Innovating social connectedness for agricultural innovations in eastern Ethiopia

Desalegn Yadeta Wedajo and Mideksa Fufa Jilito

Abstract: Agricultural innovations can be triggered by the social networks in which farmers have purposefully organized to support themselves. This paper, therefore, explores the values of social connectedness within locally established societies’ mutual support associations for agricultural innovations. This study explains how mutual support social network associations trigger agricultural innovations and the way farmers utilize such networks to spiral agricultural innovations. Indigenous mutual support associations like Guuza, Iqbi and Afoosha function in trust-based self-enforcing orders, social networks and relationships in a more flexible and reciprocity-based order. These informal social networks are employed by farmers to collaborate on society’s mutual support practices. Trust, norms and group membership are the key components of social capital within indigenous mutual support associations. The social connectedness within the sort of labor-sharing arrangement, informal financial group, funeral association and inter-village link aids member’s collective capacity to figure the development of agricultural innovations. Inherently embedded social networks, mutual support, information sharing, interaction and trust among the members within mutual support associations are the

ABOUT THE AUTHORS

Desalegn Yadeta Wedajo is an academic staff member in the Department of Rural Development and Agricultural Extension at Haramaya University, Ethiopia. He received BSc in Agriculture (Rural Development and Agricultural Extension) from Haramaya University, Ethiopia; and MSc in Rural Development and Management from China Agricultural University, China. His research and professional interests include rural development, transition processes in agriculture and extension system, rural livelihoods, indigenous social institutions, social networking, technology adoption, and agricultural innovations.

Mideksa Fufa Jilito earned his BA degree in Rural Development from Ambo University and also awarded MSc degree in Rural Development and Agricultural Extension from Haramaya University, Ethiopia. Currently, he is working in Haramaya University as lecturer and researcher. His research thematic area includes rural development and livelihoods, agricultural extension, social networking, gender, and irrigation studies. He uses mixed research methods, PRA tools and ethnographic researches.

PUBLIC INTEREST STATEMENT

Agricultural innovation is mainly triggered by locally established societies’ mutual support associations. Indigenous mutual support associations based on reciprocity, trust and cooperation towards a common goal which form the core of social networks that helps to trigger agricultural innovations. Social networks, information from social networks, experiences, encounter and trusts are the key values within indigenous mutual support social network associations which contribute to farmer’s agricultural innovations. Deepening communities’ social networks would enhance generation of agricultural innovations. This study has demonstrated the values of indigenous mutual support social networks and how farmers trigger social connectedness within locally established societies’ mutual support associations for agricultural innovations. Therefore, stakeholders within innovation and extension system should aim at creating an environment that would thicken farmers’ mutual support social networks associations for the development of agricultural innovations.
values for the event of agricultural innovations. Therefore, this study concludes that
stakeholders within extension systems should support and strengthen the locally
established society’s associations to broaden agricultural innovations. In general,
this study recommends the necessity to integrate the applications of society’s
mutual support associations for the development of agricultural innovations.

Subjects: Agricultural Development; Sustainable Development; Culture & Development;;
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Keywords: agricultural innovations; indigenous mutual aid associations; participatory rural
appraisal; social connectedness; Ethiopia

1. Introduction
In most Sub-Sahara African countries, particularly in Ethiopia, the agricultural sector is dominated
by rain-fed, subsistence oriented, weak linkage of actors, and characterized by low input-low
output and poor extension service (Ayele & Bosire, 2011; Ethiopian Agricultural Transformation
Agency [ATA], 2016). Responding to these challenges requires different strategies (Brooks &
Laevinsohn, 2011; Lybbert & Sumner, 2012). One of these strategies is practicing agricultural
innovations (Makate et al., 2018).

Agricultural innovation is mainly plied by smallholder farmers (Lemessa et al., 2019). Smallholder
farmers have been innovating agricultural practices since the dawn of agriculture. They practice agricultural
innovations to improve agricultural practices and to meet their demands, and these processes are leading to agricultural innovations (Chowdhury et al., 2011; Kibwika, 2007; Mur et al., 2015). Smallholder farmers’ throughout the tropics exhibit a deep understanding of their environment and how to utilize local environment and other resources for improved livelihoods (Talawar & Rhoades, 1998). In Ethiopia, farmers have old dating experience and time-tested knowledge of agricultural practices, and mutual support practices that are applied to respond to adverse livelihood shocks and risks (Endris et al., 2017; Maru et al., 2019). However, while smallholder farmers are among the key sources of agricultural innovations, many studies conceived them as adopters of externally developed technologies and practices (Kiptot et al., 2007; Kolade et al., 2014; Letty et al., 2011; Novo et al., 2014; Reij & Waters-Bayer, 2014; Röling, 2009).

Agricultural innovation emerges from local practices (Hooli & Jauhiainen, 2018). In the other way, authors like Korzun et al. (2014) and Mgumia et al. (2015) explicated that agricultural innovation emerges over time within a social group incorporating both learning from experiences of earlier generations and accumulated knowledge from social connectedness. According to these authors, agricultural innovation is a result of social experimentation and members own trial and error methods within the interconnected web of social connections, informal organizations and social structure at the community level. Therefore, agricultural innovations can be triggered by the social networks in which farmers are embedded or have purposefully organized to support themselves by mobilizing locally available knowledge and other resources to meet their changing needs (Fadden & Gorman, 2016; Hilkens et al., 2018; Klerkx et al., 2013; Van Rijn et al., 2012).

In Ethiopia, for many centuries, indigenous societies mutual support associations like Guuza,
Iqubi and Afoosha based on social support networks that used to respond to households and
communities social needs and wellbeing that have been institutionalized and widely practiced
among rural households in Ethiopia (Aredo, 2010; Dercon et al., 2006; Endris et al., 2017). These
social networks offer different services, such as mutual insurance, labor sharing, saving, and credit
to rural households (Bernier & Meinzen-Dick, 2014) and fulfill many other socio-cultural obligations
(Endris et al., 2017). They are based on widely agreed norms of trust, moral obligation and
reciprocities (Bernier & Meinzen-Dick, 2014; Wedajo et al., 2019). Social connectedness is mani-
festated in different types of groups at the local level from guilds and mutual aid societies, to credit
groups, labor-sharing groups, mutual support groups, informal financial groups, women groups and common celebrations groups, such as prayers, marriages, and funerals. Such types of social networks may have the advantage of allowing members for a greater access to new knowledge and practices, which would trigger the process of novelty creation and innovations. In particular, social connectedness, together with norms and trust, allows to develop a sense of belonging and a cooperation attitude between firms, institutions and people, which in turn enhance collective learning and innovative processes (Capello & Faggian, 2005).

Therefore, the objective of this paper is to explore the different forms of locally available mutual support associations and their values for agricultural innovations. In more concrete terms, this study explains how different types of indigenous social network arrangements are used to implement agricultural practices. Moreover, the study intended to explain how farmers trigger social connectedness within the indigenous mutual support associations for agricultural innovations in Meta district of eastern Ethiopia. While achieving the identified objectives, the study aims to answer the following research questions: (i) what are the different types of indigenous mutual support social network associations and how are they characterized? (ii) What are the drivers/elements to establish social connectedness within indigenous mutual support associations? And (ii) how do farmers use different types of indigenous mutual support social network associations for agricultural innovations?

2. Literature review

2.1. The notion of social capital
The exact definition of social capital is subject of debate, many analysts treat it as a characteristic of communities, and describe it in terms of trust, values and norms that enable collective action (e.g., Bowles & Gintis, 2001; Putnam, 2001; Woolcock & Narayan, 2000). It is a collective asset in the form of shared norms, values, beliefs, trust, networks, and social relations that facilitate collective action for mutual benefits. Similarly, Liang et al. (2015) define social capital as the networks that facilitate interactions between individuals. Furthermore, social capital (Carrillo Álvarez & Riera Romani, 2016) is the resources available to individuals and groups through membership in social networks. They defined social capital as a strong social network based on trust and norms of reciprocity, mutual benefit, ownership, and common goal between and among members.

In connection to this, many authors applied the concept of social capital in theoretical construct and empirical research by focusing on the potential benefits of its use. Among the number of benefits, solidarity and mutual support (Adger, 2003: Adler & Kwon, 2002), labor sharing and informal credit services (Munshi, 2011), access to information and resources (Bernier & Meinzen-Dick, 2014; Bourdieu, 1986; Coleman, 1990; Jackson & Yarin, 2011), engagement and civic sense (Knack, 2002; Putnam, 1993), informal insurance and risk sharing (Adger, 2003; Fafchamps, 2011) and trust building (Fafchamps & Lund, 2003) are mainly pronounced in many literatures.

2.2. Elements relevant to generate social capital
Social capital is made up of the norms and networks that enable people to act collectively (Woolcock & Narayan, 2000). It can occur in different types and forms. For example, Social capital can be distinguished into structural and cognitive interrelated categories (Uphoff & Wijayaratna, 2000). Heemskerk and Cossa (2004) argue that structural comprises the objectively and externally observable social structures such as networks, associations, institutions, rules and procedures; and cognitive is represented by the more subjective and intangible elements such as attitudes, norms of behavior, shared values and reciprocity and trust, as well as governance.

Trust, norms and group membership are the key components of social capital (Poder, 2011). Trust is often one of the intended (side) effects of increased group participation and at the same time might be a pre-condition for those groups to form. Social norms influence people’s preferences and constraints, facilitate the exchange of information, and enable societies to overcome social dilemmas (Cofré-Bravo et al., 2019). Group membership is often the more tangible part of
social capital targeted by policymakers to foster cooperation between people (Mansuri & Rao, 2004). The relationship between trust and group membership may depend on the type of trust and group membership (Wollebæk & Selle, 2003). In Fukuyama’s (1995) view, trust is a key to social capital, which he describes as “the expectation that arises within a community of regular, honest and cooperative behavior based on commonly shared norms on the part of other members of that society”. Social connectedness, networks, and groups and the nature of relationships are portrayed as a vital aspect of social capital (Pretty, 2003).

2.3. Types of social networks and the incentives for the formation of the networks
Social capital is built when people interact and come together for a common purpose, and creates trusting relationships and common understanding (Gotschi et al., 2008; Kiptot & Franzel, 2019). Three types of social connectedness have been identified as important for the networks within, between and beyond communities (Szreter, 2004; Woolcock, 2001). These are called “bonding social capital” (internal ties), “bridging social capital” (external ties), and “linking social capital” (institutional ties).

(1) Bonding social capital describes the links between people with similar outlooks and objectives, and is manifested in different types of groups at the local level from guilds and mutual aid societies, to credit groups, and to literary societies and mother’s groups. Bonding capital refers to horizontal ties between people with similar characteristics (Van Rijn et al., 2012). This kind of connection is characterized by homophily; high level of similarity in available information, demography, and economic and social status (Mouw, 2006). Authors Klerkx and Proctor (2013) summarized bonding as trusting and cooperative relationships between members of a network who are similar in a socio-demographic sense, with thick trust, dense multiple networks with strong ties, generally informal collaboration, and long-term reciprocity. It indicates strong ties where social relationships are based on strong trust and reciprocity. Bonding social capital corresponds to strong ties between homogeneous groups and intra-community networks (e.g., peers, neighbors, friends, family), it connects to the concept of closed networks (Coleman, 1988). This type of connection often entails the exclusion of those households that are not similar (Schuller, 2001; Van Oorschot et al., 2006).

(2) Bridging social capital connects people that span social groups, such as race, tribes, different social groups, and villages for mutual support activities. It describes the capacity of groups to make links with others that may have different views, particularly across communities. This type of connection includes those groups and networks that link different segments of the society for cooperative community activities, such as mutual aid associations, burial societies, and labor reciprocity networks at the community level. It refers to the links between separated dense networks for collaboration and coordination, characterized by larger and looser networks with weaker ties, more formalized collaboration and thinner trust (Klerkx & Proctor, 2013). Such horizontal connections can sometimes lead to the establishment of new platforms and apex organizations that represent large numbers of individuals and groups. Van Rijn et al. (2012) described bridging social capital as ties across groups. Often such ties are vertical in nature.

(3) Linking social capital represents connections between individuals and groups in a different position of financial and political power. It describes the ability of groups to engage vertically with external agencies, either to influence their policies or to draw down on resources. It refers to “norms of respect and networks of trusting relationships between people who are interacting across explicit, formal, or institutionalized power or authority gradients in society”, i.e. the ability to interact with groups with whom one does not have great similarities in the socio-demographic sense (Klerkx & Proctor, 2013). Moreover, it refers to the type of weak ties that allow the use of resources, ideas, and information from formal institutions beyond the community (e.g., government agencies, research centres, banks) and link to open networks (Cofré-Bravo et al., 2019).

Social networks may facilitate knowledge externalities as interactions among network members influence individual behavior. This is partly because individuals update their beliefs for their behavior—aspirations and expectations—are shaped not only by their own past experience but
also by experiences of others in their network. Pieces of research evidence increasingly suggested that if social connectedness within, between and beyond communities are met, and then local people’s economic and social well-being improves. Households with greater connectedness have been shown to have higher incomes (Krishna, 2002; Pretty, 2003; Wu & Pretty, 2014), better health, educational achievements and longevity (Fukuyama, 2000), improved social cohesion (Schuller, 2001), lead to more honest government and allows to develop a sense of belonging and a cooperation attitude between firms, institutions and people, which in turn enhance collective learning and innovative processes (Capello & Faggian, 2005).

### 2.4. Explaining the values of social networks for agricultural innovations

Recently, social capital theory is applied in relation to agricultural innovation (e.g., Fisher, 2013; King et al., 2019; Tregear & Cooper, 2016). Creativity and innovations are attributes of individual people but also features of organizations like cultural institutions, and social networks (Colapinto & Porlezza, 2013). Agricultural innovation in agriculture is more than a technology; involves different social, organizational or institutional processes, ranging from access to markets, credit or extension services to marketing produce in a new way (Abraham & Pingali, 2017), is a complex process where multiple actors play different roles (Dekkers et al., 2014; Dosi, 1983; Dosi et al., 1988). Smallholder farmers practice agricultural innovations to sustain food production and ensure rural food security under volatile production conditions, poor soil fertility, degraded land, proliferating agricultural risks, and high population pressure, and to address an increasingly diverse and complex range of needs (Kibwika, 2007; Lybbert & Sumner, 2012; Murray et al., 2016; Makate et al., 2018).

In the context of agricultural innovation, it is widely argued that social capital allows for access to resources that foster agricultural innovation, such as knowledge and funding, but also moral support (Fisher, 2013; Tregear & Cooper, 2016). Micheels and Nolan (2016) have shown that social capital is more important than farm size in determining the number of technologies and practices adopted. More specifically, the three different forms of social capital (bonding, bridging, and linking) each provide for different sorts of exchanges.

Bonding social capital facilitates cooperation and connection between members of the farmer community, hence favoring informal and experiential knowledge sharing, as well as the sharing of farm labour and farm machinery (Fisher, 2013; Hoang et al., 2016; Sutherland & Burton, 2011; Widmalm, 2005). Bridging and linking social capital allows for greater access to formal research-based knowledge, innovative experiences elsewhere, and training and financial resources (Ruiu et al., 2017; Saint Ville et al., 2016; Yu et al., 2013), opening opportunities for diversifying forms of production and business models. For example, Micheels and Nolan (2016) mention that farmers with greater bridging and linking social capital likely have greater capacity to acquire and assimilate knowledge about new (cutting-edge) technologies and practices coming from sources external to the farm (known as absorptive capacity). Furthermore, they have a better understanding of how these new technologies and practices can resolve different kinds of issues on their farms (crop management, marketing, and so on). Also, through bridging and linking social capital via open networks, farmers receive timely information to cope with catastrophic events (drought, frost damage, fires). Each type of social capital thus serves different purposes and can make positive contributions throughout the agricultural innovation process. This ranges from learning about new technologies and markets, accessing experiential knowledge based on practice required for the effective adoption and adaptation of technologies, to new research-based knowledge and innovative experiences elsewhere, to inspire the transformation of production systems.

Social capital can spur innovation via enhanced information flows and reduced transaction costs (e.g., Dakhli & De Clercq, 2004; Kaasa, 2009). Engagement in networks may also yield a “synergy effect,” as it fosters the combination of different ideas or skills, and a “realizability effect” due to enhanced access to different resources including political or financial support (Van Rijn et al., 2012). In more concrete terms, empirical pieces of evidence evidently suggest that social networks
provide financial and non-financial resources (e.g., emotional, and information). As cited in Sarlak and Salamzadeh (2014) informal networks have four main contents such as affect (friendships, trust, and intimate relations), political (influence, power, authority), production (advice, exchange of technical/instrumental knowledge and innovation), and cultural (communication and flow of information). Moreover, social network offers trajectory for individuals (based on which resources are accessed) as well as communities (based on levels of trust and collective action) for development of agricultural innovations (Wedajo et al., 2019). Moreover, study by Mekonnen et al. (2018) revealed that social networks are found to be positively linked with agricultural innovation and farm yields. Above all, social networks play a risk-sharing role through transfers (loans and gifts) within the networks (Mbugua et al., 2019).

### 2.5. Empirical studies on social connectedness for agricultural innovations

Various scholars identify the importance of social capital as a catalyst for the success of agricultural innovation and development (Baliamoune-Lutz & Mavrotas, 2008; Deaton, 2009). A large literature identifies social capital as a factor conducive to growth and development at macro and micro levels (Ahlerup et al., 2009; Baliamoune-Lutz & Mavrotas, 2008; Karlan, 2005). It is increasingly recognized that agricultural innovation does not happen in isolation. Rather, it is “the outcome of collaborative networks where information is exchanged and learning processes happen” (Knickel et al., 2009). Such notions of networks and interconnectedness gave way to the “innovation systems” view. This view stipulates that agricultural innovation results from the integration of knowledge from various actors and stakeholders, implying a focus on interdependence, networks, learning, and social interaction (Röling, 2009). This shift in the interpretation of innovation is clearly characterized by an increasing importance of networks, norms and trust, and thereby the concept of social capital.

Although there is an extensive literature on the diffusion of innovations and its determinants, one of which is social interactions (Foster & Rosenzweig, 2010), studies on Ethiopian agriculture largely ignore the role social networks play in agricultural innovations. Only a few studies (Dessie et al., 2012; Kossie et al., 2013; Wossen et al., 2013) investigate the effects of social networks for improved farming and natural resource management practices. Evidence from other countries, however, suggests that social networks play a central role in people’s lives in so many ways including in shaping beliefs, preferences, and decisions (Jackson, 2011). There is, for example, evidence on the role of social networks on the diffusion of information, new products, and technologies (Jackson & Yair, 2011); informal insurance and risk sharing (Fafchamps, 2011); and labor and credit networks for economic activities (Munshi, 2011). Likewise, it has been widely used by households to overcome market failures and substitute for poorly performing institutions (Adelman, 2013).

More recent studies measure networks in more detailed and structured manner that could account for various channels of information flow for agricultural innovation and adoption (e.g., self-reported networks, family, religious groups, kinship in Bandiera & Rasul, 2006; Matuschke & Qaim, 2009, or Van den Broeck & Dercon, 2011). With the exception of a few studies such as Udry (1994) and Maertens and Barrett (2012), much of the existing empirical literature relies on data which defines networks based on such group membership or on self-reported links.

### 2.6. The Oromo Gada system in Ethiopia

The Gada System is an age-class-based indigenous social institution in which the Oromo male successively assumes leading the local economic, social, cultural and political roles in every 8 years (Desalegn et al., 2007). The Gada system is based on socio-cultural orders, institutional traditional arrangements, and network-based collective actions that are predominantly driven by motives of maintaining social values, mutual assistance, reciprocity and altruism among the community. It plays a wide range of socio-economic roles including resolution of resource-driven conflicts and equitable distribution of natural resources. The inbuilt social orders and values are critical elements to use this system as customary channel for generation of innovations and adoption of various technologies. Particularly, in rural areas, where rural education, extension, and agricultural information services are
underdeveloped due to location barriers and infrastructural bottlenecks, informing and training the Gada leaders on the values of a given innovation, and using their inbuilt orders to inform, orient and convince their members to practice and use agricultural innovations, can generate externality effects from learning that bears an important multiplier effect for better adoption of agricultural innovations.

### 2.7. Afossha/iddir society in Ethiopia

Iddir is the most inclusive and widespread type of social network in Ethiopia, prevalent both in rural and urban settings and inclusive of gender, wealth, education, religion, and ethnicity (Pankhurst, 2008). Originally, iddir networks were established to provide financial (cash) and other types of support (in kind) when a family member dies. These networks also assume a key role in facilitating the burial and funeral of the deceased member. However, a close look at iddir networks reveals that they go beyond funeral associations as they are involved in many socio-economic issues. Iddirs provide small credit for their members, often without collateral (Dercon et al., 2006); help unemployed members (Pankhurst & Mariam, 2000); finance their members' health-care expenditures (Mariam, 2003); provide financial assistance when their members suffer from other shocks (Dercon et al., 2006); and in recent years, iddir networks provide insurance for death of key livestock, such as oxen.

### 3. Research methodology

#### 3.1. Study setting

Eastern Ethiopia is mainly characterized by dense population, small farm size, declining soil fertility, severe land degradation, fragile ecosystems and recurrent weather-induced shocks such as drought and flood (Setegn et al., 2011; Tesfaye & Seifu, 2016). It is also among the chronically food insecure areas of the country facing recursive drought situation (Alemayehu et al., 2018; Mulugeta et al., 2018). This study was conducted in eastern part of Ethiopia, particularly in Meta district. Meta is the worst affected district by climate change and is the most food insecure. The main agro-climate zone of the district is arid and semi-arid. Nearly all of the land in the district is in the lowland except some mountain tops, which fall outside. The annual rainfall amount ranges from 600 to 900 mm and the temperature ranges between 15°C and 37 °C (Guya et al., 2019).

#### 3.2. Research context and approach

A Participatory Rural Appraisal (PRA) was used for this study. PRA is an approach to participatory and bottom-up planning in rural areas that has the aim to learn from rural people: those who know most about their own society, livelihoods and environment (Chambers, 1994). PRA is used by many development organisations to capture knowledge and opinions of stakeholders in the planning and development of programs (De Boef & Thijssen, 2007; Chambers, 1994). This study approach was allowed representation of competing versions of reality and captures multiple perspectives of people’s perceptions, actions and experiences in social network relationships among rural households within indigenous mutual support associations. A combination of tools and methods is used to enhance interaction and the sharing of information among rural people. Therefore, PRA was conducted in Ifa Biftu and Wayber kebeles of Meta Woreda. The PRA processes were executed by three research team members, one functioning as the main facilitator and the other two participated as note taker and an observer to take note of non-verbal interactions. Development agents (DAs) were participated in selecting the participants for the PRA activities. The selection of PRA participants was carried out prior to the start of the PRA activities by considering sex, age, location, and social status of rural households to takeout diverse views. The PRA included varying perspectives of communities with different backgrounds within the Kebeles, taking into account socially constructed hierarchies (e.g., age and gender differences). Practically, in the targeted communities, men and women focus group discussions were organized, as well as youth group. Besides, separate focus group discussions were organised for wealth and gender categories, which did not follow a strict order of questions, but allowed participants to exchange in a less guided and rather free discussion. These were to ensure that the different views and opinions of different groups and collective perspectives of farmers are documented and fed into the research agendas.
3.3. Data collection methods
While the primary data were collected following a participatory rural appraisal approach, the secondary data were derived through an extensive literature review. The primary data were produced through PRA tools such as trend analysis, focus group discussions (FGDs), in-depth interview and key informant interview and participant observation aimed at capturing the diverse views of individual and collective perspectives of farmers. Data were recorded via digital voice recorder and notebooks, and later transcribed verbatim using a computer. In-depth interview, key informant interview and focus group discussions were made with community members, local elders, leaders of mutual support groups and kebeles administrative leaders. In view of that, six FGDs, namely male-headed households, female-headed households, high-income households, low asset households, leaders of mutual support groups, and youth group were organized and conducted in each kebeles to capture collective perspectives. Each group comprised 8 to 10 participants. A total of 100 participants took part in the focus group discussions from two kebeles of Meta district. The key informant interviews were held with 16 key informants (four DAs, four elders, two kebele administrators and six leaders of mutual support groups) to capture different perspectives. These were to gain an in-depth insight into the history and trajectories of indigenous mutual welfare associations and their values for agricultural innovations. The points of discussion were forwarded by the support of moderators, and discussants were raised on existing members’ experiences on indigenous mutual support practices and its values for agricultural innovations and explored how community mutual support social networks trigger agricultural innovations.

Trend analysis was assumed with local elders, leaders of mutual support groups and kebele administrative leaders. Trend analysis was conducted to capture the trends in the experience of the community-based indigenous mutual support practices that households consider as having an impact on their livelihoods. In addition, to collect the way people practice social capital; its importance, rules, contribution, and how they help each other during social issues like funeral, wedding, and agricultural activities. The FGDs were used to explore local perceptions with respect to indigenous mutual support practices, importance of associations to members and their values for agricultural innovations. The semi-structured interviews were used to collect data. Semi-structured interviews enable the interviewer to follow up and probe responses, motives and feelings. Face-to-face key informant interviews with DAs, elders, leaders of mutual support associations and kebele administrative leaders on the values of indigenous mutual support practices. Moreover, participant observation was used to take part in the daily activities and events of a group of people as a means to learn and acquire the explicit and tacit aspects of their life routines and their cultural aspects of the indigenous mutual support social network practices.

3.4. Methods of data analysis
Data collected by the abovementioned techniques were analyzed through the qualitative description in general and thematic analysis in particular. Similarly, data presentation conducted qualitatively through the narration of quoted and paraphrased statements. Thematic analysis is the process of identifying patterns or themes within qualitative data (Maguire & Delahunt, 2017). The study identified concepts to compare relations, communalities and differences in the data. Once the overlaps or similar contents checked, decisions were made for the ultimate write up of the results. In general, qualitative data were analyzed phrase by phrase and organized into themes (Creswell & Poth, 2017). The major proposed themes included were groups and networks, and households’ indigenous mutual support practices for agricultural innovations. Based on these topics, sections with similar themes were contextualized accordingly. Therefore, the results were organized into different sections such as typologies of indigenous welfare support practices, and values of mutual support practices for agricultural innovations.

4. Results and discussions

4.1. Indigenous mutual support associations and households participation
Indigenous mutual support associations identified were captured using their local names as used by local language called Afaan Oromo (the first widely spoken language in Ethiopia). In the study
area, there were different types of indigenous mutual support practices such as Guuza, Iqubi, and Afooshia, some of them specifically related to agriculture in general, and others that had a socio-economic function. The formation of these institutions has traditionally been embedded in the culture of communities and play defined functions regardless of their size. The roles and responsibilities of these institutions are defined by traditional agreements among its members. The criteria for membership in these indigenous social institutions are determined locally. Individuals are assigned in management and leadership positions based on their capability to implement, facilitate, monitor, and enforce decisions regarding their services and activities. The services and innovativeness of these indigenous mutual support associations as social connectedness are discussed as follows.

**Guuza** is a labor-sharing arrangement whereby people reciprocate for labor in agricultural activities (harvesting, threshing and manual weeding). Guuza functions based on the principle of labor reciprocity on demand. Whenever a household demands additional labor support, it requests the villagers or particularly those who are very close to them (such as family, friends, and tribe members) for labor assistance. Guuza predominantly involves the utilization of bonding social networks. And thus in-laws, close friends, kin, and neighbors are the primary providers of assistance. It is the responsibility of the caller to prepare food for the participants. In return, the caller has an obligation to return a reciprocal favor. Failure to attend a call, especially a reciprocal favor, unless for sickness, death, or other commitments (those commonly considered as legitimate excuses), may lead to a serious resentment at first. If this behavior is repeatedly happening in patterns, it may lead to the cutting of ties with the person and not dealing with him/her whatsoever. And if this behavior is reported to the local elders (those in charge of passing a verdict based on the customary rules of the society), it may lead to sanctioning the person, the highest form of which is “social exclusion.” The sanction ranges from not talking to the person up to prevent the children of the defaulter and his/her cattle from mixing up with the rest of the villagers. The sanction may remain effective for quite some time and mostly until the person learns from his mistakes; one of the way is by making an appeal to the elders. In Guuza labor sharing practice, farm household without active labor force (those households whose head has a permanent disability, old people without caretakers, and those with widowed women, etc.); they get free labor support without any conditionality. An informant mentions, “*During my health challenge, it is by the virtue of this practice that I managed to plow my plot and able to grow and harvest crops which could have otherwise been left fallow.*” Guuza is an important social networks practice in assisting households in their recovery process against various labor-related shortages. Labor sharing practices help the communities to exchange and learn new farming techniques, practices and inputs from each other. The field evidence commends that, for years, labor sharing networks have been serving the community as an information site for on-farm demonstrations through which farmers learn novel practices and jointly innovate in areas of agricultural practices.

**Iqubi** is an indigenous informal financial institution formed by a group of participants who make regular contributions to a fund, which is given to each contributor in turn until each member has received the fund. Membership is exclusively for married women. Women Iqubi is a collective name given to all types of mutual support in financial services and risk-sharing activities managed, supervised, and run by the local women. Besides, the members assist each other during peak season for activities like planting, weeding, and harvesting. The allocation procedure of this financial networking determines the net benefit that each member gets and is thus an important factor in its success. Practically, Iqubi coordinating households collect the money from its members in the networks and decide who should get it first or this process may be done through a lottery method. The winning member receiving the pool of funds and the fund winner will be excluded from the next draw. The study revealed that this networking is highly benefiting the members and is used as risk-sharing and saving practices. The winner uses the fund for the purchase of agricultural inputs, food items, cover children school fees or any other pitfalls. Moreover, the members sharing information, new practices, technologies and research results related to agriculture when they meet each others in a group during Iqubi paying. Over the
years, a woman Iqubi has been evolving on new activities and functioning depending on the local situations. For instance, milk-collecting groups are some forms of women Iqubi organized by community members. In addition to such group-based activities, they engage in all sorts of mutual support and social assistance activities including death shocks, sickness, and wedding. While these are not obligatory activities, attendance, however, is highly recommended. Members have a moral and cultural obligation to help. The FGD participants mentioned that fear of social exclusion, the anticipation of future benefits, and moral obligation are the drivers for regular participation in women Iqubi social networks arrangements. The other interesting principle in women Iqubi is prioritizing those members in dire need of assistance. The field evidence indicated that women Iqubi gives the first rounds of payouts for those households that are in critical condition compared to other members. A widow who lives with her four children recalls a recent incident of a health shock and explained how she was prioritized by Iqubi when she had to take one of her sick children to the hospital: “After noticing that my son was critically ill, I had decided to sale the one and only cow I have to cover the medical expenses. Luckily, when Iqubi members saw my condition, they deliberated on the matter and eventually decided to give me the first payout from the table banking (even if that was not my turn) to take care of my son. Consequently, I dropped the idea of selling my cow. This is how we work in the Women’s Iqubii group.”

Afoosha is known and practiced in many parts of the country probably with the same name or other names aligned with the language and culture of specific region. It is an informal local social institution that serves its members on social and economic services, provides support to each other during ceremonies (i.e., weddings, funerals); assist sick members in the carrying out of agricultural and non-agricultural activities, and resolves conflicts among its members in the community.

Afoosha is made up by a group of persons united by ties of family and friendship, by living in the same kebeles, by jobs, or by belonging to the same ethnic group. The number of members, the composition, the functions, and the organization can differ from one Afoosha to another. They are organized based on socio-cultural orders, institutional traditional arrangements, and network-based collective actions that are predominantly driven by motives of maintaining social values, mutual assistance, reciprocity, and altruism among its members in the community (Pankhurst, 2008).

Afoosha membership is voluntary and a man may decide not to join his/her immediate neighbors but may prefer to affiliate himself with a group some distance away. There are no physical boundaries between communities. These are open communities, easy for newcomers to join. They are composed of people who are, in the first place, cooperating neighbors, not kinsmen or lineage mates. New members are acceptable to the existing membership and applicants may be turned down or old members expelled for failure to carry out responsibilities and obligations. Afoosha members enter into both the verbalized agreements and the actual association of activities and interaction with the others members largely in conformity with the following principles: (1) the expectation that members will aid and cooperate with each other (2) obedience to the rules of the association to which individuals belong and loyalty to fellow members. Afoosha has rules of procedure, and officers are elected from the membership as needed. This association is the central institution of the local community and its officers are among the most capable and influential men in the community and they often serve as the representatives of the communities.

A study by Pankhurst (2008) enlightened that Afoosha is the most inclusive and widespread type of social network in Ethiopia, prevalent both in rural and in urban settings and inclusive of gender, wealth, education, religion, and ethnicity. Initially, Afoosha networks were established to provide financial and other types of support when a family member dies. These networks assume a key role in facilitating the burial and funeral of the deceased member. However, a close look at Afoosha reveals that they go beyond funeral associations as they are involved in many socio-economic issues. Afooshas provide small credit for their members, often without collateral; help unemployed members (Pankhurst & Mariam, 2000); finance their members’ health-care
expenditures (Mariam, 2003); provide financial assistance when their members’ suffer from other shocks; and in recent years, Afooshas provide insurance for death of key livestock, such as oxen.

The study revealed that mutual support associations are basically organized and emanated from the norms, values, and traditions of the community and are accessible to community members; they are powerful in influencing the behaviors of each member. They provide equal footing to each member during public hearings and decision-making. The features of social associations, such as trust, norms, and networks that can improve the efficiency of society by facilitating coordinated actions (Pierre, 1986; Robert, 1993). The farmers’ initiatives are impetus of the processes of various agricultural innovations. A farmer initiative is the impetus that necessarily drives a farmer to formulate a realistic plan, and to implement it as an attempt to create space for maneuver and to pursue change. In the above cases, we can identify farmer initiatives when actions go beyond the potentialities and opportunities of the existing individual farm household to embrace new livelihood pursuits. From an innovation systems' perspective, these type of interactions that bring different members of group together to address common problems create a joint learning environment for successful creation of value from knowledge, which is locally relevant with widespread applicability (Kilelu et al., 2013). It enables them to generate agricultural innovations and learn how to make the best use of knowledge and resources that they have in responding to meet their own demands. The study concludes that the existence of these social network associations support the creation of knowledge and learning processes which have enabled its members to trigger and practice agricultural innovations. It is these social connections and mutual benefits that have enabled farmers to practice and innovate, thus access to support, resources and information sharing from a range of social network associations contribute to development of agricultural innovations. Over time, these indigenous mutual aid social network associations have diversified their activities to include different socio-economic activities based on the spirit of collective action, reciprocity and trust which are important features of social capital. The study revealed that social networks, information from social networks, experiences, encounter/interaction and trusts are the key values within indigenous mutual aid associations which contribute to farmer agricultural innovations.

4.2. The values of mutual support associations for agricultural innovations
Putnam (1993) and Coleman (1990) note that when people interact to learn and exchange knowledge, they create networks, links of reciprocity that facilitate cooperation. Indigenous mutual aid associations utilize social capital through social actions and transform it into social benefits. The various features of social capital play a central and leading role in farmers’ day-to-day lives and their attempts to create space for manoeuvre and change. These elements of social capital include spirit of collective action, reciprocity and trust among members (Kiptot & Franzel, 2019). For instance, Guuza is an important social capital practice in assisting households in their recovery process against various labor-related shocks. Labor-sharing circles help communities exchange and learn new farming techniques and practices from each other. Field evidence (key informant interviews and observations) suggests that, for years, labor-sharing networks have been serving the community as an informal site for on-farm demonstrations through which farmers learn novel practices and jointly innovate in areas that are relevant for an incremental adjustment in their livelihood. Afoosha, the bridging between several bonding ties, which is one of the features of such group, allows households to meet new people, engage in new networks, and mobilize novel resources and information. As the findings show, farmers have different motivations to innovate on their farm. Remaining competitive and profitable, they have personal motivations such as being on top of technological trends, growing in social status, and enjoying farming activity (Cigonek et al., 2014). Farmers create different networks for generating and implementing innovations on the farm, depending on their motivations, objectives and resource endowments. Social ties and agricultural innovative activities practiced in Ethiopia partially shared from each other. The study revealed that farmers interact and associate with various social network associations importantly for information, technical knowledge, and financial resources.
5. Concluding remarks and practical implications

Indigenous community’s self-organizing mutual support associations based on reciprocity, trust and cooperation towards a common goal which forms the core of social networks that can help to shape and foster households’ agricultural innovations. The communities in the study area undertook agricultural innovations while they attempt to solve agricultural and other socioeconomic problems. In connection to this, when farmers have adequate social capital, such as well established and extended social networks, active interaction and cooperation among members and with the wider society, and have trust and credibility, then they are more able to generate creative and innovative ideas. Thus, strengthening indigenous communities’ mutual support social networking would enhance generation of agricultural innovations. This study has demonstrated the values of social networks for agricultural innovations and the power of social networking for collaborative work towards a common goal and their linking ties for agricultural innovations. Therefore, extension system should aim at creating an environment that would deepen farmers’ social networking to extend their mutual support practices, information sharing, encounter, trust, and cooperation among members. In addition, stakeholders within innovation and extension system should appreciate farmers’ practices and their innovations and be prepared to work together with farmers in their fields on questions that farmers are trying to investigate themselves. In a nutshell, fostering social network associations would promote local community’s innovation capacities, in turn and over time serves as a springboard to overcome rural poverty.

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Author details
Desalegn Yadeta Wedajo
E-mail: desalegnyadeta@gmail.com
ORCID ID: http://orcid.org/0000-0002-9954-9698
Mideksa Fufa Jilito
E-mail: desalegnyadeta@gmail.com
1 Department of Rural Development and Agricultural Extension, College of Agriculture and Environmental Sciences, Haramaya University, Dire Dawa, Ethiopia.

Notes
Kebele is the lowest tier of administration next to the district composed of groups of villages.

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