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Contribution of Seed Producer Cooperatives in Livelihoods Promotions from Gender Perspectives in Amhara National Regional State, Ethiopia

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Abstract

Background: The study was to elucidate seed producer cooperatives and livelihoods from gender perspective in Amhara National Regional State particularly in ten Integrated Seed Sector Development (ISSD) project sites of Bahir Dar University. In realizing the study, both qualitative (in-depth interviews and Focus Group Discussions) and quantitative (structured questionnaires from 200 randomly selected households) research approaches were employed to collect data. Data were analyzed through descriptive and probit model.

Results: Findings showed that the number of female-headships who involved in seed producer cooperatives was found to be very few in numbers, which accounted 14.3% in contrast with 85.7% of Male Headed Households. Though the land owning pattern between the male-headed households and female-headed households does not show variation, the other inputs like farmland size, adult labor, credit, extension, education, and saving are critical in drifting the Female Headed Households to have limited options in their livelihoods. The probit regression model analysis displayed that livelihood of household's increases by 21%, 4.5% and 61% when there is an increase of land size, credit access and saving amount on an average, respectively.

Conclusion: Thus, female headships are less participated and less benefited in seed producer cooperatives than Male Headed Households and they need attention so as to sustain their livelihoods.

Keywords: Seed producer cooperatives; Livelihoods; ISSD; Assets; Amhara National Regional State

Introduction

Agriculture is the core source of the Ethiopian economy, with more than 80 percent of the population depending on it for their livelihood. Mintewab and Mahmud confirmed that the agricultural sector also accounts for about 40% of national GDP and 90% of total exports [1]. The sector is mainly based on traditional way of farming and farmers are lacking access to productive agricultural inputs.

From the main productive resources, seed is a critical input in crop production and one of the most precious resources in farming. It is the basic unit for distribution and maintenance of plant population. The importance of improved seeds in boosting agricultural production is well recognized by agricultural scientists, farmers and development workers. Seed has to be available for every crop production cycle [2].

According to Joep more than 90% of all seed in Ethiopia including Amhara region is produced, selected and stored by farmers themselves [3]. This informal system is very important for food and seed security and is also crucial for the conservation of agro biodiversity. To this end, as Joep added, the engagement of farmers' cooperatives and unions, private seed producers and private seed companies in commercial seed production create conducive environment for enhancing agricultural productivity and food security status of farmers (Ibid).

Besides, most of the cooperatives hold much potential to empower economically weak women and men by enhancing their collective bargaining power in the market, thereby reducing the risks that they face in the market and enabling them to leverage enhanced market opportunities, and by building individual capacities, thus improving members' incomes, leadership skills, and overall socio-economic status [4].

There are many non-governmental organizations who work in assisting the capacity of farmer cooperatives. Integrated Seed Sector Development (ISSD) is one of the body works on strengthening informal and formal seed systems. It aims to enhance pluralism by matching food and seed security to private sector development. ISSD guides specific interventions in identified seed systems. It supports local seed businesses targeting crops for which improved varieties are available and supports local seed business and strives to strengthen these regional, national and international companies to produce and market quality seed of improved varieties of major food and cash crops [3].

Women's contribution in seed production is very significant. They have very decisive roles in some most farm operations of seed management including weeding, harvesting, preparing storage containers and transporting farm inputs to the field [2]. However due to unequal gender norms and relations, women have a lower socio-economic status, compared to their male counterparts, which limits their opportunities to access and participate in formal groups. Moreover, their restricted access to, control over, and ownership of land, credit, and information, as compared to men, disadvantage them from meeting conditions of formal group membership and leadership [5].

If women's have an access to participate in Seed Producer Cooperatives (SPCs), women can get the opportunity in promoting their livelihoods through various ways such as in job creation, changing their social status, maximizing their benefits, transforms

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their life style by incurring better incomes. When women are more economically and socially empowered, evidence shows that there are direct and positive impacts on women's household and community decision-making power and on access to and control over productive assets. These changes lead to improved household nutrition, food and income security, broader development outcomes [6]. Thus, this study focused on examining the seed producer cooperatives and livelihoods of members in Amhara region from gender perspectives.

Theoretical Framework

Theoretical framework is constructed under the assumption that the four variables, namely; household characteristics along with its components, membership and trainings, household assets and livelihood improvement are related to each other. It is assumed that household characteristics, memberships and trainings and household assets are independent variables, where as livelihood improvement is dependent variable as shown in Figure 1.

Description of the research sites

The study is conducted in Amhara National Regional State (ANRS) is one of the nine regional states of the Federal Democratic Republic of Ethiopia (FDRE). In geographic terms, the ANRS is located between $9^0 21`$ to $14^0 0`$, North latitude and $36^0 20`$ and $40^0 20`$ East longitude. The total area of the Amhara region is estimated to be 170,752 square kilometers. The region shares borders with Tigray region in the North, Afar and Oromia regions in the East, Oromia region in the South, and Benishangul region and The Sudan Republic in the West.

Amhara is divided into 11 zones, and 140 Weredas and 3429 kebeles. The 11 administrative zones are: North Gonder, South Gonder, West Gojjam, East Gojjam, Awie, Wag Hemra, North Wollo, South Wollo, Oromia, North Shewa and Bahir Dar City special zone.

The CSA's total population estimate for the Amhara region for 2008 is 20,136,000 with a fifty-fifty split between the sexes. Of these 2,408,000 (only 12%) are urban residents. The percentage of the urban population is below the national average. Particularly, the studies are from local seed producing cooperatives which were found in rural areas namely Woken, Marwoled, Gusha, Zabatsiyone, Kudime, Abay, Mekonta, Sirinka, Mangudo and Weyraamba which are found Debat, Womberima, Gushashukudad, Jabitahnan, Yilmanadensa, Debark, Alafa, Habru, and Moretna- Jiru Woredas in Amhara region, respectively.

Sources of data and methods of data collection

The researchers used both primary and secondary data for the writing of this paper. With regard to primary data, the researchers employed qualitative and quantitative methods of data collection so as to understand the unveiling main data. These were in-depth interviews, Focus Group Discussions (FGDs), structured questionnaires. Regarding in-depth interviews, it enabled the researcher to generate lots of information about individual's experiences, access to and control over resources, household situations before and after interventions, criteria to be membership, roles in cooperatives, and challenges faced. The kinds of informants included one male member, one female member, and one committee member from each sites and a total of 30 informants were interviewed.

The researchers together with the assistance of the agents of the projects identified groups of people who were thought to share similar types of experience. At least 6 of FGDs, which range from 6 to 8 participants, were held. The FGDs were held in combining female and male members of the cooperatives. About a total of 10 FGDs were undertaken in the study areas. The major information collected through this method included responsibility of members, major constraints, participation of women in cooperatives. The data collected with the help of structured questionnaires were socio-demographic of households, access to and control over resources, frequencies of trainings, and amounts of agricultural inputs used.

Several secondary sources of information from world, Africa and national experiences in the form of published and unpublished documents were used in this study to identify the seed production, livelihoods and gender.

Sampling techniques

Both probability and non-probability sampling techniques were used based on the nature of the instruments for primary data collection. The subjects of key-informant interviews and participants in community group discussions were selected using purposive sampling techniques based on their deep experiences and knowledge. Informants

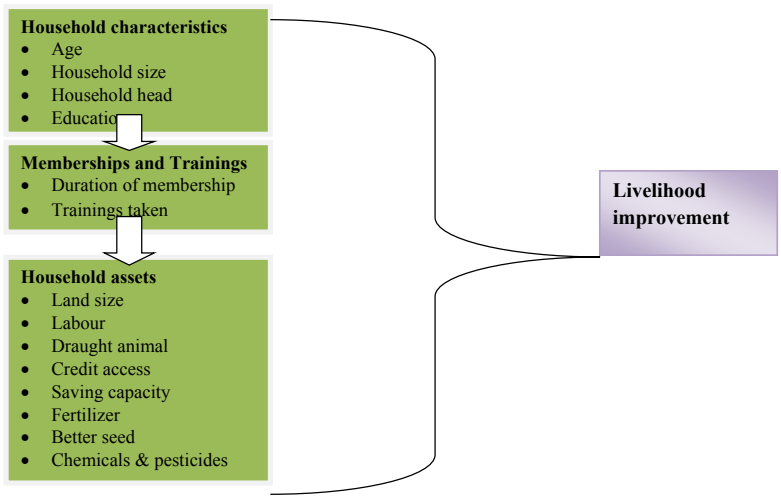

Figure 1: Theoretical framework.

were selected with the help of SPCs project experts, cooperative agents and development agents.

The first stage was the selection of study area. The study areas, which were 10 in numbers, were selected from Seed Producer Cooperatives (SPCs) through purposive sampling techniques since the project sites were already existed in Bahir Dar University ISSD of Amhara program. Five sites from LSB and five sites from partner organizations (Gondar University, Gondar Agricultural Research Institute, Sirinka Agricultural Research Institute, Debrebrihan University and Debrebirhan Agricultural Institute) were taken as samples. These were Woken, Adigsemilligasa, Mekonta, Sirninka, Kudmi, Gushashinkurta, Gudoberet, Weyramba, Makuma, and Zebatsion. The second stage was the selection of households. About 20 households were selected from each project sites using random sampling techniques. The researchers took 20 samples from each site and a total of 200 households from the lists of cooperative members in order to keep the proportion of sampling size and this in turn important for comparison purposes. However, at least 4 samples were missed.

Data analysis

Both qualitative and quantitative data analysis was employed. The perspectives and insights from the interpretations of qualitative and quantitative data were integrated to handle the research problem. In the survey questionnaire most of responses were pre-coded, and very few open-ended questions were reorganized and coded latter. Information obtained through in-depth interviews and FGDs translated into English language. Moreover, the tape recorded was transcribed into notebooks. Descriptive statistics, correlation and appropriate Probit regression method of analysis for quantitative data were used. Excel spreadsheet, Stata 12, and SPSS statistical (version 16) software were used for data management and analysis.

Findings and Discussion

Gender differentials in access to and control over household assets household characteristics from gender perspectives

Age: The age of household heads is one of the variables discussed under household characteristics dimension. The age of households matters in the overall performance of the family in such agrarian based society. Moreover, healthy and young age of household head and members make possible to secure household food availability through working in farming activities. This is especially true in case of FHHs, who are culturally banned to plough their farmlands.

The majority of MHHs (31.0%) and FHHs (39.3%) fell under the age group of 41-50. However, about 6.0% of MHHs are found at the age of greater than 61 while none is found in FHHs. Almost all FHHs are found in the age of active or working population. This implies that FHHs are in better status than MHHs in engaging in seed cooperatives although they are small in proportion.

Youssef and Hetler hypothesize that smaller household size leads to the inability of the household to draw upon human capital resources from within the household and this thereby lower the household income [7]. This could mean that the larger the family the higher is the human capital resource available for generating income. On the contrary, a recent article by White and Masset raises some interesting questions about the methodology underlying this received wisdom [8].

Empirical studies based on household surveys in developing countries have virtually always found a strong negative correlation between family size and per capita expenditure. As a consequence, according to these studies, poverty tends to increase with household size. But the finding that large households are poorer is in fact implicit to the methodology used to assess poverty. It is based on the rather implausible assumptions that all individuals consume the same amount of goods and that two or more persons living together consume the same as if they were living separately.

Accordingly, these findings appear to contradict the common assumption that larger households are generally poorer, mainly due to higher dependency ratios (particularly youth dependency, i.e., the number of children below working age in relation to productive adults).

Household size: Average household size of Amhara National Regional State according CSA is 4.8. Accordingly, about 42.9% of FHHs and 17.9% of MHHs bear less than the average size of the region respectively. While the remaining percentages of households fell above the average household size of the region. The reason for the smaller size of FHHs is, thus, that unmarried household heads usually do not have any children, and those who are widowed or divorced or separated are not likely to give birth to new children.

In the study area, the main causes for being FHHs include death of husband, divorce, desertion and never-married. Even though the causes for the formation of FHHs differ in extent of occurrence, they are part of the study communities.

Marital status: From the sample survey of 28 FHHs, the two most common reasons for being a female head of household are, understandably, married but the major breadwinners are females due to the disability or chronic illness of their husbands for more than three continuous months. The second one is widowhood. About 39.3% and 32.1% of the total respondents from FHHs are married and widowed, respectively.

Education: The other important variable in the household characteristics dimension is education of household heads. Education is central for rural development. It is an instrument for reducing poverty, improving the living conditions of rural people and building a food-secure world. Education is a basic right in itself.

About 23.8% of male-headed and 35.7% of MHHs is illiterates where as 16.7% of MHHs and 32.1% of FHHs have no formal education. Although MHHs are better than FHHs in overall educational achievements, communities' awareness to learn and access to education is very low in general. Lack of modern education in the study area affects the community in two ways: weaken farmers' creativity in the agrarian sector and creates phobia among farmers to accept modern technologies easily. That is why communities could not maintain food security in short periods of time. Moreover, from a socio-cultural viewpoint, in the rural areas where the traditional influence is greater, the attitude that education is unnecessary for girls who will only be involved in the home is strongly prevalent and culturally supported. Therefore, the social attitude towards girls' education as well as the culturally appropriate place for girls and women in the traditional life orientation greatly affects girls' access to and participation in formal schooling.

Memberships and trainings

Seed producer cooperative is one the cooperatives found in the rural areas important to produce varieties of seed in the study areas. Like other cooperatives, there are certain criteria to be members of seed producer cooperatives such as individual interests, adjacent plots, and capacity as mentioned by them during focus group discussion. Members have got some advantages to be members of seed producer

cooperatives like involving in trainings, access to better seeds, supports by extension workers, which in turn enhance their knowledge and skill to produce better seeds both in quantity as well as quality. The following table shows duration of membership and number of trainings taken by the members.

The majority household heads about 40.5% of MHHs and 42.9% of FHHs have been 3 to 4 years after joining the cooperatives. Regarding trainings, about 39.9% of MHHs and 39.3% of FHHs took trainings related to seed only once during three to four duration of membership. This is followed by 23.2% of MHHs and 21.4% of FHHs took trainings twice. However, 23.2% of MHHs and 17.9% of FHHs didn't get an access of trainings. As stated by informants during group discussions and interviews, the trainings were delivered unevenly and insufficient to improve their knowledge and skill in relation with seed. Moreover, the trainers lacked follow up of the efficiency of the trainees.

Asset distribution

Farmland size: Land[1] is considered as a vital element of rural life in the study areas. Such strong attachment of people's life in rural Amhara with the owning of farmland, according to Yohannes is due to its economic value [9]. In addition, land is status symbol, marriage criterion and identity marker of individuals in the community. Moreover, "Land particularly, healthy soil, is the foundation on which life depends. If the land is healthy, then agriculture and pasturage will yield food in plenty. If it is not, the ecosystem will show sign of strain and food production will become more difficult" [10]. The majority of peasants in the study area depend on rain-fed agriculture and lack of adjacent farmland discouraged the community members to be member of the cooperatives.

Regarding size of owned farmland, the maximum percentages of size of owned farmland by female-headed and MHHs is 33.3% and 39.3% respectively, which held 0.51 to 1 hectare and 1.01 to 1.5 hectare. The maximum size of land owned by both households was greater than 2 hectares of land. However, as mentioned by informants, their dependence on rain-fed agriculture hampered their livelihood sustainability since they didn't use irrigation schemes. As a result, they suggested that accessibility of irrigation trainings and technologies were timely issues.

Access to livestock: Livestock possession is important from three major aspects. These are access to oxen, draught power[2] and total livestock. Access to draught power holds significance value than other livestock since rural life is interrelated directly or indirectly with access to draught power. This does not mean that other livestock are not important. They are very useful to assure the food security status of households even though they are not as important as draught power. In conventional poverty analyses, livestock ownership is interpreted primarily as an indicator of wealth, savings in physical rather than financial assets, and access to livestock that are not owned by the household.

The most important productive animal in highland Ethiopia is oxen, which are used for ploughing. Oxen are the most important productive assets produced by farmers in the rural grain-plough mode of production. A pair of oxen is an indispensable input in crop production. Hence, ownership of oxen is an important indicator of the asset position of the rural households.

Shortage of oxen is one of the reasons that forces households to lease-out land. It delays the timely land preparation and planting if they depend on hired oxen, as they get them only after owners complete their own ploughing. This distribution of livestock possession by household heads is explained below.

The average livestock possessed by MHHs and FHHs reduced after joining seed produce cooperatives. Especially, the main draught animals such as oxen, mule, horse both in low land and high land areas of the region were seen good before the establishment of the cooperatives but alarmingly reduced after joining the cooperatives in case of both households. This might be focus on the production of seeds and the high price of these draught animals through time to time. Perhaps having formed a cooperative and using adjacent farmlands for production of seeds enabled them to use their livestock wisely and at the same time discouraged them to possess more draught animals than before. Another hypothesis lowering of draught animals after joining the cooperative was that since better seeds were a must to be member of the cooperative, the situation and their interest to join the cooperative changed their mind to sell their livestock and bought better seeds.

Agricultural extension: Financial assets include credits (whether formal, informal, or through NGOs), individual and group savings, rotating funds, remittances, and pensions wages, and earnings from the conversion or sale of other assets.

Credit availability, by increasing risk-taking capacity, increasing the ability to invest, and improving access to other productive inputs and assets, is very important for improving farm productivity and returns. In the study areas, people obtain credit from various sources or institutions such as 1) Amhara Credit and Saving Association (ACSI), 2) Productive Safety Net Program (PSNP), 3) merchants, 4) Non-Government Organizations (NGOs), and 5) Rural Saving and Credit Cooperatives (RSCC).

Equal proportion of MHHs had access and not-access to credits while the majority of FHHs (57.1%) had access to credits. The majority MHHs (49.4%) and FHHs (42.9%) did not show interests to take money from credit institutions. This was, according to the informants, happened due to fear of credit, high interest rate and lack interests. Regarding payment status of credits, the majority households, which accounted 75.6% of MHHs and 67.9% of FHHs, did not yet pay their credits.

Concerning saving capacity of households, 76.2% of MHH s and 78.6% of FHHs had capacities to save money in different ways. Based on this table, almost 28.6% of MHHs and 46.4% of FHHs were able to save less than Birr 1000. Only 10.1% of MHHs and 7.1% of FHHs tried to save more than Birr 10,000. However, MHHs were better and able to save more money than their counterparts.

The above institutions also provide credits not just on cash but also in kind. Credit availability, by increasing risk-taking capacity, increasing the ability to invest, and improving access to other productive inputs and assets, is very important for improving farm productivity and returns. Informants mentioned that repayment status of credits was either fully or partially depends on the capacity and interest of clients but it has limitations.

[1]The Ethiopian Constitution states that all land belongs to the state and peoples of Ethiopia and shall not be subject to sale or to other means of exchange (article 40.2 Proclamation No. 1/1995). Instead, usufruct rights are allocated to households who are recognized as *de facto* owners by their communities. Land ownership is defined here as land to which respondents have legal title recognized by their *kebele*, and on which they pay tax.

[2]Draught powers are livestock, which are important for ploughing of farmlands in the agrarian society. They can be oxen, donkeys, mules, horses that depend on the environment. However, in the study community oxen are decisive to cultivate farmlands.

Almost all households were used fertilizer to increase their productions although there were variations in frequency. The majority households, which accounted for 44.6% of MHHs and 50.0% of FHHs, were used fertilizer twice in a year. However, the majority number of MHHs (36.3%) used to the minimum 300kgs where as FHHs (32.1) used less than 100kgs. Moreover, both households were found in good status in using better seeds and according to the above table 77.4% of MHHs and 67.9% of FHHs used better seeds once in a year. The same is true in utilization of chemicals or pesticides, which accounted 56% of MHHs and 50% of FHHs respectively. This indicates members of seed producer cooperatives had good knowledge to use agriculture inputs so as to boost production. Furthermore, orientations given regarding use of agriculture inputs to members were found to be good.

They rarely attend meetings where demonstrations, information and advices are given. Since FHHs have often been in a position of relative unawareness and lack the recognition of their needs, they are thus unable to create an effective demand for their technology needs. In general, the above situations puts FHHs whether they like it or not to depend on MHHs.

Correlation of livelihood improvement with household characteristics, membership, trainings and resources

Correlation analysis was undertaken to see the degree of association of livelihood improvement to household characteristics, membership and trainings in seed cooperatives, and household resources. As mentioned Table 1, there are 21 variables run in the correlation analysis.

Household characteristics variable have significant association with livelihood improvement: such as age of the household heads (r=0.280), p=0.01) and household size (r=0.260), p=0.01) and education of the household head (r=-0.271), p=0.01). Age in this case determines the livelihood status of the household positively through the higher the age of the household head will have more experiences, knowledge and skill to understand the nature of the soil, season, and appropriate tilling practices so as to enable him/her to produce more production. In parallel with age, household size has also big contribution in improving the livelihoods of the household through sharing of labor. However, some argue that more number of household members enhances dependency of the household. Education of the household (r=271, p=0.01) head has strong association with improving of livelihoods of the household since educated individuals are easily familiarizing themselves with new technologies and agriculture extension programs than non-educated people.

During focus group discussion discussants raised that their income and livelihoods improved after joining the seed cooperatives as members and seed related trainings increased their knowledge to boost production. The findings are somewhat similar to the correlation matrix of the following table.

Table 2 displayed that being membership in seed cooperatives, duration of being membership including number of trainings taken in seed related issues have strongly associated with the livelihood improvement of the household. For example, year of membership (r=0.251, p=0.05), being membership irrespective of male (r=0.223, p=0.05) or female (r=0.131, p=0.01), and trainings taken (r=0.479, p=0.05) are positively correlated to livelihood improvement. This implied that households can diversify and maximize their livelihoods by joining such kinds of seed cooperatives Table 2.

People with different characteristics may have access to different sets of livelihood assets and resources which they can use to create a viable livelihood for themselves and their families. However, different individuals and households will have different levels of access to livelihood assets. The sort of livelihoods that people are able to create with these assets is affected by amount, balance and quality of assets.

As shown in Table 3, access to basic resource like land (r=0.332, p=0.05); fertilizer (r=0.276, p=0.05); better seed (r=0.139, credit access (r=0.172, p=0.01); and saving capacity (r=0.580, p=0.05) are fundamentals for having good livelihood sources and thus, here in this correlation, household assets have strong association with progress of livelihoods.

Probit model

The researchers identified dependent and independent variables. Dependent variable is a dummy variable i.e., 0 is livelihood improved,

	1	2	3	4	5	6
Age (1)	1.000					
Sex (2)	0.107	1.000				
Household size (3)	0.274**	0.205**	1.000			
Marital status (4)	0.196**	-0.316**	0.007	1.000		
Education (5)	-0.028	0.034	0.063	-0.081	1.000	
Livelihood improvement (6)	-0.280**	-0.012	0.260**	-0.024	0.271**	1.000

**Correlation is significant at the 0.01 level (2-tailed).

Table 1: Correlation matrix within and between household characteristics and livelihood improvement.

	1	2	3	4	5	6	7	8	9
Year of membership (1)	1.000								
Membership wife (2)	-0.015	1.000							
Membership husband (3)	0.193**	0.445**	1.000						
Membership both (4)	-0.197**	-0.104	-0.648**	1.000					
Training male (5)	-0.042	-0.234**	0.329**	-0.152*	1.000				
Training female (6)	-0.093	0.487**	-0.371**	-0.029	-0.523**	1.000			
Training both (7)	0.107	-0.136	-0.061	0.192**	-0.676**	-0.203**	1.000		
No of trainings (8)	-0.120	0.028	0.310**	-0.355**	0.153*	-0.086	-0.157*	1.000	
Livelihood improvement (9)	0.251**	0.131*	0.223**	0.115	-0.100	0.016	0.091	0.479**	1.000

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 2: Correlation between membership and trainings and livelihood improvement

	1	2	3	4	5	6	7	8	9
Land ownership (1)	1.000								
Land size (2)	0.205**	1.000							
Sharecropped/rented land size (3)	-0.325**	0.105	1.000						
Fertilizer (4)	0.079	0.043	0.022	1.000					
Better seed (5)	-0.116	0.155*	0.171*	0.291**	1.000				
Pesticides (6)	0.308**	0.120	-0.124	0.328**	0.358**	1.000			
Credit access (7)	-0.107	0.050	0.120	-0.079	-0.029	1.189**	1.000		
Saving (8)	0.043	-0.131	-0.014	-0.070	-0.124	-0.102	0.180*	1.000	
Livelihood improvement (9)	0.332**	-0.123	0.112*	0.276**	0.139*	-0.105	0.172*	0.580**	1.000

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 3: Correlation of household assets to livelihood improvement.

otherwise not, 1 where as independent variables comprise of household characteristics, seed membership and trainings and assets. Variables are coded and processed through STATA software. Depending on the attributes of variables, estimation is made probit regression model.

As stated in Table 3, for a household who is average on all characteristics, an additional one year age of the household head decreases the probability of the household's ability to improve his/her livelihood decreases by 11%. This is true that livelihoods are greatly affected by age and at older ages it will be very difficult to be productive enough since intensive work was expected in farming sector, which is so difficult for those old ages. However, some argue productivity increases while getting increase of age since lots of experience, knowledge and skill accumulated over time.

With one member increases in household size the probability of the household's ability to promote the livelihoods increases by 8.8%. This is due to high labor is needed in farming activities. The same is true in educational status of households. With an increase the status of education by one level, the livelihood of the household getting improved by 0.17% since the degree of accepted of new agricultural technologies to promote productivity is increased as long as individuals are getting educated.

Membership and trainings

Table 2 showed that being members in seed producer cooperatives and engaging in seed related technologies trainings encouraged members to live a better life since it maximizes their advantages in terms of accessing focus from the government and other bodies through obtaining of support in the form of agricultural inputs than individuals. As a result, whenever duration of membership and number of trainings increases by a year, their livelihoods also enhances by 7.6% and 9.8%, respectively.

Household assets

Household assets are decisive to maintain the sustainability of the household members. Households' ability to cope up any kinds of natural as well as human induced hazards depends on their accumulation of resources. Accordingly, as shown in Table 3, all assets are positively proportional to livelihood improvements of households. For instance, livelihood of households increases by 21%, 4.5% and 61% when there is an increase of land size, credit access and saving amount on an average respectively.

Conclusion and Recommendations

Conclusions

Farmer cooperatives can play a key role as representatives and speakers for individual farmers and link them with the 'external' world, including formal-sector service suppliers and markets. It is urgently needed to address the challenges in food security, livelihood well-being, natural resource management that faced countries like Ethiopia in general and Amhara National Regional State in particular. In the process of organizing themselves, farmers strengthen their individual and collective capacity, accumulate mutual trust, develop new identities, make their voices heard and improve their access to physical resources and financial capital. At the same time, this approach includes those who are excluded from the current development agendas, allowing them to strive for some choice instead of being told what to do and how to do it. Qualitative as well as quantitative findings showed that the number of female (female-headed households) who involved in seed producer cooperatives were found to be very few in number of FHHs were participated in SPCs, which accounted 14.3% of members of the cooperatives in contrast with 85.7% of MHHs although meaningful involvement of women farmers in the design, development and implementation of innovation processes are essential to stimulate collaboration and the creation of much-needed synergies. Though the land owning pattern between the male-headed households and female-headed households does not show variation, the other inputs like farmland size, adult labor, credit, extension, education, and saving are critical in drifting the FHHs to have limited options in their livelihoods. Thus, as a new emerging phenomenon, farmers' cooperatives are attracting much attention. Our research team appreciates their contributions to livelihood improvement and is trying to find better ways to support them.

Recommendations

The previous sections highlight the findings of the present research and it is stated that seed producer cooperatives are good sources of diversifying livelihoods although they have different status as per the nature of projects. In this section the researchers recommend some ideas for consideration in planning for the strengthening of the efficiency of the cooperatives in particular and creating resilience of female-headed households in general. Recommendations are given in two ways as follows.

1. Seed producer cooperatives are now considered as an engine for creating viable environment for diversifying livelihoods and improving the life of members on the whole. However, these cooperatives have been faced several challenges to address the problems of members. Therefore, emphasis should be given to:

1.1 Enhance the efficiency of the cooperatives through providing essential trainings in seed related issues to members in order to increase their productivity since numbers of trainings given to

members were fewer and suffer from irregularities as indicated in the findings.

1.2 Members of the cooperative can increase their production as long as they have an access to agricultural inputs like credits, better seeds, appropriate technologies and post-harvest technologies. So there is a need to avail essential services and technologies.

1.3 Most of the members raised the issues of markets and price fluctuation of their production as a critical problem. This affected the livelihoods of the members one way or another so that better market system should be established based on their interest.

1.4 Members of the cooperatives in majority sites relied on rain-fed agriculture for the production of seeds as a result this influenced their efforts to improve their livelihoods. Thus, irrigation should be practiced as a means to increase their sustainability of livelihoods.

1.5 Crop disease is one of the problems that influenced the production of the cooperative farmers and their livelihoods. Chemicals including pesticides and herbicides were not accessible to farmers as they need so that this needs much attention.

1.6 Seeds need better handling in order to preserve for long time; however, there was no suitable storage places, which was mentioned as a constraint by members of the cooperatives. Thus, members need training in relation with how to prepare better storages for seeds.

2. Promote participation of women in seed producer cooperatives since, according to the study; the numbers of female-headed households were few in number as compared to male-headed households. Thus, the researchers suggest the followings.

2.1 Special strategies should be devised to increase their number in cooperatives through adapting of easy criteria of joining the cooperatives like affirmative action done to employments.

2.2 Empowering females economically through provision of credits in the form of both in kind (fertilizer, better seeds, chemicals) and on cash enabled them to build their confidence to involve in cooperatives.

2.3 Communities, government and non-government organizations are responsible to encourage females to join the cooperatives through striving of the socio-cultural barriers.

2.4 Trainings in connection with increasing of awareness and sensitization of females in the communities are timely issues to avoid gender based inequalities in their participation in seed producer cooperatives.

2.5 Follow up of cooperatives particularly females members may help to reduce or solve their problems in advance. Thus, establishing of good monitoring and evaluation system is very essential.

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