

DETERMINANT FACTORS OF MARKETING AND NON-MARKETING RURAL-URBAN LINKAGE OF ADWA TOWN AND ITS SURROUNDING RURAL ADWA

Mewael Berhane MENGESHA* 

Department of Geography and Environmental Studies, Aksum University, Axum, Ethiopia, e-mail: mewfel@yahoo.com

Tegegne GEBRE EGZIABHER 

Department of Geography and Environmental Studies, Addis Ababa University, Addis Ababa, Ethiopia, e-mail: tegegneg@yahoo.com

Citation: Mengesha, M.B., & Egziabher Gebre T. (2023). DETERMINANT FACTORS OF MARKETING AND NON-MARKETING RURAL-URBAN LINKAGE OF ADWA TOWN AND ITS SURROUNDING RURAL ADWA. *GeoJournal of Tourism and Geosites*, 49(3), 1006–1014. <https://doi.org/10.30892/gtg.49316-1100>

Abstract: This study attempts to assess the determinant factors of marketing and non-marketing rural-urban linkage of Adwa town and its surrounding by employing a cross-sectional research design. A two-stage sampling procedure was used. Random sampling was mainly used to select 221 research subjects. A Household sample survey was the principal method used to solicit the primary data. Quantitative statistical tools such as mean, quartiles, Chi-square, ANOVA, and regression were employed. About 62% of the poor have experienced a strong non-marketing linkage, whereas 64.9% of the sample poor respondents had experienced a weak marketing linkage. The findings of the study show that a household's access to irrigation, livestock ownership, beehive ownership, access to a mobile phone, number of farm plots, age, and distance from the town was found to be the most important determinants of the orientation as well as the magnitude of marketing linkage. Similarly, a household head's gender, family size, livestock ownership, and the number of farm plots were found to be the most important determinants of non-marketing linkage.

Key words: rural-urban linkage, non-marketing linkage, marketing linkage, Adwa

* * * * *

INTRODUCTION

Background of the Study

United Nations Member States agreed to policies that support integrated urban and territorial planning and development in both the 2030 Agenda for Sustainable Development and the New Urban Agenda. They called for new, inclusive approaches and enhanced synergies between urban and rural communities that is rural-urban linkage. As a result, the weight given to rural or urban areas' developmental policies in developing countries has shown considerable variation over time. These development strategies have addressed either urban or rural areas separately (Chowdhury et al., 2005). According to Tegegne (2001), most pro-poor and anti-poverty initiatives remain steadfast for discrete urban or rural domains. It is widely recognized that there exists an economic, social, and environmental interdependence between urban and rural areas, and there is a need for a balanced and mutually supportive approach to the development of both rural and urban areas. This mutual development is manifested through rural-urban linkages (Armin and Jutta, 2021; Mohammed, 2007; Somanje et al., 2020; Tegegne, 2001).

The interaction between urban and rural areas in a given area is inevitable. What matters is the degree of the linkages and the types of linkages that exist in the area (Tacoli, 1998; 2004). Several factors can affect the linkages between rural and urban areas. Socio-economy relations resource endowment, land tenure policy, and land size, built environment are among others (Andualem and Umer, 2023; Douglass, 1998; Tegegne, 2005). Therefore, a crucial consideration should be given on the complex context-specific nature of these linkages and their potential site-specific variation (Mercandalli et al., 2023).

Statement of the Problem

Though there is a vast volume of literature on the subject of rural-urban linkages, there are gaps in our knowledge about the factors that determine such rural-urban linkages. In particular, the determinant factors of marketing and non-marketing linkages have not been well studied in Ethiopia. Those who have made studies on rural-urban linkages have tried to treat issues like farm and non-farm linkages in Northern Ethiopia (Tassew, 2002), linkages under different farming systems in Robe and Limu (Tegegne, 2001), livelihood strategies and their implications for rural-urban linkages in Wolenkomi (Mohamed, 2007), natural resource management and rural-urban linkages in Ethiopian highland (Carucci and Yihenew, 2007) and market linkages in Western Shoa Zone (Mesfin, 1995). The above studies, however, did not examine determinant factors of marketing and non-marketing linkages. This study hopes to fill this gap through a case study of Adwa town and its surrounding rural areas.

LITERATURE REVIEW

Factors Affecting Rural-Urban Linkages:

Several factors can affect the linkages between rural and urban areas (Mercandalli, 2023). Socio-economy relations,

* Corresponding author

resource endowment, land tenure policy, and land size, a built environment are among others (Douglass, 1998; Tegegne, 2005; Alemayehu et al., 2021). Socioeconomic relation is one important factor that can affect the rural-urban linkage. Inequality in income access to land and other resources can affect the linkage (Douglass, 1998).

Social exclusion such as access to education could tend to diminish rural-urban linkages (Mbella and Mbella, 2021). The built environments are major sources for regional differentiation in rural-urban linkages. Adequate infrastructure development such as roads, communication networks, market center, irrigation, electricity, telephone services, and the like can determine the nature, scale, and magnitude of rural-urban interaction (Douglass, 1998).

Conditions of a natural environment and resource endowment can also affect the rural-urban linkages. Farmers with a small size of land have a limit to produce surplus production for the market and invest and use agricultural inputs. A farming system that does not encourage inputs will tend to reduce rural-urban linkages (Tegegne, 2005).

THE RESEARCH METHODOLOGY

Research Design

To understand properly the existing local factors that determine marketing and non-marketing rural-urban linkages, a cross-sectional survey design was employed. The methodological stages of the study is presented in Figure 1.

Sampling Method and Sample Size

The study adopted a distance of 5 Kms (nearest) to 26 Kms (far) from Adwa town to be an area of intensive interaction between the rural and urban areas. Once the broader range of *Tabias* was determined, a two-stage sampling procedure was used. In the first stage, four *Tabias* from the *Wereda* that are free from the influence of the secondary market were chosen.

These *Tabias* were chosen purposively to represent different characteristics. In the second stage, with proportional allocation 221 rural household heads were selected randomly (Table 1). A roster of the respective *Tabias* served as a sample frame.

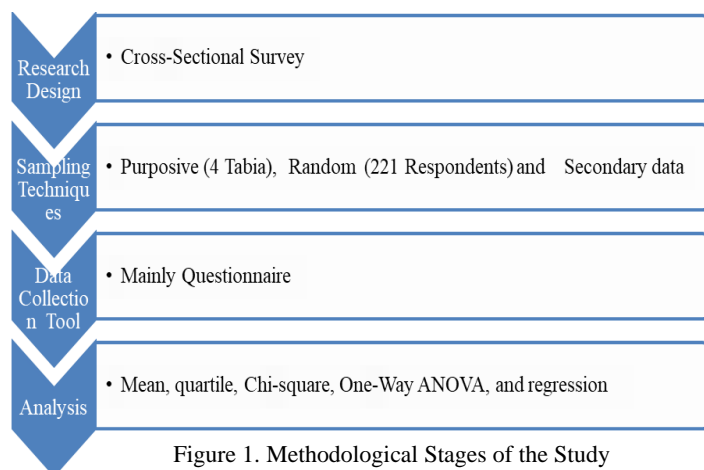


Figure 1. Methodological Stages of the Study

Table 1. Distribution of Sample *Tabias* and Rural Household Heads

Sampled <i>Tabias</i>	Specific feature	Total No. of HHs.	No. of sample HHs.	Distance to town (km)
EndabaGerima	Stone extraction, Tourism	1319	66	18
Soloda	Conservation	846	42	5
BeteYohannes	Industrial	1343	67	10
TahitayLogomti	Irrigation	915	46	26
		4423	221	

Type and Source of Data: Quantitative and qualitative data were used in this study. The quantitative data include demographic, usage of agricultural input, market use, migration, land holding size, and other related information. Statistical reports of CSA were also included.

Data Collection Techniques: Since the study uses a cross-sectional survey type, it mainly relies on quantitative primary data that are gathered from the sample through a structured questionnaire. The questionnaire was piloted to determine the clarity and understandability of the question and to assess whether the questionnaire can able to collect the intended information. Well-trained enumerators who were supervised by the researcher administered the questionnaire. A re-visit was made to several households in each site to insure reliability.

Data Analysis: The primary and secondary data obtained from respondents and documents respectively were processed, classified, and tabulated. A combination of different statistical techniques such as mean, quartile, Chi-square, One-Way ANOVA, and regression was used to adequately address the objective of this research. To do this SPSSv.20 software was used.

Model Specification: To achieve the objective, a linear regression analysis was applied. Three separate models are run to see the determinants of the marketing and non-marketing linkage.

$$Y = f(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_{13} X_{12}) \dots \text{(Adopted from Howitt and Cramer, 2011)}$$

Where Y is the level of rural-urban linkage, X₁; X₂; X₃; . . . ; X₁₂: are explanatory variables defined below, β₁; β₂; β₃; . . . ; β₁₃ are estimated regression coefficients/parameters associated with the explanatory variables (X₁, X₂, X₃, . . . , X₁₂), respectively, β₀ is a constant (random error).

Dependent Variable

Y1: The level of rural-urban linkage as measured by marketing rural-urban linkage (focus on the orientation) index is a continuous dependent variable in the model.

Y2: The level of rural-urban linkage as measured by income from marketing rural-urban linkage (the degree) is a continuous dependent variable in the model.

Y3: The level of rural-urban linkage as measured by the non-marketing rural-urban linkage index is a continuous dependent variable in the model.

Independent Variables:

The literature indicates that many factors can influence the level of rural-urban linkage at a household level. Age, sex, marital status, educational status, family size, farm size, number of plots, livestock ownership, engagement in irrigation, number of bee hives, possession of cell phones, and distance from the town are considered explanatory variables in this study.

Description of the Study Area

Adwa Wereda is located in the central zone of Tigray National Regional State. It is bordered on the south by Werié Leké, on the north by Mereb Leké, on the west by Laelay Maychew, and on the east by Ahferom Weredas. The town is completely bordered by Adwa Wereda (Figure 1). It is found about 1006 kilometers north of Addis Ababa.

RESULT AND DISCUSSION

Demographic Characteristics of the Respondents

Table 2 showed the basic demographic characteristics of the sample rural households. In terms of education, about 63.8% of the respondents had attained at least primary school (1-8 grades). This literacy rate was higher than the national literacy rate and also higher than the regional rural literacy rate which was about 41.3% (CSA, 2013).

Table 2. Basic Demographic Characteristics of Sample Rural Households

Variable	Affiliation	Number	Percentage
Education	Illiterate	54	24.4
	Primary	141	63.8
	Secondary	26	11.8
Sex	Male	176	79.64
	Female	45	20.36
Average family size		5.1	
Average Age		44.4	

Table 3. Composition of Sample Rural Households' Level of Linkage

Linkage Type	Level of Linkage Quartile				Total
	I	II	III	IV	
Marketing	51 (23%)	58 (26%)	57 (26%)	55 (25%)	221
Non-Marketing	35 (16%)	70 (32%)	22 (10%)	94 (42%)	221

Households in Ethiopia are largely male-headed. Males head about 74% of the households in the country while 77% of the rural households (EDHS, 2012). This fact was corroborated by the present study where it was found that 79.64% of the sample males headed rural households. Similarly, the average household size of the nation was 4.6 and that of the rural population was 4.9 (EDHS, 2012). The average household size of the sample (5.1) was slightly higher than the national average and almost similar to the average household size of the rural population. It was, however, higher than the regional average (4.3) and the rural regional average (4.6) (CSA, 2012).

Determinants of Rural Households' Linkages: Positive interactions between rural and urban areas facilitate an all-rounded development in both areas. The strength of interaction and interdependence of these spatial units, however, are influenced by several factors such as farming system, access to natural resources, accessibility and affordability of transport, income (measured from the volume of crop production and the number of cattle owned), and the like. To capture further factors affecting the rural-urban linkage in the study area, it is important to see first the level of rural-urban linkage. Here sample households were categorized as having strong and weak rural-urban linkages.

In this study, sampled households were categorized as first, second, third, and fourth linkage quartiles in terms of their score of marketing and non-marketing linkage indices (Table 3). In this sense, sample rural households who had a strong rural-urban linkage would have better access to information, frequency of movement (market and other non-market purposes), and utilization of financial services than their counterparts.

According to the survey result (Table 3), a large proportion of the households (42%) and little proportion (16%) of the households were grouped in the two extreme non-marketing linkages, strong and weak or fourth and first quartile respectively. In the marketing linkage, the share of the first (23%) and fourth (25%) quartiles was with little difference. The first rural-urban linkage quartile implies a very weak linkage while the fourth quartile implies a very strong linkage. However, for this study, those households who did fall in the first and second quartiles were considered to be weak linkage and those who did fall in the third and fourth quartiles were considered as having a strong linkage.

Table 4. Sample Rural Households' Level of Linkage and Economic Status (***)Significant at 99 %)

Type of Linkage	Linkage Index	Economic status			Chi-Square statistics
		Rich	Middle	Poor	
Marketing Linkage	Strong - (49.8)	26 (23.6)	56 (50.9)	28 (25.5)	36.72***
	Weak - (50.2)	18 (16.2)	21 (18.9)	72 (64.9)	
Non-Marketing Linkage	Strong - (52.5)	19 (16.4)	25 (21.6)	72 (62)	29.17***
	Weak - (47.5)	25 (23.8)	52 (49.5)	28 (26.7)	
Total (221)		44	77	100	

As shown in Table 4, about 62% of the sample poor respondents experienced a strong non-marketing linkage, which is by far higher than those who are rich in economic status (16.4%). This shows that the poor income group had frequent visits to the town to get additional income from different urban-based income-generating activities. The Chi-square test ($X^2=29.17$, $df=2$, $p=0.001$) also confirmed that there was a significant systematic association between the household head's level of non-marketing linkage and the economic status at 99% confidence interval. This is quite different from the common experience by which the rich income group is expected to have a strong linkage than the poor. The better-

off tend to diversify in the form of non-farm business activities, while the poor tend to diversify in the form of casual work, especially on other farms. Diversification by the poor therefore tends to leave them still highly reliant on agriculture, while that by the better off reduces such dependence (Ellis, 2004).

In the case of the marketing linkage, about 65% of the sample poor respondents experienced a weak marketing linkage, which is far higher than those who were rich (16.2%) and middle (18.9%) in economic status. While the majority of the middle (50.9%) and rich (23.6%) income groups had a strong marketing linkage as compared to poor income groups (Table 4). This shows that the non-poor income group had frequent visits to the town to sell their product and get more income from these outputs. The Chi-square test ($X^2=36.72$, $df=2$, $p=0.001$) also confirmed that there was a significant systematic association between the household head's level of marketing linkage and the economic status at 99% confidence interval. This is consistent with the common experience by which the rich income group is expected to have a strong marketing linkage than the poor. The better off tend to diversify in the form of non-farm business activities (Ellis, 2004). In similar way other researchers also state that the dominant population visit urban centers for marketing purpose (Christiawan et al., 2020; Mbella and Mbella, 2021).

Table 5. Distribution of Sample Rural Households' Level of Linkage in *Tabias* (***)Significant at 99 %)

Type of Linkage	Linkage Index	<i>Tabia</i>				Chi-Square Statistics
		Bete-Yohannes	Endaba-Gerima	Soloda	Tahtay-Logomti	
Marketing Linkage	Strong -(50%)	20 (18)	46 (42)	17 (15)	27 (25)	24.03***
	Weak - (50%)	47 (42)	20 (18)	25 (23)	19 (17)	
Non-Marketing Linkage	Strong - (52%)	50 (43)	29 (25)	32 (28)	5 (4)	56.51***
	Weak - (48%)	17 (16)	37 (35)	10 (10)	41 (39)	
Total (221)		67	66	42	46	

This level of linkage had also shown a difference among the target *Tabias* (Table 5). In marketing linkage, Endaba Gerima has the strongest marketing linkage with Adwa, followed by Tahtay Logomoti. This was mainly attributed due to the marketing of livestock products and honey production. To see if there could be a systematic association between the nature (characteristics) of *Tabia* and the level of marketing rural-urban linkage, a Chi-square test was carried out. Accordingly, the Chi-square test ($X^2=24.03$, $df=3$, $p=0.001$) confirmed that there was a significant systematic association between the characteristics of *Tabia* and the level of marketing linkage at 99% confidence interval. This shows that the characteristics or nature of *Tabia* affected the level of marketing linkage.

In the case of the non-marketing linkage (Table 5), BeteYohannes had the strongest linkage with Adwa, followed by Soloda. This is mainly attributed due to the relative advantage of proximity to the town. Households from these *Tabias* visited the town frequently to get different services and jobs. Particularly the distant *Tabia*, TahtayLogomti had only 4% of households who had a strong non-marketing linkage with the town. The Chi-square test also ($X^2=56.51$, $df=3$, $p=0.001$) confirmed that there was a significant systematic association between the household head's residence or *Tabia* and the level of non-marketing rural-urban linkage at 99% confidence interval. This shows that the characteristics or nature of a *Tabia* affected the level of non-marketing linkage. So, such variations attributed to different factors would be treated here under.

Linear Regression Model Result

Twelve variables were hypothesized that can significantly influence the household's level of rural-urban linkage in the study area. These variables are summarized in Table 6.

Table 6. Summary of Variables Considered

Variables	Meaning	A priori Sign
AGE	Household head's age (in years)	Positive /Negative (+/-)
SEX	Sex of the household head	(+/-)
MSTA	Marital status of the household head	(+/-)
EDU	Education level of the household head	(+)
FAMS	Total family size of the household	(+)
TLU	Livestock ownership (calculated in terms of Tropical Livestock Unit-TLU)	(+)
TFS	Total farm size of the household (in hectares)	(+/-)
NFP	Number of Farm Parcels	(+/-)
BHO	Beehive ownership	(+)
CPP	Cell phone possession	(+)
DIT	Distance from the town	(-)
IRR	Engagement in irrigation	(+)

Before running the regression model, the problem of multicollinearity among the explanatory variables was checked by using collinearity diagnostics or Variance Inflation Factor (VIF). The value of VIF for each variable proved that the assumption of multicollinearity was not violated, as VIF values for each variable are less than 10. Similarly, using the Durbin-Waston autho collinearity checked and found that there was no authocollinearity problem.

Determinants of Marketing Linkage

Farmers from the surrounding area visit the market to sell crops, livestock/livestock products, poultry, vegetable,

honey, and forest/forest products. These are the most common items brought to market by farmers. Some of them bring one of the above items to the market while others bring more than one item.

Farmers who bring more items to the market are believed to have a higher frequency of visits and higher linkage and rely more on the market than those who bring none or limited items to the market. The reason is that the products have different seasons to be brought to the market. As a result, a value of 1 was given for those who bring a specific item to the market and a value of 0 was given if they did not bring the specified item. Finally, the values were added up to get the scores of marketing linkage (orientation) for the household. The scores varied between 0 and 6; with 0 representing farmers who brought no output to the market and 6 representing farmers who brought all six major items to the market. It has to be noted that this measure shows the marketing orientation of farmers.

Table 7. Linear Regression Estimates of Variables for Marketing and Non-Marketing Linkage
Source: Model output; N.B: **, *** denotes significance at 95% and 99% level of confidence respectively

Variables	Marketing Linkage (Visit)				Marketing Linkage (Income)				Non-Marketing Linkage			
	Coefficient	Std. Error	t-Ration	P- Value	Coefficient	Std. Error	t-Ration	P- Value	Coefficient	Std. Error	t-Ration	P- Value
Constant	-3.921	1.598	-2.454	.015	5814.721	9896.343	.588	.557	8.400	2.163	3.883	.000
AGE	.228	.070	3.277	.001**	76.397	430.797	.177	.859	-.111	.094	-1.182	.239
SEX	-.271	.279	-.969	.334	-471.384	1729.188	-.273	.785	-1.023	.378	-2.706	.007**
MSTA	-.251	.136	-1.843	.067	-968.327	843.746	-1.148	.252	-.217	.184	-1.178	.240
EDU	.230	.156	1.473	.142	561.120	964.810	.582	.561	-.012	.211	-.058	.953
FAMI	-.053	.052	-1.018	.310	-558.840	320.150	-1.746	.082	.127	.070	1.812	.071*
TFAS	.419	.444	.944	.347	3634.648	2750.979	1.321	.188	-.813	.601	-1.352	.178
NFP	.149	.047	3.159	.002**	94.453	292.138	.323	.747	-.246	.064	-3.855	.000***
TLU	.154	.048	3.238	.001**	1264.259	295.356	4.280	.000***	-.129	.065	-2.004	.046**
DIT	.111	.079	1.395	.165	-1149.441	491.669	-2.338	.020**	-.018	.107	-.165	.869
BHO	.163	.042	3.872	.000***	720.463	260.007	2.771	.006**	.032	.057	.570	.570
CPP	-.413	.150	-2.751	.006**	-2577.468	929.888	-2.772	.006**	-.086	.203	-.422	.673
IRR	.337	.171	1.969	.050**	6532.648	1058.617	6.171	.000***	.077	.231	.334	.738
Age Squared	-.002	.001	-3.142	.002**	-1.418	4.514	-.314	.754	.001	.001	1.159	.248
Observations	221				221				221			
R-squared	.363				.342				.243			
Adj R-squared	.323				.300				.195			
F(13, 207)	9.058				8.262				9.722			

To examine the degree of the marketing linkage, however, the income gained from the sales of items or the linkage with Adwa market was also considered as an indicator of the degree of marketing linkage. Thus, income from the linkage was taken as the second dependent variable to be explained by the independent variables.

Table 7 depicted the regression estimates of the model and the Adjusted R-squared with a value of 0.323 indicated that the model explained the variation in the level of marketing linkage in the study area for 32.3 percent of the sample. The ANOVA statistic of 9.058 (13 df) shows that the model is different from zero and significant at 99 percent of confidence level. In other words, the model is fit at 99 percent confidence level. Most of the variables in the regression model had the correct sign as hypothesized in the priori expectation except the possession of cell phones. By removing the most insignificant variables the regression model result shows that only six variables namely Number of farm plots (NFP), Livestock ownership (TLU), Beehive ownership (BHO), Engagement in irrigation (IRR), Cell phone possession (CPP) and Age (AGE) had a significant effect on the level of marketing linkage (its orientation) in the study area.

Similarly, a linear regression model was also used to identify the variables that affect the degree of marketing linkage. The degree of marketing linkage was measured by the income derived from the visits to marketplaces. The Adjusted R-squared of 0.30 indicated that the model explained the variation of the level of marketing linkage in the study area for 30.0 percent of the sample. The ANOVA statistic of 8.262 (13 df) shows that the model is different from zero and significant at 99 percent of confidence level. The model is fit at 99 percent confidence level.

Most of the variables in the regression model had the hypothesized signs as expected. The Result showed that Livestock ownership (TLU), Beehive ownership (BHO), Engagement in irrigation (IRR), Cell phone possession (CPP), and Distance to the town (DIT) had a significant effect on the level of income earned from marketing linkage in the study area (Table 7). The following provided a discussion of the results.

Total livestock holding: Households with different livestock ownership could have a better understanding of marketing information and diversification as well as boost their overall production capacity. TLU, is thus, hypothesized to have a positive influence in enhancing the level of marketing linkage. The result showed that livestock ownership of the household head is associated with the level of marketing linkage of the household head positively and significantly ($p=0.001$) at 95 percent of significant level. A unit of change in TLU of a household affects the level of marketing linkage (its orientation) of that household by 0.154. The status of livestock ownership of the household head is also associated with the level (degree) of marketing linkage of the household head positively and significantly ($p=0.001$) at 95 percent of significant level. A unit of change in TLU of a household affects the degree of marketing linkage of that household by 1264.259. This finding is consistent with the findings of other studies by Alemayehu et al., (2021), which

found that livestock holding generates income through the sale and is an important asset for enhancing livelihood diversification. The income earned from livestock and/or livestock products could be reinvested in other agricultural and non-farm activities that would have a significant influence on strengthening the level of marketing linkage.

Table 8. TLU Ownership of the Three Income Groups (***) Significant at 99%)

Economic Status	Min	Max	Mean	SD	ANOVA
Rich-44	4.22	11.07	5.88	1.33	85.08***
Middle-77	2.27	7.31	4.73	1.01	
Poor-100	0.0	6.65	3.13	1.34	

Though there was a significant difference in the mean of livestock holding among the three income groups (Table 8: $F=85.08$, $df=2$, $p=0.001$), having several numbers of livestock holding was revealed to have a strong marketing linkage. This livestock holding was among the major indicators of a household being rich or poor. As a result, those who had a higher TLU were those who were rich. In the previous section, it was founded that those who were rich had a strong marketing linkage than their poor counterparts.

Engagement in irrigation: Most of the time farmers engaged in irrigation produce vegetables and fruits that are demanded by the nearby urban dwellers. The types of equipment and fuel for the generators are available in urban centers. The products of such activity are almost all sold in urban areas. Therefore, there is an expectation that those who are engaged in irrigation would have a positive impact on the level of marketing linkage. The result revealed that those households with irrigation are found to have a positive and significant ($p=0.05$) influence on their orientation of marketing linkage at 90 percent of confidence level. An engagement in irrigation increased the orientation of marketing linkage of the household by 0.337. The result also revealed that those household heads who engaged in irrigation were found to have a positive and significant ($p=0.001$) influence on their degree of marketing linkage at 99 percent of confidence level. Taking other variables constant, an engagement in irrigation increased the degree of marketing linkage of the household by 6532.648. This implies that those who were engaged in irrigation would have a strong marketing linkage/visiting with the town and earn more income than those who did not. This finding is consistent with that of Seid (2007) who indicated that access to irrigation schemes encourages households to focus on items that have high demand in the urban market. Irrigation thus contributed to improving the livelihood of rural households.

Number of beehives owned: Those who produced honey sold their product in the nearby town and purchased bee from such centers. It is thus expected that engagement in honey production and the availability of beehives would have a positive influence on the level of marketing linkage. The result revealed that bee hive ownership is found to have a positive and significant ($p=0.001$) influence on the households' orientation of marketing linkage at 99 percent level of confidence. An increase in the ownership of beehives by a unit had an impact of an increase in the visit of market linkage of a household by 0.163. In line with this hypothesis, bee hive ownership was also found to have a positive and significant ($p=.006$) influence on the households' level of marketing rural-urban linkage at 95 percent level of confidence. The ownership of bee hives is affecting the degree of marketing linkage of a household by a factor of 720.463.

Cell phone possession: Those with cell phones are expected to have an access to information, mainly market information from the nearby town. Understanding markets is essential for farmers. Direct access to information on consumer preferences and the price could determine the practices of farmers attending markets.

Based on the market information the farmers could be selective to visit the market only in periods when the price is favorable for them. Hence, it is hypothesized that the possession of cell-phone would have a positive influence on the level of a household's marketing linkage with the urban centers. In line with this hypothesis, possession of a cell phone had a negative and significant ($p=0.006$) influence on the households' orientation and level of marketing rural-urban linkage at 95 percent level of confidence. This is attributed to the fact that those who got market information would be selective in visiting the market. Instead of supplying their items to the market every day without assessing the price and back without selling them; farmers would be more strategic and bring their items when the market price is suitable for them. This implies that those who manage to get market information probably would have a better opportunity to spend more time in the rural area and be able to produce more production which leads them to boost their income and may not be forced to create a strong marketing linkage with the nearby town to seek an additional source of income.

Number of Farm Parcels: It is expected that, as the number of farm parcels of a farmer increases, the attention and care given to proper farming practices reduces drastically, affecting the adoption of improved technologies and maintenance of existing structures and may lead to poor yield. This may reduce the household's intention to visit towns for marketing purposes. On the other hand, the household may visit the nearby town for an additional source of income. For these reasons, the influence of the number of farm parcels on the level of rural-urban linkage on indeterminate a priori. The result showed that the number of farm parcels had a positive sign and was statistically significant ($p=0.002$). This implies, other variables held constant, probability of creating a strong marketing linkage in the study area increased as the number of farm parcels increased by 0.15 units. However, this variable did not have a significant impact on the degree of marketing linkage. The mean number of farm parcels in the study area is 3.79 with a maximum number of 9. This large number of farm plots was mostly owned by the rich and middle-income group households as they tend to share crops with the poor

households. As a result, the rich diversify their income which would enhance the farmers' visits to towns for marketing. This result is consistent with that of Shafeisabet and Mirvahedi (2021) access to agricultural land enhances rural-urban linkages.

Age (Age-Squared): The age of the household head was expected to have either a positive or negative effect on the level of rural-urban linkage. Older farmers are likely to be relatively reluctant to attend markets and diversify their income. Hence, their rural-urban linkages would be limited. On the other hand, older farmers are likely to have more farming experience and would therefore be likely to be more receptive to new technologies that would strengthen their linkage. Younger farmers would be more accommodating to new ideas and would invest in new and long-term innovations. For these reasons, the influence of age on the level of marketing linkage could not be determined a priori. The result of this study showed that age had a negative sign and it was significant ($p=0.002$) at 95% confidence level. This implies that older farmers were likely to have weak marketing linkage than their younger counterparts. This finding is consistent with other researcher's finding which noted that 'the younger generations are more able to have higher levels of rural-urban linkages in Africa' (Akkoyunlu, 2013).

Distance from the town: Greater physical access to the market improves farm and non-farm earnings opportunities. Therefore, a longer distance to the nearest market is expected negatively affects the rural-urban linkage due to high transaction and transport costs as well as a lack of market information. Income depends on market access simply because people must be able to sell their processed products, handicraft, or labour. As expected, the distance to urban center coefficient turned out to be a negative and significant ($p=.020$) influence on the households' level of income earned from marketing linkage at 95 percent level of confidence. With an increase in distance to the urban center, the level of income earned from the marketing linkage of a household decreased by 1419.441. Therefore, households closer to the town were more advantageous in getting income from different activities than distant households from the town.

Determinants of Non-Marketing Linkage

Non-marketing linkage in this study was measured by using the frequency of visits of rural households to Adwa town for non-marketing purposes. This third dependent variable was computed by summarizing the main indicators of non-market visits; mainly the major services related to finances, health, education, jobs, agricultural extension, and grain mill. Some farmers visited the town to get one service while others visited the town to get more than one service. Farmers who got more services in Adwa town were believed to have higher linkage and relied on these services than those who did not or had limited visits to get the services. As a result, a value of 1 was given for those who got a specific non-market service in the town and a value of 0 was given if they did not get the specified service. Finally, the values were added up to get the scores of non-marketing linkage for the household. The scores varied between 0 and 5 with 0 representing farmers who did not get the service in the town and 5 representing farmers who got all the five major mentioned services in the town.

The Adjusted R-squared of 0.195 indicated that the model explained the variation of the level of non-marketing linkage in the study area for 19.5 percent of the sample. The ANOVA statistic of 5.11 (13 df) shows that the model is different from zero and significant at 99 percent of confidence level. The model is fit at 99 percent confidence level (Table 7). The majority of the variables in the regression model had the correct a priori signs or the hypothesized signs as expected. By removing the most insignificant variables, the regression model result showed that only four variables namely Sex of the household head (SEX), Total number of family members (FAMI), Number of farm plots (NFP), and Livestock ownership (TLU) had a significant effect on the level of non-marketing linkage in the study area. The variables that are statistically significant with the level of non-marketing linkage of the households are estimated and presented in Table 7. The following paragraphs provided a discussion of the results.

Sex: This variable refers to male or female-headed households. More importantly, farming is a male-dominated sector because of its strenuous nature. A household head who is female could take on more family and social responsibilities that are activities carried out in rural areas. The sex of a household head is associated with the level of non-marketing linkage negatively and significantly ($p=0.005$) at a five percent of probability. Thus, if a female heads the household, the level of non-marketing linkage decreased by a factor of 1.023. Moreover, responsible household heads perhaps need services and can frequently visit the town. Male household heads would have an opportunity to visit the town to search for additional income, purchase different items or inputs, and the like. However, this finding is not consistent with that of Seid (2007) that shows the rural-urban linkage between Bahir-Dar and its surrounding rural areas in Ethiopia benefitted females the most through their participation in non-farm activities. Similarly, Akoyu (2013) and Tacoli (2004) states that women are more likely to engage in petty trade and secondary occupation.

Family Size: This is among the determinants in the level of rural-urban linkage a household has, especially concerning poor resource farmers who depend solely on family labour to maintain their farms. It was not surprising that households with larger family members had a better rural-urban linkage. Household size influences the decision of farmers to undertake different income-generating activity measures given household labour is the whole supplier of the required labour for undertaking farming and other activities. Households with abundant labour supply are believed more likely to engage in livelihood diversification or have a higher participation in non-agricultural activities. Labour-rich households feel less constrained to send some of their members to non-farm activity. Thus, as household size increased, intra-household specialization increased. The family size of a household head was associated with the level of non-marketing linkage positively and significantly ($p=0.071$) at ten percent of probability. The coefficient implies that one unit increase in a family member of household head increased the probability to have a strong non-marketing linkage by 0.127, keeping other variables in the model constant.

Total livestock holding: In line with what was hypothesized at the outset of this study, TLU determined the level of non-marketing linkage negatively. In this study, the status of livestock ownership of the household head is associated with the level of non-marketing linkage of the household head negatively and significantly ($p=0.046$) at a five percent of significant level. An increase in TLU of a household declined the level of non-marketing linkage of that household by 0.129. This finding is inconsistent with other studies. Therefore, the income earned from livestock and/or livestock products could be reinvested in other agricultural and non-farm activities that would have an insignificant influence on strengthening the level of rural-urban linkage. Those who have more oxen spend more time on their farms than their counterparts. Therefore, it was not a surprise to get a negative sign of the TLU in this regression model. The number of oxen owned also contributed to the low production in the study area. This small ownership of oxen forced one farmer to agree with another farmer to plow their land turn by turn. This situation led the poor farmers to visit the town when their ox was occupied by another partner. Therefore, this affected the linkage negatively.

Number of Farm Parcels: It is expected that, as the number of farm parcels of a farmer increase, the attention and care given to proper farming practices will consume more time. Or the attention and care given to proper farming practices to get more yield would consume more time and finally the household may fail to visit the town frequently. As a result, of such time shortage, the household could not visit the nearby town for other purposes (non-market reasons). As expected, in the analysis for this study, the number of farm parcels took a negative sign and was statistically significant ($p=0.001$). Other variables held constant, the probability of creating a strong non-market linkage in the study area reduced as the number of farm parcels increases by 0.25 units. This seems to be quite logical, as due to a lack of time to manage the farm plots in the study area most of the households have to spend more time and leading to a lower level of visiting the town for non-marketing purposes. The population pressure leading to the fragmentation of farmlands in the area could be linked to this finding.

CONCLUSION

Different households with different income statuses may show a different level of marketing and non-marketing linkage with the nearby town. Nearly, two-thirds of the sample poor respondents had experienced a strong non-marketing linkage, which was by far higher than those who were rich in economic status (16.4%). The majority (49.5%) of the middle-income group had a weak non-marketing linkage as compared to the poor (26.7%) and rich (23.8%).

This showed that the poor had frequent visits to the town to get additional income from different income-generating activities. In the case of the marketing linkage, about 65% of the sample poor respondents had experienced a weak marketing linkage. The majority of the middle (50.9%) and rich (23.6%) income groups had a strong marketing linkage as compared to the poor (25.5%). This showed that the non-poor income group had frequent visits to the town to sell their product and while the poor visited to get more income from urban-based activities. Therefore, the non-marketing linkage was facilitating livelihood diversification for the poor to improve their livelihood.

The research also set out to identify the major factors determining the marketing (both its orientation and magnitude) linkage. Accordingly, access to irrigation schemes, livestock ownership, bee hive ownership, access to cell phones, number of farm plots, and age was found to be the most important determinants of the orientation of marketing linkage of the households. The magnitude of marketing linkage of households was also influenced by access to irrigation schemes, livestock ownership, bee hive ownership, access to cell phone, and distance to the town.

The final regression model indicated that rural households, those who were younger, with a large number of farm plots, with a larger amount of TLU, with mobile phone services, who own bee hive colonies, those who were engaged in irrigation schemes and close to the town were more likely to have a strong marketing linkage. Hence, to maximize households' benefit from the marketing linkage, attempts should be made to enhance the households' access to irrigation, agricultural technologies, and rural road programs.

Similarly, the linear regression analysis pointed out that rural households that were male-headed, had large family sizes, owned a small amount of livestock, and have a small number of farm plots were more likely to have a strong non-marketing linkage. An attempt to improve the status of these factors, no doubt, contributes greatly to the enhancement of the marketing linkage of the households.

Glossary

Hinterland- refers to the rural areas around a town which is served by urban center.

Household- group of people who live together and make common provision for cooking food or other essentials of living.

Tabia- a term used to indicate the lowest administrative unit at the grassroots level in the rural area.

Wereda- refers to district, including a number of rural 'Tabias' and/or urban 'Kebeles'.

Author Contributions: Conceptualization, M.B. and T.G.; methodology, M.B. and T.G.; software, M.B.; validation, M.B. and T.G.; formal analysis, M.B.; investigation, M.B.; data curation, M.B. and T.G.; writing - original draft preparation, M.B.; writing - review and editing, M.B. and T.G.; visualization, M.B.; supervision, T.G.; project administration, M.B. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgments: We would indebted to thank Aksum University for granting the Ph.D. scholarship and providing logistics for the fieldwork.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

- Andualem, K., & Umer, A., (2023). Determinants of rural households' livelihood diversification strategies: In the case of north Wollo zone, Amhara National Regional State, Ethiopia. *Cogent Economics & Finance*, 11(1). <https://doi.org/10.1080/23322039.2023.2185347>
- Akkoyunlu, S. (2013). *The Potential of Rural–Urban Linkages for Sustainable Development and Trade*. Working Paper No 2013/37 of NCCR Trade Working Paper. <https://www.researchgate.net/publication/259577244>
- Alemayehu, A., Teshome, Y., & Abera, U. (2021). Determinants of rural livelihood diversification strategies among Chewaka resettlers' communities of southwestern Ethiopia. *Agriculture & Food Security*. BMC. <https://doi.org/10.1186/s40066-021-00305-w>
- Armin, K., & Jutta, K. (2021). *Rural-Urban Linkages for Sustainable Development*. 1st Edition. Tayler and Francis Group. <https://doi.org/10.4324/9780429288111>
- Carucci, V., & Yihewew, Z. (2007). "Experiences of MERET in Natural Resource Management and Enhancement of Productivity in Ethiopia-An Opportunity for RUL." In Gete, Z., Trutmann, P. and Aster, D. (eds.), 2007. Fostering New Development Pathways: Harnessing Rural-Urban Linkages (RUL) to Reduce Poverty and Improve Environment in the Highlands of Ethiopia. Proceedings of a Planning Workshop on Thematic Research Area of the GMP held in Addis Ababa, Ethiopia, August 29-30, 2006, 99-102.
- Chowdhury, S., Asfaw, N., & Torero, M. (2005). *Market Institutions: Enhancing the Value of Rural- Urban Links*. FCND Discussion Paper 195 Washington, DC.
- Christiawan, P.I., Wesnawa, G.D., & Sarmita, M. (2020). Spatial Analysis of Rural–Urban Linkages in Suburbs of Denpasar City. *Advances in Social Science, Education and Humanities Research*, 394, 178-183. Atlantis Press SARL. Retrieved from. <https://doi.org/10.2991/assehr.k.200115.029>
- CSA. (2012). *Population Projection of Ethiopia for All Regions at Wereda Level for 2012*. FDRE CSA. Addis Ababa.
- CSA. (2013). *Population Projection of Ethiopia for All Regions at Wereda Level from 2014-2017*. FDRE CSA. Addis Ababa.
- Douglass, M. (1998). *A Regional Network Strategy for Reciprocal Rural-Urban Linkage: An Agenda for Policy Research with Reference to Indonesia*. Third World Planning review, 2(1). In Tacoli, C. (Eds), 2006. Rural Urban Linkages. Earthscan, 124-154.
- EDHS. (2012). Ethiopia Demographic Health Survey-2011. CSA, Addis Ababa. <https://dhsprogram.com/pubs/pdf/fr255/fr255.pdf>
- Ellis, F. (2004). *Occupational Diversification in Developing Countries and Implications for Agricultural Policy*. Programme of Advisory and Support Services to DFID (PASS) Project No. WB0207.
- Howitt, D., & Cramer, D. (2011). *Introduction to Statistics in Psychology*.: 5th Edition. Pearson Education Limited, England, 380-383.
- Mbella, M., & Mbella, M. (2021). Understanding the Drivers of Rural-Urban Linkages: The Case of Meme Division, Cameroon. *International Journal of Innovative Science and Research Technology*. 6(5).
- Mercandalli, S., Girard, P., Dione, B., & Michel, S. (2023). Assessing Rural-Urban Linkages and Their Contribution to Territorial Development: Insights from Zimbabwe's Small and Medium-Sized Cities. *Sustainability*. <https://doi.org/10.3390/su15076223>
- Mesfin, W. (1995). *The Role of Small Market Towns in Integrating the Rural-Urban Economy: Case of Ten Market Towns in Sub-District of Cheliya in Gibat and Mecha Awraja*, Unpublished MA Thesis, AAU.
- Mohammed, S. (2007). *Livelihood Strategies and their Implications for Rural-Urban Linkages: The case of Wolenkomi Town and the Surrounding Rural Kebeles*
- Seid, N. (2007). Rural Livelihood, Migration, and Human Capital Formation: The Ethiopian Case. Doctoral thesis, Göttingen University, 43.
- Shafisabet, N., & Mirvahedi, N. (2021). The role of rural–urban linkages in perceived environmental effects of farmers for participation in sustainable food security plans. *Agriculture & Food Security*, 10(1), 1-26, BioMed Central. <https://doi.org/10.1186/s40066-021-00317-6>
- Somanje, A.N., Mohan, G., Lopes, J., Mensah, A., Gordon, C., Zjou, X., Moinuddin, M., Saito, O., & Takeuchi, A. (2020). Challenges and potential solutions for sustainable urban-rural linkages in a Ghanaian context. *Sustainability*, 12(2), 507. <https://doi.org/10.3390/su12020507>
- Tacoli, C. (1998). *Rural-Urban Interaction: A Guide to the Literature*. *Environment and Urbanization*, 1(10), No.1 London.
- Tacoli, C. (2004). *Rural-Urban Linkages and Pro-Poor Agricultural Growth: An Overview*. Prepared for OECD DAC POVNET Agriculture and Pro-Poor Growth Task Team, Helsinki Workshop, 17-18 June 2004.
- Tassew, W. (2002). *Promoting Farm/Non-farm Linkage for Rural Development: The case of Rural Farm/non-Farm Income Linkage in Northern Ethiopia*, Economic and Social Department, Rome, Italy.
- Tegegne, G. (2001). *Rural-Urban Linkages Under different Systems: The Case of Coffee and Non-Coffee Growing Regions in Ethiopia*. OSSREA, Ethiopia.
- Tegegne, G. (2005). "Rural-Urban Linkages in Ethiopia: The Need to Bridge the Divide". In RLDS, 2005, Issues and Challenges in Local and Regional Development: Proceedings of the Third International Policy Research Workshop in Regional and Local Development Studies. United printers, Addis Ababa, Ethiopia, 143-165.
- ***Working Papers on Population and Land Use Change in Central Ethiopia, nr. 10. http://www.svt.ntnu.no/geo/Doklager/Acta/serie_a_18_mohammed.pdf. Accessed on December 08, 2008.