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REVIEW ARTICLE

Historical Evolution of Agricultural Extension Service Approach in Ethiopia - A Review

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ABSTRACT

Ethiopia, as one of the countries found in the region, shares the broad characteristics of agriculture in the Sub-Saharan Africa region. Agricultural extension service approach is a bedrock of agricultural development since it contributes to make extension services clear for the development of the skill and knowledge of farmers to adopt new and improved technologies. The general objective of this paper is to review the historical evolution of agricultural extension service approach in Ethiopia. Ethiopia agricultural extension work was started in 1931 with the establishment of the Ambo Agricultural School. The first comprehensive package Chillalo Agricultural Development Unit project was established in the Arsi region that was employed the "Model farmer" approach until 1975. The farmers' field school, general agricultural extension, commodity specialized, training and visit approach, farming system development, participatory approach, project approach, and the cost-sharing approach were reviewed in the paper. The historical review reveals that extension service system approaches in the past country has not been participatory in its nature. In the past, the agricultural extension service approaches, except PADETS, were based on donor funding. Until 1991 regarding on agricultural extension, different approaches mostly work with commercial farmers with exclusive stallholder farmers. Furthermore, the reviews indicate that past approaches give emphasis on high agricultural potential areas with focusing on crop production, particularly cereals. The review shows that the current extension service approach encourages different stakeholders including the beneficiary farmers. However, the existing extension service approaches need critical evaluation with the farmers.

Key words: Agricultural extension, agriculture, approach

INTRODUCTION

Agricultural extension services are the bedrock of agricultural development; however, the development of the sector cannot be achieved without an efficient and effective extension system. Thus, there is a need for a well-articulated and comprehensive agricultural extension policy, which depends on decentralization and pluralism to develop agricultural extension systems.[1]

In Ethiopia, agriculture is the main source of livelihood and the basis of the national economy, accounting for 41% of the country's gross domestic product. Approximately 85% of the population lives in rural areas, relying on subsistence farming with <1 ha available for cultivation while accounting for 95% of the country's agricultural production.[2,3] The major food crops grown are cereals, which constitute the primary diet for most of the population.[3] Livestock further plays an important role since Ethiopia holds the largest livestock population in Africa and the majority of smallholder farmers depend on animals for cultivation, draught power, and transportation of goods.[4] However, agricultural production and productivity from smallholder farming have been very low and inadequate to feed the growing population in the

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country, which has been constantly struggling with problems of food and nutrition security. Majority of Ethiopian farmers have been using the traditional way of agricultural practices.

This has contributed to low productivity of the agricultural sector.[5] The recent food crisis has further underlined the urgency of supporting agricultural development. Providing economic services, such as agricultural extension, is essential in using agriculture for development. Agricultural extension service approach plays a great role since it contributes to make extension services clear for the development of the skill and knowledge of farmers to adopt new and improved technologies (seed varieties and animal breeds, implements, chemicals, and practices) and the approaches and processes with which the skill development and access to information are realized.

The government emphasis on commercialization of the agricultural sector has implications for the organization, staffing, and operation of the agricultural extension service. The role of appropriate extension service approach is more critical for commercial oriented farmers than subsistence farmers. Extension services in Ethiopia until about 2002 were focused on increasing production and productivity in view of achieving food security.[6]

However, it had become apparent around 1996 that, without integrating farmers into the market, a sustained growth in the agriculture sector would not be realized.

According to Van den Ban,[7] an agricultural extension service approach system should incorporate five goals: Transferring knowledge from researchers to farmers, advising farmers in their decision-making, educating farmers to be able to make similar decisions in the future, enabling farmers to clarify their own goals and possibilities, and stimulating desirable agricultural development. An extension approach influences the choice of the target audience, the resource requirements and the allocation, their methodologies employed, and the results and impacts of the extension efforts. This helps extension agent or any experts to understand the fundamentals, concepts, and functional methods of extension adopted to fulfill its aims, especially in the planning phase.

OBJECTIVES

The General objectives of this paper is to review on the Historical Evolution of Agricultural Extension Service Approach in Ethiopia. The specific objective is as follows:

- To review the concept of extension and extension service approaches
- To review the evolution of Ethiopia agricultural extension service approach
- To review the role of extension service approach in agricultural extension.

METHODOLOGY

The paper used document analysis as its main method of data collection and analysis. Relevant facts on the historical evolution of agricultural extension service approach in Ethiopia were analyzed. It was undertaken using some review of related literature from different sources. Published articles and books were also explored to organize the document related to Ethiopian agricultural extension service approaches.

LITERATURE REVIEW

Concept of extension and extension service approach

The dissemination and use of improved agricultural technology and management practices can be traced back thousands of years in different parts of the world, including China, Mesopotamia, Egypt, and even in the Americas. The origins of public- or government-funded extension and advisory systems can be traced back to Ireland and the United Kingdom during the middle of the 19th century. During the potato famine in Ireland (1845–1851), agricultural advisors helped Irish potato farmers diversify into different food crops. Various European and North American governments observed this development, and "traveling instructors" started being used in the second half of the 19th century by many countries. The traditional view of extension in Africa was very much focused on increasing production, improving yields, training farmers, and transferring technology.

Van den Ban (1996) defined extension in more comprehensive way and paying attention on the process of helping farmers to make their own decision. Today's understanding of extension goes beyond technology transfer and training to learning. It includes assisting farmer groups to form, dealing with marketing issues, and partnering

with a broad range of service providers and other agencies. As a system, extension facilitates the access of farmers, their organizations, and other market actors with knowledge, information, and technologies; facilitates their interaction with partners in research, education, agribusiness, and other relevant institutions; and assists them to develop their own technical, organizational, and managerial skills and practices.[8]

The agricultural extension can be defined as the entire set of organizations that support and facilitate people engaged in agricultural production to solve problems and to obtain information, skills, and technologies to improve their livelihoods and well-being. Moris[9] defined extension as the mechanism for information and technology delivery to farmers. This conceptualization of the extension service has been the basis for the transfer of technology (TOT) extension model. A more comprehensive definition of extension service is given by the World Bank as a "process that helps farmers become aware of improved technologies and adopt them to improve their efficiency, income, and welfare."

According to Axinn,[10] the approach is the style of action within system. It is like the drummer which sets the pace for all activity of the system. Extension approach refers to the doctrine for an organization, which informs, stimulates and guides such aspects of the organization as its structure, mission, vision, leadership, its programs, strategies, its resources, and linkages. The approach is like a doctrine for the system, which informs, stimulates, and guides the system as its structure, leadership, program, resources, and its linkages. It consists of a series of procedures for planning, organizing, and managing the extension institution as well as for implementing practical extension work by staff with technical and methodological qualification and using the necessary and appropriately adapted means.

Evolution of ethiopia agricultural extension service approach

According to Belay,[11] "Ethiopia agricultural extension work was started in 1931 with the establishment of the Ambo Agricultural School." It is the oldest institutions and the first agricultural high school offering general education with major emphasis on agriculture. Agricultural extension service in Ethiopia is said to have started in 1953 with the establishment of the then Imperial Ethiopian College of Agriculture and Mechanical Arts (IECAMA), currently known as Alemaya University. The extension mandate of the college included transferring local research outputs and technologies to farmers, and importing technologies and improved practices from abroad and introducing them to farmers.

Ethiopian agriculture still plays a pivotal role in the overall GDP as well as employment opportunity to the majority of the population. However, the low productivity of the agricultural sector has made it difficult to attain food self-sufficiency at a national level. The first comprehensive package project approach, the Chillalo Agricultural Development Unit (CADU), was established as an autonomous entity in the Arsi region, south of Addis Ababa, in September 1967 and was financially backed by the Swedish International Agency for Development Authority (SIDA).[11]

The extension method employed by CADU was the "Model farmer" approach until 1975. However, the model farmer's approach to the extension was criticized both from outside and within CADU itself. Empirical studies concluded that the approach was only partly successful and that it was not the most efficient way of disseminating knowledge. According to Mengisteab,[12] the CADU approaches emphasized on the overall socioeconomic development in the pilot area and designed to give service for other/scaling out to other parts of the country and scaling up to higher administrative bodies. The package incorporates crop and livestock production, credit and marketing services, research and training, rural infrastructure development (roads, water, etc.,), input supply (seeds and fertilizer), and home economics.

Since all of these programs and projects were operational in only small areas, the vast majority of the country was out of their reach. Evaluation of the comprehensive package approach led to the conclusion that the approach did not benefit smallholders and was too expensive to scale out and up both financially and in terms of manpower requirements. The second comprehensive package project was initiated in Wallayita province in 1970 under the Wallayita Agricultural Development Unit (WADU). Understanding the weakness of CADU's model farmer approach, WADU avoided the "model farmers" approach and instead demonstrated technologies on peasants' farms that were relatively resourced poor. Technology

transfer under WADU's approach has been found to be more effective than that of CADU.

As early as the 1970s, it was apparent that it would not be feasible to implement the comprehensive package projects through the whole country. Hence, the minimum package program (MPP) was initiated in Ethiopia with a claim to address the problems of the lower income bracket farmers and also with greater reliance on people's participation designed to cover large areas with input supply, credit provision, and marketing services. MPP-I adopted CADU's grain technology and also applied its extension methodology.[13]

The Derg regime, which toppled the Imperial regime in 1974, continued with the MPP-I for 4 years, although the implementation of the project was constrained by political instability and changes in the government structure. In 1980, the Minimum Package Project II was developed with funding from the World Bank, IFAD, and SIDA with the main objective to improve crop and livestock productivity, increase the production of agricultural raw materials for domestic use and for export, enhance soil and water conservation activities, establish various farmer organizations, and construct rural roads, grain stores, and agricultural offices. The MPP-II also failed to achieve its objectives due to the shortage of extension personnel and burdening extension agents with activities such as tax collection and organization of cooperatives. Finally, the MPP-II phased out in 1985.[11]

The Sasakawa Global 2000 (SG 2000) extension strategy was initiated in Ethiopia in 1993 by the Sasakawa Africa Association and Global 2000 of the Carter Centre with the objective to assist Ethiopia's efforts to increase agricultural production through an aggressive technology transfer program that disseminated improved production technologies to small-scale farmers through the extension service by invigorate the linkages between research and extension.[14] In this approach, the extension agents play a facilitating role in the management of the plots. In 1995, good weather conditions, coupled with the material and technical support that participating farmers received from SG 2000, resulted in substantial yield increments. This helps Ethiopian government that self-sufficiency in food production could be achieved by adopting the SG 2000 extension approach.

The MPP-II was phased out in 1985 and replaced by another strategy called the Peasant Agriculture Development Extension Program. It promotes packages on cereals, livestock (dairy, fattening, and poultry), high economic value crops (oil crops, pulses, vegetables, and spices), improved post-harvest technologies (handling, transport, and storage), agroforestry, soil and water conservation, and beekeeping developed for different agro-ecological zones such as highland mixed farming system, highland-degraded and low moisture, lowland agropastoralist, and lowland pastoralist zones.[11] However, the majority of contact farmers had not participated either in Participatory Demonstration and Training Extension System (PADETS) or Sasakawa Global 2000 (SG 200); due its non-participatory nature, and the participants were selected by officials.

In Ethiopia, the farmer field school (FFS) approaches are also implemented since it introduced in 1999 by Save the Children UK (a British NGO) and limited only to few organizations with area-based development program in Northern Ethiopia. The FFS approach represents a paradigm shift in agricultural extension: The training program uses participatory methods "to help farmers develop their analytical skills, critical thinking, and creativity and help them learn to make better decisions." FFS is a method to train adult farmers in an informal setting within their own environment. It is often described as a "school without walls."[15]

FFS is a practical approach to training, which empowers farmers to be their own technical experts on major aspects of localized farming systems. It assumes that farmers already have a wealth of knowledge. Therefore, field schools are oriented to provide the knowledge and management skills in a participatory manner so that the farmers' experience is integrated into the program. FFS are platforms and "schools without walls" for improving decision-making capacity of farming communities and stimulating local innovation for sustainable agriculture.[15]

FFS offers community-based, non-formal education to groups of 20–25 farmers through self-discovery and participatory learning principles. The overall objectives of FFS are to bring farmers together to carry out collective and collaborative inquiry with the purpose of initiating community action and solving community problems.[16] The foundation of FFS method is "farmers first" philosophy, which is in direct contrast to the TOT approach. "Farmers first" concept is essential to

empower farmers to learn experimentation and technology generation and decision-making.

FFS approach is increased farmers' capacity for research, innovation, and decision-making. In this approach extension agent work as facilitator and farmers actively participate in learning processes that increased responsiveness to farmer-clients demands and needs by organizations in national research, extension, and development systems.[11]

In Ethiopian in different times, the government used different agricultural extension approaches to bring agricultural transformation. These each approaches implement based on their guiding principle. There are eight different approaches to extension in developing country that used primarily for agriculture.[17] Furthermore, those extension service approaches implement in Ethiopia on agricultural extension service to facilitate and improve farmer's income in the rural areas.

The general agricultural extension approach

The general agricultural extension approaches are usually fairly centralized and government-controlled and implement the top–down planning. Planning is done on a national basis by the central government "which knows better than farmers." The agricultural extension service is under the Ministry of Agriculture and governed by the higher body. This help the central government to control and provide rapid communication from high level to rural people. However, this approach is one-way communication, and field staffs are not accountable to the rural people; they may ignore the priorities of local people while trying to satisfy supervisory personnel. It is expensive and inefficient since messages are inappropriate, the impact is low, and the cost of personnel is very high.[11,18]

In Ethiopia, the past agricultural extension service approaches were mostly not encourage to participate farmer at each stage of any agricultural extension activity, especially on technology transformation. Farmers may have been persuaded through incentives or forced by authoritarian extension workers to adopt new practices or innovations (new ways of doing things). Extension workers as well as farmers have thus been passive recipients of technological recipes in a top–down flow of information. Furthermore, in 1991, the training and visit (T and V) extension approach was adopted as a national extension system with the main characteristics of top–down system.

The commodity specialized approach

The commodity specialized approach is emphasis to increased production extension, research, input supply, marketing and prices under one administration. Extension is fairly centralized and is oriented toward one commodity or crop, and the agent has many functions. Techniques recommended must produce financial benefits for farmers and be demonstrable on farmers' own fields. New inputs must be accessible, a credit scheme was established, and the ratio between farm-gate inputs and commodity prices was considered. Technology tends to be appropriate and distributed in a timely manner because it focuses on a narrow range of technical concerns.[11,18]

As this approach being smaller and more focused, extension worker monitor and evaluate a fewer farmers. However, these approaches give less priority to farmers' interest, do not provide advisory service to other aspects of farming in the case of farmers who produce more than one commodity, and have narrow focus (environmental factors may be ignored) and lack of agricultural diversification concepts.[11,18]

Nowadays, Ethiopian government use integrated approaches with farmer's participation. The government established agricultural center in different agroecologies with emphasis to farmer's specialized agricultural practice. The agricultural policy encourages farmers to produce high-value crops based on the current market demand with agroecology of the area. Due to the nature of agroecology, the farmers pushed to use the effective agricultural practice that well performed in specific air condition. However, even the extension service more stressed with specific farmers, practice advisory service is provided for other aspect of farming. This may help farmers to improve their income throughout the production.

The T and V approach

T and V is one of the approaches, which was adopted by all of the East African countries to support the development of state extension services during the early 1990s. The T and V system was operated in >40 developing countries. The purpose of this approach is to induce farmers to increase the production of specified crops. It provides continuous feedback from farmers to extension agents and research staff; it allows for continuous adjustment to the farmers' needs. It has spread rapidly around the world because it

is seen as an effective means of increasing farm production and a flexible tool at all levels of any agricultural ministry's operation.[11,18]

This fairly centralized approach is based on a rigorously planned schedule of visits to farmers and training of agents and subject matter specialists. Under T and V, the extension system changed its way of reaching out to farmers using agents who focused mainly on technology diffusion.[19] Close links are maintained between research and extension. As the T and V is top–down approach, agents are only involved in technology transfer. The emphasis is on disseminating simple, low-cost improved practices, and teaching farmers to make the best use of available resources. Success is measured in terms of production increases of the particular crops covered by the program. This builds on a combination of the individual and group approaches.

In Ethiopia in 1991, the T and V extension approach was adopted as a national extension system until its replacement by the participatory demonstration and training extension system in 1995. The approach puts pressure on government as well as officers to get out of their offices and meet the farmer. This help farmers to get up-to-date information and it provides closer technical supervision and logistic support. But, this training and visit approach is lacking actual two-way communication, demand driven and flexibility. T and V cannot increase production unless the contemporary parts of the small farmer development package such as input supply and credit, market mechanisms, and price incentives are in place.

The farming system development approach

This approach assumes that technology which fits the needs of farmers, particularly small-scale farmers, is not available and needs to be generated locally. A key characteristic of this type of extension is its systems or holistic approach at the local level. Planning evolves slowly and may be different for each agroclimatic farm ecosystem. This approach is implemented through a partnership of research and extension personnel using a systems approach. Close ties with research are required, and technology for local needs is developed locally through an iterative process involving local people. Analyses and field trials are carried out on farmers' fields and in homes. The measure of success is the extent to which farm people adopt technologies developed by the program and continue to use them over time.[11,18] According to Norman,[20] "farming system approach is characterized by: A holistic approach viewing the farm as a whole, involvement of farmers and their priorities, research reflecting the various subsystems' interactions and linkages, and reliance on informal surveys or "rapid rural appraisal." It gives good emphasis on the needs of resource-poor farmers, gender equity, and the value of indigenous knowledge systems. Diversity is heavily encouraged in this type of system, and linkages are numerous and diverse. Advantages of this system include strong linkages between extension and research personnel and the commitment of farmers to using technologies they helped to develop. Costs can be high, and the results can be slow in coming.

The participatory agricultural extension approach

This approach assumes that farmers are skilled in food production from their land, but their levels of living could be improved by additional knowledge. Much of the work is through group meetings, demonstrations, individual and group travel, and local sharing of appropriate technologies. This approach often focuses on the expressed needs of farmers' groups, and its goal is increased production and improved quality of rural life. Implementation is often decentralized and flexible. Success is measured through number of farmers actively participating and the continuity of the program. There is much to be gained by combining indigenous knowledge with science. The system requires that extension workers, who are also animators and catalysts, stimulate farmers to organize for group efforts. Local people evaluate their own programs and play a role in establishing research agendas.[11,18]

The country adopted a PADETES in 1995, which was eventually replaced with the PES in 2010.[21,22] The PES intends to increase the coverage of the agricultural extension service, focus on natural resource management, involve the disadvantaged groups of the society, and increase farmers' participation in introducing new technologies or best practices. As it is participatory, it minimize cost, increased confidence to implement any development activities and help to understand farmers need. However, it is more work for extension agents to organize and motivate farmers. It requires agents to live and to socialize with

farmers. Hence, it is difficult to manage the whole situation.

This approach integrates community mobilization for planning and action with rural development, agricultural extension, and research; it is based on an equal partnership between farmers, researchers, and extension agents who can all learn from each other and contribute their knowledge and skills; it aims to strengthen rural people's problem-solving, planning, and management abilities; it promotes farmers' capacity to adopt and develop new and appropriate technologies/ innovations; it encourages farmers to learn through experimentation, building on their own knowledge and practices.[21]

Still the current approaches have some weaknesses: Limited consistency and quality of extension implementation, weak coordination between actors in research and extension, inadequate logistics and facilities for extension workers, poor extension services for pastoral community, low motivation leading to high turnover of extension staff, mainly DAs, limited use of communication media (ICTs) and technology multiplication centers, minimum involvement of the private sector, lack of clear line of command for the extension management, particularly at woreda and kebele levels, weak planning, monitoring, learning, and evaluation and feedback systems. Under this extension current approach, high turnover of experienced professionals in agricultural extension, price fluctuations on international markets for agricultural products, climate change and recurrent drought are some threats that hinder the extension system delivery in the country.

The project approach

This approach concentrates efforts on a particular location, for a specific time period, often with outside resources. Part of its purpose is often to demonstrate techniques and methods that could be extended and sustained after the project period. It uses large infusions of outside resources for a few years to demonstrate the potential of new technologies. Control is at the central government level, and there are often considerable financial and technical inputs from an international development agency. Short-term change is the measure of success, and it gives quick results. Under this approach, novel techniques and methods can be tested and experimented. But, to evaluate with the immediate results leading to fictitious reporting and a tendency to consume a large proportion of resources on baseline surveys and the establishment of a temporary logistic base.[11]

Starting from past to now, different projects involve in agriculture to enhance the rural the life rural farmers and urban peoples. Especially, during 1967, different projects were implemented for a specific period of time. Currently, the Ethiopian government made effort to develop collaboration with different organizations that facilitate projects that help the local community. For example, the Agricultural Growth Program (AGP) is a clear example of this collaborative effort. It is a multifaceted investment program supporting agricultural productivity and commercialization smallholder farmers in the specific area. AGP II will also give attention to the increased participation of women and youth and it contributes to the higher level goal of sustainable food security and agricultural transformation. The project is evaluated in five years interval. Its sustainability is depend on the result of the last five years effort in the project areas before start to the next phase. In the implementation area, if the project show a significance difference in the people's livelihood, it allow to continue until the donor provide resource. Still, the government encourages different projects that help the agricultural extension system and the rural farmers. Still, the government encourages different projects that may help the agricultural extension system and the rural farmers.

The cost-sharing approach

This approach is based on local people sharing part of the cost of the extension program. Its purpose is to provide advice and information to facilitate farmers' self-improvement. It assumes that cost-sharing with local people (who do not have the means to pay the full cost) will promote a program that is more likely to meet local situations and where extension agents are more accountable to local interests. Control and planning are shared by various entities and are responsive to local interests. Success is measured by farmers' willingness and ability to provide some share of the cost, be it individually or through local government units. This approach increases the relevance of the program content and methods to the needs and interests of clientele. This increases the adoption rate of any technology. If any intervention is not relay on the real life problem, it difficult to get recognition and provision from farmers. This

approach help the central government in lowering cost in extension system.[18]

Currently, in Ethiopian agricultural extension system, farmers highly participate from planning to implement phase. In addition to this, they provide resources, especially, to established Farm Training Center around their farms. For any agricultural technology evaluation, especially for the crop, they may give land without compensation and they actively do each activity with stakeholders thoughtout the project life. This reduces the labor cost of the projects. However, still, farmers are not well recognized at all areas in the same way. The farmer's capacity to cost sharing in agricultural extension depends on interest of farmers, nature of technology (consistency with the current production problem, easy to implement, and cost-effectiveness), and ability to experts convince the farmer's.

The educational institution approach

This approach uses educational institutions which have the technical knowledge and some research ability to provide extension services for rural people. Planning is controlled by those determining the curriculum of the educational institution. Implementation is through non-formal instruction in groups or individuals through a college or university. Ideally, researchers learn from extension personnel who, in turn, learn from farmers. The advantage of this approach is the relationship between specialized scientists and field extension personnel.[11,18]

In the current Ethiopian agricultural research context, farmers participate in any research output technology evaluation with the full participation of them. Each research topic was derived from the farmers' need based on the current problem that challenges in the particular area. For technology evaluation, farmers organized as farmer's research extension group and fully participate on the evaluation of any technology. This helps farmers to learn from the farmers as well as to know the relevance of the technology. This implies that all technology dissemination rates depend on the farmer's feedback based on their evaluation criteria methods.

Overall, beyond training extension personnel in higher institution, this approach is not widely implement as government level. However, currently, the higher institution conducted many research activities and try to put at the farmer level. In this situation, any experts that work with the farmers stay in the university or college. This helps to know farmer's opinion and feedback and give opportunity to communicate with specialized person.

The role of extension service approach in agricultural extension

Ethiopia is often considered a leader in its commitment to extension. The government of Ethiopia firmly believes that an effective and efficient extension system must play an important role to transform smallholder subsistence agriculture to commercial agricultural production system by facilitating adoption and utilization of yield- and quality-increasing agricultural technologies. However, lack of land ownership, underinvestment in microcredit facilities, and a lack of competition in input provision and markets limit farmer's willingness to risk land improvements required for increased productivity.[23]

Field evidence shows that, while extension agents with clear extension service approaches have a high immediate influence on productivity, farmer-to-farmer learning is more enduring. Improvement in general agricultural production, productivity, and sustainability will depend on farmers‟ willingness and access to new technology. Agricultural extension and advisory service approaches play an important role in addressing this challenge. It gives contribution by ensuring that the farmers have access to improved and proven technologies and that their concerns and needs are properly addressed by relevant service providers.[24]

When new agricultural technologies are generated by research institutions (universities and private companies) and by the farmers, agricultural extension services are expected to disseminate these technologies among their clients. Extension services are organized and delivered in a variety of forms, with the ultimate aim of increasing farmers' productivity and income. The question is how farmers can gain access to knowledge, information to adopt, increase yield, and income. In this context, agricultural extension approach provides to set a clear methods to implement the extension objective. The success of extension in achieving this will, however, depends on the extension service approach that is being used to reach or communicate to farmers. It contributes by

improving the welfare of farmers and other people living in rural areas.[12]

CONCLUSION

A common feature of the most successful extension service approach has been farmers taking the lead or sharing control in all parts of the effort. Close collaboration between research institutions, extension agencies, nongovernmental organizations, the private sector, and farmers has also been an important factor of successful extension service approach delivery. The review result shows that, at different times, the existing government formulates different extension service approach to bring agricultural development. These Approaches guides the overall extension programs implementations to facilitate agricultural production and productivity.

As the documents indicate that the current extension service approach facilitates farmers, research institute, extension, NGOs, and other stakeholder linkage to reinforce the rural farmers on the ability to solving their problem. The effectiveness and efficiency of extension service approaches are depending on the overall policy environment for agricultural development. Based on the reviewed data, this paper concludes that participatory extension approaches have flexibility and give room for implementing integrated approaches to alleviating most of the generic problems of the farmers. However, it faces many problems and always limited to fanatical crises as well as lack of effective monitoring and evaluation programs in the country.

In overall, this reviews various extension approaches completed successfully by giving satisfactory results in the past to improve the farmers' knowledge regarding newly developed agricultural technologies. Some of them are continuously running in present along with newly developed extension approaches and require little modifications in future to increase the agricultural potential of the country. Hence, any interested researcher should be done a critical way evaluation with farmers on the existing current agricultural extension service approach in the country. The result of evaluation will give direction for the government to overcome the constraint that hinders the effectiveness of the agricultural extension approach for advance agricultural productivity and improves the benefit of farmers.

REFERENCES

1. Abate, H. Review of Extension Systems Applied in Ethiopia with Special Emphasis to the Participatory Demonstration and Training Extension System (PADETES). Addis Ababa: Food and Agriculture Organization; 2007.
2. Ann RB, Graham T. Integrated Nutrient Management to Attain Sustainable Productivity Increase in East African Farming Systems. Kenya, Nairobi: INMASP Report No. 09; 2000.
3. Ashby JA, Ann RB, Gracia T. Investing in Farmers as Researchers: Experience with Local Agricultural Research Committees in Latin America. Cali, Columbia: International Centre for Tropical Agriculture; 2000.
4. Axinn GH. Guide on Alternative Extension Approaches. Rome, Italy: FAO (Food and Agriculture Organization of the United Nations); 1988.
5. Belay K, Abebaw D. Challenges facing agricultural extension agents: A case study from South-Western Ethiopia. Afr Dev Rev 2004;16:139-68.
6. Belay K. Agricultural extension in Ethiopia: The case of participatory demonstration and training extension system. J Soc Dev Afr 2003;8:49-80.
7. Berhanu K, Poulton C. The political economy of agricultural extension policy in Ethiopia: Economic growth and political control. Dev Policy Rev 2014;32:S197-213.
8. Christoplos I. Mobilizing the Potential of Rural and Agricultural Extension. Norway: Neuchatel Group; 2010.
9. Di Falco S, Yesuf M, Kohlin G, Ringler C. Estimating the impact of climate change on agriculture in low-income countries. Environ Resour Econ 2012;52:457-78.
10. Evangelista P, Young N, Burnett J. How will climate change spatially affect agriculture production in Ethiopia? Case studies of important cereal crops. Clim Change 2013;119:855-73.
11. Krishnan P, Patnam M. Neighbors and extension agents in Ethiopia: Who matters more for technology adoption? Am J Agric Econ 2013;2013:1-20.
12. Mathewos B, Chandargi DM. Models for private and public extension cooperation as applicable to the Ethiopian system. In: Tesfahun F, Osman A, editors. Challenges and Prospects of Food Security in Ethiopia. Addis Ababa, Ethiopia: Proceedings of the Food Security Conference; 2003.
13. Mengisteab K. Ethiopia: Failure of Land Reform and Agricultural Crisis. New York: Greenwood Press MOA (Ministry of Agriculture); 1990.
14. Ministry of Agriculture. Participatory Agricultural Extension System (Amharic Version). Addis Ababa, Ethiopia: Ministry of Agriculture; 2010.
15. Moris J. Extension Alternatives in Tropical Africa. London, UK: Overseas Development Institute; 1991.
16. Norman D. A history of Farming Systems Research. London, UK: CABI (Commonwealth Agricultural Bureau International) Publishing; 2000.
17. Oduori G. Report on Experiences of Farmer Field Schools in Busnia District. Poland: Ministry of Agriculture and Rural Development; 2002.
18. Omar J, Bakar A, Jais HA, Shalloof F. The impact of the

decentralization and pluralism policy on agricultural extension services. J Agric Technol 2011;16:33-54.
19. Picciotto R, Anderson J. Reconsidering agricultural extension. Kenya: The World Bank Research Observer; 1997.
20. Ponniah A, Puskur R, Workneh S, Hoekstra D. Concepts and practices in agricultural extension in developing countries: A source book, Improving Productivity and Market Success (IPMS) of Ethiopian farmers project International Livestock Research Institute (ILRI). Addis Ababa, Ethiopia: CaSt and IFPRI-ISNAR; 2008.
21. Quinones M, Takele G. An overview of the Sasakawa-Global 2000 project in Ethiopia. In: Breth SA, editor. Achieving Greater impact from Research Investment in Africa. Mexico City: Sasakawa Africa Association; 1996.
22. Tsegamariam D. Review on the contribution of agricultural extension on increasing smallholder farm productivity in case of Ethiopia. J Cult Soc Dev 2018;40:42-9.
23. Van den Ban AW. Different ways of financing agricultural extension. London, UK: ODI, AgREN Network Paper No. 106b; 1996.
24. Yishak G, Punjabi NK. Determinants of adoption of improved maize technology in Damot Gale, Wolaita, Ethiopia. J Ext Educ 2011;19:1-9.