

Full Length Research Paper

Agricultural knowledge, source and information system in central highland of Ethiopia

Beliyu Limenih

Socio-Economics, policy, Extension and Gender process, Ethiopia, Environment and Forest Research Institute 1, Addis Ababa, Ethiopia.

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The study aims to assess the effectiveness of the current agricultural information management system and communication, and the gap between required and available information to extension personnel at central highland of Ethiopia. Consulting with head of districts agricultural office, 5 to 6 farmers training center (FTC) from Welmera and Ejera districts were selected randomly. 92 development agents and eleven subject matter specialist who were working in each FTC and bureau of agricultural were interviewed. And researchers also collected qualitative data. For data analysis, descriptive statistics tools were used. In the study area, 75% of development agents (DAs) and subject matter specialist (SMS) got new and updated information frequently and occasionally. Even though, more than half of the respondents know the current extension packages that are developed by Ministry of Agriculture (MOA), they lack documentation. Moreover, development agents and subject matter specialist are less satisfied on promotional opportunity and rewarding system in their organization. The overall finding of the study underlined less availability of regular trainings on new agricultural technologies, less availability of promotional opportunities and rewarding system to DA and SMS, documentation and fewer office equipment problems at FTC level in the area. Therefore, agricultural research center and Ministry of Agriculture should provide problem solving trainings on new agricultural technologies and media design techniques regularly, reconsider salary, promotional opportunities and rewarding system of DA and SMS, supervision of documentation system at FTC level, and furnishing FTC office would help to improve the current agricultural information system in the area.

Key words: Development agents, agricultural knowledge, farmers training center, source of information.

INTRODUCTION

Agricultural information system can influence agricultural production and productivity in different ways. It can help inform decisions regarding land, labour, livestock, capital and management. According to Rolling (1998), an agricultural information system is generated, transformed,

transferred, consolidated, received, and fed back in such a manner that these processes function synergistically to underpin knowledge utilization procedures.

Agricultural productivity can arguably be improved by relevant, reliable and useful information and knowledge.

E-mail: beyebebe@yahoo.com.

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Hence, the creation of agricultural information (by extension services, research, education programs and others) is now often managed by agricultural organizations that create information systems to disseminate information to farmers so that farmers can make better decisions in order to take advantage of market opportunities and manage continuous changes in their production systems (Demiryurek et al., 2008). Supporting this, Vijayaragavan and Singh (1997) and Halim and Rosa (2017) consider that management information system in the agriculture can help farmers to:

- (1) Plan the effective resources to cultivate the land and its crop
- (2) Choose the best alternatives to produce and take part in the cultivation
- (3) Manageable day to day operations for processing the land.

Ethiopia is one of the developing country; agriculture is seen as the backbone of the economy. The government of Ethiopia has planned different strategies to improve the agriculture sector in the country. Some of the strategies are opening vocational agricultural training centers, recruiting different field development agents in each peasant association and building the capacity of agricultural officers are some of the strategies to improve the agricultural sector in a country.

Development agents and subject matter specialist personnel can get agricultural information from different source and use it to improve the production system of farm households. Agricultural productivity can arguably be improved by relevant, reliable and useful information and knowledge (Demiryurek et al., 2008).

To manage and improve the current agricultural information system there is a need to understand the source, availability and use of agricultural information. So, this study deals with assessing the effectiveness of the current information management system and communication, the gap between required and available information to extension personnel, major bottlenecks in the process of agricultural information management, and to suggest possible options on how effective and efficient information management and chain could be developed in welmera and Ejera districts.

METHODOLOGY

A multi stage sampling procedure was employed to select respondents. Welmera and Ejera districts were selected purposively. Consulting with head of districts agricultural office, 5 to 6 farmers training center (FTC) from Welmera and Ejera districts were selected randomly. The questionnaire was pre-tested before administering on the selected sample agricultural personnel's. Depending on the findings of pre-tests, some modification was made on the final version of the interview schedule. Nineteen two development agents and eleven subject matter specialist who are working in each FTC and bureau of Agricultural were interviewed. By using descriptive statistics, quantitative data types were

analyzed and qualitative data also interpreted.

RESULT AND DISCUSSION

Required and available information to extension personnel

In the study area, 75% of development agents (DAs) and subject matter specialist (SMS) had new and updated information frequently and occasionally (Table 1). Specifically, all respondent got information on new varieties, crop protection, agronomic practice, acid soil and saline soil management, watershed management, harvesting and post-harvest tools, and marketing respectively. On the other hand, 86.2, 90.3, 85, and 77.7% of respondents got information on relevant trainings, agricultural research station, non-governmental organization (NGO) and agricultural offices. In addition to that, 82.7 and 51.5% of respondents mentioned that the information gotten were not relevant, and were not available. However, 71.2, 63.6 and 52.5% of them revealed that the information gotten was easy to understand, delivered on time and relatively complete (Table 2). From this study, it was observed that development agents are working in an office that is not well furnished. And they lack the necessary skill to prepare materials that will be easily understood by farmers. Generally, the collected information's from different development agencies are less valuable to change the agricultural practice of farm households.

Information storage and processing

To sustain the agricultural information and knowledge transfer among experts, each information should be filed and documented in an appropriate way. Even though more than half of the respondents knew the current extension packages that are developed by Ministry of Agriculture (MOA), they lack filing in an organized ways (Table 3). According to Table 3, 58, 41.1 and 20.7% of the respondents response were documented in a note book, filed in FTC, and the original publications from the source were kept. Consequently, the aim of achieving fast agricultural development in a country would become lager and inconsistency. The aim of organizing consecutive training to development agents is to equip them to change the living standard of farm households. And it is assumed that each development agents transferred the knowledge they acquired by using different teaching methods. According to Table 4, more than 90% of agricultural experts used training, demonstration, field visit and village meeting as methods of information sharing to farmers. More frequently, they used village meeting as information sharing methods per season. Using village meeting more frequently would encourage farmers to accomplish each activity through participation and with common understanding.

Table 1. Type of information's available.

Information about	Almost always	Frequently	Occasionally	Rarely	Almost never
New varieties, seed and seed management	16	1	12	1	-
Major crops protection	13	15	1	1	
Agronomic practices	12	7	10	1	-
Animal husbandry	10	6	8	5	1
Forage production	5	3	17	3	2
Disease control	3	6	15	3	3
Use of AI	1	5	7	14	3
Cross-bred cows	4	6	8	9	3
Fattening	6	13	8	2	1
Soil conservation practices	5	15	5	2	3
Irrigation management	3	14	10	2	1
Acid soil management	10	6	4	10	
Saline soil management	2	12	4	12	
Vertic soil management	3	8	9	5	5
Seedling Nursery management	5	13	9	2	1
Forest Plantation management	2	11	15	1	1
Forest utilization	2	8	11	5	4
Water shed management	3	12	6	9	
Natural Resources management	6	14	8	1	1
Pre-harvest farm tools and use	2	9	6	9	4
Harvest farm tools and use	6	9	9	6	
Post-harvest tools and use	7	5	12	6	
Prices of commodity	2	8	9	6	5
Market demands	6	6	9	9	
Promotion of group marketing	3	4	12	5	6
Marketing strategies	3	3	6	12	6

Table 2. Methods of getting new information about agricultural technologies.

Source of information	Frequency (%)	
	Regularly	Irregularly
Do you get trainings relevant to your job?	24.1	86.2
Agricultural office	22.5	77.7
NGO	15	85
Agricultural Research station	9.7	90.3
Agricultural universities	42.9	57.1
Relative quality of information	Yes (Regularly)	No (Irregularly)
Availabilities	48.5	51.5
Completeness	52.5	47.5
Timeliness	63.6	36.4
Relevance	17.3	82.7
Easy to understand	71.2	28.8

Perceptions on agricultural information management

Every professional has his own perception towards availability, access of information/training and improved agricultural technologies given by other organizations.

Agricultural development and subject matter specialist evaluated the current information management system in their organization. According to Table 5, 41.7 and 75% of the respondents got adequate information for their extension work and early access to some useful

Table 3. Documentation.

Knowledge	Percentage	
	Yes	No
Do you know the current extension packages that are developed by MOA?	62.1	37.9
Do you have them in a written documents	51.7	48.3
Method of documentation		
In the note book	58	42
Information file in FTC	41.4	58.6
Keep the original publications from the source	20.7	79.3

Table 4. Methods of information sharing to farmers (2012/13).

Variable	Methods (%)		If yes, how many times per year you undertake?/score /
	Yes	No	
Training	100	0	89
Demonstration	98	2	47
Field visit/days	95	5	29
Village meeting	95	5	278
Prepare poster/leaflet	40	60	22
Visual (picture, drawing)	15	85	18
Discussion with individual farmers	98	2	367

Table 5. Perceptions on agricultural information management.

Variable	Percentage	
	Yes	No
Do you think that you get adequate information for your extension work?	41.7	58.3
Do you think you can early access some of the useful agricultural information from research and other institution?	75	25
Do you think you can adapt /modify the information you got from different sources in to easy forms that can be understood by farmers?	100	-

information from research center and other institution. Even if respondents have different perception on agricultural information system, all the respondents had the ability to customize the information gotten for easy understanding. Regarding improved agricultural technologies, development agents and subject matter specialist had reflected on their attitude in different ways. According to Table 6, more than 40% of respondents had strongly agreed on issues mentioned on 2nd, 3rd and 10th. Similarly, on issues of 'using improved agricultural technologies is rewarding' and 'improved agricultural technologies fit well in our existing conditions and practices', 67.9 and 46.4% of them disagreed. On the other hand, 57% respondents disagreed on 'there are ample choices of improved agricultural technologies for farmers of the area'. Generally, agricultural experts agreed on improved agricultural technologies would help to achieve fast agricultural development. But they pointed out less availability of technologies choices in the area.

Job satisfaction, motivation and commitment

Job satisfaction

From the sampled respondents, 53.6, 57.1 and 53.6% of the respondents were highly satisfied regarding 'the recognition given to their work and profession in the work place and in the community', 'with the effective total time you devote to your profession' and 'with being recognized as professional expert in your field' issues (Table 7). On the other hand, agricultural experts are slightly dissatisfied on 2nd, 3rd and 6th issues. This issue includes being less satisfied on promotional opportunity and rewarding system in their organization.

Job autonomy

It is believed that every profession should develop their

Table 6. Extension workers perception on improved agricultural technologies.

Variable	Perception (%)				
	Strongly disagree	Disagree	neutral	agree	Strongly agree
Using improved agricultural technologies is rewarding	-	7.1	25	67.9	-
I feel that existing improved technologies play crucial role in addressing our priority problems	-	3.6	-	42.9	53.6
I feel that I know adequate improved technologies to improve production/productivity & income of farmers	-	21.4	7.1	25	46.4
Improved technologies do not incur additional cost and labour than their local counterparts	10.7	25	7.1	28.6	28.6
Improved agricultural technologies fit well in our existing conditions and practices	10.7	-	7.1	46.4	35.7
Improved agricultural technologies are within the reach of resource-poor farmers	10.7	25	7.1	28.6	28.6
Improved technologies are not technically sophisticated and difficult to put into practice	10.7	32.1	7.1	32.1	17.9
There are ample choices of improved agricultural technologies for farmers of the area	3.6	57.1	10.7	10.7	17.9
Use of improved agricultural technologies does not involve too much risk.	3.6	32.1	7.1	35.7	21.4
The use and benefits of improved agricultural technologies will be sustainable in the long run	3.6	7.1	-	42.9	46.4
Improved agricultural technologies are within the reach of resource-poor women farmers	14.3	32.1	7.1	28.6	17.9

Table 7. DAs and SMS job satisfaction.

How much satisfied are you?	Perception (%)				
	Highly satisfied	Moderately satisfied	Neutral	Slightly dissatisfied	Highly dissatisfied
With the flexibility given by your supervisors to do your job well	32.1	39.3	10.7	7.1	10.7
With your present position when you compare it to a similar other position/ profession	32.1	14.3	14.3	21.4	17.9
With the programme you are carrying out towards the goals you set for yourself in the present position	25	42.9	7.1	17.9	7.1
With the recognition given to your work and profession in the work place and in the community	53.6	28.6	7.1	14.3	
With the effective total time you devote to your profession	57.1	21.4	7.1	14.3	
With that of promotional opportunities and reward system in your job	35.7	25	14.3	17.9	7.1
With that of you being recognized as professional expert in your field	53.6	35.7	7.1	3.6	
With the present position when you consider the expectation you had when you took up this job expectation	17.9	14.3	10.7	10.7	-
With the work you are carrying out in your position	25	42.9	25	3.6	3.6

job carrier by taking different kinds of training. Trainings would help the employee to accomplish

their day to day activities independently and efficiently. As shown in Table 8, 64% of the

interviewed agricultural experts said something about scheduling their own work. Even if they

Table 8. Job autonomy.

Statement	Perception (%)				
	Highly agree	Agree	Neutral	Disagree	Strongly disagree
I have almost no 'say' about scheduling my work	3.6	7.1	3.6	64.3	21.4
The work and procedure of my organization are all laid down by me	10.7	39.3	7.1	35.7	7.1
I have almost 'say ' about all scheduling of my work	28.6	60.7	-	7.1	3.6
I can decide what procedures to be used	35.7	42.9	3.6	10.7	7.1

Table 9. Organizational commitment of DAs and SMS.

Issue	Statement	Perception (%)				
		Almost always	Frequently	occasionally	Rarely	Almost never
1	I am willing to put a great deal of efforts to help my organization be successful	75	25	-	-	-
2	I used to talk about my organization a great organization to work for	53.6	25	14.3	7.1	-
3	I feel little loyal to my organization	-	7.1	3.6	10.7	78.6
4	I would accept almost any type of job assignment in order to keep working for my organization	60.7	21.4	10.7	7.1	-
5	I find that my values and values of the organization are similar (I have values that are shared by my organization)	53.6	35.7	10.7	-	-
6	I am forced to tell others that I am part of my organization	75	14.3	10.7	-	-
7	I would just as well be working for a different section/department as long as the type of work is similar	60.7	21.4	10.7	3.6	3.6
8	My organization really inspires me to perform well in my job	14.3	14.3	39.3	25	7.1
9	A very little change in my present circumstances can cause me to leave my organization	17.9	7.1	28.6	35.7	10.7
10	I am extremely glad that I chose this organization to work for over others	21.4	28.6	17.9	28.6	3.6
11	There is not too much to be gained by sticking with this organization indefinitely	14.3	14.3	35.7	32.1	3.6
12	Often, I find it difficult to agree with the organization on important matters relating to it's employees	7.1	17.9	39.3	28.6	7.1
13	For me this is the best of all organizations for which to work	60.7	21.4	10.7	3.6	3.6

have a say on scheduling there day to day activities experts reported that they are a little bit overruled by assignment. This might lead the professionals to become less efficient and productive on their career.

Organizational commitment

Every organization wellbeing highly depends on the availability of committed and motivated worker. And workers commitment would lead the organization to contribute more to needy citizens in a country. Since agricultural workers are directly linked to farmers, their commitment on organization vision, mission and goal play a great role for food security and poverty alleviation in a country. According to Table 9, 75, 78.6 and 60.7% of

workers are seen to be making efforts to help their organization, being loyal and working for a different section/department as long as the type of work is similar. Similarly, more than 60% of respondents always feel they are trying their best. Moreover, as indicated in the 9th issue, more than 30% of workers would not change their organization even if little change occurred in an organization. On the other hand, 39.3% of them occasionally feel their organization does not inspire them to perform well in an organization.

Conclusion

The aim of organizing consecutive training for

development agents is to equip them to change the living standard of farm households. And it is assumed that each development agents transferred the knowledge they acquired by using different teaching methods. However, training delivery system to development agents is not persistent. Even if the information's collected from different development agencies are presented in a simple manner they are still found to be less relevant to change the agricultural practice of farm households. Moreover from the study observation, majority of the development agents are working in an office that is not well furnish. And they lack the skill to prepare the information in a more easy and attractive ways to the surrounding farmers. To improve these scenarios, different media designs techniques have played a great role to transfer information's in an easier way than written and oral form of transferring information. Some development agents are also less satisfied by promotional opportunities in their organization. This disaffection made the current agricultural information system less smoother. Generally to improve the current agricultural information system conducting problem solving trainings on new agricultural technologies and media design techniques regularly, reconsider salary, promotional opportunities and rewarding system of DA and SMS, supervision of documentation system at FTC level, and furnishing FTC office would help to improve the current agricultural information system in the area.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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