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Original Research Article

Extension Events Used by Farmers in the Process of Improved Agricultural Technology Transfer: The Case of Sidama Region, Ethiopia

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Abstract: In agriculture, the role of agricultural information cannot be over emphasized in enhancing the agricultural development. Information is crucial for increasing agricultural production and improving marketing & distribution strategies. Agricultural extension has a strong reliance on information exchange among farmers. This study examined Farmers perception on the effectiveness of extension events in the process of improved agricultural technology promotion the case of Sidama region and employing a simple random sample strategy as well as a purposeful sampling technique to choose the research region and 160 respondents' farmers from study area were selected. The study showed the perception of farmers on the effectiveness of extension events in disseminating agricultural information to farmers. The majority of the farmers confirmed method of demonstrations (60.6%), training (46.1%), and farm visits (17.6) as very effective extension events to adopt new and improved agricultural technologies. However, (26.7%), (21.2%), (20.6%) (16.4%) of the farmers on the ADPLAC, FRG, use of extension materials and review meetings respectively rated as very ineffective extension events to utilize the technologies and also a positive and significant relationship between the effectiveness of extension delivery channels with a level of education, gender, membership on FRG, and trainings.
Keywords: Extension events, effectiveness, Farmer perception.

INTRODUCTION

In Ethiopia, agriculture accounts for 33.3% of the country's GDP, 80% of jobs, 70% of industrial inputs, 85% of its food supplies, and 81% of its foreign income (Girma *et al.,* 2022). Agriculture extension services are essential for encouraging the adoption of new farm technologies to boost productivity. In recent years, Ethiopia has made significant investments in its agricultural industry, including in the largest public agricultural extension system in Africa (Berhane *et al.,* 2018). The majority of Ethiopian farmers continue to use outdated agricultural methods that result in low yield. Governmental and non-governmental organizations have worked to implement change through an agricultural extension strategy in order to address these issues (Tegene *et al.,* 2023). Communication has been acknowledged as a crucial element for achieving agricultural development goals and is considered one of the triggering factors for promoting (Tegene *et al.,* 2023) and based on empirical data, farmers and a wide range of other development players share information often in order for agricultural development initiatives to be successful. According to Rodriguez and Andrade, (2018) and Masambuka-Kanchewa *et al.,* (2020), development cannot be accomplished unless all parties are committed to resolving the issues with development at the local levels. The agricultural research and extension system includes farmers, research, and extension. All three groups are connected; hence it is important to control communication during extension events. Researchers provide new technology to extension agents, who then use them to help farmers. Farmers then talk to the extension agents about issues with their farms, and the agents then relay those issues to the researchers. The ability of the research system to transfer agricultural innovations to the extension system and the ability of the extension service to promptly provide feedback to research are both promoted by investing in developing and strengthening research-extension links, according to (Argaw *et al.,* 2023). An effective linkage between research and extension is important to ensure that research and extension programs are relevant to farmers' needs and problems. The roles of agricultural researchers and extension specialists in the generation and transfer of technology are complimentary. Their success is

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dependent on how well communication channels between research, extension, and farmers are functioning as partnership mechanisms.

The extension events are the concrete process, regular event, and arrangement that span the communication gap between actors (Roling, 1989). Currently EIAR identified and used number of extension methods which could be make strength linkages between research and extension to facilitate technology promotion. Effectiveness of linkage mechanisms (extension events) to the farmers is achieved through regular feedbacks to researchers (Rathore *et al*., 2008). Disseminate agricultural technologies for improving productivity, farmers' welfare and household nutritional status (Fabiyi, 2015). The performance of the agricultural sector has been severely impeded by inadequate agricultural extension services, and one of the key issues with Ethiopian agricultural extension services was the slow rate of dissemination of available research findings to farmers (Berhane *et al.*, 2018). Participatory methods for developing and transferring technologies that are appropriate for farmers. For the purpose of disseminating and promoting improved agricultural technology, on-farm and on-station experiments, training sessions, field days, and ADPLAC meetings should all be evaluated and prioritized (Kassa and Alemu, 2016). Inviting farmers and extension workers to review meetings, training stakeholders, conducting on-farm research, method demonstrations, field days, and creating and using extension materials are just a few of the extension approaches that have been established. These methods guarantee technology transfer and adoption since farmers actively participate in the various extension event procedures (Oyetunde-Usman, 2022). This study's main objective was to evaluate the farmers' perceptions of the value of extension activities in the Ethiopian region of Sidama. The Specific objectives were to describe the socio-economic characteristics of farmers in the study area, identify the extension events used by farmers and examine the farmers' perception of the effectiveness of the extension events.

METHODS AND MATERIALS

The study was conducted in Sidama region, Ethiopia. Purposive sampling technique was used to select the study area and simple random sampling technique also used to select respondents in the study area. 160 respondent farmers were selected randomly in the study area. This gave perceived effectiveness of extension events and technology transfer methods with researchers and extension workers with the aid of questionnaire validated by researcher judgment. The results showed that the perception of farmers on the effectiveness of extension events to disseminate agricultural information to farmers. Five-point Likert type scale was used to measure this effectiveness, with values ranging from 1 for very ineffective to 5 for very effective. Data from the questionnaires were analyzed through the use of descriptive statistics, such as frequencies, percentages, means, as well as t-test. Respondents perceived effectiveness of extension events was measured in a five-point rating scale of very effective (5), effective (4), somewhat effective (3), little effective (2) and not effective (1).

The Specific objectives were to describe the socio economic characteristics of farmers in the study area, identify the extension events used by farmers and examine the farmers' perception of the effectiveness of the extension events. Extension effectiveness indicators are used to assess the effectiveness of extension personnel. Hence, extension effectiveness may be determined by the level of awareness of extension services created among the farmers, number of visits paid by the village extension worker, percentage of scheduled meetings held between farmers and extension workers, number of field meetings held, regularity of meetings held by village extension worker, number of field days organized by village extension worker , monthly or quarterly, etc., number of demonstrations organized by the village extension worker within specified time frame (monthly, quarterly, annually), number of supervisory visits, number and regularity of research-extension linkage workshops and farmer training sessions/farmers trained. For this study the data was collected through face-to-face interview with farmers by means of interview schedule and through focus group discussions which was validated and pilot tested to ensure its reliability. Seven independent variables were selected based on previous study namely: sex, age, farmer category, literacy level, training access on the extension methods, experience on the extension events and land size. To calculate the level of agreement on the effectiveness we use five-point likert scale as, very effective, effective, somewhat effective, little effective and not effective.

Agricultural information sources

Bala and Sharma (2008) suggest that farmers and extension experts should have the latest information regarding new farming recommendations and improved technologies, different farmers and agricultural experts use different sources for seeking information (Okunade, 2007). In our case the most commonly used sources of information/ extension events field days, trainings, meetings, membership with cooperatives/farmer research group, use of extension, printed materials and result and method demonstrations.

RESULTS AND DISCUSSION

Status and process of extension events in the study area

Wondo genet agricultural research center is one of centers in Ethiopian institute of agricultural research in the country. It had conducted agricultural technologies demonstration in different districts of the country. The center demonstrating and scaling up of improved technologies by using different extension methods like, providing trainings, conducting demonstrations, field

days and organizing farmers in to research groups. According to the respondents, the existing types of extension events are appropriate to transfer new technologies. In addition, researchers communicate with extension workers and farmers only when researchers have new research output. Furthermore, their linkage is normally established on the basis of trainings, demonstrations and field days. However, there is no formal partnership between development agents and researchers. So far, researchers not involve extension workers and farmers on review and ADPLAC meetings and on technology trails. The criterion is based on frequently implemented and involved extension events/linkage mechanisms was rated as very effective and showing active participation and more benefited on the event. The findings confirmed that farmers ranked method demonstrations, farm visits and trainings as very effective extension modality to communicate with farmers and transfer improved technologies. The result was in agreement with Lemma and Tesfaye (2016) report and Doamekpor, 2005 study is in Ghana.

BACKGROUNDS OF RESPONDENTS

Among the respondents, the average age was 29 years; with 90% were men farmers. Majority of respondent farmers (56.9) can read and write which positive impact on the use of extension material. The remaining 15% were can't read and write where as 13.1%, 10.6% and 4.4% were primary, secondary and graduated respectively. 53-6% of farmers indicated having one to five times experience on the participation of extension events.

Table 1: socioeconomic characteristics of respondents

	Categories	Respondents (%)	Mean
Gender	Women	10	1.10
	Men	90	
Age	<30	3.1	2.83
	30-40	42.5	
	41-50	26.9	
	51-60	23.1	
	>60	4.4	
Farmers Type	Beginner	20	1.98
	Middle	62.5	
	Model	17.5	
Literacy Level	Can't Read And Write	15	1.33
	Read And Write	56.9	
	Primary	13.1	
	Secondary	10.6	
	Graduated	4.4	
Training Access	No	38.1	0.62
	Yes	61.9	
Experience	No Experience	22.5	1.04
	1-5	53.8	
	6-10	20.6	
	>10	3.1	
Land Size	<0.25	8.8	2.73
	0.25-0.75	42.5	
	0.75-1.5	22.5	
	1.5-2	19.4	
	>2	6.9	

Farmers' perception on effectiveness of extension events

The perceived effectiveness of extension services was determined using different variables derived from different woreda of sidama region farmers. The results of the farmers' perceived effectiveness of public extension services in the study area are presented in Table 2. The scoring of the extension events used by farmers was made by using a 5 point Likert scale and ranked according to their effectiveness. Result in Table 2 shows that participation on demonstration (=3.68) was perceived by the respondents to be highly effective method in transmission of information to the farmers and ranked first. By participating on result and method demonstrations, a farmer can adopt more technologies than is possible. Getting trainings (=3.18) was agreed by the respondent to also be effective method and ranked 2nd. Participation on the field day celebration (=2.99) was ranked 3rd most effective method in transmitting information to the farmers. On farm trails (=2.66), printed extension materials (=2.10), membership on FRG (=2.05), participation on review meetings (=1.44) and participation on the ADPLAC (=1.3) were ranked 4th, 5^{th}, 6^{th}, 7^{th} and 8^{th} respectively in information transmission to the farmers. The result is in agreement with the work of Okoedo-okojie, and Okon (2013) in

Nigeria. These findings are also in accordance with those of Chaudhry *et al.* (2008); Edeoghon *et al.* (2008); Nosheen *et al.* (2010) who found that other farmers, friends and relatives were the most significant sources of information used by the farmers to get information on sustainable agricultural practices.

Table 2: Farmers' perception and its rank on effectiveness of extension events

No.	Statements	Mean	Rank
1	Farmers participation on demonstrations of new technologies	3.68	1st
2	Agricultural Trainings of farmers	3.18	2nd
3	Participation on field days	2.99	3rd
4	Jointly conduct of on-farm trails	2.66	4th
5	use of printed extension materials	2.10	5th
6	Membership on FRG	2.05	6th
7	Farmers participation on review meeting	1.44	7th
8	Participation and membership on ADPLAC	1.30	8th

The data in Table 3 shows a positive and significant relationship between effectiveness of extension delivery channels with level of education, gender, membership on FRG and trainings. Table 3 indicates that level of education, gender, membership on FRG, and training were significant and explained 8.5%, 8.2%, 6.9% and 4.8%, of the effectiveness of extension delivery channels respectively. This means that the higher the level of education, men farmers, participation on FRG and capacity building contribute to the more the effectiveness of the extension delivery channels. Boz and Ozcatalbas (2010) found educational level to have significant effect on the use of modern information channels. The ineffectiveness of other delivery channels could be due to the literacy demand, and low experience and inadequate trainings.

Educational level

The relationship between education of the respondents and their effectiveness of extension events had highly significant. The positive relationship indicates that with the increase in the educational level of the farmers, there was an increase in their effective utilization of agricultural information's. The results of the present study are in line with those of Katungi (2006) who found in his study "gender, social capital and information exchange in rural Uganda" that more educated farmers had more access to information.

Membership on farmers' research group

Based on the results, respondents indicated that the main factor in improving the farmers' technology adoption was participation of beneficiaries in related research trail and demonstrations. The result is consistent with Blay (2007) that sustainable agricultural management requires a long term approach which emphasizes on participation of beneficiaries.

Trainings

Respondents indicated that trainings were the most effective method in improving agricultural technology adoption. The result is in accordance with study by Okunade (2007) in which trainings is better equipped through capacity building. There is need for more training and motivation to change the attitude of farmers about improved agricultural technologies and enhance their role in the process of technology transfer and adoption.

Table 3: respondent's characteristics and their influence to perception on effectiveness of extension events

independent variables	Coefficient β	SE	t-value	P(significance)
Gender	.585	.111	-.547	.045**
Age	.053	.251	1.054	.093
Membership on FRG	.347	.105	2.781	.005**
Education	.153	.034	1.435	.010**
Training	.329	.123	2.877	.048**
Farming Experience	-.054	.135	.948	.120
land size	.106	.031	1.624	.132

Note: ** significant at 95% significance level

Source: own survey, 2021; Note: * significant and ** insignificant at 95% significance level

Scale: 1(very ineffective), 2(ineffective), 3(somewhat effective), 4 (effective) and 5(very effective).

CONCLUSION AND RECOMMENDATIONS

It can be concluded that most of respondents were middle age, had education can read and write, farming experience up to five years, and had land holdings between 0.25-0.75ha per household. The field days were the major sources of agricultural information, followed by demonstrations and trainings. Maleness, training access, Farmers' educational levels and membership on FRG were found to influence their effectiveness on the extension events, while land holding, age and farming experience had no relationship on their effectiveness of extension events. This was

revealed by the farmers' responses, who showed a high level of participation in the effectiveness of extension events. Review meetings, ADPLAC, FRG, and the use of printed extension materials all received very low ratings for their effectiveness as technology adoption events. On the other hand, there was a positive and significant relationship between the effectiveness of extension delivery channels and the level of education, gender, FRG membership, and trainings, implying that the higher the level of education, men farmers, FRG membership, and capacity building contribute to the effectiveness of extension delivery channels. The current study suggests that, for extension and advisory services to be effective, extension agents should render relevant, good quality services and provide through participation of Farmers on demonstrations of new technologies and Trainings of farmers that improves agricultural production and facilitates access to the technologies required by farmers. Again, farmers' level of education, gender, FRG membership, and trainings, should be identified as underlying factors to develop detailed survey instruments that measure the effectiveness of public extension and advisory services.

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