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Livelihood Choices of Youth Group Members in Ethiopia

The Role of Gender, Education and the Youth Group Membership

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Abstract

In the Tigray region in Ethiopia, a promising program was launched to create livelihood opportunities for rural, landless youth: Youth are organized in groups, which are equipped with some land to carry out specific income generating activities (e.g. beekeeping) in a sustainable way. Hence, a possible win-win-win situation is created. But what role do the youth group activities play in their members' livelihoods? In this study, a multinomial logit model and an ordered logit model were used to examine the occupational choice as well as the diversification strategies of 1,072 youth group members. Most of the youth receive the largest share of their income from the agricultural sector, followed by the non-agricultural sector and support from their parents. However, the majority of the youth group members has two or more income sources. In the job choice as well as the diversification decision gender differences were found: Females are significantly less likely to diversify, less likely to work in the non-agricultural sector and, due to overall more limited employment possibilities, more likely to work in the agricultural sector (on the family farm). Education affects the occupational choice as well: More education seems to pull the youth away from the agricultural into the non-agricultural sector. The youth group activity itself only provides limited income opportunities. Only 6% mention the youth group activity as the main income source, and for almost half of them the membership does not give any income at all. However, the regression results point to the future potential of the program. The longer the youth group exists, the more likely is the member to diversify and, therefore, an increase in the importance of the youth groups as a livelihood source is likely.

Keywords: youth, youth groups, livelihood choice, occupation, diversification, gender, education, Ethiopia

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1 Introduction

Ethiopia is one of the fastest growing economies worldwide. Between 2008 and 2018, the average annual growth rate of the GDP amounted to 9.7% and, today, Ethiopia is one of the ten largest economies in Africa (African Economic Outlook 2018). Despite the economic development, Ethiopia is still listed as one of the least developed countries in the world (UN 2018a). Approximately 26.7% of Ethiopia's population lives in extreme poverty, i.e. lives from less than $1.90 a day (2010 PPP). There are vast differences between urban and rural inhabitants. While in 2015 only 9% of the urban population lived in extreme poverty, 32% of the rural population was considered to do so. Likewise, younger people are more likely to be poor as well as less educated people. For example, 28% of those without education were poor compared to 8% of those with secondary education (World Bank 2018b). In 2017, the unemployment rate, i.e. the proportion of unemployed as percentage of the total labor force, was estimated to be 5.2%. There were, however, large gender differences with the unemployment rate for women being more than twice as high as the unemployment rate for men (7.5% vs. 3.1%). Especially the youth struggle with unemployment. In 2017, 7.4% of the 15-24 year old were searching for an employment possibility (ILO 2017).

With respect to employment possibilities in Ethiopia, agriculture is by far the largest sector. 73.6 % of the population (10 years and older) is working in the agricultural sector or in fishing and hunting. In the rural areas, this number increases to 86.6%. The high dependence on the agricultural sector comes along with some difficulties. First, climate risks, such as droughts and floods, have large effects on the agricultural based economy, and directly affect the well-being of the majority of the population. Ethiopia already is quiet prone to climate risks, but the ongoing climate change is likely to worsen the situation of the farmers (for example, see Belay et al. (2017) or Kassie et al. (2015)). Second, in Ethiopia there is a high degree of land degradation and land desertification, among others, due to conversion of forests and unsustainable land use (Lemenih & Kassa 2014). Although there has been some progress, currently only approximately 15% of the total land area are considered to be arable (World Bank 2018a). The pressure on the (remaining) land further increases through the high population growth rate of 2.9% (Statista 2017). On top of that, urbanization in Ethiopia is comparably low. While only 20% of population in Ethiopia lived in urban areas in 2016, globally more than 54% of the population does so (UN 2018b). Hence, the vast majority of the

population lives in rural areas and directly depends on land as a livelihood source. The result is land scarcity. Already today, average farm sizes in Ethiopia are small. In 2015, the average land holding was 1.03 hectare per household (on average 5.14 people) (CSA 2016). Hence, production possibilities of the farm households are limited which makes a production above the subsistence level difficult. In addition, land scarcity impedes the fulfillment of the land right of the rural population. In Ethiopia, a market for land does not exist. Instead, the Ethiopian government is legally obligated to allocate sufficient land to all people in rural areas, who want to obtain their livelihood from farming for free (Bezu & Holden 2014). Of course, land degradation, land scarcity and population growth make the fulfillment of this right problematic. As a consequence, many rural people do not have (sufficient) land, and as agriculture is by far the most important sector in the region, poverty and under- or unemployment are likely to remain. This is especially true for the youth, of which many are landless and trapped in poverty. The limited possibilities in the rural areas push more and more youth to leave the region to find sufficient livelihood sources in urban areas or abroad (Bezu & Holden 2014).

The Ethiopian government implemented different policies to combat these challenges. In 2017, Ethiopia won the UN-backed Future Policy Award for the world's best policy on combating desertification and land degradation. The award-winning policy was the Conservation-Based Agricultural Development-Led Industrialization (ADLI) (1994) together with Mass Mobilization Campaigns (1991) and the Youth Responsive Land Policy (2008). The former comprises large investments as well as a number of policies and programs to restore vast amounts of degraded lands, and to foster the uptake of sustainable agricultural practices (Wilkie et al. 2017). In 2014, more than 3 million hectares of land were protected from human or animal interference to enable restoration (Holden & Tilahun 2016; Lemenih & Kassa 2014). The mass mobilization campaigns refer to community level labor mobilization for conservation activities. Each adult able-bodied person is obliged to work 40 days per year for the communities without pay. This labor mobilization is mostly used for soil and water conservation such as building bench terraces. Overall, the protection of land and the conservation activities of the mass labor mobilization were quite successful. In many regions, water holding capacity was increased and ground water levels are on the rise again. This enables communities to use water for irrigation and, hence, increase productivity and food security in the region (Holden & Tilahun 2016; Wilkie et al. 2017). The third award-winning policy is focused on the youth in Ethiopia, who particularly struggle with securing their livelihoods in rural areas due to land scarcity, high

unemployment and poverty. This youth focused policy is of special interest in this paper and will therefore be discussed in more detail.

As described above, the Youth Responsive Land Policy was launched by the Ethiopian government in 2008, and is a part of Ethiopia's program to combat desertification and land degradation. The policy works as follows: Landless youth are assigned to a youth group and each youth group is provided with an amount of land. The land which is assigned to the youth groups mainly stems from formerly protected and now rehabilitated areas. Depending on the characteristics of the assigned area, experts predefine a suitable main activity for each group. The main activities include beekeeping, animal rearing, irrigation/horticulture, forestry and mining. To support and to facilitate the success of the groups, training is provided. In addition, credit institutions offer financial support to enable the often high initial investments. The youth groups are obliged to form primary cooperatives (i.e. limited liability organizations) based on cooperative law. The groups must prepare a business plan, elect a board and develop their own bylaws. The youth groups are also subject to regular auditing. One essential component of the policy is that the land is assigned conditional on performance. Only if the youth groups perform well in the first two years of implementation, they will receive a legal document which confirms the right of this land. The formal land certificate will be issued if youth groups continue to show good performance and, especially, demonstrate sustainable land use over a longer period of time. The sole exception are youth groups with mining as main activity. In contrast to the other youth groups, the mining groups are only of temporary nature. These groups are obliged to save 50% of the group income until a specific amount is reached. Then, the youth group activity ends, and the former members use the savings to start or work in other businesses. However, in the following only long-term youth groups are considered. The target group of the Youth Responsive Land Policy are, of course, youth. To be able to join the youth group potential members must be a resident in the same municipality the youth group is located in (Holden & Tilahun 2016; Wilkie et al. 2017). Although the Youth Responsive Land Policy was officially launched in 2008, a few youth groups were already started in 2003. By 2016, there were 742 youth groups with a total of 14,500 members in just five districts in the Tigray region. On average, each group has close to 20 members and, although gender balance was aimed for, the share of females only is 34.4%. However, in view of another aspect equality is predominant: Despite partly different workloads, almost all groups (98.7%) share the income equally among their members (Holden & Tilahun 2018b).

This approach – the organization of youth into groups, the provision of land, training and financial support while greatly encouraging sustainable land use – might help to overcome some of the challenges Ethiopia is facing. Above all, working opportunities are provided which is especially important when considering the limited employment possibilities in rural Ethiopia, and the accompanying high unemployment and poverty rates for the youth. Employment possibilities in the rural areas might also dampen migration of youth into urban areas or out of the country. Political unrests that stem from distress of youth, for example, due to high youth unemployment rates as observed in the Arab Spring might also be avoided (LaGraffe 2012). The provision of training and financial support as well as the other requirements for the groups (e.g. business plan, bylaws) facilitate the success of each group. In addition, the allocation of public land is not only in interest of the youth group members themselves, but also in interest of the government which can ensure the fulfillment of the land right. The obligation for sustainable use of the land ensures that further land degradation can be avoided.

Overall, the Youth Responsive Land Policy is a comprehensive approach that can play a role in overcoming some of the country's most pressing challenges. The main objective is to create a possibility for the landless youth to sustain their livelihoods in the rural area. However, so far it has not been researched what impact the youth group membership plays in securing livelihoods. In this paper therefore the following questions are studied: How do the youth group members sustain their livelihoods? What role does the youth group membership play in this? Hereby, a special focus will be put on the influence of gender and education on the job choice and on the diversification decision.

To answer these questions, data from the Youth Group Member Survey, Tigray, Ethiopia, which was collected from the Mekelle University in collaboration with NMBU in 2016 is analyzed. This paper is organized as follows. First, theories and literature on the two aspects of livelihoods – occupational choice and occupational diversification – are summarized. Thereby, a special focus is put on the role of gender and education in these livelihood decisions. From this, the conceptual framework is drawn, and hypothesis are derived. The third chapter gives an overview of the data and summarizes important characteristics of the youth group members. Further, the empirical methods are explained and, then, the results of the regression analyses are presented and discussed. Lastly, limitations of the study and further research needs are described.

2 Background and Literature Review

So, how do the youth group members sustain their livelihoods? And what role does the youth group membership play in this? When discussing livelihood sources, a distinction can be made between the primary income source and the diversification of income sources. The former refers to the main occupation, as this is the activity where a large part of the income is coming from and, usually, where the most time is spent on. The latter refers to not only having one income source, but instead to engage in secondary occupations and, thus, to diversify income sources. Hence, in order to analyze the livelihood decision, not only the main occupation but also occupational diversification must be considered. In this chapter, theories and literature that explain these decisions and the underlying mechanisms or influencing factors are reviewed. Hereby, a focus will be put on gender and education. Towards the end of this chapter, the youth group activity as a possible income source is discussed. The theoretical and literature findings are then used to derive the hypotheses.

2.1 Occupational Choice

Of course, the labor market or existing job opportunities shape the occupational choice. As already mentioned above, the vast majority of the working population is employed in the agricultural sector or in fishing and hunting (86.6% in rural areas), followed by housekeeping (4.2%), wholesale/trade/motor vehicle repair (3.3%) and manufacturing (2.2%) (CSA 2018). However, these numbers refer to the main activity of the working age population and, hence, neglects the extent to which household engage in non-farm activities via diversification. An overview of income diversification is given in the next section. Still, the numbers point to the fact that the agricultural sector is the main income source for the rural population and that the other sectors are comparatively small. This directly affects or limits the occupational choice.

The economic development of a country affects and is affected by the relation of the different market sectors. Theory suggests that, as a country develops, main economic activities shift from the agricultural sector to manufacturing and service sectors. Consequently, the labor demand and, hence, job opportunities change (Haggblade et al. 2007). It is assumed that people benefit from newly created jobs, higher wages and, due to the shift out of the agricultural sector, a higher per capita land size for those who pursue farm activities. With this, revenues from farm work can be increased and, thus, the road for higher agricultural investments is paved. The Ethiopian government follows this idea with its' Agricultural Development Led Industrialization (ADLI) strategy. With high investments in the agricultural sector and an

increased farm productivity, it is attempted to facilitate the development of rural non-farm activities and, with this, to create a wide range of (rural) job possibilities (Schmidt & Bekele 2016). In the last decade, the Ethiopian economy was growing substantially with annual growth rates between 7.5% and 12.5% (The World Bank 2018a). However, data shows that the structural transformation from the agricultural sector towards the service or manufacturing sectors has been small. Between 2005 and 2013, the share of people with agriculture as their main livelihood decreased only from 80.2% to 76.7% (Schmidt & Bekele 2016). As mentioned above, urbanization in Ethiopia is low with only 20% of the population living in urban areas (The World Bank 2018b). The low urbanization rate coupled with the slow shift towards the manufacturing or service sectors provide evidence that agriculture will continue to remain the main income source (Schmidt & Bekele 2016). It remains to be seen whether or when the continued economic growth in Ethiopia will transform the rural economy and create new job possibilities.

Although the labor market (e.g. labor demand in the different sectors) is an important aspect in the decision for or against an occupation, individual characteristics (e.g. preferences and education) and the social structure (which shapes personal development and defines socioeconomic conditions) are equally important. The importance of these factors implicates that the occupational choice can only partially be described as a choice. It rather can be seen as a consequence of individual characteristics and the (social) environment one is brought up or lives in. Moreover, the choice might be made unconsciously or with only limited knowledge of alternatives (Blau et al. 1956).

Individual characteristics that play an important role in the job choice are the gender and educational attainment, as discussed in some detail below. Other important individual and household characteristics include the birth rank (e.g. when assuming that parents invest more in their first-born child), the marital status, wealth of the household (e.g. ownership of livestock), social networks and land endowment. For example, limited land access or limited farm sizes might not provide the possibility to sustain adequate livelihoods and, therefore, prevent(s) from choosing a main occupation as a farmer. Next to that, the society one lives in, traditions, culture, religion and the prevalent assumption or stereotypes (e.g. with regards to the suitability of jobs) affect the job choice (Ellis 1998).

To sum up, the occupational choice is strongly influenced by the labor market, social norms, individual characteristics, own preferences, and the family one grows up in. While these factors help to explain which occupations individuals choose, they do not give reasons for income diversification (i.e. the uptake of several jobs). Therefore, reasons for occupational diversification are assessed in the next chapter.

2.2 Occupational Diversification

In the developing world, income diversification is the norm. This is also true for Ethiopia, where many households or individuals choose to diversify their income sources. As the national surveys solely ask for the main occupation of individuals (e.g. surveys from the Central Statistical Agency of Ethiopia), a national estimate of the share of households who diversify does not exist. However, empirical studies found diversification rates of farm households to be as high as 81% in the Tigray region (Woldenhanna & Oskam 2001). In the East Hararghe Zone (Oromia State), 84% of the farm households are engaged in non-farm or off-farm activities, which accounted for 23% of total household income (Demissie & Legesse 2013). This data demonstrates that the majority of (rural) households diversifies its income sources, and that off-farm and non-farm income constitutes a substantial proportion of the total household income.

Often, economic household models are used to describe livelihood diversification strategies of agricultural households. Singh et al. (1986) developed a model to illustrate (economic) decision making of these agricultural households. The households are assumed to maximize their utility derived out of consumption of self-produced agricultural commodities, purchased goods and leisure time, subject to time, cash income and production constraints. Within this framework, the decision to diversify depends on the relation of non-farm and on-farm earning possibilities. If the return to labor, that is the wage rate, of non-farm work increases or if there are more job opportunities, the household would more likely diversify its income sources. In contrast, higher farm productivity or higher output prices would reduce diversification (Ellis 2000). However, the return to labor is not the only factor shaping the diversification decision.

Instead, the decision to diversify income sources is shaped by a variety of factors. One possibility to explain diversification is with the underlying motive – while some are forced to diversify to sustain their livelihood, others diversify to accumulate wealth. This dual character of livelihood diversification is often grouped into survival-led and opportunity-led diversification (Alobo Loison 2015; Ellis 2000). One should note that as living conditions

change, so does the underlying motive. A household which prior diversified to sustain their livelihood, might later do so to accumulate wealth (Ellis 1998).

Another possibility to describe diversification strategies is with push and pull factors. Pull factors are associated with opportunity-led diversification and describe positive factors that draw or incentivize individuals to pick up an additional job (Alobo Loison 2015). Pull factors comprise higher returns to labor and/or more secure payoffs (Reardon et al. 2007). Next to higher returns to labor and secured incomes, aspects such as technological progress, better market access, higher educational attainments and an improved infrastructure are categorized as pull factors. In contrary, push factors are associated with survival-led diversification and refer to negative factors that force or push individuals to pick up additional jobs in order to secure their livelihood (Alobo Loison 2015). In the context of rural households, push factors can develop out of the surroundings such as market failures, natural disasters like floods or droughts and political unrest or wars. These type of push factors tend to affect a whole region simultaneously and the high demand for additional income sources might reduce opportunities to find off-farm work. In addition to regional conditions that push into diversification, individual constraints, such as small farm sizes, limited technology access, a reduction in farm size due to relocation, environmental deterioration of farm land and illness, are considered to be push factors (Reardon et al. 2007).

In Ethiopia, agriculture is by far the largest employment sector, especially in the rural areas. And agriculture is highly depended on the different seasons. This means, consequently, that the workload and income streams are not evenly distributed throughout the year. Considering the fact that agricultural income might not be high enough to fulfill the income needs of a household and that market imperfections or (environmental) risks limit the possibility to ensure a certain agricultural income, diversification can be crucial (Ellis 1998). Seasonality as well as environmental disasters are closely related to risks and, hence, risk strategies of the households. Income diversification is one key strategy of households to reduce risk. The idea is to diversify in income sources with low covariate risks. For example, if the main occupation is within agriculture, the household or person would diversify in another sector (e.g. manufacturing) which is not affected by the same risks (e.g. climate). Diversification as a risk strategy is a planned and voluntary behavior. It therefore differs from diversification as a coping mechanism, which takes place if unexpected shocks force individuals or households into diversification (Ellis 2000).

Diversification literature shows that there is a positive relationship between non-farm income and the well-being (e.g. income, wealth and nutrition) of households (Alobo Loison 2015). Wealthier households have a higher share of non-farm income as well as a higher total non-farm income. This implies that non-farm income possibilities are unevenly distributed, leaving the poor worse off. One reasons for this are the entry barriers, which limit the opportunity of the poor to start a new business. In addition, the poor have less education or lack skills, which limits their ability to enter the high-return nonfarm labor market (Reardon 1997). Hence, the wealthier or better educated individuals have the opportunity to choose from a wide range of high paying non-farm jobs, while the poor are forced to choose unskilled, low payed off-farm labor (Barrett et al. 2001).

While being wealthy can enable people to diversify, diversification can enable people to accumulate more wealth. Higher wages of off-farm work enable households to save and invest in their farm. With these investments, farm output and, therefore, returns to labor can be increased. With higher returns from the farm activities, the households are able to undertake further investments (for example, in education) and are more likely to be able to diversify in better paying off-farm employment activities (Reardon et al. 2007). Hence, this can be seen as a positive spiral which might eventually lift people up. In developing countries, the need to diversify to be able to save and to invest is often driven by incomplete or non-existing credit markets. However, if credit markets do not exist and entry barriers limit the possibility to diversify income sources, the poor are less likely to experience this positive spiral (Barrett et al. 2001).

As discussed above, the reasons for income diversification are manifold: Some diversify to be able to sustain their livelihoods (i.e. push factors such as small farm sizes are important), while others diversify to seize the opportunity (i.e. pull factors such as a high return to labor are important); some diversify to smooth the income streams throughout the year (e.g. when mainly relying on agriculture); environmental risks and disasters push into diversification as well as missing credit markets. Although diversification of income sources is often sought, individual characteristics restrict who is able to diversify into what jobs. Two important characteristics are the gender and the educational attainment. Therefore, in the following the role of gender and education in the labor market are discussed.

2.3 Gender

Gender matters. All over the world, differences in job choices of women and men persist. In the article "Theories of Occupational Segregation by Sex: An Overview" Richard Anker (1997) discusses several theoretical approaches to describe the background for these differences. The neo-classical economic theories as well as feminist or gender theories mentioned in the article are described below.

Neo-classical economic theories build upon the assumptions that actors behave rational and that markets are efficient. Job seekers choose the highest paying job subject to their endowments (e.g. education), their constraints (e.g. child care) and preferences (e.g. work field, flexible hours). Employers seek to maximize profits and, as markets are efficient, pay a wage similar to the marginal productivity. When considering gender differences in this framework, the labor supply as well as the labor demand can be reflected upon. Labor supply factors as well as labor demand factors capture differences in preferences of women or the employers, respectively. These preferences are influenced by learned culture, social values and stereotypes. With regards to labor supply factors, differences in human capital are used to describe differences in the job choice (and the payment) of women and men. In general, the, on average, lower educational attainment of women as well as lower on-the-job experience affects the productivity of women and, hence, also their job choice. Especially in developing countries, the gender gap in education (i.e. women have on average less education, e.g. because parents invest more in son's education than in the education of their daughters) persists and can partly explain occupational segregation by sex. In addition, women, on average, have less work experience. The main reason for this is that women are often considered to be (almost solely) responsible for domestic work and child upbringing. Consequently, they spend less time on the job, have less work experience and a lower range of jobs to choose from. Anker points out that in low-income countries jobs requiring higher education are rare and, hence, there are often more men and women who have obtained the education needed. The favoring of men or the overrepresentation of men in these jobs can then be seen as discrimination against women. The discrimination of women in the labor market results in a lower work experience, which further contributed to the disadvantage. On the labor demand side, again, educational attainment and on-the-job experience are important factors in deciding for an employee. In addition, other alleged factors play a role. For example, Anker describes that women are believed to be higher costs workers. The reasons for this are higher (assumed) indirect labor costs associated with factors such as higher rates of absenteeism (e.g. because of family responsibilities), higher turnover rates (e.g.

because of child upbringing) and less flexibility with regards to working hours. Another model that can be used to describe segregation of occupations by sex and that is grouped in the neoclassical economic theory category was developed by Becker (1971). In his book "The Economics of Discrimination" Becker explains that if (negative) prejudices against a certain visible characteristic of a person exists (e.g. the race or sex), the employment of people with these characteristics comes along with some costs (i.e. disutility). If an employer experiences disutility when employing e.g. women, the employer would decide to only employ men (Anker 1997). This can be transferred to customers decisions as well: For example, if a common prejudice in a society is that women are not able to do a certain job as well as men, customers might prefer a company where men instead of women work in this particular position. In this scenario, employers would be better off if this certain position is staffed with men. Overall, neoclassical economic theories stress the importance of the existing differences in human capital between men and women when explaining occupational segregation. In addition, other costs associated with employment (e.g. indirect labor costs, costs of discrimination) are used to explain differences in occupations.

Next to neo-classical economic theories, Anker mentions feminist/gender theories as a possibility to explain occupational segregation by sex. Feminist or gender theories stress the fact that women often are assigned a subordinate position in societies; men are assumed to be the main breadwinner of a family, while women take on the majority of household chores and child upbringing. Although these assumptions may not reflect the reality, they do affect people's behavior and make room for discrimination against women. This "division" of responsibilities leads to the belief that women need less skills that are relevant in the labor market. Consequently, not only do females obtain less work experience due to temporary or permanently leaving the labor force because of, e.g., child upbringing, but they also receive less education before even entering the labor market. In addition, gender theories stress that stereotypes about females affect the occupational segregation by sex. This includes "positive" stereotypes (e.g. caring nature), "negative" stereotypes (e.g. lesser physical strength, lesser ability in mathematics) and "other" stereotypes (e.g. greater willingness to take orders, greater willingness to accept lower wages). The negative stereotypes "exclude" women from entering certain occupations and, hence, make them typical male occupations, whereas the "other" stereotypes characterize typical female occupations (e.g. low pay and high flexibility). Next to stereotypes, gender theories also point out that cultural restrictions on women shape the occupational choice (Anker 1997). For example, a tradition or culture that is of some relevance

in Ethiopia and that discriminates against females is the allocation of land. The agricultural sector is by far the largest employment sector, especially in rural areas. However, both private (i.e. through inheritance) and public allocation of land disadvantage women (Dokken 2015). Consequently, the current allocation of land might be one reason for occupational segregation. Overall, gender theories point to the fact that the "traditional" role of women (e.g. being responsible for household and children), stereotypes and cultural restrictions often disadvantage women and limit their job choices.

To sum up, the gender is an important determinant of occupational choice. All over the world, occupational segregation by sex can be observed. Theories explain the differences in the job choices with a number of factors: the traditional role model for women; the, on average, lower human capital (i.e. education, work experience) of women; higher costs associated with hiring women; the segmentation of the labor market in typical male and female occupations; stereotypes (i.e. the public perception of suitability of certain jobs) and cultural restrictions. Hence, gender is an important determinant in describing job choice and diversification decisions.

2.4 Education

As already mentioned in the discussion above, education is another important factor when modelling the job choice. The general assumption hereby is that the higher the education is, the higher is the (assumed) productivity of a worker and the higher is the (potential) wage. Two possible explanations of the relationship between productivity, education and wages are the *schooling model* and *schooling as signal* (Borjas 2013).

The *schooling model* assumes that workers maximize the present value of their life time earnings. Depending on the individual discount rate, people invest in education (i.e. give up earnings today in return for higher earnings in the future (low discount rate)) or decide against education and for an early entrance in the labor market (i.e. current higher earnings in return for lower potential earnings in the future (high discount rate)). Higher earnings can be explained with an increased productivity through schooling. In addition, higher earnings can also be seen as a compensation for the costs associated with continued schooling (e.g. opportunity costs of foregone earnings). In this model, the person would choose to continue to go to school until the discount rate and the marginal rate of return to schooling (i.e. the percentage change in earnings resulting from one additional year of education) are equal. The wage function with respect to

education is concave – hence, there are diminishing return to years of education. And as people compare their individual discount rate to the marginal rate of return, a higher discount rate leads to an earlier drop out of school. One should note that the return to schooling differs between people. For example, it is assumed that with a higher general ability, people benefit more from each additional year of schooling than those who are less able. Overall, education increases productivity and that the higher productivity is rewarded with a higher wage rate (Borjas 2013; Mincer 1958).

In contrast, *schooling as a signal* assumes that the educational attainment acts as a signal for the productive capability of workers. Instead of education improving the productivity and thereby increasing wages, it is assumed that only the "smart" or more productive people choose more education. That only productive people engage in more education is explained with the assumption that schooling is associated with some costs (e.g. time (and accompanying foregone earnings)). These costs are substantially higher for those with low productivity (e.g. more time needed to study). As individuals want to maximize the difference between potential wages and the schooling costs, individuals who are less productive will choose less education than those who are more productive. Thus, people with more education signal the potential employers that they are more productive. Consequently, a higher education leads to a higher wage (Borjas 2013; Spence 1978).

Both theories on education point to the fact that higher education is associated with higher productivity and, consequently, obtaining more education gives an advantage in the labor market as employers prefer workers with higher productivity. Therefore, education directly affects the job choice and job diversification (e.g. more education qualifies for more jobs) decision.

2.5   Youth Groups as an Income Source

The Youth Responsive Land Policy primarily was introduced to create an employment possibility and, hence, an income source for the rural, landless youth. There are a several aspects that may currently lower the profitability of the youth groups and, hence, their suitability as a livelihood source. First of all, a large share of the youth groups has been established relatively recently. As a consequence, the youth groups might have had to undertake (high) initial investments to start the assigned activities. The start of a new activity also means preparing (e.g. planning how to carry out the activities), practicing, making mistakes and

improving. Hence, the youth are likely to have spent some time on learning, instead of producing. For these reasons it can be assumed that the first year(s) of the youth groups might not be as beneficial. Later, or with more practice and experience, the group might be able to produce more efficiently. And as less investments have to be made, more revenues are left for the members. Second, the (immediate) success or financial benefits for the youth group members most definitely depend on the activity carried out. Although the activity for each youth groups was determined by experts under consideration of the suitability for each area, there might be activities that generate higher (immediate) revenues. For example, forestry is related to long term investments and, hence, requires some time until it pays off. To sum up, especially in the early years of the youth groups, high investments, low(er) productivity or low levels of return (e.g. forestry) can limit the importance of the youth group membership as a livelihood source.

2.6 Conceptual Framework and Hypotheses

Ethiopia pursues the formation of youth groups as a strategy to provide employment possibilities and land access to rural youth, while at the same time ensuring a sustainable management of the land provided. This youth group program could be a useful approach to combat several challenges the country faces: youth un- or underemployment, scarcity of land and the related difficulties to fulfil the constitutional right of land access, high urbanization rates and degradation of land. The program has the potential to create a win-win-win situation for the government, environment and the rural youth – the constitutional right for land is fulfilled, sustainable natural resource management is ensured and employment possibilities for the youth are created (Holden & Tilahun 2016). As yet, it has not been clarified what role the youth group membership plays in the livelihoods of their members. The aim of this paper is, therefore, to assess the livelihood strategies of the youth group members and to understand how the youth group membership contributes towards their earnings.

One core component of livelihood strategies is the occupational choice of the youth. As discussed above, the choice for one occupation is not only shaped by own preferences and abilities, but also by the personal and social surroundings, and, of course, the (local) employment possibilities. The other core component is occupational diversification. While some need to diversify income sources in order to survive (i.e. push factors or survival-led diversification), others simply seize better or good income opportunities (i.e. pull factors or opportunity-led diversification). Occupational choice and occupational diversification are

linked. For example, it could be that income possibilities in the main occupation are limited so that people are forced to diversify. Overall, the livelihood strategies of youth consist of the occupational choice, diversification and the connection between these two.

When viewing determinants of these livelihood decisions, especially gender and education are interesting factors to observe. On one hand, because they are essential factors when explaining employment opportunities. On the other hand, because gender equality as well as an increase in schooling is aimed for in Ethiopia.

Hence, the following questions are asked:
- What main occupations do the youth group members choose?
- Do gender differences exist with regards to the occupational choice?
- What is the role of educational attainment in the occupational choice?
- Do the youth group members diversify?
- Do gender differences exist with regards to the occupational diversification?
- What is the role of educational attainment in the occupational diversification decision?
- What role plays the youth group activity in the occupational choice and occupational diversification decisions?

The youth group program was implemented to help a rather specific class of youth. Not only do the youth need to live in the area the youth groups are organized in, but also are assumed to lack land access. The decision to participate in a youth group is, hence, simultaneously a decision for a rural livelihood or against migration. Being part of a youth group also indicates less wealth. The members not only have limited land access, but they also choose to participate in a youth group to obtain an additional income source. Those with well-paying jobs or those that still engage in higher education to be able to work in better jobs in the future are less likely to be part of the youth groups. Overall, the youth group members can therefore be presumed to be rather poor. When viewing the occupational choice or occupational diversification strategies of youth group members, one needs to acknowledge that the above-mentioned characteristics or choices (e.g. choosing not to migrate, limited or no land access) shape the occupational choice and occupational diversification strategies. Hence, with joining the youth group some important decisions already have been made. The occupational choice and diversification strategies might therefore deviate from the general (youth) population in Ethiopia.

As discussed above, both gender and education are relevant factors in the livelihood decisions of the youth group members. Gender is important, as it partly predetermines or limits the occupational choice. In Ethiopia, rural societies follow a strict division of labor: Men are the head of the households and the breadwinners, while women are responsible for household chores and child upbringing (Holden & Tilahun 2018a). The traditional role of the women allegedly reduces the need to acquire education and lowers the possibility of gaining work experience. The associated presumed lower productivity represents a disadvantage in the labor market. Simultaneously, the higher domestic work burden increases the dependence on the husband or breadwinner of the household. In addition, stereotypes, culture or traditions matter. For example, public and private allocation of land in Ethiopia is still biased towards males and therefore limits the occupational choice of females. The fact (or stereotype) that women are less able to do the often physically demanding agricultural work might further limit the employment in the agricultural sector. Furthermore, the stereotypes lead to a segregation of the labor market in typical male and female jobs. Overall, being female is associated with less accumulation of human capital and other prejudices (e.g. assumptions about the suitability of jobs for women; women being costlier as the indirect costs, e.g. higher absenteeism because of child care, are higher), which affects the decision of potential employers. Hence, the following hypotheses are made:

Hypothesis 1: Gender and Occupational Choice

a: *Females are less likely to choose the agricultural sector as a main occupation, because they have less direct land access.*

b: *Females are less likely to choose the non-agricultural sector as a main occupation, because of the, on average, lower human capital, the division of labor (i.e. higher domestic work burden for women), as well as stereotypes about, e.g., the suitability of jobs.*

c: *Females are more likely to rely on family support as a main income source, because they spend more time on household chores and child upbringing and therefore less time at the work place.*

Hypothesis 2: Gender and Occupational Diversification

Females are less likely to diversify their income sources, because of the, on average, lower human capital, stereotypes that reduce the chances of being hired as well as the higher domestic work burden.

Education is important, as it acts as a signal of productivity for potential employers. And, hence, the higher the education is, the more likely are people hired. When keeping in mind that the youth group members lack land access and that, even if land would be available, the farm sizes in Ethiopia are very small, it can be assumed that the non-agricultural sector provides a better earning opportunity. Having more education, hence, might enable people to enter the non-agricultural sector. Previous studies show that a higher educational achievement is indeed associated with employment in non-agricultural sector and wage employment: Bezu and Holden (2014) studied the occupational choice of youth in Ethiopia. They asked 15-29-year-old about their planned future livelihood/occupation and personal/household characteristics. Among others, they assessed the effect of education on the occupational choice decision. They found that higher education pulls the youth away from the agricultural sector. Especially planned urban salary employment is associated with higher education and might capture the expectations of youth to be able to get better jobs in the city. On average, a one percent increase in years of education reduces the likelihood of choosing farming as a livelihood strategy by 9%. Another study carried out by Rahut et al. (2017) examined the occupational choice of rural youth in Bhutan. They found out that the youth prefer salary or wage work over self-employment in the (non-) agricultural sector. Education plays an important role in this finding: The more educated the respondents are, the less likely they work in self-employment. Hence, this study confirms the importance of educational attainment in the decision for an occupational choice which was ascertained by Bezu and Holden (2014). With regards to education in the context of the diversification decision of the youth, the connection might be two-sided. On the one hand, higher education is associated with higher productivity and, hence, a higher wage rate. With higher earnings in the main occupation, the need to diversify might not be given. On the other hand, employment possibilities in rural Ethiopia are limited. It can therefore be assumed that the competition for these positions is high and that this competition decreases the wage rate. If the wage is low, additional jobs might need to be picked up to ensure sufficient income. And as more education facilitates the uptake of a new job, more educated people might be more likely to diversify. One study that confirms the assumed positive relationship between education and diversification was carried out by Abdulai and CroleRees (2001). They studied income diversification of households in Mali and found out that poorer households and those living in remote areas diversify less, while better educated people are more likely to diversify in the non-farm sector. These results indicate that entry barriers exist which limit diversification

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opportunities for the poor and that education, indeed, plays a role in the diversification strategies of households. Therefore, the following hypotheses are made:

Hypothesis 3: Education and Occupational Choice
The more education the youth group members have, the more likely are they to obtain their main income from the non-agricultural sector.

Hypothesis 4: Education and Occupational Diversification
The more education the youth group members have, the more likely they are to diversify their income sources.

One focus of this work lays on the youth group activity as a livelihood source. As discussed above, the main activity of the youth group as well as the time since the foundation of the group might be important determinants of success. Hence, these factors need to be considered when assessing the role of the youth group in the occupational choice and diversification decisions.

To sum up, the aim of the paper is to assess the livelihood strategies of the youth group members and to understand how the youth group membership contributes toward their livelihoods. The two main aspects of livelihood strategies discussed in this paper are occupational choice and occupational diversification. Especially gender and educational attainment seem to be of particularly relevance in these livelihood decisions. The next chapter will explain how the research questions and hypotheses will be analyzed.

3 Empirical Analysis

In order to analyze the livelihood choices – namely occupational choice and occupational diversification – survey data from 2016 Youth Group Member Survey is used. In this chapter, an overview over the survey is given and the descriptive statistics are displayed. Furthermore, the econometric methods to test the above proposed hypotheses are explained.

3.1 The Data: Youth Group Member Survey

The data used for this study is from a survey carried out in the Tigray region of Ethiopia in 2016. The survey focuses on youth group performance and members' individual experiences within the youth groups. In addition, information on youth individual characteristics as well as household characteristics are included. The later will mostly be used in this study. Overall, 1,161 youths from a total of 119 youth groups were interviewed. Of these, 376 are females (32,4%) and 785 are males (67.6%). As the rationale of the survey was to collect data on (sustainable) youth group behavior and performance, only long-term youth groups were included. After excluding youth from temporary groups (i.e. mining groups that are dissolved after a certain amount of savings is reached) and those with missing values of important variables, the sample size was reduced to 1,074 youth, of which 745 (69.4%) are males and 329 (30.6%) are females. The main activities of the youth groups members in this study are beekeeping (approx. 36% of the youths), animal rearing (28%), irrigation/horticulture (24%) and forestry (12%). The term youth group is somewhat misleading. Although the focus of the program is to create livelihood possibilities for rural, land-poor youth, the age of the members ranges from 15 to 72 years. In Ethiopia, the youth are officially defined to be in the age range between 15 and 29 years (FDRE 2004). In this sample, only 58,5% of the youth group members are in this age range. However, as the older might have more knowledge, experience and skills regarding the youth group activities, they may play an important role in the groups and are, therefore, included in this study. With this, the mean age of this sample is 29 years. The survey was carried out in five districts (Adwa, Raya Azebo, Degua Temben, Seharti Samire and Kilite Awlalo) in the Tigray region in Ethiopia (see Figure 1). The total land area of these district is approx. 10,700 km^2 and is home to more than 641,000 people in 2015 (CSA (2015) as cited in Holden & Tilahun (2018b)). The Tigray region has a semi-arid climate and is characterized by a long dry season from October until May as well as erratic rainfalls in the rest of the year (Birhane et al. 2011). An overview of the youth group activity, age, education and regions is given below (see Table 1).

Figure 1. Map of census districts
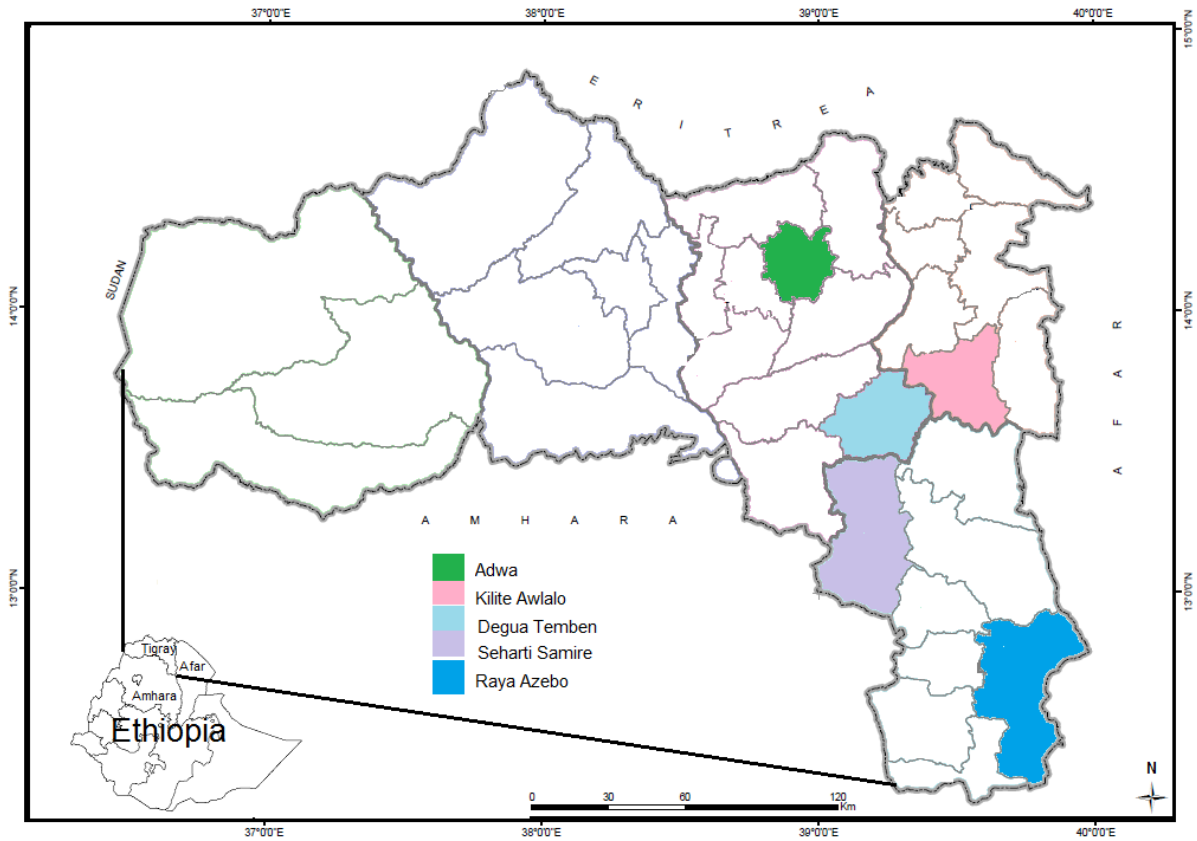
Source: Holden and Tilahun (2018b)

Table 1. *Overview of the main characteristics of the youth group members*

	Female	Male	All
Sample Size	329	743	1,072
	Percentage		
Districts			
Adwa	*31.31*	*27.05*	*28.36*
Raya Azebo	*26.75*	*21.27*	*22.95*
Degua Temben	*27.05*	*20.46*	*22.48*
Seharti Samire	*6.69*	*15.61*	*12.87*
Kilite Awlalo	*8.21*	*15.61*	*13.34*
Main Youth Group Activity			
Animal Rearing	*34.65*	*25.44*	*28.26*
Beekeeping	*24.01*	*41.32*	*36.01*
Forestry	*11.25*	*12.25*	*11.94*
Irrigation/Horticulture	*30.09*	*21.00*	*23.79*
	Average (mean)		
Age	26.03	30.52	29.14
Education	5.30	5.27	5.28

Source: Own survey data (Youth Group Member Survey, Tigray, Ethiopia).

3.2   Descriptive Statistics

Table 2 shows the main occupations of the youth in the sample. A large part of the youth relies on agriculture as the main income source. Agriculture comprises income from own farms (61% of those with agriculture as the main income source), land renting/sharecropping (37%) and other agricultural (wage) work (2%). This result is quite striking, as the youth group members are assumed to have no land access themselves. However, in comparison to country averages the percentage of people mainly employed in the agricultural sector is considerably low. While in this sample only 47% of the people receive their main income from agriculture, the country average in rural regions is 86.6% (CSA 2018). Agriculture as main occupation differs between females and males. Overall, approx. 49% of male youth group members choose agriculture as their main occupation compared to 45% of females, respectively. Females with their main occupation in agriculture are more likely to obtain the income from work on the own farm than males (73% vs. 57%) but are less likely to engage in land renting/sharecropping (27% vs. 42%). A reason for this could be that it is easier for males to conclude a contract on land renting/sharecropping, as the public perceives this work to be a "male task". The physical strength needed to do the agricultural work might partly explain this cultural norm (Holden & Tilahun 2018c). The gender differences in the agricultural sector could also be explained with males being more likely to get land access through inheritance and land distribution by official institutions (Dokken 2015).

Table 2. *Summary of the occupational choice of the youth group members*

Occupational Choice		Freq.	Percent	Cum
Agriculture	All	508	47.39	47.39
	Female	*147*	*44.68*	*44.68*
	Male	*361*	*48.59*	*48.59*
Non-Agriculture	All	254	23.69	71.08
	Female	*62*	*18.84*	*63.53*
	Male	*192*	*25.84*	*74.43*
Youth Group	All	69	6.44	77.52
Activity	*Female*	*30*	*9.12*	*72.64*
	Male	*39*	*5.25*	*79.68*
Support	All	241	22.48	100
	Female	*90*	*27.36*	*100*
	Male	*151*	*20.32*	*100*
Total	All	1,072	100	100
	Female	*329*	*100*	*100*
	Male	*743*	*100*	*100*

Source: Own survey data (Youth Group Member Survey, Tigray, Ethiopia).

The second most prevalent main occupation is the non-agricultural sector, with almost 23% of the youth mentioning this sector as main income source. Again, males are more likely to engage in the non-agricultural sector than females (25% and 18%, respectively). Most of the youth are obtaining their income in this sector from construction work and trade. When viewing the income sources within the sector, big gender differences become apparent. Females are substantially more likely to engage in trade (71% of females do so vs. 36% of males), while males are more likely to do construction work (61% of males vs. 20% of females). Due to the economic growth and the accompanying construction boom, the employment possibilities in the construction sector are good and hold potential to become even more important in the future (Bezu & Holden 2014). The fact that the construction sector is booming and that males are more likely to engage in this work might contribute to the gender differences in employment in the non-agricultural sector.

Just as important as the non-agricultural sector is the support from families as an income source for the youth group members. Approximately 23% of the youth receive the largest share of their income in form of support from their families. Here, females are more likely to receive support than their male counterparts (27% vs. 20%). Perhaps, the limited access to land as well as limited employment possibilities in the construction sector create this difference. Unemployment or underemployment raises the dependence from the youth on the parents. In addition, relying on family support as a main income source indicates that less time is spend at the work place. This time can then be used to help the family. In this case, the family support could be seen as a remuneration for youth who spend time helping their families. On average, those youth that mention family support as their main income source spend 15 full working days per month helping their family. However, even when not primarily relying on family support the youth group members spend a lot of time on helping their families. On average, they spend 12 days per month doing so. The averages for females and males are 15 days and 11 days, respectively. Overall, family support is an important income source and the youth group members spend a considerable amount of time helping out.

Surprisingly, only 7% of the youth group members receive their main income from the youth group activities. Here, females (9%) are more likely to mention the youth group as main occupation than males (5%). The most likely to receive the largest share of their income from the youth group are members of irrigation/horticulture youth groups (9% of the members), forestry (7%), animal rearing (7%) and, lastly, beekeeping (5%). Currently, the youth group

activity appears to be more of an additional income source. On average, the youth group members only spend 5.4 full working days in a month on their youth group activity. In case the youth group activity is the main income, the average working days per month raise to 7 days. Next to relatively low time spend on the youth group, some of the activities (e.g. forestry) take time to build up before profits are created which might limit the profitability of the youth group. And as 2015 was a drought year, the group performance (e.g. agriculture) was negatively affected by it (Holden & Tilahun 2018b). Nevertheless, the youth group activities are only partly contributing to securing livelihoods for the youth group members.

However, the picture changes when asking youth group members about their expected main income source 5 years subsequent to the survey. Here, more than 60% state that they expect the youth group activity to be the main income source. The shares for the agricultural sector and the non-agricultural sector are 23% and 14%, respectively. Consequently, the question is what causes this change. First of all, many youth groups were created within the last few years prior to the survey. Especially in this early stage, many investments need to be taken in order to start the activities. Hence, the youth group members might anticipate that in the future a higher share of revenues will be transferred to them as income. Second, some of the activities might need some time until the whole income potential can be fully exploited (e.g. forestry). Again, youth group members might expect bigger future earnings. Consequently, it could be that the current occupational choice is only thought of as a temporal job to bridge until the youth groups reach their full potential. In addition, the current occupational choice of the youth may not fully reflect their own decision, as many still are in an age in which their parents might decide for them. It could be, for example, that they expect to spend more time on the youth group activities and less time on helping the family. Lastly, the youth could be a little too optimistic about future income possibilities within their youth group. However, there are substantial differences in the expectation of receiving the largest share of income from the youth groups. While more than 71% of the youth group members of forestry groups expect that the youth group activity will become their main income source, only 54% of those with beekeeping as their main activity believe so. It would be interesting to carry out follow up surveys to find out about the future occupations.

Although the youth groups membership currently only represents the main income source for a small portion of the youth group members, it plays a role in their fundamental livelihood decisions. The youth were asked what they would have chosen as livelihood strategy if they did

not join the youth group. 16% of the youth mentioned that they would have migrated to an urban area or out of the country to search for employment opportunities and 9% answered that they would have gone to school to get more education. Hence, the youth group membership limits youth migration, but at the same time acts as a disincentive for more education. Other answers of the youth group members included looking for other employment opportunities (32%), working on the own farm (20%) and rent/sharecrop in (more) land (14%).

The majority of the sample chooses to diversify their income sources (see Table 3). Only approx. 23% have just one income source, 43% of the youth group members have two income sources, and 35% have three or more income sources. When comparing diversification strategies between females and males, it stands out that males are more likely to diversify than females. While only 29% of the females have three or more jobs, 37% of the males do so. One reason could be that females have more limited access to jobs (e.g. in the agricultural sector due to less land access) or that they have a higher work burden helping the family and, hence, have no time to pick up an additional job. In addition, diversification strategies seem to depend on age. While the mean age of those only having one job is 27 years, the mean age of those having two jobs is 29 years and those with three or more jobs are on average 31 years old. It could be that the older they are, the more employment possibilities (e.g. land access through inheritance) they have. In addition, the degree of diversification differs between the main occupations. If the main occupation lays within the agricultural sector, diversification is more likely. Only 14% of the youth group members with their main occupation in the agricultural sector have just one income source, 40% have two income sources and 46% have three or more income sources. This might be because the agricultural sector is prone to climate risks and income streams throughout the year vary – diversification can then be used to mitigate those risks or to smooth income streams and consumption. In contrast, the youth who obtain the majority of their income from youth group activities or family support are less likely to diversify. 33% of those with the youth group activity as a main occupation and 32% of those which mention family support as main income source only have one income source. The share of youth with three or more jobs in these occupations are 26% and 15%, respectively, which is substantial lower than the degree of diversification for those occupied in the agricultural sector. Both, the youth group activity and family support as main occupation might indicate that these youth struggle with finding other employment possibilities. The diversification level, in this case, might then not be a choice but rather an outcome of problems, such as entry barriers, that the youth face. It should be noted that almost half of the youth do not mention the youth group

activity as one of their income sources. If one would include the youth group activity as an income source for everyone, the shares of different diversification levels change drastically: approximately 3% of the youth would have one, 47% would have two, 42% would have three and 8% would have four or more income sources. However, as the many of them did not receive any income from the youth group activity, the youth group membership is not viewed as an income source for all the youth group members.

Table 3. *Summary of occupational diversification decision of the youth group members*

Number of income sources		Freq.	Percent	Cum
1	All	243	22.67	22.67
	Female	*97*	*29.48*	*29.48*
	Male	*146*	*19.65*	*19.65*
2	All	457	42.63	65.30
	Female	*136*	*41.34*	*70.82*
	Male	*321*	*43.20*	*62.85*
3 or more	All	372	34.70	100
	Female	*96*	*29.18*	*100*
	Male	*276*	*37.15*	*100*
Total	All	1,072	100	100
	Female	*329*	*100*	*100*
	Male	*743*	*100*	*100*

Source: Own survey data (Youth Group Member Survey, Tigray, Ethiopia).

Although the vast majority of the youth group members pursue several occupations, many of them still struggle with insufficient incomes. When the youth group members were asked about the main challenges they currently face, 38% of them mentioned lack of or limited cash income as their greatest concern. Especially those with only one income source seem to have difficulties sustaining their livelihood, as half of them viewed the lack of sufficient income as the main problem. Next to the need for more income, lack of capital for investments (19%), insecure tenure rights for the land (11%), lack of complementary income sources (8%) and low or no income from the youth group activity (8%) were mentioned to be problematic.

To sum up, almost half of the youth group members rely on the agricultural sector as their main income source. While the non-agricultural sector and family support are equally important income sources for the youth group members, only 7% rely on the youth group activity as a main occupation. However, approximately 60% the youth group members expect the youth group activity to become more profitable in the future and, therefore, anticipate this to be their

primary income source. More than 76% of the youth have two or more income sources. Especially those who primary engage in agriculture diversify more. However, many youths state that, despite having on average two income sources, the lack of sufficient cash income is one of their greatest concerns. Overall, the youth group membership currently seems, by far, not sufficient to secure their livelihoods. It remains to be seen, if the youth group membership develops into one of the most important income sources in the future. When looking at the current occupational choice and occupational diversification statistics of the youth, the question of determinants of these decisions remains. So, what causes the different outcomes in these decisions? In the following, the effects of gender and education attainment in the occupational choice and diversification decision are assessed.

3.3 The Methods

In order to test the hypotheses about education and gender differences in the context of occupational choice and occupational diversification decisions of the youth group members, several models are applied. The different models and estimation techniques are described below.

3.3.1 Empirical Approach: Occupational Choice

To analyze the occupational choice of the youth group members, a multinomial logit model is used (Wooldridge 2002). The dependent variable *y* is the *Occupational Choice* of the youth group members. The occupational choice refers to the main income source. As the youth group members were asked to rank their sources of income based on their importance as share of the total income, the highest-ranked income source is used. The income sources were than grouped into four categories, namely agricultural based income (e.g. own farm, land renting/share cropping), non-agricultural income (e.g. trade, construction work), income from the youth group activity and support from the family. Depending on what occupation is chosen, the variable *y* takes on the values between one and four. The model can then be described as:

$$P(y = j \mid \boldsymbol{x}) = \frac{\exp(\boldsymbol{x}\beta_j)}{1 + \sum_{j=1}^{4} \exp(\boldsymbol{x}\beta_j)}, \qquad j = 1, \dots, 4$$

The model gives the response probabilities of choosing the four alternative occupations *j*, conditional on a set of explanatory variables *$\boldsymbol{x}$*. Agricultural income is used as the base category and, hence, the probabilities of choosing one of the other income sources as main occupation with respect to changes in the explanatory variables is stated in comparison with agriculture as main income source. *$\boldsymbol{x}$* includes the core variables *Female* (i.e. dummy variable which equals one if respondent is a female and zero otherwise), *Education* (i.e. number of years of education completed) and a set of control variables (i.e. individual and household characteristics). The *individual characteristics* included are *Age*, the *Birth Rank* of the youth group member and the dummy variable *Married* (i.e. equals one if married and zero otherwise). The *household characteristics* include the *Farm Size* (i.e. own land including rented/sharecropped out land but excluding rented/sharecropped in land in *tsimdi* (approx. 0.25 hectare)), number of *Oxen* the household owns, the *Household Size* (i.e. number of persons staying in the household and eating together and dependents staying elsewhere, such as school children) and the dummy variable *Youth Household Head*, which captures if the youth group member is the head of the household (i.e. dummy equals one) or not (i.e. dummy equals zero; father/mother/spouse or other is

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household head). Next to household and individual characteristics, the variable *Youth Group Age* (i.e. number of years since the establishment of the specific youth group) is used to control for the age and, hence, maybe the entrepreneurial maturity of the youth groups. It is also controlled for regional differences (i.e. dummies/fixed effects for the districts Raya Azebo, Degua Temben, Seharti Samire, Kilite Awlalo and Adwa) and differences due to the main youth group activity (i.e. dummies/fixed effects for the youth group activities beekeeping, irrigation/horticulture, forestry and animal rearing). To capture differences across the youth groups, the standard errors are clustered at the youth group level. As the magnitude of the coefficients of the multinomial logit model are difficult to interpret (Wooldridge 2002), the marginal effects are calculated. With this, not only the sign of the coefficients, but also the magnitude of the effect is displayed.

When viewing gender differences in the job choice, the possibility exists that not only gender plays a role, but also that the effect of, for example, educational attainment differs between the genders. Therefore, the above explained econometric analysis is repeated for females and males separately from each other. In addition, models for different age groups, namely *Youth* (15-29-year-olds) and *Adults* (30 years and older), as well as a model for those with an independent household (i.e. those that are household head themselves) are carried out. The interest in a more in-depth analysis of the different age groups as well as of those youth with independent households stems from the findings of the robustness analysis (see Table A1 in the appendix). To assess the robustness of the results of the above-described multinomial logit model, the explanatory variables are included stepwise in groups (e.g. individual characteristics, household characteristics, group characteristics). Generally, the inclusion of the control variables improves the explanatory power of the model (i.e. a higher pseudo-R^2) and the coefficients of the core variables are consistent. Especially, the inclusion of the variables *Age* and *Youth Household Head* is essential. Because, first, these variables often show a significant effect on the occupational choice decision and, hence, increase the explanatory power of the model. And, second, the inclusion of these variables leads to some changes in the core coefficients (i.e. the *Female* dummy variable and *Education*). This not only points to the importance of these variables in the occupational choice of the youth group members, but also means that an exclusion of these variables would distort the results. The results of the multinomial regression model and the average marginal effects of the above-mentioned models are compared in the next chapter.

One potential problem with the models described above is that education might be endogenous. For example, ability could directly affect the level of educational attainment as well as the occupational choice. As the survey does not entail a measure of ability, the omission of ability as an explanatory variable in the regression models might result in a correlation of the variable *Education* and the error term. As a result, and if education is indeed endogenous, all coefficients of the regression analysis can be biased and inconsistent (Wooldridge 2002).

To circumvent this problem, a control function approach was used. Petrin and Train (2010) described the control function approach in the context of choice models in the following way: The background is, of course, an endogeneity problem (i.e. the (endogenous) explanatory variable and the error term are not independent) and the approach consists out of two steps. First, the endogenous explanatory variable is regressed on the explanatory variables (from the original model) and on one or more instrument variables. By doing so, one can obtain the residuals from the regression. The authors show that the residuals from the first-step regression are the source of the dependence between the endogenous variable and the error term; the residuals are not independent of, in this case, education and of the error term from the original model. Consequently, when controlling for the residuals, the (former) endogenous variable (e.g. education) is independent of the error term. Hence, the issues resulting out of the inclusion of an endogenous variable in the model can be avoided. This is the key point of the control function approach. Therefore, in the second step, the residuals (of the first step of the control function approach) are added as an additional explanatory variable in the original choice model. With this, endogeneity is avoided, and the estimates are unbiased and consistent. The approach requires a correction of the standard errors (e.g. bootstrapping).

In order to be able to use the control function approach, a good instrument for education must be found. The instrument must fulfill some criteria. Of course it needs to be an exogeneous variable (i.e. uncorrelated with the error term), that is partially and significantly correlated with the endogenous variable (when controlling for all the other exogeneous explanatory variables) and that does not directly affect the dependent variable (Wooldridge 2002). To check for the suitability of an instrument, the significance in the first regression of the control function, approach as well as an F-test can be used. In addition, the inclusion of the instrument variable in the general regression model can be used to check if the instrument variable is solely correlated with the dependent variable through the endogenous variable.

When viewing literature on education as an endogenous explanatory variable, often household characteristics, for example those that indicate well-being of a household, or characteristics of the parents, such as education of parents, are used as instrument variable. Here, education of parents cannot be used as an instrument as it significantly affects the dependent variable. However, the variable *Iron Roof* (i.e. if the household has a house with a corrugated iron roof (as an indication for better off households)) turns out to be a suitable instrument for education. The idea behind this is that the better off the people are, the more likely they are to be better educated (or to foster their children with regards to education), and the more likely they are to own a house with a corrugated iron roof. An F-test was used to test the relevance and strength of the instrument. The result of the F-test indicates that *Iron Roof* indeed is a strong instrument. In addition, *Iron Roof* does not directly affect the dependent variable. However, as the model is just identified (i.e. number of instruments equals number of endogenous variables) the validity of instruments cannot be verified by testing the overidentifying restrictions. As not all youth group members provided information on the instrument variable, the sample is reduced to 951 youth group members.

The results of the control function approach with *Iron Roof* as an instrument for education are displayed in the appendix (see Table A2a and Table A2b). When comparing the coefficient of the control function approach with the ones from the multinomial logit model using the same sample, one can observe that the signs of the coefficients are similar. Significance levels only partially deviate between those models. The residuals from the first step of the control function approach which are entered as an explanatory variable in the second step were not significant. A significant error term indicates that there is an endogeneity problem in the model (e.g. Melstrom and Lupi (2012)). Since this is not the case, it is assumed that using education as an explanatory variable does not cause an endogeneity problem.

3.3.2 Empirical Approach: Occupational Diversification

In order to analyze the occupational diversification of the youth, a ordered logit model is used (Wooldridge 2002). The dependent variable y is the *Occupational Diversification* of the youth group members. Here, occupational diversification is measured with the number of income sources each youth group member has. As the youth group members were asked to rank their income sources from one to three, it was possible to directly observe to what degree they diversify. Using the number of jobs as a measure of diversification is a little tricky, since it is not clear how important the different income sources are. For example, it could be that the

second most important income source for a person accounts for 40% of the total income, while for another person it might only account for 5%, respectively. For this reason, occupational diversification is modelled to be an ordinal, instead of a continuous variable. The ordered categories are one, two and three or more income sources. The response probabilities are:

$$P(y = 1 \mid \boldsymbol{x}) = P(y^* \le \alpha_1 \mid \boldsymbol{x}) = P(\boldsymbol{x\beta} + e \le \alpha_1 \mid \boldsymbol{x}) = \Lambda(\alpha_1 - \boldsymbol{x\beta})$$
$$P(y = 2 \mid \boldsymbol{x}) = P(\alpha_1 < y^* \le \alpha_2 \mid \boldsymbol{x}) = \Lambda(\alpha_2 - \boldsymbol{x\beta}) - \Lambda(\alpha_1 - \boldsymbol{x\beta})$$
$$P(y = 3 \mid \boldsymbol{x}) = P(y^* > \alpha_2 \mid \boldsymbol{x}) = 1 - \Lambda(\alpha_2 - \boldsymbol{x\beta})$$

where   *Λ indicates a logit function*

and   *$\alpha_1 < \alpha_2$ indicate the threshols parameters so that*

$y = 1$ *if $y^* \le \alpha_1$*
$y = 2$ *if $\alpha_2 < y^* \le \alpha_1$*
$y = 3$ *if $y^* > \alpha_2$*

Apart from the form of the dependent variable and, consequently, the set-up of the model, the same estimation technique was used (e.g. similar explanatory and control variables, clustering of standard errors). Also, the control function approach was applied to circumvent a possible endogeneity problem caused by the variable education. Once again, education seems not to create an endogeneity problem as the residuals from the first step are not significant. However, the coefficient of education changes when the instrument is used. The results of the endogeneity models are displayed in the appendix (see Tables A4a and Table A4b), while the results of the other models (i.e. the general model, regressions by gender and age group, and the youth household head models) are discussed in the next chapter.

4 The Results

To find out what role gender and education play in the decision for a main occupation as well as for the diversification of income sources, both a multinomial logit model as well as an ordered logit model were carried out. The analysis was repeated with different samples: the general model (*OC1* and *OD1*) using the whole sample, separate models for female and male youth group members (*OC2* and *OD2*), for adult youth group members and those still in their youth (*OC3* and *OD3*) as well as for those that are head of their own household and those that are regular household members (*OC4* and *OD4*). In this chapter, the results of these analyses (e.g. regression coefficients and average marginal effects) are displayed and discussed.

4.1 Results: Occupational Choice

The first regression (*OC1*) models the occupational choice decision of the youth group members, using a multinomial logit model. As described above, the general model shows the likelihood of choosing a specific occupation in comparison to the base category *agricultural sector*. However, as one cannot interpret the coefficients of the model directly, the average marginal effects are calculated as well. The results of the OC1 model are displayed below (Table 4 shows the results for the general model and Table 5 shows the average marginal effects).

Table 4. *Multinomial logit model of determinants of the occupational choice (OC1)*

	Non-Agriculture	Youth Group Activity	Support
Female	**-0.747***	**-0.060**	**-0.109**
	(0.24)	**(0.32)**	**(0.22)**
Education	**0.106****	**0.051**	**0.096***
	(0.03)	**(0.04)**	**(0.03)**
Individual Characteristics			
Age	-0.035**	-0.099***	-0.141****
	(0.02)	**(0.04)**	**(0.03)**
Birth Rank	0.076*	0.044	-0.005
	(0.04)	(0.07)	(0.06)
Married	-1.123****	-1.145***	-1.716****
	(0.23)	(0.38)	(0.28)
Youth Household Head	-0.277	-1.198**	-0.553*
	(0.27)	(0.49)	(0.29)
Household Characteristics			
Farm Size	-0.186***	-0.129	0.004
	(0.06)	(0.10)	(0.05)
Oxen	-0.454****	-0.486**	-0.445***
	(0.13)	(0.22)	(0.16)
Household Size	0.054	0.185***	0.121**
	(0.04)	(0.07)	(0.06)

Youth Group Characteristics			
Youth Group Age	-0.024	0.128	-0.046
	(0.06)	(0.13)	(0.07)
Constant	1.452**	1.652	3.802****
	(0.65)	(1.09)	(0.95)
District FE	Yes		
Main Youth Group Activity FE	Yes		
Wald Chi2	506.45		
Prob > Chi2	0.0000		
Pseudo-R2	0.2442		
Log pseudolikelihood	-978.08		
Number of obs.	1,072		

Note: The baseline occupation for the comparison is agricultural work. Cluster robust (clustered at group level) standard errors in parentheses. Significance levels: *p<0.10, **p<0.05, ***p<0.01, ****p<0.001.

Table 5. *Average marginal effects of determinants on the probability of the occupational choice (OC1)*

	Agriculture	Non-Agriculture	Youth Group Activity	Support
Female	**0.080****	**-0.118********	**0.011**	**0.027**
	(0.03)	**(0.03)**	**(0.02)**	**(0.02)**
Education	**-0.016**********	**0.012*****	**-0.001**	**0.005**
	(0.00)	**(0.00)**	**(0.00)**	**(0.00)**
Individual Characteristics				
Age	0.012****	0.003	-0.002	-0.013****
	(0.00)	(0.00)	(0.00)	(0.00)
Birth Rank	-0.008	0.012*	0.001	-0.006
	(0.01)	(0.01)	(0.00)	(0.01)
Married	0.211****	-0.080**	-0.006	-0.125****
	(0.03)	(0.03)	(0.02)	(0.03)
Youth Household Head	0.073**	0.001	-0.048*	-0.026
	(0.03)	(0.04)	(0.03)	(0.04)
Household Characteristics				
Farm Size	0.020***	-0.029***	-0.004	0.013**
	(0.01)	(0.01)	(0.00)	(0.01)
Oxen	0.074****	-0.045**	-0.009	-0.020
	(0.02)	(0.02)	(0.01)	(0.02)
Household Size	-0.014**	-0.000	0.007*	0.008
	(0.01)	(0.01)	(0.00)	(0.01)
Youth Group Characteristics				
Youth Group Age	0.002	-0.004	0.008	-0.007
	(0.01)	(0.01)	(0.01)	(0.01)

Note: Cluster robust (clustered at group level) standard errors in parentheses. Significance levels: *p<0.10, **p<0.05, ***p<0.01, ****p<0.001.

One of the factors that has an impact on the job choice and is assessed in more detail in this study is the gender. As agriculture is the base category, only the average marginal effects give evidence about the importance of gender in the decision for or against a main occupation in the agricultural sector. In contrast to *Hypotheses 1a*, females are, on average, 8% more likely to choose a job in the agricultural sector as a main occupation. This is a quite unexpected result. As described above, there are several factors that lead to the assumption that females are less likely to work in the agricultural sector: females' land access is more restricted (controlled for by including the variable *Farm Size*), males are more likely to engage in land renting/sharecropping as this is perceived as a "male" occupation, and agricultural work in Ethiopia is often physically demanding leading to the assumption that males are more likely to do this work. A study carried out by Holden and Tilahun (2018c) assesses land rental as a complementary income source using the same sample of youth group members. The results of this study help to shed light on the surprisingly positive relationship between gender and work in the agricultural sector. The authors look at gender differences in land access in more detail. Although it is true that females have less direct land access, there is no significant gender difference in land access when combining spouses land and own land. However, there are large discrepancies with respect to land renting. It is therefore not surprising that they found males to be significantly more likely to mainly engage in land renting. In addition, they found males to be more likely to receive the main income from all other activities (i.e. youth group, trade, construction work, family support and other) compared to income from the own farm. This indicates that females simply have limited access to other income sources than the own (family) farm. Hence, the agricultural sector (or working on the own farm) might often be *chosen* because it is the only option. *Hypothesis 1b* states that females are less likely to choose a main occupation in the non-agricultural sector as females often have a higher domestic work burden, and, on average, a lower human capital (e.g. work experience) as well as because of the many stereotypes of the suitability of jobs. The results of the regression confirm this assumption. That is, females are significantly less likely than their male counterparts to choose the non-agricultural sector over the agricultural sector, everything else held constant. On average, being a female reduced the likelihood of mainly being employed in the non-agricultural sector by 11.8%. The coefficients of the female variable with regards to the youth group activity and family support as main income source are not significant. Having said that, it is still surprising that the coefficients of the variable female are negative with respect to support as a main income source. The sign of the coefficient stands in contrast to the *Hypothesis 1c*, which says that females are more likely to rely on family support as a main income source since they spend

more time helping the family and, therefore, less time on the work place. The increased reliance on support could then be viewed as a remuneration for the family help or as a direct support as the females spend less time at the work place and have, in general, fewer employment possibilities. The reason for males being more likely to depend on family support as a main income source is not clear. One explanation could be that the family views the help of females as given. In this case a remuneration is unlikely. Another explanation could be that, on average, males are fostered comparably more in different aspects of life (e.g. males are more likely to inherit land) and possibly also with respect to income support. As the coefficient is not significant, the issue will not be discussed any further.

The other aspect that is looked at more in depth in this study is educational attainment in relation to the occupational choice. With regards to a main occupation in the agricultural sector the following result is found: One more year of education significantly reduces the likelihood of mainly being employed in the agricultural sector by 1.6%. In line with the *Hypothesis 3* the results show that the more education the youth group members have, the more likely they are to choose an occupation in the non-agricultural sector than in the agricultural sector, everything else held constant. To be specific, one additional year of education increases the likelihood of having the non-agricultural sector as main income source by 1.2%. This result indicates that education indeed increases employment possibilities in the non-agricultural sector. The effect of education – pulling people away from the agricultural into the non-agricultural sector – is a typical finding (e.g. Bezu and Holden (2014), Rahut et al. (2017)). However, the effect of education in this sample is relatively small. With regards to the youth group activity as a main occupation, education does not play a significant role. Lastly, the effect of educational attainment on mainly relying on family support was assessed. In the general model, education is significantly positively correlated to family support. Hence, the more education the youth group member has, the more likely he or she is to mainly rely on family support. This result is somewhat counterintuitive. A possible explanation could be that the more education one attains, the less time is spend actively working. And as the majority of the sample is still relatively young, they might have had less time to build up work relations and to find a workplace that provides sufficient income. The average marginal effect is, on the contrary, not significant.

Several control variables have a significant effect in the decision for a main occupation. For example, the variable *Age* is always significant in the general model. On average, a one-year increase in age is associated with a 1.2% higher likelihood of choosing the agricultural sector

as a main occupation. Simultaneously, a one-year increase in age is associated with a 1.3% lower likelihood to mainly rely on family support. The formation of an own household, the prevalence of farm households in the region and the independence of parents is likely to explain these effects. The dummy variable *youth household head* which indicates if the youth group member is the head of the household and, therefore, lives more independent from his or her parents also is significant. Those who are the head of their own household are 7.3% more likely to choose agriculture as a main income source. Again, the commonness of farm households might explain this. Overall, both variables, *Age* and *Youth Household Head*, might capture the effect of a higher independence. Other control variables such as the dummy variable *Married* (married youth group members are 21.1% more likely to have agriculture as a main income source, 8% less likely to mainly rely on non-agricultural work and 12.5% less likely to receive their main income in the form of family support, respectively), the *Farm Size,* number of *Oxen* and the *Household Size* have significant marginal effects.

As already discussed above, it could be that not only the gender per se plays a role in the job choice, but that also the effect of, e.g. education, differs between the genders. Therefore, two separate regressions (*OC2*) for females and males were carried out. The results of the regression are displayed in Table 6 and Table 7.

Table 6. *Multinomial logit model of determinants of the occupational choice (OC2): Comparison of females and males*

	Non-Agriculture		Youth Group Activity		Support	
	Females	Males	Females	Males	Females	Males
Education	**0.160***	**0.093***	**0.091**	**0.006**	**0.093**	**0.089**
	(0.06)	**(0.03)**	**(0.09)**	**(0.05)**	**(0.06)**	**(0.04)**
Individual Characteristics						
Age	-0.039	-0.037**	-0.152***	-0.083	-0.245****	-0.098***
	(0.03)	(0.02)	(0.05)	(0.05)	(0.06)	(0.03)
Birth Rank	0.336****	0.021	-0.038	0.034	-0.085	-0.007
	(0.08)	(0.05)	(0.14)	(0.09)	(0.11)	(0.07)
Married	-1.454***	-0.631**	-1.323*	-0.895	-2.075****	-1.869****
	(0.53)	(0.31)	(0.69)	(0.55)	(0.60)	(0.40)
Youth Household Head	-0.191	-0.543*	-0.910	-1.827***	-2.052*	-0.507
	(0.46)	(0.33)	(0.85)	(0.56)	(1.09)	(0.42)
Household Characteristics						
Farm Size	-1.054****	-0.052	-0.105	-0.241*	-0.094	0.054
	(0.32)	(0.06)	(0.17)	(0.14)	(0.13)	(0.06)
Oxen	-0.434	-0.518****	-0.510	-0.509**	-0.440	-0.549***
	(0.34)	(0.15)	(0.42)	(0.24)	(0.34)	(0.19)
Household Size	0.209*	-0.001	0.440****	0.107	0.382***	0.007
	(0.11)	(0.05)	(0.13)	(0.09)	(0.13)	(0.07)
Youth Group Characteristics						
Youth Group Age	0.184	-0.026	0.234*	0.086	-0.234*	0.017
	(0.14)	(0.07)	(0.13)	(0.16)	(0.13)	(0.08)
Constant	-0.950	1.870**	1.728	2.233*	6.047****	3.385***
	(1.47)	(0.74)	(2.02)	(1.32)	(1.66)	(1.06)
District FE	Yes	Yes				
Main Youth Group Activity FE	Yes	Yes				
Wald Chi2	1085.13	368.63				
Prob > Chi2	0.0000	0.0000				
Pseudo–R2	0.3892	0.2385				
Log pseudo-likelihood	-250.68	-667.01				
Number of obs.	329	743				

Note: The baseline occupation for the comparison is agricultural work. Cluster robust (clustered at group level) standard errors in parentheses. Significance levels: *p<0.10, **p<0.05, ***p<0.01, ****p<0.001.

Table 7. *Average marginal effects of determinants on the probability of the occupational choice (OC2): Comparison of females and males*

	Agriculture		Non-Agriculture		Youth Group Activity		Support	
	Females	Males	Females	Males	Females	Males	Females	Males
Education	**-0.018******	**-0.014*****	**0.013****	**0.011****	**0.002**	**-0.003**	**0.003**	**0.005**
	(0.01)	**(0.00)**	**(0.01)**	**(0.00)**	**(0.01)**	**(0.00)**	**(0.01)**	**(0.00)**
Individual Characteristics								
Age	0.019****	0.009***	0.002	0.000	-0.002	-0.001	-0.019****	-0.008**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Birth Rank	-0.018**	-0.002	0.035****	0.004	-0.003	0.001	-0.014	-0.003
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Married	0.243****	0.157****	-0.092**	0.011	-0.010	0.003	-0.141***	-0.170****
	(0.06)	(0.04)	(0.04)	(0.05)	(0.04)	(0.02)	(0.05)	(0.04)
Youth Household Head	0.141**	0.099**	0.029	-0.038	0.008	-0.063**	-0.177	0.003
	(0.07)	(0.04)	(0.05)	(0.05)	(0.07)	(0.03)	(0.11)	(0.05)
Household Characteristics								
Farm Size	0.082****	0.006	-0.101****	-0.009	0.005	-0.011*	0.014	0.014**
	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Oxen	0.067*	0.084****	-0.030	-0.052**	-0.018	-0.005	-0.019	-0.026
	(0.04)	(0.02)	(0.03)	(0.03)	(0.03)	(0.01)	(0.03)	(0.02)
Household Size	-0.046****	-0.001	0.009	-0.002	0.017**	0.005	0.020**	-0.001
Rve4r	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Youth Group Characteristics								
Youth Group Age	-0.008	0.001	0.021*	-0.007	0.023***	0.004	-0.036***	0.002
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)

Note: Cluster robust (clustered at group level) standard errors in parentheses. Significance levels: *p<0.10, **p<0.05, ***p<0.01, ****p<0.001.

Overall, there is a similar effect of education in the "male only" and "female only" models. In the regression model for the female youth group members, the effect of education on choosing non-agricultural work (instead of agriculture) is positive and significant. The coefficients of education with regards to choosing the youth group activity or family support as a main income source is positive, but not significant. The regression model for males yields similar results, except that the coefficient of education in relation to family support as a main income source is significant. The average marginal effects allow to compare the magnitude of the effects: For females, one additional year of education decreases the likelihood of choosing agriculture as a main income source by 1.8%. The corresponding value for males is 1.4%. As hypothesized, an increase in education by one year leads to, on average, a 1.3% higher likelihood that females and a 1.1% higher likelihood that males pursue an occupation in the non-agricultural sector. The average marginal effects with respect to the youth group activity or family support as primary income source are not significant. To sum up, education seems to be equally important for females and males in their occupational choice.

The regression model *OC3* is used to compare the effect of the gender as well as the effect of education on the job choice between younger and older youth group members. To do so, the sample was split into *Youth* (15-29-year-old youth group members) and *Adults* (30 years or older). The results of the regression are shown in Table 8 and Table 9.

Table 8. *Multinomial logit model of determinants of the occupational choice (OC3): Comparison of younger and older youth group members*

	Non-Agriculture		Youth Group Activity		Support	
	Youth	Adults	Youth	Adults	Youth	Adults
Female	**-0.800****	**-0.360**	**0.165**	**-0.661**	**0.041**	**0.734**
	(0.34)	**(0.39)**	**(0.42)**	**(0.74)**	**(0.29)**	**(0.80)**
Education	**0.082****	**0.134*****	**0.003**	**0.054**	**0.048**	**0.308*****
	(0.04)	**(0.05)**	**(0.05)**	**(0.12)**	**(0.04)**	**(0.10)**
Individual Characteristics						
Age	-0.066	-0.010	-0.201***	-0.073	-0.220****	-0.004
	(0.04)	(0.03)	(0.07)	(0.11)	(0.04)	(0.06)
Birth Rank	0.029	0.126**	0.025	-0.079	-0.037	-0.105
	(0.06)	(0.06)	(0.08)	(0.16)	(0.07)	(0.13)
Married	-1.290****	-0.629	-1.581***	1.169	-2.004****	-0.179
	(0.35)	(0.43)	(0.51)	(0.85)	(0.35)	(0.73)
Youth Household Head	0.243	-0.649*	-1.658*	-1.618**	-0.497	-0.736
	(0.40)	(0.35)	(1.00)	(0.63)	(0.44)	(0.61)
Household Characteristics						
Farm Size	-0.163**	-0.250**	-0.215**	0.305**	-0.003	-0.242
	(0.07)	(0.12)	(0.11)	(0.13)	(0.05)	(0.20)
Oxen	-0.370**	-0.516**	-0.269	-1.921***	-0.414**	-0.630
	(0.17)	(0.21)	(0.23)	(0.65)	(0.17)	(0.63)
Household Size	0.100*	-0.002	0.243***	-0.165	0.136**	0.081
	(0.06)	(0.08)	(0.08)	(0.17)	(0.06)	(0.18)
Youth Group Characteristics						
Youth Group Age	-0.058	-0.006	0.111	0.074	-0.125	-0.009
	(0.08)	(0.09)	(0.16)	(0.16)	(0.09)	(0.13)
Constant	2.078	0.249	3.740**	3.353	6.041****	-3.160
	(1.31)	(1.19)	(1.71)	(4.39)	(1.14)	(2.63)
District FE	Yes	Yes				
Main Youth Group Activity FE	Yes	Yes				
Wald Chi2	375.61	7631.77				
Prob > Chi2	0.0000	0.0000				
Pseudo–R2	0.1991	0.2286				
Log pseudo-likelihood	-637.40	-278.94				
Number of obs.	627	445				

Note: The baseline occupation for the comparison is agricultural work. Cluster robust (clustered at group level) standard errors in parentheses. Significance levels: *p<0.10, **p<0.05, ***p<0.01, ****p<0.001.

Table 9. *Average marginal effects of determinants on the probability of the occupational choice (OC3): Comparison of younger and older youth group members*

	Agriculture		Non-Agriculture		Youth Group Activity		Support	
	Youth	Adults	Youth	Adults	Youth	Adults	Youth	Adults
Female	**0.058**	**0.037**	**-0.145*****	**-0.054**	**0.024**	**-0.013**	**0.063***	**0.030**
	(0.04)	**(0.05)**	**(0.05)**	**(0.06)**	**(0.03)**	**(0.02)**	**(0.04)**	**(0.03)**
Education	**-0.009****	**-0.024******	**0.011****	**0.015****	**-0.003**	**-0.000**	**0.002**	**0.009*****
	(0.00)	**(0.01)**	**(0.01)**	**(0.01)**	**(0.00)**	**(0.00)**	**(0.01)**	**(0.00)**
Individual Characteristics								
Age	0.021****	0.002	0.009	-0.001	-0.005	-0.002	-0.026****	0.000
	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Birth Rank	-0.001	-0.012	0.008	0.020**	0.003	-0.003	-0.010	-0.005
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)
Married	0.244****	0.063	-0.042	-0.098*	-0.013	0.035	-0.189****	0.000
	(0.04)	(0.06)	(0.05)	(0.06)	(0.03)	(0.02)	(0.05)	(0.02)
Youth Household Head	0.036	0.119**	0.110	-0.069	-0.104	-0.033**	-0.042	-0.017
	(0.05)	(0.05)	(0.07)	(0.05)	(0.07)	(0.01)	(0.08)	(0.02)
Household Characteristics								
Farm Size	0.016**	0.031**	-0.024**	-0.036**	-0.012*	0.010***	0.020**	-0.006
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.00)	(0.01)	(0.01)
Oxen	0.058***	0.105****	-0.028	-0.049	0.003	-0.042***	-0.033	-0.015
	(0.02)	(0.03)	(0.03)	(0.03)	(0.01)	(0.02)	(0.03)	(0.02)
Household Size	-0.020**	0.001	0.003	0.000	0.010**	-0.004	0.007	0.003
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Youth Group Characteristics								
Youth Group Age	0.010	-0.000	-0.002	-0.001	0.014	0.002	-0.022	-0.000
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)

Note: Cluster robust (clustered at group level) standard errors in parentheses. Significance levels: *p<0.10, **p<0.05, ***p<0.01, ****p<0.001.

The gender does not play a significant role in the occupational choice in the *Adult* sub-sample. This is in stark contrast to the *Youth* sub-sample and to the general model (*OC1*). When only considering the 15-29-year-old, females are, on average, 14.5% less likely to choose an occupation in the non-agricultural sector than their male counterparts. Additionally, they are 6.3% more likely to rely on family support as a main income source, although this result is only significant at the 0.10 level. Both of these relations are in line with the *Hypothesis 1b* and *1c*. It is surprising that the gender plays a role in the job choice of younger people but does not so when considering the youth group members above 30. Education, on the other hand, seems to be important for both, younger and older youth group members. An increase in education by one year reduces the likelihood of choosing agricultural work as main income source by 2.4% for the "adults" and by 0.9% for the "youth". In both samples, an increase in education is associated with a significant higher likelihood of choosing the non-agricultural sector over the agricultural sector as a main income source, everything else held constant. While an increase in education by one year increases the likelihood of choosing the non-agricultural sector by 1.1% in the *Youth* sample, the corresponding effect for adult is 1.5%. This is in line with the *Hypothesis 3*. In contrast to the *Youth* sample, education plays a significant role in the job choice with regards to support as the main income source when only considering adults. That is, one year of education increases the likelihood of mainly relying on family support by 0.9%. Although the effect is small, it is astonishing that adults with more education are more likely to rely on family support. As in all models so far, education is not significant with regards to the youth group activity as the main income source.

Table 10. *Multinomial logit model of determinants of the occupational choice (OC4): Comparison of household heads and regular household members*

	Non-Agriculture		Youth Group Activity		Support	
	HHhead	Member	HHhead	Member	HHhead	Member
Female	0.061	-1.057***	1.341	0.214	-2.482**	0.260
	(0.46)	(0.34)	(0.89)	(0.42)	(1.18)	(0.34)
Education	0.115***	0.092**	0.104	0.020	0.094	0.066*
	(0.04)	(0.04)	(0.11)	(0.04)	(0.08)	(0.03)
Individual Characteristics						
Age	-0.008	-0.046*	0.035	-0.129***	-0.046	-0.190****
	(0.02)	(0.03)	(0.09)	(0.04)	(0.05)	(0.04)
Birth Rank	0.050	0.119*	0.047	0.036	0.035	-0.018
	(0.06)	(0.06)	(0.22)	(0.08)	(0.09)	(0.07)
Married	-0.396	-0.895**	14.760****	-1.405***	-1.754***	-2.066****
	(0.41)	(0.35)	(1.00)	(0.48)	(0.67)	(0.43)
Household Characteristics						
Farm Size	-0.187*	-0.220**	-0.229	-0.155	-0.313*	0.010
	(0.10)	(0.09)	(0.22)	(0.11)	(0.18)	(0.06)
Oxen	-0.563***	-0.294	-0.446	-0.386	-1.109***	-0.369**
	(0.19)	(0.22)	(0.50)	(0.25)	(0.38)	(0.19)
Household Size	-0.154*	0.200***	-0.202	0.260****	-0.132	0.171***
	(0.08)	(0.06)	(0.23)	(0.08)	(0.15)	(0.07)
Youth Group Characteristics						
Youth Group Age	-0.050	0.048	0.073	0.131	0.105	-0.094
	(0.07)	(0.08)	(0.20)	(0.13)	(0.13)	(0.09)
Constant	0.927	0.446	-17.399****	1.983*	1.571	4.824****
	(1.14)	(1.01)	(3.06)	(1.16)	(1.82)	(1.05)
District FE	Yes	Yes				
Main Youth Group Activity FE	Yes	Yes				
Wald Chi2	8536.18	349.87				
Prob > Chi2	0.0000	0.0000				
Pseudo–R2	0.1953	0.2069				
Log pseudolikelihood	-320.01	-608.37				
Number of obs.	482	590				

Note: The baseline occupation for the comparison is agricultural work. Cluster robust (clustered at group level) standard errors in parentheses. Significance levels: *p<0.10, **p<0.05, ***p<0.01, ****p<0.001.

Table 11. A*verage marginal effects of determinants on the probability of the occupational choice (OC4): Comparison of household heads and regular household members*

	Agriculture		Non-Agriculture		Youth Group Activity		Support	
	HHhead	Member	HHhead	Member	HHhead	Member	HHhead	Member
Female	0.047	0.047	0.041	-0.192****	0.018	0.031	-0.107**	0.115***
	(0.07)	(0.04)	(0.07)	(0.04)	(0.01)	(0.03)	(0.05)	(0.04)
Education	-0.019***	-0.010**	0.016***	0.009*	0.001	-0.003	0.002	0.004
	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Individual Characteristics								
Age	0.002	0.017****	-0.001	0.010***	0.001	-0.002	-0.002	-0.024****
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Birth Rank	-0.008	-0.007	0.007	0.019**	0.000	0.001	0.001	-0.013
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
Married	-0.011	0.208****	-0.118*	0.042	0.201****	-0.016	-0.072***	-0.234****
	(0.07)	(0.04)	(0.07)	(0.04)	(0.06)	(0.04)	(0.03)	(0.06)
Household Characteristics								
Farm Size	0.036**	0.017*	-0.023	-0.032***	-0.002	-0.009	-0.010	0.025***
	(0.02)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Oxen	0.110****	0.049**	-0.070**	-0.011	-0.003	-0.012	-0.038**	-0.026
	(0.03)	(0.02)	(0.03)	(0.03)	(0.01)	(0.02)	(0.02)	(0.03)
Household Size	0.026**	-0.028****	-0.021*	0.013*	-0.002	0.011*	-0.003	0.004
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Youth Group Characteristics								
Youth Group Age	0.004	-0.001	-0.010	0.012	0.001	0.014	0.005	-0.025*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)

Note: Cluster robust (clustered at group level) standard errors in parentheses. Significance levels: *p<0.10, **p<0.05, ***p<0.01, ****p<0.001.

Table 10 and Table 11 display the results for the regression when splitting the sample into those who are *Youth Household Heads* and those, who are not. When comparing these two groups, differences in the effect of the gender are obvious. For those heading a household the gender only plays a significant role with respect to support as a main income source. On average, being a female reduces the likelihood of mainly relying on support by 10.7%. This is in stark contrast to the effect of gender in the sample for youth group members who are not the head of a household: Here, being a female increases (and not decreases) the likelihood of mainly relying on family support by 11.5%. In addition, females that are regular household members are 19.2% less likely than their male counterparts to choose a job in the non-agricultural sector as a main income source. This is not true for those females that are household head themselves. In their case, significant differences for the genders cannot be found. Education has a similar effect in both groups. One additional year of education significantly decreases the likelihood of choosing agriculture as a main income source by 1.9% for those who are household heads and by 1% for those who are not, respectively. And, as hypothesized, a higher education increases the likelihood of mainly working in the nonagricultural sector for both groups by 1.6% (household heads) and 0.9% (not household heads).

To sum up, gender differences with respect to the job choice exist. Females are less likely to work in the non-agricultural sector, and more likely to work in the agricultural sector. The latter result may indicate that females have limited job possibilities outside their (family) farm. A higher educational attainment facilitates an employment in the non-agricultural sector and pulls away from the agricultural sector. For females and males the effect of education is quite similar in size. As already mentioned above, being more independent from the parent household (i.e. being the head of the household or being older) shapes the occupational choice decision. For example, being older or being the household head significantly increases the likelihood of mainly being employed in the agricultural sector. Interestingly, gender differences with regards to an employment possibility in the non-agricultural sector do not apply for those that are the head of the households as well as for adults. Education, on the other hand, is equally important for all groups (e.g. adults, household heads).

4.2   Results: Occupational Diversification

When assessing the diversification decision of the youth group members an ordered logit model is used. Like in the results chapter on occupational choice, first the findings of the general model

on diversification (*OD1*) using the full sample are described. The results are displayed below (Table 12).

Table 12. *Ordered logit model of determinants and average marginal effects of the occupational diversification decision (OD1)*

	Diversification Level	One	Two	Three or more
Female	**-0.473***	**0.078***	**0.023***	**-0.101***
	(0.15)	**(0.02)**	**(0.01)**	**(0.03)**
Education	**-0.010**	**0.002**	**0.000**	**-0.002**
	(0.02)	**(0.00)**	**(0.00)**	**(0.00)**
Individual Characteristics				
Age	0.011	-0.002	-0.001	0.002
	(0.01)	(0.00)	(0.00)	(0.00)
Birth Rank	-0.034	0.006	0.002	-0.007
	(0.03)	(0.00)	(0.00)	(0.01)
Married	0.535****	-0.088****	-0.026***	0.114****
	(0.16)	(0.03)	(0.01)	(0.03)
Youth Household Head	-0.283*	0.047*	0.014*	-0.060*
	(0.16)	(0.03)	(0.01)	(0.03)
Household Characteristics				
Farm Size	-0.092****	0.015****	0.004***	-0.020****
	(0.03)	(0.00)	(0.00)	(0.01)
Oxen	0.111	-0.018	-0.005	0.024
	(0.10)	(0.02)	(0.00)	(0.02)
Household Size	-0.033	0.005	0.002	-0.007
	(0.03)	(0.00)	(0.00)	(0.01)
Youth Group Characteristics				
Youth Group Age	0.079*	-0.013*	-0.004*	0.017*
	(0.04)	(0.01)	(0.00)	(0.01)
/Cut1 Constant	-1.273***			
	(0.42)			
/Cut2 Constant	0.719*			
	(0.42)			
District FE	Yes			
Main Youth Group Activity FE	Yes			
Wald Chi2	122.13			
Prob > chi2	0.0000			
Pseudo-R2	0.0405			
Log pseudolikelihood	-1097.67			
Number of obs.	1,072			

Note: The left side of the table displays the coefficient of the ordered logit model. At the right side of the table the corresponding average marginal effects for the different diversification levels (one job; two jobs, three or more jobs) are displayed. Cluster robust (clustered at group level) standard errors in parentheses. Significance levels: *p<0.10, **p<0.05, ***p<0.01, ****p<0.001.

The results confirm that the gender plays an important role in the decision to diversify income sources. Females are less likely to be in the higher categories of diversification, i.e. are less likely to diversify into several jobs. The average marginal effects give evidence about the magnitude of this relationship: Females are 7.8% more likely to only have one job and 2.3% more likely to have two jobs but are 10.1% less likely to have three or more income sources. These results are in line with the *Hypothesis 2*, which states that females are less likely to diversify because of, on average, lower human capital, stereotypes that reduce the chances of being hired as well as a higher domestic work burden.

Notably, education does not have a statistically significant effect on the diversification decision. The coefficient of education in the general model is negative, indicating that the more education the youth group members have, the less likely they are to diversify their income sources. The marginal effects display a positive relationship between education and the lower two categories, and a negative relationship between education and the highest level of diversification (i.e. category "three or more jobs"). This contradict the *Hypothesis 4*, in which an overall positive relationship between educational attainment and the level of diversification is assumed. However, as discussed above it could also be that the more education the youth group members have, the better paying is the main occupation and, hence, the less they need additional income sources. Since the average marginal effects are very small and not statistically significant, the direction of the effect will not be discussed any further. Nevertheless, it is surprising that the educational attainment does play a role in the job choice, but not in the decision or possibility to diversify the income sources.

In contrast to the variable *Education*, the control variables *Married* and *Farm Size* significantly affect the diversification decision of the youth group members. Those youth group members that are married are more likely to be in a higher category of income diversification, while those that have larger farms are more likely to be in a lower category of income diversification. That is, married youth group members are 8.8% less likely to only have one income source and 2.6% less likely to have two income sources but are 11.4% more likely to have three or more income sources. If the farm size increases by one unit (*tsimdi*), the respondents are 1.5% more likely to only have one income source and 0.4% more likely to have two income sources, but 2% less likely to be in the highest category of the diversification measure. Hence, a larger farm might reduce the need to diversify. Another control variable that affects the degree of occupational diversification, but only at a 0.1 significance level, is *Youth Household Head*. If the youth group

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member itself is the head of the (own) household, he or she is less likely to be grouped in a higher category of diversification. On average, being the head of the household, he or she is 4.7% more likely to only have one income source, 1.4% more likely two have two income sources and 6% less likely to have three or more income sources. Lastly, the age of the youth group, i.e. years since establishment of the youth group, is significant (at the 0.1 significance level). The older the youth group is, the more likely are the youth group members to be in a higher category of the diversification measure. If the youth group age increases by one year, the youth group members are, on average, 1.3% less likely to only have one income source, 0.4% less likely to have two income sources and 1.7% more likely to have three or more income sources. This result indicates that the youth group activity takes some time to generate income for their members and that it currently mainly acts as an additional income source.

Again, the sample was divided into sub-samples containing only female and male youth group members (*OD2*). The results are displayed in Table 13. For both samples, education was not significantly affecting the degree of diversification. Hence, the *Hypothesis 4* can again not be confirmed. Although not significant, the signs of the coefficient for education differ. While females with more years of education are more likely to be in the lower category of the diversification measure, the opposite is true for males. As the results are not significant, it is difficult to really infer opposing effects of education for the genders. However, when viewing the control variables gender differences become obvious. For female youth group members being married, being the head of the household and the age of the youth group is significantly affecting the diversification decision. If females are married, they are more likely to be in a higher category and if they are household heads, they are more likely to be in a lower category of the diversification measure. The earlier the year of establishment of the youth group, the more likely females are to be in a higher category of diversification, i.e. the more likely they are to diversify their income sources. Again, this result points out that the youth group activity currently usually takes the form of an additional income source. For males the farm size as well as the number of oxen are the only variables considered that significantly affect the diversification decision. The higher the farm size, the more likely they are to be in a lower category of diversification and the more oxen they own, the more likely they are to be in a higher category of diversification. It seems, that having a large farm reduces the need to diversify income sources. Having more oxen, however, might facilitate to rent additional land or to do sharecropping.

Table 13. *Ordered logit model of determinants and average marginal effects of the occupational diversification decision (OD2): Comparison of females and males*

	Diversification Level		One		Two		Three or more	
	Females	Males	Females	Males	Females	Males	Females	Males
Education	**-0.066**	**0.011**	**0.012**	**-0.002**	**-0.000**	**-0.001**	**-0.012**	**0.002**
	(0.04)	**(0.02)**	**(0.01)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.01)**	**(0.00)**
Individual Characteristics								
Age	0.005	0.014	-0.001	-0.002	0.000	-0.001	0.001	0.003
	(0.02)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Birth Rank	-0.036	-0.027	0.006	0.004	-0.000	0.002	-0.006	-0.006
	(0.06)	(0.03)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Married	0.543**	0.084	-0.099**	-0.013	0.002	-0.006	0.097**	0.019
	(0.26)	(0.26)	(0.05)	(0.04)	(0.01)	(0.02)	(0.05)	(0.06)
Youth Household Head	-0.619**	0.215	0.112**	-0.032	-0.002	-0.015	-0.111**	0.048
	(0.29)	(0.26)	(0.05)	(0.04)	(0.01)	(0.02)	(0.05)	(0.06)
Household Characteristics								
Farm Size	-0.067	-0.104***	0.012	0.016***	-0.000	0.007***	-0.012	-0.023***
	(0.07)	(0.03)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Oxen	-0.059	0.207**	0.011	-0.031*	-0.000	-0.015**	-0.010	0.046**
	(0.18)	(0.11)	(0.03)	(0.02)	(0.00)	(0.01)	(0.03)	(0.02)
Household Size	-0.088	-0.003	0.016	0.000	-0.000	0.000	-0.016	-0.001
	(0.06)	(0.04)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Youth Group Characteristics								
Youth Group Age	0.194**	0.026	-0.035**	-0.004	0.001	-0.002	0.035**	0.006
	(0.09)	(0.04)	(0.02)	(0.01)	(0.00)	(0.00)	(0.02)	(0.01)
/Cut1 Constant	-1.469*	-0.888*						
	(0.85)	(0.45)						
/Cut2 Constant	0.585	1.157**						
	(0.84)	(0.46)						
District FE	Yes	Yes						
Main Youth Group Activity FE	Yes	Yes						
Wald Chi2	89.33	69.29						
Prob > chi2	0.0000	0.0000						
Pseudo-R2	0.0903	0.0338						
Log pseudo-likelihood	-324.63	-753.93						
Number of obs.	329	743						

Note: The left side of the table displays the coefficient of the ordered logit model for the "female" and "male" sub samples. At the right side of the table the corresponding average marginal effects for the different diversification levels (one job; two jobs, three or more jobs) are displayed. Cluster robust (clustered at group level) standard errors in parentheses. Significance levels: *p<0.10, **p<0.05, ***p<0.01, ****p<0.001.

Table 14. *Ordered logit model of determinants and average marginal effects of the occupational diversification decision (OD3): Comparison of younger and older youth group members*

	Diversification Level		One		Two		Three or more	
	Youth	Adults	Youth	Adults	Youth	Adults	Youth	Adults
Female	-0.456**	-0.337	0.080**	0.048	0.006	0.031	-0.086**	-0.079
	(0.21)	(0.27)	(0.04)	(0.04)	(0.01)	(0.02)	(0.04)	(0.06)
Education	-0.028	0.039	0.005	-0.006	0.000	-0.004	-0.005	0.009
	(0.02)	(0.04)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
Individual Characteristics								
Age	0.082***	-0.003	-0.014***	0.000	-0.001	0.000	0.015***	-0.001
	(0.03)	(0.02)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Birth Rank	-0.032	-0.061	0.006	0.009	0.000	0.006	-0.006	-0.014
	(0.04)	(0.05)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Married	0.384	0.392*	-0.068	-0.056*	-0.005	-0.036	0.073	0.092*
	(0.24)	(0.23)	(0.04)	(0.03)	(0.01)	(0.02)	(0.05)	(0.05)
Youth Household Head	-0.787***	-0.030	0.139***	0.004	0.011	0.003	-0.149***	-0.007
	(0.27)	(0.24)	(0.05)	(0.03)	(0.01)	(0.02)	(0.05)	(0.06)
Household Characteristics								
Farm Size	-0.107***	-0.021	0.019***	0.003	0.001	0.002	-0.020***	-0.005
	(0.04)	(0.06)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Oxen	0.180	0.113	-0.032	-0.016	-0.002	-0.010	0.034	0.026
	(0.13)	(0.12)	(0.02)	(0.02)	(0.00)	(0.01)	(0.02)	(0.03)
Household Size	-0.091**	0.105*	0.016**	-0.015*	0.001	-0.010*	-0.017**	0.024*
	(0.04)	(0.06)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Youth Group Characteristics								
Youth Group Age	0.042	0.099**	-0.007	-0.014**	-0.001	-0.009**	0.008	0.023**
	(0.06)	(0.05)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
/Cut1 Constant	-0.407	-0.645						
	(0.83)	(0.91)						
/Cut2 Constant	1.736**	1.243						
	(0.85)	(0.89)						
District FE	Yes	Yes						
Main Youth Group Activity FE	Yes	Yes						
Wald Chi2	92.31	30.65						
Prob > Chi2	0.0000	0.0220						
Pseudo-R2	0.0570	0.0282						
Log-pseudo-likelihood	-631.42	-449.19						
Number of obs.	627	445						

Note: The left side of the table displays the coefficient of the ordered logit model for the "youth" and "adults" sub samples. At the right side of the table the corresponding average marginal effects for the different diversification levels (one job; two jobs, three or more jobs) are displayed. Cluster robust (clustered at group level) standard errors in parentheses. Significance levels: *p<0.10, **p<0.05, ***p<0.01, ****p<0.001.

The youth groups were established to create employment possibilities for rural, landless youth. Though, many youth group members are not youth (15-29-year-old) but are adults. To capture differences between youth and adult in the sample, an additional regression was carried out (*OD3*). The results are displayed below (Table 14).

As in the occupational choice model, gender does not play a significant role in the *Adult* sub-sample. However, in the *Youth* sub-sample females are more likely to be in a lower category of diversification, i.e. are more likely to diversify less than their male counterparts. On average, being a female increases the likelihood of only having one job by 8% and the likelihood of having two jobs by 0.6% but decreases the likelihood of having three or more jobs by 8.6%. This is in line with *Hypothesis 2*, which assumes females being less likely to diversify because of, in general, lower likelihood to be employed (e.g. stereotypes). As in the general diversification model, education is not significant. Again, the effect of control variables differs between the two sub-samples. The farm size, the household size and being the household head is negatively correlated with diversification in the *Youth* sample, while the age is positively correlated with the level of diversification. The diversification decision of the *Adults*, instead, is significantly positive affected by the household size (positive effect is opposite to effect in *Youth* sub-sample), the age of the youth group and the marriage status.

Lastly, the regression results for the comparison of *Youth Household Heads* and those who are regular household members are displayed (Table 15). In both groups, females are significantly less likely to diversify than their male counterparts. For those who are the household head themselves, being a female is associated with a 11.1% higher likelihood of only having one job, a 5.7% higher likelihood of having two jobs and a 16.9% lower likelihood of having three or more jobs. The corresponding numbers for regular household members are 7.3%. 0.6% and 7.9%. As before, education does not significantly affect the diversification decision of the youth group members. Also, the effect of control variables differs between the two samples. While for those that are household heads themselves only the farm size plays a significant role in the diversification decision (i.e. the higher the farm size, the less likely to diversify to a larger degree), for regular members being married, the household size as well as the age of the youth group has an effect, too.

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Table 15. *Ordered logit model of determinants and average marginal effects of the occupational diversification decision (OD4): Comparison of household heads and regular household members*

	Diversification Level		One		Two		Three or more	
	HHhead	Member	HHhead	Member	HHhead	Member	HHhead	Member
Female	-0.732**	-0.416**	0.111**	0.073**	0.057**	0.006	-0.169**	-0.079**
	(0.34)	(0.19)	(0.05)	(0.03)	(0.03)	(0.01)	(0.08)	(0.04)
Education	-0.003	-0.007	0.000	0.001	0.000	0.000	-0.001	-0.001
	(0.03)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Individual Characteristics								
Age	0.004	0.015	-0.001	-0.003	-0.000	-0.000	0.001	0.003
	(0.02)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Birth Rank	-0.020	-0.060	0.003	0.011	0.002	0.001	-0.005	-0.011
	(0.05)	(0.04)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Married	0.316	0.440*	-0.048	-0.077*	-0.025	-0.006	0.073	0.084*
	(0.29)	(0.24)	(0.04)	(0.04)	(0.02)	(0.01)	(0.07)	(0.05)
Household Characteristics								
Farm Size	-0.103**	-0.088**	0.016**	0.015**	0.008**	0.001	-0.024**	-0.017**
	(0.05)	(0.04)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Oxen	0.157	0.095	-0.024	-0.017	-0.012	-0.001	0.036	0.018
	(0.13)	(0.13)	(0.02)	(0.02)	(0.01)	(0.00)	(0.03)	(0.02)
Household Size	0.070	-0.086**	-0.011	0.015**	-0.006	0.001	0.016	-0.016**
	(0.05)	(0.04)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Youth Group Characteristics								
Youth Group Age	0.053	0.116*	-0.008	-0.020*	-0.004	-0.002	0.012	0.022*
	(0.05)	(0.06)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
/Cut1 Constant	-0.990	-1.457**						
	(0.68)	(0.60)						
/Cut2 Constant	0.784	0.739						
	(0.68)	(0.60)						
District FE	Yes	Yes						
Main Youth Group Activity FE	Yes	Yes						
Wald Chi2	48.43	62.77						
Prob > chi2	0.0000	0.0000						
Pseudo-R2	0.0376	0.0389						
Log-pseudo-likelihood	-488.68	-598.84						
Number of obs.	482	590						

Note: The left side of the table displays the coefficient of the ordered logit model for the "household (HH) head" and regular household "member" sub samples. At the right side of the table the corresponding average marginal effects for the different diversification levels (one job; two jobs, three or more jobs) are displayed. Cluster robust (clustered at group level) standard errors in parentheses. Significance levels: *p<0.10, **p<0.05, ***p<0.01, ****p<0.001.

It has to be mentioned that the explanatory power of the occupational diversification models is rather low (i.e. a low pseudo-R2). Hence, the variables included are only limitedly able to explain the heterogeneity in the diversification decision. This is not surprising, as the diversification decision, next to individual and household characteristics, depends on a variety of factors (e.g. (environmental) risks and credit availability) that were not included in the analysis. Nevertheless, the model gives information on the key questions in this thesis.

To conclude, in contrast to other studies (e.g. Abdulai and CroleRees (2001)) education does not play a role in the diversification decision of the youth group members. The gender, however, is a significant influencing factor. As hypothesized, it is found that females are significantly less likely to diversify their income sources. Solely when only considering adult youth group members, gender differences do not exist. The youth group age (i.e. the time since establishment of the individual youth group) is significantly and positive associated with the diversification decision. Hence, the longer a youth group exists, the more likely its' members are to diversify.

5   Discussion

The results of the regression analyses enable to answer some of the questions raised at the beginning of this study. It is shown that the gender plays an important role in the occupational choice as well as in the diversification decision. Further it is shown that more education pulls away from an employment in the agricultural sector into the non-agricultural sector. In this chapter, some of these findings are examined in more detail. Lastly, the limitations of this study are discussed.

5.1   Discussion of the results

The theories on occupational segregation by sex often stress that the, on average, lower human capital (e.g. educational attainment, work experience) of females is one important reason for different job choices. At least with regards to educational attainment, Ethiopia made great improvements in the last years. While in 2000, the primary school enrollment rate for males was 66% and the one for females was only 43%, the corresponding numbers in 2015 were 107% and 97% (World Bank 2018c; World Bank 2018d). (As the number of children enrolled in primary school is compared to the total number of children in the relevant age group, values higher than 100% can occur if "too young" or "too old" children are enrolled in primary school as well.) In this sample, too, female youth group members have a similar education as their male counterparts: while females have on average 5.3 years of education, males, on average, have 5.27 years. But what does this mean for the segregation of occupations by sex? Differences in human capital, at least with respect to education, do not explain the differences in job choice between females and males. More likely, preferences as well as stereotypes or discrimination seem to play a role. Also, the traditional role of females (i.e. higher domestic work burden) is assumed to limit their job choice, and, consequently, might explain differences. The survey used in this study gives information on the time the youth group members spend helping their family. In addition, information on the number of children or elderly that need to be cared for could be used to assess the effect of the domestic work burden on the job choice.

In the analysis above, different regressions were carried out to better understand the role of being independent from the parent household (i.e. being the head of the own household and being older) with regards to the occupational choice and diversification decision of the youth group members. Not only it was found that the variables *Youth Household Head* and *Age* are important determinants, but also that gender differences in the occupational choice for those that are more independent (i.e. household head sub-sample) and for those that are older (i.e.

adult sub-sample) do not exist. However, one cannot infer that gender differences with regards to the job choice do not play a role as, for example, adulthood is reached. Instead, a possible explanation could be that those females that are household head themselves as well as those that, as an adult, actively are part of youth groups or the labor force differ from regular household members or the general female population in Ethiopia. Likewise, those that are household head themselves (females and males) might differ from regular household members in certain characteristics. For a more in-depth assessment of the effect of a reduced dependency on the parents, these potential differences need to be considered.

In this study, cross-sectional data from 2016 is used to examine the livelihood choices as well as the role of the youth group membership. At that point in time, the youth group activity seems to have a limited impact in insuring sufficient income. Only 6% of the people surveyed mention the youth group activity to be their main income source, and half of the sample does not mention the youth group activity as an income source at all! For many, the youth group activity is, if at all, an additional income source. The age of the youth group might help to explain this. Many of the youth groups were created relatively recently – approximately 70% of the youth group members were part of groups less than 3 years old. The age of the youth group, however, is significantly associated with a higher likelihood of being in a higher category of the diversification measure, i.e. a higher likelihood to have three or more income sources. As years go by, the importance of the youth group activity as an income source might rise. The youth group members themselves believe this to happen; more than 60% of them expect the youth group activity to be the main income source 5 years subsequent to the survey. It would be interesting to repeat the survey and to follow-up on the youth group members. Not only would this allow to see if the youth group activities indeed mature into important livelihood sources, but also it would allow to check, for example, if the implementation of youth groups ensures a sustainable land use. And maybe, continued research allows to decide if a similar organization of youth is a promising approach that can be expanded into other regions and countries.

When diversification decisions are described or researched, the whole household is almost always the observation unit. This makes sense, as diversification of income sources does not necessarily take place at the individual level. Instead, individuals specialize in different income sources and the family as a whole diversifies and is, for example, able to mitigate risks (Reardon et al. 2007). Interestingly, specialization (or only having one income source) is rarely observed in the sample of youth group members as 77.3% of them diversify. If the household as a whole

diversifies to a larger degree (or into more income sources) is not obvious from the data set. As the sample consists solely of youth group members, another unit of observing the diversification decision could be at the youth group level. Diversifying into different youth group activities could benefit the youth groups in the same ways as it benefits households or individuals. For example, diversification can be used to seize business opportunities or as a strategy to mitigate (environmental) risks. The coalition in groups might facilitate diversification as the group can draw on the diverse skills of their members. It would be interesting to assess the (possible) diversification decision at the youth group level to, among other things, better understand the potential that the organization of youth into groups or primary cooperatives bears.

5.2 Limitations of this study

The sample consists out of a very specific group of people: all of them are part of a youth group and, consequently, already decided to stay in the rural area. In addition, they are less likely to start or pursue higher education as well as they might have less access to land. Hence, important decisions already have been made. For example, in a study from Bezu and Holden (2014) using a sample of youth in rural Ethiopia, they found that approximately 58% of the youth plan to engage in urban salaried employment. Here, the youth group members already decided against this. Overall, the sample used in this study differs from the general population and, consequently, the results cannot be generalized. However, as the focus of this study is to focus on the livelihood choices of these youth group members, the explanatory power of this study is not reduced.

The jobs of the youth group members were grouped into four categories: agricultural work, non-agricultural work, the youth group activity and family support. Though the aggregation of jobs into the agricultural and non-agricultural sector provides information on the preferences of the youth group members and the importance of these different sectors, some insights are lost. For example, most people in the agricultural sector receive their income from either the own farm or from land renting/sharecropping. However, there are large gender differences with respect to the job chosen within the agricultural sector. For example, of the females who have their main occupation within the agricultural sector, 73% of them work on a family farm and 26% are engaged in land renting/sharecropping. The corresponding shares for males are 57% and 41%. Hence, although the above regressions indicate that women are more likely to work in the agricultural sector than their male counterparts, this result might solely be driven by many of them working on the (family) farm. Similar observations can be made with regards to the

non-agricultural sector: of those mainly being occupied in the non-agricultural sector females mostly are engaged in work related to trade (71%) and males are mostly engaged in construction work (61%). Of course, the grouping into sectors is a useful method, which is quite common in the assessment of job choices. Still, a lower level of aggregation can give a deeper understanding.

In the analysis of the livelihood strategies of the youth group members, diversification was measured as the number of income sources a person has, grouped into the categories one, two and three or more income sources. This measure is somewhat incomplete, as it neglects the importance of the jobs in terms of the contribution to the overall income as well as in terms of the diversification into different types of work (e.g. sectors). To increase the informative value of the assessment of diversification, it is better to use a more comprehensive measure. In a discussion on the suitability of measures of rural income diversification, Zhao and Barry (2013) distinguish between one-dimensional and two-dimensional measures. One dimensional measures include counting the number of income sources and using the share of non-farm income of the total income as a measure of diversification. Two dimensional measures simultaneously comprise information on the relative importance of the different income sources (i.e. share of total income) and the number of areas (e.g. sectors) the jobs are in. Among others, the *Berry index* (McNamara & Weiss 2005)*,* the *entropy index* (e.g. Mishra et al. (2010)) and the *Ginevičius index* (Ginevičius 2009) are two-dimensional measures. These measures differ in the emphasis that is put on the evenness of the distribution of income shares (Berry index and entropy index) and that is put on the presence of unrelated income sources (Ginevičius index). The authors test the different measures of diversification in the context of household incomes in rural China. They found that the results of the one-dimensional measures contradict the results of the two-dimensional measures: while the two-dimensional measures all confirm a negative significant relationship between diversification and household income, the one-dimensional measures predict a positive and sometimes insignificant effect. When using the two-dimensional measures and viewing the marginal effect of diversification at the different household income quintiles, the coefficients show that poor households benefit from diversification in terms of higher overall income, while there is no effect for middle income household and a negative progressive effect of diversification on the household income of wealthier households. Zhao and Barry therefore conclude that a two-dimensional measure of diversification should be used to capture the varying effects of diversification decisions on the income of different household types. However, Zhao and Barry point out that when solely

viewing the poor, one could focus on a measure that emphasizes the number of income sources. The authors argue that the shares of the different income sources are not as relevant when focusing on the poor as the poor simply seek (all) possible job opportunities and do not have the power to control these. Hence, the poor mainly diversify to simply earn enough money. In contrast, in their study, wealthier households primarily diversify to mitigate business risks so that the distribution of the income from different sources is of higher relevance. The following can be inferred from these findings: First, when modeling diversification decisions a two-dimensional model should be used as this not only increases the informative value since the sector as well as the importance of income sources are considered, but also because it better captures the effect for different household types (e.g. poor and wealthy). Hence, when surveying the youth group members in future, data on the earnings in each income source should be collected. Second, the youth group members are, on average, quite poor (mean annual income 8,322 Ethiopian Birr (approx. 355 $); median annual income 5,750 Ethiopian Birr (approx. 245 $)). Following the argumentation of Zhao and Barry, using the number of income sources as a measure for diversification is sufficient, as the income shares are not as relevant if only relatively poor people are considered. I therefore conclude that, in this context, the above used occupational diversification variable (i.e. number of income sources sorted into three categories) is an appropriate measure. However, when carrying out a more in-depth analysis of the diversification decision (using a more diverse sample) a two-dimensional measure should be used.

Lastly, it needs to be remarked that this study is carried out using a cross-sectional data set. Hence, information is only available for one point in time and any dynamics are neglected. This might be of some importance since, first, many youth group members are at an age where they are at the edge of founding their own lives or forming their own households. It could be, that the youth are not fully involved in the decision process and that their current job or diversification decision is part of the parent's household livelihood strategy. The significant effects of the variables *Youth Household Head* and *Age* in the occupational choice as well as in the occupational diversification models indicate that being more independent from the parent household indeed shapes the livelihood choice. Over time, and as more and more of the youth group members form their own household, the importance of the different working sectors might shift (e.g. from support as main income source into the agricultural sector). And, second, most of the youth groups were established relatively recently. As discussed above, it is possible

that the youth group membership develops into an important livelihood source. To capture these (possible) dynamics, a repetition of the survey would be necessary.

6 Conclusion

In Ethiopia, the limited land access as well as the only few employment possibilities in the non-agricultural sector make it difficult for the rural youth to secure their livelihoods. As a result, youth un- or underemployment are high, and more and more youth migrate into cities or out of the country. Social and economic crises in the rural areas as well as in the cities the youth migrate to might be the consequence (Bezu & Holden 2014). With its' Youth Responsive Land Policy, Ethiopia launched a promising program to create employment possibilities for the rural youth. So, is the program successful in enabling the youth group members to ensure sufficient and sustainable livelihoods in the rural areas?

In this study, data from the 2016 Youth Group Member Survey is used to examine the livelihood choices (i.e. job choice and diversification decision) of 1,072 youth group members. The youth group activity is currently only for 6% the main income source, and half of the respondents do not receive any income at all from the youth groups. The relatively recent establishment of the youth groups (mean age 2.2 years) might be the reason for that. The regression results confirm this assumption as a significant positive relationship between the age of the youth group and the likelihood to diversify exists. Currently, most of the youth group members receive the largest share of their income from work in the agricultural sector (47%), followed by a work in the non-agricultural sector (24%) and family support (22%). As found in other studies, a higher educational attainment is associated with a higher likelihood of working in the non-agricultural sector, and a lower likelihood of working in the agricultural sector. In the diversification decision, the education does not play a significant role. Surprisingly, females are more likely to choose a main occupation in the agricultural sector as their male counterparts. Probably, this result is driven by limited employment possibilities for females. Since females in this sample are, on average, slightly higher educated than the males, the fewer employment possibilities in the non-agricultural sector point to disadvantages (e.g. stereotypes, discrimination) faced by females in the labor market. Likewise, females are less likely (or less able) to diversify.

As the organization of rural youth into these youth cooperatives is a relatively young program, continued research is necessary to better understand the effect of the youth group membership on the livelihoods of their members. It might be that not only the current youth group activities develop into secure and sufficient (additional) income sources, but also that the youth groups themselves take the initiative and diversify. This remains to be seen.

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Appendices

Table A1. *Robustness analysis of the multinomial logit model of determinants of the occupational choice*

	Non-Agriculture				Youth Group Activity				Support			
	1	2	3	4	1	2	3	4	1	2	3	4
Female	**-0.374***	**-0.371***	**-0.465****	**-0.747*****	**0.422**	**0.496***	**0.528***	**-0.060**	**0.234**	**0.286**	**0.356***	**-0.109**
	(0.22)	**(0.22)**	**(0.22)**	**(0.24)**	**(0.29)**	**(0.28)**	**(0.29)**	**(0.32)**	**(0.18)**	**(0.20)**	**(0.20)**	**(0.22)**
Education	**0.142*****	**0.128*****	**0.131*****	**0.106*****	**0.139*****	**0.100*****	**0.107*****	**0.051**	**0.215*****	**0.163*****	**0.167*****	**0.096*****
	(0.03)	**(0.03)**	**(0.03)**	**(0.03)**	**(0.04)**	**(0.04)**	**(0.04)**	**(0.04)**	**(0.03)**	**(0.03)**	**(0.03)**	**(0.03)**
Individual Characteristics												
Age				-0.035**				-0.099***				-0.141****
				(0.02)				**(0.04)**				**(0.03)**
Birth Rank		0.086**	0.084*	0.076*		0.028	0.046	0.044		0.007	0.015	-0.005
		(0.04)	(0.04)	(0.04)		(0.07)	(0.07)	(0.07)		(0.06)	(0.06)	(0.06)
Married		-1.135****	-1.415****	-1.123****		-2.001****	-1.999****	-1.145***		-2.842****	-2.634****	-1.716****
		(0.21)	(0.23)	(0.23)		(0.32)	(0.36)	(0.38)		(0.26)	(0.27)	(0.28)
Youth Household Head				-0.277				-1.198**				-0.553*
				(0.27)				(0.49)				(0.29)
Household Characteristics												
Farm Size			-0.176***	-0.186***			-0.031	-0.129			0.070*	0.004
			(0.06)	(0.06)			(0.08)	(0.10)			(0.04)	(0.05)
Oxen			-0.430***	-0.454****			-0.365*	-0.486**			-0.381**	-0.445***
			(0.13)	(0.13)			(0.20)	(0.22)			(0.16)	(0.16)
Household Size			0.019	0.054			0.133**	0.185***			0.088	0.121**
			(0.04)	(0.04)			(0.07)	(0.07)			(0.05)	(0.06)
Youth Group Characteristics												
Youth Group Age			-0.068	-0.024			0.039	0.128			-0.152**	-0.046
			(0.06)	(0.06)			(0.12)	(0.13)			(0.07)	(0.07)
Constant	-1.214****	-0.619	0.478	1.452**	-1.894****	-0.616	-1.207	1.652	-1.727****	-0.090	-0.047	3.802****
	(0.29)	(0.41)	(0.52)	(0.65)	(0.37)	(0.51)	(0.79)	(1.09)	(0.34)	(0.43)	(0.59)	(0.95)

					Yes
District FE					Yes
Main Youth Group Activity FE					
	1	2	3	4	
Wald Chi 2	219.75	344.81	479.86	506.45	
Prob > Chi 2	0.0000	0.0000	0.0000	0.0000	
Pseudo-R2	0.1000	0.1803	0.2101	0.2442	
Log pseudolikelihood	-1168.42	-1051.22	-1022.16	-978.08	
Number of obs.	1,074	1,074	1,072	1,072	

Note: The baseline occupation for the comparison is agricultural work. Cluster robust (clustered at group level) standard errors in parentheses. Significance levels: *p<0.10, **p<0.05, ***p<0.01, ****p<0.001. The models above (1-4) differ with regards to the control variables.

Table A2a. *Multinomial logit model of determinants of the occupational choice: Regression results of the second-step of the control function approach when using "Iron Roof" as an instrument variable for education*

	Non-Agriculture	Youth Group Activity	Support
Female	**-0.742****	**0.287**	**-0.126**
	(0.30)	**(0.44)**	**(0.28)**
Education	**0.356***	**0.150**	**0.068**
	(0.20)	**(0.43)**	**(0.25)**
Individual Characteristics			
Age	0.011	-0.082	-0.139**
	(0.04)	(0.09)	(0.06)
Birth Rank	0.152**	0.080	-0.018
	(0.07)	(0.12)	(0.07)
Married	-0.959****	-1.354***	-1.806****
	(0.27)	(0.51)	(0.32)
Youth Household Head	-0.624**	-1.273	-0.571
	(0.30)	(1.95)	(0.38)
Household Characteristics			
Farm Size	-0.232****	-0.118	0.018
	(0.06)	(0.13)	(0.05)
Oxen	-0.571****	-0.471	-0.413**
	(0.17)	(0.31)	(0.20)
Household Size	0.144***	0.257****	0.155**
	(0.05)	(0.08)	(0.06)
Youth Group Characteristics			
Youth Group Age	-0.073	0.155	-0.035
	(0.08)	(0.17)	(0.10)
Residuals (First stage)	-0.250	-0.108	0.037
	(0.20)	(0.45)	(0.25)
Constant	-2.175	-0.453	3.630
	(2.62)	(5.59)	(3.38)
District FE	Yes		
Main Youth Group Activity FE	Yes		
Wald Chi2	306.81		
Prob > Chi2	0.0000		
Pseudo-R2	0.2605		
Log pseudolikelihood	-844.30		
Number of obs.	951		
First stage F-Value	19.99		
Prob>F	0.000		

Note: The baseline occupation for the comparison is agricultural work. Cluster robust (clustered at group level) standard errors in parentheses. Significance levels: *p<0.10, **p<0.05, ***p<0.01, ****p<0.001.

Table A2b. *Multinomial logit model of determinants of the occupational choice (Same sample as in control function approach)*

	Non-Agriculture	Youth Group Activity	Support
Female	**-0.836***	**0.250**	**-0.092**
	(0.27)	**(0.34)**	**(0.23)**
Education	**0.112******	**0.044**	**0.105***
	(0.03)	**(0.04)**	**(0.03)**
Individual Characteristics			
Age	-0.030*	-0.101**	-0.133****
	(0.02)	(0.04)	(0.03)
Birth Rank	0.103**	0.058	-0.012
	(0.05)	(0.07)	(0.06)
Married	-1.094****	-1.406****	-1.788****
	(0.25)	(0.41)	(0.28)
Youth Household Head	-0.540*	-1.226**	-0.574*
	(0.28)	(0.54)	(0.35)
Household Characteristics			
Farm Size	-0.215****	-0.109	0.017
	(0.06)	(0.10)	(0.05)
Oxen	-0.473****	-1.226**	-0.425**
	(0.14)	(0.23)	(0.17)
Household Size	0.131***	-0.428*	0.160***
	(0.05)	(0.07)	(0.06)
Youth Group Characteristics			
Youth Group Age	-0.057	0.160	-0.037
	(0.06)	(0.13)	(0.08)
Constant	0.870	0.888	3.169***
	(0.68)	(1.29)	(1.01)
District FE	Yes		
Main Youth Group Activity FE	Yes		
Wald Chi2	447.98		
Prob > Chi2	0.0000		
Pseudo-R2	0.2596		
Log pseudolikelihood	-845.36		
Number of obs.	951		

Note: The baseline occupation for the comparison is agricultural work. Cluster robust (clustered at group level) standard errors in parentheses. Significance levels: *p<0.10, **p<0.05, ***p<0.01, ****p<0.001.

Table A3. *Robustness analysis of the ordered logit model of determinants of the occupational diversification decision*

	Diversification Level			
	1	**2**	**3**	**4**
Female	-0.347**	-0.362***	-0.395***	-0.473***
	(0.14)	(0.14)	(0.14)	(0.15)
Education	-0.034**	-0.013	-0.015	-0.010
	(0.02)	(0.02)	(0.02)	(0.02)
Individual Characteristics				
Age				0.011
				(0.01)
Birth Rank		-0.035	-0.038	-0.034
		(0.03)	(0.03)	(0.03)
Married		0.682****	0.514****	0.535****
		(0.12)	(0.13)	(0.16)
Youth Household Head				-0.283*
				(0.16)
Household Characteristics				
Farm Size			-0.079***	-0.092****
			(0.03)	(0.03)
Oxen			0.111	0.111
			(0.10)	(0.10)
Household Size			-0.024	-0.033
			(0.03)	(0.03)
Youth Group Characteristics				
Youth Group Age			0.085**	0.079*
			(0.04)	(0.04)
/Cut1 Constant	-1.650****	-1.343****	-1.414****	-1.273***
	(0.19)	(0.22)	(0.32)	(0.42)
/Cut2 Constant	0.269	0.623***	0.573*	0.719*
	(0.19)	(0.22)	(0.33)	(0.42)
District FE	Yes	Yes	Yes	Yes
Main Youth Group Activity FE	Yes	Yes	Yes	Yes
Wald Chi 2	41.33	84.79	113.24	122.13
Prob > Chi2	0.0000	0.0000	0.0000	0.0000
Pseudo-R2	0.0187	0.0327	0.0392	0.0405
Log pseudolikelihood	-1124.90	-1108.88	-1099.13	-1097.67
Number of obs.	1,074	1,074	1,072	1,072

Note: Cluster robust (clustered at group level) standard errors in parentheses. Significance levels: *p<0.10, **p<0.05, ***p<0.01, ****p<0.001. The models above (1-4) differ with regards to the control variables.

Table A4a. *Ordered logit model of determinants of the occupational diversification decision: Regression results of the second-step of the control function approach when using "Iron Roof" as an instrument variable for education*

	Diversification Level
Female	**-0.410****
	(0.17)
Education	**0.079**
	(0.14)
Individual Characteristics	
Age	0.023
	(0.03)
Birth Rank	-0.037
	(0.04)
Married	0.641***
	(0.20)
Youth Household Head	-0.130
	(0.21)
Household Characteristics	
Farm Size	-0.089***
	(0.03)
Oxen	0.052
	(0.13)
Household Size	-0.058*
	(0.03)
Youth Group Characteristics	
Youth Group Age	0.056
	(0.05)
Residuals (First stage)	-0.094
	(0.14)
/Cut1 Constant	-0.561
	(1.81)
/Cut2 Constant	1.480
	(1.82)
District FE	Yes
Main Youth Group Activity FE	Yes
Wald Chi 2	125.84
Prob > Chi2	0.0000
Pseudo-R2	0.0453
Log pseudolikelihood	-964.00
Number of obs.	951
First stage F Value	19.99
Prob<F	0.0000

Note: Cluster robust (clustered at group level) standard errors in parentheses. Significance levels: *p<0.10, **p<0.05, ***p<0.01, ****p<0.001.

Table A4b. *Ordered logit model of determinants of the occupational diversification decision (Same sample as in the control function approach)*

	Diversification Level
Female	**-0.450***
	(0.16)
Education	**-0.013**
	(0.02)
Individual Characteristics	
Age	0.007
	(0.01)
Birth Rank	-0.055*
	(0.03)
Married	0.589****
	(0.16)
Youth Household Head	-0.100
	(0.19)
Household Characteristics	
Farm Size	-0.083***
	(0.03)
Oxen	0.088
	(0.10)
Household Size	-0.063**
	(0.03)
Youth Group Characteristics	
Youth Group Age	0.062
	(0.05)
/Cut1 Constant	-1.708****
	(0.49)
/Cut2 Constant	0.332
	(0.48)
District FE	Yes
Main Youth Group Activity FE	Yes
Wald Chi 2	124.39
Prob > Chi2	0.0000
Pseudo-R2	0.0451
Log pseudolikelihood	-964.26
Number of obs.	951

Cluster robust (clustered at group level) standard errors in parentheses. Significance levels: *p<0.10, **p<0.05, ***p<0.01, ****p<0.001.