

**Social Networks and Rural Feeder Roads:
Livelihood effects of Social Networks in Rural
Remote Communities in the context of Increasing
Mobility**

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Evidence from Tigray Region, Ethiopia.

IDS Research Internship on Feeder Roads Ethiopia

Master Thesis

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I Abstract

Roads and social networks have been topical in research in the last few decades. Indeed, the two separate concepts are arguably vital in rural development but the study described in this thesis is among the first to systematically link social networks and road infrastructure in rural development. After all, in most rural social networks in developing context, whether people can benefit from their membership depends on physically accessing the network. This research has a twofold focus as it seeks to assess the role of social networks in the lives and development of inhabitants of rural remote areas and to investigate the role of roads and mobility in creating, accessing and functioning of those networks.

This research shows how social networks operate and how they depend on- and are influenced by a recently constructed road in a case study village in the Northern Ethiopian Tigray region. The findings are based on 3 focus-group discussions with network members, 31 semi-structured interviews with inhabitants of the village that participate in various networks and 11 interviews with leaders of networks and government officials.

Although membership is often self-evident or even obligatory, social networks appear to constitute people's lives significantly in the case study. The results indeed indicate that both formal and informal as well as vertical and horizontal social networks play a large role in sustaining the lives of people in the rural village. Formal networks appear to be highly institutionalized, recently created and controlled by the government and aimed at economic, financial, employment or knowledge benefits. The informal networks on the other hand are century-old local traditions of charity and helping the community. Mainly based on reciprocity of the community membership rates of the informal networks appear very high compared to the formal networks.

Regarding the road, although people are generally satisfied about the newly constructed road in their village, the effect of the road on social networks appears limited. Altogether the data does not indicate the creation of new networks or disappearance of old ones because of the road construction. Neither does it suggest major changes in the way the existing networks operate. Some perceived effects however are found in the data: the main changes in social networks that respondents attributed to the rural road and increased mobility potential are an increase in frequency of meetings in vertical networks, an overall modest decrease in travel time and easier and comfortable journeys, the latter being especially true for groups less physically vital network members. Altogether, although roads

can thus reinforce social networks, the issue of limited available and affordable (public) transport is problematic. As a result of this, virtually all social trips within the village to both formal and informal network meetings are made on foot which is a time-consuming matter.

After critically reviewing these results, this thesis concludes by stating that 'the social' in general and more specifically social networks should be included as a factor in rural road appraisal, both by researcher and policy makers. Similarly, research on social networks in rural development should adopt mobility as a relevant factor in assessing livelihood effects of networks. The 'transport disadvantage' of poor members of a network should be continuously included in these assessments.

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Rotterdam, August 2015



A first image of the multi-purpose road in Adikisandid: it allows both research and recreational activities.

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GTP = Growth and Transmission Plan

RSDP = Road Sector Development Plans

SIOT = Single issue oral testimonies

TPLF = Tigray People Liberation Front

URRAP = Universal Rural Road Access Programm

Chapter 1 - INTRODUCTION

Roads have since long been a topic of interest in rural development research and practice. The latter is certainly the case for Ethiopia, where in last two decades the government and donors have put a lot of effort in rural road construction. Ethiopia's two most recent five year plans reveal that the main reason behind this effort is a strong believe that a large and well maintained road network is essential in the economic development of both urban and rural areas (MoFED, 2006; MoFED, 2010). This focus on roads in Ethiopia is also supported by various (multilateral) donors or NGOs such as the African Development Bank and World Vison (AfDB, 2011). As a result of this emphasis on roads, many Ethiopian rural villages have been connected to the main regional road network in recent years. Where previously many villages were only accessible by foot, through the construction of low class unpaved feeder roads they are now connected to main tarmac roads. Consequently, this hugely increases the mobility potential as these villages can now be reached by cars, minivans, motor tricycle Bajaj Taxis and horse-carts.

Although economic development is arguably important, it has since long been acknowledged that development relates to more than merely economic aspects of life. That development for instance can also refer to less tangible or social dimensions of life, is proven by the large amount of research on Quality of Life or Social Capital. Similar, the more holistic (sustainable) livelihood approach incorporates both human, social, natural and economic aspects into its view on development (Zoomers, 2014). Social networks and links have been proven relevant for economic growth. The World Bank for instance describes the importance of social relationships or networks in cultural, social ánd economic life (Bradbury, 2006). Apart from creating a happy and qualitative social life, apparently, vital social networks help in sustaining collective benefit such as economic growth (Schideler, 2003). Although immaterial in nature, these social networks or links are arguably supported by physical infrastructures such as telecommunication and roads.

However, this link has been rarely made in development research. Although roads are thus arguably a major topic in development, so far very little systematic qualitative or quantitative research has been conducted to study the perceived advantages of rural roads and increased mobility potential. This is the case for the commonly assumed economic benefits, but this lack of evidence is even more persistent for social networks in relation to increasing rural mobility potential trough road construction.

Research objectives

In changing contexts of increasing accessibility and (potential) mobility such as described above, it is thus interesting to see in more detail how social networks shape the lives of people and how this relates to rural infrastructure and mobility. The ambition of this research is to do this in one selected rural mountain village in Tigray Region in Northern Ethiopia: namely the tabia Adikisandid in the woreda Kilde Awealo. This research fits within a wider 2,5 year research program on socio-economic and environmental impact of road construction in rural Ethiopia called '*Feeder Road Development for Inclusive Productive Employment*'. Within this program, this thesis opts for a specific social focus with the following two main research objectives:

- Assessing the role of formal and informal social networks in the lives and development of inhabitants of rural remote areas.
- Assessing the role of roads and mobility in creating, accessing and maintaining those networks.

As will become clear in the theory section, the first objective is relatively well researched in development studies. To date, however, the link between roads, mobility and social networks has not been made often. In a context of increasing rural mobility (potential) both objectives are relevant. The first objective remains relevant because in any new context for research, networks and their meaning might differ and this data will allow a well-informed assessment of the role of roads in these networks and therefore will help answering to the second objective.

To reach these objectives, the following research questions and sub-questions have been developed:

How do rural social networks affect people's lives in the context of increasing mobility in rural communities in Tigray, Ethiopia?

1. What kind of different rural formal and informal social networks exist?
2. Who are included and excluded from these networks and why?
3. How do these rural social networks emerge and evolve?
4. What are the individual and community benefits and costs (efforts) of rural social networks?

5. What is the role of road infrastructure in creating, accessing and maintaining rural social networks?
6. How do changes in road infrastructure and accessibility affect rural social networks?

Relevance

These questions are arguably relevant for both science and society. Summarizing the points made so far in the introduction the overall argument is that until now, little evidence is available to value how rural social networks are affected by changing contexts of mobility and the extent to which rural road construction actually contribute to people's lives. This thesis does not aim to test or prove assumptions made about roads and social networks. Rather it seeks to contribute to the limited body of literature and potential further research by providing a broad qualitative exploration of the topic. Some more detailed points about either political and developmental relevance or scientific relevance can be made as well.

Policy and rural development

First, social development remains a vital aspect in the development of a society. Especially in the case of Ethiopia this is a highly relevant topic for research because national policy is primarily focussed on economic development of the nation.

Second, many places in rural Ethiopia are still not connected by roads and the existing road infrastructure is often poorly maintained and of low quality (AfDB, 2011). Feeder roads construction is highly topical at the moment because the Ethiopian government invests a lot in construction or maintenance of this low class rural infrastructure. Focussing on the effects of this infrastructure that links former unconnected places is therefore highly relevant.

Scientific relevance for development studies

First, despite being arguably related to and influencing each other, within development studies, the social notions of development have been seldom linked to road infrastructure development and mobility in rural contexts.

Finally this research will add to the body of knowledge on Social Networks and to Infrastructure and Development and will be among the first to systematically link these two concepts in a rural development context.

Thesis Outline

The following research outline is presented. Chapter two discusses the main theory; firstly on social networks and roads separately, secondly on potential links between the two concepts. Chapter three provides a regional thematic framework on infrastructural- and social policies in Ethiopia and in the Tigray region. Following on that, chapter four presents an extensive description of the research methods. Starting with the research objectives and questions, a conceptual model is developed that is used for the operationalisation of the main research concepts and perceived relationships. This is followed by explaining the research methodology and ends with some major research limitations. Subsequently the results will be presented in 4 separate chapters. Chapter 5 gives a broad overview as it discusses some of the very basic results and analysis. The chapter 6,7 and 8 will provide more in-depth results as they respectively discuss the role of formal social networks (chapter 6), informal social networks (chapter 7) and the perceived effects of roads and mobility on these social networks (chapter 8). These results will then be discussed and evaluated in chapter 9, and will lead to the conclusion in chapter 10.

Chapter 2 - THEORETICAL FRAMEWORK

This section reviews the existing literature on Social Networks, Social Capital and road infrastructure, mobility and development.

2.1 Social Capital & Social Networks

In a very basic understanding, every social network consists of different nodes (groups, households or individuals) that are connected to each other by edges (social links). The network is then the total socio-spatial pattern of links between various nodes (Gamboa, 2010; Schideler, 2003). Viewing networks in such way, allows both quantitative (econometric) research that measures and computes a quantifiable aspects of networks such as centrality and closeness, or a more qualitative research that reviews the way in which networks are used an shape people's lives.

Theoretically, social networks can be placed under the umbrella of Social Capital. Social Capital emerged as a concept in sociology and became popular in the 1980s. According to Portes (1998, p.2) the concept was found strong and appealing because it supported the idea that social interactions have positive outcomes that can be viewed as a source of capital. Although nonmonetary in nature, such forms of capital can be drivers of power, growth and mutual benefit. In academic literature, this potential was first theoretically captured by Pierre Bourdieu who defined social capital as *"the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition"* (Portes, 1998, p.2). Although abstract and broadly defined this definitions draws attention to two key elements; networks and relationships. Where Bourdieu with its focus on power and struggle is a bit more negative, others have emphasized social capital in a more positive and enabling view. Robert Putnam who is known for its research on social capital in Italy and his article on America's declining social capital is the main thinker on this. He states that social capital are the *"features of social organizations, such as networks, norms, and trust, that facilitate action and cooperation for mutual benefit"* (ibidem, p.18). In this view, members of a community can cooperate easily if there is strong social capital. Presented as opposing views, Bourdieu is mainly valued for his focus on social conflicts and struggles and Putnam more on integration, trust and consensus in social capital networks (Siisiäinen, 2000).

Were Bordieu and Putnam thus present opposing views, Portes (1998) sketches a

nuanced picture as he views social capital as a continuum that can be either be restrictive or enabling or a combination of both. *“Social ties can bring about greater control over wayward behaviour and provide privileged access to resources; they can also restrict individual freedoms and bar outsiders from gaining access to the same resources through particularistic preferences”* (Portes, 1998, p.21). However, although acknowledging the value of social capital as a theory, Portes has criticized the overenthusiastic mainstreaming of the term. He agrees on the value of social capital as an analytical tool, but is sceptical about its (often politicized) use outside the field of sociology.

Within development studies Social Capital has not remain unnoticed. From the 1970s and onwards the believe grew that development was not only about economic development. It is in this environment that social capital was linked to poverty reduction and development and has been the topic of many research (Davis, 2002; Garret, 1999). According to Bradbury (2006, p. 80) the concept has also been adopted by important actors in development such as the UK Department for International Development(DFID) and the World Bank. The first defines social capital as *“the social resources upon which people draw in pursuit of livelihoods (i.e. networks, membership of groups, relationships of trust and access to wider institutions of society)”* and the latter defines social capital as the *“institutions, relationships and norms that shape the quality and quantity of a society’s social interactions”* (Bradbury, 2006, p. 80). These networks of social relationships will strive for collective benefit. The belief is thus widely shared that a strong social capital is beneficial for development.

However, an important notion for development studies in this respect is de question to what extent this social capital results in equal and inclusive development. Garret (1999, p.9), in line with Portes’ criticism justly notes here that social networks are not always inclusive and solidary. On the contrary, because the mutual benefit in social capital in this view often only counts for a limited group of relatively homogenous individuals, the social relations result in a system of haves and have-nots or insiders and outsiders. Social exclusion can thus be a consequence of strong social networks. It has been proven that especially the very poor and the marginalized become excluded while the better-off increase their prosperity trough social captial networks (Garret, 1999; Rigg, 2002).

2.2 Road infrastructure, mobility and (rural) development

The main reason why road infrastructure is deemed so important in many development

research and interventions is the believe that many development issues are caused by isolation. Remote localities (often rural areas) are characterized by a lack of supply of/access to basic facilities, healthcare and social services. Absent or deprived road infrastructure contributes to this lack of services because transportation costs of goods and services are very high (Barrios, 2008, p.6). It has been estimated that in some contexts creating an sufficiently and well maintained road system can reduce transportation costs up to 90 per cent (Gleaser & Kohlhase, 2003). Barrios lists some of the development implications of low transportation costs:

- people are no longer tied to natural resources;
- consumer-related natural advantages become more important
- public transportation becomes increasingly irrelevant
- location of manufacturing firms is not driven by proximity to customers or suppliers;
- provision of education (Barrios, 2008, p.6).

In rural contexts, research has proven road construction can lead to lower vehicle operating cost and transportation charges or tariffs; faster, more reliable and safer travel as short term effects. This results in improved access to cheaper and better goods and services as well as traffic growth and more efficient transport services as long term impacts (SSATP, 2014, p.6). Such implications do indeed point to the crucial role that road construction can play in poverty reduction and development (Walle, van de, 2002).

However, similar to Social Capital, road infrastructure in development too has been linked to inequality. Although in many policy documents constructing road infrastructure appears a goal in itself, it is widely acknowledged among scholars that infrastructure is just the basis. The means of transportation determine if and how these roads are being used and to what extent they result in development and or poverty reduction. Lucas (2011) in this respect speaks of the 'transport disadvantage'. This relates not only to access to infrastructure itself or access to motorized services, but also to the amount of money people can spent on transport and linked to that, the amount of time people spent traveling and waiting for transportation. In these issues of access and affordability the poorer members of society tend to be benefit less from new or existing road infrastructure. If the better-off people in society have more means to use road infrastructure and benefit from it, this will increase inequalities between rich and poor.

Related to this, van de Walle (2002) criticizes the monetary focus in impact measurement of many road infrastructure programs. Because in many contexts measuring benefits for the poor in monetary terms is not relevant, she proposes social welfare as an indicator. Social welfare is then defined as the average road user's social equity value in a community targeted by a particular road link, multiplied by the per-person efficiency gain and the number of people in that community.

2.3 Linking road infrastructure and social capital networks

Although a lot of research has been done at either social capital and inequality or social infrastructure, these have been seldom linked to each other in the context of rural feeder road construction in developing contexts. Problematic here is that of the available research that is somewhat similar to this, the majority of these sources base themselves on research in western, mostly European contexts (Lucas, 2011, p. 1322). Another, perhaps even larger amount of sources, does mention 'social benefits' without clearly specifying what these effects are. Social capital, social networks or social development are then mentioned in one go together with economic, political and cultural development. These are then more an indication of broad and inclusive development, rather than explicit sources on rural infrastructure and social development (eg. van de Walle, 2011; MoFED, 2006). However, this gap in literature and in rural roads construction program assessments has not remain unnoticed. Indeed some scholars too already argued for including social aspects into road appraisal. But in doing so, Norman (2013) and Odoki et.al. (2008) for instance in their contributions for respectively UK DFID and the World Bank mainly focus on social benefits such as health and education. The social network element in communities that is key for social capital approaches plays only a marginal role in these documents.

Some however do address this dimension and state that physical infrastructure can foster networks of social relations. Airey for example confirms this by stating that through increased mobility, rural roads do indirectly contribute to social capital through the maintenance of social networks (SSATP, 2014, p.6). Davis in 2002 was the first to address this issue systematically. She argues that transport and mobility is the agency by which social capital networks are supported and that this physical access to social capital thus needs to be researched (Davis, 2002, p.2¹). Her research is mainly concerned with how the poor can

¹ Davis (2002) later revised and republished her findings as Bradbury (2006)

access and be included in social capital networks. Rural roads are essential in this because “*mobility is essential to the sustainability of social networks, both in enabling access to cognitive and structural social capital, and in creating opportunities for networking the very act of making a journey*” (ibidem, p.3). A stronger social capital in this view is essential for poor people in dealing vulnerability associated shocks and stresses.

As becomes clear from the statement above, Davis distinguishes two types of social capital resources; cognitive and structural which both can be related to rural road infrastructure. Cognitive or informal resources or social capital include relationships of trust and confidence, along with perceptions of family and home. The structural (or formal) social capital refers to networks, memberships of groups, access to wider institutions of society and extra-local linkages and relations. Too she makes the useful distinction between horizontal (within community) and vertical (outside of the community) linkages of social capital relations. The cognitive networks Davis identified are not intended to result in financial gains. Based on trust and reciprocity, these networks can be an informal form of social insurance in rural communities. Sharing means of production and transport is common here. Structural networks on the other hand aim at capital gains and can be found for instance in farmers groups collectively buying a plough. The main example she mentions is the self-help community bicycle-taxi service that enables people to travel relatively cheap (Davis, 2002; Bradbury 2006).

In her survey the majority of trips made for social purposes were about leisure activities, religious activities and visiting friends and relatives. The roads are being used to do so and the community transport stimulates this. It is in this way that rural roads thus influence social capital. It needs to be mentioned however, that the majority of trips were made by foot. Bradburys (2006, p.83) conclusions are in line with van the Walle (2002) as she states that “*there is a role for social capital benefits in rural road investment appraisal and for justification of a rural transport service subsidy to strengthen ‘cognitive’ and ‘structural’ social capital in areas where a conventional cost–benefit analysis (CBA) does not apply*”

Chapter 4 will use these theoretical notions in creating a conceptual model and assumptions that will form the basis for developing the research questions and methodology. But first, chapter 3 will briefly sketch the geographical and political context of this research.

Chapter 3 - THEMATIC AND GEOGRAPHICAL CONTEXTS

This chapter presents a brief policy- and geographical overview of Ethiopia and, where applicable, will zoom in on the Tigray region. First some general geographical characteristics and recent macro social-economic developments of the region are presented.

3.1 Introducing the Tigray region

Geography

The research will be conducted in the Tigray region in northern Ethiopia. Tigray is the upper northern region of Ethiopia and it borders with Eritrea in the north, the Afar region in the east, the Amhara region in the south and North-Sudan in the west (see figure 1). Tigray's total land area is 40.000 square kilometres, which is similar to the Netherlands or Switzerland. Most of the region consist of mountains or relatively flat highlands.

Social-economic trends

Traditionally, the majority of the rural population depends on rain-fed agriculture through cash-crop farming or subsistence farming. One of the main problems are water shortages or drought as a result of unpredictable, irregular and decreasing rainfall in the rain-season (DRMFSS, 2007). In the last decade, farmers have been motivated to use the groundwater and river water for irrigation in the dry-season. This has increased food security throughout the whole year but has also lead to over-use, water shortages and consequently to crop failure.

There are two stories to be told about the social-economic development of Ethiopia in general. One image is of Ethiopia as one of the least developed countries in the world, the country for instance scores very low on the Human Development Index and the Global Hunger Index. Too, in 2012 29 per cent of the population was said to live below the national poverty line (IFAD, 2015). The country is prone to drought and climate appears to decrease rainfall and makes it less predictable (Helvetas, 2015). Furthermore the country has been qualified as a low-quality democracy and an authoritarian regime with limited civil rights.

Although indeed many issues in development persist, another and more positive story about Ethiopia in general and Tigray in particular can be told as well. 20 years ago the region was plagued by famine, relentlessly ruling landlords, the corrupt and violent military Derg regime and a brutal civil war. But efforts of the Tigray People Liberation Front (TPLF) brought peace, public safety and stability. This improving context has fostered other

developments such as improvements in education and rapid economic growth through domestic and foreign investments. And although there is still a long way to go regarding food security, with help of donors through food supply programs and with improved irrigation methods, large steps have been made in providing 3 meals a day for all Ethiopians.

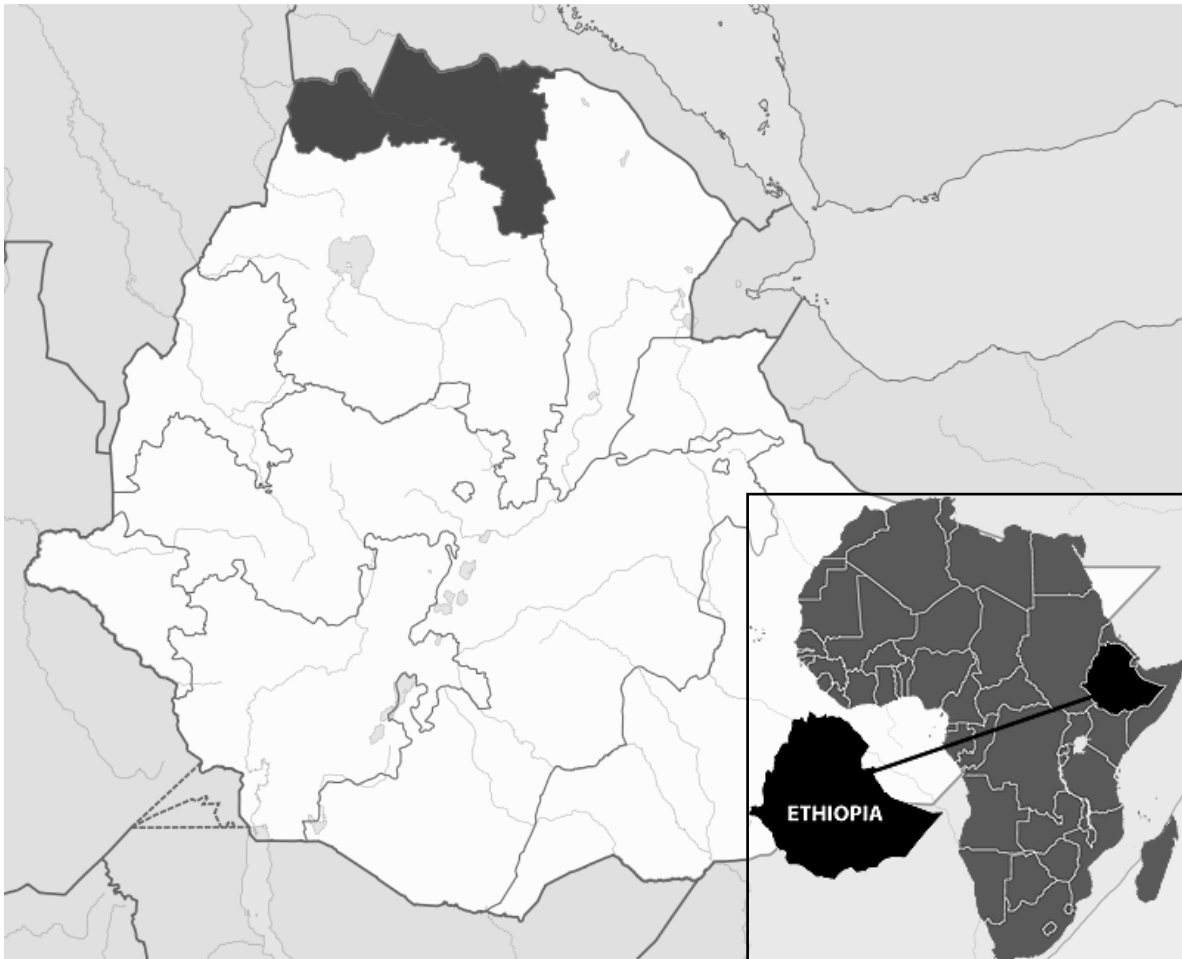


Figure 1 – Map of Ethiopia with Tigray region highlighted

3.2 Policy context on roads

As already briefly indicated in the introduction, the Ethiopian government puts a lot of time and effort in creating a good road infrastructure network in the country. Since 1997, four Road Sector Development Plans (RSDP) have been made and the national overall development policies have put great emphasis on road upgrading and construction. The most recent policies present three main goals. First, access to rural areas should be improved. Second, the quantity and quality of the overall road network should be improved. Third, the responsible road agencies should further develop their organizational capacity to create or sustain an effective management of the road networks (MoFED, 2010, p.68).

In concrete terms, the Ethiopian government targets at connecting all smallest administrative regions of Ethiopia to all weather roads through rural low class (feeder) roads. Apart from the construction and maintenance of several thousands of trunk and link roads, too, the national Growth and Transmission Plan (GTP) aims at constructing more the 80.000 kilometre of rural roads (70.000 of which are feeder roads). All road policies and plans will be executed in an inclusive way that for instance *'increases revenues of the road fund office, build capacity of local contractors and consultants, uses intermediate equipment technology that is labour intensive to create employment and adopt environmental management and HIV/AIDS activities in road projects* (MoFED, 2010, pp. 68-69). Regarding road density and road length per 1000 inhabitants, Tigray is performing relatively well compared to Ethiopia as a whole. In 2009 these were respectively 43 kilometres of road per 1000 square kilometres of land and 0,57 kilometres of road per 1000 inhabitants for Ethiopia and 56km/1000km² and 0,69 km/1000 inhabitants for Tigray (TRS, 2010).

Furthermore, in relation to RSDP-4 (2010-2015) the *"government is embarking on a Universal Rural Road Access Program (URRAP) that sets out to connect all Kebele by roads of a standard that provides all-weather, year round access, meets the needs of the rural communities, are affordable and maintainable. As a catalyst, the URRAP is designed to improve rural livelihoods by reducing isolation for rural populations and to provide year round access to their markets, social and other services. The inclusion of labour-based approaches, community contributions and an expanded participation by the private sector are key elements of this.* (ERA, 2010, p.12).

Although these policy documents mention social benefits as desired effects of road construction, they do not go into detail about these social effects. Similar, they do not address potential effects on social networks. The focus is mainly on economic, healthcare and education benefits as a result of increased accessibility. Where they are mentioned, social benefits are mostly designated under the umbrella of inclusive road appraisal without specifically mentioning what these might be.

3.3 Social (network) policy

Social networks in this thesis are studied both on their own and in relation to roads. Policymakers apparently do not clearly link these two but their responsibility relates to both of them. This section therefore describes the social policy context that relates to social

networks in rural areas.

Neither national policy documents nor local Tigayan policy documents specifically address social networks in their core policies. They do however focus on several policy areas that directly or indirectly relate to social networks and their role in development. Both national and regional policy in this respect highly value social security and equality. The government seeks to ensure this through education, training and support of various target groups (TRS, 2010; MoFED, 2010). In general terms, the government promotes social participation in villages through its decentralisation policy. The Tigray Regional State (TRS) for instance states that *'public participation is central to ensuring citizens own development and to the success of good governance initiatives in a sustainable way. Hence, efforts have been made to expand democracy and good governance through the participation of the community based organizations (CBOs) and then to make them own the development process, to play the role of main characters in any activity and to feel a sense of responsibility for any development activities'* (TRS, 2010, p.11). Social networks are likely to play a role in this public community participation. Four more specific themes in social policy are mentioned that relate to social networks in rural Ethiopia.

First, training and education are high on the agenda. Children and youngsters form the first group that is addressed in this policy. But apart from improving schools, the government also invests in the grown-up share of the population by focussing on training for farmers and small businessman in villages. This can be for example through best-practice model groups of farmers that learn from each other about irrigation (TRS, 2010, p.69). Second, healthcare is another focal point in government policy. This relates to social networks in rural areas through health training and advice in new and existing social groups. Third, gender equality is a key priority throughout all policy as the government promotes equal chances for women in all aspects of society. To ensure this emancipation numerous women groups have been created both in urban and rural areas. (TRS, 2010, p 100; MoFED, 2010, p.27). Members of these groups receive training and advice on how to run their households, engage in farming activities or work on their health. The fourth specific theme relates to the empowerment of vulnerable minority groups of society. Social networks play an important role in this. The national and regional government in this respect promotes the empowerment of disabled people, elderly and youngsters. Groups or associations have been

created to ensure social and economic security of these target groups (TRS, 2010, p.70; MoFED, 2010, p.27).

This chapter has shown road construction and social networks being topical in current government policy in Ethiopia in general and the Tigray region in particular. Both gain significant attention in policy and practice. Taking this context in mind, the next chapter provides the research outline and work towards a way of investigating these to topics and their potential links.

Chapter 4 - RESEARCH OUTLINE

The aim of this chapter is to present the outline of the research. The starting point here are the research questions as presented in the introduction. Following on that and based on the literature section a conceptual model/framework is presented that will allow a structured operationalisation of the key concepts. Following on this, a detailed description of the research methodology and its limitations is given.

4.1 Research objectives and questions

In the introduction of this thesis the following two research objectives were presented. First, to assess the role of (formal and informal) social networks in the lives and development of inhabitants of rural remote areas. And second, to assess the role of roads and mobility in creating, accessing and maintaining those networks.

This has been argued relevant in both an academic and societal perspective. The academic relevance of the research is secured because it adds to the body of literature on roads and on social networks in rural development. The majority of road appraisal studies appears to focus more on economic and extra-local effects of road construction. With its social network approach, this research aims to focus on local social effects of roads. Moreover, it is among the first to systematically link social networks and road construction in a context of increasing rural mobility. Beside this potential academic avail, this research is also highly relevant in development from a societal and policy perspective. Where time and money is invested in social networks and/or roads, it is worthwhile to see how target groups perceive the use and benefits of such changes. This is also the case for potential linkages between the different policy fields of roads and social networks. Findings of this research might reveal development potential in linking these fields in order to optimise the perceived benefits. Building on chapter 3, this is most true in the case of Ethiopia and the Tigray Region in particular. However, these potential implications and understandings for society and policy can be transferred to other rural developing contexts.

Having argued the relevance of these objectives in general terms and context-specific in the case of the Tigray region of Ethiopia, to pursue these objectives the following research question was formulated.

How do rural social networks affect people's lives in the context of increasing mobility in rural communities in Tigray, Ethiopia?

To formulate an answer to this main question, the research was subdivided into 6 smaller questions which were presented in the introduction. In working towards an operationalisation and research methodology, the following part uses the central concepts in these questions and the relevant concepts as found in the literature to build a conceptual model that helps in an overall understanding of the research plot.

4.2 Conceptual model

The two central concepts in this thesis are roads and social networks. These concepts and other relevant contextual factors have been visualized in a conceptual model (see figure 2). Several assumptions about the different nodes and their relationships with each other are made in the model. The two bold arrows refer to the two research objectives: the arrow between 'social networks' and 'livelihood objectives' to the first objective, the arrow between 'social networks', 'mobility' and 'road-infrastructure' to the second objective.

The nature of social networks

There are two main assumed distinctions regarding the nature of social networks. First, and relating to their organisational structure, networks can be either cognitive or structural. Cognitive networks are informal and thus based on habits, community traditions, reciprocity and trust and operate more along unwritten rules rather than official written ones. Opposed to that, structural social networks are more formal in nature.

Second, the nature of social networks differs regarding the geographical spread of the networks. Vertical and horizontal networks are distinguished here. Horizontal networks refer to links and relationships within a certain geographic locality such as a village or sub-village. Vertical networks on the other hand stretch beyond these boundaries as they make connections between two or more different localities.

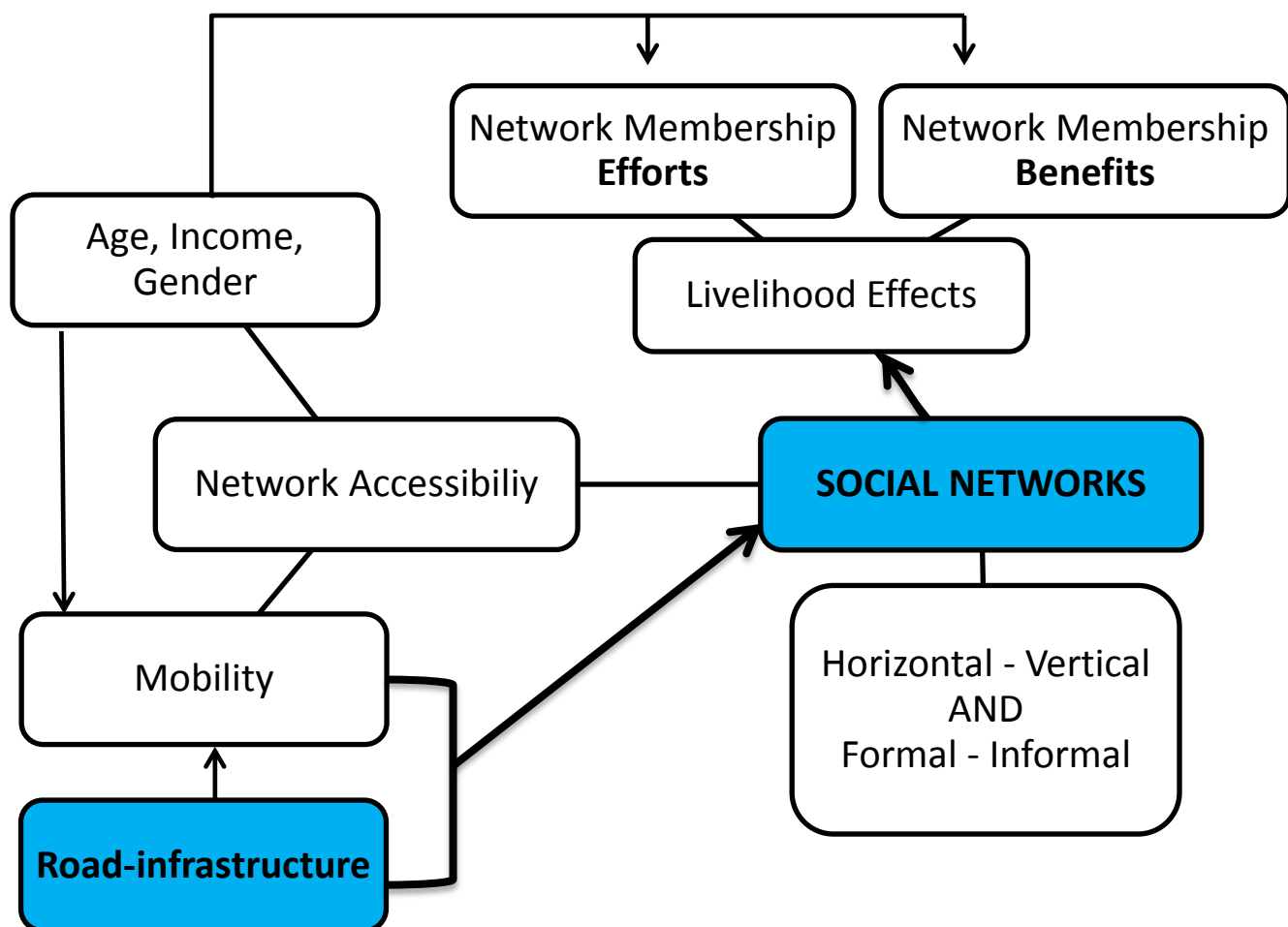


Figure 2 – Conceptual Framework on social networks and roads

The livelihood effects of social networks

Social networks are deemed to have a great effect on people’s lives. Although arguably too ‘economically’ framed, the total effect for the individual member of a social network is a balance between efforts he or she puts into the network and the benefits gained from the membership. Efforts can be time, labour, money or products invested in accessing or maintaining the network. Benefits might be money or products or less-tangible gains such as help and support. It is especially these less-tangible aspects that make it difficult to actually measure this balance between efforts and benefits. However, for qualitative analysis, it does function as a useful conceptual distinction to assess the effect of social network on people’s lives.

The physical, social- and economic accessibility of social networks

Whether social networks can have certain livelihood effects on their members is assumed to depend on the possibility to access the networks. The degree of access – and therefore the

degree of social in- or exclusion – can be influenced by personal or contextual factors or a combination of both. First, these personal aspects can be age, gender, income or profession. Second, as the main contextual factor in this research, transport and mobility are viewed to influence the physical access to networks. The availability of certain modes of transportation is crucial here. Too, the actual amount of road infrastructure is assumed to effect the accessibility of social networks.

Linkages and relations

To sum it up, five major relationships or linkages between the various concepts of the model are assumed. First and foremost, social networks are assumed to have a positive or negative effect on people's lives. This effect is viewed as the sum of efforts gained- and benefits put into the network. Second, these effects and in- or exclusion in the networks are influenced by personal- or group specific characteristics such as age, income and gender. Poor people might for instance profit more from membership because they get more informal community help. Third, in this model the nature of social networks is not fixed, but influenced by the available road infrastructure and mobility; better roads and increasing mobility might expand social networks, especially the vertical relations and frequency of accessing the networks. Fourthly, the amount of formal and informal networks will influence each other; if few structural networks exist more cognitive ones could emerge and vice versa. Fifth and finally, the degree of mobility and transport is again also affected by the previously mentioned personal- or group specific characteristics. Especially the poorer members of a community are perceived less mobile because they will be more likely to lack the financial capacity to use motorized transport.

Before shifting to the operationalisation of these concepts for data collection, it should be mentioned here that although outside the scope of this model, social networks and road infrastructure are also influence by government policy such as discussed in chapter three. Or, to put it differently, in reality this simplified model will not occur in isolation.

4.3 Operationalization of main concepts

In order to use the main concepts for research and analysis, in line with the literature and conceptual model, this section presents their definitions and operationalisations in the way they are used throughout the research. Roads and social networks have been presented as the two central concepts in this thesis.

Although one universally accepted definition does not exist, building on the literature as discussed in chapter 2, **social networks** are defined as social-spatial patterns of internal or external and formal or informal links and relationships between various actors (individuals, groups, households) of one or more given localities. The scope of this research is on rural networks. In the case of vertical networks this scope might widen to other villages, towns or cities, depending on the range of the network. Examples of such rural social networks might be farmers groups, family relations or religious groups. Second, and unless mentioned otherwise, because of the rural Ethiopian setting of this study, when speaking of **the road infrastructure** this thesis refers to a rural unpaved low-class feeder road that enables motorized access to its destination.

Three other relevant concepts are rural mobility and social in-and exclusion. First, **rural mobility** is defined as the degree of mobility as a result of existing infrastructure and modes of transportation. Combined with roads, this is a crucial dimension in this research because roads in itself do not necessarily enhance mobility. Second, **social in- and exclusion** is viewed as the degree in which people are excluded from or included in the benefits of social networks based on age, gender or income. Third, the **accessibility** of social networks is strongly related to these two as it is defined as the people's ability to use a network depending on personal or contextual factors. These factors thus might be rural mobility or social in- or exclusion. For example; a rich male farmer might easily access a vertical network because he can afford transportation costs, but he will be excluded from a women group for obvious reasons.

4.4 Methodology

The conceptual model and operationalisation as presented above enabled designing the research methods in working towards answering the research question. This methodology will be presented in detail here which includes the strategy and development of the different phases of the research, the selection of the research area and how the data was collected and analysed.

4.4.1 Research strategy

After research preparation (consisting of literature-, policy- and geographical context study) at home in the Netherlands, broadly speaking, once arrived in the field the research was conducted in three parts. A first exploratory phase helped preparing the second main phase

in which the majority of qualitative interviews on roads and social networks was conducted. The research was finalized by the third phase that consisted of interviews with leaders and experts and a few small focus groups to fill in all the in-depth information gaps.

1) Exploratory phase: Cooperative conduction of Single Issue Oral Testimonies

When entering a new research area to study a relatively unexplored topic an exploratory phase can hugely add to preparations of the actual study. The in-depth research about social networks was preceded by a joint exploratory research phase with two partners from the feeder road research program. 80 single issue oral testimonies (SIOTs) were conducted, approximately 20 in each of the 4 villages (tabias) that were selected for the wider research program. Using very broad and open questions, this method mapped the daily activities of respondents, the changes in their lives and their community and the extent to which the road played a role in this. SIOTs are interviews that deal with an important issue or event and its influence on the respondents life. In this research this event is the construction of a feeder road in remote rural areas. Because it wants to explore how peoples life are affected and how people think about that, closed questions or predefined categories would influence the outcomes. SIOT therefore only uses open questions. Crucial in this method are the follow-up questions that mainly ask people to further elaborate on their statements.

Basically four categories of open questions were developed.

- Questions about the respondents life and daily activities
- Questions about the respondents use of the road
- Questions about the road itself (e.g. age and previous road)
- Questions about the (perceived) influence of the road on the respondents life

For a full understanding of the method and its result one should refer to the future works of dr. ir. Rammelt. However, for developing this research, a rough analysis of 42 interviews provided a preliminary image of existing social networks or relations as well as a good overview of the general characteristics of the field-sites. Taking this data and the general characteristics of the tabia as observed during SIOT in mind, the final research questions as presented above could be developed.

2) Social network analysis

To answer the research questions, this research opted for qualitative data collection through semi-structured interviews with inhabitants. For this phase the research sub-questions 1,2,4,5 and 6 appropriate measurement indicators and focus were decided as well as the data collection method and the desired respondent type (see table 2). This was then used to develop an interview guide or topic list with the right questions for the interviews in the field (see appendix 1). During the process, sub-question 3 appeared too specific and detailed for 'ordinary' network members and was therefore shifted to the third phase.

As the unit of analysis for this method, the individual was chosen. This was viewed as most suitable because focussing only household heads probably would have created bias in gender and age as the majority would then be middle-aged males. The individual is therefore the most obvious choice because the type of networks in which people can participate might differ within households. The most obvious example of this is a women group in which, for obvious reasons, only women can participate.

Table 1 – Measurement indicators and respondent type per research question

Sub question	Measurement indicators & focus	Data collection method & respondent-type
1. What kind of different rural formal and informal social networks exist?	Formal networks might be Informal networks might be different types of associations, community or family contacts. The way these networks operate might differ. Respondents will be asked to list all kinds of formal and informal rural social networks in their community.	- qualitative semi-structured interviewing - SIOT (inhabitants & leaders/officials)
2. Who are included and excluded from these networks and why?	Networks can operate for the whole community or include/exclude certain groups or individuals based on for example gender, age and income.	- qualitative semi-structured interviewing

	Respondents will be asked to list who can and cannot participate in the networks and for what reason.	(inhabitants & leaders/officials)
3. How do rural social networks emerge and evolve?	Respondents will be asked when and why networks were created, who were involved in their creation. Too, they will be questioned about the general changes in the network and who or what was involved in these changes.	- qualitative semi-structured interviewing (leaders/officials)
4. What are the individual and community benefits and costs of rural social networks?	Respondents will be asked to list the efforts they make for the networks as well as the benefits they get from participating in this network. Both are split up in to benefits or efforts in time, money or in kind.	- qualitative semi-structured interviewing (inhabitants & leaders/officials)
5. What is the role of physical infrastructure in accessing rural social networks?	Respondents will be asked to list how, how often and why they access the network through road infrastructure and what modes of transportation is used to do that.	- qualitative semi-structured interviewing (inhabitants & leaders/officials)
6. How do changes in road infrastructure affect rural social networks?	The construction of a road might change the number and type of existing social networks. Respondents will be asked if there were changes in social networks after the road was constructed in type and frequency of activities and accessibility of the network.	- qualitative semi-structured interviewing (inhabitants & leaders/officials)

3) Filling the gaps: in-depth interviews with leaders & small focus group discussions.

After the second phase writing an interim report with preliminary data analysis the following main shortcomings or data-gaps were determined. First, too few information was obtained to answer the third research question about the creation of social networks. This was mainly because the respondents did not have the historic knowledge about the networks in which they participated. Second, more information was needed on in- and exclusion in the networks, as well as a more detailed overview on the time and money members of network had to invest. Furthermore, several social networks only became apparent to the researcher at the end of the second phase and thus required more in-depth details. These were for instance the development group, disabled association and the fighters association. Too the role of the church – whether being a social network itself, or more a facilitator of networks – required some further analysis. To get an answer on these questions, interviews with leaders, experts and government officials were held. The interview guide developed in the second phase was reused for this purpose, with an extra focus on the missing elements (see appendix 1). Furthermore, three small focus-group discussion were held to get to the bottom of the working and operation of the three networks that appeared of biggest influence in the village, knowingly the youngsters-, farmers- and women-association (a new focus-group interview/discussion guide was developed for this purpose – see appendix 2).

4.4.2 Selection of the research area

Choices made in research area selection were partly substantively and partly pragmatic. Time-, resource- and logistical limitations of this research meant making radical choices in the selection of the research area. Fortunately however, because of the research partnership on road development for inclusive productive employment, this research could follow and benefit from some of the choices made by the research consortium.

First, as already presented in chapter 3, within Ethiopia the northern Tigray region was selected as a useful research area because of its mixed geographical characteristics and road construction being highly topical in the last two decades. Within the Tigray region two smaller sub-areas (Woredas) were selected by the consortium and within those two, a total of four municipalities (Tabias) were selected (see figure 3). The selection of tabias thus covered mixed geographical areas and both new and relatively old roads. For this research this was especially useful for the exploratory phase as it allowed to conduct this in

cooperation with two other consortium partners in all of the four tabias.

For the second and third phase only one tabia could be selected because of limited time and logistical issues. The tabia Adikisandid in the Eastern Tigrayan woreda Kiltse Awealo was selected for several reasons. First and most important, the road in Adikisandid has been constructed two to six years ago. This is ideal for studying perceived changes after of road construction because it is long enough to observe effects and not too long ago to recall those effects. Adding to this, the road through Adikisandid was constructed within the URRAP program as described in chapter 3. Second, close to the main woreda town (Wukro) which makes it easy to observe vertical network linkages as well as convenient to access for the researcher. Third, apart from the road, various available modes of transportation were observed during the exploratory phase which is an essential factor in the research.

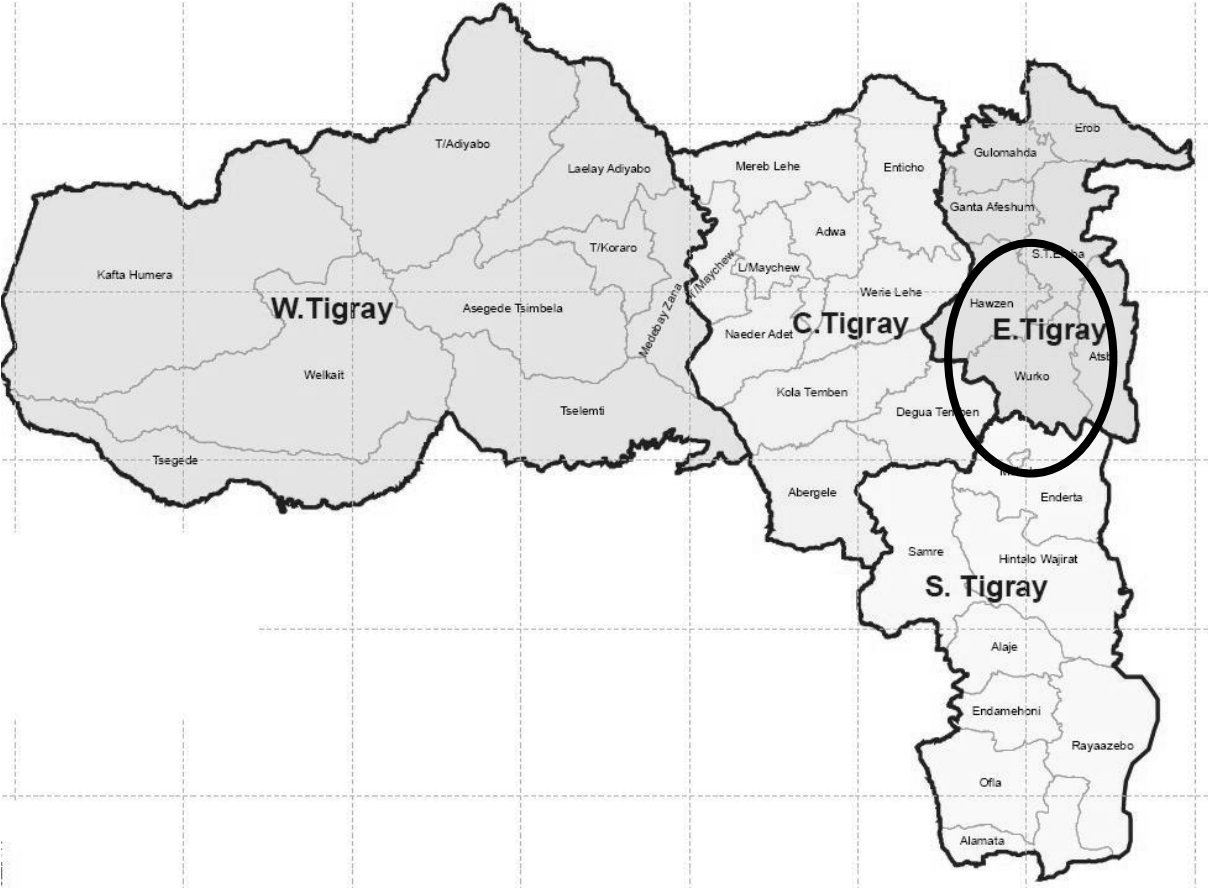


Figure 3 – Tigray region with highlighted research area Wukro Woreda

Needless to say, a selection of one tabia cannot be viewed as representative for the Tigray region, let alone for the whole of rural Ethiopia. However, within the time and resource boundaries of this research, altogether this case will nonetheless create a valuable image of existing rural social networks in contexts of changing mobility (potential) in Ethiopia.

Box 1: Introducing Adikisandid

In the North-East of the Ethiopian Tigray region, the village Adikisandid is one of the 20 tabias of the woreda Kilde Awealo. It is situated in a mountainous area, and starts next to the regional tarmac road approximately 6 km north from the Woreda town centre Wukro, 45 kilometers north from the Tigray Regional capital Mekelle (see figure 3 and 4). Adikisandid used to be one tabia, but two years ago it was administratively divided in a lower (taitai) and higher (laylay) part because of population growth. This research views the two as a whole and will only make a distinction between lower and higher (or close or remote to the tarmac) if useful. The tabia is divided in 7 administrative sub-villages called *cuchets*. According to a local census of 2015, the total population of lower and higher Adikisandid together consist of 10,230 people and 2,231 households.

A 15 kilometre long feeder road leads from the tarmac through the tabia and stops at the highest *cuchet* of Higher Adikisandid. This first draft feeder road was constructed 7 years ago, the complete road was finished to its current situation 2 years ago. The lower part of Adikisandid has been longer connected than the upper part. It appears that the lower part is approximately 5 years accessible for horse-carts. Since 2 years, both higher and lower Adikisandid are (potentially) accessible by Bajaj Taxi, bikes, cars and horse-carts.

Traditionally, the majority of the population engages in farming as their main source of income. Adikisandid was dependent on rain-fed agriculture. Since a few years, some farmers have now access to river irrigation facilities. Both cash-crops and own consumption foods are grown here. Since a few years some stone-grinding machines provide jobs to day-labourers from inside and outside the tabia.

4.4.3 Data collection: research population and sampling

The research population in this study consisted of all the inhabitants of Adikisandid. Random sampling is difficult and time consuming in rural remote areas and statistical representative selection of respondents is not necessary per se for qualitative analysis. Therefore this research opts for opportunity sampling. For this research, anyone above 18 years old, both

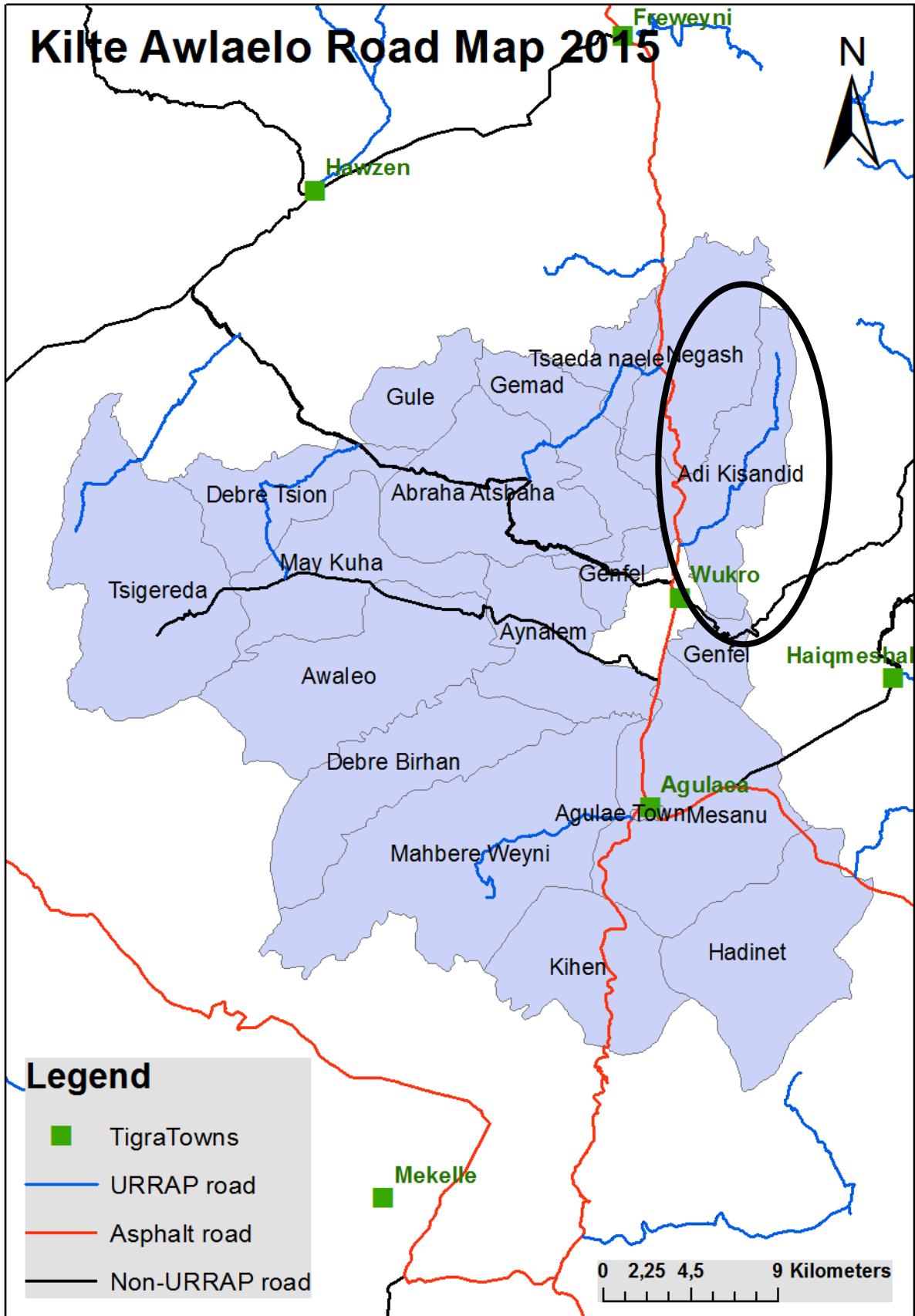


Figure 4 – The woreda Kiltse Awealo with highlighted tabia Adikisandid

male and female, can be included in the interviews. When approaching respondents, the researcher assured the widest possible variety in respondents by age, gender profession, income group, times of the day and place along the road. Potential respondents were approached by approaching homes in various parts of the tabia (cuchets). If found home, then the respondents were asked if they were willing to participate. Apart from age and gender and cuchet, the respondents remained anonymous.

Collected data

In the first phase during 7 days in the field, together with research partner Paula Beens, 42 interviews were conducted in 4 tabias to contribute to contribute to the SIOT data collection. In the second phase, 31 semi-structured interviews with inhabitants of Adikisandid were held. 13 of them were female- and 18 of them were male respondents. The average age of the 31 respondents was 42,5 years, the oldest being 67, the youngest 18 years old. The median age was 39. The third phase consisted of 11 interviews with government- and network leaders or experts. Too, three small focus group discussions were held with groups of 3 or 2 members of respectively the farmers-, women- and youngsters-association.

Where the first phase yielded mostly explorative data, phase two and three resulted in the main qualitative data that was useful for actual analysis. Once transcribed, the interviews and discussions were analysed through both deductive and inductive coding in NVivo. This produced a coding tree that founded the structure of result part of this thesis. All interviews and discussions were taken together in the coding process, but were useful the results will distinguish between the various phases of the research and the potential effect of that on the data. Before discussing this collected data in the results, the next section first presents the main research limitations.

4.5 Main research limitations

Before shifting to the results of the data analysis, this section discusses the main limitations of the research that will put the findings in a just perspective.

First, it should be noted that this thesis discusses the findings regarding social networks and roads, based on research in only one case in rural northern Ethiopia. This is not to say that the results are not valuable outside the context of Adikisandid, but as a whole the study can thus not be viewed as representative for rural Ethiopia. To a certain extent

this is also the case for Adikisandid itself. Although the author believes that having conducted more than 30 qualitative interviews with diverse respondents and a dozen of interviews with experts, leaders and officials, a feasible image of roads and social networks in the village can be given. However, because of the sampling method the results cannot be viewed as officially representative for the whole of Adikisandid.

An even greater research limitation deals with the post-conflict setting and current political climate. First off all, Ethiopia has come a long way from war, drought and famine to where the country now stands. Although by international standards Ethiopia can definitely be qualified as a so-called developing country, this recent history and developments evidently effect the way how people perceive their lives. Especially older respondents compare their lives with 20 years ago and are very happy about their current living conditions. However, although people thus appear happy and satisfied, the current political climate apparently is far from a free democracy. As an indication of this, by international standards of popular media institutes, Ethiopia was declared having a very low quality of democracy in 2010 (DemocracyRanking.org, 2015) and qualified as an authoritarian regime in 2012 (Economist Intelligence Unit, 2012). Too, the recent 2015 election results (100% for the leading party) raises critical questions on this. Although the author has no systematic evidence on this, it is his strong assumption that when it comes to government policy and presence – especially the case in formal social networks – people hesitate to criticize the government, its policy and how their lives are affected by it. It can thus not be excluded that respondents in this study exaggerated their satisfaction regarding roads and networks.

Too, some research-technical issues potentially have put some limitations on the findings. Because the author did not speak the local language (Tigrinya) he had to work with a translator and therefore valuable information might have gone lost in translation. Too, because of the absence of transport and electricity in evening hours, the research had to be conducted during day time. Therefore some respondent categories such as day labourers were potentially missed in the sample. Finally, another limitation deals with the way in which the researcher conducted (and perceived) the semi-structured interviews in the second phase. Whether unconsciously or not, in interviewing the respondents the researcher was somewhat preoccupied with getting a quantitative image about the networks (who participates, how often do you meet, etc.). In itself this is not a bad thing,

but a quantitative survey will serve this purpose better. However, most of the missing bits of information were acquired in the third phase of the data collection.

Before moving towards the results, the next paragraph presents some photos that provide the reader with an visual image of roads and networks in the research village Adikisandid.

4.6 Visual impression of roads and social networks in Adikisandid



Figure 5 – Sub-road construction in progress in the research village Adikisandid. This sub-road will allow big trucks to reach stone-grinding facilities. Meanwhile a group of women passes by as they are walking along the existing main road through the village.



Figure 6 – A focus group of members of the Women-Association



Figure 7 – Easy access with a 4x4 pickup truck to end of the road in Adikisandid. Pickups are quick and comfortable, but exceptional in the village.



Figure 8 – A Bajaj Taxi in Adikisandid: the most common form of motorized transport



Figure 9 – Members of the Farmers Association building a tent for a meeting while other members are waiting for the meeting to start.

Chapter 5 - RESULTS

Chapter 5 – 9 discuss the main findings and analyses based on the obtained data in the 3 phases of the fieldwork. This chapter will present some very basic findings and a few general remarks that put the results in their right perspective. The next chapters build on that and go into greater detail about the networks and the road. Chapter 6 deals with the role of formal networks, chapter 7 with informal social networks and 8 with the effects of road construction related to social networks.

Social Networks in general

The first research objective was to assess the role of formal and informal social networks in the lives and development of inhabitants of rural remote areas. Various types of rural social networks have been found active in Adikisandid. In total, 10 forms of formal social networks and 3 forms of informal social networks were distinguished. They were most active on a horizontal level but most of them had some vertical elements as well. All of the 31 respondents in the second phase participated in at least one of these social networks. The degree in which participation in the various networks affects people's lives was studied by assessing the efforts people put into the networks and the benefits people gained from their membership. This varied for each respondent and differed per network, but a general remark here is that various respondents found it difficult to respond to the question about personal costs and benefits of networks. People did not always thought of their membership in these terms, but rather viewed it as their moral, religious, social or political obligation to participate in them. For example, when asked about the personal benefits of being a member of a network a 35 year old women stated that *"it is actually not in terms of benefit. It is more about religious people that want to do something good and serve God. It is not about the benefit, people just do it out of respect for their family. This is the same for funerals: in order to rest in peace, the community will pray for the deceased community member. The same is true for a wedding: you just do that what is needed, you want to do something meaningful for a brother or sister. This is an act out of love (Respondent nr. 03)."* This is not to say that efforts or benefits are irrelevant in how social networks are perceived, but does help realising that sometimes predefined values or classifications do not always apply to the way that respondents value their lives. Chapter 6 and 7 will go into more detail about this.

Social networks and the road.

The second objective was to assess the role of roads and mobility in creating, accessing and maintaining rural social networks. Chapter 8 will discuss the findings related to this objective in detail, but the following general findings can be presented here.

Overall, respondents are very positive about the road. This positive attitude towards the road does not in the first place relate to social networks. When asked about the effects of the road related to social networks, many respondents nonetheless mention their satisfaction about other road related themes such as easy transport for market access or health-services. A 67 year old man in this respect stated that *'people mostly use the road for medical services. Also, people are able to move easier since the road is constructed. Before there were no stones, it was not safe and people travelled only by foot and with donkey'*. He continues about the use of the road for accessing the social network in which he participates: *'Nowadays, all people can walk on the road to go to church. There are no regular Bajaj Taxis, only if you call a contract Bajaj Taxi they will come. But I never use a taxi, I always walk to the meetings (Respondent nr. 04).'*

His last statement points to the finding that although the road has been constructed, still many journeys are made on foot. Especially when it comes to travelling within the village this seems to be the case. Related to this, there appears to be a difference in influence of the road between horizontal and vertical networks. Respondent nr. 04 stated that he walks to local meetings, a 45 year old female states that *'She can use Bajaj Taxi to visit my family. Before the road this was difficult. I am seriously ill since two years and my family can visit me now because of the road (Respondent nr. 11)'*. Roads thus seem to have a greater effect on vertical networks than on horizontal networks.

Taking these general findings in mind, the following chapters will present a detailed overview of the obtained data on Social Networks and how they relate to road construction.

Chapter 6 - FORMAL SOCIAL NETWORKS

This chapter discusses in detail the findings about formal social networks. This is based on the data that was collected in relation to the first research objective and research sub-questions 1,2,3, and 4. After a general overview, this part will assess the 10 different formal social networks divided in 5 categories. It will deal with their emerge, workings, benefits, efforts and in- and exclusion in the networks.

Table 2 – Formal Social Networks in Adikisandid

Formal Social Networks	Number of members	Estimated total network target population	Estimated share of total network target population participating in the network
Women Association	1600 (female, 20-60 year)	1800	89%
Farmer Association	750 (male, 40-65 year)	850	88%
Youngsters Association	900 (male, 15-40 year)	1050	86%
CC Association (community social security/insurance)	700 households	2231 households	31%
Cooperative Association	unknown (male & female, 18-65)	4700	unknown
Saving- and Credit Association	2216 (male & female, 18-65)	4700	47%
Disabled Association	75 (male & female, disabled, all ages)	unknown	unknown
Fighters Association	unknown	unknown	unknown
Development Groups	1750 (male & female, 18-65)	1750 (selected by municipal government)	100%
Church (apart from individual religious devotion)	2231 households	2231households	100%

In total, 10 formal social networks were found existing in the tabia of Adikisandid (see table 2). They share three overall characteristics: first, the formal networks are very structured

and institutionalized. Second, apart from the church network, they all have strong ties with the local and/or regional government and the regional political party TPLF. Finally, all but the Development Group network require annual payments as a membership fee (see table 3).

Apart from these three points, the networks are very diverse in nature as the size, target groups, activities and aim varies among the networks. Some distinctive categories can be made here. The first category consists of the Women-, Farmers- and Youngsters Association. These three networks are very similar in their organisational structure and purpose. They are divided in different sub-divisions, report back to higher regional institutions and share training and local problem solving as their main purpose. They meet relatively frequent and their estimated share of total network target population participating in the network is relatively high. This makes them the most visible and active formal networks. The second category is made up of three networks that aim at shared collective material or financial benefits for its members. The CC Association, Cooperative Association and the Savings- and Credit Association form this category. Third, the Disabled Association and the Fighters Association form a relatively small category. Their target groups are small minorities and they seek to promote the rights, needs and emancipation of their members. Fourth, the Development Groups form another category. They aim at organizing community work and too provide work opportunities for poor inhabitants. As part of this social security system, participating in the network activities for the poorest is not voluntary but part of the government Safety Net Program. Finally, a fifth and separate category is the church. As a century old institution it is different from the others that emerged in the last 50 years. Too it is unique because in principle, the whole community participates in this formal network.

Inclusion and exclusion in formal social networks

Other classifications can be made based on in- and exclusion criteria, some of which have already been mentioned above. Gender, age and income emerge as three major criteria from the data (see table 3). First of all, people are in- or excluded based on their age. In general, people under 19 or above 60-65 years old are less likely to participate. Second, gender is a major criteria. Women have their own Women-Association and man, depending on their age, are member of the Youngsters- or Farmers-Association. Other formal networks are open for both sexes but mostly dominated by man. Next to gender and age thirdly, most structural social networks require some monthly or annual contribution payment. In this

way, poorer inhabitants of the tabia are less likely to participate in these networks or at least be limited in other (potentially essential) expenses.

Table 3 – In- and exclusion and contribution to formal social networks in Adikisandid

Structural (formal) Social Networks	Member selection criteria	Annual contribution (exchange rate: 1 Euro = 22.9 Ethiopian Birr)
Women Association (WA) Linked to WA: - TPLF - League	Female members between 20 and 60 year - -	- 10 birr (€0.44) - 12 birr (€0.52) - 3 birr (€0.13)
Farmer Association (FaA) Linked to WA: - TPLF - League	Male farmers above 40 year	- 10 birr (€0.44) - 12 birr (€0.52) - 3 birr (€0.13)
Youngsters Association (YA) Linked to YA: - TPLF - League	Male members between 15 and 40 year - -	- 8 birr (€0.35) - 12 birr (€0.52) - 3 birr (€0.13)
CC Association (community social security/insurance)	Households, each household can participate	- 288 birr (€12.58) per household
Cooperative Association	Male & female members (50%/50%)	- 10 birr (€0.44) - 11 birr (€0.48) (single registration fee) - Optional: 30 birr or more (minimal input for loan)
Saving- and Credit Association	Male & Female members (70%/30%)	Input depends on loan / savings deposit
Fighters Association	(Retired) Soldiers	Unknown
Disabled Association	Disabled inhabitants	- 10 birr (€0.44) - 5 birr (€0.22) (single registration fee)
Development Groups	Male & Female members (80%/20%)	No contribution: obligatory labour for community.
Church (apart from individual religious devotion)	Traditionally, every household is member	- 60 birr (€2.62)

Livelihood effects of formal social networks

The effect that formal social networks have on the lives of their members was studied by questioning the efforts that people put into the networks and the benefits they gain from being a member. In other words: the sum of the 'costs' and 'profits' people make from their network membership indicates how people's lives are affected by being a member of a formal social network.

The aim of most of the formal social networks is to a large extent to create economic, financial, employment or knowledge benefits for its members. To achieve these goals, all formal social networks require certain efforts of its members. Because of the structural nature of these networks, overhead or organisational costs are inevitable. This results in the fact that one of the main efforts required from the members of these networks is contributing an annual membership payment (see table 3). Another way of contributing to the networks is by investing time or labour into the network activities.

Taking these general findings in mind, the following paragraphs describe the 10 different networks in more detail. They are ordered in five paragraphs according to the classification presented above. In line with the first four research sub-questions the paragraphs are divided in four parts that subsequently deal with network characteristics, network emerge and evolution, in- and exclusion in the networks and finally the livelihood effects of networks.

6.1 Women-, Farmer- and Youngsters Association

6.1.1 Network characteristics

The three most common formal networks in Adikisandid are the Women Association, the Farmers Association and the Youngsters Association. They operate on a horizontal level within the village and regular members only use the networks on this horizontal scale. There are however vertical linkages in two ways: on the administrative level leaders report to the central regional (woreda) offices and in return the offices provide guidelines and send trainers, experts and extension workers to the tabias to give trainings, workshops and education.

The networks have a strong hierarchical order: the three associations are divided in groups of 30 members and these are subdivided in groups of 5 members. Each association has its central board that directs and administrates the network. Smaller (sub)groups have

their own group leaders. They report to higher levels in the associations and in its turn, the central board redirects to the regional (woreda) network institutions. The local government worker on Rural Development and Agricultural Extension in this respects stated that *'all three associations have to report to me about their discussions and their weekly progress and plans to me'* (Respondent Officials nr. 02).

The smaller the subgroup, the more frequent they meet. The focus-group of 3 members of the Women Association explains: *'There are different levels of groups and meetings and the frequency of meeting differs per group. The smallest groups are groups of 5 women and they meet once in every 3-5 days. The bigger groups of 30 women meet once every week. And once every month all members of the Women Association of the whole tabia meet in a general meeting. Too once in every 2 months, there is a productive meeting with all leaders of the Women Association of the whole woreda in the woreda town Wukro'* (Respondent Focus Group nr. 02). Similar statements were given by members of the Youngsters- and Farmers Association. At these meetings members receive trainings but also discuss problems they face in their homes or in their work. Together they try to help and find solutions. The smaller groups can discuss their issues in personal detail, the larger meetings of the whole tabia deals with more general topics.

The main aim of these three associations appeared to be providing training to its members. These trainings mainly focus soil- and water conservation and on increasing labour- and farming productivity for youngsters and farmers. A 38 year old farmer for example states that *'they get instructions on how to use fertilizer (respondent nr. 09)'* and a 50 year old fellow network member adds: *'we discuss about infrastructure use and different activities within the kushet (sub-village). We also discuss community activities such as soil- and water conservation. (respondent nr. 01)'*. For members of the Women Association these trainings focus more on improving household healthcare- and sanitation. However, although indeed traditionally women still engage mostly in household tasks, the Women Association is also focussing on emancipation on this level. *'The women now gain more respect from man. Too, women can now get a loan (up to 5000 birr) to start business. Furthermore, there were 20 members in this tabia of the Women Association that previously did not have land. Through the Women Association, the government gave them land. We can now make for instance make roasted barley, sell it on the market and make profit. Women work hard in the WA, for instance through jobs in sand collecting that they can get with the Women*

Association. *Women are now equal from man, before they were dependent on man (Respondent Focus Group nr. 02).*

6.1.2 Network emerge and evolution

The three formal social networks exist in their current form since the 1990s. Some respondents indicate that during the Derg-regime similar networks already existed, but they were not uniform about this pre-1990 period. They are sure however about the fact that after the turbulent and violent era of the Derg-regime the TPLF (re)established the three associations as part of revitalizing the rural areas. The farmers focus group explains: *'In Derg time, there was very bad policy. The new government that came after the Derg was called TPLF and had a better policy system. The TPLF wanted the Farmers Association. This was purely for the benefit of the farmers. For long times they could not produce for their own benefit because of the feudal system and the bad land lords of the Derg that owned all the land. So the TPLF wanted the famers to know about good farming practices and to own own land in fair division (Respondent Focus Group nr. 02)'*. The chairman of the Youngsters Association confirms this image for 'his' network as he states that *'it already existed but it was re-established and reinforced after the Derg-regime by the Tigray People Liberation Front (Respondent Officials nr. 09)'*.

Respondents do not describe many changes in these three formal social networks. This is mainly because the networks are relatively young and their organisational structure has stayed the same. Some changes did occur in the networks however. One female respondent that had been a member of the Women-Association since its founding in the 1990s mentioned the increase of the annual contribution. Others mention a change in topics that are being discussed. *'We are currently discussing very broad and different topics. In the early days of the Farmers Association, farmers did not know how to farm in a good and just manner. Therefore in the 1990s the focus of the topics was on the basics of farming, because they were not understanding it right. Now they discuss broader topics such as soil and water conservation, health, ect. (Respondent Focus Group nr. 02)'*. Similar, many respondents relate to the irrigation activities that are being promoted by their associations since 10 years. Too, in line with the statement about women emancipation, for the Women Association there was also a shift towards broader topics in recent years.

6.1.3 In- and exclusion & participation

Although member selection criteria allow virtually all members of society to participate in these formal networks, not everyone can be a member of all these three associations. The first in- or exclusion criteria is based on a combination of gender and type of occupation. For obvious reasons only women can participate in the Women Association. Both the Youngsters- and Farmers Association only have male members. The two are highly linked to each other. A 39 year old member of the Youngsters Association explains that *'if you are above 40, from then on you can join the Farmers Association (Respondent nr. 07)'*. Men between 15 and 40 years old can be a member of the Youngsters Association. Interestingly, according to the chairman of the Youngsters Association, the majority of members engage in farming activities and 24% even has his own farming land. It remains unclear why the distinction between the two associations is made. The second selection criteria is based on income. Although it has not reportedly led to exclusion, members are required to pay an annual contribution as a membership fee (see table 3). This membership comes with strings attached because next to the annual contribution for the association there is also an obligated paid membership of the TPLF for the members of the association. Together this costs the members 1 euro per year.

Membership-rates of the research population in these three formal social networks is high: the estimated share of total network target population participating in the network is between 85 and 90 percent (see table 2). Two interesting aspects arise here. First, membership of these networks is said to be voluntary and based on personal interest by all respondents. Indeed, not everyone is a member according to this 25 year old farmer: *'I am not participating in any association [...] and I have no plans to join. If the sub-village administration would ask me, he might join, but they don't. I can be good, but I do not really understand the benefits, I am managing fine myself (Respondent nr. 23)'*. Second however, a 62 year old woman stated the following: *'I was an active member in the past, now I still pay my annual contribution but I am not participating anymore. I have to pay the money for the Women Association to get an ID card for the tabia (Respondent nr. 24)'*. Similar reactions of other respondents support this idea of pseudo-voluntary membership. Various respondents too stated that they have to get permission to be inactive. This permission is then only given if people are struggling with your health or if they cannot attend meetings because of young children.

6.1.4 Livelihood effects: efforts for and benefits of networks

The way in which respondents value the effect that these three formal social networks have on their lives is generally positive. Although some members have complaints or dissatisfactions about the networks, the overall image is that people are either neutral about them or explicitly satisfied with the associations.

Table 4: Efforts for and benefits of Women-, Farmers- and Youngsters Association membership.

Efforts or costs	Benefits or gains
<ul style="list-style-type: none"> - Annual payments: Contribution: 10 birr (€0.44) / TPLF: 12 birr (€0.52) / League: 3 birr (€0.13) 	<ul style="list-style-type: none"> - Training & knowledge on: farming practices health & sanitation business soil- and water conservation politics
<ul style="list-style-type: none"> - Time: up to 14 hours a month + personally varying travel time Sub-meetings: 8 * 30 minutes 30-group meetings: 4 *1,5 hours General meetings: 1*4 hours 	<ul style="list-style-type: none"> - Loans Government subsidised loans with fair interest rates.
	<ul style="list-style-type: none"> - Land divided among members through lottery
	<ul style="list-style-type: none"> - Cheap subsidized goods/products
	<ul style="list-style-type: none"> - Jobs (Youngsters Association only) landless youngsters get priority

Being a member of these three associations gains you several benefits (see table 4). The farmers focus group summarizes: *‘We are fighting for our benefits together such as good water, food and a nice home. Being a member of the Farmer Association, we can get a loan. Too, sometimes cheap tools such as a shovel are provided through the network. Furthermore there are all sorts of training, for example in bee-hiving or how to deal with water and irrigation. We discuss a lot of topics such as education on how to increase productivity through the use of fertilizers and the right preparation of the farmland. Further agricultural education is given on terracing and planting in straight lines and irrigation. (Respondent Focus Group nr. 01)’*. The youngsters add to this that through the association they get jobs in

stone grinding, *'sand-collecting and cattle keeping. Too, most members do not own farmland, so each year there is a lottery where different members get a piece of land. This can be 2 – 10 members each year, depending on the available land (Respondent Focus Group nr. 03)'*.

However, not everyone is happy about the benefits. Within the Youngsters Association for example, some members expected more jobs to be arranged by the network. Some farmers stated that the division of benefits within the association is an unfair process: *'There is a bias in farmer group in what members gain: if the leaders like you, you can for instances join the Safety Net Program, but if they don't like you, you do not profit. They are the ones who decide (Respondent nr. 13)'*.

Whether profitable or not, membership does also require some efforts to be put into the networks (see table 4). The first effort is paying the total of 1 euro for annual contributions. Most members take this for granted but some complain: *'We are all paying the contribution, because the coordinators are asking for it. But it is not beneficial for me'*. I am paying 10 Birr, but I think it is for coordinators own pocket *(Respondent nr. 13)'*. Secondly, all members need to invest time by attending the meetings of the networks. For most members the benefits outweigh these two efforts of time and money, but for some people such as a 35 year old Women Association sub-group leader this is more problematic: *'I was chosen as a sub-leader because I was the only one in this neighbourhood that was literate. Sometimes is even too busy for me. It takes a lot of time and therefore I have less time for my children. I do not get paid for being a leader. When I complained to the tabia administration that this was financially difficult for me, they said it was just my duty (Respondent officials nr. 14)'*.

6.2 CC Association, Cooperative Association and Saving- and Credit Association

6.2.1 Network characteristics

The second category of formal social networks consists of three other influential associations. The Community Credit (CC) Association, Cooperative Association and Saving- and Credit Association that form this category all aim at a form of shared collective material or financial benefit for its members. This can be through cheap loans, market advice, subsidized products or even free grants. They have a strict organisational structure with an administrative board including a chairman and a secretary. In this way, within the tabia the associations function independently at a horizontal level. They do also have some vertical

links, but similar to the first category, these function outside the scope of the ordinary members. These vertical links relate to the hierarchical links to higher regional scale levels of these associations. These are all public/governmental institutions. This mainly applies for the Cooperative Association and the Savings- and Credit Association. The woreda official of the Cooperative Association for example explains: *'The Association also works top-down. This office even gets some of its info also from the regional offices in Mekele. The local tabia Cooperative Association gets the market information for the advice and the products from the Woreda Union and is responsible for distributing this info and the subsidized goods among the members in the tabia (Respondent Officials nr. 10-11)'*. The Saving- and Credit Association is also a public institution receives part of its budget for loan distribution from the regional woreda office and has to report back to this office every year. The CC-Association functions independent but *'its existence is also licenced by the regional government and there are also [vertical - red.] links with some (inter)national NGO's such as World Vision to assist in times of need Respondent Officials nr.04'*.

These three formal social networks focus mostly on the individual members and their links with the network. The collective aim is creating shared benefits but these can be obtained and used individually. Compared to the first category of networks, therefore the frequency of meetings is relatively low. A 50 year old member of the Saving- and Credit Association tells that *'Every a month, we have a meeting on the 24th. During that meeting, we discuss how much money is still left, who paid his contribution and debts and who did not (Respondent nr. 01)'*. The Cooperative Association meets even less frequent. The chairman explains: *'there are two meetings every year and there we evaluate the activities of the association and its members and give feedback (Respondent Officials nr.8)'*.

6.2.2 Network emerge and evolution

The Cooperative Association is the oldest of the three networks. It was founded together with the Farmers Association as an effort of the TPLF. It has strong links with the farmers; the main reason why it was founded in the 1990s *'for creating market stability and protecting the people from bad retailers. It wanted to create better service for the farmers (e.g. nearby shops) and it wanted to balance the market. It wanted to provide qualitative and productive products and seeds for low prices (Respondent Officials nr. 10-11)'*. 10 years ago the Cooperative Association also started to broadcast information on market prices in the

region as a service for their members.

The Saving- and Credit Association and the CC-Association were founded more recently between 10 and 15 years ago. The first was mainly created to enable farmers to get credit for buying agricultural inputs. The Cooperative Association used to provide this service *'but now they stopped with that because repayment was problematic: they have to pay it in cash. They don't want to give loans anymore. Farmers cannot afford the fertilizer than can ask the Saving- and Credit Association to get a loan in in June to buy it (Respondent Officials nr. 03)'*. The CC-Association was created 12 years ago because there was need of a form of social insurance to help the weak and needy of the society.

6.2.3 In- and exclusion & participation

Compared to the first category, the three formal social networks of the second category have less strict membership criteria regarding age and gender. Everyone above 18 years old, both male and female, can be a member of the associations. In the CC-Association, indirectly even children are included because membership is based on households, and not on individuals which is the case in the Cooperative Association and the Saving- and Credit Association. The Cooperative Association has an equal division of male and female members. 70 per cent of the members of the Saving- and Credit Association is male, 30 percent female. The use of the credit differs between male and female members. Similar to other female respondents, a 23 year old women for instance told that *'women now can get a loan from the government [through the Saving- and Credit Association – red.] They can use it for instance for a chicken farm (Respondent nr. 18)'*. Various male respondents on the other hand stated that they use credits for farming inputs, or for irrigation materials.

These three associations are however more exclusive when it comes to the required monthly or annual payments. Compared to the first category these payments are relatively high (see table 3). The fixed annual payments are especially high for the CC-Association: 12.58 euro. For the other two this is much less, but the variable investments are only beneficial from a substantial annual amount, starting from 1.32 euro per month. Membership rates are relatively low compared to the Women- Farmers- and Youngsters Association. They range between 30 and 50 percent of the target population (see table 2).

6.2.4 Livelihood effects: efforts for and benefits of networks

The effect the network has on people's lives was assessed by mapping the efforts put in to

the network and benefits gained by being a member. The most remarkable difference with the first category is that the both efforts and benefits can vary greatly among the members (see table 5). What is gained and/or invested in the network depends on personal circumstances and in the case of the Cooperative Association and the Saving- and Credit Association highly depends on the amount of money members individually invest in the formal network.

Table 5 – Efforts and benefits of formal social networks: CC-, Cooperative-, and Saving- and Credit Association

	Efforts or costs	Benefits or gains
CC- Association	<ul style="list-style-type: none"> - 288 birr (€12.58) Annual contribution per household 	<ul style="list-style-type: none"> - Interest free loans - Free grants - Payment for orphans/elderly/ HIV-AIDS victims - Help for the needy
Cooperative Association	<ul style="list-style-type: none"> - 10 birr (€0.44) Annual individual contribution - 11 birr (€0.48) Single registration fee - 12 meetings per year - 4 hours per meeting + personally varying travel time 	<ul style="list-style-type: none"> - Cooperative Association dividend profit through lottery. - Cheap subsidized home- and agricultural inputs - Market prices information
Saving- and Credit Association	<ul style="list-style-type: none"> - 360 birr (€15,72 - minimal annual input) Input depends on loan / savings deposit - If loan: interest - 2 meetings a year - 4 hours per meeting + personally varying travel time 	<ul style="list-style-type: none"> - Loans (government money) - Safe saving system

Members of the CC-Association only benefit from their membership if they face difficulties in life. The tabia head explains: *The Association functions as a sort of social insurance and social welfare system, for example for orphans, HIV/AIDS victims or old people. Too, when there are problems (eg. loss of cattle or land) this network can give free grants.). The CC can also*

provide loans, free of interest for example to buy chicken. The aim is to help each other and especially the needy members of society (Respondent Officials nr.04)'. The benefits of the Cooperative association are market information, cheap subsidized home- and agricultural inputs and members can get lucky by winning the Associations dividend lottery: 'The CA is divided in subgroups of 7 – 12 members. These members contribute 10 birr each year. Furthermore, the reduced goods the CA sells have a little profit margin. Contribution and profit are used to cover the costs, but if money remains, this profit can be divided among the members. This is done through a lottery system among the sub-groups. In the end, an individual farmer of a subgroup can for example receive 200 birr. (Respondent Officials nr. 10-11)'. The main goal and benefit of the Saving- and Credit Association is providing loans to its members. Various respondents do have loans for business-related activities such as the chicken farm mentioned above. There is however a downside to all these benefits. The Saving- and Credit Association has become more reticent in providing loans in recent years: 'The amount of loan decreased because farmers are not paying the back loan. The government would double the loans and money available if the amount is paid back on time. But because the farmers do not pay back the money there is less money to provide (Respondent Officials nr. 08)'.

The financial efforts required for the membership of these three associations is considerably higher compared to the contributions to the first category of associations. This ranges from 0.44 euro (CA) and costs for home inputs to 12.58 euro (CCA) and a minimal of 15.72 euro (SCA) annually. The effort in time on the other are relatively limited for these associations: maximal 1 meeting per month.

6.3 Disabled Association and Fighters Association

Two relatively small associations form the third category of formal social networks which are the Disabled Association and the Fighters Association. Hardly any data was obtained on the Fighters Association, and useful but limited insight was gained in the Disabled Association. They are unknown to most respondents: only one 66 year old man was found to be a member of the Fighters Association and none of the respondents was participating in the Disabled Association. Upon asking around in the village, the majority of people did not even know the latter existed at all. Only in talking to a regional Woreda official, some data could be obtained about the Disabled Association.

6.3.1 Network characteristics

Both networks are government controlled and have an organizational board with a leader. Members pay some contribution and meet each other on a regular bases. Their aim is to promote the position of their members in society and help them with problems they face. The networks operate first and foremost on a horizontal level within the tabia, but both have vertical linkages as well. In the case of the Disabled Association (DA) for example the *'regional woreda office has a guideline of how to create a local tabia DA. The tabia government gathers the people together to form a DA. A newly formed DA then needs to get a licence from this Woreda office (Respondent Official nr. 13)'*. Furthermore, the regional office provides assistance and training for the local tabia associations.

6.3.2 Network emerge and evolution

Both networks were founded very recently compared to the first two categories of formal social networks. The tabia-head states that both were created 5 years ago. This was mainly a government effort to promote the rights of these two vulnerable minority groups. In the case of the Disabled Association *'there was a declaration from TPLF development office. In this top-down declaration, they stimulated awareness towards disabled people and were encouraging full participation of the disabled in society. But apart from these regional and national stimulation & encouragement, the actual initiatives for creation of local tabia Disabled Associations should come from below (Respondent Official nr. 13)'*.

6.3.3 In- and exclusion & participation

For obvious reasons, these two associations have strict member selection criteria. The Disabled Association only allows disabled males and female members of 18 years or older. Only 75 members are registered in the tabia, but the share of the target population that is active remains unknown. The Fighters Association on the other hand allows only male army veterans as a member. Membership numbers of- and the share of target population participating in the Fighters Association are unknown.

6.3.4 Livelihood effects: efforts for and benefits of networks

For the members of the Disabled Association, this formal network has a positive influence on their lives according to the Woreda Disabled Association Expert Worker. This influence can be both material and non-material: *'The main focus of the Disabled Association is on*

positively influencing attitudes towards people with disabilities. It creates awareness of the fact that the disabled have qualities. They can contribute to society and this is the reality and this is possible. Too, they seek to provide material assistance. Although the Association itself has no budget to give people this, disabled people can contact the Woreda Association Office and propose for some assistance such as a wheelchair. The office then will try to connect the needy to other development stakeholders such as NGO's like WorldVision. They might have the budget to give them the necessary tools such as a wheelchair or crutches (Respondent Official nr. 13)'. Other benefits for members are special loans for disabled people to start a business and assistance in writing business plans. Furthermore, the regional Disabled Association provides trainings and lessons at schools in the tabia's to change the perception about disabled peoples to alter the idea of disabled peoples being sinners, punished by God, helpless and dependent.

In order to profit from these benefits, members need to contribute an annual membership fee of 0.44 euro and a single registration fee of 0.22 euro. Furthermore the members need to attend meetings and trainings which can be difficult for them, especially when the meetings are in the regional woreda town. *'If the distance to a meeting is really far than it is really problematic and difficult for the members. They have to use donkey to get to the bus and return ticket for bus is 40 birr so it is expensive (Respondent Official nr. 13)'*.

Therefore, if possible, meetings and trainings are held locally at a central point in the tabia.

6.4 Development Groups

6.4.1 Network characteristics

The fourth type of formal social network that was distinguished is the network of Development Groups. The main aim of this government-led and controlled network is to organize obligated community labour for its members. This community labour focusses on soil- and water conservation and the activities range from mountain slope terracing to reforestation and digging of irrigation channels. The activities are only within the tabia, hence the horizontal nature of the Development Groups. Indirectly, the network has a vertical link as well. Poor members that get food support through the national Safety Net Program (SNP) are required to participate more in the network compared to non-SNP members.

The network has a hierarchal structure with a directional board with a chairman and

subgroups with sub-leaders that redirect to the main organization. *'These sub-groups are small groups leaded by the government: 70 in total existing of 58 men and only 12 women groups. One group exists of 25 members. [...] Every three days the leader and chairman meet; once in two weeks there is general meeting. (Respondent Official nr. 09).'*

6.4.2 Network emerge and evolution

Although forms of joint community work have been existing long before the TPLF, the current institutionalized formal network of the Development Groups was created in the last 30 years as a governmental TPLF effort. The link it has with the SNP will end in 2015 because due to budget limitations the SNP will be terminated by the end of 2015.

6.4.3 In- and exclusion & participation

Membership of the Development Groups is not a matter of personal interest. A former chairman of the Development Group explains: *'Everyone is a member, even the old peoples; it is an obligation to be a member (Respondent Official nr. 09)'*. Both women and men are included in the Development Groups but male members form a large majority (80%) compared to the female members (20%). There are two categories of members. The distinction is made based on social-economic status. *'The members participate mainly in soil and water conservation. There is a difference between regular members and Safety Net Program (SNP)-members of the DG. SNP-members have to work for 20 days per month, the regular members only when there is a larger government campaign for the whole tabia. These larger campaigns are community work and do not get paid. The SNP-members get their 20 days per month payment in kind through the regional SNP-office (Respondent Official nr. 09)'*. There is a limited amount of members that can participate in the SNP. Based on social-economic characteristics, the tabia government decides who can be a member within the SNP.

6.4.4 Livelihood effects: efforts for and benefits of networks.

For regular members of the development groups there are no individual benefits of participating in the network. Their obligated community labour in the case of soil- and water conservation campaigns does not gain them direct personal benefit. Being a member of the community simply requires them to work for the development group. Through this collective work they do however add to the liveability and sustainability of the village which

is in their own interest as well. For members that are part of the Safety Net Program, more work is required for the network but they also receive the SNP-payment every month. 20 days of work per month gains them 60 kilogram of grain per household member.

Not all members are happy about this distinction between SNP- and non SNP-members and how this is decided. Some feel that they need the SNP-support as well and are frustrated about the SNP-member selection. A 65 year old man explains: *'There is a bias in the selection. If they like you, you can join the SNP, but not if they do not like you. The leaders decide. It is an unfair process: if you have cattle you are rich and you are not supposed to participate in the SNP. But there also people that do have cattle that are nonetheless included in the SNP. So it is biased and there are a lot of inequalities (Respondent nr. 13)'*.

6.5 The Church

6.5.1 Network characteristics

The fifth category of networks is different from the other four that have been described above. The church that forms this formal social network category is very old, has very high participation rates and has relatively little vertical and governmental interference compared to the other networks. The churches in the tabia of Adikisandid are part of the Ethiopian-Orthodox Church and each sub-village within the tabia has its own church. Its activities are mostly horizontal in nature: all members of the network go to the closest church in their sub-village. Each church in the village has its own head-priest and several normal priests that lead the ceremonies. They meet every Sunday and on religious holidays.

Apart from its own activities, the church plays an important facilitating role for many of the other formal social networks in the village. In many occasions the church grounds are used as a meeting place for the Associations. The general meetings for the whole tabia of the Women-, Farmers- and Youngsters Associations for example are held on Sunday mornings after the church ceremonies are finished.

6.5.2 Network emerge and evolution

Compared to the associations described above, the church network is very old. The village in the region were of the country were centuries ago the Orthodox Church was first established. A recent development in the last 30 years for the Church network is its facilitating role for all the Associations.

6.5.3 In- and exclusion & participation

Especially in the rural areas in Ethiopia, religion plays a big role in personal and societal life. Hence, unsurprisingly virtually all inhabitants of all ages in the tabia Adikisandid are involved in this network. Separated from each other at most activities, both man and women equally participate in the network. However, as part of the cultural-religious tradition women are not allowed a leading role.

Although membership of the Church network is commonplace in the village, there is a big difference in the intensity of participation in the network. Some members rarely visit meetings and celebrations at the church because they are occupied with other things and/or have limited interest in the Church for different reasons. A 65 year old respondent for example stated: *'I only go to church for praying, not for social activities. After my wife died, I did some speeches in church, but people were disappointed about this. So since then I do not this kind of activities anymore (Respondent nr. 13)'*. Opposed to this type of members is a group of members that is very active. A 35 year old female respondent for example explained she is a member of a group 12 women within the church that honours the holy saint Mary. *'Every month, on the 21th the community celebrates Saint Mary and there is one big celebration each year. The community prepares food, drinks, bread, etc. and the priest will give his blessing to the 12 women (Respondent nr. 03)'*.

6.5.4 Livelihood effects: efforts for and benefits of networks

The effect the Church network has on the lives of its members is less tangible compared to the Associations. The benefits people gain from participating in the Church are immaterial and relate to social- and religious wellbeing.

As effort, people have to attend ceremonies and celebrations. This can take several hours each time as well as personally varying travel time. Furthermore, members are required to make material and financial efforts as well. A 38 year old man explains: *'People are very religious and wish the best for the church. They slaughter sheep and bring drinks for the whole church and specially for the priest. With eastern, they also bring gifts for the priest (Respondent nr. 09)'*. Similar, a 30 year old women states: *'Yes, I participate when there is a holy day. I make injera (flat bread) and bring other food and drinks (Respondent nr. 22)'*.

Apart from this material efforts by bring food and drinks to the meetings, members also are required to pay an annual contribution: *'every family of this kushet (sub-village) has*

to pay 60 Birr (€2.62) per year for the priest and also for maintaining the church, etc. (Respondent nr. 06)'. Others confirm this but add that 'they are debating the payment because the priests are asking more money for themselves, and the community does not want that. 60 Birr per year is more than enough (Respondent nr. 09)'.

Chapter 7 - INFORMAL SOCIAL NETWORKS

Similar to chapter six this chapter relates to the first research objective and research sub-questions 1,2,3, and 4. The focus here is on informal or cognitive social networks. After a general overview of the findings on these networks, three paragraphs describe the distinguished categories in more detail.

Table 6 – Forms of in informal social networks in Adikisandid

Form of informal social network mentioned by respondents	Estimated share of research population participating in the network
Family- and friends networks - Regular visiting - Special occasions and celebrations	Up to 100%
Informal community help	Up to 100%
Informal community saving	Around 5%

In the tabia Adikisandid three types of informal social networks were found active. Based on differences in target-group type and network aims, the following three categories were distinguished. The first category consists of numerous smaller and larger networks of family and friends. Networks of informal community help form the second category of informal social networks. Third, although few in number, there are also small networks of informal community saving.

Compared to the formal networks the informal networks are older, fewer in number, less institutionalized and less homogenous in nature. Furthermore they operate relatively independent as they are not controlled or founded by the government. Membership of two of the three is commonplace in the village and approaches an estimated 100 per cent of the research population. One of the three on the other hand plays a minor role because not more than 5 percent of the population is estimated to be a member.

The networks all function in a way that creates a form of collective benefit. For the rarely occurring informal community saving networks this is the explicit aim of their foundation. This explicit goal applies less to very common family- and friend networks; they

were established more gradually and are part of century-old relations of kinship and community commitment. In such networks, reciprocity, neighbourly love and charity are undisputed virtues and a natural part of daily life. The networks are most active on a horizontal base, but although less frequent, the family- and friend network too have a vertical dimension with relationships beyond the borders of the village.

In- and exclusion in informal social networks

The criteria on which members of the informal networks are in-or excluded vary between the three categories, but overall the networks are less selective regarding age, income and gender compared to the formal social networks. For the family- and friend networks kinship and acquaintanceship determine the membership of a network. For informal community help as well as for informal community saving, geographical proximity is the main criteria for inclusion in the network (see table 7). Within the village, such network can exist for example within a certain cluster of houses within a sub-village. People that live a few kilometres apart from each other are thus unlikely to participate within the same network of community help.

Table 7 - In- and exclusion and contribution in informal social networks in Adikisandid

Form of informal social network mentioned by respondents	Member selection criteria	Annual contribution
Family- and friends networks - Regular visiting - Special occasions and celebrations	Kinship Acquaintanceship	- Gifts (income dependent) - Gifts & labour (income dependent)
Informal community help	- Geographical proximity	- Labour - Food and drinks
Informal community saving	- Income - Geographical proximity	- Money, depending on agreements

Livelihood effects of informal social networks

Although less in number compared to the formal social network, the informal social networks in Adikisandid play an important role in the lives of its members. The costs for

these networks are mainly in providing food, presents, attention/presence or voluntary labour. Examples of this are bringing food or gifts to family visits, helping building a wedding tent, mourning for 7 days with a family that lost a loved-one or helping your neighbour with harvesting his matured products. In this informal networks everyone contributes to his or her capacity; the poorer members of a network will contribute somewhat less than the better-off members.

Unsurprisingly, the efforts put into these networks are also the benefits for those who can apply for the help of the network, for instance in the case of a wedding, funeral or family visiting you.

Taking these general findings in mind, the following paragraphs describe the 3 different network categories in more detail. Similar to chapter six, both general characteristics, network emerge and evolution, in- and exclusion in the networks and finally the livelihood effects of each networks will be discussed successively.

7.1 Family- and friends networks

7.1.1 Network characteristics

The first type of informal social networks that was distinguished in the tabia of Adikisandid consist of a multitude of linkages between family and friends. These networks do not have a clear organisational structure such as many formal networks but are rather based on principle values of taking care for each other and commitment to your family and loved ones. A 65 year old man for example states: *'We just help each other. I support my relatives with some grain and I expect the same in return when I am in need (Respondent nr. 13)'*. It is in this way, that the reciprocity and solidarity on which these networks are based support the existence of these networks.

The way these networks function is less structured compared to other formal and informal networks. Two distinctions can be made that influence the type and frequency of meeting in the networks. First, people can either meet each other without a particular occasion, just for the sake of meeting. Some respondents for example explained that they visited their grandparents or brothers every weekend. Another option is visiting and meeting each other on special occasions or celebrations such as a wedding or a funeral. Several respondents state that the latter is much more common in Ethiopia. A 59 year old male for example states: *'I only visit my family outside this village in Adigrat and Wukro on special*

occasions like a wedding or an anniversary (Respondent nr. 02)'. This also relates to the second distinction in network type and frequency: the difference between horizontal and vertical networks. Members of horizontal networks live close to each other and can meet each other relatively easy compared to family or friends that live in different villages and form a vertical network. A 35 year old women states: 'I have family in Wukro and in other places outside this village. If I visit them, I use a car if I have money, otherwise I will walk. I visit them once every six month(Respondent nr. 03)'. Several respondents too, access their vertical networks combined with other activities: an 18 year old man for instance tells: 'I visit my family on in Wukro on the way to the market, sometimes I use transport, but most of the time I walk (Respondent nr. 08)'. Opposed to these vertical links are for example a 55 year old man and his two brothers (Respondent nr. 15). Their horizontal family bond within the village allows them to visit each other on a Sunday afternoon.

7.1.2 Network emerge and evolution

Informal networks of friend- and family linkages are not founded at a given moment but evolve naturally over time. The networks that were distinguished in the village of Adikisandid, in particular the family bonds, are centuries old and the way these networks operate are based on old traditions and values. No further explicit data was obtained on the emerge and evolution of the family- and friend

7.1.3 In- and exclusion & participation

All respondents claimed to be involved in some sort of family- and/or friends network. All households of the village are active in The inclusion in does not appear to be a matter of choice, preference or personal interest. Similar to the statement under 7.1.1, a 38 year old man refers to this as a moral duty: *'We just help each other by pepper and other foods, sometimes I bring gifts such as wheat (Respondent nr. 09)'.*

Although everyone participates, intensity and type of contribution varies among the members and differs based economic status, available time and personal health. Some of the poorer members from a network give less presents and some people stated to be very busy and therefore invest little time in the networks . Other, relatively old respondents, stated that they could not access the network because they were bound to their homes because they are not healthy.

7.1.4 Livelihood effects: efforts for and benefits of networks

The family- and friend networks are thus deeply embedded in societal life in the tabia of Adikisandid. When looking at the efforts for and benefits of network membership, the fact of reciprocity makes it a balanced system based on solidarity. People gain all sorts of material and immaterial benefits. Most respondents mention food and drinks as gifts for each other. Other mention the support they gain in the case of a funeral.

Because of the core value of reciprocity, people make efforts similar to the benefits. Apart from (travel)time and attention people invest in each other, the efforts people make can vary per person, depending on the intensity of the relationship. A 66 year old male for example explains: *If a wedding is from a close relative then I contribute money, alcoholic beverages and bread. During the evening, I will give some prizes while presenting a quiz. The closer the family member is to me, the more I contribute (Respondent nr. 16)*'.

The way people approach this tradition of reciprocity varies. Some do not focus on personal benefit: *'It is not about the benefit, people just do it out of respect for their family. In the case of a funeral, in order to rest in peace, the community will pray for the deceased community member. The same is true for a wedding: we just do that what is needed, we want to do something meaningful for our brothers and sisters. It is an act out of love (Respondent nr. 03).'* Others however somewhat relativize this sentiment and show a more individualistic attitude. A 60 year old man states: *'I do not help my brother who lives far away. Not really no, everyone their own lives and families. I have to take care for myself (Respondent nr. 14).'*

7.2 Informal Community Help

7.2.1 Network characteristics

The second type of informal social networks that was found active in Adikisandid according to the data consists of a large number linkages of informal community help. There are multiple of these horizontal networks active in the village. Each of these networks stretch over a limited geographical area and depending on definition, their size can vary from a few households to a larger group of households within a part of a sub-village. One could argue about size and definition, but most respondents refer to helping their neighbours as the main activity within these networks. Hence, the aim of these networks is to provide all members of a community with material or immaterial help when needed. People meet each

other to provide help on several occasions such as weddings, funerals, harvesting time. An 18 year old youngsters for example clarifies his immaterial commitment and the boundaries of his network: *'If there is a funeral from a younger member, I will go to the funeral out of respect. But if the funeral is too far, then I won't go to the funeral (Respondent nr. 08)'*. The occasions for informal community help are not fixed in days or hours, but they depend on what happens in the community and the willingness and needs of its members.

7.2.2 Network emerge and evolution

Similar to the family-and friend networks, the networks of informal community help emerged a long time ago and developed old habits and behavioural norms . A 50 year old man confirms this image as he states: *'It is just a tradition that started a long time ago in which people from the community help each other when there is a wedding or a funeral (Respondent nr. 01)'*. The age and taken-for-granted image of these networks consequently led to a minimal amount of further in-depth data on their emerge and evolution.

7.2.3 In- and exclusion

In principle, all households of the community participate in these networks. Although there is no exclusion based on age, gender or income, the type of activity within the network differs between different members. Women mostly engage in preparing food for the various network activities. An 18 year old women explains: *'In the community when helping at weddings and funerals there is no difference in young and old, everyone participates in preparing food etc. Me and my younger sister do that as well (Respondent nr. 21)'*. Male members of the community help networks engage in other activities. They can help each other with harvesting or in the case of a wedding or funeral of a neighbour help with slaughtering cattle or building a tent. The economic status of a member is a relevant aspect but does not lead to exclusion, every member participates and cooperates to his abilities: *'If a poor family cannot help or contribute, we discuss if it is okay if they bring something small to a ceremony (respondent nr. 25)'*. Similar, at *'wedding activities the amount of help depends on peoples' income; if they have money, they will make a lot of tahla - alcoholic beverage red - (Respondent nr. 09)'*.

7.2.4 Livelihood effects: efforts for and benefits of networks

Some of the livelihood effect of this type of informal social networks have been described in

already above. Compared to the formal social network, the way efforts and benefits relate to each other is very clear and transparent: the efforts of helping someone in the community at a certain moment are the benefits for that person. In the future, this might be the other way around. The efforts and benefits thus vary among the members depending on their personal life events and economic status. If for example for a certain member a year passes by without big life events and the year was economically and socially successful, this member is likely to put more effort in the network than he gains benefit from his membership in that specific year. However, most people do not value these network in such economic terms. Hence the overall principle for all members is reciprocity to everyone's capacity. A 50 year old male respondent confirms this as he tells about the community help in the case of a wedding: *'When a beloved one passes away, there is a period of grief for 12 days. The community stays with the family and helps them. Also, you can contribute an amount of money that you have or can miss (Respondent nr. 01)'*. Finally, compared to the networks of family and friends, members of these networks invest less travel time in accessing the networks because of the sub-local horizontal nature of the

7.3 Informal Community Saving

7.3.1 Network characteristics

Informal Community Saving groups form the third category of informal social networks. Compared to the other two types of informal networks they are relatively structured and operate more on a structural and regular basis. Similar to the networks of community help, these saving networks operate on a small local scale. Members usually live close to each other and thus make these networks purely horizontal. They exist independently and are not controlled or guided through government involvement. The aim of an informal saving groups is to save money for individual or collective use.

They are however less widespread in number and few people participate in these saving groups compared to for example the formal Saving- and Credit Association. It is estimated that less than 5 percent of the population participates in an informal saving group. Only one respondent stated to be a member of an informal saving networks and according to a government official these networks *'are an exception in the village and they are not controlled by the government. In order to save the money together, people first will need to agree with each other [...] but they might disagree (Respondent Officials nr. 02)'*.

7.3.2 Network emerge and evolution

Traditions of community saving do not have a clear period of beginning. Therefore, no precise data on the emerge and reasons for the foundation of these informal networks was obtained. Interestingly however, various respondents stated that in recent times several saving networks were established. But these networks were short-lived and terminated were soon terminated. A 29 year old women explains: *'No, we do not have an informal community saving group here. They tried it, but it does not exist anymore. There were too many disagreements; some people can just not save money. Money is a problem. (Respondent nr. 29)'*. A 56 year old man adds to this: *'It is better to invest yourself than to save together. They (the saving group - red.) had a disagreement so now people prefer to save money on their own. This system just does not work here (Respondent nr. 31)'*.

7.3.3 In- and exclusion & participation

The few networks that exist are relatively selective in allowing members to participate. Member selection criteria can be gender or profession, but also geographical proximity plays a role because members usually live in the same neighbourhood. There are for example farmers that join their forces and save money to buy an irrigation motor. Some groups do only allow women: *'There is a group of ten women and they all save 20 Birr per month. Every month, someone else can use this collective money. They use it for own consumption, and for buying clothes (Respondent nr. 22)'*.

7.3.4 Livelihood effects: efforts for and benefits of networks

The effect these small informal saving networks have on people's lives mainly depends on the efforts people make for the network. Efforts are purely financial and the benefits are proportional with the investments people make. Other than in family- and friend networks and in community help, there are no charity or solidarity elements in the informal saving. In the case of the group of ten women for example, in ten months all women both invest and receive 200 birr.

Chapter 8 - ROADS AND SOCIAL NETWORKS

In three parts, this chapter discusses the findings that relate to the second research objective and research questions 5 and 6. First, a general overview will be given of how respondents relate to the road in general. The second part will assess the roll of roads in the different social networks. Third, the effects of changes in road infrastructure and mobility on social networks are discussed.

8.1 Roads and road use in Adikisandid

A road in Adikisandid that is accessible for motorized vehicles, horse-carts and bikes is a relatively new phenomenon in the mountainous rural village. The road ends in the furthest sub-village and stretches approximately 15 kilometres from the regional tarmac road.

Respondents vary somewhat in how they recall the age of the road, but it is estimated that the road construction started 7 years ago. The construction took place in different phases: sub-villages that are situated close to the regional road were connected in an early stage, and the road was finished in the furthest sub-village between one and two years ago.

Although it was not the aim of this research to investigate the general effects people's perception of road construction, respondents were eager to tell about their perception of the effects and benefits of road construction for themselves or others. Two narratives can be observed here that are both relevant as context for the relation between social networks and roads.

First, when asked about the impact of road on networks, many respondents instead listed non-network related effects of road construction. Apart from a few respondents mentioning negative effects of road construction such as increased levels of dust in the air and loss of small parts of farmland, their perception towards road construction was remarkably positive. Most respondents are happy as they list all the new modes of transportation that are available in the village such as small taxi's, pick-up trucks, horse-carts, bicycles and lorries. A 45 year old man for instance lists several benefits: *'There is now access with horse-carts and other vehicles. There are also ambulances that take women to the hospital to give birth. Life is all better now because of the road (Respondent nr. 25)'*. A 30 year old woman adds to this: *'Because of the road, I have now better access to the market in the regional woreda town Wukro (Respondent nr. 22)'*. Other respondents ascribe several infrastructural improvements in the village to the road: *'There is now electricity and houses*

can be constructed with modern material such as corrugated steel roofs (Respondent Focus Group nr. 01)'. Others mention the benefits for employment such as access for stone-grinding facilities and irrigation infrastructure.

Second, although people's perception about the road and its effect on their lives are very positive, simultaneously the degree in which people use the road is often limited. The vehicles described above do indeed enter the village, but the frequency and intensity remains limited. A 67 year old man explains: *'There are no regular line Bajaj Taxis, only if you call a contract Bajaj Taxi they will come. I always walk to the meetings (Respondent nr. 04)'*. Although precise quantitative data is not available on this topic the majority of road use is on foot and with donkey transport. Observation by the researcher during fieldwork days indicates that motorized transport indeed is exceptional in the village. Many respondents confirm this image as they state that most of the time people walk to for example markets or meetings. Depending on the location of people's homes, this can take for example up to 3 hours walking to the market. This is partly a structural and bureaucratic problem because there is no regular public transportation in the village: *'If public minibuses owners want to operate in the village, they have to get permission of the transportation officials at the regional woreda administration. This is to protect the people from overcharging for transport. That is why there are fixed prices. But this process is still ongoing because of 2 factors. First, the distance needs to be officially measured to determine the fixed price, this takes time. Second, the road to the furthest sub-village is not good enough, this requires upgrading first; this is also being planned (Respondent Officials nr. 12)'*. Overall, people lack the financial resources to organize their private transport on a regular basis and therefore walking is often the only option.

8.2 The role of the road and mobility in social networks

In general, roads were shown as being valued very positively by the inhabitants of the rural village of Adikisandid. Hence, respondents could easily relate to the value the road has in their personal lives. How the road related to social networks on the other hand was more difficult data to obtain. This section nonetheless discusses the role of roads and mobility in assessing and maintaining, creation of, in-and exclusion in and livelihood effects of the social networks in the village.

The road and network-accessing & maintenance

For network creation roads played a minor role in Adikisandid, but road are of greater significance for accessing and maintaining of the social networks in the village. In line with the above, this is only the case since 7 years. However, several respondents state that the roads are important for accessing the networks. This can be either on foot or on a (motorized) vehicle. However, for most of the horizontal networks, the latter is exceptional.

Table 8 – Type of road use for regular members in social networks in Adikisandid²

Type of Social Network	Maximum distances	Type of road use in network access
Formal Social Networks		
Women Association	0.5 - 5 km*	Walking (seldom: car/taxi transport)
Farmer Association	0.5 - 5 km*	Walking (seldom: car/taxi transport)
Youngsters Association	0.5 - 5 km*	Walking (seldom: car/taxi transport)
CC Association (community social security/insurance)	Not applicable	Not applicable
Cooperative Association	0.5 - 5 km*	Walking (seldom: car/taxi transport)
Saving- and Credit Association	0.5 - 5 km*	Walking (seldom: car/taxi transport)
Disabled Association	unknown	Unknown
Fighters Association	unknown	Unknown
Development Groups	0.5 - 5 km*	Walking (seldom: car/taxi transport)
Church (apart from individual religious devotion)	4 km	Walking
Informal Social Networks		
Family- and friends networks	Horizontal: 0 - 15 km** Vertical: > 15 km	Horizontal: Walking (seldom: car/taxi transport) Vertical: Car/taxi (occasionally: walking)
Informal community help	0 - 1 km	Walking
Informal community saving	0 - 1 km	Walking

* : General meetings are held at central places in the village. 5 km was taken as a maximal travel distance to these meetings based on statements that members travel a maximum of 1 hour to a meeting.

** : The road through the village is 15 km long, this was taken as a hypothetical maximum geographical width of an horizontal network within the village.

² Most of the formal social networks have a vertical dimension in their linkages through their formal relations with government offices in the regional woreda town Wukro. Government officials and trainers from Wukro regularly access the networks in Adikisandid with motorized transport. They were not included in this table because they form a minor part of all the social network related road use.

There is mainly one factor that determines the value of roads in accessing and maintaining the network: the size in terms of geographical coverage of the social network. Members of vertical networks that stretch over a large geographical area, for example an informal Friends- or Family Network, depend highly on reliable roads and transportation to access and maintain their network (see table 8). A 35 year old women for example explains: *'I have family in the regional woreda town Wukro and in other places. If I visit them, I use a car when I have enough money, otherwise I go on foot and walk (Respondent nr. 03)'*. Although mainly horizontal in nature, most formal social networks in the village have vertical links with the regional government for training and controlling purposes. Many trainers or other regional government officials access the local networks in the village by car, bajaj taxi or motorbikes in the case of a training or an administrative check-up.

In accessing small horizontal networks on the other hand, for example a sub-group of the Women Association, the road is a negligible factor. Indeed, contrary to the vertical networks many respondents walk to access the local horizontal networks: *'The meetings of the Youngsters Association are around the school, I go there on foot which is 30 minutes walking from where I live (Respondent nr. 08)'*. This is the same for members and for leaders of the Associations as a sub-group coordinator of the Women Association explains: *'If my group members are working, she will go to them on foot to discuss their issues and give individual advise. If we have important things to discuss together; we walk to a meeting point nearby under a group of trees (Respondent nr. 29)'*. Similar, all three focus groups are explicit about the mode of transport of their members: everyone walks to the meetings '(

Exceptional situations however can occur in which the local leaders together with the government use a car to maintain the network relations. On one research day in the village for example the researcher observed some leaders of the Farmer-Association driving to the furthers sub-village to investigate the damage to farm-land after heavy rainfall.

The road and network creation

For all except two social networks that were found active in the village, roads played no role in their creation. Except for the Fighters Association and the Disabled Association, the road in the village had not yet been constructed when the social networks emerged. This is true for both formal or informal and horizontal or vertical social networks in the village. They were all founded more than 7 years ago and the road was therefore not a factor in their

emerge. Needless to say, mobility still played a role in the times before the road was constructed. Mobilizing, contacting and meeting people to form networks happened on foot or by donkey-transport.

The Fighters- and Disabled Association are the only two associations that were founded in the village after the road was constructed. For the Disabled Association, the data obtained from the Woreda Disabled Association Expert Worker suggests that roads have possibly played a role in the creation of an Disabled Association on the tabia level. This is mainly because the target population faces mobility difficulties due to their disabilities. The emerge of an Disabled Association would thus have been difficult without a road. The expert worker explains: *'I go myself with my motorbike to the different tabias, for example for teaching and selecting disabled model farmers. [...] I stimulate the awareness of disabilities full participation of disabled in society and I promote the creation of local Development Associations (Respondent Officials nr. 13)'*.

The road and network in-and exclusion

The road and mobility in the village was not found to affect the official in- and exclusion criteria of the formal and informal social networks in the village. However, some specific groups within the networks, inevitably used to be excluded from active participation in the networks. Three categories of people used to be homebound due to their physical limitations: Elderly people, people that suffer from illness and disabled people. The increased mobility potential through the availability of a smooth road and motorized transport enables these groups to access their networks. A 50 year old women for example explains: *'I got sick 10 years ago, I had a heart attack. Since then I am not allowed to walk far so I use a car to collect my medicine and visit my family in Wukro (Respondent nr. 05)'*.

The road and livelihood effects of networks

As indicated above, except for the Fighters- and Disabled Association, all social networks existed before the road was constructed. Most of the direct impact networks have on people's lives is not effected by the road and the increased mobility. Members do however mention one aspect in which the way networks affects people's lives is influenced by the road. If a good road exists and if there are good transport opportunities, people need to invest less time in accessing the network. This time can then be invested in other activities. The focus groups of the Youngsters Association for example explains: *'Members can now*

come quick and in time (Respondent Focus Group nr. 03)'. The same is true for government officials and leaders of the networks: 'Previously, we had to walk for a long time to reach the farmers. It is now easier to move because of the road, also because of the use of transport that is now possible (Respondent Officials nr. 02)'.

However, taking in consideration the fact that a large majority of the journeys to access the networks happens on foot (see section 8.1), arguably the role of the roads remains relatively limited on this point. Precise data on this matter is not available in this research, but walking on a smooth road arguably only saves some minutes compared to walking on footpaths.

8.3 Changes in roads and mobility, changes in networks?

Taking the role of the road and mobility in the social networks as described above as a starting point, the question remains if the changes in road infrastructure and mobility lead to changes in social networks. Overall, respondents are satisfied about the road and its influence of the road on networks, but struggle to mention explicit changes in the social networks as a result of the road construction. However, two direct and one indirect perceived effects of roads on social networks were observed in the data.

The first effect relates to the frequency of accessing the networks. Various respondents feel that after the road was constructed the number of meetings in some of their social networks has increased. This is true for meetings in the formal social networks such as the Women-, Farmer, and Youngsters Association and for the informal family- and friend networks: *'There are changes in the amount of visits: older family members can now come easier to me because of the Bajaj Taxi's. Their visits have increased (Respondent nr. 09)'. Similar, a 30 year old female respondent adds to this: 'The meetings in the Women Association have increased after the road construction. Members can now come easy and safely, there are no obstacles anymore (Respondent nr. 12)'.*

Other respondents however somewhat oppose this idea of increased frequency of meetings in the social networks. Regarding the Farmers Association for example the focus groups puts the increase in meetings in perspective as they state that *'the number of big meetings for the whole tabia has decreased because the frequency of smaller meetings of the sub-groups of 30 farmers have increased (Respondent Focus Group nr. 01)'. They also add another factor that limits the frequency in meetings: 'Apart from the road there is also*

technological change: the world has improved. People call each other to inform about a meeting, previously we had to walk to each other to do that (Respondent Focus Group nr. 01)'. A 45 year old man confirms this can be the same in informal family networks: 'However, because we can use mobile phones now it is easy to catch up with family without traveling to them (Respondent nr. 25)'.

Second, and linked to the first point, respondents point towards the strengthening of vertical networks or vertical elements in their networks. This appears most obvious for the vertical dimension of family networks. 20 respondents indeed stated that their vertical networks had intensified since the road construction. A 30 year old woman for example explains: 'I have a brother who lives in the Tigray regional capital Mekelle, his visits have increased because he can use a car now (Respondent nr. 22)'. Interestingly, although the vertical links indeed might be strengthened by the road, according to a 37 year old man, the length of visits to family can decrease because of the increased mobility: *'It is easier nowadays to visit: people can take a Bajaj Taxi or a car and come for only one day, instead of staying the night over (Respondent nr. 26)'.* Apart from the family networks, the road too appears to ease the vertical dimension of the formal networks through the increased access of external experts, government officials and trainers to the various Associations. According to a 59 year old farmer, this can for example be convenient in urgent situations: *'Because of the road, the administration now has more direct contact with us. If there is an issue, the agricultural agents (from Wukro – red.) can come quickly and help with the plants and seeds (Respondent nr. 02)'.*

Third, some respondents mentioned an indirect effect of the road construction on the social networks which relates to employment and agriculture. Some respondents attribute the emergence of stone-grinding activities and irrigation facilities to the road construction. Indeed, because the road was constructed, heavy construction materials and machines could enter the village, and products such as sand and stones can be exported from the village. This affects the social networks: since the road was constructed, irrigation has become a major topic for training and education in both the Women-, Farmer, and Youngsters Association. Too, increased employment opportunities affect the Youngsters Association: *' The new jobs in for example the stone-grinding facilities are divided among the members of the Youngsters Association depending on two criteria: whether people have land*

or not, and whether people are active participating members of the Association (Respondent Officials nr. 09)'.

Chapter 9 - DISCUSSION

Before coming to the conclusion in chapter 10, this chapter presents a comprehensive overview of the different empirical parts and were applicable will critically reflect on the outcomes and will draw links with the literature as discussed in chapter 2.

9.1 Social Networks

Social networks appeared very active in the rural village of Adikisandid. Similar to Bradbury (2006) both formal (structural) and informal (cognitive) networks could be distinguished as well as horizontal and vertical social networks. The latter however appeared a less distinctive difference as some networks such as family networks or the formal associations are more multi-dimensional social networks because they have both horizontal and vertical linkages.

Regarding in- and exclusion, respondents have shown a remarkably positive image about the way the social networks select their members. Indeed, the member selection criteria appear to be based on four transparent indicators: age, gender, geographical proximity and kinship or acquaintanceship. For all formal networks, income can be viewed as a fifth selection criteria as for all members an equal membership fee is required. Although some respondents appeared unhappy about the total amount of money they have to spend on their network membership, overall no one complained about in- or exclusion in the social networks. This is a remarkable finding as various authors on social capital networks such as Portes (1998), Garret (1999) and Rigg (2002) point to these networks as sources of social exclusion in which especially the poorer members of society tend to get excluded from these networks.

Contrary to this idea, although rich and poor do coexist in Adikisandid, various networks in the village function as a social security system in which the poorer members of society are required to contribute less and/or gain more. Examples of this are the Family- and Friend Networks, the networks of Informal Community Help and the CC-Association. Furthermore, the fact that for most respondents, membership of their network appears to be rather self-evident because of habits, traditions or obvious benefits than a personally motivated choice, puts this apparent lack of feelings of exclusion in perspective. Similarly, for many of the networks that were found active in the village, membership is not a matter of personal interest but either obligated by the government or a natural fact of social life in the village.

The effect social networks have on people's lives vary between the networks, but overall the networks aim at creating long- or short term collective and individual benefits for its members. These benefits can be material through gaining money or products or immaterial by receiving assistance, mental support or knowledge. To gain these benefits, members are required to put some effort in the networks such as contributing an annual membership payment or investing time or labour into the network activities. This balance of benefits and efforts is in line with theorists such as Putnam who speaks for example of '*networks, norms and trust that facilitate action and cooperation for mutual benefits (Portes, 1998, p. 18)*'.

9.2 Roads & Social Networks

The respondents in Adikisandid were found to have a very positive overall perception of the road in their village. Improvements in healthcare, market access and modern infrastructure were stated to be general advantages of the road in the rural village. The role of roads in social networks on the other hand appeared less obvious. Three points however can be made here that critically summarize the findings regarding roads and social networks.

First, although road construction is essential in stimulating rural mobility, this can only be perceived as a first step. For actual increase in mobility in a certain locality, there need to be modes of transportation and moreover the population need to be able to afford the financial costs of the use of this transport. Although cars, horse-carts and Bajaj Taxis can access Adikisandid, private car ownership is highly exceptional and there is no regular (public) transport. Bajaj Taxis and minibus, the most common modes of personal transport in the region only access on a contract base. With an average daily wage of 60 birr, the transportation costs are relatively high (a return travel to Wukro with Bajaj Taxi for example will costs somewhere between 20 and 30 birr). The further away from the tarmac road the more difficult (and thus more expensive) access by motorized vehicles becomes. Although this research did not provide systematic quantitative evidence on this matter, the data thus points towards the idea of the '*transport disadvantage*' of roads for the poorer members of society such as described by Lucas (2011). Furthermore, although the tabia is accessible for motorized vehicles, this is only true for the main road through the tabia. At least two community sub-roads that lead to different sub-villages are to date not accessible for these kinds of transportation.

Second, and logically following from the first point, the actual use of motorized transport, horse-carts and bicycles remains relatively limited compared to journeys on foot. However, road construction too makes walking a lot easier, especially in a mountainous area such as Adikisandid. However, the widely recognized idea that roads lower transportation costs and time (See for instance: Barrios, 2008; Gleaser & Kohlhase, 2003) might be true in Adikisandid as well, but for the majority of inhabitants this has little value.

Thirdly, indeed several respondents state that the roads are important for accessing the networks. This can be either on foot or on a (motorized) vehicle. This is a similar finding as Bradbury's (2006) work on social trip making. This research goes further than that as various respondents state that both frequency of network accessing and the size, width and intensity of the vertical networks did increase. However, most respondents also state that the majority of journeys with motorized vehicles seems to be for economic or market purpose³. This does mean that the road has no relevance for social networks: various respondents for example combine their market trips to Wukro with accessing vertical social networks by visiting their family or friend. However, this should be constantly kept in mind when assessing the (relative) value people give to the road and its use for social networks.

³ Beens (2015) extensively discusses the role of the road in market access.

Chapter 10 - CONCLUSION

This final chapter presents a conclusion which reflects on the findings in terms of general implications. It seeks to answer the research question and in doing so, it moves beyond the details of the case study. The chapter ends with some suggested implications for further research.

In the introduction of this thesis it was argued that both roads and social networks in are highly topical at this moment and important factors for development in rural remote areas. Furthermore, it was stated that although relatively underexplored as a topic these two are arguably linked to each other. To contribute to this research plot both theoretically and empirically, this thesis was built around the following main question: *'How do rural social networks affect people's lives in the context of increasing mobility in rural communities in Tigray, Ethiopia?'* First this chapter briefly reviews the first four sub-questions about networks and subsequently discusses sub-question five and six about the relationship of networks and roads. In doing so, it works towards answering the main research question.

Network types and characteristics

Both literature and data in this thesis gives a consistent image of what kind of social networks play a role in rural development. The first sub-question gained insight on the characteristics and relevance of both formal and informal as well as horizontal and vertical networks. All networks aim at creating some sort of collective benefit for its members. Three points can be made here. First, compared to the formal networks, the informal networks appear to be much more active in terms of share of population that participates in these networks. The benefits of these informal networks are more immaterial and are based more on reciprocity and trust compared to the formal networks which aim predominantly on financial wellbeing and domestic- and agricultural knowledge. Linked to this, secondly, the government controls most of the rural formal social networks. Through this control the government can also provide training and assistance. Thirdly, many of the networks are connected with each other or cooperate at a certain level. The church is a good example of this as it can play a central role in social networks because many of the meetings of both the formal networks and the informal networks take place in or around the church.

Emerge and evolve of social networks

Regarding the second sub-question of 'how do rural social networks emerge and evolve?'

one remarkable feature of Ethiopian rural social networks appeared from the data. Apart from the church, all formal social networks have been created within the last 30 years as a result of government effort. The informal social networks on the other hand, together with the church, emerged long time ago and are inseparable parts of social life in the rural village.

In- and exclusion in social networks

Member selection criteria appear to be based on four transparent indicators: age, gender, geographical proximity and kinship or acquaintanceship. For all formal networks, income can be viewed as a fifth selection criteria as for all members an equal membership fee is required.

For many networks, membership does not show itself purely as a matter of personal choice or interest. Especially the membership of formal social networks appears not to be completely voluntary at all times. The membership of the three most common formal networks (the Women-, Farmer- and Youngsters- Association at least shows some pseudo-voluntary characteristics. Rural inhabitants in this respect can only access some essential government services such as an ID-card, training, help and subsidized agro-inputs if they are a member of these associations.

Livelihood effects of social networks

The actual degree in which these networks effect the lives of their members varies among the different network types. Overall though, the individual and community benefits of the membership of rural social networks outweigh the efforts or contributions made in time, money, products or labour. There is however a clear difference between formal and informal social networks regarding this balance of benefits and efforts. For formal social networks, although membership requires a considerable investment in time and money, because many of the networks receive some form of government support, members gain far more economic, financial, employment or knowledge benefits than they invested in the network with their personal efforts. In the independently functioning informal social networks on the other hand, the starting point is reciprocity. On average, either in a short or long term, members will receive what they invest. Care of the poorer members of the networks as a form of social security however forms an exception on this characteristic.

Changes in Roads, Changes in Networks?

The data suggest that road construction is especially beneficial for the vertical accessing of Social Networks. The two most apparent examples of this are increased traveling to family beyond the rural locality (or vice versa) and the increased and eased access of government officials and experts for training and guiding structural networks. Especially regarding family visits the data points towards an increase of this network because of the road. In many cases the road gives older family members the opportunity to visit relatives. Previously, long journeys on foot were impossible for elderly people.

Regarding horizontal social networks the effect seems less strong because most of the networks are accessible in a limited walking distance. The effect of the new road on the frequency of meetings remains disputed as this frequency in some associations has increased after the road was constructed, but simultaneously also decreased as a result of telecommunication or changed to a lower scale level which requires less mobility of network members. The efficiency of meetings in formal networks nonetheless is said to have increased after the road construction because now all members can access on time without delay.

Thirdly it does appear that many horizontal social networks, whether formal or informal, do have a certain local maximum catchment area. For the informal networks such as community help this does not stretch beyond the boundaries of a sub-village (chuchet) or even a sub-chuchet. For formal networks these boundaries are mostly the borders of the tabia. The data suggests that apart from vertical networks because of this local orientation of many networks, the changes because of increased mobility are only modest.

The question remains *how rural social networks affect people's lives in the context of increasing mobility in rural communities*. It was shown that social networks in all their appearances have a large impact on people's lives and are an inseparable part of social life in a rural Ethiopian village. A changing context due to road construction and increased potential mobility appears to have a modest effect on this system. Although people are generally satisfied about the road in their village, the effect of the road on social networks remains limited. Altogether the data does not indicate the creation of new networks or disappearance of old ones because of the road construction. Neither does it suggest major changes in the way the existing networks operate. Some effects however can be observed:

the main changes in social networks that are attributed to the rural road and increased mobility potential are an increase in frequency of meetings in vertical networks, an overall modest decrease in travel time and easier and comfortable journeys, the latter being especially true for groups less physically vital network members. The most persisting fact however remains that despite road construction and increased mobility potential, for most rural inhabitants their actual mobility is not improved by road construction because of limited available and affordable means of transportation. Walking along the newly constructed road for these people is often the only option to access their social networks.

Further Research

This thesis has shown roads and social networks to be relevant factors in rural developing contexts. Overall, in line with Bradbury (2006) this thesis argues for an inclusion of 'the social' in general and more specifically social networks as a factor in rural road appraisal. Similarly, research on social networks in rural development should adopt mobility as a relevant factor in assessing livelihood effects of networks. The so-called 'transport disadvantage' as described by Lucas (2011) of (relatively) poor members of a network should be continuously included in these assessments.

This thesis gave qualitative and explorative insight in the relation between roads and social networks based on a single retrospective case. Further research on roads and social networks can add to this by adopting a broader, quantitative and comparative approach. This could give especially valuable statistical insights on how efforts and benefits of social network membership relate to each other and to the road. Furthermore, comparative and longitudinal studies between road-connected and non-road-connected communities would allow a more detailed and reliable image of the effects of road construction on social network.

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APPENDICES

1 - Interview guide / topic list (semi-structured interviews phase 2 and 3)

1. General respondent info

- a. ~~Name ??????~~
- b. Age
- c. Gender
- d. Income group (land, livestock, job, type of farming)
- e. Location (tabia / chuchet / subchuchet?)
- f. Distance of house to feeder road (in minutes / kilometres?)
- g. Since when inhabitant of this tabia?

----- FORMAL/INFORMAL SOCIAL NETWORKS -----

1. **What kind of formal and informal social networks are there in this tabia/chuchet?**
 - a. Community associations (e.g. Idir)
 - b. Groups (e.g. Equb, 1/5 groups, women groups, farmers teaching groups, etc)
 - c. Religious groups/church/mosque
2. **In which of these networks do you participate?**
 - a. Since when?
 - b. Why in these?
 - c. Why not in others?
 - d. Would you like to participate in other networks? Why?
3. **What effort do you put in this networks?**
 - a. Is this the same for other members?
 - b. How many time/days?
 - c. Frequency
 - d. Activity
4. **What benefits do you get from this networks?**
 - a. Is this the same for other members?
5. **What kind of infrastructure do you use to access / maintain / use these networks?**
6. **Changes in social networks after road construction?**
 - a. Number & type of networks
 - b. Changes in activities
 - c. Changes in frequency

----- If time left: -----

7. How do these networks operate function?

- a. How many leaders Tasks/ responsibilities
- b. Participants & tasks/responsibilities
- c. What kind of activities?
- d. How are conflicts/differences managed?
- e. Frequency of meeting / functioning?
- f. Is there participation with or influence from outside the community? (e.g. governments, ngo's, companies, neighbouring communities)

8. How did those networks emerged?

- a. Since when?
- b. Why were they created?
- c. What steps were taken?
- d. Did anything changed in the networks (activity, participants, frequency, etc?)

9. Who created these networks (internal, external or both?)

- a. Who participated in the creating?
- b. Was there involvement from outside tabia?

10. Did some networks disappeared?

- a. When did they disappeared?
- b. Why did they disappeared?

----- FRIEND/FAMILY SOCIAL NETWORKS -----

1. Do you have linkages with family members or friends?

- a. What is the character of these linkages? (pleasure, happenings, financial help, social help)
- b. Is this inside or outside the tabia or both?
- c. How often do you visit your family/friends? And how often do they visit you?
 - i. How do you visit them? (means of transport?)
- d. What are your inputs / efforts for your family / friends?
- e. What are your benefits for your family / friends?
- f. Did contacts change after road was constructed?

Prioritize: First focus on the individual, if time left, for tabia in general. This is also important because the experience from SIOT learned us that people sketch a too positive and generalized image of the whole tabia. This is especially true for gender and income equality.

1. Existing networks in tabia/cuchet?
2. In which do you cooperate?
3. Individual costs & benefits?
4. Use of infrastructure to access?
5. Changes in social networks after road was constructed

2 – Interview guide focusgroup discussion phase 3

Focus group respondents separately

1. **Of all respondents separately:** Age, Gender, Daily Activities, How long in this tabia?, Own / rented land, Own or rented house, How many animals do you own?
2. **Of all respondents separately:**
 - a. How long in YA/WA/FA?
 - b. Why did you joined it?
 - c. Do you participate in other groups, networks, associations?

To focus group:

3. List all the activities that the YA/WA/FA undertakes (perhaps useful to distinguish in main-/subgroups – eg: groups of 5 and 25 and whole tabia)
 - a. Frequency
 - b. Does everyone participate?
 - c. Has anything changed in this since they are in the Association?
4. List everything (all topics) that is being discussed at meetings
 - a. Has anything changed in this since they are in the Association?
5. Is there a difference between young & older members?
6. Is there a difference between richer & poorer members?
7. Are you obliged to join Association or is it voluntary?
 - a. What about non-members?
 - b. What about less-active members?
8. Decision-making
 - a. What kind of decisions are made (e.g. training topics /type of production /fertilizer) ?
 - b. Top-down (gov/leaders) or bottom-up? |old/young members?
9. What if conflicts/disagreement arise?
 - a. About what? Give examples
 - b. How is it being managed?
10. Are there problems/frustrations/shortcomings of the Association?
11. What do members contribute to the Association?
 - a. Money contribution (annual/monthly/incidental)
 - b. Contribution in kind – eg. food/ products/materials?
 - c. Contribution in time (eg. attendance, labour, etc.)
 - i. Is this the same for all members (Young/Old – Rich/Poor)?
12. In what way do members benefit from their membership?
 - a. Money / products? (examples !)
 - b. Knowledge? (examples)
 - c. Help / advise (examples)
 - i. Is this the same for all members (Young/Old – Rich/Poor?)
13. Road and mobility and other infrastructure
 - a. What is the max travel time to Association (distinguish between sub-groups)
 - b. Do people use bajaj to come? Number/share of people? How often?
 - c. Did anything changed in the Association after road construction?

- i. Activities – frequency – travel time – external people – new external ideas?
- d. Influence of other infrastructure (eg. telephones)?