



Case Study On: Impact of urban expansion on agricultural land: the case of Lalibela Town, Amhara Regional state, Ethiopia

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ABSTRACT

The paper is addressing the impact of urban expansion on agricultural land in Lalibela town, Amhara regional state, Ethiopia and the most problems that occurs in the study area are reducing the amount of urban and rural agricultural lands, displacement of farmers from their agricultural land, loss of the most productive agricultural land, and land disputes. The town covers an area of 92,166 kilometer square and it is one the municipal woreda with a population of 51,328. It consists of six (6) woredas. Tools and methods include questionnaires for affected households, focus group discussion, field observation and from the municipal and agricultural development office through interview were applied to investigate on the impact of urban expansion on agricultural land. To meet the general objective, the following specific objectives were set: determining the amount of agricultural land lose caused by urban expansion and assessing the driving forces for urban expansion on agricultural land in the study area. The collected data results showed that, there were rapid conversions of agricultural land for urban use in Lalibela woreda. During the year 2011-2020 more than 1543 hectares amount of agricultural land were used for residential land use in Lalibela town. The main driving forces contributed for urban expansion on agricultural land were increase in population through rural to urban migration and natural increase in the town. There are different mechanisms to reduce losses of agricultural land due to urban expansion. Such as, vertical urban development, compact settlement, applying zoning regulation of the town, building social service at kebele level to minimize rural-urban migration, use properly family planning method, building condominium, the expansion of the town must consider agricultural land and the local government must take in to account the agricultural land to protect from urban expansion.

KEYWORDS: urbanization, urban expansion, agricultural land, agricultural land conversion.

1. INTRODUCTION

The process of urban expansion is a worldwide phenomenon, recorded in the history of all urban centers. It started with the earliest human civilization of Babylonians (Firew.B, 2010). Urban expansion is spontaneous phenomenon that leads to spontaneous growth by displacing rural and urban farming community and also decreasing the amount of land available for agricultural land (Tamirat.M, 2016). Urbanization is the process of urban expansion, may involve horizontal expansion of the physical structure of urban areas, and result in loss of agricultural land, natural beauties, range lands, parks and sceneries (Teketel.F, 2015). Urban expansion is the result of population pressure in urban area through rural-to-urban migration and natural population increases (McGee, 1989).

The population of the world becomes more urbanized and cities grow from time to time. This happen because, urban areas have been playing a major role as the center of industry, information, communication, trade, education, skilled lab our, research, bank and finance. Due to the presence of these conditions the population moves from rural to urban area and the urban population become increasing from time to time (Afolabi.A, 2008). In the 1950 the world urban populations were about 746 million, which is 30% of the world population,

but in 2014 it reaches 3.9 billion, which, is 54% and by 2050 this condition will also increases and reached 66% % (UNESA, 2014).

The growth of cities in the developing world is dynamic, diverse and disordered. The rapid urban expansion requires a large amount of land, mostly prime agricultural land to be converted to urban land use (e.g. residential construction, social service and infrastructural development) (UNFPA, 2007). The expansion of urban area particularly in the developing world is taking place on agricultural land (Feyera.A, 2005). The rate of urbanization in developing countries like Africa and Asia is so high; Africa and Asia are becoming, urbanized more rapidly than other regions of the world (UNESA, 2014). In many developing countries, however, lack of sound policy on managing and planning for urban expansion worsens the negative impact of urbanization (McGee, 1989). In African nations, agricultural production and land use in areas that surround urban centers have been affected by urban expansion (Simon.D et al, 2004). The combined effect of primary cities and over urban expansion are the main cause for the reduction of productive agricultural land which is the backbone of the developing country's economy (Eyaya.B, 2014).



Ethiopia has a long history of urbanization that developed next to the ancient Egyptian civilization in East Africa like Axum, Lalibela, Gondar and Harar and then finally Addis Ababa become the capital city of the country. The Ethiopian urban centers are expanding at an alarming rate (4.3 %) that resulting in losing of many very productive agricultural lands. This leads in sufficient of agricultural production (Alemu.A, 2015).

Urbanization in Lalibela woreda was started during the 11th century and it is next to Axum. Most of the recent urban expansion of Lalibela town has occurred out wards to Simeno town and Kurakur-nakutolab kebele. This was happened by displacing the agricultural land owners from their agricultural land. The conversion of agricultural land in to urban use has negative consequence on agricultural land. Some of these problems are reduces the amount of agricultural land, loss of the most productive agricultural land, food insufficiency, poverty, loss of job opportunity from agricultural sector, and land disputes.

2. Related Literature Review

2.1. Conceptual frame work

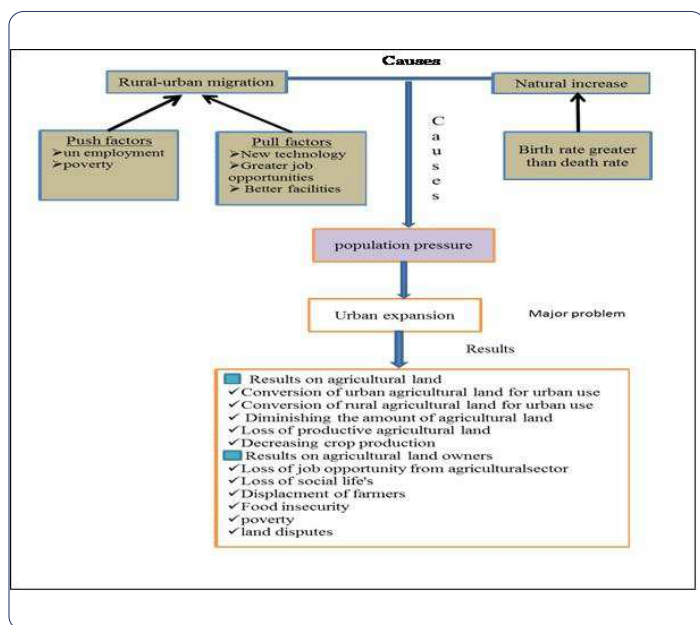


Figure 2.1: The causes and consequence of urban expansion on agricultural land

2.2. Theoretical frame work

2.2.1. Trends of urbanization

The urban population is expected to continue to grow, so that by 2050, the world will be one-third rural (34%) and two-thirds or 2.5 billion (64%) will be urban and with nearly 90% of the increase concentrated in Asia and Africa (UNESA, 2014). In 2025, for the first time in history, the global urban population exceeded the global rural population. After in 2025 more people live in urban areas than in rural areas in the world (UN, 2014).

The population of Africa is growing rapidly-almost twice as fast as any other major region of the world. By 2025, African society will become predominantly urban (UN, 2012). Ethiopia has a long history of urbanization that developed next to ancient Egyptian civilization in East Africa: like; Axum, Gondar, Lalibela, Harar, etc. and then finally in the 1880s Addis Ababa has become the capital city of Ethiopia (Alemu.A, 2015). The Ethiopian urban centers are expanding at an alarming rate (4.3 %) (Alemu.A, 2015). This unexpected rate of urban expansion resulting reduce in loss of agricultural land (Tamirat.M, 2016).

2.2.2. The relation between urban expansion and agricultural land

Urban expansion is out ward expansion of the urban area into agricultural land. During the expansion of urban area out ward, huge amount of agricultural land is devoted for fulfilling urban basic facilities and results diminishing of agricultural land. There is inversely relationship between urban expansion and agricultural land because when urban expansion increases out ward in the area, agricultural land decreases. In other words, when urban expand out ward, huge amount of agricultural lands are losses for urban use. As a result, loss of agricultural land leads for reducing gain crop production (Kaifang et al, 2016). Urban expansion and agricultural land have inverse relationship. Because when urban expansion increase in the area, agricultural land decrease (Njungbwen.E, 2011).

3. Research Method/Material

The objective of this research paper is to study the impact of urban expansion on agricultural land in Lalibela town, Amhara regional state, Ethiopia. In order to address the research objectives, both qualitative and quantitative research approach were used to study this research. The data sources for this study were primary and secondary data source. Primary data were collected from the respondents of the selected sites who lost their agricultural land during urban expansion, municipal officials and agricultural officials by means of prepared questionnaires, interview, focus group discussion and observation of the sites. Secondary data were collected from published and unpublished materials. These data were obtained from municipal office reports, agricultural developmental office reports and other materials relating to urban expansion in relation to agricultural land. This study used both probability (simple random) and non-probability (purposive) sampling. This research design was generalized based on sample size and method to assess the impact of urban expansion on agricultural land in Lalibela town. Scope of the study was impact of urban expansion on agricultural land in Lalibela town from 2011 to 2020.

4.Result and Discussion

4.1. Socio-economic condition and access to social service

Lalibela town is located in Amhara national regional state of North wollo zone at a distance of about 701 kms from Addis Ababa, and 300kms from Bahirdar the regional capital and 180 kms from Woldiya. The town covers an area of 92,166 kilometer square and it is one the municipal woreda that found in North wollo. The town is located at latitudinal and longitudinal extensions of 12°01'5" N 39°02'28" E respectively. The relative location of Lalibela town is surrounded by lasta woreda. In Lalibela town, residential land use is the dominant land use which accounts more than 1543 hectares(Lalibela town administration, 2020). The life of the community in Lalibela town is depends on agriculture, trade and tourism. In Lalibela there is one general market, which stands once a week, every Saturday.

In this day a lot of people came from different directions and the major commercial activity takes place on Saturdays and on the rest day of the week (from Monday to Friday) minimum number of people exchange their goods and service (Own observation, 2020). According to Lalibela town administration (2020), in Lalibela town, there is one Hospital, one Health center and six clinics of different levels were found in the town. Regarding to water resource, the majority of the water sources are ground, and to some extent surface water. Shemshiha is the source of ground water, which is currently used for drinking purpose for Lalibela residents. In addition to this some rivers that found in the periphery are also used for drinking purpose, cloth washing and in small amount for irrigation purpose. Regard to education, in Lalibela, there are 4 primary school (1-8), 1 secondary school (9-10) and 1 preparatory school. Lalibela town has gotten some of the indispensable facilities such as airport, banking, health service, hospital, telephone service, electricity and water supplies are prior to the town (Lalibela town administration, 2020).

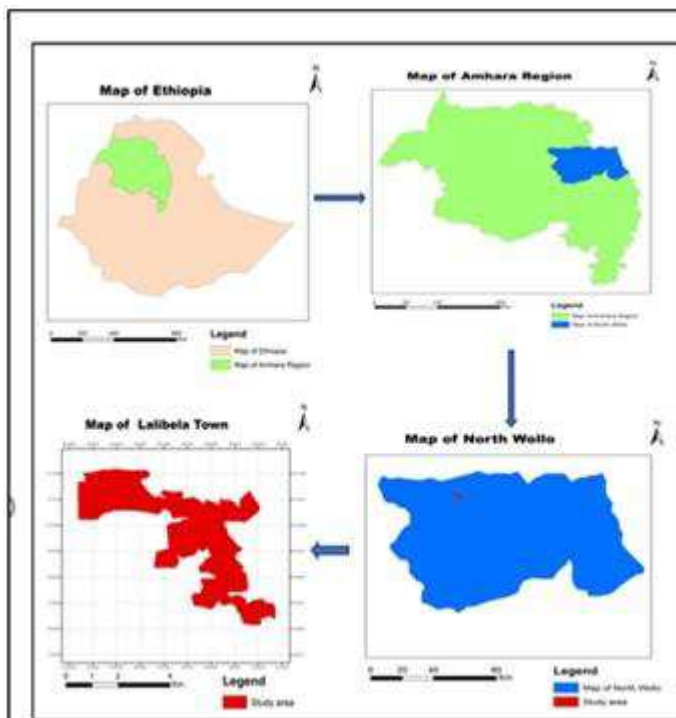


Fig.1: Location Map of Study Area, Source: Researcher,2020

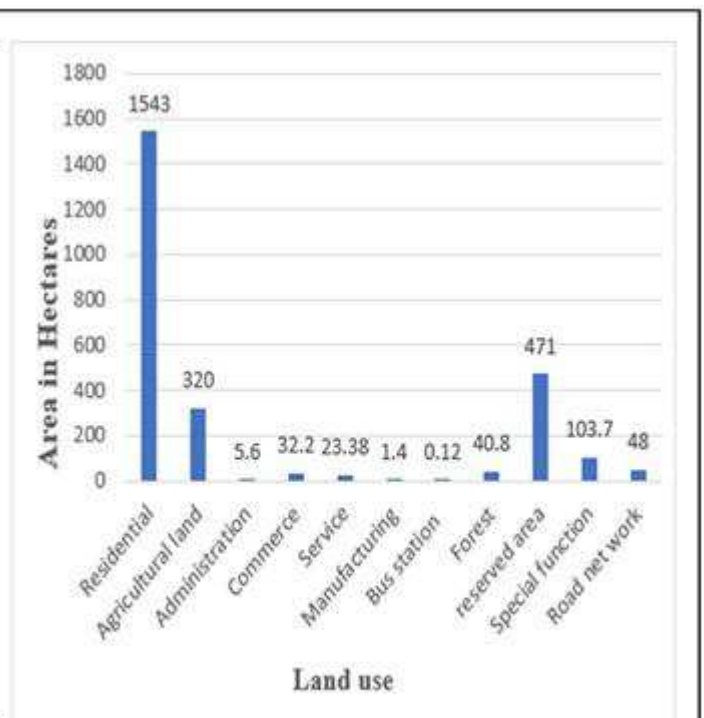


Fig.2: Land Use of Lalibela Town, Source: Lalibela Town Administration

4.2. Interpretation and discussion

4.2.1. Amount of agricultural land converted due to urban expansion

According to the woreda town administration document analysis of 2019, the amount of agricultural land lost due to urban expansion ranges from 0.062 to 2.877 hectares per household from 2011 to 2019. Based on this data the average amount of agricultural land lost by urban expansion was 1.4 hectares per household.

Based on Lalibela Town administration 2019, Lalibela town have been expanding rapidly and horizontally at the present time by incorporating the nearby peri-urban agricultural land. During the year 2011-2020 agricultural land was diminishing from over 1635 hectares before 2011 to 320 hectares in 2020.

Fig.3: The highest amount of agricultural land lost per household

Source: Lasta Woreda Administration, 2019

Fig.4: the lowest amount of agricultural land lost per household

Source: Lasta Woreda Administration, 2019

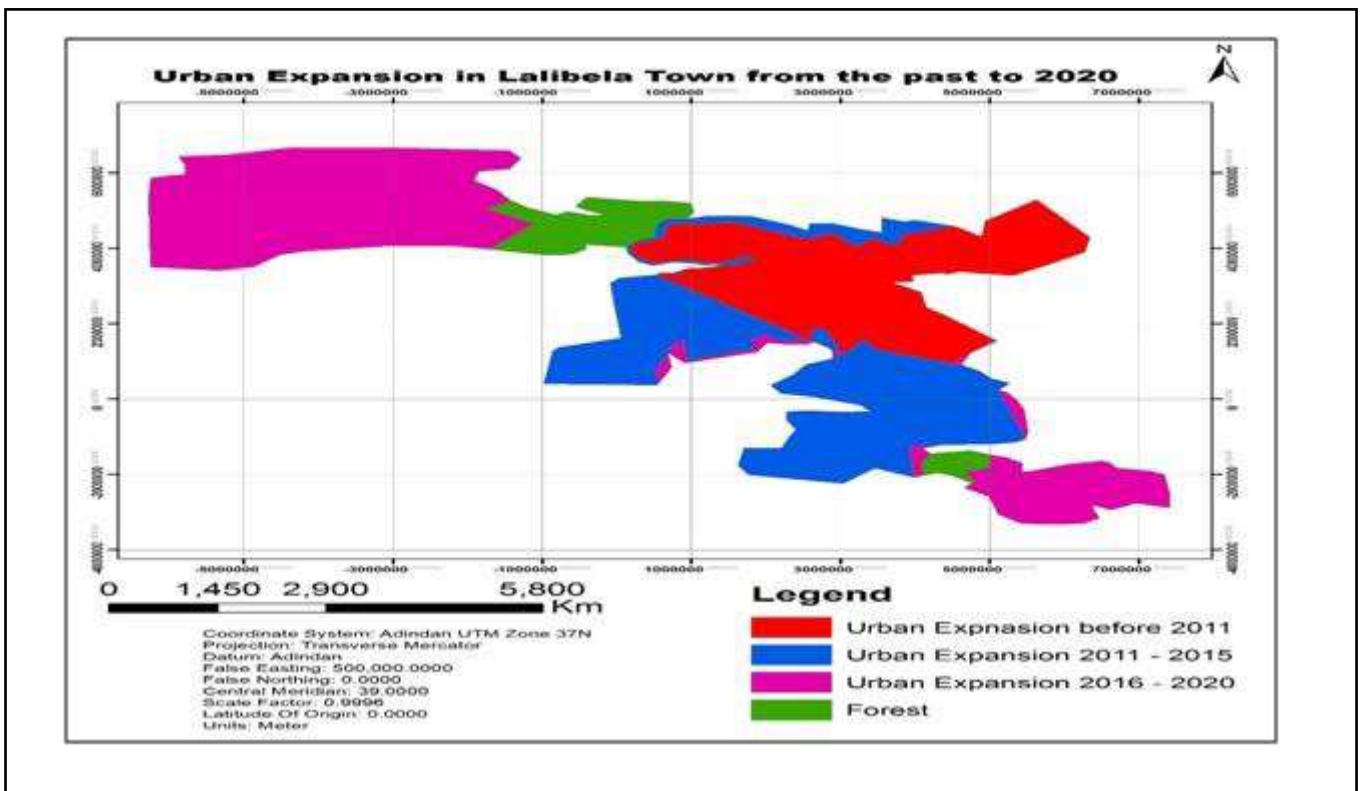


Fig.5: Urban expansion in Lalibela town from the past to 2020
Source: Lalibela Town Administration & Own digitization, 2020

Based on the Household survey data 2020, reveals that, 13 (11.50%) of the respondents lost the amount of agricultural land due to urban expansion were below 0.25 hectares, 30 (26.55%) lost the amount of agricultural land ranges from 0.26 to 0.50 hectares, 25 (22.12%) lost the amount of agricultural land ranges from 0.51 to 1 hectars, and 45 (39.82%) of the respondents lost the amount of agricultural land due to urban expansion were greater than 1 hectars. The total amount of agricultural land converted due to urban expansion were 157.09 hectars from 113 respondents. The average agricultural land converted by urban expansion were 1.39 hectars per household.

Based on observation, large amount of agricultural land was expropriated for urban use and this large amount of agricultural land were devoted for cooperative housing and infrastructural development.

According to Teketel (2015), during urban expansion, the amount of agricultural land become diminishing from time to time but, built up area increasing from time to time.

To conclude, large amount of agricultural land was lost due to urban expansion. The information obtained from the town administration and the field survey shows that average amounts of agricultural land lost due to urban expansion in the study area were nearly the same. The amount of agricultural land lost due to urban expansion increase from 2011 to 2020. This large amount of agricultural land lost due to urban expansion used for fulfilling different urban facilities.

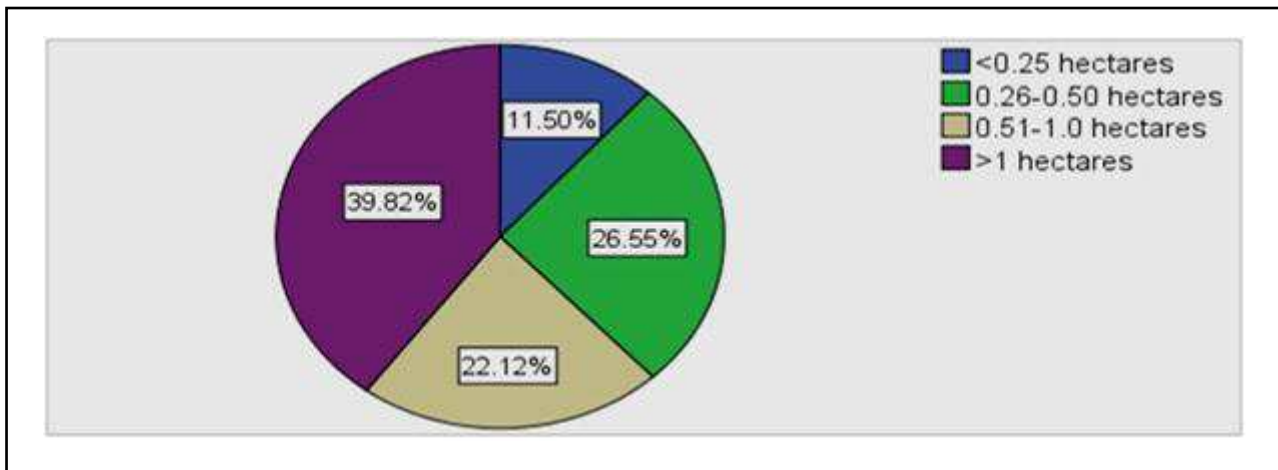


Fig. 6: The amount of agricultural land converted due to urban expansion
Source: Field survey, 2020

4.2.2. Driving force for urban expansion on agricultural land

According to the interview of municipal and agricultural development official's (2020), there are two main driving forces for urban expansion on agricultural land. These are: rural to urban migration and natural increase.

4.2.2.1. Rural to urban migration

According to the interview of the municipal experts (2020), rural-urban migration has its own influence on the population sizes of Lalibela town. Rural-urban migration is the result of because of the availability if infrastructures and social services in the town, so in order to get these services the surrounding rural people moved in to Lalibela town. According to table 1 shows that, the number of rural – urban migrates increase from time to time. During the year 2012, there were 875 rural-urban migrates and in 2019 there were 2354.

Migration has its own impact on the population size of in sending and receiving of cities /towns. In receiving urban area, the population number increasing from time to time and inversely that of sending rural area. During rural to urban migration, the numbers of population living in urban area become increase. During this time, huge amount of agricultural land was devoted for fulfilling urban basic facilities (Habtamu.B, 2015).

4.2.2.2. Natural increase

According to the Municipal and Agricultural developmental experts(2019), in the town, conversion of agricultural land was the result of an increase of urban population from both natural increase and rural to urban migration. Natural increase in population occurs when birth rate is greater than death rate. There are more births than deaths in Lalibela town.

Fig.7: Urban expansion on agricultural land out ward to Simeno River,Source: Field survey, 2019



Fig.8: Urban expansion on agricultural land out ward to Kurakur,Source: Field survey, 2019



Years	Rural-urban migration	Birth rate	Total population
2012	875	889	27200
2013	1543	1221	29964
2014	1459	1305	32728
2015	1371	1393	35493
2016	1293	1471	38256
2017	2045	1945	42246
2018	2124	2041	46411
2019	2354	2563	51328

**Table 1:Rural-urban migration and birth rate of Lalibela woreda.
Source: Lalibela Town Administration, 2019**

Table.1 shows that, the number of births were increased from year to year. In 2012 the numbers of newly born children were 889 and 2019 were 2563. The total numbers of births from 2012 to 2019 were 12828.

In Ethiopia, during 2020, birth rate estimates 36.9 births/1000 people and death rate estimates 7.9 deaths/1000 people per day. This indicates that in Ethiopia the numbers of births are greater than deaths(CIA, 2017).



To conclude, the main driving force for urban expansion outwards in to agricultural lands is population increments in the town through rural-urban migration and natural increase. According to Lalibela town administration (2019), the population number of the town increase from 27200 in 2012 to 51328 in 2019 due to natural increase and rural-urban migration. In Lalibela town the population is grown by an average of approximately 2764 people every year. According to Habtamu.B (2015), the increments of urban population were the result of natural increase (50.4%) and rural urban migration (49.6%). This indicates that natural increase has equal value with rural-urban migration for increment of urban population.

4.3.3 Effects of urban expansion on agricultural land

According to the interview of the municipal experts 2019, urban expansion has negative effects on agricultural land. Because, when urban expands outward, the amount of agricultural land become diminishing from time to time. Regarding to the effect of urban expansion on the farming community, loss of agricultural land due to urban expansion has positive and negative effects on the farming community. Positive effects of urban expansion, some agricultural land owners were got benefit during displacing from their agricultural land due to urban expansion. Such as, in 2016, five agricultural land owners bought minibus cars by the compensation birr in order to give transport service for the community. During This time, these minibus car owners improve their way of life in a good way and some of the farming community are participating in trade by compensation birr to improve their way of life. Negative effects urban expansion include; majority of the farming community are still stay without any work. This leads negative effects on these agricultural land owners and they feed their family by the compensation birr. But after the compensation birr will finish, their way of life may be disordered.

According to table 2, majority of the respondents (92 or, 81.42%) agreed that urban expansion on agricultural land has negative effects on the farming community and 21 (18.58%) of the respondents agreed that urban expansion has no effect on agricultural land owners.

The focus group discussion pointed out that, small in number agricultural land owners are participated in trade, bought minibus cars, and built houses for rent by the compensation birr to improve their way of life.

The Ethiopian and abroad scholars show that, urban expansion has many positive and negative effects on farmers in the peri-urban areas. A positive effect of urban expansion includes center of market area, center of production and distribution of goods and services. The negative consequences of urban expansion are loss of large amount of agricultural land, displacement of agricultural land owners, land degradation, diminishing of rural agricultural land, over use of resources and conflict (Shishay.M, 2011). Conversion of farm land reduces the amount of lands available for food and crop production (Samat.N et al, 2014).

Generally, urban expansion is one of the major problems that losses agricultural land. Expropriation of agricultural land due to urban expansion has negative and positive impacts on the farming community. According to the interview of the municipal experts, field survey as well as FGD, in Lalibela town expansion, even if some of the agricultural land owners were benefited from urban expansion on their agricultural land. But, on the majority of the agricultural land owners, there were negative effects on the farming community after losses of their agricultural land due to urban expansion.

Agricultural land owners		Frequency	Percent
Effect of urban expansion on agricultural land owners	Yes	92	81.42
	No	21	18.58
	Total	113	100.0

Table 2: Effects of urban expansion on agricultural land owners.
Source: Field survey, 2017

4.3.3.2 Consent level of agricultural land owners for urban expansion

According to the interview of the municipal experts, majority of the agricultural land owner were not voluntary to leave their agricultural land. Even if the agricultural land owners were not voluntary to leave their agricultural land, the local government displaced them based on proclamation No.455/2005.

Chart 4.4 show that, during the decision-making process, the consent level of agricultural land owners for urban expansion plan were, 5(4.42%) of the respondents were strongly agree, 20(17.70%) of the respondents were agree, 38(33.63%) of the respondents were disagree, 33(28.32%) of the respondents were strongly disagree during urban expansion plan on agricultural land and the rest 17 (15.93%) of the respondents were neutral (they were not stay on decision making process and those who were abstention during the participation on urban expansion plan). Based on this data majority of the respondents (61.95%) were disagree and strongly disagree to urban expansion plan out wards on agricultural land.

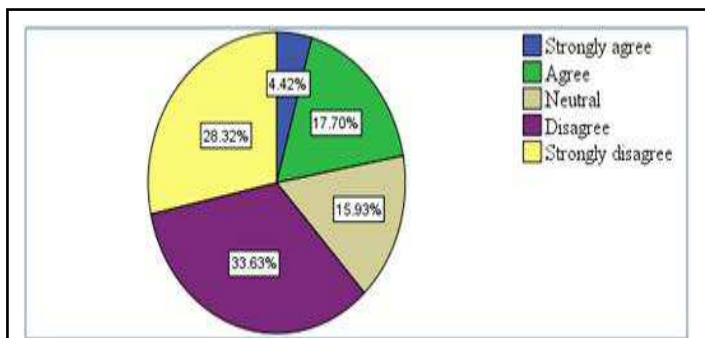


Fig. 10: Consent of agricultural land owner for urban expansion
Source: Field survey, 2017

According to the focus group discussion 2020, all participated (8) agricultural land owners were not voluntary to urban expansion plan on agricultural land because agriculture land is the only means of enhancing urban food security, healthy nutrition, poverty alleviation, social integration and source of income for the farming community. But the local government displaced the farming community by using force and menace.



Fig. 11: Focus group discussion
Source: Field survey, 2020

To conclude, majority of the respondents (61.95%) were not voluntary during urban expansion plan on agricultural land because agricultural lands are the only means of food production and source of income for the farming community. Even if the farming community disagrees on urban expansion plan, the local government expropriated the farming community based on the proclamation No. 455/2005 Art 3(1) states that, the government has the power to expropriate private property for public use. And also, even if using force is not good in order to displace the agricultural land owners, but the local government used forces for some farming community to displaced from their agricultural land.

5.Results/ findings

Based on the above discussion, the main findings for this study were; The amount of agricultural land lost due to urban expansion from 2011 to 2020. ranges from 0.062 to 2.877 hectares per household. Based on this data the average amount of agricultural land lost by urban expansion was 1.4 hectares per household. During the year 2011-2020 agricultural land was diminishing from over 1635 hectares before 2011 to 320 hectares in 2020. The main driving force for urban expansion out wards in to agricultural land is population increment in the town through rural-urban migration and natural increase. the number of births were increased from year to year. In 2012 the numbers of newly born children were 889 and 2019 were 2563. The total numbers of births from 2012 to 2019 were 12828. And During the year 2012, there were 875 rural-urban migrates and in 2019 there were 2354. Migration has its own impact on the population size of in sending and receiving of cities /towns.

In order to minimize loss of agricultural land due to urban expansion, the local government must be applied the following recommendations. These recommendations are given based on the above discussed findings. The local government must be expanding urban areas vertically. Even if vertical development is not accepted in the town, there is a chance to build up to G+4 buildings. It may be solving the problem of urban expansion on agricultural land; the local government should take into account of the agricultural land. Because agricultural land is the only means of source income and food production for the farming community of the area; applying zoning regulation for managing agricultural land. It used to manage effectively the agricultural land; the town administration must be developing policies that will bring compact urban development with including basic facilities in order to minimize the loss of agricultural land; Improving knowledge and skills of the urban planners to balance the increasing land demand and the loss of agricultural land; The government should build social services such as school, court, health center at kebele level to minimize rural-urban migration; The government should apply family planning method properly in order to minimize population number that increase through natural increase; Strengthen the construction of condominiums at woreda level on a small plots of area size in order to minimize loss of large amount of agricultural land due to urban expansion.

Conclusion

There were rapid conversions of agricultural land for urban use. During the year 2011-2020 the amount of agricultural land lost due to urban expansion from 2011 to 2020. ranges from 0.062 to 2.877 hectares per household. During the year 2011-2020 agricultural land was diminishing from over 1635 hectares before 2011 to 320 hectares in 2020. The main driving force for urban expansion out wards in to agricultural land is population increment in the town through rural-urban migration and natural increase. There are different mechanisms to reduce losses of agricultural land due to urban expansion. Such as, vertical urban development, compact settlement, applying zoning regulation of the town, building social service at kebele level to minimize rural-urban migration, use properly family planning method, building condominium, the expansion of the town must consider agricultural land and the local government must take in to account the agricultural land to protect from urban expansion.

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