Harnessing indigenous social institutions for technology adoption: ‘Afoosha’ society of Ethiopia

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ABSTRACT

The search for effective mechanisms in technology adoption is high on the agenda of researchers and policy makers. In Ethiopia, adoption of technologies followed the diffusion of innovation information through public extension agents, cooperatives and their unions. The use of statutory channels evidenced to largely limit the innovation diffusion and the timely reach of technologies to the end user farmers for adoption due to their operational inefficiencies and bureaucracies emanating from statutory rules and regulations. This raises concerns how innovative ways of intermediating such technologies can be developed in a way that users trust and make informed decisions about the adoption of technologies. Thus, this study explains the roles of Afoosha social networks for technology uptake. Afoosha social network functions on the basis of orders in the predominant social capital, trustworthiness, altruism and with no self-centeredness. The existence of Afoosha social networks in the rural villages of Ethiopia would provide complementary pathways for effective diffusion of innovation and adoption of technologies. This study, therefore, generates a shred of evidence for the innovative mode of diffusing innovation concepts and adopting technologies that help to design policies that integrate the customary and statutory approaches for better technology adoption.

1. Introduction

Uptake of modern technologies remains limited among smallholder farmers in developing countries. However, without adoption of technologies enhancing agricultural productivity, transforming the agriculture sector and fostering agriculture-led sustainable development is unthinkable (Dercon and Christiaensen 2011). In addition, in lower-income countries, experimentation and generation of modern technologies are capital intensive, and thus, under adoption implies inefficient utilization of scarce financial resources (Baker 2000).

Two interrelated explanations are often indicated as to why the uptake of technologies remains low in developing countries. First, factor markets and institutions that intermediate the exchange of technologies and inputs are characterized by imperfections and inefficiencies emanating from information asymmetry, weak contract enforcement, fuzzy property rights and inaccessible infrastructure that combine to excessively increase transaction costs (Stiglitz and Weiss 1981; De Janvry, Fafchamps, and Sadoulet 1991; Barreti and Mutambatsere 2008). Second, the failure of technology or input markets and the subsequent increase in transaction costs usually calls upon state interventions to intermediating innovation diffusions between the end users and suppliers. State interference and state-contingent input supply system by itself hampers the free and competitive functioning of input markets (Collier 1983; Hoff and Stiglitz 1990; Pender and Fafchamps 2006). This is because operations of state functionaries like public extension services or cooperatives are limited due to infrastructural bottlenecks, location barriers and inbuilt statutory procedures and bureaucracies (Caeyers and Dercon 2012). Hence, where technology intermediating institutions are part of the national legal and political-administrative structure, statutory requirements, and state-contingent operations with their bureaucratic structures may limit easy diffusion of technologies to reach the end users.

In Ethiopia, adoption of agricultural technologies followed the diffusion of innovation concepts through public extension agents and adoptions were intermediated by cooperative unions (RREP 2013). However, diffusion of innovation and technology adoption involves interactions among a wide range of actors in society, who form a system of mutually reinforcing learning activities...
Social networks, informal groups and social structure influence and affect how an innovation infiltrates a population. For instance, social influence has a profound impact on many aspects of client decision-making, including the adoption of new technologies (Trusov, Bodapati, and Bucklin 2010; Aral and Walker 2011b; Ghose and Han 2011; Katona, Zucscek, and Sarvary 2011). Similarly, communications from peers within an organization help to identify with and achieve adoption (Frambach and Schillewaert 2002). Moreover, traditional, informal organizations, and social structure at the community level provide linkages to outside actors and serve as a mechanism for information sharing (Spielman et al. 2006). As innovation travels through an interconnected web of social connections, the structure and characteristics of social networks can determine how widely and how soon the innovations get adopted (Valente 1995). Evidently, however, extension programs may be an effective way of transmitting information about modern inputs and encouraging adoption of technology. But, across Sub-Saharan Africa, evidence for the effectiveness of the extension system is varied and disputed (Bindlish and Evenson 1997; Evenson 1997; Gautam and Anderson 1999).

The use of the public extension agents, cooperatives, and their unions was evidenced to largely limit the information exchange, innovation diffusion, and the timely reach of technologies to the end user farmers for adoption due to their operational inefficiencies and bureaucracies emanating from statutory rules and regulations. Thus, apart from affordability, the problem of trust in the technology delivery and information diffusion was indicated to be the main factors that limited easy diffusion of the innovations for adoption. The statutory channel through extension agents and cooperatives constitutes a top-down technology adoption strategy that puts more concern on rules and regulations than on easy and timely reach of the innovations to the end users. Therefore, overcoming the limitations in the top-down statutory channel can add value for effective diffusion of technologies.

Afrosha is an indigenous local social institution established to provide financial and other types of support when a family member dies. Afrosha society is known and practiced in many parts of Ethiopia probably with the same name or other names aligned with the language and culture of specific region. Afrosha 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 Afrosha 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).

During the past regimes in Ethiopia, Afrosha society was utilized to mobilize communities for certain political and cooperative activities, as this association has proved to be very strong in recruiting community members to participate in any sort of activity they are involved in (Pankhurst and Mariam 2000). Even though the roles that Afrosha association can play in modern technology, adoption is rarely addressed and documented in recent studies, the inbuilt social orders and values are critical elements to use Afrosha as customary channels for diffusion of innovations and adoption of technologies. Particularly, in rural areas, where rural education, extension, and information services are underdeveloped due to location barriers and infrastructural bottlenecks, using Afroshas inbuilt social orders and values to inform, orient, and convince their members to acquire and use technologies, can generate externality effects from learning that bears an important multiplier effect for better adoption of technologies. Nonetheless, studies on technology adoption practices have yet to fully embrace indigenous social networks as complementary pathways for technology adoption. This article, therefore, aims to explain how Afrosha as indigenous social networks fosters technology adoption.

2. Literature review

2.1. Conceptualizing indigenous social institutions

In recent years, following the limited success of attempts to impose practices, rules, and values from other socio-eco-cultural contexts, development agencies have turned their attention to indigenous institutions of various kinds. Development projects are looking to strengthen indigenous institutions in order to achieve development goals (Watson 2003). Indigenous institutions are seen as a ready-made set of power structures that enable a group of people to organize themselves, to take decisions, to enforce regulations and to resolve conflicts (Warren, Adedokun, and Omolaoye 1996).

In the last decades and so, customary institutions have been seen as powerful resources for development because they are likely to have echoes of indigenous beliefs and values and will be stronger for this (Warren, Adedokun, and Omolaoye 1996). The way in which customary institutions are embedded in the shared
memory of local people made them particularly powerful (Warren, Adedokun, and Omolayo 1996). As cited by 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/innu-

mental knowledge, and innovation), and cultural (communication and flow of information). Author Wool-
cock (2001) distinguished three different types of social networks:

1) Bonding social network: describes the connections among individuals who are emotionally close, such as friends and family. This kind of connection is characterized by homophily: high level of similarity in available information, demography, and economic and social status (Mouw 2006). It indicates strong family ties where social relationships are based on strong trust and reciprocity. Most of the time this type of connection is closed and exclusive (Gittell and Vidal 1998; Heffron 2001; Putnam 2001) in the sense that access to membership and benefit of membership is restricted to those individuals and households who have similarity. This type of connection often entails the exclusion of those households that are not similar (Schuller 2001; Van Oorschot, Arts, and Gelissen 2006).

2) Bridging social network: connects people that span social groups, such as race, tribes, different social groups, and villages for mutual support activities. It serves as a bridge linking between different bonding social capitals. It enables households belonging to other groups to access extra resources, such as novel information, knowledge, and financial resources that might not be accessed through bonding connections (Hawkins and Maurer 2009). The information and knowledge traded between groups allow the community to benefit from a diversified social endowment accumulation. 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.

3) Linking social network: represents connections between individuals and groups in a different position of financial and political power. It is considered as an essential mechanism for ‘forging alliances with sympathetic individuals in the position of power’ (Fox and Brown 1998) and for leveraging resources from formal and informal institutions beyond the local community (Woolcock and Narayan 2000).

2.2. Explaining indigenous social institutions for technology adoption

Various studies addressed the role of indigenous social institutions for technology adoption for instance, earlier studies (e.g. Besley 1994) evidenced strong correlation between technology adoption of a household with that of its neighbors, relatives, friends or those within similar social networks, while more recent ones (e.g. Bandiera and Rasul 2006; Conley and Udry 2010; McNiven and Gilligan 2012; Magnan et al. 2013; Maertens 2017) were concerned with identifications of causal pathways how social capital and network density, institutions, and traditions influence the adoption of technologies. In addition, Valente and Rogers (1995) revealed that social contacts, social interaction, and interpersonal communication influence technology adoption. The co-learning between individuals, collaboration for collective actions, and networking for socioeconomic and information sharing would facilitate technology adoption.

Interestingly, these studies documented more concrete evidence that technology adoption decisions of farmers were mainly derived by social information diffusion and social learning than mimicry or the attributes shared in the social network. As technology and input markets are failed (Binswanger and McIntire 1987; Udry 1994) and state-contingent technology and input supply systems were suffered from unregulated and bureaucratic operations (Rivera 2001), farmers in developing countries rely on information from neighbors, relatives, and progressive farmers in their informal social networks to acquire information about innovation (Munshi 2004). Empirical pieces of evidence evidently suggest that social networks and groups provide financial and nonfinancial resources (e.g. emotional and 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 technology adoption. Hence, the functions of predominant social structures, traditional institutional arrangements, and social networks play critical roles for technology adoption.

Indigenous social institutions (e.g. Afoosha/Iddir) function on trust-based self-enforcing orders, informal networks, and relationships in a more flexible and reciprocity-based order (Udry 1994; Fafchamps 2006; Pankhurst 2008). Resource-driven conflict resolution (Edossa et al. 2007), provision of social insurance to smooth consumption (Townsend 1995; Fafossa and Lund 2001; Fafchamps 2006), rectifying local input market imperfections through expediting information flows (Udry 1994; Barr 2000), reducing monitoring, transaction, and enforcement costs (Sadoulet, De Janvry, and
Fukui 1997; Fafchamps and Minten 2002; Karlan 2007; Berhane, Gardebroek, and Moll 2009), and developing trust among agents (Fafchamps and Lund 2003) were documented as the critical roles being played by indigenous institutions. The prevalence of indigenous social institutions plays a wide spectrum of socioeconomic roles in risk management and consumption smoothing (Udry 1994; Fafchamps and Lund 2003; Okten and Osili 2004; Hoddinott, Dercon, and Krishnan 2009; Wydick, Hayes, and Kempf 2011), credit, saving and transaction costs, technology adoption, and productivity-enhancing (Barr 2000; Fafchamps and Minten 2002; Fafchamps and Lund 2003; Bandiera and Rasul 2006; Krishnan and Sciubba 2009). In general, the social capital elements of indigenous institutions like reciprocity and altruism overcome moral hazard, adverse selection and opportunistic behaviors in screening, monitoring, and enforcing information for diffusion of technologies, providing a better avenue for adoption.

2.3. Reality checks in the current extension system

Over the past three decades, Ethiopia's government has been reforming national extension systems by focusing on structural changes; decentralization of extension organization at woreda levels, a shift in extension approaches from the transfer of technologies paradigm to the participatory paradigm; the establishment of participatory demonstration and training extension system that entails farm visits and on-farm demonstration in 1995 and shift to Farmer Training Center (FTC) as broad based human resource development at kebele level since 2002/3 (Habtemariam 2007). Although the progress of reform has been seen as strength, there is long way to go to ensure farmers-owned, farmers-driven entities, and effective extension system in the country to realize demand-driven extension system. The literature revealed that there is no best extension model to be followed, but, the best reform is the one that could operationalize different combination of elements of reforms particularly; decentralization, market orientation, and participatory extension and hence, draws multiple alternatives of extension service delivery and financing, i.e. pluralistic service delivery in nature (Kassa and Alemu 2016).

In Ethiopia, where public agricultural extension remains dominant and pluralism in the service delivery is just emerging; strengthening public extension has received due policy attention (Lemma, Sehai, and Hoekstra 2011). Since 2004, more than 60,000 development agents (DAs) were trained to serve in extension system and 8500 FTCs have been built by government with substantial contributions from rural communities (MOARD 2009a). The establishment of FTC recommends the beginning of a strategic shift towards knowledge-based approach to smallholder agricultural development as well as a shift from a sole focus on the transfer of technology to emphasize on human resource and social capital development. The assignment of thousands of DAs in FTCs represents huge resource and opportunity to move forward, however, making the FTCs functional, responsive, effective, and dynamic remains a real challenge. According to MOARD (2009a), about 2500 (30%) out of 8500 FTCs were functional. FTCs often lack basic facilities, funding for operational costs, appropriate approaches, and linkages for accessing and delivering information. Effectiveness of extension has been challenged by rigid bureaucracy and financial autonomy at field extension services, a weak research-extension linkage, less focus on farmers’ demand and DAs are overburdened by non-extension tasks.

2.4. Afoosha society of Ethiopia

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 (Pankhurst 2008). Originally, 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 socioeconomic issues. Afooshas provide small credit for their members, often without collateral; help unemployed members (Pankhurst and 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.

3. Methodology

Participatory Rural Appraisal (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 organizations to capture the knowledge and opinions of stakeholders in the planning and development of projects and programs (Chambers 1994; de Boef and
This study, therefore, aims to explore an insight into indigenous social networks and suggest the best alternatives for innovation diffusion and technology adoption. Identifying better ways of technology adoption that either substitutes or complements the conventional channels, which are evidenced to limit effective technology adoption not only provides for higher level of productivity but also contributes for economic growth and poverty reduction at national level. Exploring the roles of indigenous social institutions in technology adoption uncovers their undocumented values and potentials to influence policies aimed at promoting bottom-up approaches for the development of better innovation diffusion. Complementing public extension systems with indigenous social networks would foster technology adoption. To do so, a PRA was conducted in Ifa Biftu kebele of Meta Woreda, East Hararghe zone of Oromia region, Ethiopia. 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) 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 take out diverse views. The PRA included varying perspectives of communities with different backgrounds within the Kebele, 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 organized for wealth and gender categories. These were to ensure that the differentiated views and needs of different groups are documented and fed into the research agendas.

The data were produced through the trend analysis, focus group discussions (FGDs), Venn diagrams, and key informant interview, and participant observation. The trend analysis was assumed with Afoosha and kebele administrative leaders. The trend analysis was used to capture the trends in the experience of the community-based indigenous social networks that households consider as having an impact on their livelihoods. Six FGDs, namely male-headed households, female-headed households, mixed (both male and female households), low asset households, Afoosha leaders, and youth group were organized and consulted. The FGDs were used to explore local perceptions with respect to indigenous social institution, extension services, and technology adoption. The focus group discussants participated also in Venn diagram activities. Venn diagrams were used to identify community-based indigenous social institutions, importance of associations to members, and their potentials for innovation diffusion. 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 social networks. Finally, key informant interviews were held with DAs, kebele elders, kebele administrative and Afoosha leaders. In general, the data were recorded via digital voice recorder and notebooks, and later transcribed verbatim using a computer. Afterward, we identified concepts to compare relations, communalities, and differences in the data. Once we checked for overlaps or similar contents, finally we made decisions for the ultimate write-up of the results.

4. Results and discussions

4.1. Technology adoption: improved sorghum varieties case in the context

The crop production in Ifa Biftu kebele is highly subsistence-oriented, natural resource-intensive, low input–low output, and rain-fed systems. The kebele is highly challenged by striga weed problem and frequent crop failures due to erratic rainfall (WARDO 2018). In responding to the challenges and support the seed demand of the community and hence to satisfy their food demand, improved striga-resistant sorghum variety (Gobiye) and early maturing (Teshale) sorghum variety were introduced in 2003 by woreda agricultural office. However, male-headed FGD participants mentioned that bird attack as the most important problem associated with the adoption of early maturing sorghum variety. The FGD participants explicated that the early maturing variety of the improved sorghum have attractive color and sweet in taste as a result, the variety was susceptible to bird attack. Additionally, the male FGD mentioned that the early maturing sorghum variety reaches the maturity level before all other crops reach pod stage in the village. The farmers explicated that early maturing sorghum variety cannot be adopted in individual basis because this variety is susceptible to birds and furthermore, the participants stated that if limited farmers adopt it, all birds would attack that farm plot unless all the neighbors’ farmers sow this variety just to reduce the birds’ attack from individual sorghum plots. The FGD discussants stressed that individual farmers cannot adopt this sorghum variety without collective adoption. Given the experiences of farmers on sorghum varieties’ adoption, mobilizing
farmers for collective adoption of early maturing sorghum variety provides a crop production security for the households. Collective adoption would be useful in sharing risks related to technology adoption, setting priorities, and experimenting with, evaluating, and disseminating technologies. Knox and Lilja (2004) discovered that where strong norms of collective action and social capital exist, joint technology experimentation, sharing of innovation ideas, motivating and coordinating the actions of multiple resource use, spreading risks, adopting and scaling up of the technologies would be facilitated. Social networks influence individuals to follow group decision in technology adoption through their function as a source of informal finance, as channels of information and vehicles of learning, as a means for resolving externalities and collective action problems, or through enforcement of social norms. Tomass (2012) points out that in the informal association members follow rules and social norms while pursuing collective goals. The study concludes that the members of social networks would exert powerful influence on individuals in the process of technology adoption through mobilizing interest and capacities, enhancing feelings of interdependence, organizing contact, and building trust among farmers and other actors.

4.2. Farmer information search strategies and perceptions on extension system

Farmers obtain information from a number of sources, including, among others, their own trial and error and from members of their social networks. Aside from relying on their own experience, the main sources for information highlighted in the focus group discussions were interpersonal sources, like, neighbors, family and relatives, progressive farmers, and development agents. The women FGD cited their husbands as information sources as well. Farmers watched their neighbors’ fields, met with other farmers in different places, and spoke with progressive farmers for the search of information. One of the male focus group discussants said that farmers tend to follow the input application and use patterns of their neighbors, so information is integrated between different sources to apply inputs. Similarly, despite the use of the DAs as information source, some farmers considered the information from the DAs not trustworthy and inconsistent with other information sourced. The result shows that information diffusion requires different delivery strategies in extension programs. Formation of farmer-based organizations is often encouraged to disseminate information to farmers. Farmers’ interaction and interpersonal relationships with other farmers, DAs, and progressive farmers can be captured by their level of social capital within farmer-based local organizations.

Development agents have been mobilizing farmers for innovation diffusion and technology uptake through the full force of the local government-party set-up, whereby administrative arrangements of the ruling party go hand in hand through a series of arrangements, called ‘1 to 5’, ‘development army/groups’ (Garee Misooma) and party cells (Tokko-Shanee), sometimes even without considering the farmers’ interest for the uptake of new technologies. Given the large share of public extension efforts, convincing, organizing individual farmers is paramount for innovation diffusion and technology adoption process. Extension system has been utilizing FTC plot and model farmers’ approaches for innovation diffusion. However, the focus group discussion with farmers revealed that the current extension system pathways do not comply with indigenous social networks rather deemed with the local government-party set-up structures for innovation diffusion. Public extension system has been delivering technologies to farmers without considering societal structure, socioeconomic, and knowledge diversities of farmers. Moreover, the focus group discussants explicated that public extension system utilizes FTC plot selection instead of farmers plot for technology demonstrations. Similarly, public extension has been employing model farmers approach for technology popularization instead of working with indigenous social networks that represent the interests of the majority of farmers. This study attests that model farmers approach is exceptionally and hardly representing the only model and small number of farmers for innovation uptake.

4.3. Indigenous social institutions in Ifa Biftu kebele, Meta Woreda

There are a number of indigenous social institutions in Ifa Biftu kebele, which have been established for a number of different purposes (Table 1). These include Guuza, Iqubii, and Afosha. The formation of these institutions has traditionally been embedded in the culture of communities and plays 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.

Guuza is a labor-sharing arrangement whereby people reciprocate for labor in agricultural activities
(harvesting, threshing, and weeding). Guuza functions, based on the principle of labor reciprocity, are 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 one, unless for sickness, death, or other commitments (those commonly considered as legitimate excuses), may lead to a serious resentment at first. If this behavior repeatedly happens 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 ways 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 network 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 and practices from each other. The field evidence confirms 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.

Iqubii 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 Iqubii 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 crop harvesting.

### Table 1. Indigenous social institutions in IfaBiftu kebele, Meta Woreda, East Hararghe Zone, Oromia Region, Ethiopia.

| Social Institutions | Objective | Community members they target | Criteria for membership | Management | Number of members |
|---------------------|-----------|--------------------------------|-------------------------|------------|-------------------|
| Afosha              | • To support each other during ceremonies (i.e. weddings and funerals) • To support sick people in the carrying out of agricultural and non-agricultural activities • To resolve conflicts | Men and women separately | • Not clearly defined but should be a married or mature adult • Household heads and partners | Traditional (strong) | Not defined |
| Guuza               | • To share labor during peak periods of agricultural activities (like tillage, planting, weeding, harvesting) | Male or female groups separately | • Ability to perform the activities • Should be a villager or a neighbor | Traditional | NNot defined |
| Iqubii/Qubii        | • To provide financial services: women save money weekly and draw chances for the members and give it to members in turn basis and in which priority is given for the needy members. • Moreover, the members assist each other during peak season for activities like planting, weeding, and crop harvesting | Women | • Ability to contribute the required money | Traditional | Not defined |
groups are some forms of women *Iqubii* 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 *Iqubii* social network arrangements. The other interesting principle in women *Iqubii* is prioritizing those members in dire need of assistance. The field evidence indicated that women *Iqubii* gives the first rounds of payouts for those households that are in critical condition compared to other members. A widow who lives with her 4 children recalls a recent incident of a health shock and explains how she was prioritized by *Iqubii* 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 sell the one and only cow I have to cover the medical expenses. Luckily, when *Iqubii* 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 an informal local social institution that serves its members on social and economic services, provides support to each other during ceremonies (i.e. weddings and funerals); assists sick members in the carrying out of agricultural and non-agricultural activities, and resolves conflicts among its members in the community. *Afoosha* membership is voluntary and a man may decide not to join his 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 other 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 formal 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.

The study revealed that the communities prefer to be fully governed by informal institutions than by the formal and modern bureaucratic organs. These institutions are basically 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 study witnessed that despite their irreplaceable roles in the lives of the communities, these social networks are not well recognized and protected, insured, and given due attention to sustain by formal institutions mainly due to the failure of its leaders and members to create linkages and/or formal government failed to entertain such institutions. Generally, the study concluded that what sustained these institutions are predominant social orders, trust, relationship, and commitments among the members.

### 4.4. Potentials of Afoosha society for technology adoption

The transfer of new knowledge and innovation adoption involves interactions among a wide range of actors in society, who form a system of mutually reinforcing learning activities (Juma 2015). The effective institutional arrangements, socio-cultural orders, and relationships influence stakeholders’ attitudes, decisions, and actions for mutual benefits. The FGD participants explained that *Afoosha* society was inherently established with the sense of community-centered trust and altruism in the structure of a community. Thus, if public extension system complements its service with *Afoosha* social networks, it would solve the problem of trust in technology delivery and effective information diffusion in the communities. In addition, the focus group discussants argued that if statutory channels complement its service delivery with *Afoosha*, the problem of transparency in innovation diffusion and the bureaucratic structures that limit easy diffusion of technologies to reach the end users in public extension system would be solved. From its nature of the establishment, *Afoosha* is accessible and transparent to its members regardless of their socioeconomic status. Moreover, regarding farmers’ trust in technology delivery, one of the key interview informants explained as follows: ‘If one bottle of oil given for “X Afoosha” association to be shared with its members, it will be shared equally to its members without creating conflicts among X Afoosha members.’
The interview with Afosha leaders explicited that Afosha members meet once in a month or depending on the pertaining issues in the community for discussions, conflict resolution and primarily to deal with cases which arise from Afosha affairs. This would bear the chance for extension agents to diffuse information regarding modern inputs and encourages technology adoption.

At the time of the investigation, however, it was also discovered that access and poor purchasing capacity of technologies by farmers were reported as challenge for technology adoption. The discussions with development agents and farmers indicated that the purchase of inputs had been costly, thus greatly impacting the adoption of technologies. This scenario would provide an opportunity for extension workers to utilize these networks to address the challenge of access and purchase of agricultural inputs. Because Afosha social networks represent connections between individuals and groups in a different position of financial and political power; thus, it can be developed as an essential mechanism for ‘forging alliances with sympathetic individuals in the position of power’ (Fox and Brown 1998) and for leveraging resources from formal and informal institutions beyond the local community (Woolcock and Narayan 2000). Given that, the inherently inbuilt trustworthiness in Afosha would help extension workers to mobilize rural communities for technology adoption. Generally, the study concluded that if public extension complements its services through Afosha social networks for innovation diffusion and technology popularization; it would provide at least three potential advantages; (1) Afosha members would pool their resources or leverage resources from formal institutions to adopt technologies. This gives a chance for extension agents to mobilize Afosha members for the access of credit services from formal financial institutions. This, in turn, improves farmers’ financial capacity for the purchase of agricultural technologies. And besides, it would create a favorable condition for both sectors to complement each other and particularly for the formal extension system to popularize technologies. (2) Community-based social networks would facilitate for any possible sort of contractual agreement to be entered with government or NGOs for technology adoption processes. For example, Afosha members could participate as a farmer research group for technology adoption. (3) Many of agricultural technologies largely depend on a community level or group actions thus; this social network would enhance collective actions and provides a vehicle for groups of farmers to work together. Generally, this study concluded that complementing Afosha social networks along statutory extension channels would be, by far, rewarding pathways in the development of innovation and technology diffusion rather than wasting time in mobilizing farmers via local government-party set-up, whereby administrative arrangements of the ruling party go hand in hand through a series of arrangements, called ‘1 to 5’, ‘development army (Garee Misooma) and party cells (Tokko-Shanee) for innovation diffusion.

5. Conclusion

Indigenous social institutions are playing a significant role in enhancing rural livelihoods. However, there is a variation on the type, nature, composition, and functions of indigenous social institutions across the studied communities. Afosha society has more power to influence the behavior, decision-making, values, and practices of community members. Its strong socio-cultural orders and social networks would influence and affect how an innovation infiltrates in the community members. In the rural villages of Ethiopia, Afosha association is inherently utilized and formalized with specialized functions, and is currently an almost ubiquitous grassroots form of social organization. Thus, Afosha society should be given due attention from the government-led extension system for innovation diffusion and technology adoption. In order to utilize the values and potentials of Afosha for technology uptake, the belief in self-initiated indigenous social institution needs to be harnessed in the legal frameworks. In addition, supporting organizational structures, traditional arrangements, and network-based collective actions need to be in place. Therefore, Afosha could be another alternative mechanism for bridging and linking the community members for technology adoption. This article concludes that the future of innovation diffusion and technology adoption process should not only focus on formal channels but also complement with Afosha social networks for enhanced technology adoption.

Notes

1. Lowest tier of administration next to the district composed of groups of villages
2. The ‘1 to 5’ groupings and ‘development groups’ are organized by clustering all residents of a village into smaller administrative units. Accordingly, the ‘1 to 5’ is composed of five to seven members whereby the leader of the group (commonly called ‘dursaa garee’, which literally means hook), catches disobedient members within the group and reports them to the ‘development group’, locally called garee misooma. ‘Development groups’ are formed when seven to 10 clusters of ‘1 to 5’ arrangements come together. The leaders
of a development group and of ‘1 to 5’ groups are always members of the ruling party.

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References
Aral, S., and D. Walker. 2011. “Identifying Social Influence in Networks Using Randomized Experiments.” *IEEE Intelligent Systems* 26 (5): 91–96.

Baker, J. L. 2000. *Evaluating the Impact of Development Projects on Poverty: A Handbook for Practitioners.* Washington, DC: The World Bank.

Bandiera, O., and I. Rasul. 2006. “Social Networks and Technology Adoption in Northern Mozambique.” *The Economic Journal* 116 (514): 869–902.

Barr, A. 2000. “Social Capital and Technical Information Flows in the Ghanian Manufacturing Sector.” *Oxford Economic Papers* 52 (3): 529–559.

Barreti, C. B., and E. Mutambatsere. 2008. “Agricultural Markets in Developing Countries.” The New Palgrave Dictionary of Economics 1–8: 91–95.

Berhane, G., C. Gardebroek, and H. A. Moll. 2009. “Risk-matching Behavior in Microcredit Group Formation: Evidence From Northern Ethiopia.” *Agricultural Economics* 40 (4): 409–419.

Besley, T. 1994. “How Do Market Failures Justify Interventions in Rural Credit Markets?” *The World Bank Research Observer* 9 (1): 27–47.

Bindlish, V., and R. E. Evenson. 1997. “The Impact of T&V Extension in Africa: The Experience of Kenya and Burkina Faso.” *The World Bank Research Observer* 12 (2): 183–201.

Binswanger, H. P., and J. McIntire. 1987. “Behavioral and Material Determinants of Production Relations in Land-abundant Tropical Agriculture.” *Economic Development and Cultural Change* 36 (1): 73–99.

Caeyers, B., and S. Dercon. 2012. “Political Connections and Social Networks in Targeted Transfer Programs: Evidence from Rural Ethiopia.” *Economic Development and Cultural Change* 60 (4): 639–675.

Chambers, R. 1994. “The Origins and Practice of Participatory Rural Appraisal.” *World Development* 22 (7): 953–969.

Collier, P. 1983. “Malfunctioning of African Rural Factor Markets: Theory and a Kenyan Example.” *Oxford Bulletin of Economics and Statistics* 45 (2): 141–172.

Conley, T. G., and C. R. Udry. 2010. “Learning about a New Technology: Pineapple in Ghana.” *American Economic Review* 100 (1): 35–69.

de Boef, W. S., and M. H. Thijsen. 2007. *Participatory Tools Working with Crops, Varieties and Seeds. A Guide for Professionals Applying Participatory Approaches in Agro-biodiversity Management, Crop Improvement and Seed Sector Development.* Wageningen: Wageningen UR Centre for Development Innovation.

De Janvry, A., M. Fafchamps, and E. Sadoulet. 1991. “Peasant Household Behaviour with Missing Markets: Some Paradoxes Explained.” *The Economic Journal* 101 (409): 1400–1417.

Dercon, S., and L. Christiaensen. 2011. “Consumption Risk, Technology Adoption and Poverty Traps: Evidence from Ethiopia.” *Journal of Development Economics* 96 (2): 159–173.

Edossa, D. C., S. B. Awulachew, R. E. Namara, M. S. Babel, and A. D. Gupta. 2007. “Indigenous Systems of Conflict Resolution in Oromia, Ethiopia.” Community-based Water Law and Water Resource Management Reform in Developing Countries, 146.

Evenson, R. 1997. “The Economic Returns of Agricultural Extension to Agricultural and Rural Development.” In *Improving Agricultural Extension A Conference Manual. Food and Agricultural Organization, Rome.*

Fafchamps, M. 2006. “Development and Social Capital.” The *Journal of Development Studies* 42 (7): 1180–1198.

Fafchamps, M., and S. Lund. 2001. *Risk Sharing Networks in Rural Philippines.* Oxford: Department of Economics, Oxford University.

Fafchamps, M., and S. Lund. 2003. “Risk-sharing Networks in Rural Philippines.” *Journal of Development Economics* 71 (2): 261–287.

Fafchamps, M., and B. Minten. 2002. “Returns to Social Network Capital among Traders,” *Oxford Economic Papers* 54 (2): 173–206.

Fox, J. A., and L. D. Brown. 1998. *The Struggle for Accountability: The World Bank, NGOs, and Grassroots Movements.* Cambridge: MIT press.

Frambach, R. T., and N. Schillewaert. 2002. “Organizational Innovation Adoption: A Multi-level Framework of Determinants and Opportunities for Future Research.” *Journal of Business Research* 55 (2): 163–176.

Gautam, M., and J. R. Anderson. 1999. *Reconsidering the Evidence on Returns to T&V Extension in Kenya.* Washington, DC: The World Bank.

Ghose, A., and S. P. Han. 2011. “An Empirical Analysis of User Content Generation and Usage Behavior on the Mobile Internet.” *Management Science* 57 (9): 1671–1691.

Gittell, R., and A. Vidal. 1998. *Community Organizing: Building Social Capital as a Development Strategy.* Newbury Park, CA: Sage.

Habtemariam, A. 2007. “Review of Extension Systems Applied in Ethiopia with Special Emphasis to the Participatory Demonstration and Training Extension System (PADETSES).” Addis Ababa, Ethiopia. 129pp.

Hawkins, R. L., and K. Maurer. 2009. “Bonding, Bridging and Linking: How Social Capital Operated in New Orleans Following Hurricane Katrina.” *British Journal of Social Work* 40 (6): 1777–1793.

Heffron, J. M. 2001. “Beyond Community and Society: The Externalities of Social Capital Building.” In *Social Capital as a Policy Resource*, 251–268. Boston, MA: Springer.

Hoddinott, J., S. Dercon, and P. Krishnan. 2009. *Networks and Informal Mutual Support in 15 Ethiopian Villages.* Washington, DC: International Food Policy Research Institute (IFPRI).

Hoff, K., and J. E. Stiglitz. 1990. “Introduction: Imperfect Information and Rural Credit Markets: Puzzles and Policy Perspectives.” *The world Bank Economic Review* 4 (3): 235–250.

Juma, C. 2015. *The New Harvest: Agricultural Innovation in Africa.* New York: Oxford University Press.
