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Multidimensional Poverty Dynamics and its Determinants in Peri-Urban Areas of Amhara National Regional State: Evidence from Dessie, Kombolcha and Kemise Towns

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ABSTRACT

The access to affordable and adequate housing and land in peri-urban areas of the Amhara National Regional State of Ethiopia has become a pressing issue, leading to illegal land sales and displacement of peri-urban farm households. This study aims to assess the state of multidimensional poverty dynamics and its determinants in peri-urban areas, specifically in Dessie, Kombolcha, and Kemise towns. A total of 384 households were surveyed for this study, with an equal division between those who were displaced through compensation and those who were displaced through the unauthorized sale of land. This study examines the extent of multidimensional poverty among peri-urban farm households using the multidimensional poverty index. Two limit Tobit models were employed to identify the factors that contribute to poverty in the study area. The decomposition results of the multidimensional poverty index indicate that households who were displaced through compensation were multidimensionally poor compared to those who were displaced through the unauthorized sale of land. Moreover, results of the two-limit Tobit model revealed that family size, access to job opportunities, regular household income, landholding size, access to remittance, and access to credit were the major factors that determine poverty for peri-urban farm households displaced through compensation in the study area. To address this issue, the government should allow private ownership of land, enabling farmers to sell their land at market value and potentially reducing multidimensional poverty and improving their living standards. Additionally, the government should strive to create job opportunities for peri-urban farm households by providing support for their engagement in various urban farming activities.

Key words: Compensation, deprivation, displaced, index, land selling

INTRODUCTION

Compared to wealthy nations such as Europe (72.7%) and North America (79.1%), Africa has a relatively low rate of urbanization at 37.1%. Nevertheless, the rate of urbanization in developing nations is increasing at a significantly faster pace than in developed nations, with annual rates as high as 3% or 4%. Marshall *et al.* (2013) provided evidence in support of this argument, stating that factors such as rapid population growth, economic development, rural-urban migration, and technology advancements are responsible for the quick rate of urbanization in developing nations.

According to research by Webster *et al.* (2004), industrial expansion brought on by both domestic and foreign investment, or structural transformation as a result of investments in agricultural technology, such as "the green revolution," provides the basis for urbanization in the majority of Asian countries. In contrast, informal settlements are primarily to blame for Africa's urbanization. Urbanization in Africa is

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sometimes referred to as the "urbanization of poverty," according to numerous studies, and urbanization has occurred in many African nations even during periods of weak economic growth (Henderson *et al*, 2013; Tacoli, 2012). Informal settlements and working conditions are major characteristics of the urbanization process, according to a World Bank (2018) research.

Ethiopian peri-urban areas are defined by the steady growth of informal settlements and the failure of formal land interventions to achieve desired results (Adam, 2014). This is a result of the fact that the majority of Ethiopia's cities developed as metropolitan centers without the benefit of comprehensive land use plans (Fetene *et al*., 2014), which also disregarded the possibility of a growth in informal settlements. As a result, there is now a noticeable rise in unlawful land occupation as well as unequal allocation and access to land.

These problems, particularly in peri-urban locations, lead to the growth of uncontrollably large land uses and the appearance of erratic land use conflicts (Dube, 2013). Furthermore, unregulated population growth in Ethiopia (Wubie *et a*l., 2021) exacerbates the underlying causes of informality (Bennett and Alemie, 2016), compelling landholders to engage in informal transactions that lead to frequent changes in land use (Fenta *et al.*, 2017; Gashu and Gebre-Egziabher, 2018; Manikandan, 2019).

A plethora of empirical research has been carried out globally to determine the factors driving the growth of informal settlements (Datt *et al*., 2016; Zewdie *et al*., 2018). Regarding the determinants, research from both developed and developing nations has produced conflicting results. While factors that influence the growth of informal settlements differ from nation to nation, city to city, and urban center to urban center, in terms of both their impact and magnitude.

Even by African standards, Ethiopia's level of urbanization is low, with only 19% of the population residing in urban areas (UN-Habitat, 2017; Addisyihun Abayneh, 2019). However, in recent years, Ethiopia's urban population has grown at a comparatively high rate-4% annually-more than that of its rural areas (UNDP, 2015). With an extraordinary urban growth rate of more than 5% annually, estimates indicate that Ethiopia's urban population will triple in the next 20 years. Furthermore, it is anticipated that the nation's urban population will increase by 3.98% on average, with 42.1% of the population estimated to live in urban areas by 2050 (UN-Habitat, 2017).

Amhara National Regional State is among the Ethiopian regions where urban population growth is most rapid. According to CSA (2007), the regional state's urban population is expected to grow by around 6 million people, or nearly three times, from 2.4 million in 2007 to 8.2 million in 2037. As a result, the Amhara National Regional State's unprecedented urban population increase has raised demand for urban land (Abubeker, 2018; Kassahun, 2018).

In order to satisfy the enormous demand for urban land, city administrations have started to incorporate the pre-existing agricultural areas into urban areas. insufficient compensation, the native farmers in these rural areas are forced to flee from their agricultural land and properties. However, it was found that the city administration's rehabilitation methods, which mostly consisted of a financial compensation arrangement, were unable to replace their primary resource, land (Belachew, 2013; Gashaw, 2015; Indris *et al*., 2020).

Furthermore, obtaining sufficient and accessible land or housing has emerged as a crucial and escalating issue (ANRS, 2017; Indris *et al*., 2020). This situation has opened up opportunities for the illegal land business, leading to the purchase of property by many urban households from farmers in peri-urban areas for the construction of "moonshine houses," or illegal residences, in addition to the means of legal land acquisition.

Due to the fact that many peri-urban farm households were displaced as a result of illegal land sales without authenticating their claims, this is a prominent feature of many towns in the region and raises sensitive issues about good governance. Accordingly, this study aims to assess the state of multidimensional poverty dynamics and its determinants in peri-urban areas of Ethiopia, specifically in Dessie, Kombolcha, and Kemise towns.

The study makes a theoretical contribution by acknowledging that poverty is a complex phenomenon that encompasses a variety of elements like housing, health, and education in addition to financial poverty. By offering insights into the poverty dynamics of displaced peri-urban farm households, the study contributes empirically to the field. The findings of this research may inform policymakers and stakeholders about the consequences of illegal land sales and dispossession with compensation on household poverty and well-being. It might help in designing targeted interventions to address the root causes of poverty in the study area, providing empirical evidence on the socio-economic impacts of

these activities and their implications for poverty reduction efforts. Moreover, this research may empower affected communities to advocate for their rights and seek appropriate compensation and support.

REVIEW OF RELATED LITERATURES

Ethiopian peri-urban areas face challenges such as informal settlements and inadequate formal land interventions (Adam, 2014). This has resulted in unlawful land occupation, unequal land allocation and access, and conflicts over land use (Dube, 2013). Unregulated population growth exacerbates these issues (Wubie *et al.*,2021), leading to frequent changes in land use and the growth of informal transactions (Fenta *et al*.,2017; Gashu and Gebre-Egziabher, 2018; Manikandan, 2019).

Informal settlements in developing countries are mainly caused by political, economic, and institutional flaws (Huchzermeyer, 2004; Rakodi and Leduka, 2004). The urban poor often lack access to formal housing due to low incomes and limited opportunities in the formal property market (Durand-Lasserve and Royston, 2002; Hansen and Vaa, 2004; Huchzermeyer and Karam, 2006).

In Ethiopia, landowners sometimes refuse compensation from the state due to low prices offered (Wubneh, 2018). This leads to illegal transactions and inflated land prices in the informal market. Poverty is a significant issue in Ethiopia, with a large percentage of the population living in multidimensional poverty (OPHI, 2017). Poor urban expansion plans towards peri-urban areas contribute to this poverty (World Bank, 2018).

Measuring poverty is complex and goes beyond income or consumption indicators. Approaches such as the multidimensional poverty index (MPI) and frameworks highlighting different dimensions of poverty have been used (Alkire and Foster, 2011; Alkire and Santos, 2014; Gulyani *et al*., 2014; Andersen, 2019). In informal settlements, residents face various vulnerabilities related to income instability, high prices for necessities, limited rights and voice within political systems, inadequate infrastructure provision, lack of access to credit, and health burdens (Mitlin and Satterthwaite, 2014). A multidimensional approach is crucial for understanding and addressing poverty in these settlements.

RESEARCH METHODOLOGY

Description of the study area

The study was conducted in the Amhara National Regional State (ANRS), specifically in the towns of Dessie, Kombolcha, and Kemise, as indicated on the following map.

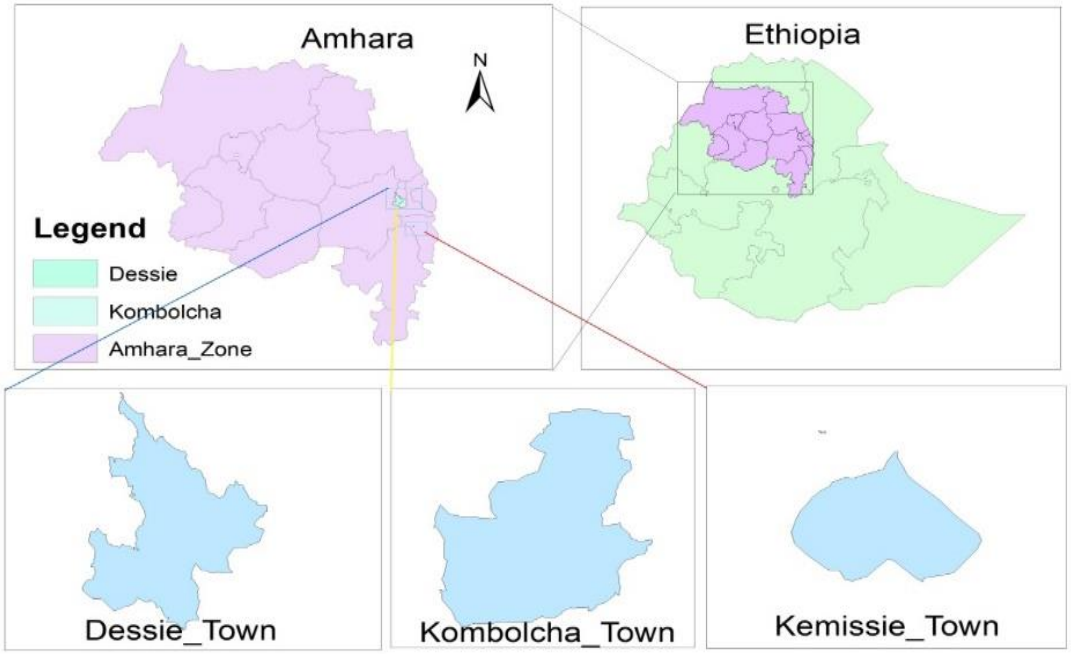

Figure 1.Map of the study area

Sampling Technique and Sample Size

A multistage sampling procedure was employed to draw a representative sample of households for the study. In the first stage, two towns from the South Wollo Zone and one town from the Oromia Special Zone were purposely selected. These towns represent

major urban expansion features and informal settlements in the east of the Amhara National Regional State.

In the second stage, peri-urban kebeles (neighborhoods) were identified from the respective town administrations. Specifically, peri-urban kebeles in Dessie, Kombolcha, and Kemise towns were selected, totaling five pre-urban kebeles (2 from Dessie, 2 from Kombolcha, and 1 from Kemise towns).

In the third stage, lists of displaced peri-urban farm households who illegally sold their land without authentication and those who were dispossessed of their land through receiving compensation will be identified from the respective peri-urban kebeles and towns administrations. Legally displaced farm households will be identified through a checklist of those who received official compensation from the respective town administration. Lists of illegally displaced farm households will be estimated through the respective town administrations, which have already screened and listed those who sold their land illegally for legal action and further measures. A total of 384 farm households (192 from illegal land sales without authentication through bargain and 192 from land dispossession through compensation) will be taken from the four peri-urban kebeles using sample size determination.

To determine the sample size, the researcher will use a statistical formula developed by Daniel (1999). The confidence level is set at 95% with a 5% error term. Using a Z-score value of 1.96 at this confidence level, the following sample is drawn.

$$n = \frac{Z^2 p(1-p)}{d^2} \quad \text{---------- (1)}$$

Where: n= sample size
Z= z-statistic for the level of confidence
P= expected prevalence or proportion (in proportion of one if 50%; p=0.5)
d= precision (in proportion of one if 5% d=0.05)

$$n = \frac{1.96^2 * 0.5(1-0.5)}{0.05^2} \qquad n = 384.16 \approx 384$$

Table 1. Number of sample households from each peri-urban *kebeles*

town	Peri-urban *Kebeles*	Population	Sampled households		Total
			displaced through compensation	displaced through selling land	
Kombolcha	Abakolba	3,282	32	32	64
	Mutegrar	4,219	42	42	84
Dessie	Boru	3,319	33	33	66
	Tita	4,727	47	47	94
Kemise	Shekila	3,909	38	38	76
Total		19,456	192	192	384

Methods of Data Analysis

Multidimensional poverty focuses on deprivations in health, education, and standard of living; and each receives equal (that is one-third of the overall total) weight (UNDP, 2010).

Health-two indicators with equal weight - whether any child has died in the family, and whether any adult or child in the family is malnourished –weighted equally (each count as one-sixth toward the maximum deprivation in the MPI).

Education-two indicators with equal weight - whether no household member completed 5 years of schooling, and whether any school-aged child is out of school for grades 1 through 8 (each counts one-sixth toward the MPI).

Standard of Living, equal weight on 6 deprivations (each count as 1/18 toward the maximum): lack of electricity; insufficiently safe drinking water; inadequate sanitation; inadequate flooring; unimproved cooking fuel; household does not own at least 1/3 of important durable assets.

Some of the durable assets are; radio/tape recorder, TV, mobile, bicycle, motorbike/Bajaj, Refrigerator, Jewelry / Gold, cart, chairs/bench, Tables, Sofa set, fanos/gas, stove (*medija*), beds wooden/metal(*alga*), plough (*maresha*), hammer (*fas or*

martelo)/saw(*megaz*). If a household owns more than one-third of the listed assets, then each person in it is considered non-deprived. There is no internationally or nationally agreed cutoff for asset holding. The cutoff is based on the researcher's judgment of what and how many assets should a household need to have to classify them as deprived or non-deprived (Alkire and Santos, 2011; Andualem and Raffaele, 2015). Alkire and Santos (2011) used a deprivation of one asset (durable goods) as a cutoff out of 7 durable goods. In generic terms, the use of 1/3 of the available listed assets could be optimal since most poor people are deprived of at least 1/3 of the available assets.

Table 2.Description of dimensions, indicators, and their cut-offs

Dimensions	Indicators	Cut–off points
Education	Years of Schooling	No household member aged 7-15 years or older have completed five years of schooling, then D =1 and 0 otherwise
	Child enrolment	At least one school-age child not enrolled in school, then D=1 and 0 otherwise
Health	Child mortality	One or more children have died in the five years preceding the survey, then D=1 and 0 otherwise
	Nutrition status	At least one member of the household is malnourished, then D=1 and 0 otherwise
Standard of living	Asset owned	If the household does not own at least 1/3 of important durable assets, then D=1 and 0 otherwise
	Flooring	If household house flooring is dirt, then D=1, and 0 Otherwise
	Toilet facilities	Households using inadequate sanitation facilities such as pit latrine without a slab, open pit latrine, and hanging toilet, then D=1, 0 otherwise
	Drinking water	No access to clean drinking water such as open wells, open springs, or surface water, then D=1 and 0 otherwise
	Electricity	If the household has no electricity, D=1, and 0 otherwise
	Cooking fuel	Household uses cooking fuel such as dung, firewood or charcoal then D=1, and 0 otherwise

Source: theoretical and empirical literature and author's view

Using the above dimensions and indicators, deprivation score of each person is calculated by taking a weighted sum of the deprivations experienced so that the deprivation score for each person lies between 0 and 1. The score increases as the number of the deprivations of the person increases and reaches its maximum of 1 when the person is deprived in all indicators. A person, who is not deprived in any indicator, receives a score equal to 0. Formally:

$$c_i = w_1 I_1 + w_2 I_2 + \ldots\ldots + w_d I_d \quad (2)$$

Where I_i=1 if the household is deprived in indicator i and I_i=0, otherwise, and w_i is the weight attached to indicator i with $\sum_{i=1}^{d} w_i = 1$

Following the structure of the Adjusted Headcount (M_0) measure of Alkire and Foster (2011), the MPI combines two key pieces of information: (1) the proportion or incidence of people (within a given population) whose share of weighted deprivations are

k or more and (2) the intensity of their deprivation: the average proportion of (weighted) deprivations they experience. Formally, the first component is called the multidimensional headcount ratio (H):

$$H = P_0 = \frac{Q}{N} \quad (3)$$

Here Q is the number of people who are multidimensionally poor and N is the total population. The second component is called the intensity (or breadth) of poverty (A). It is the average deprivation score of multidimensionally poor people and can be expressed as:

$$A = \frac{\sum_{i=1}^{n} c_i(k)}{Q} \quad (4)$$

Where C_i(k) is the censored deprivation score of individual i and Q is the number of people who are multidimensionality poor. The MPI is the product of both:

$$MPI = \frac{Q}{N} * \frac{\sum_{i=1}^{n} c_i(k)}{Q} = (\frac{\sum_{i=1}^{n} c_i(k)}{N}) \quad (5)$$

If the sum of the weighted deprivations is 33 percent or more of possible deprivations, the person is considered to be multidimensional poor. If a household is deprived in 20-33 % of the weighted indicators they are considered 'vulnerable to poverty' and if they are deprived in 50% or more (i.e., k=50%), they are identified as being 'severe poverty' (OHPI, 2017). Hence, identification of poverty status in this study was made above a dual cutoff.

To identify the determinants of multidimensional poverty of households a two-limit Tobit model was employed. The dependent variable for this study is defined as the percentage of deprivation of displaced farm households by the weighted indicators. Thus, the value of the dependent variable ranges between 0 and 1 and a two-limit Tobit model has been chosen as a more appropriate econometric model.

The two-limit Tobit was originally presented by Rossett and Nelson (1975) and discussed in detail by Maddala (1992) and Long (1997). The model derives from an underlying classical normal linear regression and can be represented as:

$$y^* = \beta' xi + \varepsilon i \quad (6)$$

$\varepsilon \sim N [0, \sigma 2]$

Denoting Yi as the observed dependent (censored) variable

$$Yi = \begin{cases} L & \text{if } Y^* \le L \\ Y^* = X\beta + \varepsilon_i & \text{if } L < Y^* < U \\ U & \text{if } Y^* \ge U \end{cases} \quad (7)$$

Where, Yi= the observed dependent variable, in our case the percentage of deprivation of peri-urban farm households by the weighted indicators (MPI index) ; Y_i^* = the latent variable (unobserved for values smaller than 0 and greater than 1); X_i= a vector of independent variables; β_i =Vector of unknown parameters; ε_i=Residuals that are independently and normally distributed with mean zero and a common variance σ^2 ,and i= 1,2,…n (n is the number of observations).

The log likelihood function for the general two-limit Tobit model can be given as follow:

$$\log L = -\frac{1}{2}\sum_{j\varepsilon c} w_j \left[\left(\frac{y_i - x\beta}{\sigma} \right)^2 + \log 2\pi\sigma^2 \right] + \sum_{j\varepsilon L} w_j \log \Phi \left(\frac{y_{Lj} - x\beta}{\sigma} \right) + \sum_{j\varepsilon R} w_j \log \left[1 - \Phi \left(\frac{y_{Rj} - x\beta}{\sigma} \right) \right] + \sum_{j\varepsilon I} w_j \log \left[\Phi \left(\frac{y_{2j} - x\beta}{\sigma} \right) - \Phi \left(\frac{y_{1j} - x\beta}{\sigma} \right) \right] \quad (8)$$

Where C's are point observations, L's are left censored observations, R's are right-censored observations, and I's are intervals. And Φ is the standard cumulative normal distribution, and the w_j is the normalized weight of the j^{th} observation.

RESULTS AND DISCUSSION

Aggregate Deprivation by dimensions

The study results in Table 3 reveal that the largest number of sample households in the study area were deprived in the standard of living dimension. Approximately 54.43% of the sample households were deprived in the asset holding indicator. The main assets considered in this study included radio/tape recorder, TV, mobile, bicycle, motorbike/bajaj, refrigerator, jewelry/gold, cart, chairs/bench, tables, sofa set, fanos/gas, stove (medija), beds wooden/metal (alga), plough (maresha), hammer (fas or martelo)/saw (megaz). This indicates that the majority of sample households did not own at least one-third of these listed durable assets.

Similarly, the second-largest number of deprived sample households, in terms of the standard of living dimension, was related to drinking water. As shown in Table 3, approximately 50.52% of the sample households were deprived in terms of the cooking MPI indicator. Moreover, the largest numbers of deprived sample peri-urban households in terms of the standard of living dimension were related to cooking fuel, electricity, flooring, and toilet facilities indicators, with deprivation percentages of 49.48%, 48.18%, and 47.92% respectively (Table 3).

The second-largest number of sample households deprived, after the standard of living dimension, was in the health dimension. Approximately 51.04% and 46.88% of the sample households were deprived in terms of child mortality and nutrition status indicators, respectively (Table 3). However, the lowest number of sample households deprived in the study area was in the education dimension. Approximately 37.76% and 37.24% of the sample households were deprived in terms of years of schooling and child enrollment indicators, respectively (Table 3).

Table 3. Number of households' deprivation in each dimension

Dimensions of MPI	Indicators in each Dimension	Number of deprived households	Percentage of deprivation
Education	Years of Schooling	145	37.76 %
	Child Enrolment	143	37.24 %
Health	Child mortality	196	51.04%
	Nutrition status	180	46.88 %
Standard of living	Asset owned	209	54.43 %
	Flooring	185	48.18 %
	Toilet facilities	184	47.92 %
	Drinking Water	198	51.56 %
	Electricity	190	49.48 %
	Cooking fuel	194	50.52 %

Source: computed from own survey data, 2023

Deprivations and MPI estimation

The survey results in Table 4 provide insight into the multidimensional poverty of displaced peri-urban farm households in the study area. The headcount ratio (H) of 0.641 indicates that 64.1% of displaced peri-urban farm households were classified as MPI poor. This means that a significant proportion of households in the study area are experiencing poverty in multiple dimensions.

Additionally, the Intensity (A) of 0.615 represents the average share of indicators in which poor peri-urban displaced farm households are deprived. This means that among the poor households, 61.5% experienced deprivation across the weighted indicators.

Combining these two measures, the multidimensional poverty index (MPI) for the study area is calculated as MPI=H×A=0.394. This indicates that a large proportion of displaced peri-urban farm households in the study area are considered multidimensionally poor, with 39.4% of the total households experiencing deprivation in one or more dimensions (Table 4).

Table 4. Deprivations and MPI estimation

Main	Coef.	Std. Err	[95% Conf.Interval]
H	0.641	0.025	0.593 0.689
M0	0.394	0.017	0.361 0.427
A	0.615	0.012	0.593 0.638

Source: computed from own survey data, 2023

The survey results in Table 5 provide insight into the contribution of each indicator to the multidimensional poverty index. In the education dimension, the indicator with the highest contribution to the multidimensional poverty index was the year of schooling, accounting for 14.1%. This was followed closely by the child enrollment indicator, which contributed 13.8% to the index.

Moving to the health dimension, the child mortality indicator had the highest contribution to the multidimensional poverty index of displaced peri-urban farm households, making up 18.6% of the index. On the other hand, the nutrition status indicator had the least contribution, with only 18.1%.

Shifting focus to the standard of living dimension, the asset owned indicator made the highest contribution to the multidimensional poverty index at 6.3%. This was followed by drinking water, which contributed 6.1%, and cooking fuel, which contributed 5.9%. Both toilet facilities and electricity indicators had an equal contribution of 5.7% to the multidimensional poverty index of displaced peri-urban farm households.

Lastly, among all the indicators considered, flooring had the least contribution to the multidimensional deprivation index of displaced peri-urban farm households, accounting for only 5.6% (Table 5).

Table 5. The relative contribution of each indicator to MPI

Dimensions of MPI	Indicators in each Dimension	Mo
Education	Years of Schooling	0.141
	Child Enrolment	0.138
Health	Child mortality	0.186
	Nutrition status	0.181
Standard of living	Asset owned	0.063
	Flooring	0.056
	Toilet facilities	0.057
	Drinking Water	0.061
	Electricity	0.057
	Cooking fuel	0.059

Source: computed from own survey data, 2023

MPI decomposition by subgroups

The survey results in Table 6 demonstrate that the poverty headcount ratio (H) for displaced households through compensation was higher compared to those displaced through selling land without authentication. The poverty headcount ratio (H) for displaced peri-urban farm households through compensation was recorded as 76.4%, while for those who sold their land without authentication, it was found to be 23.6%.

Similarly, about 82.9% of the displaced peri-urban farm households through compensation were found to be multidimensionally poor, while those displaced peri-urban farm households through selling their land without authentication were multidimensionally non-poor. This is because only 17.1% of the total households were deprived in one or more dimensions (Table 6).

Table 6. MPI decomposition by subgroups

Main	displaced through compensation	displaced through selling land
H	0.764	0.236
M_0	0.829	0.171

Source: computed from own survey data, 2023

Table 7 provides a breakdown of the contributions of different dimensions to the multidimensional poverty index for displaced peri-urban farm households through compensation and those who sold their land

without authentication. The results show that the standard of living dimension was the most significant contributor to the multidimensional poverty index for both groups, with a contribution of 36.5% for those who received compensation and 30% for those who sold their land without authentication.

For displaced households who received compensation, the health dimension was the second-highest contributor to the multidimensional poverty index, with a contribution of 35.7%. In contrast, for those who sold their land without authentication, the health dimension was the highest contributor, with a contribution of 41.8%.

Interestingly, education contributed the least to the multidimensional poverty index for both groups, with a contribution of only 27.8% for those who received compensation and 28.3% for those who sold their land without authentication.

Overall, these results suggest that displaced peri-urban farm households through compensation are considered MPI poor in both the standard of living and health dimensions, while those who sold their land without authentication are MPI poor only in the health dimension and non-poor in both education and standard of living dimensions (Table 7).

Table 7. Relative Contribution of each dimension to MPI

Dimensions	Displaced through compensation	Displaced through selling land	Total
	M0	M0	
Education	0.278	0.283	0.279
Health	0.357	0.418	0.367
Standard of living	0.365	0.300	0.354

Source: computed from own survey data, 2023

Determinants of multidimensional poverty of displaced farm households through compensation

The results of the two-limit Tobit model in Table 8 revealed that out of the total 12 explanatory variables entered into the model, six of them family size, access to job opportunities, regular household income, landholding size, access to remittances, and access to credit were found to be the major determinants of multidimensional poverty for the farm households displaced through receiving compensation in the study area.

The results in Table 8 revealed that family size positively determines multidimensional poverty for farm households displaced through compensation at a 5% probability level. The marginal effect of the two-limit Tobit model shows that whenever farm households displaced through compensation have a larger family size, the probability of being MPI-poor increases by 0.99% (Table 8). This implies that a larger family size is directly linked to a greater share of household fixed resources, which leads to an increased risk of poverty.

As shown in the results of Table 8, access to job opportunities was found to be a significant factor in determining multidimensional poverty for farm households displaced through compensation, negatively affecting them at a 1% probability level. When farm households are forced to sell their land and are dispossessed from their farmland, they are often pressured to transition from agriculture-dominated activities to alternative income-earning employment opportunities (non-farm income) in order to survive and integrate into the urban economy. However, indigenous farm households face limited opportunities to compete with others for urban jobs, and only a very small number of displaced farm households have access to employment opportunities. The marginal effect of the two-limit Tobit model shows that whenever farm households displaced through compensation have access to job opportunities, the probability of being MPI-poor decreases by 8.42% (Table 8).

On the other hand, as indicated in Table 8, it has been found that the regular income of displaced farm households through receiving compensation negatively determines the multidimensional poverty of households at a 1% probability level. The results of the marginal effect of the two-limit Tobit model show that as those displaced farm households receive compensation from the respective administration and have regular incomes, the probability of being MPI-poor decreases by 7.51% (Table 8). This implies that having regular sources of income plays a significant role in reducing poverty for those farm households that have been displaced through compensation in the study area.

Similarly, the relationship between landholding size and poverty status was found to be negative and significant at a 1% probability level (Table 8). The marginal effect of the two-limit Tobit model, as shown

in Table 8, reveals that, on average, for each additional hectare of landholding for farm households displaced through compensation, the probability of being MPI-poor decreases by 6.82%. This indicates that landholding size is an important asset for smallholder farmers in the peri-urban area.

Access to regular remittances was found to be another significant variable that negatively determines multidimensional poverty for peri-urban farm households displaced through compensation at a 1% probability level (Table 8). The marginal effect of the results in Table 8 shows that whenever peri-urban farm households displaced through receiving compensation have access to remittances (from relatives, family, friends, and individuals - local or abroad) in the form of cash or in-kind, the probability of being poor decreases by 5.02%.

The survey results in Table 8 show that access to credit is a significant factor that negatively affects the poverty status of displaced farm households through compensation at a 10% probability level. The marginal effect of the results shows that whenever peri-urban farm households displaced through compensation have access to credit, the probability of being MPI-poor decreases by 2.82% (Table 8).

Table 8.Maximum likelihood estimates of the two-limit Tobit model

Variables	Coefficient.	Robust Std. Err.	t-value	Marginal effects
Sex	-0.0172387	0.0245337	-0.7	-0.0169983
Age	0.0004035	0.0006838	0.59	0.0003978
Education	-0.0004705	0.0022614	-0.21	-0.000464
Family size	0.0101091	0.0047519	2.13**	0.0099681
Distance from city	-0.0013071	0.0037079	-0.35	-0.0012889
Dependency ratio	0.0054976	0.0134726	0.41	0.005421
Access to job	-0.0853957	0.01645	-5.19***	-0.0842049
Regular income	-0.0761709	0.0180617	-4.22***	-0.0751087
Landholding	-0.069186	0.0263535	-2.63***	-0.0682212
Livestock	-0.0000524	0.0039799	-0.01	-0.0000517
Remittance access	-0.0508789	0.019497	-2.61***	-0.0501694
Access to credit	-0.0285724	0.0173066	-1.65*	-0.028174

***, **, *Significant at 1%, 5% and 10% respectively
Source: computed from own survey data, 2023

CONCLUSIONS AND POLICY IMPLICATIONS

This study aims to assess the state of multidimensional poverty dynamics and its determinants in peri-urban areas of Ethiopia, specifically in Dessie, Kombolcha, and Kemise towns. Nowadays, poverty goes beyond expenditure and is often accompanied by a multidimensional poverty index calculated based on three dimensions: education, health, and standard of living. An equal weight approach was used for each dimension, and similar weights were used for indicators within a dimension.

The multidimensional poverty index decomposition results indicate that the poverty headcount ratio (H) for displaced peri-urban farm households through compensation was recorded as 76.4%, while for those who sold their land without authentication, it was found to be 23.6%. Similarly, about 82.9% of the displaced peri-urban farm households through compensation were found to be multidimensionally poor, while those displaced peri-urban farm households through selling their land without authentication were multidimensionally non-poor.

A breakdown of the contributions of different dimensions to the multidimensional poverty index results suggests that displaced peri-urban farm households through compensation are considered multidimensionally poor in both the standard of living and health dimensions, while those who sold their land without authentication are multidimensionally poor only in the health dimension and multidimensionally

non-poor in both education and standard of living dimensions.

A two-limit Tobit model was used to identify the determinants of multidimensional poverty of those peri-urban farm households displaced through compensation. Results of the two-limit Tobit model revealed that family size, access to job opportunities, regular household income, landholding size, access to remittance, and access to credit were the major determinants of multidimensional poverty for those peri-urban farm households displaced through compensation in the study area.

Therefore, poverty reduction intervention measures should target identifying dimensions such as living standards that cause poverty for those peri-urban households displaced through receiving compensation from respective town administration than those displaced by selling their land through bargaining at current land value. To deal with this problem, stakeholders such as the government should either provide land compensation at current land value before displacing peri-urban smallholder farmers or secure the farmers' right to own land so that they can negotiate and sell their land at market price as they do for their other assets. Moreover, the government should endeavor to create job opportunities for peri-urban farm households, such as by supporting them to engage in various urban farming activities.

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