



Institutional Innovations and Integrations towards Sustainable Development Goals: Evidence from Ethnographic Research in South Eastern Ethiopia

Mideksa Fufa Jilito¹ and DesalegnYadeta Wedajo¹

¹ Department of Rural Development and Agricultural Extension, College of Agriculture and Environmental Sciences, Haramaya University, 138, Dire Dawa, Ethiopia Corresponding author E-mail:mideksafufa@gmail.com

Abstract

This paper explores how better integration and innovation of various institutions contribute to the achievement of sustainable development goals. It emphasized the way networking among institutions facilitate and foster the implementation of sustainable development goals. To do so, ethnographic fieldwork was conducted in Tiyo district, East Arsi Zone of Oromia Region, South Eastern Ethiopia. The data was gathered from farmers using observation, interview schedule, focus group discussions and key informant interviews. The gathered data was qualitatively narrated. Results revealed that various institutions available in the study area were closely interlinked and working for sustainable agricultural development. These institutions deliver various services to farmers to promote sustainable agriculture. Besides, the institutions also provide innovative ideas and materials to farmers to improve their agricultural practices. As Venn diagram depicts, the existing various institutions integrated and overlapped in terms of activities to achieve sustainable development goals. Therefore, concerned bodies should work for the sustainable integration and innovation of institutions to achieve 2030 agenda of sustainable development goals.

Keywords:
Ethnography,
Innovation,
Integration,
Institution,
Sustainable
Development
Goals

1. Introduction

United Nations Member States formally adopted 17 Sustainable Development Goals (SDGs) on September 2015. The 2030 agenda for sustainable development came into force in January 2016 for ending poverty and achieving food security at world level. It is widely recognized that successful achievement of this agenda, which is comprised of 17 SDGs and 169 targets, requires efforts and integrations of international, national, regional and local institutions across the societies and sectors. The goals have been implemented in all member states since 2016 (UN, 2016). As a framework, the SDGs extend the previous Millennium Development Goals (MDGs) which is a global development framework with 8 goals, 21 targets and 60 indicators. The UN Secretary General Ban Ki-Moon calls the MDGs, signed in January 2000, the most successful antipoverity movement in history by lifting more than

one billion people out of extreme poverty, and making specific gains on targets such as reducing hunger and increasing female education (Fehling et al., 2013). In this context, high expectations are being placed on the SDGs to do more (UNDP, 2015; UN 2015).

Likewise, Ethiopia implemented the Millennium Development Goals, integrating them into its national development framework and registering remarkable achievements in the period 2000 to 2015. This enables the country to make significant contributions to the preparation of the 2030 Global Agenda for Sustainable Development. The Federal Democratic Republic of Ethiopia (FDRE) accepted and approved the 2030 Agenda for Sustainable Development during the UN Member States meeting held in New York from September 25-27, 2015. Subsequently, Ethiopia integrated the SDGs into the second Growth and Transformation

Plan (GTP-II). The Ethiopian Planning Commission argues that implementing the SDGs is legally binding in Ethiopia because the Council of Ministers and the House of Peoples' Representatives adopted the "SDG-integrated GTP II" in 2016. At the same time, it is evident that the GTP-II is the guiding policy document and not the SDGs. The SDGs are supposed to become part of substantive policy changes in Ethiopia, which include the implementation of a decentralized administrative system (FDRE, 2017).

The SDGs represent a significant departure from the MDGs in two important respects. First, the MDGs applied to developing countries, while the SDGs are framed to address poverty alleviation in all countries. Second, the SDGs place sustainability at the heart of the development agenda, recognizing the need to address the complex links between development and the environment. The SDGs aim to cover the whole sustainable development universe, which includes basically all areas of the human development (Le Blanc, 2015). SDG 2 – end hunger, achieve food security, improved nutrition and promote sustainable agriculture is preconditions and essential for achieving all the remaining sustainable development goals. At the same time, SDG 2 depends on the achievement of other SDGs. Therefore, this paper begins by underpinning the importance and integrations of institutions for agricultural development thereby reduce hunger, food and nutrition insecurity (Ntona and Morgera, 2018).

Institutional conditions that influence innovation include availability of reliable input and output markets and supportive strategies and capacity building trainings related to the promotion and adoption of agricultural innovations for sustainable agricultural and rural development (Muchara and Mbatha, 2016). Given that the enabling environment often influences how the actors in a sector can use their knowledge, skills and practices. Such environment is an important promoter of innovation capacity (World Bank, 2006). Thus, effective institutional integration and innovations across agricultural sector is critical for addressing the interconnected nature of the SDGs. Achieving the sustainable development goals requires active action and involvement of all stakeholders. Sustainable Development Goals require interaction of state and non-state institutions either through formal mechanisms or informal contacts and relations. Civil society and non-governmental organizations are often at the forefront of initiatives to effect change and promote sustainable development, keeping the pressure on governments to act on the SDGs. Different actors bring distinctive benefits and value in their interactions and innovations with

governments in the process of implementing the SDGs (Bejakovic, 2018).

Even though the 2030 Agenda for Sustainable Development Goals and 169 targets came into effect in January 2016, full implementation of such a broad and essential agenda faced challenges of institutional linkages and collaborations at national, regional, zonal and local levels across all sectors of society. There is a particular need and emphasis for integrating institutions, innovations, strategies and approaches for practicing and implementing the SDGs in ways that emphasize their interdependence and role for their achievement (Raquel et al., 2016).

Lack of integration and innovations across institutions in terms of agricultural development plans, strategies and implementation has been perceived as one of the main pitfall to sustainable development. Sustainable development goals require integration of institutional innovations. Insufficient synergies across institutions have impacts on actions aiming to achieve sustainable development goals (UN, 2012a; UNDP, 2015). Achieving greater institutional integration and innovations at various levels is a core concern of achieving SDGs. More broadly, previous development agendas have been criticized for failing due to absence or limited integrated and interlinked development institutions (Le Blanc, 2015).

Although synergies, interdependence and inter-linkages has received much attention in recent years, and even more since the adoption of the SDGs, institutional integrations and innovations seem to have received less emphasis. Therefore, this ethnographic research study was aimed to explore how better integration and innovation of various formal and informal institutions achieve SDGs. It emphasized the way networking among institutions facilitate and foster the implementation of sustainable development goals. Generally, the study was guided by the following research questions: (a) what are the available local and international institutions in the study area? (b) What are the services delivered by existing institutions to the local farmers? (c) How the existing institutions are integrated and innovative to support the implementation and achievement of SDGs? (d) What are the major factors influencing farmers to utilize services delivered by existing institutions? And (e) what are emerging issues and challenges in the integration of the available institutions within broader framework of SDGs?

Tenywa et al. (2011) defined institutional innovations as changes made in redefining roles and responsibilities of different organizations or individuals to deliver more returns like improved productivity. Institutional impediments have a negative impact on smallholder farming; thus the

removal of these barriers is the prime focus of institutional innovations. The concept of institutional innovation is used to repair and maintain systems that run in the community. The concept of institutional innovation is part of the institutional changes. One of the mechanisms of institutional change is institutional innovation. Ruttan and Hayami (1984), state that the institutional innovation is the technical institutional change. Activities undertaken in the process of institutional change is technically referred to as an institutional innovation.

Institutions are defined as the rules by which agents interact achieve desired outcomes (World Bank, 2002). Institution is a broad and multi-faceted term, which encompasses a range of structures, frameworks and norms that organize human life and society. This paper covers institutional interactions to achieve SDGs. The 2030 Agenda outlines principles that institutions should strive to achieve SDGs at all levels (Bejakovic, 2018). The main purpose of an institution is to coordinate human activities towards local or national development. Institutional activities towards a SDGs achievement based on relationships organized through vertical integration and social networks (Boehlje 1999; Loader and Hobbs, 1999). Such organization tends to be positively influence the performance and achievement of sustainable agricultural development (Desmond and Salin, 2012). However, the performance of smallholder farmers towards SDGs achievement is influenced mostly by institutional innovations and networks. As such, smallholder farmers are subject to institutional factors such as market input and output, institutional services and supports, which in turn influence their production and marketing activities. Societies developed informal institutions such as culture, norms, trust and kinship, as well as formal institutions to facilitate development goals (Williamson, 2000). Both formal and informal institutions had an influence on the innovation process and its adoption thereof. For instance, Varsakelis (2001) analyzed panel data from developing and industrialized countries and found national culture to be a determinant factor affecting the intensity of adoption of research and development initiatives. Typically, roles of actors and interactions between actors are shaped through infrastructures (e.g. research infrastructure, physical infrastructure (roads) and communications infrastructure). Besides the actors, interactions and infrastructures, structures in innovation systems are also considered to contemplate the institutions that govern their behavior and influence the interactions and relationships among actors (Hall et al., 2006; Wieczorek and Hekkert, 2012): these include formal rules and regulations (laws, intellectual property

rights) and informal rules such as norms, values, and incentives (Lamprinopoulou et al., 2014).

2. Materials and methods

2.1. Description of the Study Area

East Arsi Zone is found in Oromia Regional State, South Eastern part of Ethiopia. Tiyo district is one of the districts that found in East Arsi Zone at 175 km from capital city of Ethiopia, Addis Ababa. Two kebeles namely; Haro Bilalo and Shala Chabeti kebeles were selected out of 18 kebeles that found in Tiyo district for ethnographic research. Tiyo district is bordered in the south by Munesa, in the west by Ziway Dugda, in the northeast by Hitosa, and in the southeast by Digeluna Tijo districts. The administrative center of the district and zone is Asella. Chilalo is the highest mountain in the district. Rivers in the district include Katar, Kulumsa, Gonde, Dosh and Walkesa. Fourty percent (40%) of the land in the district is arable or cultivable land which 32% planted with cereals, 23.1% pasture, 8.7% forest, and the remaining 28.2% is considered swampy, mountainous or otherwise unusable (Socio-economic Profile of Arsi Zone, 2019). According to 2007 national population and housing census, the total population of the district is 86,761, of whom 43,463 were men and 43,298 were women; 6,525 (7.52%) of its population were urban dwellers (CSA, 2007). Agriculture is the major livelihood activity for the majority of households in the study area. People of the kebele also engaged in nonfarm activities such as petty trade, wage labor, sewing and washing clothes. The main crops grown include barley, wheat, bean, pea, potato whereas sheep, cattle, goat, donkey and horse are the most common reared livestock in Tiyo district.

2.2. Research Design and Sampling Procedures

Ethiopia is a federal country divided into nine regions and two self administrative cities. Each region is further subdivided into zones and the zones are divided into districts. A district comprises peasant associations (PAs) known as kebeles, which are the smallest administrative units consisting of a few villages. This study was conducted in Tiyo district, Arsi Zone of Oromia Regional State, Southeastern Ethiopia. Tiyo district was selected based on its high potential in availability of various local and international institutions working to implement SDGs. To select the kebeles, the 18 kebeles in Tiyo district were first characterized based on diversity of formal institutions particularly based on availability of NGOs and financial institutions. This has been done in consultation with agricultural extension coordinator working in Tiyo district office. Out of 18 kebeles, two were selected purposively namely Haro

Bilalo and Shala Chabeti based on their proximity to each other and availability of various institutions working in the two kebeles. At the final stage, sample respondents were identified for the survey and ethnographic interview. For the ethnographic field work, farmers were sampled based on their access to the services delivered by different institutions. For interview schedule, a total of 60 farmers were drawn purposively from each sampled kebele. This has been done in consultation with kebele's development agents. For focus group discussions (FGDs), four categories of groups involved namely; men focus group, women focus group, youth focus group (15 – 30 age group), and low asset farmers. Each group consists of 10 members and the total of 40 participants was involved in the focus group discussions. Besides, key informant interviews (KIIs) were conducted with 20 people selected from local kebeles administrative leaders and elders, community leaders, and institutional managers. Finally, 120 respondents involved in the study during the ethnographic fieldwork.

2.3. Data Collection Methods and Instruments

The study aimed to investigate the available institutions and their support to smallholder farmers for implementing SDGs in the study area. During this study, three categories of PRA tools were used to describe the institutional integrations and innovation towards SDGs. These are Venn diagram, discussion tools (FGDs and KIIs), and observational tools. Furthermore, transect walk and ranking matrix were used to collect data. Therefore, the data for this study was obtained using individual and household survey interview, discussions, key informants interview, and observations.

The quantitative data was gathered using interview schedule. Questions in the survey instrument focused on identifying, justifying, and ranking of frequently occurring of the institutions, their services and challenges they faced in delivering services. In order to identify potential institutions and their priority services, respondents were asked to mention major institutions working with them over the last three years. They were also asked to prioritize them based on their services. Households were asked to mention the institutions from which they received agricultural inputs support, credit services, marketing information and services, crop production information, advice and training.

The observation checklist included information on day to day livelihood activities of farmers by particular institution. Observation data is basically generated to examine the direct provision of services to the communities by institutions. This is

particularly to determine how institutions play a key role in achieving sustainable development goals.

Focus group discussions depict the integration of institutions using Venn diagram based on their services. Institutional Venn diagram was conducted in order to determine the linkage, closeness and overlapping of each institutions in terms of their services delivery and their socio-techno-technical impacts on farmers income. Key informant interviews were conducted with the local elders, leaders of the village, focal person or leaders of each institution, kebele managers, informal institutions' leaders, and development agents. This is to gain an in-depth insight into services of each institution to the farmers and their impacts on farmers' income. The interview checklist included information regarding to farmers' access to services from various institutions in relation to their agricultural production and productivity.

2.4. Methods of Data Analysis

Qualitative data obtained from in-depth ethnographic interviews, focus group discussions and observations were analyzed using content analysis. Qualitative data was categorized into themes. Accordingly, results were organized into four major sections: local and international institutions available in the study area; institutional innovations and services for implementing SDGs; network of institutions in the lens of SDGs; and major agricultural constraints farmers faced. The relationships and integration of each institution was interpreted using Venn diagram (Figure 1). Moreover, data collected on different aspects of institutional services and relationships were narrated. This means, major institutions available in the study area were identified. Then, farmers asked to rank these institutions based on their importance towards SDGs implementation and achievement. Finally, the most important institutions were selected and explored to identify the nature of institutional innovations, integrations and services that were delivered to achieve SDGs.

3. Results and discussion

3.1. Institutional Innovations and Roles in Achieving SDGs

The public wing is one major institutional role used to coordinate and spread the achievement of SDGs. The other stakeholders include NGOs, financial institutions, informal institutions and private sectors. The major institutions located in the study area and working for the achievement of SDGs include Agricultural Transformation Agency (ATA), Barley Malt Seed Production and Marketing Factory (PLC), Agricultural Growth Programme (AGP), Oromia Credit and Saving Share Company, GIZ,

Oromia Seed Enterprise Arsi Branch, Informal Institutions (Iddir, Ekub, Mahber), Farmers' Cooperatives, Women and Youth Associations. The services and innovativeness of these institutions discussed as follows. The institutions discussed here are considered key in resolving some of the constraints to the implementation of SDGs.

3.1.1. Agricultural Transformation Agency

Agricultural Transformation Agency (ATA) has been undertaking various activities under government control. It works in line to government agricultural and rural development policies and strategies. Accordingly, ATA provides services for farmers in various forms. For instance, many informants and group discussants narrated the following:

The institution provides theoretical and practical advice to farmers in terms of short term training and demonstration. It collects farmers together and gives advice on system of controlling weed, how to multiply and use improved seed, animal production. Demonstration on black cumin (*Nigella sativa*) and coriander (*coriander sativum*) has been practiced on farmers land in collaboration with the local development agents and ATA staff members. After this innovative demonstration is practiced on small plot of farmers' farm, the innovation disseminated to other farmers. The institution also sometimes distributes pesticides, herbicides and fertilizer to the farmers.

Another informant says the following in relation to information services through calling 8028: I'm calling to 8028 and got agricultural information services without any cost through mobile phones. I informed information all about my agricultural activities. So that I can simply made decision regarding to my farming practices.

ATA focal person at Tiyo district level also says the following to us:

In July 2014, the ATA, in collaboration with the Ministry of Agriculture, Ethiopian Institute of Agricultural Research and Ethio Telecom, launched 8028 Ethiopia's first agricultural hotline. The 8028 hotline seeks to support sustainable agriculture by empowering smallholders with access to agronomic best practices and market information through phone calls. Smallholder farmers can now call into the 8028 automated hotline for free and receive information on a wide range of agricultural activities on all major cereals, pulses and high-value crops. Recognizing the diversity of Ethiopia's smallholder farmers, the system functions in three local languages (Amharic, Afan oromo, and Tigrigna) and provides information about crops specific to soil type and altitude. Twelve weeks after its July 2014 launch, the hotline had received nearly 1.5 million calls from 300,000

farmers in the Oromia, Amhara, Tigray and Southern Nations, Nationalities and Peoples Regions.

3.1.2. Barley Malt Seed Production and Marketing Factory: Implications for Contract Farming

Contract farming is formal agreement between farmers and processing and/or marketing firms for the production and supply of agricultural products. Contract farming has the potential to link farmers to markets, give them access to credit, technologies and inputs, and to stimulate agricultural production. Contracts usually involve a purchaser commitment to purchase the commodity and provide production support through, for example, the supply of inputs and technical advice, and a producer commitment to provide agreed quantity and quality of a commodity (Eaton and Sheperd, 2001).

In this respect, one of the male participants says the following about the role of this factory in improving his livelihoods and food security:

The factory provides me improved seed of malt barley. During agricultural production process, the factory helps and follows me. Inputs like seed, fertilizer, pesticides, and herbicides are provided to me. In addition to this, continuous training and advice were given by the factory's experts. Due to these support, I committed to keep the quality of barley. Finally the factory purchase all barley I produced based on our prior agreement. Therefore, the factory highly enables me to improve food security at household level and to achieve SDGs at global level.

A senior barley extension and marketing expert of the factory says the following in relation to producing and purchasing barley with farmers:

Our factory provides both internal and external improved barley seed varieties for farmers with full packages: all necessary inputs including training and follow up during production process. Ibon, Sabini and holker are internally released barley seed variety in Ethiopia and distributed to the farmers while grace and bablier barley variety are external variety (imported from outside Ethiopia). Since the factory and the farmers have agreement between each other, they selling to the factory after harvesting. The barley extension and marketing expert of the factory also told us that the demand of the factory to barley and the supply by farmers are imbalanced. The factory wants 100% supply from farmers with 0% from traders. For this achievement, he says that they have to work to get 100% malt barley supply from farmers by supporting them with adequate inputs, training and other necessary supports.

3.1.3. Agricultural Growth Programme (AGP)

Agricultural Growth Programme provides material support such as tables, black board, chairs

etc for farmers' training centers. It starts working with communities since 2016 in Tiyo district in general and in Haro Bilalo and Shala Chabeti kebeles in particular. Its goal is to increase production and productivity of crop and animal. Like ATA, AGP also depends on the government structure to deliver its services for the farmers, particularly for its member farmers. The main thematic area of this institution includes nutrition (dietary diversity), climate smart agriculture, coffee, irrigation activities, quality of livestock products (meat, milk, butter), inclusion of youth and women in extension and development activities. The institution has 40 farmer members (women 20, youth 10, male 10). The institution design different projects to expand irrigation farming at household level. It also cultivates fruit and vegetables at framers guard to address their nutrition security and livelihood challenges. Moreover, it works with zonal and district trade office to provide market information to the farmers. Furthermore, it organizes women in dairy production and marketing. The women collect milk from farmers and distribute to the consumers.

3.1.4. Oromia Credit and Saving Share Company (OCSSC)

OCSSC has 375 branches in Oromia Regional State and 33 branches in Arsi Zone. The aim of the company is to help poor people and the member who need job creation through their own effort. It is working with vision of seen economically empowered and transformed society. It provides credit services for member farmers. It gives credit with different interest rate to different members. It organizes farmers in group containing member of minimum 5 and maximum 60 to provide credit services. The time interval of the credit repayment is one year. As problems, the company faced that the borrowers unable to pay back the credit when their production damaged due to various reasons. Although various MFIs available in and around the study are, the farmers do not use credit services due to its high interest rate. Instead, the farmers engaged in sheep and poultry production beside crop production. In one of the group discussions, one of the participants says the following:

I have 25 hens in small square house in my garden. They produce 10-15 eggs per day. The price of one egg is 4 to 6 birr. So that, on average, I got about 1950 birr in a month from eggs. Another farmer says that he engaged in buying different crops during harvesting (low price) and keep it in store and sell when price of crops increases. He got 150-200 birr profit per quintal. Both informants strongly speaking that engaged in other income generating activities are better than taking credit services with high interest rate just like the case of OCSSCO.

3.1.5. GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit)

GIZ is non-governmental organization funded by German government. It is aimed to increase income of the farmers and reduce monocropping agricultural mechanism. It works on rotating bean and wheat to improve soil fertility thereby to increase production and productivity of bean and wheat crops. This means farmers exchange the cultivation of bean and wheat yearly, particularly faba bean with red wheat. This is for the purpose of nitrogen gas fixation from underground which is great molecule to increase production and productivity. For these implementations, the institution teaches the farmers in the field. It provides training both for extension workers and farmers on agricultural activities. Moreover, the institution focused on innovative activities. For instance, ART (Alemayo Row Seeding Technology) is designed and developed by GIZ organization. The technology is used to make row by using oxen power during sowing seed. GIZ organize farmers in one group consist of 24 members. All members of the group engaged in cultivating 20 hectares of land together. They divided profit equally. As one of the participants mentioned, GIZ give me BBM (broad bed method) which is used to ploughing the land particularly flat land contains more water. Broad bed method is used to plough more good than traditional ones by exposing the weed to air and sunlight.

3.1.6. Oromia Seed Enterprise Arsi Branch

Oromia seed enterprise multiplies and distributes seed for the farmers. An institutional manager says the following:

Oromia seed enterprise has three branches at Oromia National Regional State level: Wollega Seed Enterprise (western Ethiopia); Bale and Arsi Seed Enterprise (south eastern part of Ethiopia). The enterprise starts in Ethiopia in 2008 and these three enterprises have common goal managed by head office located at Addis Ababa, capital city of Ethiopia. According to manager's points, Arsi branch of seed enterprise has three main functions: providing short term training for farmers, distributing seed to them and increasing varieties of seed for selection. Surprisingly, the Asella branch enterprise also provides various incentives for its workers to increase their work motivation. For instance, grains for consumption have been freely provided to all workers of the enterprise throughout the year. In addition to this, the enterprise purchase and gives goat/sheep during Ethiopian holidays for its workers. Another farmer respondent said that the enterprise plays key roles in enhancing the skills and knowledge of farmers in science of seed multiplication and utilization.

3.1.7. Informal institutions: Equb, Iddir and Mahber

Farmers form informal groups based on trust and mutual understanding to acquire agricultural inputs. Although production was done individually, collective action was also done during the sowing, weeding, harvesting and procurement of certain inputs. It is common for farmers to put money together using equb mechanism. One of the local elder says the following to us:

There are many groups of equb in the study area. Each group contains a member of 10 to 30. They collect 10-50 birr weekly. Using collected money, they purchase agricultural inputs, food and animals. Others using for trading, particularly petty trading. All members compete with each other to improve their livelihoods using equb. The local elder also add that iddir is mutual supporting practices during funeral, wedding and other social events. Entry and exit is open for members. However, entry has payment about 200-300 birr because iddir spends a lot of time and accumulates huge capital since its establishment.

Regarding to the role of mahber in promoting farmers' food security at household level and fostering the implementation of SDGs, a religious leader says the following:

One of the existing mahber in the study area was called Balawaldi. This mahber consist of 110 members. They contribute 10 birr per month. The collected money support members in cash as well as by buying materials during death and wedding among the member family of the mahber. They also buy ox for ploughing land when the ox of member died to sustain his/her agricultural activities. Although the entry to this mahber is open, the new member pays 250 birr to increase their capital and equalize the new member with old members. Furthermore, the mahber provide credit services with low interest rate from collected money (e.g 300 birr with 20 birr interest per month).

Furthermore, the mutual supporting practices of the study area were very nice. The communities help each other during land preparation, sowing and harvesting. The community also practices traditional conflict resolution mechanism, particularly during killing each others. An informant mentions the following:

One of the mechanisms of conflict resolution is called harka bafata. Harka bafata explained as follows by the respondent. The person who kills another person will be punished by law. His/her family collecting money from their tribes, relatives and friends; and buy old sheep. The sheep is slaughtered and the deceased family and the guilty family wash their hands by using the blood of the

sheep. Finally families of the two sides live together as one family without keeping any revenge in their heart.

3.2. Network of Institutions in the Lens of SDGs

The map of the institutions as a network to achieve SDGs is shown on Figure 1. The institutions are represented as circles of differing size, while SDGs are figured by bigger circle. Figure 1 presents the institutions involved in SDGs implementation both directly and indirectly. The most important institutions directly influencing achievement of SDGs (Figure 1A) are: (a) government institutions such as Agricultural Transformation Agency, Agricultural Growth Programme, Health Centre, Health Post, Kulumsa Agricultural Research Institute (KARI), Schools (primary school, high school, TVET); (b) Non-governmental organizations like Save the Children, GIZ, Barley Malt Seed Production and Marketing Factory, Oromia Seed Enterprise (OSE) - Arsi Branch; and (c) Micro financial institutions (MFIs) including Oromia Credit and Saving Share Company, Busa Gonofa Micro Financial Institution, Wasasa Micro Financial Institution. A second group of institutions (Figure 1B) has an indirect influence on SDGs. These include informal institutions (iddir, ekub, mahber and marriage system), local administration representing the state (e.g kebele administration), farmers' cooperatives, youth and women associations.

Venn diagram was developed to depict the network of institutions contributing for the implementation and achievement of SDGs. Venn diagram tool gives an overview of important institutions in the kebeles that have an influence on agriculture, food and nutrition security, income and wellbeing. It also indicates the extent to which they are connected to each other and their importance to the implementation of SDGs. Ten people of mixed group involved in developing Venn diagram. The composition of the group includes 3 people from men group, 3 people from women group, 2 people from low asset farmers and 2 people from youth group. Six steps followed to draw Venn diagram. These include:

1. Objective of drawing Venn diagram explained to the participants.

2. One of the participants asked to list institutions available in the community. Narrow down the discussion to the most important institutions working on agriculture and farming related activities including introduction of new practices and technologies.

3. Then, participants asked which institutions in the community are organized around agriculture and environment (irrigation water, arable land, soil conservation), economic (saving, credit)

and social (health, education, nutrition, religion, tradition, education etc.).

4. Then the participants asked to jointly decide which of these institutions are most important to agricultural development and technology introduction in the kebeles. We let them cut circles out of the coloured paper, of which the size corresponds to the importance of these actors. We asked why these specific institutions are more important and more contributing than others in the community. Response was written under section of each institution.

5. Then participants let to stick the coloured papers representing the institutions on the big sheet. The position should be based on the

integration/relation the institutions have to each other (do they work closely together or not at all?) The closer the relationship, the closer the circles are placed to each other. They can also overlap. The further their position towards each other, the weaker their linkage.

6. To finish, we have asked the participants which of the institutions on the sheet could help introduce or scale new agricultural technologies to implement and achieve SDGs.

Accordingly, the following institutional Venn diagram was developed based on community discussions, household and individual interviews conducted in different villages.

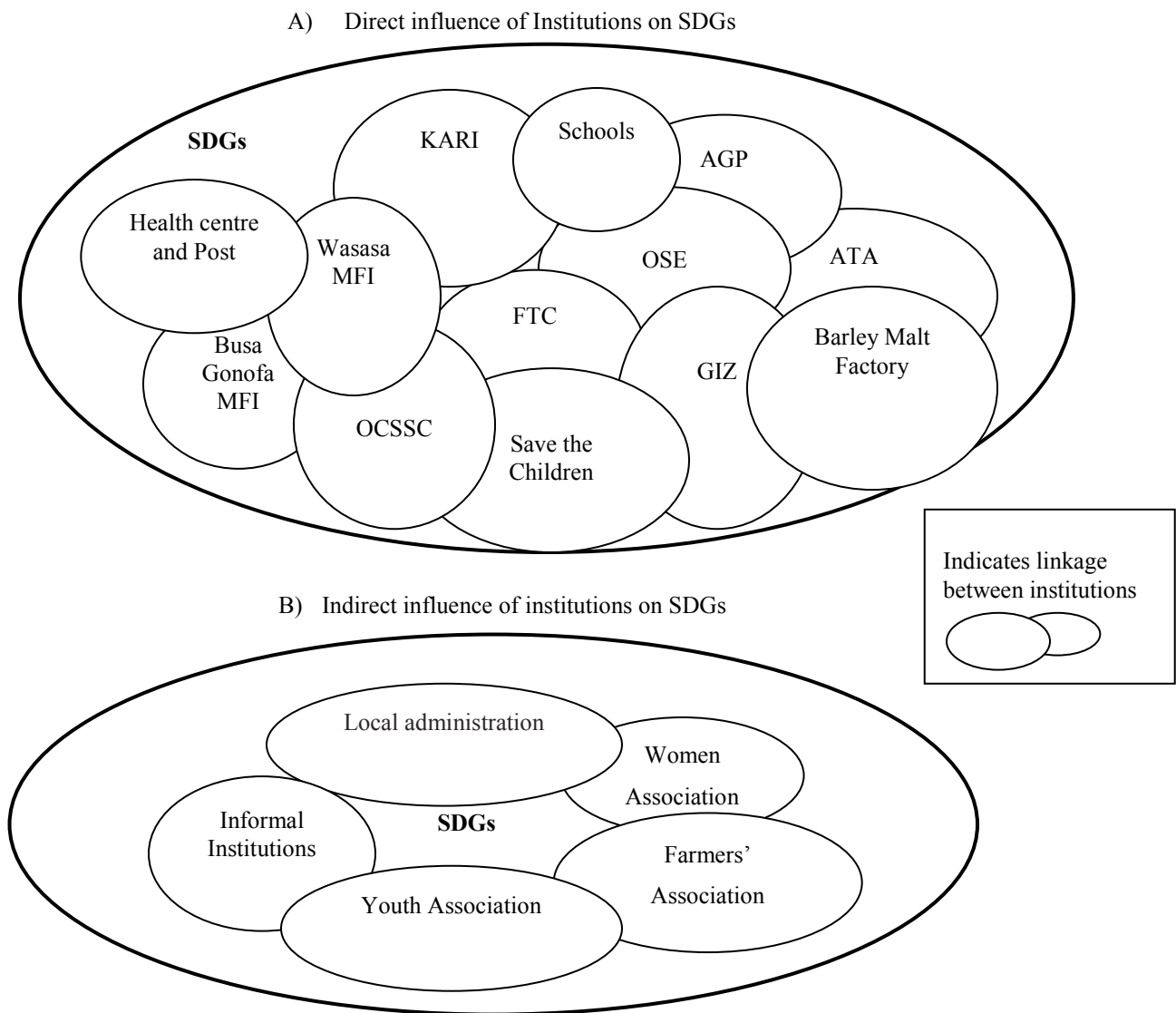


Figure 1. Venn diagram representing the most important institutions (A) and their linkage, and the institutions having an indirect influence (B) on SDGs in Asella. Developed by authors, 2019

3.3. Major Agricultural Constraints Farmers Faced

There are different problems that affect the farmers' production and productivity in the study area. Crop diseases such as rust (wheat disease), insects and weed are the most common constraints for agricultural production. Pesticides and insecticides were expensive and beyond farmers capacity to purchase. For instance they bought one liter of rust drug by 1600 birr. If they do not use this pesticide, crops affected at maturity stage thereby reduce the quality of the seed and decrease the income of the farmers. In order to reduce or avoid weeding, they spray herbicides such as poxido, pallas, 2-4-D and green star. However, they were not timely accessed these agro-chemicals near to their residence. They travel long distance to get these agro-chemicals.

According to respondents' response, there are many animal and human health problems in the study area. Among the animal diseases, abasanga is the most common and dangerous attacks many animals. The probability to cure from this disease is low. Mixed of saliva and blood dropped through the mouth of infected cattle. The disease transfer from infected animal to uninfected animal unless separately treated in a separate room. Regarding to human problem, women faced challenges during child delivery due to lack of highly skilled and experienced health professionals. Since health extension workers not properly deliver health services for women, they went to Asella town to follow up health services particularly during pregnancy. Moreover, there are inadequate drugs at kebele level. Agricultural inputs such as improved seed, fertilizer, pesticides, herbicides etc are also not adequately and timely supplied and distributed to the communities. Beside, high interest rate of micro financial institutions such as Oromia Credit and Saving Share Company, Wasasa and Busa Gonofa MFIs hinder the farmers to get services from these institutions.

During the focus group discussions and KIIs, an effort was made to identify variables affecting farmers' innovation at production level and institutional innovation during service provision. These variables include high interest rate of micro financial institutions, market information, input supply and access to training. The results show that lack of market information such as prices and quantity demanded drawback in selling their products. These affect their income at household level. Farmers indicated that without adequate knowledge of what the market wants they end up neglecting some crops or reducing cultivation area to minimize risks and losses if they fail to secure a

market after production. One of the group discussants says the following about marketing problems:

Marketing problems influences our livelihood activities. Immediately after harvesting our crops, the price of the crop decreases because all farmers sold their products. To avoid or reduce the price reduction problem, farmers organized in a group and rent vehicle to transport and sell their products to long distances. For example, they transport to Adama town which is 100 kilometers far from the residential area of the farmers.

4. Conclusion and recommendations

Although integrating institutions and innovation activities towards SDGs have received an increased attention during the past years, methodological and practical approaches to integrate these institutions to achieve sustainable development goals are poorly developed. However, sustainable development goals require integration of institutional innovations and activities. Therefore, this paper aimed to explore how better integration and innovation of various formal and informal institutions working at community level contribute to the achievement of SDGs. In addition, the study also addresses the emerging issues and challenges in the integration of these institutions within broader framework of SDGs. Thus, the study concluded that institutional innovations and stakeholders' constraints are interrelated and require collective action for the implementations of SDGs. Therefore, this study presents the path towards integrated framework that combines the experiences and strengths of different institutions and allows providing a better understanding of innovations within the formal and informal institutions and their socio-techno-technical supports for the achievement of SDGs.

The following practical implications can be set from the findings of this study. Firstly, although institutions and innovations can be an entry points into a process of further contribution to SDGs, their integration were not given recognition. Therefore, attention should be paid by different stakeholders including policy makers, development partners and government bodies to complement, extend, and underpin their participation in innovation activities. Secondly, smallholder farmers who are operating in a risky environment should be fortified to participate in institutional innovation activities. Thus, integrating innovative institutions and innovation activities would promote local development, in turn and over time serves as a spring board to overcome rural poverty and finally helps to achieve SDGs.

Acknowledgements

The authors would like to thank college of Agriculture and Environmental Sciences, Haramaya University, Ethiopia for supporting the research. The authors would also like to thank all development agents working in Haro Bilalo and Shalla kebeles.

References

- Boehlje, M. (1999). Structural changes in the agricultural industries: How we measure, analyze and understand them? *American Journal of Agricultural Economics*, 81(5):1028-1041.
- Bejakovic, P. (2018). Working together: integration, institutions and the Sustainable Development Goals, *World Public Sector Report 2018*, *Public Sector Economics*, 42(4): 487-494.
- Desmond, Ng., and Salin, V. (2012). An institutional approach to the examination of food safety, *International Food and Agribusiness Management Review*, 15(2): 21-46
- Eaton, C., and Shepherd, A. (2001). Contract farming: Partnerships for growth (No. 145). Food and Agriculture Organization of the United Nations, Rome.
- Fehling, M., Nelson, B. D., and Venkatapuram, S. (2013). Limitations of the Millennium Development Goals: a literature review, *Global Public Health*, 8(10): 1109-1122.
- Federal Democratic Republic of Ethiopia (FDRE). (2017). The Voluntary national reviews on SDGs of Ethiopia: Government commitments, national ownership and performance trends.
- Hall, A., Janssen, M., Pehu, E., and Rajalahti, R. (2006). Enhancing agricultural innovation: How to go beyond the strengthening of research systems. The World Bank, Washington DC. doi: 10.1596.
- Lamprinopoulou, C., Renwick, A., Klerkx, L., Hermans, F., and Roep, D. (2014). Application of an integrated systemic framework for analyzing agricultural innovation systems and informing innovation policies: Comparing the Dutch and Scottish agri-food sectors, *Agricultural Systems*, 129: 40-54.
- Le Blanc, D. (2015). Towards integration at last? The Sustainable Development Goals as a Network of Targets, *Sustainable Development*, 23(3): 176-187.
- Loader, R., and Hobbs, J.E. (1999). Strategic responses to food safety legislation, *Food Policy*, 24 (6): 685-706.
- Muchara, B., and Mbatha, C. N. (2016). Role of institutional innovations on smallholder agricultural entrepreneurship in KwaZulu-Natal, South Africa, *Journal of Human Ecology*, 55(1,2): 41-50
- Ntona, M., and Morgera, E. (2018). Connecting SDG 14 with the other Sustainable Development Goals through marine spatial planning, *Marine Policy*, 93 (2018): 214-222.
- Raquel, N. A., Kelley, L., and O'Riordan Tim. (2016). The importance of an integrating framework for achieving the Sustainable Development Goals: the example of health and well-being. *BMJ Global Health*, 1(3): 1-12
- Ruttan, V. W., and Hayami, Y. (1984). Toward a theory of induced institutional innovation, *The Journal of development studies*, 20(4): 203-223.
- Tenywa, M.M., Rao, K.P.C., Buruchara, R., Kashaia, I., Majaliwa, J.D., Tukahirwa, J.B., Adekunle, A.A., Fatunbi, A.O., Mugabe, J., Wanjiku, C., Mutabazi, S., Pali, P., Mapatano, S., Lunze, L., Mugabo, J. and Ngaboyisonga, C. (2011). Institutional innovations for building impact-oriented agricultural research, knowledge and development institutions, *Journal of Agriculture and Environmental Studies*, 2(1): 24-55
- UN. 2015. Transforming our world: the 2030 agenda for sustainable development. United Nations, New York
- United Nations Development Programme (UNDP). (2015). A new sustainable development agenda. 2015. <http://www.undp.org/content/undp/en/>
- United Nations. (2012a). United Nations Conference on Sustainable Development Outcome Document: The future we want.
- United Nations. (2016). Compilation of metadata for the proposed global indicators for the review of the 2030 agenda for sustainable development. Department of Economic and Social Affairs, United Nations Statistics Division. <http://unstats.un.org/sdgs/>
- Varsakelis, N. C. (2001). The impact of patent protection, economy openness and national culture on Research and Development investment: A cross-country empirical investigation, *Research policy*, 30(7): 1059-1068.
- Wieczorek, A. J., and Hekkert, M. P. (2012). Systemic instruments for systemic innovation problems: A framework for policy makers and innovation scholars, *Science and public policy*, 39(1):74-87
- Williamson, O. E. (2000). The new institutional economics: taking stock, looking ahead, *Journal of economic literature*, 38(3): 595-613.
- World Bank. (2006). Enhancing agricultural innovation: How to Go beyond strengthening of research systems. Washington, DC.
- World Bank. (2002). Building institutions for markets. World Development Report. Washington, DC.