

Are land-poor youth accessing rented land? Evidence from northern Ethiopia

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ABSTRACT

Continued population growth in densely populated parts of Sub-Saharan Africa makes it harder for youth to choose agriculture as main source of income. We investigate whether near landless youth can access rented land as a source of income. We used data collected in 2016 (from 1138 youths in 119 youth business groups) and 2019 (from 2427 youths in 246 business groups), in five districts of Tigray region of Ethiopia. We find that 42% of the youth had access to rented land in 2016 and 47% in 2019. The average area rented land was 0.66 ha in 2016 and 0.74 ha in 2019. Access to rented land, though constrained, accounted close to 70% in 2016 and 61% in 2019 of the average operated land by youth group members. Male youth who own oxen and ploughs are much more likely to rent land whereas female youth group members appeared generally disadvantaged in their access to rented land and other complementary sources of income. Sharecropping dominated as the main form of land rental contract covering 94% of the contracts in 2016 and 90% of the contracts in 2019. Utilizing a trust game to elicit trust and trustworthiness of the youth, we found a positive association between trustworthiness and particularly accessing land from non-relatives. The prohibition of land sales limits the potential of the “agricultural ladder” to facilitate youth climbing out of poverty through purchase of land. Overall, the land rental market has become more important for land access of land-poor youth and is likely to grow in importance to facilitate rural transformation and diversification of rural livelihoods as land scarcity grows and market access improves. Thus, it appears that the land rental market has helped many of these very land-poor youth to establish sustainable land-based livelihoods. While the land rental market does not function perfectly, we recommend not to intervene to change the fundamental characteristics or to impose area restrictions in the market as has been attempted recently in Ethiopia. Such restrictions can easily cause more harm than good.

1. Introduction

Youth unemployment is a growing challenge in developing countries (Awogbenle and Iwuamadi, 2010). Unemployment rates are hard to estimate in developing countries where the majority of the population lives in rural areas and agriculture is the dominant source of livelihood. There are indications that youth unemployment rates are three times as high as adult unemployment rates (Anyanwu, 2014). Continued high population growth in Sub-Saharan Africa contributes to growing land scarcity and shrinking farm sizes while area expansion becomes increasingly difficult and a threat to remaining forest areas (Chamberlin et al., 2014; Tilman et al., 2011). Shrinking farm sizes and growing landlessness is associated with accelerating youth outmigration from rural areas (Bezu and Holden, 2014). Yet, such rapidly increasing youth

rural-urban and international migration can lead to increasing youth unemployment, frustrations, and social and political instability (Blattman and Miguel, 2010; Onah and Okwuosa, 2016). Policy action is needed to provide new employment and livelihood opportunities for youth in rural as well as in urban areas (Okafor, 2011; Ajufo, 2013; Salami, 2013) including policy action for ensuring youth's access to agricultural land (Kidido et al., 2017). Land policy reforms need to accommodate the complexity of contemporary changes to land tenure arrangements (Asaaga and Hiron, 2019). Moreover, a strong land governance is a precondition for economic growth and poverty alleviation in rural areas of developing countries (Azadi, 2020).

Ethiopia has spearheaded a new approach to youth employment by allocating rehabilitated communal lands to unemployed, land-poor and landless youth (Holden and Tilahun, 2018a) and this is driven by

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shrinking farm sizes (Holden and Tilahun, 2020). The youth organize themselves in business groups formalized as primary cooperatives based on cooperative law. They are allowed to establish a sustainable business on the allocated land. They elect a board, make their own bylaw, and prepare a business plan that has to be accepted by the local administration. They typically invest in activities such as forestry, apiculture, livestock rearing, horticulture, and irrigation. It takes time for these joint activities to start to yield sizable incomes to be shared by group members. They, therefore, depend on complementary sources of income. Although land sales are prohibited in Ethiopia (Holden et al., 2010, 2011) and there has been indications of resistance among small-holder farmers to legalizing land sales (Holden and Bezu, 2016), the country has a well-developed land rental market. This may, therefore, be one important source of additional income although there are access constraints in the market (Holden et al., 2007; Gebru et al., 2019).

This paper investigates the potential of the land rental market to provide rented land as a complementary source of income to the youth who have joined this type of youth business groups. Our sample does not include youth that have chosen other livelihood strategies such as migration or higher education. However, we have returned migrants in the sample. We have also included questions on what the group members would have chosen as a livelihood strategy if the youth business group alternative were unavailable. It is of high policy interest whether the youth business group model contributes to reduced migration.

We try to answer the following research questions: a) to what extent are land-poor rural youth accessing rented land? b) what constraints do youth face in their attempts at accessing land through the land rental market and what are the conditions that enhance such access? c) can the land rental market be an important complementary source of land and income, and thereby stabilize and secure the livelihood of youth business group members? d) how important is land renting as a complementary source of income for near landless youth compared to other sources of such income? and e) what livelihood options would the youth business group members have chosen as their primary option if they were unable to join the business group, and how likely are they to give up and drop out of the group?

We hypothesize that the land rental market potentially can be an important complementary source of income but that this depends on gender, farm endowments and social capital (trust and trustworthiness) (Coleman, 1990; Berg et al., 1995; Fehr, 2009) of youth group members as these factors affect access to land through the land rental market (Holden et al., 2010; Gebru et al., 2019). Our sample consists of landless and near-landless rural youth that for this fact have been found eligible by the local government to join youth business groups that are allocated rehabilitated communal land as a complementary source of livelihood. We use data from 1138 youth business group members in 119 youth business groups surveyed in 2016 and 2427 youth in 246 youth business groups surveyed in 2019 in the Tigray Region in northern Ethiopia to test the hypotheses. The two main novel contributions of the paper include, first, the choice of a large sample of land-poor rural youth that aims to establish rural livelihoods to investigate their access to rented land. Second, to our knowledge this is the first attempt to use the trust game to elicit trustworthiness of youth as a potential factor influencing access to rented land.

Part 2 of the paper provides a theoretical framework and hypotheses for testing, part 3 presents the data and estimation strategy, part 4 provides results and discussion on the descriptive analyses and testing of hypotheses, and the last part presents conclusions and policy recommendations.

2. Theoretical model and hypotheses

We draw on the literature on land rental markets and contracts with emphasis on the allocation efficiency in these markets (Bliss and Stern, 1982; Skoufias, 1995; Holden et al., 2010). Such allocation efficiency may be constrained by transaction costs. There is no need for land

markets if all other factor markets function perfectly (Singh et al., 1986; Holden et al., 2010). High transaction costs in non-land factor markets provide opportunities for efficiency gains in the land rental (tenancy) market. Non-linear (fixed and variable) transaction costs may cause non-participation or partial adjustment through the land rental market when non-land factor markets are imperfect. The immobility and spatial dispersion of land contribute to the only partially reducible transaction costs in land rental markets (Binswanger and Rosenzweig, 1986). Tenure insecurity may be an important reason for allocative inefficiency as well as Marshallian inefficiency in some contexts, among others due to failed policy reforms (Otsuka, 2007; Holden et al., 2013). Ethiopia introduced a tenure security-enhancing low-cost land registration and certification reform from 1998 and it has contributed to improved tenure security and more active land rental markets (Deininger et al., 2008, 2011; Holden et al., 2011).

Access to and participation in the land rental market as a complementary source of income and livelihood option depends on supply and demand characteristics in the tenancy market. We think that both demand and access depend on the potential tenant's ability to farm and their access to land from other sources than the land rental market. The ability to farm depends on non-land resources such as labor endowment, farming skills, capital endowments in the form of oxen for ploughing, and equipment such as ploughs for cultivation. More of such capital is likely to be associated with higher expected returns from additional land. On the supply side in the land rental market, in a market where sharecropping is the dominant contract type, the ability to farm also matters for the landlord selecting tenants for her/his land to be rented out. Observable ability to farm may be inspected through the physical endowments of potential tenants. The same ability factors that are associated with higher demand for land and higher expected marginal returns from additional land are therefore also proposed to increase the likelihood that potential tenants are accessing land in the rental market.

We study land renting in a context where gender has been shown to have a strong role in terms of a gender division of labor in agriculture. Land cultivation with the use of oxen is considered primarily a male task. This also implies that male youth are likely to have better chances of accessing land in the land rental market and are more likely to attempt to access such land. The reason for male dominance in land cultivation with oxen is likely related to the greater upper body strength of males as an underlying explanation for this strong cultural norm in the Ethiopian context (Holden et al., 2011; Bezabih et al., 2016).

Given the limited incentives in sharecropping contracts, landlords may also be cautious in their choice of tenants and prefer tenants they trust and/or easily observe or are more able to influence in the way they cultivate the rented land (Otsuka et al., 1992). Trust and trustworthiness are not variables that are easily observable by researchers but may still be taken into consideration by landlords in their choice of tenants based on their accumulated knowledge of alternative tenant candidates.

We only have information from one side of the market, that of tenants, in terms of their access to rented land. In addition, we have some information about the type of landlord they access the land from, whether the landlord is kinship-related, is a neighbor, comes from the same community or whether the land is accessed outside their own community. We also have information about their contract type, see Table 2 for details.

We formulate the simple reduced-form model with a dummy dependent variable for access to land, DR_{gi} , in the rental market (which includes sharecropping and fixed rent contracts, where fixed rent contracts imply upfront cash payment as rent, by youth group member i in group g based on the above theoretical contextual considerations:

$$DR_{gi} = \alpha_1 A_{gi} + \alpha_2 E_{gi} + \alpha_3 G_{gi} + \alpha_4 TW_{gi} + D_g + \varepsilon_{gi} \quad (1)$$

where A_{gi} is the land available for youth group member i in group g from other sources (own and spouse land). E_{gi} is the non-land endowment in form of oxen that are instrumental for land cultivation, G_{gi} is the gender

variable, a dummy= 1 for being male, TW_{gi} is a measure of trustworthiness (we return to how this is measured), and D_g represents group fixed effects and controls for and higher-level observables and unobservables, and ε_{gi} is an error term.

Non-linear transaction costs in the land rental market associated with access and limited information (search and negotiation costs, trust, monitoring, and enforcement costs) imply that access in the past will enhance the likelihood of current access (Holden et al., 2007; Gebru et al., 2019). We, therefore, include lagged land rental market access ($DR_{gi,t-1}$) as an RHS variable. The lagged dependent variable also controls for endogeneity (unobservable member characteristics that are time-invariant) (Wooldridge, 2010; Holden et al., 2010; Gebru et al., 2019).

We assess whether access to rented land is from relatives or non-relatives of the tenant households. We assume it may be harder to obtain land from non-relatives while relatives are more likely to provide land as a favor to their kin. We suggest therefore that the oxen endowment and trustworthiness may be more important for accessing land from non-relatives. We estimate three models for that reason; one for overall access, one for access from relatives (DR_{gi}^R), and one for access from non-relatives (DR_{gi}^{NR}). We use linear panel data models with youth group fixed effects for this. The group FEs control for group and community unobservables, such as group-specific trust-related characteristics such that it is only the individual within-group residual trustworthiness variation that we test; whether it can affect land rental access, and particularly so for non-relative landlords. We include access to land from non-relatives in the model for access to rented land from relatives and vice versa. This is to test whether these sources of access serve as complements or substitutes. The same tenant may or may not access land from relatives as well as from non-relatives. With severe access problems in the market, it is more likely that the two types of access are complements than substitutes.

$$DR_{gi} = \alpha_1 A_{gi} + \alpha_2 E_{gi} + \alpha_3 G_{gi} + \alpha_4 TW_{gi} + \alpha_5 DR_{gi,t-1} + D_g + \varepsilon_{gi} \quad (2a)$$

$$DR_{gi}^R = \alpha_1^R A_{gi} + \alpha_2^R E_{gi} + \alpha_3^R G_{gi} + \alpha_4^R TW_{gi} + \alpha_5^R DR_{gi,t-1} + \alpha_6^R DR_{gi}^{NR} + D_g + \varepsilon_{gi}^R \quad (2b)$$

$$DR_{gi}^{NR} = \alpha_1^{NR} A_{gi} + \alpha_2^{NR} E_{gi} + \alpha_3^{NR} G_{gi} + \alpha_4^{NR} TW_{gi} + \alpha_5^{NR} DR_{gi,t-1} + \alpha_6^{NR} DR_{gi}^R + D_g + \varepsilon_{gi}^{NR} \quad (2c)$$

Based on the theoretical considerations we hypothesize:

H1. $\alpha_1 < 0$, as access to own land reduces the need and demand for rented land increases (Bliss and Stern, 1982; Skoufias, 1995; Holden et al., 2010). The better the land rental market works, the better the rented land serves as a substitute for own land.

H2. $\alpha_2 > 0$; the rental market for ploughing services is poorly developed and the ownership of oxen, therefore, increases the expected marginal returns from rented land (Ghebru and Holden, 2009). Landlords are more likely to be willing to rent land to tenants that have their own oxen.

H3. $\alpha_3 > 0$; the labor market is imperfect and male and female labor are not perfect substitutes. Males are more likely to be interested in renting land and more likely to access land from landlords given the cultural norms in the Ethiopian society.

H4. $\alpha_4 > 0$; higher trustworthiness of the tenant (tenants with good behavior and reputation) is likely to be associated with better access to rented land in the market, especially from non-kin landlords. Trust and trustworthiness is likely to be more important in sharecropping contracts because the performance and reliability of the tenant is important for what the landlord gets for the land. Sharecropping contracts dominate in northern Ethiopia (Gebrehiwot and Holden, 2020).

H5. $\alpha_5 > 0$; past access to land in the rental market enhances current

access due to the non-linear transaction costs in the market related to search and negotiation costs, trust and reputation building, and social network building (Holden et al., 2007; Gebru et al., 2019).

H6. $\alpha_6^R, \alpha_6^{NR} < 0$; access to rented land from relatives and non-relatives are substitutes.

Unlike absentee landlords, resident landlords, which dominate in our study sites, may select tenants they trust because the trustworthiness of potential tenants may to some extent be public knowledge to residents in the community (Otsuka et al., 1992). If this is the case, landlords are more able to select trustworthy tenants in addition to selecting kinship-related tenants as kin relations may enhance trust and trustworthiness. We used trust games (Berg et al., 1995; Fehr, 2009; Holden and Tilahun, 2018b) to obtain measures of individual trustworthiness in our sample of youth.¹ This allowed us to assess whether members that are more trustworthy were more likely to obtain rental contracts and especially contracts with non-kin landlords. Trustworthiness is endogenous and may depend on observable and, for researchers, unobservable individual, and community characteristics. The lagged dependent variable should control for time-invariant unobservable individual characteristics and the group fixed effects controls for unobservable group and community characteristics.

When it comes to intensity of land renting, we believe the same basic mechanisms are at work and pull in the same direction as in Eq. (1). Even those with access to the market may still be constrained. They may not have obtained as much land in the market as they had aimed for. One fundamental reason for this is that a land rental market dominated by sharecropping does not have a rental price that clears the market. This typically leads to rationing on the tenant side of the market. The model above therefore may be reformulated by replacing the probability of access with the area accessed (through both sharecropping and fixed rent contracts) in the market as follows;

$$\bar{R}_{gi} = \beta_1 A_{gi} + \beta_2 E_{gi} + \beta_3 G_{gi} + \beta_4 TW_{gi} + \beta_5 DR_{gi}^R + \beta_6 DR_{gi,t-1} + D_g + \mu_{gi} \quad (3)$$

where \bar{R}_{gi} is the rented area accessed by youth group member i in group g . With efficient allocation of land in the rental market, owned land and rented land should be perfect substitutes. Under such conditions, $\beta_1 = -1$. We hypothesize:

H7. $\beta_1 > -1$; we think that youth do not have smooth and easy access to land in the rental market due to significant transaction costs. These transaction costs are related to the immobility and spatial dispersion of land, the dominance of sharecropping and the need for landlords to monitor tenants.

We hypothesize that access to land in the rental market depends on the possession of non-land resources that are essential for farming, especially oxen for ploughing. This is essentially our hypotheses H2 and H3. These imply that $\beta_2 > 0, \beta_3 > 0$. These effects are caused by transaction costs in the market for non-land factor markets (such as for skills, traction power, capital), production risk and the inter-temporal nature of land renting and the associated dominance of sharecropping contracts, with screening and rationing of tenants. Tenants that are more trustworthy may earn a good reputation and are more likely to be trusted. Trustworthiness is therefore likely to be rewarded through the accumulation of a good reputation. Our measure of trustworthiness with the trust game is a test for such an effect. Sharing contracts between kin partners, for example, are common in Asia and Sadoulet et al. (1997) argue that kinship reduces moral hazards, and there is also an incentive among kin to cooperate and offer insurance in case of eventualities. Actual observed trustworthiness is important in communities where individuals know each other well and interact repeatedly over time in

¹ Trustworthiness is measured by the returning behavior of the trustee to an anonymous trustor in the standard trust game (Berg et al., 1995).

close neighborhoods and kinship networks. This may explain the dominance of land rental contracts between kin partners in Ethiopia (Holden et al., 2011) but trustworthiness maybe even more important for accessing land from non-kin landlords. Our hypothesis H4 therefore also applies here; $\beta_4 > 0$, the trustworthiness variable should be associated with access to more land in the rental market.

3. Data and estimation strategy

3.1. Data

Based on a census of 742 youth business groups in five districts in the Tigray Region that we conducted in February-March 2016, we sampled 119 groups (1138 individual members as sample respondents) that were allocated land for establishing a sustainable land-based business option. We followed up with an extended survey of an additional 246 groups (2427 individual members as sample respondents) in 2019. From each group we sampled randomly up to 12 group members among those available at the time of the survey in July-September 2016 and January-May 2019. The surveys were combined with incentivized lab-in-the-field experiments to elicit trust and trustworthiness of members. The survey included questions about the characteristics of individual members and their families and their complementary sources of income such as land rental income.

Measures of trust and trustworthiness were obtained using the standard incentivized trust game (Berg et al., 1995). It has become a popular and recognized tool for the measurement of trust and trustworthiness (Fehr, 2009; Johnson and Mislin, 2011; Alós-Ferrer and Farolfi, 2019). The amount that the trustor has invested is tripled by the researchers before it is given to another random and anonymous member of the same youth group (trustee). This trustee decides freely how much of this amount to send back to the anonymous trustor. The strategy method was used to elicit returned amounts for varying received amounts. The stated amounts to return were binding. Trustworthiness behavior was measured as the share of a received endowment (30 Ethiopian Birr (ETB) that was returned by the trustee in the game where all interviewed members played the roles as trustor and trustee while anonymity was ensured. The 30 ETB is close to the average amounts received from anonymous trustors. The strategy method was used to elicit trustworthiness (see Appendix for the elicitation method used). At the time of the survey 1 US\$ = 21 ETB and 30 ETB implies that the trustor invested 10 ETB out of an initial endowment of 30 ETB received. The amount was tripled by the researchers such that the anonymous trustee received 30 ETB and could freely decide how much to return to the anonymous trustor.

3.2. Estimation strategy

One challenge with the models above is that trustworthiness is likely to be endogenous. Tentatively, landlords may have information about the trustworthiness of youth group members based on their past behavior or expressed attitudes. Trustworthiness of the youth group members, as revealed in the experiments, may or may not be correlated with landlords' perceptions of the trustworthiness of the youth group members. Our study is, therefore, a test of the reliability of the trust game as an instrument to measure trustworthiness as well as the extent to which such knowledge about the individual members is common knowledge within the communities among relatives and neighbors as most access to rented land is from kin and neighbors.

Within-group trust and trustworthiness are likely to depend on group characteristics, social relations within groups and their ability to perform well as groups. We use group fixed effects to control for such group characteristics, as we are interested primarily in the individual variation in trustworthiness and the degree to which such variation is local public knowledge that can affect access to land in the rental market.

As an additional control for endogeneity of trustworthiness, we include lagged access to rented land (lagged dependent variable) as a control for time-invariant unobservable individual characteristics. While actual individual trustworthiness may not change much over time, the reputation of trustworthy individuals may build up and lead to improved access to rented land over time. This is what we test after imposing these controls for endogeneity associated with unobservable group and time-invariant individual characteristics.

The parsimonious model in Eq. (1) is estimated as a linear panel data probability model with group fixed effects that control for group and community characteristics, including average group trustworthiness:

$$DR_{gi} = \alpha_1 A_{gi} + \alpha_2 E_{gi} + \alpha_3 G_{gi} + \alpha_4 TW_{gi} + D_g + \varepsilon_{gi} \quad (4)$$

The model with lagged rental market access is estimated in the same way and so are the land rental access models for rented land from relatives and from non-relatives. However, we also estimate bivariate probit models for access to land from relatives and non-relatives. We estimate two versions of these models, one seemingly unrelated regression (SUR) version, and one sequential version, based on the assumption that potential tenants first explore their access from relatives before they approach non-relatives for rented land access. These models are estimated with group fixed effects like the linear panel data models but without the lagged rented land variable, due to its high correlation with current rented land (such models fail to converge). The SUR version implies joint estimation of Eqs. (5a) and (5b) below where the error correlation can be assessed. The sequential estimation implies that the first dependent variable is included on the RHS side in the second equation. We compare the unconditional marginal effects from the alternative specifications as well as the error correlations, and the conditional access to land from non-relatives, given access from relatives.

$$DR_{gi}^R = \alpha_1^R A_{gi} + \alpha_2^R E_{gi} + \alpha_3^R G_{gi} + \alpha_4^R TW_{gi} + D_g + \varepsilon_{gi}^R \quad (5a)$$

$$DR_{gi}^{NR} = \alpha_1^{NR} A_{gi} + \alpha_2^{NR} E_{gi} + \alpha_3^{NR} G_{gi} + \alpha_4^{NR} TW_{gi} + \left(\alpha_6^{NR} DR_{gi}^R \right) + D_g + \varepsilon_{gi}^{NR} \quad (5b)$$

We estimate the area rented with censored Tobit models with group fixed effects (FE). We assume that the same factors are at work and pull in the same direction for the probability of access and degree of access. The group FE control for observable and unobservable group and community effects associated with land renting such as land availability from potential landlords, the general level of trust in the community and the specific group situation which may affect group members' search for complementary sources of income. As an additional control for unobservable time-invariant tenant characteristics, we have included lagged access to rented land (models 6b and 6c) (Wooldridge, 2010). This is similar to a model with lagged dependent variable that serves as a dynamic control for how lagged access affects current access. Finally, in model 6c we have added a dummy for accessing land from relatives. We rely on the dynamic control (lagged access variable) as a control for endogeneity of this variable.

$$\overline{R}_{gi} = \beta_1 A_{gi} + \beta_2 E_{gi} + \beta_3 G_{gi} + \beta_4 TW_{gi} + D_g + \mu_{gi} \quad (6a)$$

$$\overline{R}_{gi} = \beta_1 A_{gi} + \beta_2 E_{gi} + \beta_3 G_{gi} + \beta_4 TW_{gi} + \beta_6 DR_{gi,t-1} + D_g + \mu_{gi} \quad (6b)$$

$$\overline{R}_{gi} = \beta_1 A_{gi} + \beta_2 E_{gi} + \beta_3 G_{gi} + \beta_4 TW_{gi} + \beta_5 DR_{gi}^R + \beta_6 DR_{gi,t-1} + D_g + \mu_{gi} \quad (6c)$$

The limited dependent variable characteristic of the models implies that the incidental parameter problem can bias the results from youth group FE models. We tested alternative specifications with community and district FE and found that the key results were very stable across these alternative specifications (the results are available from the authors upon request).

To investigate factors associated with the type of income source the youth have as their most important source of income, we used

Table 1

Land access from alternative sources, by gender.

	2016 survey			2019 survey			2016 Gini-coef.	2019 Gini-coef.
	Females Means	Males Means	Pr ($ T > t $)	Females Means	Males Means	Pr ($ T > t $)		
Number of observations	359	779		759	1668			
Own land access, dummy	0.24	0.25	0.506	0.27	0.32	0.034		
Own land area, <i>tsimdi</i>	0.32	0.35	0.544	0.29	0.47	0.000	0.46	0.55
Spouse own land, dummy	0.13	0.08	0.006	0.47	0.37	0.000		
Spouse own land area, <i>tsimdi</i>	0.18	0.12	0.017	0.52	0.45	0.058	0.39	0.42
Own or spouse land, dummy	0.32	0.30	0.491	0.61	0.56	0.017		
Sum of own and spouse land, <i>tsimdi</i>	0.50	0.46	0.480	0.81	0.92	0.056	0.46	0.48
Rented land access, dummy	0.29	0.48	0.000	0.39	0.51	0.000		
Rented land area, <i>tsimdi</i> (full sample)	0.65	1.32	0.000	0.83	1.64	0.000	0.41	0.43
Rented land area, <i>tsimdi</i> (those renting)	2.26	2.74	0.098	2.15	3.24	0.000		
Operational land access, dummy	0.48	0.59	0.001	0.72	0.70	0.244		
Operational land area, <i>tsimdi</i>	1.15	1.79	0.000	1.64	2.27	0.000	0.44	0.47

Source: 2016 and 2019 Baseline survey data.

multinomial logit models. Only one specification of this model is included. It presents relative risk ratios and uses own farm as the baseline source of income.

4. Results and discussion

4.1. Descriptive analysis

4.1.1. Land access by source

Table 1 gives an overview of alternative sources of land based on the two years of data, decomposed by gender. This includes own inherited or allocated land through redistribution, land of spouse, and rented land. The table includes dummy variables for access to the different sources of land as well as average areas accessed for all households, measured in the local measurement unit, *tsimdi*, which is approximately 0.25 ha.

Out of the surveyed samples in 2016 only close to 25% of the youth group members had their own land and the average land size of own land was 0.34 *tsimdi* \approx 0.085 ha. This land was accessed through either inheritance and/or land redistribution whereas the remaining two-third of the samples were landless. The proportion of sample youth group members with own land in the 2019 survey was close to 30% and the average size of own land was 0.41 *tsimdi* \approx 0.1 ha. Looking at the high proportion of landless youth and the very small average sizes of own land in both survey years, which are less than or close to 0.1 ha, we clearly see that our samples are composed of landless and near landless/land-poor youths. Though the average size of own land in both survey years were very small, the average land size operated by sample youth group members in both survey years were about 1.6 *tsimdi* in 2016 survey and 2.27 *tsimdi* in 2019 survey and both figure were relatively higher than the average sizes of own land. In other words, average size of own land accounts only 21.4% and 18.2% of the average operated land sizes in the survey years of 2016 and 2019 respectively. Close to 70% of the average operated land (1.11 *tsimdi*) in 2016 and 61% of the operated land (1.39 *tsimdi*) in 2019 were land accessed through the land rental market in terms of sharecropping and fixed rent contracts. This implies that the land rental market is the major source of youth group members' access to land. Close to 42% of the members surveyed in 2016 and 47% of the members surveyed in 2019 rented in land.

Land of spouse is the other alternative source for youth group members to access to land. But, land of spouse only accounts for 6% of the average operated land in 2016 and 17.7% of the average operated land in 2019. In the 2016 survey, only 9.6% of the subjects indicated that their spouses had land and the average size of spouse's land was 0.14 *tsimdi* or 0.035 ha whereas in the 2019 survey close to 40% of the samples indicated that their spouses had land and the average size of

Table 2

Contract types, landlord types by output, input and payment characteristics.

Contract type	2016 survey		2019 survey	
	Number of contracts	% of contracts	Number of contracts	% of contracts
Sharecropping (only sharing of output)	577	91.0	1 679	88.5
Sharecropping (output sharing) with cash	10	1.6	17	0.9
Output and input sharing	9	1.4	12	0.6
Cash rental contract	38	6.0	190	10.0
Total contracts	634	100.0	1 898	100.0
Rent land from whom?				
From relative	366	56.1	925	49.0
From neighbor	206	31.6	621	32.9
Other villagers in home <i>tabia</i> ^a	71	10.9	239	12.7
From villager in other <i>tabia</i>	9	1.4	94	5.0
Total	652	100.0	1879	99.5
Contract agreement types:				
Oral contract without witnesses	496	77.6	1 690	90.2
Oral contract with witnesses	105	16.4	80	4.3
Written contract signed by both parties	24	3.8	79	4.2
Written contract signed and reported to <i>tabia</i> land administration	14	2.2	24	1.3
Total	639	100.0	1 873	100.0
Contract duration types:				
For one year/season	158	25.2	566	30.3
Open-ended (renewed year by year)	439	70.1	1091	58.4
For a fixed number of years	29	4.6	210	11.2
Total	626	100.0	1867	100.0

^a *Tabia*=community, the lowest administrative level. There were additional 10 contracts with the government body in the 2019 data, not included among the rented from whom part.

Source: 2016 and 2019 Baseline survey data. The deviations in total numbers are due to some missing responses.

such land was 0.47 *tsimdi* or 0.12 ha.

Table 1 shows that male and female members are about equally likely to own some land and about 25% of them do so. Females are more likely to have a spouse that owns some land than males are, hence, females have significantly more access to land than males have through

their spouses. After combining own and spouse own land there is no significant gender difference in land access besides land renting. Males have significantly better access to land in the rental market than females in both years. Overall, males access more land through the rental market than through other sources while this is not the case for females. 48% of the females and 59% of the males had access to land from at least one of these sources of land in 2016 and this had increased to 72% and 70% for females and males in 2019. In terms of marital status, 60% of the surveyed members were married in 2016 (58% for females and 62% for males) against 71% in 2019 (73% for females and 70% for males).

This individual access to land comes in addition to the jointly allocated land for their youth groups. [Table 1](#) also presents Gini-coefficients for the distribution of the different sources of individually accessed land among the youth group members. The Gini coefficients do not vary substantially across the different sources of land. [Fig. A.1](#) in the Appendix shows the distribution of rented area across the sample for the 2019 survey.

4.1.2. Land rental contract characteristics

Land rental contracts may be characterized based on the contract agreement details in the form of sharing of inputs/input costs, output sharing, duration or renewal expectations of contracts, whether contracts are written or oral and have witnesses, and based on how closely related the contract parties are (social distance). These characteristics together say something about the functioning of the rental market, access constraints and transaction costs in the market and how varying levels of trust may affect who has access and to what types of contracts.

We first inspect the variation in output sharing and input sharing contract conditions for the contracts that the youth group members in our sample have, see [Table 2](#).

[Table 2](#) shows that pure output sharing contracts totally dominate and constitute more than 90% of all contracts whereas only 6% of the contracts are fixed rent contracts. A small share of the sharecropping contracts includes a cash payment upfront at the time of contract agreement. The dominance of output sharing contracts implies that the youth share the production risks with their landlords and do not have to pay for the land till at harvest time when the output is shared. Sharecropping implies that the tenant characteristics and efforts affect the outcomes of the contracts for the landlords who therefore need to worry about the performance of their tenants. Trust, therefore, plays a more important role in sharecropping than in fixed rent contracts, and screening and monitoring costs may be reduced by renting land to kin partners and neighbors and selecting tenants that are known to be more trustworthy. The actual trustworthiness of potential tenants appears to be public knowledge in the communities our data come from and the trust games appear to have been able to reveal such actual trustworthiness. When this is case, landlords prefer to select more trustworthy tenants in addition to selecting kinship-related tenants as kin relations may enhance trust and trustworthiness. The result in [Table 2](#) supports this claim in that it inspects the types of landlord partners the youth have for their rented land.

[Table 2](#) shows that the youth primarily obtain land in the rental market from their relatives and neighbors. About 11% access land from others in their home community and very few access land outside their own community. This demonstrates the limited spatial integration in the land rental market. It may also indicate the importance of trust and personalized relations for land access. [Table 2](#) shows that 56% in 2016 and 49% in 2019 of the contracts were with kin landlords and another 32% and 33% of the contracts were with neighbors in 2016 and 2019 respectively. Relatives may be more trusted, and neighbors are more easily observable, and this reduces information asymmetries and monitoring costs. We inspect this further by looking at the nature of the contracts in terms of the degree to which they are written, have wit-

nesses and are reported to the community administration.

[Table 2](#) shows that 78% of the contracts in 2016 and 90% in 2019 are oral contracts without witnesses and this demonstrates a high degree of trust among the contract partners such as may be expected among relatives and neighbors. While the land laws state that all rental contracts should be written and reported to the local land administrations, we see that only 6% of the contracts were written and only 2.2% of the contracts followed this regulation in 2016 and there is no increase in the percentage of formally registered contracts from 2016 to 2019. This may be due to local perceptions that such reporting is unnecessary for sharecropping contracts with local persons you trust. It indicates also a high level of trust in the youth that have received such contracts but this rationed access and trust applies mainly to a subsample of business youth group members; mostly male youth with oxen and ploughs that are kin or neighbors that can easily be monitored. This demonstrates a very limited spatial integration in this market and that land renting as a complementary source of income for youth primarily works for youth staying close to home. Although females appear to have poorer access to land themselves, their access through their husbands is better and the fact that the percentage of the females that are married had increased from 2016 to 2019 contributes to improved land access for females as well.

[Table 2](#) also presents data on the duration and/or renewal conditions of contracts and shows that 70% of the contracts were open-ended in 2016 against 58% in 2019. This means they continue from year to year until one of the parties decides to end the contract. There are few with longer-term fixed-rent contracts although we see an increase in such types of contracts (from 5% to 11%). The dominance of one year and open-ended contracts provides flexibility for landlords to pull out if tenants do not perform well, and this could potentially also represent a “threat of eviction” as renewal may depend on performance ([Kassie and Holden, 2007](#)). However, we did not collect data to investigate this further. For the youth this may imply tenure insecurity in the rental market. However, this will also depend on mutual trust among the contract partners.

4.1.3. Relative importance of land renting as a source of income

All youth group members were asked to rank their three main sources of income, see [Table A.1](#) in the Appendix for details. Their own farm and support from the family are the most important sources of income followed by land renting (renting in land). The youth group business activity has not yet become the main source of income for the majority of the youth group members. Trade and construction work employment and daily wage labor are important non-farm sources of income.

We also asked about the expected main source of income five years into the future. The responses are reported in [Appendix Table A.2](#). In 2016, 61% expected the youth group activity would be the main source of income while only 6% expected land renting to be the main source of income five years into the future. This indicates that land renting was perceived to be a temporary complementary source of income. The data from 2019 indicates that the expectations regarding the youth group activity have been modified as only 32% expected this youth group activity to be the main source of income in five years. At the same time, 13% expected land rental income to be the main source of income in five years. This indicates that they may have been too optimistic about the future benefits from the youth group activity in 2016 and these expectations have been modified. By 2019 more members have realized that they need to depend more on other complementary sources of income, including land renting.

The 2019 surveys included questions about the conditional livelihood choices if they had not joined the youth business group, see [Appendix Table A.3](#) for a summary of the responses. About 21% stated that

Table 3
Parsimonious models: Overall land access versus access from relatives and from non-relatives.

	Rented land access	Rented land from relatives	Rented land from non-relatives
Trustworthiness	0.106* (0.0453)	0.0499 (0.046)	0.0996* (0.0413)
Male, dummy	0.0765** (0.0199)	0.0381* (0.0191)	0.0648** (0.0179)
Own land	0.00757 (0.0078)	0.0122 (0.0087)	-0.0054 (0.0071)
Oxen	0.212** (0.014)	0.147** (0.0118)	0.144** (0.0114)
Constant	0.182** (0.0223)	0.111** (0.0222)	0.0481* (0.021)
N	2427	2427	2427
R-sq., within	0.161	0.086	0.091
R-sq., between	0.513	0.416	0.305
R-sq., overall	0.243	0.144	0.133
F-value	72.04	47.65	45.48
Prob>F	0.0000	0.0000	0.0000

* Significance levels: $p < 0.05$.

** Significance levels: $p < 0.001$.

Source: 2019 Baseline survey data. Models with youth group FE. Standard errors are corrected for clustering at the youth group level.

Table 4
Land rental models with dynamic control for endogeneity.

	Rented land access	Rented land from relatives	Rented land from non-relatives
Lagged land access	0.959*** (0.008)	0.885*** (0.014)	0.846*** (0.018)
Trustworthiness	0.0242* (0.011)	0.036 (0.028)	0.0595* (0.029)
Male, dummy	-0.004 (0.006)	0.004 (0.011)	0.018 (0.013)
Own land	-0.004 (0.002)	-0.002 (0.006)	-0.008 (0.006)
Oxen	0.00733* (0.004)	0.0468*** (0.008)	0.0571*** (0.008)
Land from non-relative		-0.619*** (0.022)	
Land from relative			-0.640*** (0.022)
Constant	-0.003 (0.006)	-0.0297* (0.013)	-0.0439** (0.015)
N	2427	2427	2427
R-sq., within	0.934	0.647	0.587
R-sq., between	0.972	0.826	0.800
R-sq., overall	0.944	0.684	0.631
F-value	4862.4	846.6	490.8
Prob>F	0.0000	0.0000	0.0000

* Significance levels: $p < 0.05$.

** Significance levels: $p < 0.01$.

*** Significance levels: $p < 0.001$.

Source: 2019 Baseline survey data. Models with youth group FE. Standard errors are corrected for clustering at the youth group level.

they would have migrated but some of the other options such as looking for other employment opportunities may also have implied migration. We also see that 24% would have tried to rent (more) land.

One may also wonder how likely it is that the youth group members will give up the youth group activity and look for other livelihood opportunities. The responses to that question in the 2019 survey are summarized in Table A.4 in the Appendix. We see that about 17% indicate that this is quite likely or very likely, showing that the large majority plan to continue. In contrast, Bezu and Holden (2014) found

Table 5
Bivariate probit models for access to land from relatives and non-relatives.

	SUR model		Sequential model	
	Land from relatives	Land from non-relatives	Land from relatives	Land from non-relatives
Trustworthiness	0.049 (0.045)	0.097* (0.041)	0.051 (0.044)	0.101** (0.039)
Male, dummy	0.038* (0.019)	0.060*** (0.019)	0.034 (0.020)	0.066*** (0.017)
Own land	0.010 (0.007)	-0.004 (0.006)	0.012 (0.008)	0.000 (0.006)
Oxen	0.135*** (0.011)	0.120*** (0.010)	0.136*** (0.010)	0.151*** (0.010)
Land from relative				-0.254*** (0.048)
Athrho	-0.242*** (0.055)		0.633* (0.285)	
Rho	-0.237		0.560	

Standard errors are corrected for clustering at youth group level. SUR-model: Wald test of $\rho=0$: $\chi^2(1) = 19.304$, Prob $>\chi^2 = 0.0000$. Sequential model: Wald test of $\rho=0$: $\chi^2(1) = 4.916$, Prob $>\chi^2 = 0.0266$.

* Significance levels: $p < 0.05$.

** Significance levels: $p < 0.01$.

*** Significance levels: $p < 0.001$.

Source: 2019 Baseline survey data. Note: Models with youth group FE. The table presents unconditional marginal effects.

Table 6
Tobit models for area rented in.

	Tob1	Tob2	Tob3
Trustworthiness	1.249** (0.456)	0.968* (0.398)	0.964* (0.394)
Male, dummy	0.978*** (0.184)	0.692*** (0.201)	0.702*** (0.202)
Own land	-0.086 (0.069)	-0.191** (0.061)	-0.196** (0.060)
Oxen	2.000*** (0.163)	0.927*** (0.143)	0.913*** (0.143)
Lagged rent in dummy		22.55*** (0.872)	21.93*** (0.881)
Rent from relatives, dummy			0.403** (0.148)
Group FE	Yes	Yes	Yes
Constant	-3.087*** (0.392)	-20.93*** (1.049)	-20.43*** (1.050)
var(e.rent~)	8.687*** (1.045)	4.075*** (0.542)	4.057*** (0.544)
N	2427	2427	2427

* Significance levels: $p < 0.05$.

** Significance levels: $p < 0.01$.

*** Significance levels: $p < 0.001$.

Source: 2019 Baseline survey data. Note: Standard errors are corrected for clustering at the youth group level.

that the majority of the youth in some densely populated areas in Southern Ethiopia did not see a future within agriculture.

4.1.4. Socio-economic characteristics

Additional socio-economic characteristics of the youth and their family/parent households were obtained through survey interviews and lab-in-the-field experiments. Summary statistics for the socio-economic variables for male and female youth group members are presented in Table A.5 in the Appendix. The data are grouped by gender due to our hypothesis that the land rental market primarily is a complementary source of income for males and the table demonstrates some important systematic differences between males and females that may contribute

Table 7
Multinomial logit models for the main source of income of youth group members, 2019 data.

	Youth group activity	Land renting	Trade	Construction work	Family support	Daily laborer	Borrowed land	Other income
Male, dummy	6.599*** (2.295)	4.514*** (0.868)	3.258*** (0.818)	2.600** (0.955)	2.817*** (0.615)	3.430*** (0.653)	3.100*** (0.683)	2.078** (0.471)
Age, years	0.861*** (0.024)	0.884*** (0.010)	0.879*** (0.013)	0.939** (0.022)	0.744*** (0.017)	0.869*** (0.012)	0.862*** (0.012)	0.914*** (0.015)
Education, years	1.077* (0.040)	1.0099 (0.025)	1.085** (0.031)	1.120* (0.053)	1.054 (0.030)	1.001 (0.023)	0.992 (0.026)	1.118*** (0.037)
Married, dummy	0.107*** (0.038)	0.675 (0.215)	0.290*** (0.100)	1.200 (0.764)	0.061*** (0.020)	0.597 (0.167)	0.724 (0.263)	0.293*** (0.097)
Own & spouse land	0.588** (0.102)	0.451*** (0.038)	0.524*** (0.055)	0.568*** (0.082)	0.241*** (0.082)	0.419*** (0.046)	0.878** (0.044)	0.648*** (0.061)
Oxen	1.144 (0.207)	1.562*** (0.146)	0.636* (0.118)	0.393*** (0.099)	0.633** (0.108)	0.553*** (0.061)	0.999 (0.119)	0.885 (0.129)
District: Raya Azebo=base								
Degua Tembien	0.143*** (0.080)	0.212*** (0.051)	0.361** (0.129)	1.377 (0.797)	0.231*** (0.077)	0.618 (0.188)	0.184*** (0.063)	0.299*** (0.100)
Seharti Samre	0.267* (0.158)	0.302*** (0.090)	0.969 (0.341)	1.146 (0.860)	0.527 (0.185)	1.665 (0.546)	0.614 (0.198)	0.635 (0.237)
Adwa	0.191** (0.104)	0.427** (0.112)	0.485* (0.178)	2.787 (1.639)	1.115 (0.330)	4.217*** (1.199)	1.476 (0.439)	0.812 (0.238)
Main activity: Irrigation=base								
Livestock	0.188*** (0.477)	0.914 (0.206)	1.315 (0.382)	1.050 (0.536)	1.290 (0.344)	1.235 (0.306)	0.956 (0.240)	1.538 (0.489)
Perennials	0.420 (0.242)	1.034 (0.339)	0.397* (0.176)	0.600 (0.436)	1.094 (0.376)	1.490 (0.450)	1.245 (0.447)	1.944 (0.715)
Beekeeping	0.074*** (0.037)	0.571* (0.141)	0.405** (0.131)	0.430 (0.253)	0.882 (0.265)	0.674 (0.176)	0.766 (0.213)	0.751 (0.250)
Constant	392.85*** (400.817)	111.4*** (59.615)	152.0*** (104.428)	0.568 (0.698)	52,762.2.9*** (39,364.460)	134.97*** (83.499)	84.73*** (46.738)	15.12*** (11.335)

* Significance levels: $p < 0.05$.

** Significance levels: $p < 0.01$.

*** Significance levels: $p < 0.001$.

Source: 2019 Baseline survey data. Note: The baseline activity for comparison is income from own farm. The table presents relative risk ratios with cluster robust standard errors.

to the “gender” differences in land rental market access.

Table A.5 shows that there are significant gender differences in farm endowments such as oxen and ploughs which are instrumental for land cultivation. This is likely to affect land access in the rental market. Parent households of males have on average larger farm sizes than the parent households of females. There are also significant gender differences in trust and trustworthiness.

4.2. Econometric analyses

4.2.1. Access to land in the rental market

We assess what the results indicate for our first four hypotheses. Hypothesis H1 states that access to own or other sources of land reduces the need and demand for rented land. We see from Table 3 that the coefficients on own and spouse land as well as on parents’ farm size are insignificant and close to zero. We, therefore, reject this hypothesis. This may indicate that the land rental market functions poorly and rented land is not a good substitute for owned land. It will, however, be more interesting to discuss the size of these coefficients in the area rented models.

Hypothesis H2 states that oxen owned by tenants increase the expected marginal returns from rented land and these are observable endowments that make landlords more willing to rent out their land. We see that the coefficients on oxen are highly significant and positive in all model specifications in Tables 3, 4 and 5, giving strong support to this hypothesis. Overall, oxen raise the likelihood of accessing land in the rental market by 21% points. Oxen are obviously crucial for access to land in the rental market.

Hypothesis H3 states that males are more likely to access land from landlords, given the cultural norms in the Ethiopian society. Table 3 and 5 show that the coefficient on the male gender dummy is significant and positive in all specifications and males are 8% points more likely to access land in the rental market than female youth group members,

ceteris paribus. The lack of significance in Table 4 may be due to high collinearity between access in the past and the gender dummy.

Hypothesis H4 states that more trustworthy tenants have better access to rented land, especially land from non-relatives. Tables 3, 4 and 5 show that more trustworthy tenants are significantly (at 5% level) more likely to access land in the rental market. It is, however, only access to land from non-relatives that is significantly associated with trustworthiness, measured with the trust game (share of the amount returned as trustee). These results are significant at 5% level of significance in all model specifications.

Hypothesis H5, that non-linear (non-convex) transaction costs in the land rental market are associated with access and limited information (search and negotiation costs, trust, monitoring, and enforcement costs), implies that access in the past will enhance the likelihood of current access. This hypothesis has strong support in the models in Tables 3 and 5. The lagged land access variable is highly significant in all models.

Table 5 shows that access to rented land is enhanced by the trustworthiness and oxen endowment of tenants after also controlling for past access.

Finally, hypothesis H6 that access to rented land from relatives and from non-relatives are substitutes also has strong support in the models in Tables 4 and 5 (sequential bivariate probit model).

To assess this potential correlated access from relatives versus non-relatives, we estimated two types of bivariate probit models for the two sources of access, one with a SUR² formulation and one sequential, assuming that potential tenants first try to obtain land from relatives before they search for land from non-relatives. Table 5 presents the model results.

Table 5 confirms the significance of trustworthiness as important for access to land from non-relatives. Being male also enhances access to

² Seemingly Unrelated Regression.

rented land from non-relatives more than from relatives. Oxen are important in both cases. Those with access to land from relatives are 25% points less likely to access land from non-relatives. This is likely due to less effort by the tenants to obtain such land.

4.2.2. Area rented models

Table 6 presents Tobit models with group fixed effects for total area rented in by tenants. Lagged access to rented land is included as a control for endogeneity associated with unobservable time-invariant tenant characteristics in models Tob2 and Tob3. This variable is highly significant and indicates that access to rented land in the past is associated with larger current rented areas. We should be cautious about the interpretation of the coefficients on this variable. However, it should help to control and remove endogeneity bias in the parameters for the other key variables. We see that its inclusion causes substantial changes in the parameter estimates for these other key variables as demonstrated by comparing the results in model Tob1 with models Tob2 and Tob3. We see that males access 0.7 *tsimdi* additional rented land compared to females (supports hypothesis H3, significant at 0.1% level). One extra ox increases access to rented land by 0.9 *tsimdi* (supporting hypothesis H2, significant at 0.1% level), trustworthiness enhances how much land is rented in (supports hypothesis H4, significant at 5% level). One *tsimdi* extra own land reduces access to rented land by 0.2 *tsimdi*, demonstrating substantial transaction costs in the adjustment of operational land area through the rental market (supporting hypothesis H7). In a smoothly functioning market where rented land easily is substituted for owned land, we expect that the coefficients on own land and possibly parents' land if the youth cooperate with their parents in their farming activity, should be close to -1 (Bliss and Stern, 1982; Holden et al., 2010).

Model Tob3 also adds a dummy for accessing land from relatives. We see that such access is associated with 0.4 *tsimdi* additional land (significant at 1% level).

4.2.3. Main income source models

We assessed factors associated with the main income source of the youth group members utilizing the Rank 1 responses in Table A1 and using multinomial models. The most common source, own farm, is the base category that the other alternatives are compared with. The results are presented in Table 7. We did not have any particular hypotheses we wanted to test here. We therefore just summarize the key results. The table presents relative risk ratios.

We see that males are more likely than females to have all the alternative income sources as the main source of income compared with own farm. Older individuals are less likely than younger individuals to have all the alternative income sources as the main income source, compared to own farm. Members that are more educated are more likely to have the youth group activity, trade, construction work, and other income sources as the main income source. Married members are less likely to have the youth group activity, trade, family support and other income as main source of income. More own (and spouse) land enhances the probability that own farm is the main source of income compared to all other activities. Members with more oxen are more likely to have land renting as the main source of income. The youth group activity is more likely to be the main source of income in Raya Azebo district than in the other three districts and the same is the case for land renting. The youth group activity is also more likely to be the main source of income for irrigation groups than for the other types of groups.

5. Conclusions and policy recommendations

We have investigated the potential of the land rental market to serve

as a complementary source of income for land-poor rural youth in northern Ethiopia. Our study is of land-poor youth that are formal members of youth business groups that recently were allocated land for joint business establishment as a complementary source of livelihood. We have attempted to answer five research questions. First, we aimed to answer to what extent the land-poor youth access rented land on an individual basis. We found that access to rented land was common among the youth group members with 42% having access to rented land in 2016 and 47% having such access in 2019. Converting from the local area unit *tsimdi* to hectares we found that those with access on average accessed 0.66 ha of rented land in 2016 and 0.74 ha in 2019. Second, we asked what constraints do the youth face in their attempts to access rented land and what can enhance their access? We found that it was mostly male youth, who own oxen, that were able to rent land. Being trustworthy, measured using the trust game, also enhanced access to land in the rental market and particularly accessing land from non-relatives. Female youth group members appeared generally disadvantaged in their access to complementary sources of income. Earlier studies have found that it was primarily experienced male farmers with oxen that accessed rented land (Holden et al., 2010). Our study reveals that access to rented land by youth has improved over the years with growing youth landlessness. The shrinking farm sizes in the study areas (Holden and Tilahun, 2020) also put pressure on the land rental market as a mechanism to reallocate land from the relatively more land-rich to the land-poor, able, motivated and trustworthy youth that are capable of managing rented land. The land rental market is therefore likely to play a more important role in rural transformation processes where diversification into non-agricultural activities becomes more important and facilitates different forms of specializations in livelihoods.

The relatively high degree of access to the land rental market does not imply that the market operates efficiently, however. Access is constrained by non-linear transaction costs as evidenced by the low coefficients on own land in the regressions and access being highly dependent on gender and oxen ownership and kinship ties as well as lagged access. Our data compared to earlier studies in the study region (Gebru et al., 2019; Ghebru and Holden, 2009; Holden et al., 2011) indicate that access has improved over time for those who prove that they are reliable tenants. Tenure security, provided through the land registration and certification reform, has been an important basis for this (Deininger et al., 2008; Holden et al., 2011).

Our third and fourth research questions were whether rented land can provide an important source of income for the youth and how important rented land is as a complementary source of income for near landless youth compared to other sources of income. We found that land renting was the most important source of income for 17% and 16% in 2016 and 2019 and the second most important source of income for 14% and 20% of the respondents in 2016 and 2019 respectively. In relation to these questions we assessed future expectations of the youth about sources of income. Asking about expectations five years into the future, we found that the expectations that the youth group activity would be the main source of income had been reduced from 61% to 32% of the respective samples in 2016 and 2019. The share that expected land renting to become the main source of income had increased from 6% to 13%. We may, therefore, conclude that land renting to a larger extent was perceived as a temporary solution in 2016 than in 2019. The fact that land cannot be purchased or sold in Ethiopia limits the potential for the "agricultural ladder" to be a pathway out of poverty for the poor through first renting and then purchasing land. However, we see that land access through inheritance, administrative redistributions and marriage also have improved overall land access. Jointly with rented land and the jointly held land through the youth business groups it appeared that the large majority of these very land-poor youth were able

to establish sustainable land-based livelihoods.

In our study we have used a theoretical framework based on transaction cost theory adapted to the land rental market. This theory emphasizes the role of non-linear transaction costs and imperfect information that cause rationing and unequal access in the market. Social networks and trust that can be improved over time and vary across potential market participants and cause the market not to be a level playing field. The market works better for those with connections (kinship contracts), those with observable capacity to farm efficiently (having oxen and male labor), and those that are known to be trustworthy (public knowledge). With sharecropping being the dominant type of land rental contract, which also makes sense in this type of risky environment as a risk-sharing mechanism, these fundamental characteristics of the market are likely to prevail. Our recommendation is not to try to intervene to change these fundamental characteristics or to impose area restrictions in the land rental market as has been attempted recently in Ethiopia (Holden and Ghebru, 2016).

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Appendix

Elicitation of trustworthiness

The strategy method was used to elicit amounts (to be) returned depending on amount received and depending on whether the sender and receiver was an anonymous person from the same youth group or an unknown person belonging to another youth group in the same district. As land is typically rented from persons outside their own group we used the amount returned to an unknown person from another group in the same district as the measure of generalized trustworthiness. The responses in these questions were later enforced when they received the envelope from the respondent (revealing actual type of trustor and amount sent by the trustor). We chose the responses for the conditional question that was closest to the average actual amounts sent to a stranger in the game (1/3). The questions stated were as follows (translated into the local language Tigrinya):

How much will you leave in the envelope (return to the sender who is a random anonymous person in own youth group) if the amount in the envelope is 30 ETB?	ETB
How much will you leave in the envelope (return to the sender who is a random anonymous member of another youth group in the same district (woreda)) if the amount in the envelope is 30 ETB?	ETB

See Fig. A.1 and Tables A.1–A.5 here.

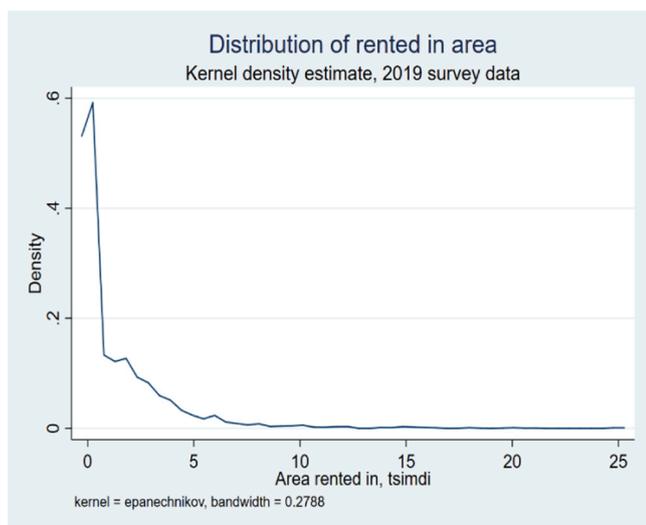


Fig. A.1. The distribution of area rented in.

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Table A.1
Youth income sources, by rank. Rank 1 =most important.

	Income sources, August2015-July2016			Income sources in 2018		
	Rank 1, %	Rank 2, %	Rank 3, %	Rank 1, %	Rank 2, %	Rank 3, %
Youth group activity	7.0	27.6	16.8	2.9	8.7	12.8
Land renting/ Sharecropping	16.8	14.0	3.5	16.0	20.4	8.6
Trade	9.6	7.4	3.4	6.6	5.6	3.7
Construction work	10.9	8.7	4.5	1.4	1.1	0.9
Support from family	20.9	10.3	3.5	17.7	5.7	1.5
Own farm	29.2	5.3	1.9	25.1	9.1	2.6
Daily laborer	–	–	–	16.9	17.0	9.4
Other, specify	5.7	5.7	3.0	4.5	4.0	3.2
Temporary land from family	–	–	–	8.9	12.4	7.8
No activity	0	20.9	63.5	0	16.0	49.5
Total	100	100	100	100.0	100.0	100.0
Sample size	1138	1138	1138	2427	2427	2427

Source: 2016 and 2019 Baseline survey data.

Table A.2
Expected main source of income five years into the future.

Source of income	2016 survey		2019 survey	
	Freq.	Percent	Freq.	Percent
Youth group activity	691	60.7	771	31.8
Land renting/Sharecropping	67	5.9	314	12.9
Trade	137	12.0	432	17.8
Construction work	20	1.8	55	2.3
Support from family	9	0.8	45	1.9
Own farm	189	16.6	604	24.9
Other, specify	11	1.0	128	5.3
Do not know/Very uncertain	6	0.5	78	3.2
Missing responses	8	0.7	0	0
Total	1138	100	2427	100

Source: 2016 and 2019 Baseline survey data.

Table A.3
Livelihood choices if not joining the youth business group.

	First choice		Second choice	
	Freq.	Percent	Freq.	Percent
Migrated to urban area to search for employment	474	19.5	347	16.2
Rented/ Sharecropped in (more) land	589	24.3	381	17.7
Migrated out of the country	36	1.5	14	0.7
Gone to school to get more education	84	3.5	13	0.6
Looked for other employment opportunities	370	15.3	237	11.0
Own farm	595	24.5	143	6.7
Other, specify	279	11.5	102	4.8
No more			1190	42.4
Total	2427	100.0	2427	100.0

Source: 2019 Baseline survey data.

Table A.4
How likely is it that you will give up the youth group activity and look for another source of livelihood?.

	Freq.	Percent
Very unlikely	757	31.2
Quite unlikely	1247	51.4
Quite likely	350	14.4
Very likely	73	3.0
Total	2427	100.0

Source: 2019 Baseline survey data.

Table A.5
Socio-economic characteristics, by gender.

	2016 survey			2019 survey		
	Females Means	Males Means	Pr (T > t)	Females Means	Males Means	Pr (T > t)
Number of oxen	0.54	0.82	0.0000	0.79	0.96	0.0000
Number of ploughs	0.49	0.73	0.0000	0.90	1.06	0.0001
Farm size of parents, <i>tsimdi</i>	1.95	2.46	0.0002	2.56	3.15	0.0000
Trust, share invested	0.36	0.43	0.0000	0.36	0.44	0.0000
Trustworthiness, share returned	0.27	0.30	0.0072	0.29	0.33	0.0001
Birth rank	3.09	3.11	0.8600	3.21	3.42	0.0333

Source: 2016 and 2019 Baseline survey data.

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