Perceptions and key challenges towards sustainable condominium housing development in Gondar City, Ethiopia.

Bantayehu (✉ bantayal2006@gmail.com)
University of Gondar

Research Article

Keywords: Perception, Condominium, Sustainability, Ethiopia

Posted Date: December 21st, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-1185554/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License. [Read Full License](#)

Abstract

Condominium houses were one of the housing typologies that differed in administration, shared resources, and activity delivered in the houses. The study focused on the perception of condominiums and the challenges of their sustainability. The researcher followed qualitative and quantitative research approaches in which 357 samples were taken through probability sampling techniques from a total of 3346 condominium residents. Primary data gathered through questionnaires, interviews, and observations, as well as secondary data gathered through document review, were combined and analyzed using SPSS version 20 and presented in a table and wordily with explanations. The finding shows that the residents have a positive perception of condominiums in social and cultural diversification, resource sharing, the accumulation of dry waste, accommodating social services and facilities, and reducing travel costs. On the other hand, they perceived that the quality of house, administration and management system of the resources, local community involvement and infrastructural integration were poor; areas of floor and corridor were not uniform and narrow; the cost and renting were high. The challenges to sustaining the condominium housing development were affordability, quality of the house, building and neighborhoods, cost variation, low loan return and administration system.

1. Introduction

Housing is a basic necessity for human beings. In the world, there are different housing typologies, of which condominium is one of them. Condominiums represent one type of common interest legal tenure, combining detached and individually-owned property with undivided fractional ownership of common areas and infrastructure (Stefan & Randy 2019). The condominium is a dominant and popular form of home ownership in metropolitan areas, with an escalating popularity of owner-occupied homes in the last couple of decades (Yip, et. al. 2007). Its development has helped land-use policies to encourage urban intensification (Lehrer & Wieditz, 2009; Rosen & Walks, 2015); and displaced other forms of residential tenure (Stefan & Randy, 2019). Yet, managing and up-keeping such homes poses a challenge to most condominium owners, with larger condominiums equipped with sophisticated facilities becoming increasingly popular (Yip et al. 2007).

In housing development, packaging of green strategy (Zhang et al. 2011), housing density to control housing land consumption (Asfour, 2012), sustained government intervention (Arku, 2020), strategic activation of specific instruments (Debrunner and Hartmann, 2020), inclusive of the poor and infrastructure provision, has a significant contribution to sustainable housing development. Affordability is a necessary condition for the transformation toward sustainable housing. The connection between affordability and other sustainability conditions is a must (UN-Habitat, 2012, stated Haidar and Bahammam, 2020). A sustainable housing approach can make a valuable contribution to improving the quality of life and providing a healthy environment for the lives of the inhabitants while improving social, economic, and environmental conditions (Haidar & Bahammam, 2021). In recent years, housing challenges have been enormous, and would require a substantial and sustained flow of resources into the sector. At the national level, it requires sustained government intervention (Arku, 2020).

Environmental challenges in condominium housing development stem from poorly designed open spaces and houses with limited greenery and indoor air (Weldeyesus, 2019). The other challenges to sustainability identified were well-suited funding mechanisms for owners' occupiers in the Netherlands (Duffhues, 2019). To some extent, condominium development influences the urban form and lives of local residents and thus implicates various aspects of social sustainability to some extent in Toronto (Qing, 2018). On the other hand, in condominium house development, sustainability from the economic perspective is given more emphasis than social well-being and environmental protection (Arku, 2020). The researcher's arguments focused on the difficulties that existed in their country. In addition, communal condominium space management was addressed by many researchers.

Residents' perceptions of the quality of condominiums either harm or help their development. According to studies, residents have varying opinions about the quality, affordability, accessibility, neighboring, sanitation, and location of condominium houses (Gebrewold, 2015). The condominium house leads to weak social interactions, housing conditions, and insufficient traditional utilities and is not effective in constructing quality and comfortable houses for beneficiaries (Ingwani, et al., 2010). As a result, the perception of condominium dwellers or owners on social deterioration, social value contradicts, and poor administration reduces the housing program's sustainability. Since perception is a process by which individuals organize and interpret their sensory impressions in order to give meaning to their environment (Dhingra and Dhingra, 2011), However, individuals' positive or negative perceptions of their house may or may not reflect the objective condition of a house. Studies on housing perception explore residents' perceptions of their housing conditions.

Research was conducted and their focuses were on housing satisfaction, residents' well-being (Kahlmeier et.al., 2001), income level, marital status, family size, gender, and ownership status (Teck-Hong, 2012; Lee and Park, 2010), and the perception varied with age, ownership status, and material well-being. On the other hand, the perception of maintenance activities, management problems, and lessons was addressed (Vergara, et.al., 2019), but this research will look beyond that, which incorporates the perception of social value, affordability, environmental impact, and administration. Housing satisfaction and residential satisfaction are used interchangeably. Residential satisfaction is gained from the housing unit and its neighborhood. The researcher (Gebrewold, 2015) conducted research on the quality of condominiums and reached the conclusion that variation existed in location and building floor, i.e., the inner-city condominium sites and ground floor residents were more satisfied than urban periphery condominium sites and other building floor residents. In this research, housing satisfaction means satisfaction with housing unit characteristics that correspond with financial, social, physical, and environmental characteristics of the site.

In the study area, the condominium was constructed and transferred to the urban dwellers. In this aspect, there are different visible challenges and the perception of them varies. As a result, the research assists the city administration, scholars in the field, and consultants in understanding the key challenges and perceptions of condominium dwellers.

2. Methods And Materials

2.1 Study Area

The study was conducted in the city of Gondar, Ethiopia, which is geographically located at 12°45'North latitude and 37 ° 45 ' East longitude. It was established in 1636 as the permanent capital city in the history of the country. The principal natural constraints for the physical expansion of the town are sloppy land and man-made ones, like the city occupied by a historical area or heritage that hinders its expansion.

Demographically, the population of the city is rising rapidly. In the first national census conducted in 1984, the total population was 80,886. In the second and third censuses of 1994 and 2007, the population was recorded as 112,249 and 207,044 respectively. In the 2019 national census conducted by the Central Statistical Agency of Ethiopia (CSA), Gondar had a total population of 500,788, of whom 300,000 were men and 200,788 women.

2.2 Methodology

The research used a qualitative and quantitative research method to identify the perceptions and challenges of condominium development in the study area. The quantitative has been used to quantify the frequencies of the respondent in all closed-end questions and the qualitative has been used to describe the results qualitatively, which were collected through interviews and observations.

2.2.1 Sampling Methods and Sample Size Determination

In order to analyze the perception and challenges of condominiums, the researcher used purposive and systematic sampling methods. Purposive sampling was used to select respondents for the interviews from among residents and government officials. In addition, offices and officials were selected due to the existence of relevant data from them. Systematic sampling was used to take condominium household samples to identify the perceptions and challenges of residents of condominium houses, and the sample size of the respondents was determined using Taro Yamane's (1973) formula with 94.85% confidence level and 5.14% precision. The total number of condominium housing units in the study area was 3346. The calculation is presented as follows:

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

Where n is the sample size,
N is the total household in the condominium
e is the level of precision (5.14%).

$$n = \frac{3346}{1 + (3346 * 0.0514 * 0.0514)}$$

$$n = 340$$

Thus, 340 respondents were taken for the questionnaire.

2.2.2 Data Types, Sources, and Collection Methods

Both primary and secondary data were used in order to conduct research on the perception and challenges of condominium houses. The primary data sources were the condominium households, committees, and officials, and the data has been collected through questionnaires, interviews, and observations. Whereas the secondary data was collected from reports through document review.

2.2.3 Data Analysis

The data was analyzed using both qualitative and quantitative methods. The data collected via a questionnaire was analyzed quantitatively using SPSS 20 and presented in the form of a table. The information gathered through interviews, observations, and document reviews was analyzed qualitatively or quantitatively.

3. Result And Interpretation

This part of the article deals with the findings from the survey, observations, and documents. These results discussed in this part are presented as follows.

3.1 The Perceptions of Residents

People have different views on the situation. Some of them may be negative, while others may be positive. The view of the user has an impact on the policy implementation like an integrated housing development program (condominium). Thus, this research tries to cover their perception of condominium houses.

3.1.1 The Cost of Owning or Rent

In Ethiopia, only 39% (1.8 million) of all urban units were owner-occupied, compared with 95% (13.9 million) of all rural units (CSA, 2016). This indicates that 51 percent were renters. The presence of more renters and the increased demand for housing raised the cost of renting and owning a home. Housing costs make up a large share of the household budget, and the low-income population is often constrained by the level of resources left for other essential expenditures. High housing costs can thus threaten households' material well-being and economic security (Matsumoto & Crook, 2021). Thus, the increase in housing costs has an effect on the well-being of the residents.

Table 1: A cross-tabulation of condominium rent prices and purchase costs based on housing rights.

Price for purchasing condominium is high				Type of right on House		Total
				Renter	Owner	
Agree	Price of rent is very high	Agree	Frequency	100	189	289
			Percentage	39.1	42.2	81.2
		Disagree	Frequency	28	20	48
			Percentage	10.9	7.8	18.8
	Total			Frequency	128	256
				Percentage	50.0	100.0
Disagree	Price of rent is very high	Agree	Frequency	12	8	20
			Percentage	15.0	10.0	25.0
		Disagree	Frequency	16	44	60
			Percentage	20.0	55.0	75.0
	Total			Frequency	28	80
				Percentage	35.0	100.0
Neutral	Price of rent is very high	Agree	Frequency	4		4
			Percentage	100.0		100.0

Source: Field Survey, (2020)

As indicated in Table 1, the condominium renter and owner perceived that the cost and rent of the condominium were high. Compared with the renters, a relatively higher number of house owners identified that the condominium rental price was not expensive. Almost insignificant numbers of the respondents had no information on the price and cost of rent and purchase. Hence, as they do have information about the cost of the condominium since they are living there, the cost of the condominium can be easily identified by the dwellers. In an interview conducted with the committee member regarding the cost, the committee member responded like this:

We entered into an agreement to build the houses based on the housing typology. The cost per meter square and the area between the plan and the actual varied between years, with the actual being less than the plan. In 2008, the cost per meter square for one bed was 3,553.05 birr, but it was 1,813.19 birr in 2007. Regarding area, in the houses constructed in 2008, for instance, in one building, the area on plan for one bed was 43.64m², but the actual area on the ground was only 32.00m². In this case, there was an 11.64 m² difference, for which the house owner was supposed to pay an additional payment. Hence, the participants were required to pay beyond the actual area.

Generally, the cost of the price for condominiums was high, which resulted in the incorporation of a price beyond the actual area. The owner and renter's perceptions of the cost and rent price were insignificantly different.

3.1.2 The Quality of the House

Housing quality in Ethiopia is lower than in neighboring countries, with overcrowded and poor living conditions constituting the major housing challenges in large urban centers. The houses were constructed from wood and mud. The

two most commonly used materials for flooring in urban housing units were "earth or sand" and "dung" (Matsumoto & Crook, 2021). Whereas the condominium was not constructed from such materials, and the poor quality would not have resulted from the material of sand and dung. The poor quality resulted from the roof, colon and height of bime alignment, downward pipe, floor of corridor, rendering, blocket alignment, light installation, and septic tank. Residents' positive perceptions of the quality of condominiums increased their desire to participate in and continue to participate in the program. In this research, the quality of housing units and buildings was in-sighted and residents view was presented in table 2.

Table 2: Perceptions of the house's quality

Variables	Responses	Frequency	Percent
Enough spaces of corridor in housing unit	Enough	156	45.9
	Not Enough	184	54.1
The Area of the house is enough and uniform	Agree	148	43.5
	Disagree	192	56.5
Good straight case	Agree	204	60.0
	Disagree	132	38.8
	Neutral	4	1.2
Good meter electric installation	Agree	196	57.6
	Disagree	144	42.4

Source: Field Survey (2020)

As indicated in table 2, the majority of the respondents identified that the corridor and areas of the houses were poor, but the light, electric installations, and straight cases were good. A small number of respondents were undecided about the quality of the house and the straight case.

As observations were conducted, the quality of the housing units, buildings, and neighborhoods was not uniform. On the other sites, the quality of the houses was good, but on the sites of Azezo, the quality of the houses was poor.

Generally, the quality of the condominium houses was not uniform. The space of the corridor and area of the floor in the housing unit were not enough and uniform, whereas the straight and metric electrical installations were good.

3.1.3 Environment

Viable environmental conditions are vital for residents. In any area where there is water, land, or air pollution, people will be exposed to epidemic diseases. The environmental condition would be polluted as a result of poor drainage, low dry waste disposal mechanisms, and poor community involvement in cleaning the surroundings.

The indoor environment, as determined by lighting, air quality, chemical, and damp conditions, can have an impact on the occupants' well-being (Al-Horr, et. al., 2016). Cleaning products, construction activities, carpets and furnishings, water-damaged building materials, microbial growth, insects, and outdoor pollutants can all expose building occupants to a variety of contaminants. Other factors, such as indoor temperatures, relative humidity, and ventilation levels, can also influence how people react to their surroundings. Understanding and controlling the sources of indoor environmental contaminants can often help prevent or resolve building-related worker symptoms (CDC, 2013). Practical guidance for

improving and maintaining the indoor environment is available in advanced countries. Indoor environmental conditions in developing countries, on the other hand, are incompatible with international standards. We perceive the indoor environment by considering the oddities of mold and dampness.

Residential satisfaction is a preliminary step for creating home attachments that can exist due to the exterior view of the house and neighboring buildings, neighboring satisfaction, and the quality and good reputation of the neighborhood (Saadati, 2019). Neighborhood environmental quality is vital for playing football, conducting different ceremonial events, and securing health and mental satisfaction.

The environmental quality is the result of both indoor and outdoor conditions, which was the perception of the residents presented below.

Table 3: Residents' perceptions of the environment

Variable	Response	Frequency	Percent
Presence of indoor environmental quality	Agree	244	71.8
	Disagree	96	28.2
Clean neighborhood	Agree	112	32.9
	Disagree	228	67.1
Improved solid waste disposal mechanism	Agree	244	71.8
	Disagree	96	28.2
Sewerage in building and neighborhoods	Good	152	44.7
	Poor	188	55.3

Source: Field Survey (2020)

As indicated in table 3, nearly 72 percent of the respondents felt that indoor environmental quality was good. Whereas, 28 percent perceived that the indoor housing quality was poor. In study areas, more than half of the respondents identified that the neighborhood quality was poor. The majority of the respondents responded that the solid waste disposal was good but the sewerage in the building and neighborhood was poor.

Generally, the respondent perception of the indoor environment was better than the outdoor environment.

3.1.4 Infrastructure and Facilities

Adequate infrastructure and services serve as the backbone for growth and are essential for community health, safety, and quality of life. Infrastructure can enhance the quality of life, improve the safety of residents, improve health and aesthetics, reduce household expenditures, create new employment opportunities and enhance neighborhood vitality. In the condominium within one high-rise building, there were many residents that shared infrastructure for all living there. Table 4 depicts residents' perceptions of infrastructure affordability and service provision.

Table 4: Residents' perceptions of infrastructure and service provision.

Variable	Response	Frequency	Percent
Distance from social services and service provision	Low	208	61.2
	High	132	38.8
Nearer to work place	Agree	140	41.2
	Disagree	200	58.8
Infrastructure's integration	Low	176	51.8
	High	164	48.2
Trait and problem to pay service cost	Less	284	83.5
	High	56	16.5

Source: Field Survey (2020)

Table 4 shows that more than 60 percent of the respondents perceived that the condominiums were not far from social services like schools and health centers. whereas more than 58% were residents living far from the workplace. In relation to the integrated infrastructural provision in the condominium, nearly 51 percent perceived that there was less integration in infrastructure like roads, water, and electricity. A sizable proportion of respondents (83%) stated that the condominium offered fewer amenities and reduced the cost of services such as water and electricity.

Generally, social services and facilities were not far from condominiums; infrastructural integration was low, and condominiums had fewer opportunities to pay service costs.

3.1.5 Administration

The administration system enhanced the overall continuity and sustainability of the program. In condominiums, there were communal plots, infrastructure, parking, corridors, and shared walls. These properties require clear administrative frameworks and understanding by the residents. It brings negative externalities to its property management unless its administration is guided by an institutional setup and framework. The residents' view of the administration system was presented in table 5.

Table 5: Administration System Perceptions

Variables	Response	Frequency	Percent
Administration system	Good	140	41.2
	Poor	200	58.8
Community participation in the management	High	136	43.5
	Low	196	56.5
	Good	164	48.2
Condominium management	Poor	176	51.8

Source: Field Survey (2020)

As indicated in table 5, more than 58 percent of the respondents said that the administration system was poor. Below, 44 percent of the respondents identified that the overall community participation in condominiums was limited. In relation to

the management of the condominium, more than half of the respondents said that the management was poor.

Generally, the residents perceived that the administration system was poor, there was low community participation in the management, and the overall management of the condominium was poor.

3.1.6 Social and Cultural Roles

A condominium development influences the urban form and lives of local residents, thus implicating various aspects of social and cultural integration to some extent. The condominium development affects socio-cultural aspects like sex, age, language, religion, and ethnic diversity (Yan Qing, 2018). The condominium paves the way for repeated meetings of the residents that may enhance or reduce socio-cultural diversification. In the study area, the perceptions of the condominium dwellers on the social and cultural aspects were presented in table 6.

Table 6: Perception of residents on the social and cultural role of condominium

Variable	Response	Frequency	Percent
Enhanced Social integration	Yes	232	68.2
	No	108	31.8
Helped for sharing culture	Agree	216	63.5
	Disagree	124	36.5
Enhanced mutual respect	Yes	244	71.8
	No	96	28.2
Helped on sharing and immediate problem solving	Agree	176	51.8
	Disagree	160	47.1
	Neutral	4	1.2

Source: field survey (2020)

Table 6 shows that two-thirds of the respondents agreed that condominium houses helped to enhance social integration and mutual respect. Nearly 63 percent of respondents responded that condominiums can help in the sharing of culture. Whereas 47 percent of the respondents responded that condominiums helped in sharing resources and problems immediately, nearly one percent of the respondents could not determine whether the condominium had a role in sharing resources and problems.

Generally, in the condominiums of the study area, people of different religions, sexes, ages, languages, and ethnicity live within one building on one floor. This makes the diversity of languages and religions respected and allows for the sharing of resources at the time of sermonizing activity without any problems.

3.2 The Challenges of Condominium Housing

The challenges hinder the development of the program. The following are some of the problems identified as problems for the sustainability of the program.

3.2.1 Affordability

The main drivers of the urban housing shortage are the low incomes of urban residents, insufficient supply of serviced land, and requirements for costly and highly unrealistic housing units, which become severe for low incomes due to lack of affordable and quality housing and difficulties in obtaining housing finance (World Bank, 2015; Centers for Affordable Housing Finance in Africa, 2019). Affordability can be for those seeking to own or rent. The condominium housing development was not sustained beyond two years, i.e., availability was limited for owning and renting. Thus, dwellers could not access the limited number of housing units beyond 3346.

The level of affordability can be understood in different ways by different countries. For instance, housing affordability in OECD countries is defined as the proportion of household expenditure on housing costs that does not exceed 30% of disposable income, but in the Ethiopian context, housing may appear relatively affordable at first glance: expenditures on "housing (rent), water, electricity, and gas" account for around 19% of annual household expenditures. Low-income households are unable to afford upfront down payments and long-term mortgage payments (Matsumoto & Crook, 2021). In the study area, the perceptions of residents regarding affordability are presented in table 7.

Table 7: Condominium affordability

Challenges	Response	Frequency	Percent
Price affordability to own or rent condominium	Affordable	140	41.2
	Not affordable	200	58.8

Source: Field Survey by Author (2020)

Table 7 shows that nearly 59 percent of the respondents indicated that condominiums were not affordable to rent or own. The remaining 41% said the condominiums were affordable to rent or own.

As the interview was conducted on the affordability of the condominium, the respondent responded like this:

Due to the lack of construction, the condominium has a limited number of units. Renting a condominium is appealing to those who do not own a home, but it is limited. The program is not sustainable, so you have no choice except to buy it, but it is pricey.

As the documents were reviewed, the goal of condominiums was to reduce the housing problem by affording houses to many. The inclusion of four unit typologies was to address affordability, but the approach wrongly assumed that the smallest and cheapest units were occupied by the poor (UN Habitat, 2010). In the study area, to be eligible for the condominium, there was a minimum first payment of more than 6,640 birr, which was difficult for the poor. In addition, there was a minimum monthly payment of more than 400 birr for 25 years for studio housing unit typology. Furthermore, the commercial bank of Ethiopia announced that some of the owners of the condominium could not pay their long-term mortgage payments.

In general, condominiums were out of reach for the poor in terms of ownership and rental.

3.2.2 Cost Variation

In the study area, condominiums were constructed in 2007 and 2008 at five sites. In later years, the construction was conducted at the Azezo site, where the cost of houses was high, in addition to compromising the quality. In this regard, the document review of the cost variation between the 2007 (Collage and Aba-Samuel) and 2008 (Azezo) condominiums was presented as follows.

Table 8: The Cost Variation of Unit Housing Typologies by Year

Housing Typology	Housing Price per M ² in 2007	Housing Price per M ² in 2008	Housing Price per M ² change between 2007 and 2008	
			Number	Percent
Studio	1269.23	2,487.14	1217.91	199.4
One Bed	1813.19	3553.05	1739.86	193.2
Two Bed	1903.85	3748.47	1574.62	182.7
Three Bed	1994.50	3801.76	1807.25	190.6

Source: Report of the Gondar City Condominium Complain Investigator Committees (2020).

As shown in table 8 in both housing typologies, after a year the cost of the house is raised by nearly double. When comparing 2008 to 2007, the prices of studio, one-bed, two-bed, and three-bed housing typologies increased by 199, 193, 183, and 191 percent, respectively.

Generally, the price of the condominium was raised over time without consideration of the country's inflation context. As a result, the complaint about its costs was noticed.

3.2.3 Low Loan Returns

The commercial bank of Ethiopia is a government-owned bank that provides loans for commercial purposes. The bank provided loans to condominium beneficiaries with an annual interest rate of 8.5 percent. This loan was not continued in the regional state of Ethiopia as a result of low demand (UN HABITAT, 2010).

As per document review from the Gonder City condominium complaints investigatory committee report (2020), 837 condominium beneficiaries were not fully repaid until 2020. This indicated that the loan return was not fully and consistently made.

3.2.4 Quality

Good housing conditions are also essential for people's health and affect childhood development. Measuring housing conditions and their effects on people's well-being is complex. An ideal set of indicators to measure housing conditions should provide information about both the physical characteristics of the dwelling and the broader environmental characteristics of the area. The share of the population satisfied with housing quality is a perceived indicator and also useful for assessment of quality of life related to housing (Streimikiene, 2015). In the study area, how the residents perceive the quality of the condominium is presented in table 9.

Table 9: Quality of the House

Challenges	Response	Frequency	Percent
Satisfaction on quality of the condominium	Satisfied	176	51.8
	Not satisfied	164	48.2

Source: field survey by Author (2020)

Table 9 shows that nearly 51 percent of the respondents responded that the quality of the condominium satisfied them, whereas 48 percent were dissatisfied with the quality.

In table 10, the perceptions of the dwellers about the broader environmental characteristics of the area are presented.

Table 10: The environmental characteristics of the condominium

Challenges	Response	Frequency	Percent
Condominium indoor and outdoor sewerage	Good	108	31.8
	Not good	232	68.2
Appropriated dry waste disposal	Appropriate	220	64.7
	In-appropriate	120	35.3

Source: Field Survey by Author (2020)

As shown in table 10, more than 68 percent of the respondents responded that the overall sewerage of the condominium was not good. In terms of waste disposal suitability, more than 64% were determined to be suitable for dry disposal.

As an observation was conducted, the overall sewerage was not uniform. In some sites, like Azezo, the sewerage was not as good compared to the college and Gibrena sites. The sewerage system was not that great, but the dry waste disposal was better. In addition, the commercial bank of the Gondar district announced that in the Azezo condominium sites, some of the loaners were not paying the loan. In this regard, as the interview was conducted, the respondents responded as follows:

The Azezo condominium site is the last constructed condominium and there will be no others after it. The quality was poor and people (owners) were complaining about it, and some of them were not paying their loans to the bank.

In general, most of the condominium owners of the later constructed units did not pay the loan due to complaints about the quality of their construction, in addition to their low capability.

3.2.5 Administration

The housing administration function is wide-ranging, covering aspects of estate and tenancy management at both a strategic level and day-to-day contact with individual tenants (Blomé, 2010). In condominium houses, there are common resources that are different from natural resources. According to Ostrom's design principles, the communal resource boundary should be clearly defined and the use and provision of the resources should be adaptable to the local community (Foster & Iaione, 2019). The involvement of the local community, especially residents of the condominium, fosters the management system. The improved management of condominiums enhances the utilization of communal resources like open space, infrastructural, corridors, buildings, and shared walls. In the study area, the responses of dwellers to the administration system are presented in table 11.

Table 11: Housing Administration

Challenges		Absence of administration hierarchy in the condominium			
		No		Yes	
		Frequency	Percent	Frequency	Percent
Process to transfer right	Bureaucratic	68	39.5	104	61.9
	Non-bureaucratic	104	60.5	64	38.1

Source: Field Survey by Author (2020)

Table 11 shows that the respondents that identified the presence of an administration hierarchy responded that the process of right transfer was non-bureaucratic. The other respondents that identified the absence of an administration system responded that processes for transferring rights were bureaucratic.

Generally, the administrative hierarchical level was not clear and understood by the residents. The management of the communal property was managed poorly.

4. Summary And Recommendation

Housing is an essential sector in any country's economy and plays an important role in social and economic development (Arku, 2020). Condominiums differ from other housing typologies in the share of resources, ownership, administration, and perception of the residents. In this research, the perception of the residents and the challenges to the sustainability of the condominium houses were addressed. Qualitative and quantitative research designs and probability sampling techniques were used. The survey, interview, observation, and document review were used to reach a conclusion, and data was collected from 357 respondents. Thus, using such techniques, methods, and data, the researcher reached the following conclusion:

The condominiums were constructed in 2007 and 2008, but since then they have not been sustained. Dwellers have different perceptions of condominium houses. The respondents perceived the cost and rent of condominiums as high compared to renting private houses. Some of the costs were incorporated beyond the actual area of the housing. The quality of the condominium houses was not uniform. In some sites, the space, straight cases, housing units, and buildings were better. On the other hand, at some sites, the space between the corridors and the area of the floor in housing units was not enough and uniform. Relatively, in the study area, housing unit floors and corridors were not uniform and narrow, whereas the straight case and metric electric installation were good. The residents perceived that the indoor environmental conditions like odder, mold, and dampness were relatively better than the outdoor environmental conditions. The outdoor environment affects the neighborhood through providing bad odder and the disposition of sewerage to the surrounding area. Proximity to services, facilities, and work places can enhance the value of houses. In this regard, the respondents perceived that the condominium was nearer to the social services and facilities and work places. Whereas the infrastructural integration was poor. Regarding the administration system, the condominium requires clear legal institutional frameworks and local community participation. But, the dwellers identified that the administration and management systems of the resources and local community involvement were poor. The condominium accommodated a minimum of 18 to 45 households within one building. This helped to respect each other, share resources and their culture and social aspects like religion and language.

The challenges to sustaining the condominium housing development were affordability. The condominiums were expensive to rent as well as own through purchase. Affordability was a big challenge for low-income groups, but the programs were designed for them. Even though the condominiums were financed by mortgage loans from the Commercial Bank of Ethiopia, issued in the form of mortgage interest deduction (Matsumoto & Crook, 2021). The owners

were unable to pay loan interest and the down payment. As a result, some of the housing units were put up for bidding to be replaced. The second challenge was cost variation between the 2007 and 2008 construction years. The increase in housing prices per square meter during this period ranged from 182 to 199 percent. But, the material costs were low, which resulted in complaints and played a vital role in non-sustainability. The third challenge was the low loan return. The condominium was constructed with a loan granted by the commercial bank of Ethiopia. The loans were not consistently returned. The fourth challenge was the poor quality of the houses, buildings, and neighborhoods. The residents were dissatisfied with the quality. The outdoor sewerage and indoor sewerage were challenges for the residents. The last challenge was the administration system. In condominiums, the existence of communal property may be the source and cause of conflict when it is not properly administered. In the study area, poor administrative systems and bureaucracy on the transfers on the right were challenged to be sustained.

As per the actual data, the researcher recommended it to the local administration, policy makers, and researchers, which was presented below:

- To enhance affordability, the government subsidizes the poor instead of providing the plot for them.
- As a social obligation, the government should coordinate with the private banks to assist the poor through relatively low loan rates.
- Improve the quality through strict followup and community participation to assure the quality.
- In the construction of the houses, the emphasis should be on quality, which results in an effect on the cost and well being of the community.
- Infrastructural integration should be integrated into the planning and implementation.
- There should be clear institutional and understandable frameworks in the administration of common resources.
- The condominium enhanced the cultural and social integration, and it should be a lesson to others who have problems.

Declarations

The authors declare no competing interests.

References

1. Al horr, Yousef; Arif, Mohammed; Katafygiotou, Martha; Mazroei, Ahmed; Kaushik, Amit; Elsarrag, Esam (2016). *Impact of indoor environmental quality on occupant well-being and comfort: A review of the literature. International Journal of Sustainable Built Environment*, 5(1), 1–11. doi:10.1016/j.ijbsbe.2016.03.006
2. Arku G., (2020). Housing Policy in Developing Countries, International Encyclopedia of Human Geography (Second Edition), P.79-82, <https://doi.org/10.1016/B978-0-08-102295-5.10395-6>.
3. Asfour O. S., (2012). Towards an effective strategy to cope with housing land scarcity in the Gaza Strip as a sustainable development priority, Habitat International, Volume 36, Issue 2, P.295-303, <https://doi.org/10.1016/j.habitatint.2011.10.005>.
4. Blomé, G. (2010). Local housing administration models for large housing estates. *Property Management*.
5. CDC. (2013). The National Institute for Occupational Safety and Health (NIOSH): Indoor Environmental Quality. Available at: <https://www.cdc.gov/niosh/topics/indoorenv/>
6. Centers for Affordable Housing Finance in Africa (2019). Housing Finance in Africa: A review of Africa's Housing Finance Markets. Accessed

7. CSA (2016). Welfare Monitoring Survey 2015/2016. Volume II: Statistical Report Indicators on Living Standard, Accessibility, Household Assets. Central Statistical Agency, Addis Ababa, <https://www.statsethiopia.gov.et/our-survey-reports/>.
8. Debrunner and Hartmann (2020). Strategic use of land policy instruments for affordable housing – Coping with social challenges under scarce land conditions in Swiss cities: Land Use Policy, Volume 99. <https://doi.org/10.1016/j.landusepol.2020.104993>.
9. Dhingra, M., & Dhingra, V. (2011). Perception: Scriptures' Perspective. *Journal of Human Values*, 17 (1), 63–72. doi:10.1177/097168581001700104
10. Duffhues, G. (2019). The Sustainability Challenge of Condominium Associations in the Netherlands: An Ex-Ante Policy Analysis of Building-Bound Financing.
11. Foster, S. R., & Iaione, C. (2019). Ostrom in the city: Design principles and practices for the urban commons. In *Routledge Handbook of the Study of the Commons* (pp. 235–255). Routledge.
12. Gebrewold, T. A. (2015). *Condominium Dwellers' Housing Quality Perception and Satisfaction in Addis Ababa*. University of Twente Faculty of Geo-Information and Earth Observation (ITC).
13. Haidar E. A., Bahammam A. S, (2020). An optimal model for housing projects according to the relative importance of affordability and sustainability criteria and their implementation impact on initial cost, *Sustainable Cities and Society*, V.64, <https://doi.org/10.1016/j.scs.2020.102535>.
14. Ingwani, E., Gondo, T., Gumbo, T., & Mazhindu, E. (2010). *Design Considerations and Sustainable Low Cost Housing Provision for the Urban Poor in Addis Ababa, Ethiopia*. na.
15. Kahlmeier, S., Schindler, C., Grize, L., & Braun-Fahrlander, C. (2001). *Perceived environmental housing quality and wellbeing of movers. Journal of epidemiology and community health*, 55(10), 708–715. <https://doi.org/10.1136/jech.55.10.708>
16. Lee & Park (2010). Housing Satisfaction and Quality of Life Among Temporary residents in the United States, *Housing and Society*, 37:1, 43–67, DOI: 10.1080/08882746.2010.11430580
17. Lehrer, U. & Wieditz, T. (2009). Condominium development and gentrification: The relationship between policies, building activities and socio-economic development in Toronto, *Canadian Journal of Urban Research*, 18, pp. 140–161.
18. Matsumoto, T., & Crook, J. (2021). Sustainable and inclusive housing in Ethiopia: a policy assessment.
19. Qing, Y. (2018). *Can Condominium Development Contribute to Social Sustainability? The Case of Inner Toronto* (Master's thesis, University of Waterloo).
20. Rosen, G. & Walks, A. (2015). Castles in Toronto's sky: Condo-ism as urban transformation, *Journal of Urban Affairs*, 37, pp. 289–310.
21. Saadati, S. (2019). The Role of House Outdoor Environment Features in Creating Home Attachment. *Space Ontology International Journal*, 8(4), 1–11.
22. Stefan R. Treffers & Randy K. Lippert (2019). Condominium self governance? Issues, external interests, and the limits of statutory reform, *Housing Studies*, DOI: 10.1080/02673037.2019.1646217
23. Streimikiene, D. (2015). Quality of life and housing. *International Journal of Information and Education Technology*, 5(2), 140.
24. Teck - Hong, T. (2012). Housing satisfaction in medium- and high-cost housing: The case of Greater Kuala Lumpur, Malaysia. *Habitat International*, 36 (1), 108–116. doi:10.1016/j.habitatint.2011.06.003
25. UN- Habitat (2012). Sustainable housing for sustainable cities: A policy framework for developing countries; Nairobi, Kenya.

26. UN-HABITAT (2010). The Ethiopia Case of Condominium Housing: The Integrated Housing Development Programme. United Nations Human Settlements Programme: Nairobi.
27. Vergara, L., Gruis, V., & van der Flier, K. (2019). Understanding Housing Management by Low-income Homeowners: Technical, Organisational and Sociocultural Challenges in Chilean Condominium Housing. *Buildings*, 9(3), 65. doi:10.3390/buildings9030065
28. Weldeyesus, Y. (2019). *Determinants of Environmental Sustainability of Condominium Housing Projects in Addis Ababa* (Doctoral Dissertation, St. Mary's University).
29. World Bank (2015). Ethiopia Urbanization Review. <https://openknowledge.worldbank.org/bitstream/handle/10986/22979/Ethiopia000Urb0ddle0income0Ethiopia.pdf?sequence=1&isAllowed=y%20p.Xii> (Accessed 2 December 2020).
30. Yamane, T. (1967). *Statistics: an introductory analysis*, (2nd Ed). New York: Harper and Row.
31. Yan Qing (2018). *Can Condominium Development Contribute to Social Sustainability? The Case of Inner Toronto.. UWSpace*. <http://hdl.handle.net/10012/13743>
32. Yip, N., Chang, C. and Hung, T. (2007). "Modes of condominium management: a principal-agent perspective", *Facilities*, Vol. 25 No. 5/6, pp. 215–226. <https://doi.org/10.1108/02632770710742183>
33. Zhang X., Shen L., Wu Y., (2011). Green strategy for gaining competitive advantage in housing development: a China study, *Journal of Cleaner Production*, Volume 19, Issues 2–3, P. 157-167, <https://doi.org/10.1016/j.jclepro.2010.08.005>.

Figures

Figure 1

Source: Ethiopian Mapping Agency modified by Author