuses are conducted periodically in Ethiopia to obtain detailed information on the size, distribution, and characteristics of the population. The most recent census conducted in Ethiopia was the 4th National Population and Housing Census, which was conducted from April 7 to 28, 2007. The census was conducted by the Ethiopian Central Statistical Agency (CSA) and covered all regions and administrative zones in the country (CSA, 2008).

2.3. Data Analysis

2.3.1 The urbanization rate

The urbanization rate is the percentage of the population living in urban areas. The urbanization rate can be calculated by dividing the urban population by the total population and multiplying by 100.

The urbanization level was measured using eq. 1 & 2.
\[ A = \frac{U}{P} \times 100 \quad \text{Eq. 1} \]
\[ A = \frac{U}{R} \times 100 \quad \text{Eq. 2} \]

Where \( U \) is the urban population, \( R \) is the rural population and \( P \) is the total population.

2.3.2 The speed of urbanization

The speed of urbanization refers to the rate at which a population is shifting from rural areas to urban areas or the rate at which urban areas are expanding. It is usually measured in terms of the increase in the urban population over time, typically expressed as a percentage growth rate per year.

The tempo or speed of urbanization was measured using eq. 3

\[ TA = \frac{1}{n} \left( pu^{t+n} - pu^{t} \right) \quad \text{Eq. 3} \]

2.3.4 Ratio of Urban-Rural Population: The ratio of urban to rural population should be considered as it measures another aspect of the urbanization process. This index is as simple as the percent of the total population urban and is closely related to it where the proportion of the population urban tells us the relative number of persons in a country. In symbols, the urban-rural population ratio may be expressed as:

\[ UR = \frac{UP}{RP} \quad \text{Eq. 4} \]

Where, \( UR \) is the Urban-rural ratio, and \( U \) and \( R \) are the urban and the rural population respectively.

3. Results and Discussion

3.1 Population size

Based on the available data, Tigray is one of the least urbanized regions in Ethiopia. According to the 4th National Population and Housing Census conducted in 2007, only 14.9% of Tigray’s population lived in urban areas, compared to the national average of 16.8%.

Table 1: Population size of Tigray regional state (1994-2020)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Western</td>
<td>84560</td>
<td>649402</td>
<td>733962</td>
<td>179,618</td>
<td>913878</td>
<td>1,093,496</td>
<td>313,569</td>
<td>1063006</td>
<td>1,376,575</td>
</tr>
<tr>
<td>Central</td>
<td>91058</td>
<td>852792</td>
<td>943850</td>
<td>176,445</td>
<td>1,068,778</td>
<td>1,245,223</td>
<td>307279</td>
<td>1244514</td>
<td>1551793</td>
</tr>
<tr>
<td>Eastern</td>
<td>85508</td>
<td>499438</td>
<td>584946</td>
<td>146301</td>
<td>609332</td>
<td>755633</td>
<td>254155</td>
<td>709266</td>
<td>963421</td>
</tr>
<tr>
<td>Southern</td>
<td>110414</td>
<td>666157</td>
<td>776571</td>
<td>219188</td>
<td>785370</td>
<td>1,004,558</td>
<td>280,000</td>
<td>964154</td>
<td>1244154</td>
</tr>
<tr>
<td>Mekelle</td>
<td>96938</td>
<td>96938</td>
<td>215546</td>
<td>215546</td>
<td>376679</td>
<td>376679</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>468478</td>
<td>2667789</td>
<td>3136267</td>
<td>937,098</td>
<td>3377358</td>
<td>4,314,456</td>
<td>1,531,682</td>
<td>3980940</td>
<td>5,512,622</td>
</tr>
</tbody>
</table>

3.2 Level of Urbanization

Table 2 shows the level of urbanization. It is worth noting that urbanization increased very fast, it was projected to be 27.8% in 2020. In the last two decades, there has been a significant effort by the Ethiopian government to promote urbanization and economic development in the country, including in Tigray. The city of Mekelle, the regional capital of Tigray, has undergone significant urbanization and development in recent years, with new infrastructure projects, commercial centers, and residential areas being built.

Table 2: Level of Urbanization

<table>
<thead>
<tr>
<th>Zones</th>
<th>1994</th>
<th>2007</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Eq. 1</td>
<td>Eq. 2</td>
<td>Eq. 1</td>
</tr>
<tr>
<td>Western</td>
<td>11.5</td>
<td>13</td>
<td>16.42</td>
</tr>
<tr>
<td>Central</td>
<td>9.64</td>
<td>10.7</td>
<td>14.2</td>
</tr>
<tr>
<td>Eastern</td>
<td>14.6</td>
<td>17.1</td>
<td>19.4</td>
</tr>
<tr>
<td>Southern</td>
<td>14.2</td>
<td>16.6</td>
<td>21.8</td>
</tr>
<tr>
<td>Total</td>
<td>14.9</td>
<td>17.6</td>
<td>21.7</td>
</tr>
</tbody>
</table>

Source: Study

However, the ongoing conflict in Tigray since 2020 has had a significant impact on the region's urbanization and development. There have been reports of destruction and damage to infrastructure and residential areas in urban centers, including Mekelle, and many people have been displaced from their homes, both in urban and rural areas.

Overall, while there has been some progress in promoting urbanization in Tigray, the ongoing conflict and instability in the region have significantly impacted the pace and trajectory of development.

Table 3: Tempo or Speed of Urbanization

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Western</td>
<td>0.37</td>
<td>0.49</td>
<td>0.43</td>
</tr>
<tr>
<td>Central</td>
<td>0.35</td>
<td>0.43</td>
<td>0.39</td>
</tr>
<tr>
<td>Eastern</td>
<td>0.37</td>
<td>0.54</td>
<td>0.45</td>
</tr>
<tr>
<td>Southern</td>
<td>0.58</td>
<td>0.05</td>
<td>0.32</td>
</tr>
<tr>
<td>All</td>
<td>0.52</td>
<td>0.55</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Source: Study

As indicated in the above table 3, the tempo or speed of urbanization 0.43, 0.39, 0.45 and 0.32, in the Western Zone, Central Zone, Eastern Zone and Southern zones respectively from 1994 up to 2020, whereas the tempo or speed of urbanization at the regional level is 0.49 per annum within the same time duration. This implies that the tempo or speed of urbanization is high in the Eastern Tigray zone followed by the Eastern zone of Tigray and the lowest tempo of urbanization is recorded in the Southern zone of Tigray.
Table 6. Urban –Rural Ratio

<table>
<thead>
<tr>
<th>Tigray region zones</th>
<th>1994</th>
<th>2007</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western</td>
<td>0.13</td>
<td>0.16</td>
<td>0.29</td>
</tr>
<tr>
<td>Central</td>
<td>0.1</td>
<td>0.17</td>
<td>0.25</td>
</tr>
<tr>
<td>Eastern</td>
<td>0.17</td>
<td>0.24</td>
<td>0.35</td>
</tr>
<tr>
<td>Southern</td>
<td>0.17</td>
<td>0.28</td>
<td>0.29</td>
</tr>
<tr>
<td>Mekelle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>0.17</td>
<td>0.28</td>
<td>0.38</td>
</tr>
</tbody>
</table>

Source: Study

The above table 6 shows that the urban-rural ratio at regional level indicates 0.17, 0.28 and 0.38 in 1994, 2007 and 2020 respectively. This implies that the number of people living in urban area increased by 21% between 1994 and 2020.

Conclusions

It is important to note that the population size of each zone may have changed due to various factors, including migration, natural disasters, and conflicts in the region. Therefore, any information on the zone-wise population size of Tigray should be treated as estimates based on the available data.

The government policies to address urbanization in Tigray should be comprehensive and multi-faceted and should take into account the economic, social, and environmental impacts of urbanization. Here are some policy recommendations:

Promoting balanced regional development: The government should promote balanced regional development by investing in rural areas and creating economic opportunities outside of urban centers. This can help to reduce the pressure on urban areas and encourage people to stay in rural areas.

Planning and management of urban growth: The government should develop and implement urban planning policies that promote sustainable urban growth, including the provision of basic infrastructure and services, such as water, sanitation, and electricity. This can help to reduce urban poverty and improve the quality of life for urban residents.

Affordable housing: The government should invest in affordable housing schemes to address the housing shortage in urban areas. This can be achieved through the provision of subsidies, tax incentives, and other measures that encourage private-sector investment in housing.

Strengthening local governance: The government should strengthen local governance structures and empower local communities to participate in urban planning and decision-making. This can help to ensure that urban development is responsive to local needs and priorities.

Environmental protection: The government should implement policies and regulations to protect the environment and natural resources in urban areas. This can include measures to reduce pollution, promote sustainable land use, and protect natural habitats.

Education and skills development: The government should invest in education and skills development programs to equip young people with the skills and knowledge they need to participate in the formal economy and contribute to sustainable urban development.
So, the government policies to address urbanization in Tigray should be focused on promoting sustainable and inclusive economic growth, improving social services, and protecting the environment while ensuring that the benefits of urbanization are shared by all segments of society.

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Tsega, Y. (2020). Urban land use/land cover change analysis using remote sensing and GIS in Adwa town, Tigray,


Figures

Figure 1

Location Map of the study area