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**Perceptions of field officers, extension officers, and farmers
regarding Agricultural Extension Education in Swaziland**

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Iowa State University, 1993

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Perceptions of field officers, extension officers, and
farmers regarding Agricultural Extension Education in Swaziland

by

Musa M. A. Dube

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CHAPTER I. INTRODUCTION

Swaziland is one of the smallest countries in Africa in terms of size and population. Its area is 17,364 square kilometers (6,704 square miles). The Census Report of 1986 estimated the population to be approximately 800,000. It is landlocked and wedged between the Republic of South Africa to the south, west, and north and Mozambique to the east. It lies between the 25th and 27th latitudes south of the equator.

The country is ruled by King Mswati III, the youngest head of state in Africa. There are two chambers in the house of Parliament: The House of Senate and Assembly. These two chambers are responsible for policy formulation and budgetary debates and allocations. Also, they generate advisory ideas to His Majesty's Government. Swaziland gained her independence from Britain on September 6, 1968.

The official language is English, and SiSwati is a native language. Swazis are mostly Christians and enjoy the freedom of multi-denominations. The currency for the country is Emalangeni (plural); Lilangeni (singular). The Lilangeni is equivalent to 38 cents of the U.S. dollar (E1.00=\$0.38).

Swaziland is a country of great geographical and climatological contrasts. These contrasts affect all agricultural resources in the country (Leistner & Smit, 1969; Post Independence Development Plan, 1969). The country is divided into four major ecological regions extending north-south along roughly parallel lines (Figure 1). These regions are from west to east: the Highveld, the Middleveld, the Lowveld, and the Lubombo plateau (Booth, 1983).

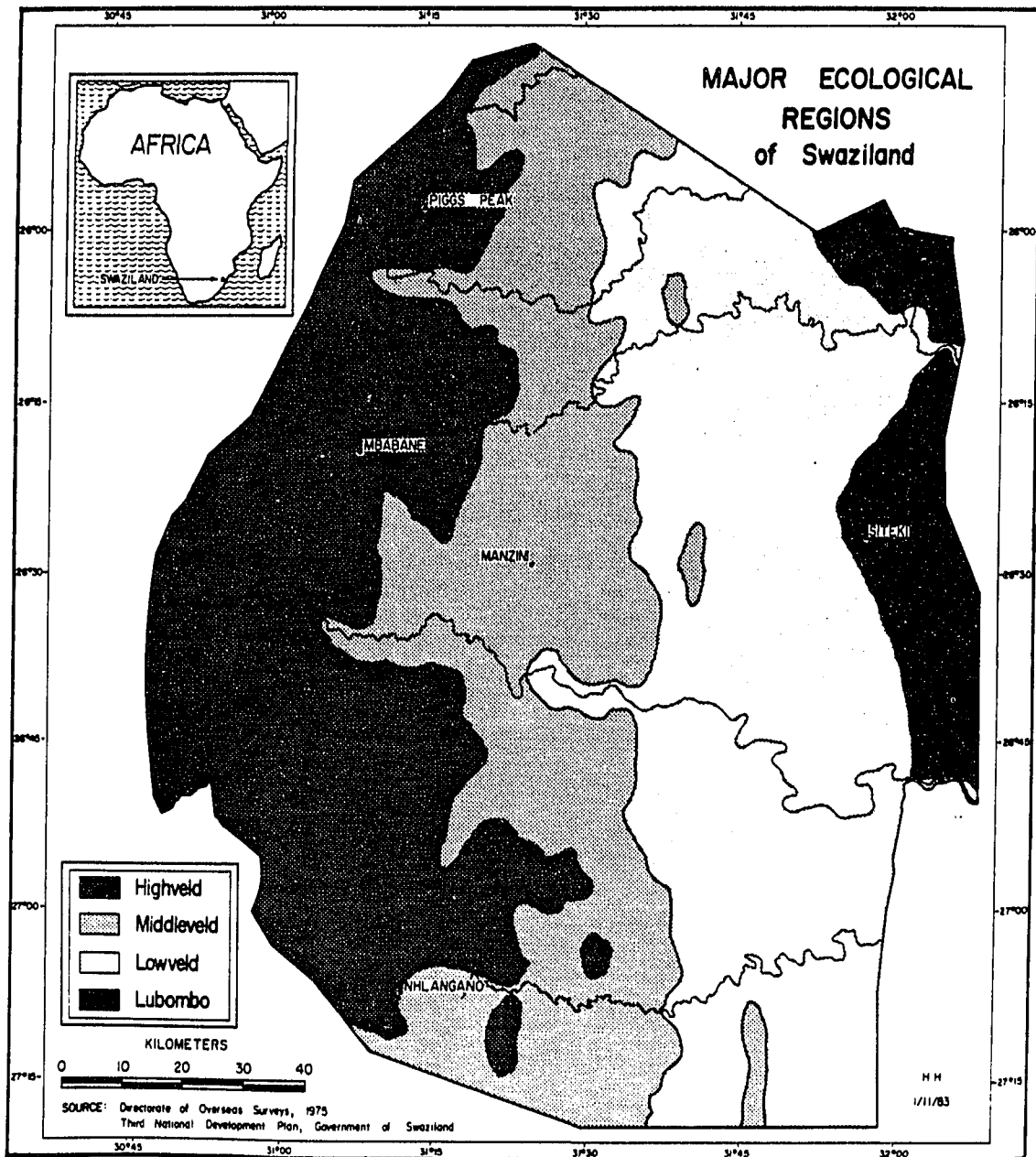


Figure 1. A schematic map of major ecological regions of Swaziland

Agriculture has for many years played a significant role in the Swazi culture. The agricultural sector employs over 75 percent of the Swazi people. It further generates 23 percent of the Gross Domestic Product (GDP) (Fourth National Development Plan, 1983/84-1987/88). Over 80 percent of the Swazi people live in rural areas and earn their living mainly from agriculture.

The major agricultural crops include sugar cane, cotton, citrus fruits, maize (the staple food crop of Swaziland), rice, pineapples, sweet potatoes, and tobacco. Other crops include a wide range of indigenous and exotic crops and vegetables. In addition to crop production, livestock is another agricultural enterprise which is very important to the economy of the country.

In recent years, it has been realized that progress in the agricultural sector requires a massive effort in the field of research, education, staff development, and Agricultural Extension Education (AEE). In order to expedite accelerated growth in agriculture, the Government of Swaziland has decided to concentrate resources on the most essential sectors. Agriculture is one of the sectors in which the Government of Swaziland is committing her resources. Also, it was deemed necessary to concentrate the remaining effort on those projects which were likely to have an early and marked impact on the agricultural economy.

Since the 1930s, the Ministry of Agriculture and Cooperatives (MOAC), formerly known as the Department of Agriculture (DOA), has been charged with the responsibility of monitoring the development of the agricultural sector.

The education of extension agents has always been considered one of the fundamental approaches in agricultural development. Initially the education of extension staff was conducted at Mdutjane and at the Swaziland Agricultural College and University Center (SACUC). Today the latter is part of the University of Swaziland, Faculty of Agriculture. It is responsible for the education (training) of agricultural extension staff.

The training programs include a certificate (currently suspended), diploma, and undergraduate degree. Farmer training centers were also used as sites for conducting in-service workshops for farmers. Currently, the farmer training centers are used for many other purposes. For example, they are used for conducting in-service workshops and meetings for various groups. The research station at Mdutjane was charged with the responsibility of conducting basic and applied research activities. To this date, the research station is continuing with these functions with some on-site research activities.

The contributions of the MOAC, SACUC, and Research Station in the development of the agricultural sector have not been researched extensively in Swaziland. Therefore, the issue of how effective these institutions have been for agricultural development requires further investigation.

In view of the importance of the agricultural sector to the Swazi people, the need to provide high quality AEE programs is critical. In this regard, a study of perceptions held by field officers, extension

officers, and farmers regarding AEE in Swaziland was considered important. It is part of the continuous search for building up a quality AEE system.

Statement of the Problem

For many decades, internal and external reviewers of the AEE program in Swaziland have been critical of it (Easter, 1985; Trail, 1985; Diamond, 1992). Reviewers have alleged that the AEE program is shrouded in ambiguity. The claim is that the AEE program lacks well-defined objectives and principles. Teaching methods and teaching tools are somewhat ill-defined. Further, there have been problems concerning the conduct of AEE activities. To know whether or not these problems were current, it was deemed appropriate to collect data directly from participants in AEE activities. Therefore, the need to study the perceptions of AEE held by field officers, extension officers, and farmers was considered to be appropriate.

Purpose and Objectives of the Study

The primary purpose of the study was to identify and analyze the perceptions of AEE in Swaziland held by field officers, extension officers, and farmers.

Specifically, the study attempted to:

1. Identify demographic characteristics of field officers, extension officers, and farmers in Swaziland.
2. Describe perceptions of field officers, extension officers, and farmers regarding program objectives, principles, teaching methods,

teaching tools, and problems which were perceived to restrict the conduct of AEE activities.

3. Compare perceptions regarding AEE of field officers, extension officers, and farmers and their selected demographic variables.

4. Determine the relationship between perceptions of field officers, extension officers, and farmers regarding objectives, principles, teaching methods, teaching tools, and problems of AEE and their selected demographic variables.

5. Elicit suggestions and comments of field officers, extension officers, and farmers on how AEE in Swaziland could be improved.

Theoretical Framework of the Study

The study operated on the premise that AEE is a vehicle which could be used to foster sustainable agricultural practices. With this goal in mind, AEE as an organization seeks to establish and maintain a client-based approach. This approach could effectively bring about the desired farming practices (Claar et al., 1984). In this perspective, AEE should assume the status of being an organization. As an organization, it is assumed that AEE should be structured such that it is effective and efficient in providing educational programs to farmers.

Bolman and Deal (1991) stated that three approaches are fundamental to enabling an organization to be effective and efficient. First, they proposed that improvement of management and leadership in the organization is fundamental. Second, they pointed out that consultants could be contracted to help revitalize an organization. Third, government

intervention through legislation, regulation, and policy-making could be another option. They advised that the latter strategy has to be employed with caution. Additionally, they advanced that the process of helping an organization to be more effective and efficient is described as "reframing the organization."

"Reframing the organization" is the process of drawing schemata, maps, images, and metaphors of an organization that will make it more effective and efficient in achieving organizational goals. Frames are both windows on the world and lenses that bring the world into focus. They filter out some things while allowing others to pass through easily.

Four frames are key to the reframing process. These frames include structural, human resource, political, and symbolic frames (Bolman & Deal, 1991). The frames could serve several purposes. They each provide a pluralistic view of an organization and a theoretical perspective that has a unique and comparative advantage. Frames could enact a different image of an organization and contain ingredients that are essential to an integrative science of an organization.

The structural frame pertains to the notion of defining structure (of an organization) such that goals and all the pertinent information is laid out clearly. This approach helps to make goals and information of an organization much clearer. The human resource frame pertains to the employee morale and motivational levels. Political and symbolic frames refer to power distribution, which cannot be ignored, and the enormous extent to which reality is socially constructed and symbolically mediated, respectively.

The suggested reframing approach by Bolman and Deal (1991) could provide an unbiased analysis of the AEE system. Such an approach was considered suitable for the analysis of the AEE system in Swaziland. By using the frames in combination, our ability to understand and manage any organization could be enriched. A more comprehensive and multi-frame approach is rapidly gaining steam and promises a challenging and exciting future for understanding of organizational science (Bolman & Deal, 1991). Perceptions of AEE by field officers, extension officers, and farmers could be assumed as "windows" or "frames" to be used in the analysis of the AEE in Swaziland.

Need for the Study

The success of any educational program depends largely among many other things, on clear objectives, principles, teaching methods, and teaching tools (Trail, 1985). These aspects should be guided by an explicit and comprehensive agricultural policy which is based on the primary actors and clientele's opinions about the program (Programme Advisory Note, 1991; Dutia, 1989). Also, a sound philosophy is necessary to establish an effective educational program (Trail, 1985; Programme Advisory Note, 1991).

A need to develop a deeper understanding of problems of AEE that are perceived by the primary actors, namely, field officers, extension officers, and farmers, was considered to be very essential. It is generally believed that there are many problems which besiege the conduct of AEE in most developing countries. Swaziland is no exception.

Therefore, an analysis of the AEE program in Swaziland as perceived by the selected groups in this study was considered to be a sound course of action. Results of the study could be very useful to the MOAC and all stakeholder groups on how to make the AEE program in Swaziland more effective.

Limitations of the Study

The study was limited to selected field officers, extension officers, and farmers as individuals who were direct stakeholders in conducting AEE programs. Due to the time frame and the drought crisis in Swaziland at the time, the study left out many stakeholder groups in AEE programs such as senior agricultural officers and senior extension officers. Yet, their views on the current image of AEE in Swaziland could have been very important.

Implications and Educational Significance

This study was initiated to identify and analyze the perceptions of AEE in Swaziland held by field officers, extension officers, and farmers. Information learned from this study could be extended to revitalizing AEE in Swaziland. First, to gain a better insight of AEE regarding its objectives, principles, teaching methods, and teaching tools to be used. Second, to find ways to address those problems which are believed to limit the effectiveness of AEE activities.

Operational Definition of Terms

1. Perception: Act of perceiving, consciousness, a mental image, discernment, and physical sensation (Webster's Dictionary, 1988).
2. Field Officer: Officer who is employed at field level by the MOAC who is in direct contact with farmers.
3. Extension Officer: Officer at the field level whose primary responsibility is to supervise the field officers.
4. Senior Extension Officer: An officer who is responsible for coordinating AEE activities at a district level.
5. Project Manager: Officer or administrator who is in charge of a Rural Development Area (RDA).
6. Rural Development Area: An agricultural center at which a team of agricultural field staff and farm inputs in a given area are stationed.
7. Senior Agricultural Officer: Administrative officer based at headquarters, either extension or technical designated.
8. Subject Matter Specialist: A specialized officer in a subject area either of national or regional status.
9. Training and Visit System (T&V): A method of technology transfer which emphasizes occasional training and follow-up visits on site.
10. Farmer Training Centers: Agricultural centers which were established for the purpose of providing in-service training to farmers.
11. Frames: Windows, tools used to characterize and bring images of certain phenomenon into focus or put them in perspective (Bolman & Deal, 1991).

12. Extension: Transmitting information to individuals or groups with the view that the individual or group will make use of the information.
13. Agricultural Extension: A form of nonformal agricultural education to farmers.
14. Program Principles: Fundamental constructs which undergird Agricultural Extension Education.
15. Program Objectives: Specific anticipated outcomes Agricultural Extension Education seeks to attain.
16. Teaching Methods: The ways in which an extension worker teaches and informs farm people.
17. Teaching Tools: Facets and materials used during extension teaching meetings.
18. Problems in AEE: Those things which impact AEE activities.
19. Sebenta Education: Literacy education in which participants are taught writing and reading skills.
20. Secondary Education: A three-year school education.
21. High School Education: A two-year school education.
22. Certificate: A one-year university training in agriculture.
23. Diploma: A two-year university training in agriculture.

Acronyms

1. AEE: Agricultural Extension Education.
2. IFAD: Fund for Agricultural Development.

3. AIAEE: Association for International Agricultural Extension Education.
4. MOA: Ministry of Agriculture.
5. MOAC: Ministry of Agriculture and Cooperatives.
6. SNL: Swazi Nation Land.
7. SAO: Senior Agricultural Officer.
8. SEO: Senior Extension Officer.
9. N/DSMS: National/District Subject Matter Specialist.
10. EO: Extension Officer.
11. FO: Field Officer.
12. RDA: Rural Development Area.
13. LUP: Land Use Planning.
14. RO: Research Officers.
15. D/ASMS: District/Area Subject Matter Specialist.
16. FV: Field Visit.
17. RFV: Repeat Field Visit.
18. RP: Reporting.
19. FAO: Food and Agriculture Organization.
20. DA: Director of Agriculture.

CHAPTER II. LITERATURE REVIEW

The purpose of this study was to identify and analyze the perceptions of Agricultural Extension Education (AEE) in Swaziland held by field officers, extension officers, and farmers. The essence of the study was to identify the perceptions of selected stakeholders of Swaziland AEE regarding AEE program objectives, principles, teaching methods, teaching tools, and problems.

The review of the literature is divided into six major subheadings:

1. Background of AEE
2. Types of AEE systems
3. History of AEE in Swaziland
4. Criticism of the AEE in Swaziland
5. Related Studies in AEE
6. Summary of the Reviewed Literature.

Background on Agricultural Extension Education

Agricultural Extension Education (AEE) is widely recognized as a means to improve rural life. Its primary purpose is to educate rural people through nonformal educational means based on their needs and problems, and help them solve their agricultural problems on a self-help basis (Dusenberry, 1966; Rivera & Corning, 1990). Blackburn and Vist (1984) quoted Leagans to have stated that:

The process of extension education is one of working with people, not for them; of helping people become self-reliant, not dependent on others; of making people the central actors in the drama, not stage hands or

spectators; in short, helping people by means of education to put useful knowledge to work for them.
(p. 1)

However, the aforementioned characterization of AEE is often interpreted in many ways by different people. For this reason, Rivera and Corning (1990) stated that it is wise to look at AEE from a much broader context of agricultural development goals. Also, one should view AEE from the overall direction of the country's development and strategy.

Coombs (1972) stated that agricultural extension is a form of agricultural education. As a form of agricultural education, it should be viewed as a knowledge delivery system whose overall purpose is to help farmers achieve better knowledge and understanding and to change their behavior and practices in order to improve productivity, income, and general well-being for themselves, their families, and their neighborhoods. Rivera and Corning (1990) stated that agricultural extension is the transfer through nonformal educational means of practical knowledge of agriculture and the enhancement of rural development.

Samarasinghe et al. (1990, p. 1) reported Maunder to have defined agricultural extension as a service or system which assists farm people through educational procedures, in improving farming methods and techniques, increasing production efficiency and income, bettering their levels of living, and lifting the social and educational standards of rural life. Watts (1984, p. 20) stated that Maunder had earlier asserted that agricultural extension was established to change the knowledge, skills, practices, and attitudes of the rural people. In this way, agricultural extension is envisaged to complement rather than compete with

other institutions, services, and organizations contributing to development progress in rural areas.

According to the Report on Global Consultation in Agricultural Extension (1989), agricultural extension is a form of nonformal agricultural education for farmers. In the report, it was further stated that agricultural extension is concerned primarily with technology transfer to increase agricultural productivity. At times it is viewed as a social investment that is designed to cater to the needs of the economically disadvantaged population, notably the small-scale men and women farmers, rural youth, and landless producers.

Khumalo (1989) stated that agricultural extension should be viewed as an essential part of the agricultural development process. He described it as a process which expedites the flow of technology from the research institutes to the farmers through AEE. His description of agricultural extension is presented in Figure 2.

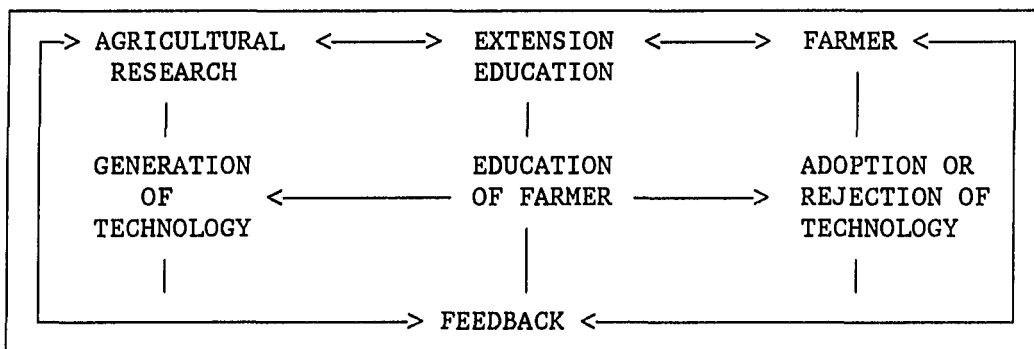


Figure 2. Khumalo's view of Agricultural Extension Education

Clearly, agricultural extension should be very instrumental in improving rural life. However, there are numerous indications that many people are dissatisfied with the quality of the agricultural extension worldwide (Rivera, 1990; Baxter et al., 1989; Moris, 1984-85; Belloncle, 1984-85). AEE programs, especially in developing countries, are believed to be in crisis. Thus, many people are continually expressing considerable dissatisfaction with the quality of AEE programs.

The present status of AEE programs was well described in the Report on Global Consultation (1989) on the African Extension. The report stated that shortage of funds for extension work has caused AEE programs to lag behind. Thus, AEE has not met the needs of men and women farmers. Furthermore, due to the shortage of funds, many governments of developing countries have been forced to seek supplementary funding from the World Bank, International Fund for Agricultural Development (IFAD), and regional banks.

The external funding sources for AEE programs has raised several questions. First, who should be the target clientele for AEE programs? Second, what should be the objectives, principles, teaching methods, and teaching tools undergirding AEE? Third, what should be the content and scope of AEE programs? Fourth, what kind of extension messages should be transmitted to the different target clientele? Finally, what problems are impacting AEE? Implicitly, the external funding sources are the ones which determine the answers to all these critical questions.

According to Belloncle (1984-85), the dissatisfaction with AEE programs in Africa is a realistic situation. Export crop production is at

a standstill. Staple food crop production is insufficient to feed the rural population properly. Additionally, there is much less food to supply to the swelling cities. Axinn and Thorat (1972) have reiterated the shortage of food when they stated that world population is overtaking the production of food worldwide. Therefore, food production in Sub-Saharan Africa cannot keep pace with the rapid growth of the population.

According to Samarasinghe et al. (1990, p. 1), Blankenburg stated that there are many problems which could cause people to be dissatisfied with extension services. Such problems include inadequate numbers of extension personnel, extra duties delegated to extension workers besides the advisory function, lack of knowledge of extension methods and technical matters, inadequate supervision of lower level workers, poor coordination within agricultural research, and the wrong target group approach.

Coombs (1972) stated that agricultural education has a variety of interlocking components each of which has particular functions essential to the effective operation of the system as a whole. Without a well-coordinated arrangement of these interlocking parts in agricultural education, Coombs argued that the system would be ineffective. Additionally, he pointed out that lack of adequate backstopping from the staff development knowledge generating components at the higher echelons of the system, and generally poor communications and relationships throughout the system have all contributed to the unsatisfactory status of agricultural education.

According to the United Nations Development Program Advisory Note (1991), the lack of clear agricultural policies especially in developing countries has exasperated the weaknesses of the AEE programs. The Advisory Note stated that an agricultural policy is necessary to provide the overall direction for developing an effective agricultural extension system. Also, a policy could help provide a legislative mandate which states the mission of the agricultural extension program. Thus, agricultural extension should be able to continue with its activities without radical shifts in organization and strategy.

Lavery (1990), at the annual conference of the Association for International Agricultural and Extension Education (AIAEE), underscored the need for everyone to understand the rapidly changing environment in which successful development in agricultural education has to occur. He stated that there are rapid changes in agricultural policies, collaborative arrangements, aid and trade, and emerging democracies. In this regard, he advised that there is a need to ensure that agriculture is sustainable. Also, that all these emerging challenges and demands should be treated with urgency.

Types of Agricultural Extension Systems

According to Baxter et al. (1989), governments of many nations spent substantial amounts of funds on agricultural extension education programs. Sometimes local governments rely on external funding sources. Therefore, the need to reexamine agricultural extension programs requires urgent attention. Furthermore, because of the diversity of agricultural

extension programs in terms of structure, design, mission, principles, methods, and teaching materials, the need to constantly review the programs becomes inevitable. It is after reviewing the agricultural extension system that the most effective ways can be identified to improve the quality of agricultural extension.

There are many systems of agricultural extension that have been described in the literature. Four major agricultural extension systems have been adopted by many governments of the developing nations. Baxter et al. (1989) stated that these systems include the rural extension, the commodity approach, the university-based research system, and the Ministry of Agriculture (MOA)-based system. Each one of the systems is selected by each government on the basis of its perceived merits. At times, some agricultural extension systems are imposed by the donor agency that might be financing the agricultural extension program (Global Consultation Report, 1989).

The rural-based agricultural extension system operates as part of a wider government wing which aims at changing rural attitudes and promoting community self-reliance. It stresses human resource development alongside technology development within agriculture. Through this approach, a wider range of functions than the provision of technical advice on crop and animal production is performed. The poorer or disadvantaged groups are aided to improve their income and welfare, and have access to certain services such as land and water from which they are often deprived.

The commodity approach is the one in which the government concentrates most of the agricultural extension efforts on specific

commodities. This approach seeks to provide a relatively intensive service in order to ensure, for example, quality control, adequate supplies to processing plants, and regulating planting programs. The university-based agricultural extension system is the model of the United States land grant system. This system views agricultural extension as primarily a mechanism for carrying research results to the farmers and linking farmer requirements to the research system. Additionally, through this system, scientists are expected to be constantly aware of farmers' needs. The role of extension agents is to provide research station results to farmers. Finally, the Ministry of Agriculture-based extension service's primary purpose is to link farmers and research scientists in a two-way transfer process.

Each one of these agricultural extension systems has weaknesses which have been widely discussed. The rural approach is diluted and weakened by being broad-based. Baxter et al. (1989) advised that efforts must be expended to isolate the main components of the agricultural extension system that appear to offer the greatest scope for the improvement of agricultural education programs. The commodity-based system's major criticism is embedded in the tendency of governments to foster and impose commercial and high technology demanding crops. Rogers (1983) cautioned that the diffusion of high technology demanding innovations is precarious. He stated that high technology innovations often cause frustrations among farmers. Farmers are forced to subscribe to more costly technologies once they adopt a high input cost technology. Yet, the resources farmers have may not at all allow them to do so.

Regarding the university-based extension program, fewer criticisms have been noted. However, it is widely believed that this system requires a cadre of highly trained scientists and extension agents. They are needed to conduct research and take the research results to the farmers in a more effective way. The MOA agricultural extension system has been criticized for lacking a distinctive philosophy, tendency to assign field staff nonagricultural related duties, and has been built on the colonial philosophy of controlling farmers and imposing on them what crops and livestock enterprises to undertake (Baxter et al., 1989). The tendency to overload field officers with nonextension related tasks was confirmed by Benor (1984). He stated that these nonagricultural extension related tasks included data collection, compiling reports, and collecting credit loans.

Belloncle (1984-85) stated that agricultural extension nearly everywhere in Africa is totally misguided. He pointed out that the misguidance of agricultural extension in Africa has put agricultural production in a precarious position. His contention was that the fundamental cause of stagnation in agriculture was embedded in the so-called "projects" in agriculture. Projects tend to belittle farmers and constantly force them to change their ways of thinking and farming. Farmers under projects are not usually treated as responsible adults with wealth of their own experience. Instead, they are treated as children, thus they end up "deriding" the field officer's "catechism."

In addition to these tendencies described above, Belloncle enumerated five erroneous assumptions which have plagued agricultural extension in

Sub-Saharan Africa. These erroneous assumptions included the tendency to overly supervise farmers, the need for pilot farmers, the need to compartmentalize or fragment technical recommendations, the existence of the model farm, and high representativeness of adult males.

Belloncle pointed out that close supervision, which is usually associated with externally funded projects, tends to give a set of precepts or catechisms rather than a scientific understanding of agriculture. Second, the use of pilot farmers, which most unfortunately contradicts the value of traditional African society. Third, the compartmentalization of technical recommendations where simple and complex technologies are the major categories, often leads to serious misunderstanding between farmers and extension agents. Fourth, the tendency to think of some farms as models; yet in Africa most fields are dispersed and worked on by different people who put them to different uses. And finally, the issue of representativeness of adult females. This assumption underscores the discrimination against women being in agriculture which is prevalent worldwide. Belloncle (1984-85) stated that:

African women play a key role in agricultural production. The changes that have occurred in agriculture, however, have often added to their already burdensome tasks of carrying water and wood, processing crops, and preparing food. (p. 43)

These erroneous assumptions have stifled agricultural extension. Above all, Belloncle stated that farmers have extraordinary abilities as a group to analyze their situation. They have a remarkable clear line of thought and have a high degree of expectation compared with those of the

outside specialists. Therefore, the need to treat farmers as responsible adults becomes very essential.

History of Agricultural Extension Education in Swaziland

AEE in Swaziland was formerly started in the 1930s. Lack of up-to-date and systematic documentation has made it difficult to trace the events which took place as AEE evolved in Swaziland. However, there is no reason to believe that there were few events as agricultural extension evolved. Available reports are very fragmented to account for the events which took place along with the evolution of the agricultural extension system in Swaziland (Khumalo, 1988).

Available literature provides scanty evidence of events associated with the agricultural sector. In the Post-Independence Development Plan (1969), it was stated that the Government of Swaziland postulated that Swaziland was to remain a predominantly agricultural country. It was further stated that the development of the agricultural sector was to continue receiving the highest priority over other sectors. However, the attention given to the agricultural sector has not been as adequate as anticipated. Hence, many external reviewers have constantly criticized the AEE system in Swaziland (Trail, 1985; Easter, 1985; Diamond, 1992).

Some of the bottlenecks to agricultural development over the years have included inadequate education and training of staff, insufficient credit facilities, and unsatisfactory marketing machinery for certain products (Post-Independence Development Plan, 1969). Most of these problems have contributed to deteriorated performance by the agricultural

extension staff. Thus, the AEE program is considered to be ineffective in Swaziland.

Twala et al. (1984) confirmed the deteriorating performance of the agricultural extension staff in Swaziland. They stated that if the frontline extension worker fails, the system shall fail regardless of the individual efforts in the higher echelons. Also, if the frontline staff fails to deliver the technical message to the farmer and the farmer's education does not take place, the chance for increased agricultural output would be diminished.

The MOAC has four main departments: the departments of Agriculture and Extension, Research and Planning, Cooperative Development, and Veterinary Services (which is the oldest). The agricultural extension division is responsible for the promotion of crop, horticulture, and livestock production on the Swazi Nation Land (SNL). The promotional process is accomplished through seminars, agricultural shows, demonstrations, field days, individual farmer visits, and in cooperation with the research division on-farm trials and demonstrations (Nxumalo, 1990). The livestock unit is under the director of veterinary services. This section has its own field extension staff but works cooperatively with the general agricultural extension unit.

The agricultural extension division is headed by a Senior Agricultural Officer (SAO). He works closely with another SAO whose sole responsibility is the technical dimension of crops and horticulture. There is a Senior Extension Officer (SEO) who is also based at headquarters as an assistant to the SAO-extension. Other key persons are

the National/District Subject Matter Specialists (N/DSMS). Their primary responsibility is to provide backup support to Extension Officers (EOs) and Field Officers (FOs). There are four SEOs who are charged with the responsibility of coordinating regional agricultural extension activities in the four geographical zones in Swaziland.

A support division to the AEE program is the information and publication department which is based at headquarters. Its primary task is to assist all agricultural extension staff with publication and the production of teaching tools or visual aids. The department liaises very closely with the Extension Training Officer who is based at headquarters. His major responsibility is planning and coordinating in-service courses for the field staff. The in-service courses are usually held in winter when the farming activities are not at their peak.

There are Rural Development Areas (RDAs), about four in each region. RDAs are part of all the agricultural institutions which are centers for the AEE staff, agricultural supply shops, and a tractor pool for farmers to hire. Project managers are in charge of one or two RDAs and are responsible for coordinating all the extension activities in the center.

Criticisms of Agricultural Extension in Swaziland

Several documents that present information on AEE in Swaziland give conflicting reports. Some indicate great success while others show dissatisfaction with the agricultural extension system in Swaziland. Regarding the latter, a claim is made that agricultural extension is fragmented and lacks systematic and quality educational activities.

According to Trail (1985), the mission of AEE was ill-defined. In this regard, he recommended that the MOAC in Swaziland needed to clearly define the mission of AEE. Along with the redefinition of the mission of AEE, he recommended that the purpose, goals, objectives, strategies, guidelines, and policies should be stated in comprehensive terms. Such a move would help communicate how AEE fits into Swaziland's Annual National Development Plan.

It is further believed that farmers are never consulted prior to any program development process. Yet the need to consult farmers during planning is very essential (Maina, 1977). Bunch (1990) pointed out that the failure to put the farmers' agenda first is likely to cause extension staff to address the wrong problems and needs. Therefore, this subject should be a cause for concern among the providers and recipients of agricultural extension in Swaziland.

Maina (1977) also noted similar weaknesses in the Swaziland AEE program. He then proposed several ways to circumvent weaknesses with agricultural extension in Swaziland. He recommended that a clear policy be formulated, written, and reviewed annually. Such a policy would state precisely what the MOAC should do and the kind of support needed by the AEE from government.

Maina further stated that a food production policy which would not jeopardize the favorable food export potential toward self-sufficiency needed to be drawn. He said that program planning should be conducted by the field officers in consultation with the farmer. The identification of the target audience should be part of the programming process. The

extension officer or any senior staff should guide the program planning process.

Additionally, Maina pointed out that lack of proper record and log-book keeping had resulted in poor accountability by the field officers. He stated that most of the available records were from informally and unscientific reports. The relationship between research and extension was found to be ill-defined. Maina pointed out that the attitudes of officers towards work (extension service) were somewhat lukewarm. He therefore urged that the MOAC should ensure that these problems were addressed as a matter of urgency.

Twala et al. (1984) stated that the MOAC had four primary objectives. They were to 1) enhance self-sufficiency in crop production and diversification, 2) promote nonformal agricultural education for the rural population, 3) promote and enhance cooperative facilities for the procurement and distribution of farm inputs at reasonable prices, 4) improve marketing facilities and channels, and 5) promote and enhance cooperative facilities for the disbursement of agricultural credit to the Swazi Nation Farmers (SNF).

The primary objectives stated by Twala et al. (1984) were consistent with the propositions in the Post-Independence Development Plan (1969). However, sound objectives on paper are not of any use unless efforts are expended to carefully help the main actors to implement them accordingly. Also, farmers who are the recipients of the AEE program need to be included in the determination and implementation of the AEE activities. When problems are encountered by the field officers and extension

officers, some assistance should be made readily available to help them curb those problems that impact the conduct of AEE activities.

In order for the MOAC to achieve its primary objectives, it needs to have an effective AEE system. An effective extension system requires dedicated, committed, motivated, and highly inspired extension agents. According to Prawl et al. (1984), the key to the success of any extension program is the extension officer. The officer's ability to sympathize and understand the people and their farming problems are the most invaluable characteristics. Also, the understanding of principles of agricultural extension, how to apply them to different situations, and possessing a sound technical education by field officers are extremely essential.

The Hunting Technical Services (1983) pointed out that the quality of extension service in Swaziland had been plagued by many factors. In addition to the many other factors, the major problems center on the lack of clearly defined technical messages to be disseminated to the majority of farmers, very rapid organizational changes of the AEE system, and the lack of a sound philosophical framework of the AEE system (Diamond, 1992).

As an attempt to improve agricultural extension in Swaziland, the Hunting Technical Services recommended that the entire MOAC needed to be overhauled and reorganized. The reorganization of the MOAC alone could not, however, effectively help improve the quality of the agricultural extension system, especially when the field officers, extension officers, and farmers as main actors are left out of the reorganization process (Benor et al., 1984; Watts, 1984). All the stakeholder groups in

agricultural extension need to be involved, particularly those who are closest to the action.

Khumalo (1989) attested to the alarming weaknesses of the AEE system as did the Hunting Technical Services. He stated that the dilution of the agricultural extension program started between 1970 and 1980 during the restructuring process of the MOAC. The dilution was characterized by proliferation of sectors. This proliferation of sectors meant that each sector had to have its own extension unit and manage its resources. As a result of this arrangement, some confusion and administrative problems became eminent.

Khumalo indicated that there was loss of efficiency in dealing with the problems of a farmer. The loss of efficiency in dealing with farmers was compounded by the tendency of extension staff to oversupervise farmers. Yet, according to Belloncle (1984-85) and Bunch (1990), farmers are responsible adults who always want to know where they are being taken before setting out on the trip.

The paucity of documentation of events since the inception of the extension service in the 1930s has been another handicap in the development of agricultural extension in Swaziland. Lack of documentation has made it difficult for one to have a complete picture on the sequence of events as agricultural extension evolved (Khumalo, 1988).

In recent years, the MOAC has expended efforts to improve agricultural extension in Swaziland. The introduction of the Training and Visit (T&V) system in 1984 is one of the most recent efforts to improve agricultural extension. The T&V system was introduced to help revitalize

AEE and improve farmer education through regular training of staff and scheduled visits to farmers.

According to Samarasinghe et al. (1990), the T&V system of extension has several advantages. Under the T&V system, schedules of work, duties, and responsibilities of extension personnel are clearly specified and supervised at all levels. Additionally, the number of farm families per field-level extension worker is set at a manageable level. They further pointed out that a specified schedule of visits to farmers' fields is an integral part of the system and this training could enhance farmers' confidence.

However, since the introduction of the T&V system in Swaziland, there have been more complaints from the public. People have alleged that the new method of conducting extension education has not been satisfactory. As a result of the complaint, a review team was commissioned by the MOAC to evaluate the T&V-AEE system in 1987.

Malaza et al. (1988), a rural sociologist, conducted an evaluation of the T&V system as commissioned by the MOAC. The study was undertaken to 1) determine the experiences of the extension staff and farmers with the T&V system, and 2) identify problems and constraints the extension staff encountered in adopting the new agricultural extension education method to their local situations. Additionally, the study sought to determine how satisfied the farmers were with the T&V system as opposed to the old traditional extension method of AEE.

Results of the study revealed that there were serious problems for both the field officers and the farmers. Field officers reported that the

content of the T&V messages was shallow. Secondly, that the timing of the meetings was not congruent with the farmers' schedules. While farmers, on the other hand, indicated that they could not cope with the frequency and the number of meetings they were asked to attend. Such a situation where there is a time schedule conflict between an agent and the clientele group could cause unprecedented inconveniences and dissatisfactions to both parties.

According to Rogers (1983), it is essential that any planned meeting to educate farmers should not cause inconvenience. This notion underscores the concept of time dimension and compatibility of innovations to a targeted audience. The experience with the T&V system seemed to have not catered to the officers' and the clientele's needs. As a result of the mentioned experiences with the T&V system, the review team recommended that the T&V system needed to be revised and modified to curtail some of the problems leading to the whole agricultural extension program being perceived as ineffective.

Efforts have been expended to effect some changes in the T&V system. These efforts were stated in Lukhele's (1988) memorandum. In this memorandum, he stated that the modification was not implying a new method of conducting extension education. Secondly, all extension workers starting with the National Subject Matter Specialists (NSMS) to the front line officers were expected to follow the new approach without any major difficulties. In the event that some difficulties were encountered, he advised that such incidences were to be reported to the extension officers without delay.

The proposed modification included seven aspects. The field officers assisted by extension officers were to map and subdivide the area allocated to him or her into three units designated A, B, and C. In addition to the subdivision, the field officer would then determine the total number of homesteads in each unit and the total size of the area of operation. The services of the Land Use Planning (LUP) section were to be solicited through the supervising officers.

The field officers were expected to identify and select not more than six agricultural production enterprises that were considered important in the field officer's area of operation. It was proposed that the senior extension officer would then review and synthesize all the activities identified by the field officer in order to develop a comprehensive program for the region. However, this short circuit approach would violate the line of command if the senior extension officer would be the one to receive the field officer's program of activities. It should have been the extension officer who was the immediate supervisor to the field officer and then the extension officer would in turn pass it on to the SEO.

The field officer was advised to adhere to a fortnight schedule as shown in Figure 3. The officer had to spend days 1, 2, and 3 visiting farmers exclusively in Units A, B, and C in that order. During these visits, the officer was free to make individual farmer consultations, conduct meetings, carry out demonstrations, field days, and seminars. On days 4 and 5 of the first week and day 4 of the second week, the officer

<u>Week 1:</u>					
UNIT	A	B	C		
DAY	1	2	3	4	5
Activity	FV	FV	FV	RFV	RFV
<u>Week 2:</u>					
UNIT	A	B	C		
DAY	1	2	3	4	5
Activity	FV	FV	FV	RFV	RP
<u>Note:</u> FV - Field Visit					
RFV - Repeat Field Visit					
RP - Reporting					

Figure 3. Fortnight schedule of extension activities

would repeat visits or make follow-ups on special needs expressed by the farmers. Finally, on day 5 of week 2, the officer should spend some time writing reports and repeat the schedule of activity in the second fortnight of the month.

The fourth aspect was on field training which had to be attended by all regional extension staff and collectively trained by NSMSs and Research Officers (ROs). The training modules would be based on the training needs expressed by the field officers. This arrangement is prone to criticism because the training needs of field officers might differ from those of Project Managers, Extension Officers, and District/Area

Subject Matter Specialists. Furthermore, the proposed duration of 3 days per region within a 3 month period seemed to be just arbitrarily proposed.

The last three aspects were the research meetings, D/ASMSs, and implementation of the proposed extension program. Regarding research extension meetings, it was proposed that NSMS, ROs, and Extension Training Section of the MOAC would meet to review, plan, and develop a comprehensive training program for implementation during subsequent training sections for the field staff. The SAO-extension would be the convener and the SAO-technical would also attend.

The D/ASMSs were expected to provide backup services to the field officers who are the front line staff. In order for the D/ASMSs to effectively provide the backup support to the field officers, they needed to schedule visits which coincided with that of frontline officers in that locality. This arrangement seemed plausible but widely criticized as being a complicated process. Moris (1984-85) stated that if field officers were forced to follow the schedule of higher authorities when making visits to farmers, their (field officers') efforts would likely remain unrecognized by farmers and immediate supervisors.

Finally, the implementation process stated that the Director of Agriculture (DA) would be ultimately responsible for the effective implementation of this program. The day-to-day administration and supervision of the whole program was delegated to the SAO-extension in collaboration with the SAO-technical. It was proposed that the new approach was to be implemented by April 1, 1989, and that all preparatory and planning work was to be completed by that time. The extension

training and the LUP units of the MOAC were urged to assist SEOs in planning all regional area extension activities. This modification was considered to be very flexible for the field officers. Results of the proposed modification were yet to be seen at the time this study was conducted.

Studies Related to Agricultural Extension Education

Several other studies related to AEE have been conducted in Swaziland and in other countries. Easter (1985) studied professional competencies needed by agricultural extension officers in Swaziland. Results of his study indicated that there were no substantial differences in the perceptions of the professional competency categories when examined by the individual's position, area of responsibility, experience, age, sex, and educational level attained. Program planning, program evaluation, teaching, and evaluation competencies were consistently perceived as important competencies to be possessed by extension professional staff.

Surprisingly, communication and maintaining professionalism were not viewed as major areas of concern. Yet, as informed by Bembridge and Steyn (1984), these competencies are fundamental to the effectiveness of field officers. Also, according to Rogers (1983), a strong proponent of effective communication of innovations, a change agent should perceive communication as the key to the success of the diffusion of innovations. He stated that unless a change agent develops effective communication skills and understands the communication process, he cannot be an effective change agent.

Rogers (1983) further pointed out that a change agent has seven major functions which are all related to communication. A change agent has to be a part of a need for change on the part of the clients, establish an information-exchange relationship, diagnose clients' problems, translate their intent into action, stabilize adoption and prevent discontinuances, and achieve a terminal relationship with the clients. Therefore, communication should be viewed as a critical factor in the diffusion of innovations.

Msitsini (1987) studied perceptions of major problems encountered by agricultural extension agents in Swaziland held by area agents. His working premise was that there was a widespread belief in Swaziland that the performance of agricultural extension agents was far below expectations. This premise was attributed to the fact that officers were alleged to be lacking motivation. As a former extension officer himself, Msitsini attested to the deteriorated level of motivation among field officers. Furthermore, he pointed out that there were many more unnoticed problems that hindered the conduct of the extension service in Swaziland.

Results of his study revealed that lack of transportation was perceived as the major problem in conducting AEE activities in Swaziland. Poor maintenance of officers' houses, low salaries, and lack of further training opportunities for officers contributed to low work morale among field officers. Low morale often yields poor performance by agricultural extension agents. He recommended that the MOAC should view these problems with serious concern and find ways to alleviate them.

The problems reported by Msitsini were also confirmed by Moris (1984-85). He stated that in six Nigerian states and Tanzania, 1) insufficient transportation, 2) low prices for agricultural products, 3) lack of proper markets, 4) lack of cooperation from other agencies in program implementation, 5) lack of staff motivation, 6) inadequate technical training in agriculture, and 7) lack of research, technical, and administrative support were of great concern in the AEE program.

According to Mosher (1966), agricultural development of any country is a complex task. It is complex because different conditions have to be created or modified by different persons and groups. Also, appropriate techniques must be employed. All these factors need to be combined and used with intelligence, imagination, experimentation, and continuing hard work. Therefore, the problems stated by Msitsini (1987) and Moris (1984-85) could be problematic in AEE everywhere if not avoided.

Ibrahim (1979) studied perceptions of the Tanzanian agricultural extension service held by trainers, employers, extension officers, and the clientele group. The primary objectives of the study were to determine perceptions held by the extension clientele, extension officers, employers, and trainers regarding the role of the Tanzanian agricultural extension service, and identify strategies, problems encountered, and extension methods used. The study sought to determine respondents' attitudes toward the extension service and extension officers' training competence and performance.

Results of the study revealed that significant differences in the perceptions of the role of the Tanzania extension service, strategies, and

problems existed among the trainers, employers, extension officers, and the clientele group. All the respondents, with the exception of trainers, expressed a need for extension programs to be organized and coordinated at the national level. This notion underscored the call for moving away from centralized to decentralized planning (Rogers, 1983). A decentralized planning process could promote involvement of the people who are closest to the action.

Furthermore, the respondents were in strong agreement that the extension service helped farmers to help themselves and that the current local AEE programs were less than satisfactory. Farmers, in particular, were not satisfied with the performance of the extension agents. The trainers, employers, extension officers, and farmers felt that the success of the AEE in Tanzania depended on a change of attitude of farmers, extension agents, administrators, and political leaders.

Ibrahim suggested several recommendations in his study. The most intriguing recommendations were that the agricultural policy and the organization of the agricultural extension service in Tanzania needed to be reviewed such that the nature of duties of extension staff would reflect a practical and nonformal education effort. Also, that the farmer education program was to be based on felt needs and problems of farmers. Belloncle (1984-85), Boyle (1981), and Bunch (1990) agreed with the last point because they strongly believed that farmers as adults are responsible individuals and would articulate their needs much better and participate more actively if they were involved during the planning process for AEE.

Ibrahim recommended that agricultural extension systems needed to be reviewed. Results from the review process would help to determine reasons why agricultural extension could be perceived as unsatisfactory.

Additionally, there is a need to constantly study opinions of all the interest groups in agricultural extension. He stated that by studying the opinions of all the interest groups in agricultural extension, one would be able to determine the similarities and diversity of opinions. Once established, AEE programs would be tailored to the needs of the clientele.

Gajian and Lawrence (1986) studied Zanzibar's progressive farmers' perceptions of extension agents. Findings of their study revealed that farmers claimed that extension agents were capable of maintaining farmers' interest. Secondly, the farmers believed the value of extension work was high. At the same time, the farmers reported that the extension agents were unable to help them solve farming problems.

Bahal et al. (1990) conducted an analysis of agricultural extension personnel worldwide. This study was prompted by the belief that the effectiveness of extension systems depends in large part upon the quality and quantity of human resource available within that system. The authors stated that without adequate numbers of competent extension personnel, the entire extension system would be limited in its ability to plan, execute, and evaluate educational programs and other technology transfer activities.

Results of the study revealed that agricultural extension personnel worldwide was conservatively estimated in excess of 600,000 extension workers. Africa in particular accounted for 10.8 percent of extension

personnel and had more field staff (82.3%). Regarding gender categorization and educational qualifications, Africa had the second least number of female agriculture field workers and educational qualifications (6.9% and 2.5%) compared to Europe. Africa had the fourth highest (1:1,809) ratio of agents to farmers. Annual turnover of extension staff was also reported to be a critical factor in Africa.

Farner et al. (1990) conducted a study of agricultural extension systems worldwide under the auspices of the Food and Agriculture Organization (FAO) of the United Nations. Results of the study showed that early attempts to organize extension especially in Europe and North America were ad hoc efforts. Most agricultural extension systems did not become institutionalized until the beginning of the twentieth century. The vast majority of extension organizations have been organized in developing countries primarily during the past three decades.

The study further revealed that several approaches to extension worldwide were being employed. The approaches employed depended largely upon the purpose and function of the extension program. Also, the approaches were influenced by the financial support, organization, and client participation in policy formulation and program development.

Farner et al. (1990) asserted that some types of extension institutions, such as those with integrated approaches to extension, could assist farmers and/or rural farm households to get organized so that they could better utilize government services. Others such as the T&V extension system have more specific objectives, namely, technology transfer.

The conclusion the authors drew from this study was that most countries have some type of agricultural extension system in place. The authors concluded that agricultural extension systems in developing countries have been organized by the local government with the assistance of donor agencies. It is this kind of arrangement that has caused some problems with many agricultural extension systems in developing countries. Finally, the authors concluded that most extension systems give heavy attention to technology transfer, with far fewer resources being allocated to broaden human capital development goals, especially those of educational activities that contribute to sustainable, broad-based agricultural and rural development.

Summary of the Review of Literature

Agricultural extension was established as a vehicle to disseminate agricultural innovations to farmers. It was envisaged to educate rural people about improved and sustainable farming techniques. It has been viewed as a means of communicating research results to the farm families through extension agents. Overall, its inception was to help many nations to produce enough food for family consumption, help provide income to the unemployed rural people, and to provide raw materials to the swelling industries.

The reviewed literature underscores that agriculture is very important to the lives of many nations. In order for the agricultural sector to continue being the backbone of developing countries, it requires an efficient AEE system. An effective and efficient system is usually

built upon an explicit agricultural policy. An agricultural policy is needed to provide the overall direction of AEE. Also, the policy should be linked to the philosophy and primary mission of the extension service.

The literature revealed that AEE especially in developing countries has been widely criticized. The alarming criticisms suggest that many stakeholder groups are dissatisfied with extension education. The challenge is what could be done to change the current image of the AEE system? It might sound simple to consider Bowman and Deal's (1991) suggested strategy of "reframing" AEE. However, such an exercise is not very easy as confirmed by Bowman and Deal (1991). It requires careful framing and systematic analysis. Also, from the reviewed literature there is evidence that some agricultural extension systems are more effective than others. Therefore, on top of formulating a sound agricultural policy, the choice of a suitable agricultural extension system is very important.

Field officers, extension officers, and farmers are the primary actors in the conduct of an agricultural extension system. As the main actors, these individuals are very important to the success of the agricultural extension system. Therefore, it becomes imperative to collect their perceptions of the AEE system. A study of the perceptions of the AEE system held by the stakeholder of that system could help to provide insights regarding program objectives, principles, teaching methods, and teaching tools, as well as identify problems which could impact AEE system activities.

CHAPTER III. METHODS AND PROCEDURES OF THE STUDY

Chapter III is divided into six major subheadings: 1) Purpose and Objectives, 2) Research Design, 3) Population and Sample Selection, 4) Instrumentation, 5) Collection of Data, and 6) Analysis of Data.

Purpose and Objectives

The primary purpose of the study was to identify and analyze perceptions of field officers, extension officers, and farmers regarding the Agricultural Extension Education (AEE) system in Swaziland. The specific objectives of this study were to:

1. Identify demographic characteristics of field officers, extension officers, and farmers.
2. Describe perceptions of field officers, extension officers, and farmers regarding objectives, principles, teaching methods, teaching tools, and problems which are perceived to limit the conduct of AEE activities.
3. Compare perceptions of field officers, extension officers, and farmers and their selected demographic variables regarding AEE.
4. Determine the relationships between perceptions of field officers, extension officers, and farmers regarding program objectives, program principles, teaching methods, teaching tools, and problems impacting AEE and their selected demographic variables.
5. Elicit suggestions and comments of field officers, extension officers, and farmers on how AEE in Swaziland could be improved.

Research Design

The study employed a descriptive survey method. It was a perception survey, which is a recommended way of eliciting subjects' reflections regarding their past and present opinions of a phenomenon (Rivera et al., 1983). Perceptions of field officers, extension officers, and farmers regarding AEE were correlated with their selected demographic characteristics to explore the relationships that existed. There was no manipulation of variables, only the descriptions of variables and relationships as they occur naturally.

Population and Sample Selection

Permission to conduct the analysis of AEE in Swaziland was sought from the Ministry of Agriculture and Cooperatives (Appendix B) and was granted by the Senior Agricultural Officer (Appendix C).

An up-to-date list of field officers and extension officers was obtained from the Senior Extension Officers (SEOs) as regional supervisors. The list was purged to avoid an officer being repeated in the survey and to control frame and selection error. According to Dlamini (1987), selection error often occurs when certain subjects in a population have a greater chance of falling into the sample more than others. Therefore, selection was not a threat to the study after ensuring that there were no multi-listed persons in the samples.

The target population for the study was all field officers and extension officers working in the Rural Development Areas (RDAs) in Swaziland and all farmers who were receiving AEE services from the RDAs.

The names of all field officers from the RDAs were written down on small pieces of paper from which 50 officers were randomly selected. There were 20 extension officers in total from the RDAs and all of them were included in this study.

The selected field officers were asked to provide a list of all the farmers who were participating in AEE activities in their areas. From these lists, three farmers were randomly selected from 14 RDAs and four from the two largest RDAs, making a total of 50 farmers.

The procedures described above were followed to ensure that a representative sample of the three groups was selected to participate in this study.

Instrumentation

Following a review of selected studies and reports (Ibrahim, 1979; Ogola, 1982; Bembridge & Steyn, 1984; Twala et al., 1984; Trail, 1985; Easter, 1985; Gajian & Lawrence, 1986; Msitsini, 1987; Khumalo, 1988, 1989; Creswell, 1990), an instrument was developed.

The instrument was divided into four parts. Part I consisted of extension program objectives, program principles, teaching methods, and teaching tools. Part II, III, and IV consisted of problems impacting AEE activities, demographic characteristics, and general suggestions and comments on how AEE in Swaziland could be improved, respectively (Appendix E).

In Part I, a Likert scale of Strongly Agree=5, Agree=4, Neutral=3, Disagree=2, Strongly Disagree=1 was used by the respondents to rate each

item by circling the appropriate letters. Under Part II, the same Likert scale was used with slight changes to avoid respondents from rating items without carefully reading each statement. In this section, the respondents were asked to rate each statement by placing a checkmark (✓) under each number that was closest to their opinion.

The survey form was reviewed by three experts in AEE at Pennsylvania State University and the major professor and was approved by the Human Subject Research Review Committee at Iowa State University. The experts from Pennsylvania State University were familiar with the AEE program in Swaziland. Upon receipt of suggestions from the reviewers, some questionnaire items were modified or deleted and wording improved.

These procedures were followed in order to ensure content validity of the instrument. It was then bound in booklet form for it to be attractive, easy for the respondents to read and complete, and also easy for the researcher to code and score responses as advised by Dillman (in Ary et al., 1990, p. 426).

The instrument was pilot-tested with former extension agents who were undergraduate students at the University of Swaziland, College of Agriculture, and international graduate students at Iowa State University in the Department of Agricultural Education and Studies. The reliability coefficient for each category and overall instrument reliability were computed using the SPSS-X Microsoftworks computer facilities at Iowa State University. These procedures were followed to ensure that reliability requirements of a survey instrument were met as advised by Ary et al.

(1990). The reliability coefficients for the instruments are indicated in Table 1.

The overall instrument reliability was 0.97. The reliability coefficients were considered to be reasonable to proceed with the data collection.

Table 1. Reliability coefficients of instrument on agricultural education

Instrument scale	Number of items	Alpha	Standardized alpha
Program objectives	22	0.82	0.84
Principles	16	0.68	0.78
Teaching methods	22	0.94	0.94
Teaching tools	22	0.95	0.96
Problems	26	0.77	0.78

Collection of Data

A cover letter for the questionnaire was written by the researcher and edited by the major professor (Appendix D). This letter served to ask the subjects to participate in the study and assured them confidentiality of their responses, and also that they reserved a right to participate or withdraw their participation during the course of the study.

Questionnaires were mailed and hand delivered to field officers and extension officers during Summer 1992. Questionnaires were coded using numbers to identify nonrespondents for follow-up efforts to collect completed questionnaires. After receiving a returned questionnaire, the identification number was removed. According to Dillman (1978), this

follow-up practice has to be employed in survey research in order to achieve a better response from a study population.

The farmers were interviewed by the researcher using the same questionnaire. Those farmers who could read and write were asked to complete the questionnaire with the assistance of the researcher. Each interview took approximately one hour.

Analysis of Data

Data were analyzed and summarized using the Statistical Package for Social Sciences (SPSSx: User's Guide, 1990) and SAS (1991) of the Iowa State University Computation Center. The following statistical procedures were used: frequencies, percentages, means, standard deviations, t-test, one-way analysis of variance, and Scheffé/Duncan procedures. Correlation coefficients were computed to detect the relationships between the respondents' perceptions and their selected demographic variables.

A priori alpha level of .05 was set to interpret analysis of variance (ANOVA) and relationships between the respondents' perceptions of AEE and their selected demographic variables. Hinkle et al. (1988) descriptors were used to describe the magnitude of the relationships.

General suggestions and comments to improve AEE in Swaziland were edited and summarized for further consideration.

CHAPTER IV. FINDINGS AND ANALYSIS

The study focused on the identification and analysis of the perceptions of field officers, extension officers, and farmers regarding Agricultural Extension Education (AEE) in Swaziland. An attempt was made to identify demographic characteristics of field officers, extension officers, and farmers. The study described perceptions of the respondents regarding program objectives, program principles, teaching methods, teaching tools, and problems which could limit AEE activities. The study further compared perceptions of the respondents and their selected demographic variables regarding AEE. Also, the study sought to determine the relationship between perceptions of field officers, extension officers, and farmers regarding program objectives, program principles, teaching methods, teaching tools, and problems of AEE and their selected demographic variables. Finally, an attempt was made to elicit suggestions and comments of the respondents on how AEE could be improved in Swaziland.

The data collected from the field officers, extension officers, and farmers were analyzed using a number of procedures: frequencies, means and standard deviations, one-way analysis of variance, Scheffé and Duncan tests, t-test, and correlation analysis. The statistical analyses and findings are presented in this chapter.

The chapter is divided into the following sections: 1) demographic characteristics of respondents, 2) findings by research objectives, 3) added statements grouped according to five aspects of AEE, and

4) selected suggestions and comments from respondents regarding ways to improve AEE in Swaziland.

These three groups were found to be not easily accessible due to the prevailing drought crisis in Swaziland at the time of the study. Hence, some of the participants either could not return the survey form or be interviewed as planned. The overall response rate was 106 (88.3%) and was considered adequate to continue with the analysis.

Demographic Information

Information on frequency and percentage distribution of field officers, extension officers, and farmers is presented in this section.

Region

Table 2 indicates that there were 26 respondents (24.5%) from Manzini region, 28 (26.4%) from Hhohho region, 21 (19.8%) from Lubombo region, and 31 (29.2%) from Shiselweni region.

Table 2. Frequency and percentage distribution of respondents by region

Region	Frequency	Percent	Cumulative percent
Manzini	26	24.5	24.5
Hhohho	28	26.4	50.9
Lubombo	21	19.8	70.8
Shiselweni	<u>31</u>	29.2	100.0
Total	106		

Position

Table 3 indicates that 43 respondents (40.5%) were field officers, 15 (14.2%) were extension officers, and 48 (45.3%) were farmers.

Age

As can be observed in Table 4, 11 (10.4%) of the respondents were 30 years or less, 40 (37.7%) were between 31 and 40 years, 21 (19.8%) were between 41 to 50 years, 10 (9.4%) were between 51 to 60 years, and 12 (11.3%) were over 60 years old. The remaining 12 (11.3%) did not indicate their age. The average ages were 33.3 for the field officers, 40.5 for the extension officers, and 50.6 for the farmers.

Academic qualifications

Table 5 provides information on academic qualifications of respondents indicating that 11 (10.4%) of the participants had no formal education. About 4 (3.8%) had Sebenta literacy education (basic reading and writing). Eighteen respondents (16.9%) had lower and higher primary

Table 3. Frequency and percentage distribution of respondents by position

Position	Frequency	Percent	Cumulative percent
Field officers	43	40.6	40.6
Extension officers	15	14.2	54.8
Farmers	<u>48</u>	45.3	100.0
Total	106		

Table 4. Frequency and percentage distribution of respondents by age

Age	Frequency	Percent	Cumulative percent
<30	11	10.4	10.4
31-40	40	37.7	48.1
41-50	21	19.8	67.9
51-60	10	9.4	77.3
>60	12	11.3	88.6
Missing	<u>12</u>	11.3	100.0
Total	106		

Table 5. Frequency and percentage distribution of respondents by academic qualifications

Academic qualifications	Frequency	Percent	Cumulative percent
No formal education	11	10.4	10.4
Sebenta literacy	4	3.8	14.2
Lower and higher primary	18	16.9	31.1
Secondary and high school	12	11.3	42.4
Certificate in Ag.	43	40.6	83.0
Diploma in Ag./Ed.	<u>18</u>	16.9	100.0
Total	106		

education. There were 12 (11.3%) who had secondary and high school education. There were 43 (40.6%) respondents with a certificate in agriculture. The remaining 18 (16.9%) had either a diploma in agriculture or education.

Farm/work experience

In Table 6, information on years of farm/work experience of respondents is presented. The average years of farm/work experience was 9.9 years for field officers, 17.2 years for extension officers, and 12.8 years for farmers. It can be observed that 21 respondents (19.8%) had 5 years or less of experience, 29 (27.4%) had 6 to 10 years of experience, 37 (34.9%) had 11 to 20 years of experience, 6 (5.7%) had 21 to 30 years of experience, and 5 (4.7%) had 30 and above years of farm or work experience.

Table 6. Frequency and percentage distribution of respondents by farm/work experience

Years of farm/ work experience	Frequency	Percent	Cumulative percent
<5 years	21	19.8	19.8
6-10 years	29	27.4	47.2
11-20 years	37	34.9	82.1
21-30 years	6	5.7	87.8
>30 years	5	4.7	92.5
Missing	<u>8</u>	7.5	100.0
Total	106		

Gender

Information presented in Table 7 shows the characteristics of extension staff and farmers according to gender. As can be observed from the table, 67 (63.2%) respondents were male, 38 (35.8%) were female, and 1 (0.9%) did not indicate his or her gender.

Table 7. Frequency and percentage distribution of respondents by gender

Gender	Frequency	Percent	Cumulative percent
Male	67	63.2	63.2
Female	38	35.8	99.0
Missing	<u>1</u>	0.9	100.0
Total	106		

Marital status

Regarding marital status (Table 8), 22 (20.8%) respondents were single, 83 (78.3%) were married, and 1 (0.9%) did not indicate his or her marital status.

Table 8. Frequency and percentage distribution of respondents by marital status

Marital status	Frequency	Percent	Cumulative percent
Single	22	20.8	20.8
Married	83	78.3	99.1
Missing	<u>1</u>	0.9	100.0
Total	106		

Major purpose of farming

Table 9 contains information regarding characteristics of farmers according to major purpose of farming. As can be observed from the table, 41 (85.4%) farmers indicated that their major purpose for farming was for

Table 9. Frequency and percentage distribution of respondents by major purpose of farming

Major purpose of farming	Frequency	Percent	Cumulative percent
Family consumption	6	12.5	12.5
Marketing	1	2.1	14.6
Both family consumption and marketing	<u>41</u>	85.4	100.0
Total	48		

both family consumption and marketing produce. Six respondents (12.5%) were farming for family consumption only. One farmer was farming for marketing purposes.

Agricultural enterprise

Table 10 indicates 40 participants (83.3%) were raising maize, 6 (12.5%) other crops, and 2 (4.2%) did not indicate which crops they were raising. With regard to livestock, 44 (91.6%) did not provide information on which livestock they were raising. There were 2 (4.2%) who were beef producers and the remaining 2 (4.2%) were raising other livestock. Information on poultry indicates that 4 (8.3%) were raising broilers. None were raising other types of poultry and 44 (91.7%) did not provide information.

Table 10. Frequency and percentage distribution of respondents by agricultural enterprise

Agricultural enterprise	Frequency	Percent	Cumulative percent
Crops: Maize	40	83.3	83.3
Other	6	12.5	95.8
Missing	<u>2</u>	4.2	100.0
Subtotal	48		
Livestock: Beef	2	4.2	4.2
Other	2	4.2	8.4
Missing	<u>44</u>	91.6	100.0
Subtotal	48		
Poultry: Broiler	4	8.3	8.3
Other	0	0.0	8.3
Missing	<u>44</u>	91.7	100.0
Subtotal	48		

Decision about farming

Information regarding decisions made about farming in a household is presented in Table 11. As can be observed from the table, 31 (64.6%) farmers indicated that the husband and wife made decisions about farming.

Table 11. Frequency and percentage distribution of respondents by decision about farming

Decision about farming	Frequency	Percent	Cumulative percent
Husband	2	4.2	4.2
Wife	6	12.5	16.7
Husband and wife	31	64.6	81.3
Others	<u>9</u>	18.7	100.0
Total	48		

There were 2 (4.2%) who stated that the husband made the decisions about farming, 6 (12.5%) indicated that the wife made the decisions, and 9 (18.7%) stated that others made decisions about farming.

Respondents' Perceptions Regarding the Aspects of Extension

Program objectives

The data in Table 12 indicate that field officers, extension officers, and farmers rated 18 of the 22 listed objectives for AEE fairly high on the scale. Mean scores for these statements ranged between 3.65 and 4.78.

Respondents seemed indecisive on whether or not government enforced production goals and regulation should be objectives for AEE with farmers expressing more disagreement than others. The respondents indicated disagreement that encouraging farmers to produce commercial crops only and farm for family consumption only should be potential objectives of AEE with mean scores of 1.97 and 1.63, respectively.

Program principles

The data shown in Table 13 indicate that the respondents highly rated all the listed items except one, thus indicating they should be considered as principles to undergird AEE in Swaziland. The respondents seemed less inclined to support the principle that farmers' participation in agricultural extension meetings should be compulsory. The mean for this item was 2.96.

Table 12. Means and standard deviations of perceptions held by Swaziland field officers, extension officers, and farmers regarding program objectives^a

Objectives	n	<u>FOs^b</u>	n	<u>EOs^b</u>	n	<u>Farmers</u>	N	<u>Total</u>
		<u>Mean</u> SD		<u>Mean</u> SD		<u>Mean</u> SD		<u>Mean</u> SD
1. Transferring subject matter	41	<u>4.34</u> 0.79	14	<u>4.85</u> 0.36	48	<u>4.79</u> 0.58	103	<u>4.62</u> 0.68
2. Assisting farmers to shift from subsistence to commercial farming	42	<u>4.69</u> 0.56	15	<u>4.60</u> 0.50	48	<u>4.56</u> 0.58	105	<u>4.61</u> 0.56
3. Helping farmers to raise quality livestock	42	<u>4.69</u> 0.46	15	<u>4.73</u> 0.45	48	<u>4.35</u> 0.56	105	<u>4.54</u> 0.53
4. Helping farmers to raise quality yielding crops	42	<u>4.71</u> 0.59	15	<u>4.73</u> 0.45	48	<u>4.81</u> 0.39	105	<u>4.76</u> 0.49
5. Teaching farmers to diversify	42	<u>4.04</u> 0.94	15	<u>4.13</u> 0.83	48	<u>4.64</u> 0.69	105	<u>4.34</u> 0.86
6. Encouraging formation of cooperatives	42	<u>4.50</u> 0.63	15	<u>4.73</u> 0.59	48	<u>4.41</u> 1.14	105	<u>4.49</u> 0.90
7. Improving marketing of farm produce	41	<u>4.36</u> 0.73	15	<u>4.46</u> 0.63	48	<u>4.66</u> 0.47	104	<u>4.51</u> 0.62
8. Teaching farmers to keep records	42	<u>4.54</u> 0.59	15	<u>4.53</u> 0.51	48	<u>4.62</u> 0.48	105	<u>4.58</u> 0.53
9. Linking research with farmers	42	<u>4.52</u> 0.70	15	<u>4.60</u> 0.50	47	<u>4.27</u> 0.74	104	<u>4.42</u> 0.70
10. Helping farmers to make intelligent decisions	43	<u>4.23</u> 0.71	15	<u>4.33</u> 0.72	47	<u>4.89</u> 0.31	105	<u>4.54</u> 0.65

^aRating scale: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree.

^bFOs=field officers, EOs=extension officers.

Table 12. Continued

Objectives	n	<u>FOs</u>	n	<u>EOs</u>	n	<u>Farmers</u>	N	<u>Total</u>
		<u>Mean</u> SD		<u>Mean</u> SD		<u>Mean</u> SD		<u>Mean</u> SD
11. Encouraging farmers to use locally available agricultural resources	43	<u>4.58</u> 0.58	15	<u>4.33</u> 0.61	47	<u>4.72</u> 0.45	105	<u>4.60</u> 0.54
12. Teaching farmers to conserve the soil through proper farming	43	<u>4.74</u> 0.49	15	<u>4.66</u> 0.48	47	<u>4.78</u> 0.41	105	<u>4.75</u> 0.45
13. Encouraging farmers to apply for farm loans	43	<u>3.37</u> 0.92	15	<u>3.86</u> 0.63	47	<u>3.85</u> 1.44	105	<u>3.65</u> 1.17
14. Encouraging farmers to plan their farming	43	<u>4.72</u> 0.45	15	<u>4.46</u> 0.63	47	<u>4.68</u> 0.47	105	<u>4.66</u> 0.49
15. Encouraging proper maintenance of farm machinery	43	<u>4.62</u> 0.48	15	<u>4.66</u> 0.48	47	<u>4.59</u> 0.49	105	<u>4.61</u> 0.48
16. Helping farmers locate farm inputs	43	<u>4.25</u> 0.75	15	<u>4.26</u> 0.59	47	<u>4.85</u> 0.50	105	<u>4.52</u> 0.69
17. Teaching farmers to prioritize	43	<u>4.74</u> 0.49	15	<u>4.60</u> 0.50	47	<u>4.87</u> 0.33	105	<u>4.78</u> 0.43
18. Teaching farmers to use reference literature	42	<u>3.83</u> 0.82	15	<u>3.80</u> 0.77	46	<u>3.67</u> 0.81	103	<u>3.75</u> 0.81
19. Enforcing government production goals	43	<u>3.65</u> 1.08	15	<u>3.46</u> 1.12	47	<u>2.14</u> 1.57	105	<u>2.95</u> 1.50
20. Regulating farming practices	42	<u>3.73</u> 0.88	15	<u>3.06</u> 1.16	47	<u>2.14</u> 1.57	104	<u>2.92</u> 1.46
21. Encouraging farmers to produce commercial crops only	43	<u>2.09</u> 0.92	15	<u>1.73</u> 0.45	47	<u>1.93</u> 1.27	105	<u>1.97</u> 1.05

Table 12. Continued

Objectives	<u>FOs</u>		<u>EOs</u>		<u>Farmers</u>		<u>Total</u>	
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD
22. Encouraging farmers to farm for family consumption only	43	<u>1.41</u> 0.49	15	<u>1.60</u> 0.82	46	<u>1.84</u> 1.21	104	<u>1.63</u> 0.93
Composite means		4.11		4.09		4.09		4.10

Table 13. Means and standard deviations of perceptions held by Swaziland field officers, extension officers, and farmers regarding program principles^a

Principles	<u>FOs^b</u>		<u>EOs^b</u>		<u>Farmers</u>		<u>Total</u>	
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD
1. Voluntary farmer participation in extension meetings	42	<u>3.69</u> 1.19	15	<u>4.20</u> 1.01	47	<u>4.25</u> 1.46	104	<u>4.01</u> 1.32
2. Using grass-roots approach to farmers' problems	42	<u>4.47</u> 0.59	15	<u>4.20</u> 0.86	46	<u>4.82</u> 0.38	103	<u>4.59</u> 0.60
3. Providing educational services on non-discriminatory basis	43	<u>4.37</u> 0.87	15	<u>4.46</u> 0.51	47	<u>4.78</u> 0.83	105	<u>4.57</u> 0.83
4. Putting emphasis on applied research	43	<u>4.16</u> 0.84	15	<u>4.13</u> 0.91	47	<u>3.29</u> 0.68	105	<u>3.77</u> 0.89
5. Encouraging teamwork among extension staff	43	<u>4.72</u> 0.45	15	<u>4.33</u> 1.11	47	<u>4.93</u> 0.24	105	<u>4.76</u> 0.56
6. Promoting use of opinion leaders	43	<u>3.72</u> 0.88	14	<u>4.14</u> 0.77	47	<u>4.87</u> 0.39	104	<u>4.29</u> 0.86
7. Encourage consultation among farmers	43	<u>4.23</u> 0.57	15	<u>4.40</u> 0.63	47	<u>4.91</u> 0.28	105	<u>4.56</u> 0.57
8. Encourage cooperation of other agencies' extension staff	43	<u>4.72</u> 0.50	15	<u>4.73</u> 0.45	45	<u>4.86</u> 0.34	103	<u>4.86</u> 0.43
9. Using suitable teaching methods	43	<u>4.67</u> 0.47	14	<u>4.71</u> 0.61	47	<u>4.87</u> 0.33	104	<u>4.76</u> 0.44
10. Lead farmers toward self-reliance	43	<u>4.46</u> 0.73	15	<u>4.40</u> 0.73	47	<u>4.89</u> 0.37	105	<u>4.64</u> 0.63

^aRating scale: 1-Strongly disagree, 2-Disagree, 3-Neutral, 4-Agree, 5-Strongly agree.

^bFOs=field officers, EOs=extension officers.

Table 13. Continued

Principles	<u>FOs</u>		<u>EOs</u>		<u>Farmers</u>		<u>Total</u>	
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD
11. Develop problem-solving skills	43	<u>4.55</u> 0.58	15	<u>4.53</u> 0.51	47	<u>4.93</u> 0.24	105	<u>4.72</u> 0.49
12. Use of formative evaluation	41	<u>4.17</u> 0.70	15	<u>3.93</u> 0.79	47	<u>4.21</u> 0.54	103	<u>4.15</u> 0.65
13. Use appropriate summative procedures	41	<u>3.87</u> 0.67	15	<u>3.86</u> 0.83	46	<u>4.13</u> 0.45	102	<u>3.99</u> 0.62
14. Farmers' needs be basis for program planning	43	<u>4.65</u> 0.65	15	<u>4.73</u> 0.45	46	<u>4.82</u> 0.38	104	<u>4.74</u> 0.52
15. Meeting farmers' needs	43	<u>4.67</u> 0.64	15	<u>4.66</u> 0.48	46	<u>4.93</u> 0.24	104	<u>4.78</u> 0.49
16. Farmers' participation in extension meetings should be compulsory	43	<u>3.83</u> 1.32	15	<u>3.06</u> 1.22	46	<u>2.10</u> 1.72	104	<u>2.96</u> 1.69
Composite means		4.31		4.28		4.47		4.38

Teaching methods

Table 14 shows that the respondents rated most of the identified teaching methods fairly high. The mean scores for the teaching methods which were rated high ranged from 3.73 to 4.77. They expressed less support for buzz groups as one of the extension teaching methods with a mean score of 3.09.

Teaching tools

Information on field and extension officers' perceptions of selected extension teaching tools is presented in Table 15. The respondents rated the following instructional tools fairly high: 1) field support guides, 2) advisory bulletins, 3) agricultural research results, 4) films, 5) exhibits and displays, 6) real objects, 7) flip charts, 8) radio, 9) videotapes, 10) educational tours, 11) newsletter, and 12) village drama. The respondents did not rate high the use of computers and satellite.

Problems

Table 16 shows information on field officers', extension officers', and farmers' perceptions of problems impacting AEE in Swaziland. Participants rated the following major problems as having a high degree of impact on AEE in Swaziland: 1) wide area to cover, 2) shortage of transportation, 3) farmers' reluctance to attend extension meetings,

Table 14. Means and standard deviations of perceptions held by Swaziland field officers, extension officers, and farmers regarding extension teaching methods^a

Methods	<u>FOs^b</u>		<u>EOs^b</u>		<u>Farmers</u>		<u>Total</u>	
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD
1. Method demo	43	<u>4.60</u> 0.72	15	<u>4.80</u> 0.41	46	<u>4.93</u> 0.24	104	<u>4.77</u> 0.53
2. Result demo	43	<u>4.53</u> 0.76	15	<u>4.66</u> 0.48	46	<u>4.73</u> 0.77	104	<u>4.64</u> 0.73
3. Individual farmer visit	42	<u>4.02</u> 1.15	15	<u>4.40</u> 0.50	46	<u>4.47</u> 1.04	103	<u>4.28</u> 1.05
4. Agricultural shows	43	<u>3.97</u> 1.05	15	<u>4.13</u> 0.74	46	<u>4.52</u> 0.72	104	<u>4.24</u> 0.90
5. Short courses	43	<u>4.41</u> 0.76	15	<u>4.46</u> 0.63	45	<u>4.55</u> 0.58	103	<u>4.48</u> 0.66
6. Field days	43	<u>4.60</u> 0.49	15	<u>4.53</u> 0.51	45	<u>4.66</u> 0.52	103	<u>4.62</u> 0.50
7. Workshops	43	<u>4.58</u> 0.49	15	<u>4.60</u> 0.50	45	<u>4.55</u> 0.58	103	<u>4.57</u> 0.53
8. Seminars	43	<u>4.60</u> 0.49	15	<u>4.66</u> 0.48	45	<u>4.35</u> 0.67	103	<u>4.50</u> 0.59
9. Lectures	43	<u>4.18</u> 0.85	15	<u>4.20</u> 0.86	41	<u>3.56</u> 0.83	99	<u>3.92</u> 0.89
10. Lecture-discussions	43	<u>4.30</u> 0.88	15	<u>4.40</u> 0.63	39	<u>3.84</u> 0.84	97	<u>4.13</u> 0.86
11. Group discussions	43	<u>4.48</u> 0.66	15	<u>4.66</u> 0.48	39	<u>4.33</u> 0.66	97	<u>4.45</u> 0.64

^aRating scale: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree.

^bFOs=field officers, EOs=extension officers.

Table 14. Continued

Methods	<u>FOs</u>		<u>EOs</u>		<u>Farmers</u>		<u>Total</u>	
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD
12. Panel discussions	41	<u>3.70</u> 0.87	14	<u>4.07</u> 0.82	39	<u>4.20</u> 0.57	94	<u>3.96</u> 0.78
13. Buzz groups	42	<u>2.92</u> 1.02	13	<u>3.53</u> 0.96	39	<u>3.12</u> 0.40	94	<u>3.09</u> 0.83
14. Role playing	42	<u>3.90</u> 0.85	15	<u>4.33</u> 0.81	39	<u>3.64</u> 0.58	96	<u>3.86</u> 0.77
15. Case studies	43	<u>3.53</u> 1.03	15	<u>3.73</u> 0.88	39	<u>4.33</u> 0.66	97	<u>3.88</u> 0.94
16. Questioning	41	<u>4.00</u> 0.70	15	<u>4.13</u> 0.51	38	<u>4.15</u> 0.59	94	<u>4.08</u> 0.63
17. Problem solving	43	<u>4.34</u> 0.65	15	<u>4.46</u> 0.63	39	<u>4.82</u> 0.60	97	<u>4.55</u> 0.66
18. On-farm trials	41	<u>4.41</u> 0.59	15	<u>4.66</u> 0.61	38	<u>4.10</u> 0.72	94	<u>4.32</u> 0.67
19. Brainstorming	42	<u>3.66</u> 1.00	15	<u>4.33</u> 0.48	38	<u>4.23</u> 0.71	95	<u>4.00</u> 0.87
20. Tours	42	<u>4.57</u> 0.50	15	<u>4.53</u> 0.51	38	<u>4.15</u> 0.54	95	<u>4.40</u> 0.55
21. Focus groups	42	<u>3.80</u> 0.80	15	<u>4.00</u> 0.75	38	<u>3.55</u> 0.64	95	<u>3.73</u> 0.74
22. Nominal group	34	<u>3.38</u> 0.73	10	<u>3.40</u> 0.69	37	<u>4.21</u> 0.82	81	<u>3.76</u> 0.86
Composite means		4.11		4.30		4.23		4.19

Table 15. Means and standard deviations of perceptions held by Swaziland field officers and extension officers regarding teaching tools^a

Teaching tools	<u>FOs^b</u>		<u>EOs^b</u>		<u>Total</u>	
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD
1. Field support guides	43	<u>4.58</u> 0.58	15	<u>4.80</u> 0.41	58	<u>4.62</u> 0.55
2. Advisory bulletin	43	<u>4.48</u> 0.59	14	<u>4.50</u> 0.51	57	<u>4.49</u> 0.57
3. Agricultural research results	43	<u>4.62</u> 0.57	15	<u>4.46</u> 0.83	58	<u>4.58</u> 0.64
4. Films	43	<u>4.44</u> 0.85	15	<u>4.13</u> 0.99	58	<u>4.36</u> 0.89
5. Exhibits and displays	43	<u>4.09</u> 0.89	15	<u>4.20</u> 0.77	58	<u>4.12</u> 0.86
6. Real objectives	42	<u>4.21</u> 0.89	15	<u>4.33</u> 0.72	57	<u>4.24</u> 0.85
7. Chalkboard	43	<u>3.81</u> 0.79	15	<u>4.26</u> 0.45	58	<u>3.93</u> 0.74
8. Models	42	<u>3.85</u> 0.89	15	<u>4.13</u> 0.51	57	<u>3.92</u> 0.82
9. Flip charts	43	<u>4.11</u> 0.66	15	<u>4.40</u> 0.50	58	<u>4.18</u> 0.63
10. Radio	42	<u>4.45</u> 0.73	14	<u>4.57</u> 0.51	56	<u>4.48</u> 0.68
11. Videotapes	43	<u>4.32</u> 0.94	15	<u>4.33</u> 0.48	58	<u>4.32</u> 0.84
12. Television	42	<u>4.09</u> 1.05	15	<u>3.60</u> 1.12	57	<u>3.96</u> 1.08

^aRating scale: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree.

^bFOs=field officers, EOs=extension officers.

Table 15. Continued

Teaching tools	FOs		EOs		Total	
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD
13. Computer aided instruction	43	<u>3.32</u> 1.12	14	<u>3.07</u> 0.99	57	<u>3.26</u> 1.09
14. Bulletin boards	43	<u>3.72</u> 1.05	11	<u>3.45</u> 1.12	54	<u>3.66</u> 1.06
15. Instructional posters	42	<u>3.88</u> 0.86	15	<u>4.13</u> 0.83	57	<u>3.94</u> 0.85
16. Flannel board	43	<u>3.65</u> 0.84	15	<u>4.00</u> 0.84	58	<u>3.74</u> 0.84
17. Satellite	42	<u>3.07</u> 0.97	14	<u>2.85</u> 0.94	56	<u>3.01</u> 0.96
18. 35 mm slides	43	<u>3.72</u> 1.09	15	<u>4.00</u> 0.84	58	<u>3.79</u> 1.03
19. Tours	43	<u>4.69</u> 0.46	15	<u>4.66</u> 0.48	58	<u>4.68</u> 0.46
20. Newsletter	43	<u>4.25</u> 0.72	15	<u>3.93</u> 0.88	58	<u>4.17</u> 0.77
21. News stories	43	<u>3.95</u> 0.92	15	<u>3.66</u> 0.81	58	<u>3.87</u> 0.89
22. Village drama	42	<u>4.11</u> 0.91	14	<u>4.28</u> 0.72	56	<u>4.16</u> 0.86
Composite means		4.06		4.08		4.07

Table 16. Means and standard deviations of perceptions held by Swaziland field officers, extension officers, and farmers regarding problems impacting AEE^a

Problems	n	<u>FOs^b</u>	n	<u>EOs^b</u>	n	<u>Farmers</u>	N	<u>Total</u>
		<u>Mean</u> SD		<u>Mean</u> SD		<u>Mean</u> SD		<u>Mean</u> SD
1. Wide area to cover	43	<u>4.58</u> 0.95	15	<u>4.66</u> 0.48	47	<u>4.65</u> 0.89	105	<u>4.62</u> 0.86
2. Lack of supervision	43	<u>2.95</u> 1.37	15	<u>4.00</u> 0.75	47	<u>3.27</u> 1.34	105	<u>3.24</u> 1.32
3. Shortage of transportation	43	<u>4.88</u> 0.39	15	<u>4.93</u> 0.25	47	<u>4.70</u> 0.85	105	<u>4.80</u> 0.63
4. Farmers' reluctance to attend extension meetings	43	<u>4.02</u> 1.03	15	<u>3.73</u> 0.96	48	<u>4.27</u> 1.23	106	<u>4.09</u> 1.12
5. Inadequacy of in-service training	43	<u>3.86</u> 1.22	14	<u>3.92</u> 0.82	45	<u>2.66</u> 0.85	102	<u>3.34</u> 1.18
6. Shallow information at in-service training	43	<u>3.30</u> 1.33	15	<u>2.86</u> 1.35	45	<u>2.68</u> 0.90	103	<u>2.97</u> 1.19
7. Difficult to translate technical information into SiSwati	42	<u>2.30</u> 1.37	15	<u>2.46</u> 1.12	45	<u>2.82</u> 0.91	102	<u>2.55</u> 1.16
8. Adequacy of backup support by SMS	43	<u>3.51</u> 1.14	15	<u>2.93</u> 1.27	45	<u>3.00</u> 0.70	102	<u>3.20</u> 1.02
9. Farmers' tendency to avoid program ownership	42	<u>3.52</u> 1.01	14	<u>3.28</u> 1.06	45	<u>3.91</u> 1.29	101	<u>3.66</u> 1.16
10. Farmers' reluctance to accept new ideas	43	<u>3.74</u> 1.17	15	<u>3.60</u> 1.24	46	<u>4.30</u> 1.22	104	<u>3.97</u> 1.23

^aRating scale: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree.

^bFOs=field officers, EOs=extension officers.

Table 16. Continued

Problems	<u>FOs</u>		<u>EOs</u>		<u>Farmers</u>		<u>Total</u>	
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD
11. Cultural events coinciding with planned events	42	<u>3.76</u> 1.16	14	<u>4.14</u> 0.77	44	<u>3.72</u> 1.53	100	<u>3.80</u> 1.29
12. Recognition of FO for outstanding performance	43	<u>3.44</u> 1.14	14	<u>3.85</u> 1.02	44	<u>4.04</u> 1.11	101	<u>3.76</u> 1.14
13. Shadow of the predecessor	42	<u>3.40</u> 1.01	15	<u>3.60</u> 1.05	44	<u>3.84</u> 1.18	101	<u>3.62</u> 1.10
14. FO experience mental fatigue (burnout)	42	<u>2.97</u> 1.09	13	<u>3.07</u> 1.32	45	<u>3.17</u> 1.17	100	<u>3.08</u> 1.15
15. Farmers' ability to keep accurate records	43	<u>3.86</u> 0.99	15	<u>4.13</u> 0.63	45	<u>4.00</u> 1.04	103	<u>3.96</u> 0.96
16. Farmers have lost confidence in AEE	43	<u>2.90</u> 1.17	15	<u>2.73</u> 1.03	45	<u>3.37</u> 1.35	103	<u>3.08</u> 1.25
17. Adequacy of support from researchers	43	<u>3.16</u> 1.06	15	<u>2.93</u> 1.03	42	<u>3.23</u> 0.48	100	<u>3.16</u> 0.86
18. FO's ability to answer problems on crops	43	<u>2.44</u> 1.20	15	<u>3.06</u> 1.38	45	<u>2.20</u> 0.94	103	<u>2.42</u> 1.15
19. FO's ability to answer livestock questions	43	<u>2.69</u> 1.16	15	<u>2.93</u> 1.22	45	<u>2.20</u> 0.94	103	<u>2.51</u> 1.11
20. FO's ability to answer farm implement questions	43	<u>2.55</u> 1.14	15	<u>3.33</u> 1.23	45	<u>2.20</u> 0.94	103	<u>2.51</u> 1.12
21. FO's ability to handle machinery questions	43	<u>2.69</u> 1.10	15	<u>3.33</u> 1.29	45	<u>2.20</u> 0.94	103	<u>2.57</u> 1.12
22. FO's ability to handle problems on soils	43	<u>2.69</u> 1.22	15	<u>3.26</u> 1.27	45	<u>2.20</u> 0.94	103	<u>2.56</u> 1.16

Table 16. Continued

Problems	<u>FOs</u>		<u>EOs</u>		<u>Farmers</u>		<u>Total</u>	
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD
23. Too much information to transfer		<u>3.39</u> 1.46		<u>3.20</u> 1.32		<u>2.37</u> 1.11		<u>2.92</u> 1.37
24. Incentives availability in AEE	41	<u>3.19</u> 1.36	15	<u>3.20</u> 1.61	44	<u>4.00</u> 1.05	100	<u>3.55</u> 1.32
25. Quality of pre-service training	42	<u>3.40</u> 1.06	15	<u>3.20</u> 1.20	44	<u>2.72</u> 0.62	101	<u>3.07</u> 0.96
26. Frequent transfers of FOs	42	<u>3.09</u> 1.39	15	<u>3.66</u> 1.49	44	<u>4.02</u> 1.11	101	<u>3.58</u> 1.35
Composite means		3.32		3.46		3.29		3.33

4) farmers' tendency to avoid program ownership, 5) farmers' reluctance to accept new ideas, 6) cultural events coinciding with planned extension meetings, 7) recognition of field officers' outstanding performance, 8) shadow of the predecessor, 9) farmers' inability to keep accurate farm records, 10) incentive availability in AEE, and 11) frequent transfers of field officers.

The remaining items seemed to be rated at a lower level of impact as perceived by these respondents.

Comparisons of Respondents' Perceptions of Extension According to Selected Demographic Variables

Program objectives according to region

Table 17 presents information on the analysis of variance of perceptions held by Swaziland field officers, extension officers, and farmers regarding objectives of AEE according to selected regions. There were no significant statistical differences found ($\alpha .05$) except on the perceptions of two objectives: 1) encouraging farmers to form cooperatives and 2) linking researchers with farmers. Hhohho, Lubombo, and Shiselweni regions were significantly statistically different from the Manzini region regarding the objective of encouraging farmers to form cooperatives. Regarding linking researchers with farmers, participants from Hhohho (mean=4.66) and Lubombo (mean=4.61) regions were significantly different from the participants from the Manzini region (mean=4.16) but not significantly different from participants from the Shiselweni (mean=4.29) region.

Table 17. Analysis of variance of perceptions held by Swaziland field officers, extension officers, and farmers regarding program objectives according to region^a

Objectives	<u>R1</u>		<u>R2</u>		<u>R3</u>		<u>R4</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
1. Transferring technical information	23	<u>4.69</u> 0.63	23	<u>4.53</u> 0.63	21	<u>4.71</u> 0.71	31	<u>4.58</u> 0.76	103	<u>4.62</u> 0.68	.391	.759
2. Assisting farmers to shift	25	<u>4.72</u> 0.45	28	<u>4.60</u> 0.49	21	<u>4.66</u> 0.57	31	<u>4.51</u> 0.67	105	<u>4.61</u> 0.56	.665	.575
3. Assisting farmers to raise livestock	25	<u>4.52</u> 0.50	28	<u>4.53</u> 0.57	21	<u>4.66</u> 0.57	31	<u>4.48</u> 0.50	105	<u>4.54</u> 0.53	.505	.679
4. Assisting farmers to raise yielding crops	25	<u>4.64</u> 0.48	28	<u>4.71</u> 0.59	21	<u>4.90</u> 0.30	31	<u>4.80</u> 0.47	105	<u>4.76</u> 0.49	1.291	.281
5. Teaching farmers to diversify	25	<u>4.32</u> 0.85	28	<u>4.28</u> 0.71	21	<u>4.42</u> 0.87	31	<u>4.35</u> 1.01	105	<u>4.34</u> 0.86	.114	.951
6. Encouraging farmers to form cooperatives	25	<u>3.92</u> 1.44	28	<u>4.67</u> 0.54	21	<u>4.76</u> 0.43	31	<u>4.61</u> 0.61	105	<u>4.49</u> 0.90	5.128	.002*
7. Improving marketing	25	<u>4.36</u> 0.75	28	<u>4.60</u> 0.62	20	<u>4.55</u> 0.51	31	<u>4.54</u> 0.56	104	<u>4.51</u> 0.62	.764	.516

^aR=Regions, 1=Manzini, 2=Hhohho, 3=Lubombo, 4=Shiselweni.

*Significant at the .05 level.

Table 17. Continued

Objectives	n	<u>R1</u>	n	<u>R2</u>	n	<u>R3</u>	n	<u>R4</u>	<u>Composite</u>		F ratio	F prob.
		Mean SD		Mean SD		Mean SD		Mean SD	N	Mean SD		
8. Teaching keeping accurate records	25	<u>4.52</u> 0.58	28	<u>4.60</u> 0.49	21	<u>4.71</u> 0.46	31	<u>4.51</u> 0.56	105	<u>4.58</u> 0.53	.716	.544
9. Linking researchers with farmers	25	<u>4.16</u> 0.74	27	<u>4.66</u> 0.55	21	<u>4.61</u> 0.58	31	<u>4.29</u> 0.78	104	<u>4.42</u> 0.70	3.344	.022*
10. Helping farmers make intelligent decisions	26	<u>4.57</u> 0.74	27	<u>4.44</u> 0.55	21	<u>4.52</u> 0.58	31	<u>4.61</u> 0.78	105	<u>4.54</u> 0.70	.348	.790
11. Encouraging use of locally available resources	26	<u>4.53</u> 0.58	27	<u>4.51</u> 0.64	21	<u>4.66</u> 0.48	31	<u>4.70</u> 0.46	105	<u>4.60</u> 0.54	.817	.487
12. Teaching soil conservation methods	26	<u>4.65</u> 0.56	27	<u>4.77</u> 0.42	21	<u>4.85</u> 0.35	31	<u>4.74</u> 0.44	105	<u>4.75</u> 0.45	.805	.493
13. Encouraging application for farm loans	26	<u>4.00</u> 0.93	27	<u>3.18</u> 1.17	21	<u>3.66</u> 1.19	31	<u>3.77</u> 1.25	105	<u>3.65</u> 1.17	2.383	.073
14. Encouraging farmers to plan farming	26	<u>4.53</u> 0.50	27	<u>4.70</u> 0.54	21	<u>4.76</u> 0.43	31	<u>4.67</u> 0.47	105	<u>4.66</u> 0.49	.898	.444
15. Encouraging proper maintenance of farm machinery	26	<u>4.53</u> 0.50	27	<u>4.59</u> 0.50	21	<u>4.66</u> 0.48	31	<u>4.67</u> 0.47	105	<u>4.61</u> 0.48	.470	.703
16. Helping farmers to locate farm inputs	26	<u>4.38</u> 1.02	27	<u>4.44</u> 0.57	21	<u>4.76</u> 0.43	31	<u>4.54</u> 0.56	105	<u>4.52</u> 0.69	1.312	.274

Table 17. Continued

Objectives	<u>R1</u>		<u>R2</u>		<u>R3</u>		<u>R4</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
17. Teaching prioritiza- tion	26	<u>4.61</u> 0.57	27	<u>4.74</u> 0.44	21	<u>4.90</u> 0.30	31	<u>4.87</u> 0.34	105	<u>4.78</u> 0.43	2.402	.072
18. Teaching farmers to use references	26	<u>3.73</u> 1.04	26	<u>3.69</u> 0.73	21	<u>3.95</u> 0.66	30	<u>3.70</u> 0.74	103	<u>3.75</u> 0.81	.513	.673
19. Enforcing government production goals	26	<u>3.00</u> 1.52	27	<u>2.92</u> 1.56	21	<u>3.00</u> 1.41	31	<u>2.90</u> 1.57	105	<u>2.95</u> 1.50	.028	.993
20. Regulating farming practices	25	<u>2.92</u> 1.60	27	<u>3.07</u> 1.41	21	<u>2.85</u> 1.42	31	<u>2.83</u> 1.48	104	<u>2.92</u> 1.46	.140	.935
21. Encouraging produc- tion of commercials only	26	<u>2.03</u> 0.99	27	<u>1.81</u> 1.07	21	<u>2.00</u> 0.89	31	<u>2.03</u> 1.19	105	<u>1.97</u> 1.05	.269	.847
22. Encouraging farming for consumption only	26	<u>1.61</u> 0.85	26	<u>1.53</u> 0.85	21	<u>1.71</u> 0.90	31	<u>1.67</u> 1.10	104	<u>1.63</u> 0.93	.163	.920

Program principles according to region

Information regarding respondents' perceptions of program principles according to regions is presented in Table 18. There were no significant statistical differences found with nearly all the principles. A significant statistical difference was found on the perceptions regarding reliance on applied research. The Lubombo region (mean=4.09) was significantly statistically different from the Shiselweni region and not from Manzini and Hhohho regions.

Teaching methods according to region

As can be observed in Table 19, no significant statistical differences were found on how the respondents from the four regions perceived the listed teaching methods used in AEE.

Teaching tools according to region

In Table 20, information on the perceptions of the respondents from the four regions regarding use of teaching tools is presented. There were no significant statistical differences found with regard to the perceptions of the teaching tools except on 1) bulletin boards and 2) tours. Participants from Lubombo region (mean=4.25) reported statistically significant different views from respondents from Hhohho (mean=3.13) region but not from respondents from Manzini (mean=3.46) and Shiselweni (mean=3.92) regions regarding perception ratings on the use of bulletin boards. Respondents from Lubombo region reported consistently different views from participants from Hhohho region but not different

Table 18. Analysis of variance of perceptions held by Swaziland field officers, extension officers, and farmers regarding program principles according to region^a

Principles	<u>R1</u>		<u>R2</u>		<u>R3</u>		<u>R4</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
1. Voluntary participation by farmers	25	<u>3.64</u> 1.60	27	<u>4.33</u> 1.03	21	<u>4.09</u> 1.26	31	<u>4.00</u> 1.31	104	<u>4.01</u> 1.32	1.227	.303
2. Use grass-roots approach	24	<u>4.66</u> 0.56	27	<u>4.66</u> 0.55	21	<u>4.33</u> 0.79	31	<u>4.64</u> 0.48	103	<u>4.59</u> 0.60	1.670	.178
3. Provide educational services	26	<u>4.65</u> 0.56	27	<u>4.74</u> 0.52	21	<u>4.61</u> 0.92	31	<u>4.32</u> 1.10	105	<u>4.57</u> 0.83	1.427	.239
4. Reliance on applied research	26	<u>3.88</u> 0.90	27	<u>3.85</u> 0.81	21	<u>4.09</u> 0.83	31	<u>3.38</u> 0.88	105	<u>3.77</u> 0.89	3.262	.024*
5. Encourage teamwork among FOs	26	<u>4.80</u> 0.40	27	<u>4.74</u> 0.52	21	<u>4.95</u> 0.21	31	<u>4.61</u> 0.80	105	<u>4.76</u> 0.56	1.619	.189
6. Promote use of opinion leaders	26	<u>4.38</u> 0.80	27	<u>4.33</u> 0.67	21	<u>4.47</u> 0.60	30	<u>4.06</u> 1.17	104	<u>4.29</u> 0.86	1.107	.349
7. Encourage consultation among farmers	26	<u>4.65</u> 0.56	27	<u>4.59</u> 0.57	21	<u>4.61</u> 0.49	31	<u>4.41</u> 0.62	105	<u>4.56</u> 0.57	.965	.412

^aR=Regions, 1=Manzini, 2=Hhohho, 3=Lubombo, 4=Shiselweni.

*Significant at the .05 level.

Table 18. Continued

Principles	<u>R1</u>		<u>R2</u>		<u>R3</u>		<u>R4</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
8. Cooperation between and among agencies' extension officers	26	<u>4.84</u> 0.36	27	<u>4.77</u> 0.42	20	<u>4.85</u> 0.36	30	<u>4.70</u> 0.53	103	<u>4.78</u> 0.43	.697	.555
9. Use suitable exten- sion teaching methods	26	<u>4.80</u> 0.40	27	<u>4.77</u> 0.50	21	<u>4.71</u> 0.46	30	<u>4.76</u> 0.43	104	<u>4.76</u> 0.44	.170	.916
10. Programs to foster self-reliance	26	<u>4.69</u> 0.54	27	<u>4.62</u> 0.56	21	<u>4.76</u> 0.53	31	<u>4.54</u> 0.80	105	<u>4.64</u> 0.63	.521	.668
11. Develop farmers' problem-solving skills	26	<u>4.73</u> 0.60	27	<u>4.74</u> 0.44	21	<u>4.66</u> 0.48	31	<u>4.74</u> 0.44	105	<u>4.72</u> 0.49	.118	.949
12. Use formative evaluation	25	<u>4.12</u> 0.78	26	<u>4.19</u> 0.74	21	<u>4.38</u> 0.49	31	<u>4.00</u> 0.51	103	<u>4.15</u> 0.65	1.493	.221
13. Use summative eval- uation skills	25	<u>4.00</u> 0.64	25	<u>4.04</u> 0.61	21	<u>4.04</u> 0.66	31	<u>3.90</u> 0.59	102	<u>3.99</u> 0.62	.311	.817
14. Farmers' needs basis for program development	26	<u>4.80</u> 0.40	26	<u>4.69</u> 0.54	21	<u>4.66</u> 0.73	31	<u>4.77</u> 0.42	104	<u>4.74</u> 0.52	.394	.757
15. Farmers' needs be given priority	26	<u>4.84</u> 0.36	26	<u>4.65</u> 0.68	21	<u>4.85</u> 0.35	31	<u>4.80</u> 0.47	104	<u>4.78</u> 0.49	.900	.443
16. Farmers' participa- tion in AEE meetings be compulsory	26	<u>3.19</u> 1.69	26	<u>2.92</u> 1.71	21	<u>3.28</u> 1.70	31	<u>2.58</u> 1.66	104	<u>2.96</u> 1.69	.941	.423

Table 19. Analysis of variance of perceptions held by Swaziland field officers, extension officers, and farmers regarding teaching methods according to region^a

Teaching methods	<u>R1</u>		<u>R2</u>		<u>R3</u>		<u>R4</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
1. Method demo	26	<u>4.73</u> 0.45	26	<u>4.69</u> 0.83	21	<u>4.95</u> 0.21	31	<u>4.77</u> 0.42	104	<u>4.77</u> 0.53	1.019	.387
2. Result demo	26	<u>4.53</u> 0.76	26	<u>4.69</u> 0.83	21	<u>4.76</u> 0.43	31	<u>4.61</u> 0.80	104	<u>4.64</u> 0.73	.406	.748
3. Individual visit	26	<u>4.03</u> 1.28	25	<u>4.36</u> 0.99	21	<u>4.61</u> 0.74	31	<u>4.19</u> 1.04	103	<u>4.28</u> 1.05	1.314	.274
4. Agricultural shows	26	<u>4.26</u> 0.91	26	<u>4.07</u> 0.97	21	<u>4.52</u> 0.60	31	<u>4.16</u> 1.00	104	<u>4.24</u> 0.90	1.050	.373
5. Short courses	26	<u>4.42</u> 0.80	25	<u>4.40</u> 0.76	21	<u>4.57</u> 0.59	31	<u>4.53</u> 0.50	103	<u>4.48</u> 0.66	.410	.745
6. Field days	26	<u>4.69</u> 0.54	25	<u>4.56</u> 0.50	21	<u>4.71</u> 0.46	31	<u>4.54</u> 0.50	103	<u>4.62</u> 0.50	.734	.533
7. Workshops	26	<u>4.53</u> 0.64	25	<u>4.52</u> 0.50	21	<u>4.66</u> 0.48	31	<u>4.58</u> 0.50	103	<u>4.57</u> 0.53	.327	.805
8. Seminars	26	<u>4.30</u> 0.73	25	<u>4.56</u> 0.50	21	<u>4.57</u> 0.59	31	<u>4.58</u> 0.50	103	<u>4.50</u> 0.59	1.303	.277

^aR=Regions, 1=Manzini, 2=Hhohho, 3=Lubombo, 4=Shiselweni.

Table 19. Continued

Teaching methods	<u>R1</u>		<u>R2</u>		<u>R3</u>		<u>R4</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
9. Lectures	26	<u>3.80</u> 0.93	21	<u>4.00</u> 0.89	21	<u>3.85</u> 0.96	31	<u>4.03</u> 0.83	99	<u>3.92</u> 0.89	.378	.768
10. Lecture-discussions	25	<u>4.00</u> 0.86	20	<u>4.05</u> 1.05	21	<u>4.23</u> 0.83	31	<u>4.22</u> 0.76	97	<u>4.13</u> 0.86	.476	.699
11. Group discussions	25	<u>4.36</u> 0.81	20	<u>4.50</u> 0.51	21	<u>4.52</u> 0.51	31	<u>4.45</u> 0.67	97	<u>4.45</u> 0.64	.285	.835
12. Panel discussions	25	<u>3.96</u> 0.73	19	<u>3.57</u> 1.01	21	<u>4.09</u> 0.70	29	<u>4.13</u> 0.63	94	<u>3.96</u> 0.78	2.301	.082
13. Buzz groups	25	<u>2.96</u> 0.97	18	<u>3.05</u> 0.63	21	<u>3.42</u> 0.81	30	<u>3.00</u> 0.78	94	<u>3.09</u> 0.83	1.519	.215
14. Role play	25	<u>3.96</u> 0.93	19	<u>3.84</u> 0.68	21	<u>3.85</u> 0.91	31	<u>3.80</u> 0.60	96	<u>3.86</u> 0.77	.184	.906
15. Case studies	25	<u>3.96</u> 1.17	20	<u>3.60</u> 0.88	21	<u>4.14</u> 0.65	31	<u>3.83</u> 0.93	97	<u>3.88</u> 0.94	1.212	.309
16. Questioning	24	<u>4.20</u> 0.65	19	<u>4.05</u> 0.62	21	<u>4.19</u> 0.60	30	<u>3.93</u> 0.63	94	<u>4.08</u> 0.63	1.090	.357
17. Problem solving		<u>4.44</u> 0.82		<u>4.55</u> 0.60		<u>4.57</u> 0.74		<u>4.64</u> 0.48		<u>4.55</u> 0.66	.441	.724
18. On-farm trials	25	<u>4.24</u> 0.83	20	<u>4.45</u> 0.51	21	<u>4.42</u> 0.67	28	<u>4.25</u> 0.64	94	<u>4.32</u> 0.67	.625	.600

Table 19. Continued

Teaching methods	<u>R1</u>		<u>R2</u>		<u>R3</u>		<u>R4</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
19. Brainstorming	25	<u>4.12</u> 1.05	19	<u>3.78</u> 0.91	21	<u>4.00</u> 0.89	30	<u>4.03</u> 0.66	95	<u>4.00</u> 0.87	.529	.663
20. Tours	24	<u>4.41</u> 0.58	20	<u>4.55</u> 0.51	21	<u>4.47</u> 0.51	30	<u>4.23</u> 0.56	95	<u>4.40</u> 0.55	1.563	.203
21. Focus groups	25	<u>3.60</u> 0.76	19	<u>4.00</u> 0.81	21	<u>3.61</u> 0.74	30	<u>3.76</u> 0.67	95	<u>3.73</u> 0.74	1.267	.290
22. Nominal group technique		<u>3.85</u> 0.91		<u>3.41</u> 0.71		<u>3.82</u> 1.01		<u>3.88</u> 0.81		<u>3.76</u> 0.86	1.211	.311

Table 20. Analysis of variance of perceptions held by Swaziland field officers and extension officers regarding use of teaching tools according to region^a

Teaching tools	<u>R1</u>		<u>R2</u>		<u>R3</u>		<u>R4</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
1. Field support guides	14	<u>4.57</u> 0.75	16	<u>4.43</u> 0.51	12	<u>4.91</u> 0.28	16	<u>4.62</u> 0.50	58	<u>4.62</u> 0.55	1.821	.154
2. Advisory bulletin	14	<u>4.50</u> 0.65	16	<u>4.50</u> 0.51	12	<u>4.66</u> 0.49	15	<u>4.33</u> 0.61	57	<u>4.49</u> 0.57	.752	.525
3. Agricultural research reports	14	<u>4.57</u> 0.64	16	<u>4.56</u> 0.62	12	<u>4.58</u> 0.90	16	<u>4.62</u> 0.50	58	<u>4.58</u> 0.64	.271	.993
4. Films	14	<u>4.50</u> 0.85	16	<u>4.18</u> 0.98	12	<u>4.75</u> 0.45	16	<u>4.12</u> 1.02	58	<u>4.36</u> 0.89	1.484	.229
5. Exhibits and display	14	<u>4.28</u> 0.91	16	<u>3.93</u> 0.99	12	<u>4.58</u> 0.51	16	<u>3.81</u> 0.75	58	<u>4.12</u> 0.86	2.425	.075
6. Real objects	14	<u>4.14</u> 0.94	16	<u>4.18</u> 0.98	12	<u>4.50</u> 0.67	15	<u>4.20</u> 0.77	57	<u>4.24</u> 0.85	.451	.717
7. Chalkboard	14	<u>3.78</u> 0.97	16	<u>4.00</u> 0.63	12	<u>4.00</u> 0.73	16	<u>3.93</u> 0.68	58	<u>3.93</u> 0.74	.247	.863
8. Models	14	<u>4.00</u> 0.78	15	<u>3.73</u> 0.96	12	<u>4.00</u> 0.95	16	<u>4.00</u> 0.63	57	<u>3.92</u> 0.82	.376	.770

^aR=Regions, 1=Manzini, 2=Hhohho, 3=Lubombo, 4=Shiselweni.

Table 20. Continued

Teaching tools	<u>R1</u>		<u>R2</u>		<u>R3</u>		<u>R4</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
9. Flip charts	14	<u>4.00</u> 0.87	16	<u>4.31</u> 0.60	12	<u>4.16</u> 0.57	16	<u>4.25</u> 0.44	58	<u>4.18</u> 0.63	.659	.580
10. Radio	13	<u>4.38</u> 0.50	15	<u>4.33</u> 1.04	12	<u>4.58</u> 0.51	16	<u>4.62</u> 0.50	56	<u>4.48</u> 0.68	.625	.601
11. Videotapes	14	<u>4.07</u> 0.99	16	<u>4.25</u> 1.06	12	<u>4.41</u> 0.66	16	<u>4.56</u> 0.51	58	<u>4.32</u> 0.84	.925	.435
12. Television	14	<u>4.00</u> 1.03	16	<u>3.75</u> 1.29	12	<u>4.00</u> 1.00	16	<u>4.12</u> 1.02	58	<u>3.96</u> 1.08	.321	.809
13. Computer aided	14	<u>3.21</u> 1.42	16	<u>3.00</u> 1.09	12	<u>3.50</u> 0.90	16	<u>3.40</u> 0.91	58	<u>3.26</u> 1.09	.569	.637
14. Bulletin boards	13	<u>3.46</u> 1.39	15	<u>3.13</u> 1.06	12	<u>4.25</u> 0.75	14	<u>3.92</u> 0.61	54	<u>3.66</u> 1.06	3.276	.028
15. Posters	14	<u>3.85</u> 0.94	15	<u>3.93</u> 1.03	12	<u>4.08</u> 0.79	16	<u>3.93</u> 0.68	57	<u>3.94</u> 0.85	.148	.930
16. Flannelboard	14	<u>3.78</u> 0.69	16	<u>3.75</u> 1.06	12	<u>3.83</u> 0.71	16	<u>3.62</u> 0.88	58	<u>3.73</u> 0.84	.153	.927
17. Satellite	14	<u>3.00</u> 1.03	16	<u>3.00</u> 1.03	12	<u>3.25</u> 0.75	14	<u>2.85</u> 1.02	56	<u>3.01</u> 0.96	.353	.787
18. 35 mm slides	14	<u>3.50</u> 1.40	16	<u>4.00</u> 1.03	12	<u>3.83</u> 0.93	16	<u>3.81</u> 0.75	58	<u>3.79</u> 1.03	.577	.632

Table 20. Continued

Teaching tools	<u>R1</u>		<u>R2</u>		<u>R3</u>		<u>R4</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
19. Tours	14	<u>4.78</u> 0.42	16	<u>4.43</u> 0.51	12	<u>4.91</u> 0.28	16	<u>4.68</u> 0.47	58	<u>4.68</u> 0.46	2.983	.039*
20. Newsletter	14	<u>4.14</u> 1.09	16	<u>4.06</u> 0.77	12	<u>4.41</u> 0.51	16	<u>4.12</u> 0.61	58	<u>4.17</u> 0.77	.517	.672
21. News stories	14	<u>3.85</u> 1.09	16	<u>3.56</u> 1.09	12	<u>4.08</u> 0.66	16	<u>4.06</u> 0.57	58	<u>3.87</u> 0.89	1.096	.358
22. Village drama	13	<u>4.15</u> 0.80	15	<u>4.20</u> 1.08	12	<u>4.16</u> 0.83	16	<u>4.12</u> 0.80	56	<u>4.16</u> 0.86	.018	.996

*Significant at the .05 level.

from the ones from Manzini and Shiselweni regions on the perception of tours as a teaching tool.

Problems according to region

Table 21 presents information on the analysis of variance of perceptions held by field officers, extension officers, and farmers regarding problems impacting AEE according to selected regions in Swaziland. Overall, there were no significant statistical differences found. With regard to 1) lack of supervision and 2) farmers' inability to keep accurate records, significant statistical differences were found. Respondents from Hhohho (mean=3.88) region were significantly different from respondents in the Manzini (mean=2.80) region but not from Lubombo (mean=3.00) and Shiselweni (mean=3.22) regions regarding the perception of lack of supervision. Regarding the perception of farmers' inability to keep accurate records, respondents from Manzini (mean=4.38) region reported significantly different views from the respondents in the Hhohho (mean=3.56) region but not from those in Lubombo (mean=4.00) and Shiselweni (mean=3.90) regions.

Program objectives according to academic qualifications

Information in Table 22 shows comparisons of perceptions held by Swaziland field officers, extension officers, and farmers regarding objectives of AEE according to academic qualifications. As can be observed from the table, no significant statistical differences were found on the perceptions of 14 objectives. Significant statistical differences

Table 21. Analysis of variance of perceptions held by Swaziland field officers, extension officers, and farmers regarding problems impacting AEE according to region^a

Problems	<u>R1</u>		<u>R2</u>		<u>R3</u>		<u>R4</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
1. Wide area to cover	26	<u>4.76</u> 0.81	27	<u>4.66</u> 0.83	21	<u>4.57</u> 1.02	31	<u>4.51</u> 0.85	105	<u>4.62</u> 0.89	.440	.724
2. Lack of supervision	26	<u>2.80</u> 1.41	27	<u>3.88</u> 1.18	21	<u>3.00</u> 1.48	31	<u>3.22</u> 1.08	105	<u>3.24</u> 1.32	3.533	.017*
3. Shortage of transportation	26	<u>4.88</u> 0.58	27	<u>4.88</u> 0.32	21	<u>4.95</u> 0.21	31	<u>4.58</u> 0.95	105	<u>4.80</u> 0.63	2.003	.118
4. Farmers' reluctance to attend AEE meetings	26	<u>4.34</u> 1.12	28	<u>4.17</u> 1.02	21	<u>3.80</u> 1.03	31	<u>4.00</u> 1.26	106	<u>4.09</u> 1.12	1.006	.393
5. Inadequacy of in-service	25	<u>3.36</u> 1.38	25	<u>3.28</u> 0.97	21	<u>3.52</u> 1.20	31	<u>3.25</u> 1.18	102	<u>3.34</u> 1.18	.237	.870
6. Shallow information at in-service courses	26	<u>3.00</u> 1.35	25	<u>2.92</u> 1.07	21	<u>3.04</u> 1.32	31	<u>2.93</u> 1.09	103	<u>2.97</u> 1.19	.056	.982
7. Difficult to translate technical information	26	<u>2.53</u> 1.24	25	<u>2.96</u> 1.20	21	<u>2.35</u> 1.18	31	<u>2.38</u> 1.02	102	<u>2.55</u> 1.16	1.447	.233

^aR=Regions, 1=Manzini, 2=Hhohho, 3=Lubombo, 4=Shiselweni.

*Significant at the .05 level.

Table 21. Continued

Problems	<u>R1</u>		<u>R2</u>		<u>R3</u>		<u>R4</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
8. Adequacy of backup from SMS	26	<u>3.23</u> 1.06	25	<u>3.52</u> 1.04	21	<u>3.23</u> 0.94	31	<u>2.90</u> 0.97	103	<u>3.20</u> 1.02	1.739	.163
9. Farmers' tendency to avoid program ownership	26	<u>3.84</u> 1.28	24	<u>3.70</u> 0.95	21	<u>3.28</u> 1.10	30	<u>3.73</u> 1.25	101	<u>3.66</u> 1.16	.990	.400
10. Farmers' reluctance to accept new ideas	26	<u>4.03</u> 1.37	26	<u>3.84</u> 1.12	21	<u>4.04</u> 1.20	31	<u>3.96</u> 1.27	104	<u>3.97</u> 1.23	.138	.937
11. Cultural events coincide with planned meetings	26	<u>3.61</u> 1.26	22	<u>4.31</u> 0.94	21	<u>4.00</u> 1.09	31	<u>3.45</u> 1.54	100	<u>3.80</u> 1.29	2.358	.076
12. Recognition of FO for outstanding performance	26	<u>3.76</u> 1.36	23	<u>4.04</u> 0.92	21	<u>3.61</u> 0.92	31	<u>3.64</u> 1.22	101	<u>3.76</u> 1.14	.678	.567
13. Shadow of the predecessor	26	<u>3.53</u> 1.30	23	<u>3.69</u> 1.01	21	<u>3.85</u> 0.96	31	<u>3.48</u> 1.09	101	<u>3.62</u> 1.10	.556	.645
14. FO experiencing burnout	25	<u>3.00</u> 1.41	24	<u>3.20</u> 0.97	21	<u>3.04</u> 1.16	31	<u>3.06</u> 1.08	100	<u>3.08</u> 1.15	.142	.934
15. Farmers' ability to keep accurate records	26	<u>4.38</u> 0.69	25	<u>3.56</u> 1.04	21	<u>4.00</u> 0.94	31	<u>3.90</u> 1.01	103	<u>3.96</u> 0.96	3.345	.002*

Table 21. Continued

Problems	<u>R1</u>		<u>R2</u>		<u>R3</u>		<u>R4</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
16. Farmers lost confidence in AEE	26	<u>3.23</u> 1.33	25	<u>3.32</u> 1.06	21	<u>2.71</u> 1.34	31	<u>3.03</u> 1.25	103	<u>3.08</u> 1.25	1.04	.377
17. Adequacy of support from researchers	24	<u>3.08</u> 0.82	24	<u>3.16</u> 0.86	21	<u>3.42</u> 0.97	31	<u>3.03</u> 0.79	100	<u>3.16</u> 0.86	.971	.409
18. FO's ability to answer problems on crops	26	<u>2.57</u> 1.41	25	<u>2.48</u> 0.91	21	<u>2.61</u> 1.28	31	<u>2.12</u> 0.95	103	<u>2.42</u> 1.15	1.05	.372
19. FO's ability to answer questions on livestock	26	<u>2.38</u> 1.20	25	<u>2.56</u> 0.86	21	<u>2.61</u> 1.32	31	<u>2.51</u> 1.09	103	<u>2.51</u> 1.11	.190	.902
20. FO's ability to answer questions on implements	26	<u>2.46</u> 1.24	25	<u>2.68</u> 0.98	21	<u>2.66</u> 1.35	31	<u>2.32</u> 0.97	103	<u>2.51</u> 1.12	.618	.604
21. FO's ability to answer questions on machinery	26	<u>2.53</u> 1.17	25	<u>2.72</u> 1.02	21	<u>2.61</u> 1.11	31	<u>2.45</u> 1.20	103	<u>2.57</u> 1.12	.276	.842
22. FO's ability to answer questions on soils	26	<u>2.57</u> 1.27	25	<u>2.72</u> 1.02	21	<u>2.71</u> 1.30	31	<u>2.32</u> 1.10	103	<u>2.56</u> 1.16	.699	.554
23. Too much information to transfer	26	<u>2.50</u> 1.39	26	<u>3.26</u> 1.31	21	<u>2.61</u> 1.28	30	<u>3.20</u> 1.39	103	<u>2.92</u> 1.37	2.185	.094

Table 21. Continued

Problems	<u>R1</u>		<u>R2</u>		<u>R3</u>		<u>R4</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
24. Incentives available	25	<u>3.40</u> 1.22	24	<u>3.45</u> 1.41	20	<u>3.90</u> 1.16	31	<u>3.51</u> 1.45	100	<u>3.55</u> 1.32	.606	.612
25. Quality of pre- service training	26	<u>2.76</u> 1.06	24	<u>3.20</u> 0.93	20	<u>3.25</u> 0.96	31	<u>3.12</u> 0.88	101	<u>3.07</u> 0.09	1.281	.285
26. Frequent transfers of FOs	25	<u>3.60</u> 1.58	24	<u>3.58</u> 1.31	21	<u>3.57</u> 1.20	31	<u>3.58</u> 1.33	101	<u>3.58</u> 1.35	.001	.999

Table 22. Analysis of variance of perceptions held by Swaziland field officers, extension officers, and farmers regarding program objectives according to academic qualifications^a

Objectives	<u>G1</u>		<u>G2</u>		<u>G3</u>		<u>G4</u>		<u>G5</u>		<u>G6</u>		<u>Composite</u>		F	F
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD	ratio	prob.
1. Transferring technical information	11	<u>4.72</u> 0.46	4	<u>5.00</u> 0.00	19	<u>4.63</u> 0.83	12	<u>5.00</u> 0.00	41	<u>4.31</u> 0.78	14	<u>4.92</u> 0.26	101	<u>4.61</u> 0.69	3.541	.005
2. Assisting farmers to shift	11	<u>4.45</u> .052	4	<u>4.25</u> 0.95	19	<u>4.57</u> 0.60	12	<u>4.66</u> 0.49	42	<u>4.66</u> 0.57	15	<u>4.73</u> 0.45	103	<u>4.62</u> 0.56	0.744	.592
3. Assisting farmers to raise livestock	11	<u>4.14</u> 0.60	4	<u>4.75</u> 0.50	19	<u>4.26</u> 0.56	12	<u>4.58</u> 0.51	42	<u>4.69</u> 0.46	15	<u>4.66</u> 0.48	103	<u>4.54</u> 0.53	3.264	.009*
4. Assisting farmers to raise higher yielding crops	11	<u>4.81</u> 0.40	4	<u>5.00</u> 0.00	19	<u>4.78</u> 0.41	12	<u>4.75</u> 0.45	42	<u>4.71</u> 0.59	15	<u>4.73</u> 0.45	103	<u>4.75</u> 0.49	0.302	.910
5. Teaching farmers to diversify	11	<u>4.54</u> 0.52	4	<u>5.00</u> 0.00	19	<u>4.73</u> 0.73	12	<u>4.50</u> 0.90	42	<u>4.04</u> 0.90	15	<u>4.13</u> 0.91	103	<u>4.33</u> 0.86	2.814	.020*
6. Encouraging farmers to form cooperatives	11	<u>4.36</u> 1.20	4	<u>4.50</u> 1.00	19	<u>4.63</u> 0.95	12	<u>4.08</u> 1.50	42	<u>4.54</u> 0.63	15	<u>4.53</u> 0.63	103	<u>4.48</u> 0.90	0.648	.663
7. Improving marketing	11	<u>4.54</u> 0.52	4	<u>4.75</u> 0.50	19	<u>4.73</u> 0.45	12	<u>4.58</u> 0.51	42	<u>4.39</u> 0.73	15	<u>4.40</u> 0.63	102	<u>4.50</u> 0.62	1.054	.390

^aG1=No formal education, G2=Sebenta education, G3=Lower and higher primary education, G4=Secondary and high school education, G5=Certificate in agriculture, G6=Diploma in agriculture or education.

*Significant at the .05 level.

Table 22. Continued

Objectives	<u>G1</u>		<u>G2</u>		<u>G3</u>		<u>G4</u>		<u>G5</u>		<u>G6</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
8. Teaching keeping accurate records	11	<u>4.54</u> 0.52	4	<u>4.75</u> 0.50	19	<u>4.63</u> 0.49	12	<u>4.66</u> 0.49	42	<u>4.61</u> 0.49	15	<u>4.33</u> 0.72	103	<u>4.58</u> 0.58	0.869	.504
9. Linking researchers with farmers	11	<u>4.18</u> 0.75	4	<u>4.25</u> 0.95	18	<u>4.27</u> 0.75	12	<u>4.58</u> 0.66	42	<u>4.54</u> 0.67	15	<u>4.46</u> 0.63	102	<u>4.44</u> 0.69	0.854	.514
10. Helping farmers make intelligent decisions	11	<u>4.90</u> 0.30	4	<u>5.00</u> 0.00	18	<u>4.88</u> 0.32	12	<u>4.91</u> 0.28	43	<u>4.23</u> 0.71	15	<u>4.33</u> 0.72	103	<u>4.54</u> 0.65	6.509	.000*
11. Encouraging use of locally available resources	11	<u>5.54</u> 0.52	4	<u>4.75</u> 0.50	18	<u>4.77</u> 0.42	12	<u>4.83</u> 0.38	43	<u>4.55</u> 0.54	15	<u>4.40</u> 0.73	103	<u>4.61</u> 0.54	1.367	.243
12. Teaching soil conservation methods	11	<u>4.72</u> 0.46	4	<u>4.75</u> 0.50	18	<u>4.83</u> 0.38	12	<u>4.75</u> 0.45	43	<u>4.76</u> 0.42	15	<u>4.60</u> 0.63	103	<u>4.74</u> 0.45	0.445	.816
13. Encouraging application for farm loans	11	<u>3.63</u> 1.36	4	<u>5.00</u> 0.00	18	<u>3.55</u> 1.61	12	<u>4.33</u> 0.98	43	<u>3.46</u> 0.95	15	<u>3.53</u> 0.74	103	<u>3.66</u> 1.14	2.373	.044*
14. Encouraging farmers to plan farming	11	<u>4.81</u> 0.40	4	<u>4.75</u> 0.50	18	<u>4.61</u> 0.50	12	<u>4.66</u> 0.49	43	<u>4.69</u> 0.46	15	<u>4.53</u> 0.63	103	<u>4.66</u> 0.66	0.516	.763
15. Encouraging proper maintenance of farm machinery	11	<u>4.45</u> 0.52	4	<u>4.50</u> 0.57	18	<u>4.61</u> 0.50	12	<u>4.75</u> 0.45	43	<u>4.62</u> 0.48	15	<u>4.60</u> 0.50	103	<u>4.61</u> 0.48	0.458	.806
16. Helping farmers to locate farm inputs	11	<u>4.81</u> 0.40	4	<u>5.00</u> 0.00	18	<u>4.94</u> 0.23	12	<u>4.83</u> 0.38	43	<u>4.27</u> 0.59	15	<u>4.06</u> 1.16	103	<u>4.51</u> 0.30	6.100	.000*

Table 22. Continued

Objectives	<u>G1</u>		<u>G2</u>		<u>G3</u>		<u>G4</u>		<u>G5</u>		<u>G6</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
17. Teaching prioritiza- tion	11	<u>4.72</u> 0.46	4	<u>5.00</u> 0.00	18	<u>4.88</u> 0.32	12	<u>5.00</u> 0.00	43	<u>4.74</u> 0.49	15	<u>4.53</u> 0.51	103	<u>4.77</u> 0.44	2.154	.065
18. Teaching farmers to use references	11	<u>3.27</u> 0.64	4	<u>3.25</u> 0.50	18	<u>3.72</u> 0.82	12	<u>4.25</u> 0.62	43	<u>3.83</u> 0.79	15	<u>3.65</u> 0.97	103	<u>3.75</u> 0.81	2.213	.059
19. Enforcing government production goals	11	<u>1.54</u> 1.21	4	<u>2.25</u> 1.89	18	<u>2.11</u> 1.40	12	<u>2.91</u> 1.92	43	<u>3.65</u> 1.06	15	<u>3.46</u> 1.18	103	<u>2.99</u> 1.49	7.094	.000*
20. Regulating farming practices	11	<u>1.54</u> 1.21	4	<u>2.25</u> 1.89	18	<u>2.11</u> 1.40	12	<u>3.00</u> 1.95	42	<u>3.64</u> 0.90	15	<u>3.26</u> 1.22	103	<u>2.96</u> 1.45	7.147	.000*
21. Encouraging produc- tion of commercials only	11	<u>1.63</u> 1.20	4	<u>2.25</u> 1.89	18	<u>2.05</u> 1.16	12	<u>2.08</u> 1.44	43	<u>2.16</u> 0.87	12	<u>1.53</u> 0.51	103	<u>1.99</u> 1.05	1.134	.347
22. Encouraging farming for consumption only	10	<u>1.30</u> 0.48	4	<u>2.25</u> 1.89	18	<u>2.05</u> 1.16	12	<u>2.00</u> 1.47	43	<u>1.48</u> 0.63	15	<u>1.40</u> 0.50	103	<u>1.64</u> 0.94	2.193	.061

were found on 1) transferring technical information, 2) assisting farmers to shift from subsistence to commercial farming, 3) teaching farmers to diversify, 4) helping farmers make intelligent decisions, 5) encouraging farmers to apply for farm loans, 6) encouraging farmers to locate farm inputs, 7) enforcing government production goals, and 8) regulating farming practices.

Perceptions held by respondents with Sebenta (mean=5.00) and secondary and high school education (mean=5.00) regarding transferring technical information were statistically significantly different from those with a certificate in agriculture (mean=4.31). Respondents with Sebenta education (mean=4.75), certificate in agriculture (mean=4.69), and diploma (mean=4.66) reported statistically significantly different views from the others regarding their perceptions of assisting farmers to shift from subsistence to commercial farming. Regarding teaching farmers to diversify, Sebenta education respondents were statistically significantly different from respondents with a certificate and diploma education.

Regarding the remaining items, significant statistical differences were found. The Scheffé procedures indicated that perceptions of respondents with secondary and high school education and below were statistically significantly different (mean ranged between 4.88 to 5.00) from certificate and diploma graduates (means=4.23-4.33). Respondents with Sebenta education perceptions (mean=5.00) were significantly different from all the others except from secondary and high school graduates (mean=4.33).

Graduates with Sebenta and lower and higher primary education held perceptions significantly different from certificate graduates. Secondary and high school, certificate, and diploma graduates' perceptions were significantly different from those with a lower and higher primary, Sebenta, and no formal education. Graduates with secondary and high school education, certificate, and diploma graduates held perceptions statistically significantly different from graduates with lower and higher primary education and below, respectively.

Program principles according to academic qualifications

Data analysis of variance of the perceptions held by the respondents is presented in Table 23. No significant statistical differences were found on 43.75% of the principles. Significant statistical differences were found on:

1. Use of grass-roots approach. Graduates with secondary and high school education and below reported significantly different responses from diploma graduates but not different from certificate graduates.
2. Reliance on applied research, where graduates with certificates were found to report statistically significantly different responses from graduates with no formal education but not different from the rest.
3. Promote use of opinion leaders. Perceptions of respondents with secondary and high school education and below were consistently different from certificate and diploma graduates.

Table 23. Analysis of variance of perceptions held by Swaziland field officers, extension officers, and farmers regarding program principles according to academic qualifications^a

Principles	<u>G1</u>		<u>G2</u>		<u>G3</u>		<u>G4</u>		<u>G5</u>		<u>G6</u>		<u>Composite</u>		F	F
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD	ratio	prob.
1. Voluntary participation by farmers	11	<u>4.63</u> 1.20	4	<u>4.00</u> 2.00	18	<u>4.38</u> 1.28	12	<u>3.75</u> 1.86	42	<u>3.76</u> 1.18	15	<u>3.93</u> 1.09	102	<u>4.00</u> 1.32	1.188	.320
2. Use grass-roots approach	11	<u>4.81</u> 0.40	4	<u>5.00</u> 0.00	18	<u>4.77</u> 0.42	12	<u>4.75</u> 0.45	42	<u>4.50</u> 0.55	14	<u>4.14</u> 0.94	101	<u>4.58</u> 0.60	3.240	.009*
3. Provide educational services	11	<u>4.90</u> 0.30	4	<u>5.00</u> 0.00	18	<u>4.50</u> 1.29	12	<u>5.00</u> 0.00	43	<u>4.34</u> 0.86	15	<u>4.53</u> 0.51	103	<u>4.56</u> 0.83	1.921	.097
4. Reliance on applied research	11	<u>2.90</u> 0.70	4	<u>3.25</u> 0.50	18	<u>3.27</u> 0.66	12	<u>3.75</u> 0.75	43	<u>4.20</u> 0.80	15	<u>3.93</u> 0.96	103	<u>3.77</u> 0.89	7.260	.000*
5. Encourage teamwork among FOs	11	<u>4.90</u> 0.30	4	<u>5.00</u> 0.00	18	<u>4.94</u> 0.23	12	<u>4.58</u> 1.16	43	<u>4.67</u> 0.47	15	<u>4.73</u> 0.59	103	<u>4.75</u> 0.56	1.112	.358
6. Promote use of opinion leaders	11	<u>4.90</u> 0.30	4	<u>5.00</u> 0.00	18	<u>4.88</u> 0.32	12	<u>4.83</u> 0.38	43	<u>3.76</u> 0.84	14	<u>3.92</u> 0.99	102	<u>4.28</u> 0.87	12.184	.000*
7. Encourage consultation among farmers	11	<u>4.90</u> 0.30	4	<u>5.00</u> 0.00	18	<u>4.94</u> 0.23	12	<u>4.83</u> 0.38	43	<u>4.27</u> 0.59	15	<u>4.26</u> 0.59	103	<u>4.55</u> 0.57	8.691	.000*

^aG1=No formal education, G2=Sebenta education, G3=Lower and higher primary education, G4=Secondary and high school education, G5=Certificate in agriculture, G6=Diploma in agriculture or education.

*Significant at the .05 level.

Table 23. Continued

Principles	<u>G1</u>		<u>G2</u>		<u>G3</u>		<u>G4</u>		<u>G5</u>		<u>G6</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
8. Cooperation between and among agencies' extension officers	11	<u>4.90</u> 0.31	4	<u>5.00</u> 0.00	17	<u>4.94</u> 0.24	12	<u>4.83</u> 0.38	43	<u>4.69</u> 0.51	15	<u>4.73</u> 0.45	101	<u>4.79</u> 0.43	1.218	.306
9. Use suitable exten- sion teaching methods	11	<u>4.90</u> 0.30	4	<u>5.00</u> 0.00	18	<u>4.77</u> 0.42	12	<u>5.00</u> 0.00	43	<u>4.69</u> 0.46	14	<u>4.57</u> 0.64	102	<u>4.76</u> 0.44	1.901	.101
10. Programs to foster self-reliance	11	<u>5.00</u> 0.00	4	<u>5.00</u> 0.00	18	<u>4.83</u> 0.38	12	<u>4.75</u> 0.62	43	<u>4.46</u> 0.70	15	<u>4.46</u> 0.83	103	<u>4.64</u> 0.63	2.362	.045*
11. Develop farmers' problem-solving skills	11	<u>4.81</u> 0.40	4	<u>5.00</u> 0.00	18	<u>4.94</u> 0.23	12	<u>5.00</u> 0.00	43	<u>4.55</u> 0.58	15	<u>4.53</u> 0.51	103	<u>4.71</u> 0.49	3.631	.004*
12. Use formative evaluation	11	<u>4.09</u> 0.53	4	<u>4.25</u> 0.50	18	<u>4.22</u> 0.42	12	<u>4.33</u> 0.65	41	<u>4.17</u> 0.66	15	<u>3.86</u> 0.91	101	<u>4.14</u> 0.65	1.921	.097
13. Use summative evaluation	10	<u>3.90</u> 0.31	4	<u>4.25</u> 0.50	18	<u>4.22</u> 0.42	12	<u>4.08</u> 0.66	41	<u>3.90</u> 0.70	15	<u>3.86</u> 0.74	100	<u>3.99</u> 0.62	1.000	.422
14. Farmers' needs basis for program development	11	<u>4.70</u> 0.48	4	<u>4.75</u> 0.50	18	<u>4.94</u> 0.23	12	<u>4.83</u> 0.38	43	<u>4.62</u> 0.65	15	<u>4.80</u> 0.41	102	<u>4.74</u> 0.52	1.085	.373
15. Farmers' needs be given priority	10	<u>4.80</u> 0.42	4	<u>4.75</u> 0.50	18	<u>5.00</u> 0.00	12	<u>5.00</u> 0.00	43	<u>4.67</u> 0.64	15	<u>4.66</u> 0.48	102	<u>4.78</u> 0.50	1.768	.126
16. Farmers' participa- tion in AEE meetings be compulsory	10	<u>1.00</u> 0.00	4	<u>2.00</u> 2.00	18	<u>2.05</u> 1.69	12	<u>3.41</u> 1.88	43	<u>3.74</u> 1.38	15	<u>3.26</u> 1.22	102	<u>3.00</u> 1.68	8.313	.000*

4. Encourage consultation among farmers. Perceptions of respondents with secondary and high school education were consistently reported as different from certificate holders and diploma graduates.

5. Lead farmers toward self-reliance. Perceptions of respondents with Sebenta, secondary, and high school education were significantly different from certificate and diploma graduates, respectively.

6. Farmer participation in AEE activities to be compulsory.* Perceptions of respondents with secondary and high school and certificate were significantly different from all the others except from diploma graduates. Diploma graduates reported significantly different responses compared to graduates with no formal education.

Teaching methods according to academic qualifications

Information on the analysis of variance of perceptions held by respondents regarding teaching methods in AEE according to academic qualifications is summarized in Table 24. As can be observed in the table, significant differences were found on:

1. Method demonstrations; however, the Scheffé and Duncan procedures showed that the differences were negligible among respondents with different academic qualifications.

2. Seminars, where Sebenta graduates' perceptions were statistically significantly different from the other graduates' perceptions.

3. Lectures, where both certificate and diploma graduates' perceptions were statistically significantly different from the other (means=4.18 and 4.20, respectively).

Table 24. Analysis of variance of perceptions held by Swaziland field officers, extension officers, and farmers regarding teaching methods according to academic qualifications^a

Methods	<u>G1</u>		<u>G2</u>		<u>G3</u>		<u>G4</u>		<u>G5</u>		<u>G6</u>		<u>Composite</u>		F	F
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD	ratio	prob.
1. Method demo	10	<u>4.90</u> 0.31	4	<u>5.00</u> 0.00	18	<u>4.94</u> 0.23	12	<u>5.00</u> 0.00	43	<u>4.55</u> 0.73	15	<u>4.86</u> 0.35	102	<u>4.77</u> 0.54	2.662	.026*
2. Result demo	10	<u>4.90</u> 0.31	4	<u>5.00</u> 0.00	18	<u>4.72</u> 0.75	12	<u>4.50</u> 1.16	43	<u>4.51</u> 0.76	15	<u>4.73</u> 0.45	102	<u>4.63</u> 0.74	0.862	.509
3. Individual visit	11	<u>4.90</u> 0.31	4	<u>3.50</u> 1.73	18	<u>4.38</u> 1.14	12	<u>4.66</u> 0.88	43	<u>4.07</u> 1.09	15	<u>4.13</u> 0.91	101	<u>4.26</u> 1.05	1.952	.092
4. Agricultural shows	10	<u>4.30</u> 0.67	4	<u>4.25</u> 0.95	18	<u>4.61</u> 0.60	12	<u>4.50</u> 0.90	43	<u>4.02</u> 1.03	15	<u>4.06</u> 0.88	102	<u>4.22</u> 0.91	1.421	.223
5. Short courses	9	<u>4.44</u> 0.52	4	<u>4.00</u> 0.81	18	<u>4.50</u> 0.61	12	<u>4.83</u> 0.38	43	<u>4.37</u> 0.75	15	<u>4.60</u> 0.63	101	<u>4.47</u> 0.67	1.425	.222
6. Field days	9	<u>4.55</u> 0.52	4	<u>4.50</u> 0.57	18	<u>4.61</u> 0.60	12	<u>4.75</u> 0.45	43	<u>4.53</u> 0.50	12	<u>4.80</u> 0.41	101	<u>4.61</u> 0.50	0.835	.527
7. Workshops	9	<u>4.55</u> 0.52	4	<u>4.00</u> 0.81	18	<u>4.50</u> 0.61	12	<u>4.66</u> 0.49	43	<u>4.53</u> 0.50	15	<u>4.80</u> 0.41	101	<u>4.56</u> 0.53	1.682	.146

^aG1=No formal education, G2=Sebenta education, G3=Lower and higher primary education, G4=Secondary and high school education, G5=Certificate in agriculture, G6=Diploma in agriculture or education.

*Significant at the .05 level.

Table 24. Continued

Methods	<u>G1</u>		<u>G2</u>		<u>G3</u>		<u>G4</u>		<u>G5</u>		<u>G6</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
8. Seminars	9	<u>4.33</u> 0.50	4	<u>3.75</u> 0.50	18	<u>4.33</u> 0.68	12	<u>4.58</u> 0.79	43	<u>4.55</u> 0.50	15	<u>4.80</u> 0.41	101	<u>4.50</u> 0.59	2.838	.019*
9. Lectures	7	<u>3.71</u> 0.95	4	<u>3.00</u> 0.00	17	<u>3.41</u> 0.79	11	<u>3.81</u> 0.98	43	<u>4.18</u> 0.85	15	<u>4.20</u> 0.86	97	<u>3.92</u> 0.90	3.414	.007*
10. Lecture-discussions	6	<u>4.33</u> 0.81	4	<u>3.50</u> 0.57	17	<u>3.76</u> 0.90	10	<u>3.90</u> 0.99	43	<u>4.27</u> 0.88	15	<u>4.40</u> 0.63	95	<u>4.13</u> 0.87	1.841	.112
11. Group discussions	6	<u>4.66</u> 0.51	4	<u>4.25</u> 0.50	17	<u>4.47</u> 0.62	10	<u>4.00</u> 0.81	43	<u>4.51</u> 0.66	15	<u>4.60</u> 0.50	95	<u>4.46</u> 0.64	1.436	.219
12. Panel discussions	6	<u>4.50</u> 0.54	4	<u>4.00</u> 0.81	17	<u>4.23</u> 0.66	9	<u>4.11</u> 0.33	41	<u>3.73</u> 0.86	15	<u>4.00</u> 0.84	92	<u>3.96</u> 0.79	1.805	.120
13. Buzz groups	6	<u>3.16</u> 0.40	4	<u>3.00</u> 0.00	17	<u>3.17</u> 0.39	9	<u>3.22</u> 0.44	43	<u>3.00</u> 0.95	13	<u>3.23</u> 1.30	92	<u>3.09</u> 0.83	0.259	.934
14. Role play	6	<u>4.00</u> 0.63	4	<u>3.50</u> 0.57	17	<u>3.70</u> 0.58	10	<u>3.50</u> 0.52	43	<u>3.95</u> 0.84	14	<u>4.14</u> 0.94	94	<u>3.87</u> 0.77	1.276	.281
15. Case studies	6	<u>4.33</u> 0.81	4	<u>4.75</u> 0.50	17	<u>4.29</u> 0.68	10	<u>4.10</u> 0.99	43	<u>3.51</u> 1.03	15	<u>3.93</u> 0.70	95	<u>3.88</u> 0.95	3.337	.008*
16. Questioning	6	<u>3.83</u> 0.40	3	<u>4.66</u> 0.57	17	<u>4.23</u> 0.66	10	<u>4.20</u> 0.42	41	<u>4.00</u> 0.70	15	<u>4.13</u> 0.51	92	<u>4.09</u> 0.63	1.130	.350
17. Problem solving	6	<u>4.83</u> 0.40	4	<u>5.00</u> 0.00	17	<u>4.82</u> 0.52	10	<u>5.00</u> 0.00	43	<u>4.34</u> 0.65	15	<u>4.26</u> 0.88	95	<u>4.54</u> 0.66	3.942	.002*

Table 24. Continued

Methods	<u>G1</u>		<u>G2</u>		<u>G3</u>		<u>G4</u>		<u>G5</u>		<u>G6</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
18. On-farm trials	5	<u>4.20</u> 0.44	4	<u>3.75</u> 0.50	17	<u>4.23</u> 0.66	10	<u>4.40</u> 0.69	41	<u>4.46</u> 0.59	15	<u>4.33</u> 0.89	92	<u>4.34</u> 0.67	1.040	.399
19. Brainstorming	5	<u>4.20</u> 0.44	4	<u>4.50</u> 0.57	17	<u>4.29</u> 0.68	10	<u>4.30</u> 0.67	42	<u>3.66</u> 0.97	15	<u>4.20</u> 0.86	93	<u>4.00</u> 0.88	2.434	.040*
20. Tours	5	<u>4.00</u> 0.00	4	<u>4.50</u> 0.57	17	<u>4.05</u> 0.55	10	<u>4.40</u> 0.51	42	<u>4.52</u> 0.50	15	<u>4.66</u> 0.48	93	<u>4.41</u> 0.53	3.530	.005*
21. Focus groups	5	<u>3.20</u> 0.44	4	<u>3.50</u> 0.57	17	<u>3.47</u> 0.62	10	<u>4.00</u> 0.66	42	<u>3.80</u> 0.80	15	<u>3.93</u> 0.79	93	<u>3.74</u> 0.75	1.599	.169
22. Nominal group technique	6	<u>4.00</u> 0.63	4	<u>4.25</u> 0.95	17	<u>4.23</u> 0.75	9	<u>4.33</u> 1.00	37	<u>3.43</u> 0.72	7	<u>3.00</u> 0.57	80	<u>3.75</u> 0.86	5.559	.000*

4. Case studies, where Sebenta graduates' perceptions (mean=4.75) were statistically significantly different from the rest of the respondents.

5. Problem solving, where both Sebenta and secondary and high school graduates' perceptions were statistically significantly different from certificate and diploma graduates' perceptions.

6. Brainstorming, where the differences among the perceptions of respondents with different academic qualifications were negligible based on the Scheffé and Duncan procedures.

7. Tours, in which perceptions of diploma graduates (mean=4.66) reported statistically significantly different data from graduates with no formal education and lower and higher primary education (means=4.00 and 4.05, respectively).

8. Nominal group technique, in which perceptions of graduates with no formal and Sebenta education were statistically significantly different from diploma graduates; lower and higher primary and secondary and high school education graduates were statistically significantly different from certificate holders and diploma graduates.

Problems according to academic qualifications

In Table 25, data regarding the analysis of variance of perceptions held by respondents regarding problems in AEE are presented. As can be observed in the table, significant statistical differences were found on the perceptions of:

Table 25. Analysis of variance of perceptions held by Swaziland field officers, extension officers, and farmers regarding problems impacting AEE according to academic qualifications^a

Problems	<u>G1</u>		<u>G2</u>		<u>G3</u>		<u>G4</u>		<u>G5</u>		<u>G6</u>		<u>Composite</u>		F	F
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD	ratio	prob.
1. Wide area to cover	10	<u>4.40</u> 1.07	4	<u>4.75</u> 0.50	19	<u>4.57</u> 1.12	12	<u>4.91</u> 0.28	43	<u>4.53</u> 0.95	15	<u>4.80</u> 0.41	103	<u>4.62</u> 0.87	0.623	.682
2. Lack of supervision	10	<u>3.30</u> 1.33	4	<u>3.50</u> 1.29	19	<u>3.42</u> 1.38	12	<u>2.75</u> 1.21	43	<u>3.06</u> 1.35	15	<u>3.80</u> 1.20	103	<u>3.24</u> 1.32	1.119	.355
3. Shortage of transportation	10	<u>4.60</u> 0.96	4	<u>4.25</u> 1.50	19	<u>4.68</u> 0.94	12	<u>4.91</u> 0.28	43	<u>4.86</u> 0.41	15	<u>5.00</u> 0.00	103	<u>4.80</u> 0.64	1.372	.241
4. Farmers' reluctance to attend AEE meetings	10	<u>4.00</u> 1.41	4	<u>4.75</u> 0.50	19	<u>4.31</u> 1.24	12	<u>4.16</u> 1.33	43	<u>4.02</u> 0.98	15	<u>3.80</u> 1.14	104	<u>4.08</u> 1.13	0.662	.652
5. Inadequacy of in-service	10	<u>2.40</u> 0.51	4	<u>2.50</u> 0.57	18	<u>2.55</u> 0.61	11	<u>3.00</u> 1.18	42	<u>3.88</u> 1.19	15	<u>3.86</u> 0.99	100	<u>3.34</u> 1.17	7.924	.000*
6. Shallow information at in-service courses	10	<u>2.60</u> 0.69	4	<u>2.50</u> 0.57	18	<u>2.66</u> 0.68	11	<u>2.54</u> 1.03	43	<u>3.20</u> 1.33	15	<u>3.26</u> 1.48	101	<u>2.96</u> 1.18	1.410	.227
7. Difficult to translate technical information	10	<u>3.00</u> 1.05	4	<u>3.25</u> 0.95	18	<u>2.77</u> 0.64	11	<u>2.27</u> 1.00	42	<u>2.16</u> 1.18	15	<u>3.00</u> 1.51	100	<u>2.54</u> 1.16	2.346	.047*

^aG1=No formal education, G2=Sebenta education, G3=Lower and higher primary education, G4=Secondary and high school education, G5=Certificate in agriculture, G6=Diploma in agriculture or education.

*Significant at the .05 level.

Table 25. Continued

Problems	<u>G1</u>		<u>G2</u>		<u>G3</u>		<u>G4</u>		<u>G5</u>		<u>G6</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
8. Adequacy of backup from SMS	10	<u>2.60</u> 0.51	4	<u>2.75</u> 0.95	18	<u>3.05</u> 0.41	11	<u>2.90</u> 0.83	43	<u>3.39</u> 1.13	15	<u>3.40</u> 1.35	101	<u>3.17</u> 1.01	1.583	.172
9. Farmers' tendency to avoid program ownership	10	<u>3.60</u> 1.42	4	<u>4.50</u> 0.57	18	<u>4.16</u> 1.15	11	<u>3.54</u> 1.57	43	<u>3.46</u> 1.05	13	<u>3.38</u> 0.96	99	<u>3.64</u> 1.17	1.528	.188
10. Farmers' reluctance to accept new ideas	10	<u>3.80</u> 1.31	4	<u>5.00</u> 0.00	19	<u>4.47</u> 1.17	11	<u>4.09</u> 1.44	43	<u>3.60</u> 1.27	15	<u>4.00</u> 0.84	102	<u>3.95</u> 1.23	2.095	.072
11. Cultural events coincide with planned meetings	10	<u>3.50</u> 1.64	4	<u>2.25</u> 1.25	17	<u>3.64</u> 1.57	11	<u>4.45</u> 1.21	41	<u>3.73</u> 1.16	15	<u>4.13</u> 0.74	98	<u>3.77</u> 1.29	2.200	.060
12. Recognition of FO for outstanding performance	10	<u>4.40</u> 0.84	4	<u>5.00</u> 0.00	17	<u>4.11</u> 0.99	11	<u>3.18</u> 1.40	42	<u>3.38</u> 1.12	15	<u>4.06</u> 0.96	99	<u>3.75</u> 1.15	4.106	.002*
13. Shadow of the predecessor	10	<u>3.80</u> 1.31	4	<u>3.75</u> 0.50	17	<u>4.11</u> 1.05	11	<u>3.36</u> 1.43	42	<u>3.35</u> 1.03	15	<u>3.80</u> 1.01	99	<u>3.61</u> 1.11	1.437	.218
14. FO experiencing burnout	11	<u>2.81</u> 0.98	4	<u>4.25</u> 0.50	18	<u>2.88</u> 1.18	10	<u>3.50</u> 1.26	41	<u>2.92</u> 1.05	14	<u>3.21</u> 1.36	98	<u>3.06</u> 1.14	1.535	.186
15. Farmers' ability to keep accurate records	11	<u>3.45</u> 1.28	4	<u>4.75</u> 0.50	18	<u>4.44</u> 0.61	10	<u>3.80</u> 1.03	43	<u>3.93</u> 0.91	15	<u>3.93</u> 0.96	101	<u>3.99</u> 0.93	2.396	.043*
16. Farmers lost confidence in AEE	11	<u>3.36</u> 1.02	4	<u>4.75</u> 0.50	18	<u>3.22</u> 1.43	10	<u>2.80</u> 1.39	43	<u>2.90</u> 1.08	15	<u>2.93</u> 1.38	101	<u>3.07</u> 1.24	2.000	.085

Table 25. Continued

Problems	<u>G1</u>		<u>G2</u>		<u>G3</u>		<u>G4</u>		<u>G5</u>		<u>G6</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
17. Adequacy of support from researchers	11	<u>3.09</u> 0.30	4	<u>3.00</u> 0.00	16	<u>3.12</u> 0.34	9	<u>3.55</u> 0.88	43	<u>3.18</u> 1.07	15	<u>2.93</u> 0.96	98	<u>3.15</u> 0.86	0.622	.683
18. FO's ability to answer problems on crops	11	<u>2.18</u> 0.98	4	<u>2.00</u> 0.81	18	<u>2.27</u> 1.01	10	<u>2.10</u> 0.73	43	<u>2.55</u> 1.27	15	<u>2.73</u> 1.27	101	<u>2.42</u> 1.14	0.757	.583
19. FO's ability to answer questions on livestock	11	<u>2.18</u> 0.98	4	<u>2.00</u> 0.81	18	<u>2.27</u> 1.01	10	<u>2.10</u> 0.73	43	<u>2.83</u> 1.19	15	<u>2.53</u> 1.12	101	<u>2.51</u> 1.10	1.613	.164
20. FO's ability to answer questions on implements	11	<u>2.18</u> 0.98	4	<u>2.00</u> 0.81	18	<u>2.27</u> 1.01	10	<u>2.10</u> 0.73	43	<u>2.64</u> 1.20	15	<u>3.00</u> 1.19	101	<u>2.51</u> 1.11	1.584	.171
21. FO's ability to answer questions on machinery	11	<u>2.18</u> 0.98	4	<u>2.00</u> 0.81	18	<u>2.27</u> 1.01	10	<u>2.40</u> 1.17	43	<u>2.74</u> 1.11	15	<u>3.00</u> 1.25	101	<u>2.57</u> 1.11	1.453	.212
22. FO's ability to answer questions on soils	11	<u>2.18</u> 0.98	4	<u>2.00</u> 0.81	18	<u>2.27</u> 1.01	10	<u>2.30</u> 0.94	43	<u>2.88</u> 1.29	15	<u>2.60</u> 1.12	101	<u>2.56</u> 1.16	1.434	.218
23. Too much informa- tion to transfer	11	<u>2.54</u> 1.21	4	<u>3.00</u> 1.15	18	<u>2.33</u> 1.08	10	<u>2.20</u> 1.13	43	<u>3.34</u> 1.42	15	<u>3.20</u> 1.56	101	<u>2.93</u> 1.38	2.453	.038*
24. Incentives available	11	<u>3.90</u> 0.94	3	<u>3.66</u> 1.52	18	<u>3.88</u> 1.27	10	<u>4.50</u> 0.52	41	<u>3.39</u> 1.33	15	<u>2.53</u> 1.40	98	<u>3.53</u> 1.33	3.730	.004*

Table 25. Continued

Problems	<u>G1</u>		<u>G2</u>		<u>G3</u>		<u>G4</u>		<u>G5</u>		<u>G6</u>		<u>Composite</u>		F	F
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD	ratio	prob.
25. Quality of pre-service training	11	<u>2.72</u> 0.64	3	<u>2.33</u> 0.57	18	<u>2.83</u> 0.51	10	<u>2.70</u> 0.82	42	<u>3.23</u> 1.00	15	<u>3.60</u> 1.29	99	<u>3.08</u> 0.96	2.463	.038*
26. Frequent transfers of FOs	11	<u>3.63</u> 1.12	3	<u>5.00</u> 0.00	18	<u>4.11</u> 1.07	10	<u>3.90</u> 1.28	42	<u>3.33</u> 1.35	15	<u>3.00</u> 1.64	99	<u>3.56</u> 1.35	2.289	.052

1. Inadequacy of in-service training. Perceptions of graduates with certificates and diplomas were significantly different from those with no formal, Sebenta, and lower and higher primary education.

2. Difficult to translate technical information into SiSwati. The Scheffé and Duncan procedures showed that the difference was negligible.

3. Recognition of field officers for outstanding performance. Perceptions of graduates with no formal education were significantly different from perceptions of graduates with secondary and high school; and perceptions of graduates with Sebenta education were significantly different from those with secondary and high school and certificate education.

4. Farmers' ability to keep accurate records. Perceptions of graduates with Sebenta education were significantly different from graduates with no formal and secondary and high school education; and those with lower and higher primary and secondary education were significantly different from those with no formal education.

5. Too much information to transfer. The Scheffé and Duncan procedures showed that the differences were negligible.

6. Incentives' unavailability in AEE. Perceptions of graduates with no formal education, lower and higher primary, and secondary and high school education were significantly different from perceptions of graduates with Sebenta, certificate, and diploma qualifications.

7. The quality of pre-service training. Perceptions of graduates' mean ratings on perceptions with a diploma were significantly different from perceptions of Sebenta graduates but not from the others.

Program objectives according to position

Information regarding analysis of variance of perceptions held by respondents regarding objectives of AEE is presented in Table 26. There were significant statistical differences found on:

1. Transferring technical information, where extension officers' perceptions (mean=4.85) were statistically significantly different from those of field officers and farmers (means=4.34 and 4.79, respectively).
2. Assisting farmers to raise quality livestock. Field and extension officers' perceptions (means=4.69 and 4.73) were statistically different from farmers' perceptions (mean=4.35).
3. Teaching farmers to diversify. Farmers' perceptions (mean=4.64) were consistently significantly different from field officers' perceptions (mean=4.07) but not from the extension officers' perceptions (mean=4.13).
4. Helping farmers to make intelligent decisions. Farmers' perceptions were statistically different (mean=4.83) from both field officers and extension officers' perceptions (means=4.23 and 4.33, respectively).
5. Encouraging farmers to use locally available resources. Farmers' perceptions were significantly different from field officers' perceptions but were not different from the field officers' perceptions.
6. Helping farmers to locate farm inputs. Farmers' perceptions were statistically different (mean=4.85) from the other two groups (means=4.25 and 4.26, respectively).

Table 26. Analysis of variance of perceptions held by Swaziland field officers, extension officers, and farmers regarding program objectives according to position

Objectives	<u>FO^a</u>		<u>EO^a</u>		<u>Farmer</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
1. Transferring technical information	41	<u>4.34</u> 0.79	14	<u>4.85</u> 0.36	48	<u>4.79</u> 0.58	103	<u>4.62</u> 0.68	6.280	.002*
2. Assisting farmers to shift	42	<u>4.69</u> 0.56	15	<u>4.60</u> 0.50	48	<u>4.56</u> 0.58	105	<u>4.61</u> 0.56	0.587	.557
3. Assisting farmers to raise livestock	42	<u>4.69</u> 0.46	15	<u>4.73</u> 0.45	48	<u>4.35</u> 0.56	105	<u>4.54</u> 0.53	6.009	.003*
4. Assisting farmers to raise higher yielding crops	42	<u>4.71</u> 0.59	15	<u>4.73</u> 0.45	48	<u>4.81</u> 0.39	105	<u>4.76</u> 0.49	0.473	.624
5. Teaching farmers to diversify	42	<u>4.07</u> 0.94	15	<u>4.13</u> 0.83	48	<u>4.64</u> 0.69	105	<u>4.34</u> 0.86	5.987	.003*
6. Encouraging farmers to form cooperatives	42	<u>4.50</u> 0.63	15	<u>4.73</u> 0.59	48	<u>4.41</u> 1.14	105	<u>4.49</u> 0.90	0.704	.496
7. Improving marketing	41	<u>4.36</u> 0.73	15	<u>4.46</u> 0.63	48	<u>4.66</u> 0.47	104	<u>4.51</u> 0.62	2.729	.070

^aFOs=field officers, EOs=extension officers.

*Significant at the .05 level.

Table 26. Continued

Objectives	<u>FO</u>		<u>EO</u>		<u>Farmer</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
8. Teaching keeping accurate records	42	<u>4.54</u> 0.59	15	<u>4.53</u> 0.51	48	<u>4.62</u> 0.48	105	<u>4.58</u> 0.53	0.301	.740
9. Linking researchers with farmers	42	<u>4.52</u> 0.70	15	<u>4.60</u> 0.50	47	<u>4.27</u> 0.74	104	<u>4.42</u> 0.70	1.943	.148
10. Helping farmers make intelligent decisions	43	<u>4.23</u> 0.71	15	<u>4.33</u> 0.72	47	<u>4.89</u> 0.31	105	<u>4.54</u> 0.65	16.120	.000*
11. Encouraging use of locally available resources	43	<u>4.58</u> 0.58	15	<u>4.33</u> 0.61	47	<u>4.72</u> 0.45	105	<u>4.60</u> 0.54	3.122	.048*
12. Teaching soil conservation methods	43	<u>4.74</u> 0.49	15	<u>4.66</u> 0.48	47	<u>4.78</u> 0.41	105	<u>4.75</u> 0.45	0.405	.667
13. Encouraging application for farm loans	43	<u>3.37</u> 0.92	15	<u>3.86</u> 0.63	47	<u>3.85</u> 1.44	105	<u>3.65</u> 1.17	2.191	.116
14. Encouraging farmers to plan farming	43	<u>4.72</u> 0.45	15	<u>4.46</u> 0.63	47	<u>4.68</u> 0.47	105	<u>4.66</u> 0.49	1.526	.222
15. Encouraging proper maintenance of farm machinery	43	<u>4.62</u> 0.48	15	<u>4.66</u> 0.48	47	<u>4.59</u> 0.49	105	<u>4.61</u> 0.48	0.129	.878
16. Helping farmers to locate farm inputs	43	<u>4.25</u> 0.75	15	<u>4.26</u> 0.59	47	<u>4.85</u> 0.50	105	<u>4.52</u> 0.69	11.315	.000*

Table 26. Continued

Objectives	<u>FO</u>		<u>EO</u>		<u>Farmer</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
17. Teaching prioritiza- tion	43	<u>4.74</u> 0.49	15	<u>4.60</u> 0.50	47	<u>4.87</u> 0.33	105	<u>4.78</u> 0.43	2.525	.085
18. Teaching farmers to use references	42	<u>3.83</u> 0.82	15	<u>3.80</u> 0.77	46	<u>3.67</u> 0.81	103	<u>3.75</u> 0.81	0.444	.642
19. Enforcing government production goals	43	<u>3.65</u> 1.08	15	<u>3.46</u> 1.12	47	<u>2.14</u> 1.57	105	<u>2.95</u> 1.50	15.543	.000*
20. Regulating farming practices	42	<u>3.73</u> 0.88	15	<u>3.06</u> 1.16	47	<u>2.14</u> 1.57	104	<u>2.92</u> 1.46	17.251	.000*
21. Encouraging production of commercial crops only	43	<u>2.09</u> 0.92	15	<u>1.73</u> 0.45	47	<u>1.93</u> 1.27	105	<u>1.97</u> 1.05	0.694	.501
22. Encouraging farming for consumption only	43	<u>1.41</u> 0.49	15	<u>1.60</u> 0.82	46	<u>1.84</u> 1.21	104	<u>1.63</u> 0.93	2.416	.094

7. Enforcing government production goals. Both field and extension officers' perceptions were statistically different (means=3.65 and 3.46) from farmers' perceptions (mean=2.14).

8. Regulating farming practices, where field and extension officers' perceptions were statistically different (means=3.73 and 3.06) from the farmers' perceptions (mean=2.14).

Program principles according to position

Information contained in Table 27 shows a comparison of perceptions held by field officers, extension officers, and farmers regarding principles of AEE. Significant differences were found on:

1. Using a grass-roots approach to tackle farmers' problems. Farmers' mean ratings on perceptions (mean=4.82) were statistically different from extension officers' (mean=4.20) and not statistically different from field officers' perceptions (mean=4.47).

2. Putting reliance on applied research. Field and extension officers' perceptions (mean=4.16 and 4.13) were significantly different from farmers' perceptions (mean=3.29).

3. Encouraging teamwork among extension staff. Field officers' and farmers' perceptions (mean=4.72 and 4.93) were significantly different from extension officers' perceptions (mean=4.33).

4. Promoting the use of opinion leaders. Farmers' perceptions (mean=4.87) were significantly different from field and extension officers' perceptions (means=3.72 and 4.14). Also, the extension

Table 27. Analysis of variance of perceptions held by Swaziland field officers, extension officers, and farmers regarding program principles according to position

Principles	<u>FO^a</u>		<u>EO^a</u>		<u>Farmer</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
1. Voluntary farmer participation in extension meetings	42	<u>3.69</u> 1.19	15	<u>4.20</u> 1.01	47	<u>4.25</u> 1.46	104	<u>4.01</u> 1.32	2.241	.111
2. Using grass-roots approach to farmers' problems	42	<u>4.47</u> 0.59	15	<u>4.20</u> 0.86	46	<u>4.82</u> 0.38	103	<u>4.59</u> 0.60	8.557	.000*
3. Providing educational services on non-discriminatory basis	43	<u>4.37</u> 0.87	15	<u>4.46</u> 0.51	47	<u>4.78</u> 0.83	105	<u>4.57</u> 0.83	3.062	.051
4. Putting emphasis on applied research	43	<u>4.16</u> 0.84	15	<u>4.13</u> 0.91	47	<u>3.29</u> 0.68	105	<u>3.77</u> 0.89	15.351	.000*
5. Encouraging teamwork among extension staff	43	<u>4.72</u> 0.45	15	<u>4.33</u> 1.11	47	<u>4.93</u> 0.24	105	<u>4.76</u> 0.56	7.530	.000*
6. Promoting use of opinion leaders	43	<u>3.72</u> 0.88	15	<u>4.14</u> 0.77	47	<u>4.87</u> 0.39	104	<u>4.29</u> 0.86	31.998	.000*
7. Encouraging consultation among farmers	43	<u>4.23</u> 0.57	15	<u>4.40</u> 0.63	47	<u>4.91</u> 0.28	105	<u>4.56</u> 0.57	24.269	.000*

^aFOs=field officers, EOs=extension officers.

*Significant at the .05 level.

Table 27. Continued

Principles	<u>FO</u>		<u>EO</u>		<u>Farmer</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
8. Encouraging cooperation of other agencies' extension staff	43	<u>4.72</u> 0.50	15	<u>4.73</u> 0.45	45	<u>4.86</u> 0.34	103	<u>4.86</u> 0.43	1.374	.257
9. Using suitable teaching methods	43	<u>4.67</u> 0.47	15	<u>4.71</u> 0.61	47	<u>4.87</u> 0.33	104	<u>4.76</u> 0.44	2.400	.095
10. Lead farmers toward self-reliance	43	<u>4.46</u> 0.73	15	<u>4.40</u> 0.73	47	<u>4.89</u> 0.37	105	<u>4.64</u> 0.63	7.207	.001*
11. Develop problem-solving skills	43	<u>4.55</u> 0.58	15	<u>4.53</u> 0.51	47	<u>4.93</u> 0.24	105	<u>4.72</u> 0.49	9.270	.000*
12. Use of formative evaluation	41	<u>4.17</u> 0.70	15	<u>3.93</u> 0.79	47	<u>4.21</u> 0.54	103	<u>4.15</u> 0.65	1.060	.350
13. Use appropriate summative procedures	41	<u>3.87</u> 0.67	15	<u>3.86</u> 0.83	46	<u>4.13</u> 0.45	102	<u>3.99</u> 0.62	2.186	.117
14. Farmers' needs be basis for program planning	43	<u>4.65</u> 0.65	15	<u>4.73</u> 0.45	46	<u>4.82</u> 0.38	104	<u>4.74</u> 0.52	1.259	.288
15. Meeting farmers' needs be the priority goal	43	<u>4.67</u> 0.64	15	<u>4.66</u> 0.48	46	<u>4.93</u> 0.24	104	<u>4.78</u> 0.49	3.783	.026*
16. Farmers' participation in extension meetings should be compulsory	43	<u>3.83</u> 1.32	15	<u>3.06</u> 1.22	46	<u>2.10</u> 1.72	104	<u>2.96</u> 1.69	14.669	.000*

officers' perceptions were significantly different from field officers' perceptions.

5. Encouraging consultation among farmers. Farmers' perceptions (mean=4.91) were different from both field and extension officers' perceptions (means=4.23 and 4.40).

6. Leading farmers toward self-reliance. Farmers' perceptions were consistently different from field and extension officers' perceptions.

7. Developing problem-solving skills. Farmers' perceptions were significantly different from field and extension officers' perceptions.

8. Meeting farmers' needs should be the priority goal. The Scheffé and Duncan procedures showed that the differences were negligible.

9. Farmers' participation in extension meetings should be compulsory. Field officers' perceptions (mean=3.83) were significantly different from farmers' perceptions (mean=2.10) but not different from extension officers' perceptions (mean=3.06).

Teaching methods according to position

Table 28 presents a summary of the analysis of variance of perceptions held by respondents regarding teaching methods used in AEE. It can be observed in the table that significant differences were found in the mean ratings of perceptions of:

1. Method demonstration: Farmers' perceptions (mean=4.93) were significantly different from field officers' perceptions (mean=4.60) and not different from extension officers' perceptions (mean=4.80).

Table 28. Analysis of variance of perceptions held by Swaziland field officers, extension officers, and farmers regarding teaching methods according to position

Methods	<u>FO^a</u>		<u>EO^a</u>		<u>Farmer</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
1. Method demo	43	<u>4.60</u> 0.72	15	<u>4.80</u> 0.41	46	<u>4.93</u> 0.24	104	<u>4.77</u> 0.53	4.461	.013*
2. Result demo	43	<u>4.53</u> 0.76	15	<u>4.66</u> 0.48	46	<u>4.73</u> 0.77	104	<u>4.64</u> 0.73	0.860	.425
3. Individual farmer visit	42	<u>4.02</u> 1.15	15	<u>4.40</u> 0.50	46	<u>4.47</u> 1.04	103	<u>4.28</u> 1.05	2.212	.114
4. Agricultural shows	43	<u>3.97</u> 1.05	15	<u>4.13</u> 0.74	46	<u>4.52</u> 0.72	104	<u>4.24</u> 0.90	4.393	.014*
5. Short courses	43	<u>4.41</u> 0.76	15	<u>4.46</u> 0.63	45	<u>4.55</u> 0.58	103	<u>4.48</u> 0.66	0.461	.631
6. Field days	43	<u>4.60</u> 0.49	15	<u>4.53</u> 0.51	45	<u>4.66</u> 0.52	103	<u>4.62</u> 0.50	0.424	.655
7. Workshops	43	<u>4.58</u> 0.49	15	<u>4.60</u> 0.50	45	<u>4.55</u> 0.58	103	<u>4.57</u> 0.53	0.047	.953
8. Seminars	43	<u>4.60</u> 0.49	15	<u>4.66</u> 0.48	45	<u>4.35</u> 0.67	103	<u>4.50</u> 0.59	2.688	.072

^aFOs=field officers, EOs=extension officers.

*Significant at the .05 level.

Table 28. Continued

Methods	<u>FO</u>		<u>EO</u>		<u>Farmer</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
9. Lectures	43	<u>4.18</u> 0.85	15	<u>4.20</u> 0.86	41	<u>3.56</u> 0.83	99	<u>3.92</u> 0.89	6.604	.002*
10. Lecture-discussions	43	<u>4.30</u> 0.88	15	<u>4.40</u> 0.63	39	<u>3.84</u> 0.84	97	<u>4.13</u> 0.86	3.939	.022*
11. Group discussions	43	<u>4.48</u> 0.66	15	<u>4.66</u> 0.48	39	<u>4.33</u> 0.66	97	<u>4.45</u> 0.64	1.573	.212
12. Panel discussions	41	<u>3.70</u> 0.87	14	<u>4.07</u> 0.82	39	<u>4.20</u> 0.57	94	<u>3.96</u> 0.78	4.507	.013*
13. Buzz groups	42	<u>2.92</u> 1.02	13	<u>3.53</u> 0.96	39	<u>3.12</u> 0.40	94	<u>3.09</u> 0.83	2.835	.063
14. Role playing	42	<u>3.90</u> 0.85	15	<u>4.33</u> 0.81	39	<u>3.64</u> 0.58	96	<u>3.86</u> 0.77	4.757	.010*
15. Case studies	43	<u>3.53</u> 1.03	15	<u>3.73</u> 0.88	39	<u>4.33</u> 0.66	39	<u>3.86</u> 0.94	8.746	.000*
16. Questioning	41	<u>4.00</u> 0.70	15	<u>4.13</u> 0.51	38	<u>4.15</u> 0.59	94	<u>4.08</u> 0.63	0.659	.519
17. Problem solving	43	<u>4.34</u> 0.65	15	<u>4.46</u> 0.63	39	<u>4.82</u> 0.60	97	<u>4.55</u> 0.66	5.923	.003*
18. On-farm trials	41	<u>4.41</u> 0.59	15	<u>4.66</u> 0.61	38	<u>4.10</u> 0.72	94	<u>4.32</u> 0.67	4.581	.012*

Table 28. Continued

Methods	<u>FO</u>		<u>EO</u>		<u>Farmer</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
19. Brainstorming	42	<u>3.66</u> 1.00	15	<u>4.33</u> 0.48	38	<u>4.23</u> 0.71	95	<u>4.00</u> 0.87	6.128	.003*
20. Tours	42	<u>4.57</u> 0.50	15	<u>4.53</u> 0.51	38	<u>4.15</u> 0.54	95	<u>4.40</u> 0.55	6.840	.001*
21. Focus groups	42	<u>3.80</u> 0.80	15	<u>4.00</u> 0.75	38	<u>3.55</u> 0.64	95	<u>3.73</u> 0.74	2.352	.100
22. Nominal group technique	34	<u>3.38</u> 0.73	10	<u>3.40</u> 0.69	37	<u>4.21</u> 0.82	81	<u>3.76</u> 0.86	11.561	.000*

2. Agricultural shows: Farmers' perceptions (mean=4.52) were significantly different from field officers' (mean=3.97) and not from extension officers' perceptions (mean=4.13).

3. Lectures: Both field and extension officers' perceptions (means=4.18 and 4.20) were significantly different from farmers' perceptions (mean=3.56).

4. Lecture-discussions: Extension officers' perceptions (mean=4.40) were significantly different from farmers (mean=3.84) but not significantly different from field officers (mean=4.30).

5. Panel discussions: Farmers' perceptions (mean=4.20) were significantly different from field officers' perceptions (mean=3.70) and not from extension officers' perceptions (mean=4.07).

6. Role play: Extension officers' perceptions (mean=4.33) were significantly different from farmers' perceptions (mean=3.64) and not significantly different from field officers' perceptions (mean=3.90).

7. Case studies: Farmers' perceptions (mean=4.33) were significantly different from field officers (mean=3.53) and extension officers' perceptions (mean=3.73).

8. Problem solving: Farmers' perceptions (mean=4.82) were significantly different from field officers' perceptions (mean=4.34) and extension officers' perceptions (mean=4.46).

9. On-farm trials: Extension officers' perceptions (mean=4.66) were significantly different from farmers' perceptions (mean=4.10) and not from field officers' perceptions (mean=4.41).

10. Brainstorming: Extension officers' perceptions (mean=4.33) were significantly different from field officers' perceptions (mean=3.66) but not significantly different from farmers' perceptions (mean=4.23).

11. Tours: Both field and extension officers' perceptions (means=4.57 and 4.53) were significantly different from farmers' perception (mean=4.14).

12. Nominal group technique: Farmers' perceptions (mean=4.21) were significantly different from field and extension officers' perceptions (means=3.38 and 3.40).

Problems according to position

A comparison of perceptions held by respondents regarding problems in AEE is presented in Table 29. As can be observed from the table, significant statistical differences were found regarding the perceptions of over half of the rated problems. These included:

1. Lack of supervision: Extension officers' perceptions (mean=4.00) were significantly different from field officers' (mean=2.95) and farmers' perceptions (mean=3.27).

2. Inadequacy of in-service training: Both field and extension officers' perceptions (means=3.86 and 3.92) were significantly different from farmers' perceptions (mean=2.66).

3. Shallow information at in-service training: The Scheffé and Duncan procedures showed that the differences were negligible.

Table 29. Analysis of variance of perceptions held by Swaziland field officers, extension officers, and farmers regarding problems impacting AEE according to position

Problems	<u>FO^a</u>		<u>EO^a</u>		<u>Farmer</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
1. Wide area to cover	43	<u>4.58</u> 0.95	15	<u>4.66</u> 0.48	47	<u>4.65</u> 0.89	105	<u>4.62</u> 0.86	.105	.899
2. Lack of supervision	43	<u>2.95</u> 1.37	15	<u>4.00</u> 0.75	47	<u>3.27</u> 1.34	105	<u>3.24</u> 1.32	3.647	.029*
3. Shortage of transportation	43	<u>4.88</u> 0.39	15	<u>4.93</u> 0.25	47	<u>4.70</u> 0.85	105	<u>4.80</u> 0.63	1.249	.291
4. Farmers' reluctance to attend extension meetings	43	<u>4.02</u> 1.03	15	<u>3.73</u> 0.96	48	<u>4.27</u> 1.23	106	<u>4.09</u> 1.12	1.459	.237
5. Inadequacy of in-service training	43	<u>3.86</u> 1.22	15	<u>3.92</u> 0.82	45	<u>2.66</u> 0.85	102	<u>3.34</u> 1.18	17.547	.000*
6. Shallow information at in-service training	43	<u>3.30</u> 1.33	15	<u>2.86</u> 1.35	45	<u>2.68</u> 0.90	103	<u>2.97</u> 1.19	3.102	.049*
7. Difficult to translate technical information into SiSwati	42	<u>2.30</u> 1.37	15	<u>2.46</u> 1.12	45	<u>2.82</u> 0.91	102	<u>2.55</u> 1.16	2.209	.115
8. Adequacy of backup support by SMS	43	<u>3.51</u> 1.14	15	<u>2.93</u> 1.27	45	<u>3.00</u> 0.70	102	<u>3.20</u> 1.02	3.531	.033*

^aFOs=field officers, EOs=extension officers.

Table 29. Continued

Problems	<u>FO</u>		<u>EO</u>		<u>Farmer</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
9. Farmers' tendency to avoid program ownership	42	<u>3.52</u> 1.01	14	<u>3.28</u> 1.06	45	<u>3.91</u> 1.29	101	<u>3.66</u> 1.16	2.086	.129
10. Farmers' reluctance to accept new ideas	43	<u>3.74</u> 1.17	15	<u>3.60</u> 1.24	46	<u>4.30</u> 1.22	104	<u>3.97</u> 1.23	3.213	.044*
11. Cultural events coinciding with planned events	42	<u>3.76</u> 1.16	14	<u>3.14</u> 0.77	44	<u>3.72</u> 1.53	100	<u>3.80</u> 1.29	0.573	.565
12. Recognition of FO for outstanding performance	43	<u>3.44</u> 1.14	14	<u>3.85</u> 1.02	44	<u>4.04</u> 1.11	101	<u>3.76</u> 1.14	3.234	.043*
13. Shadow of the predecessor	42	<u>3.40</u> 1.01	15	<u>3.60</u> 1.05	44	<u>3.84</u> 1.18	101	<u>3.62</u> 1.10	1.707	.186
14. FO experience mental fatigue (burnout)	42	<u>2.97</u> 1.09	13	<u>3.07</u> 1.32	45	<u>3.17</u> 1.17	100	<u>3.08</u> 1.15	0.328	.721
15. Farmers' ability to keep accurate records	43	<u>3.86</u> 0.99	15	<u>4.13</u> 0.63	45	<u>4.00</u> 1.04	103	<u>3.96</u> 0.96	0.499	.608
16. Farmers have lost confidence in AEE	43	<u>2.90</u> 1.17	15	<u>2.73</u> 1.03	45	<u>3.37</u> 1.35	103	<u>3.08</u> 1.25	2.309	.104
17. Adequacy of support from researchers	43	<u>3.16</u> 1.06	15	<u>2.93</u> 1.03	42	<u>3.23</u> 0.48	100	<u>3.16</u> 0.86	0.688	.505
18. FO's ability to answer problems on crops	43	<u>2.44</u> 1.20	15	<u>3.06</u> 1.38	45	<u>2.20</u> 0.94	103	<u>2.42</u> 1.15	3.339	.039*

Table 29. Continued

Problems	<u>FO</u>		<u>EO</u>		<u>Farmer</u>		<u>Composite</u>		F ratio	F prob.
	n	<u>Mean</u> SD	n	<u>Mean</u> SD	n	<u>Mean</u> SD	N	<u>Mean</u> SD		
19. FO's ability to answer questions on livestock	43	<u>2.69</u> 1.16	15	<u>2.93</u> 1.22	45	<u>2.20</u> 0.94	103	<u>2.51</u> 1.11	3.636	.029*
20. FO's ability to answer questions on farm implements	43	<u>2.55</u> 1.14	15	<u>3.33</u> 1.23	45	<u>2.20</u> 0.94	103	<u>2.51</u> 1.12	6.336	.002*
21. FO's ability to handle questions on machinery	43	<u>2.69</u> 1.10	15	<u>3.33</u> 1.29	45	<u>2.20</u> 0.94	103	<u>2.57</u> 1.12	6.866	.001*
22. FO's ability to handle problems on soils	43	<u>2.69</u> 1.22	15	<u>3.26</u> 1.27	45	<u>2.20</u> 0.94	103	<u>2.56</u> 1.16	5.645	.004*
23. Too much information to transfer	43	<u>3.39</u> 1.46	15	<u>3.20</u> 1.32	45	<u>2.37</u> 1.11	103	<u>2.92</u> 1.37	7.125	.001*
24. Incentives available in AEE	41	<u>3.19</u> 1.36	15	<u>3.20</u> 1.61	44	<u>4.00</u> 1.05	100	<u>3.55</u> 1.32	4.858	.009*
25. Quality of pre-service training	42	<u>3.40</u> 1.06	15	<u>3.20</u> 1.20	44	<u>2.72</u> 0.62	101	<u>3.07</u> 0.96	5.956	.003*
26. Frequent transfers of FOs	42	<u>3.09</u> 1.39	15	<u>3.66</u> 1.49	44	<u>4.02</u> 1.11	101	<u>3.58</u> 1.35	5.561	.005*

4. Adequacy of backup support by SMS: Field officers' perceptions (mean=3.51) were significantly different from extension officers' perceptions (mean=2.93) and not from the farmers' perceptions (mean=3.00).

5. Farmers' reluctance to accept new ideas: Farmers' perceptions (mean=4.30) were different from extension officers' perceptions (mean=3.60) but not different from field officers' perceptions (mean=3.74).

6. Recognition of field officers for outstanding performance: The Scheffé and Duncan procedures showed that the differences were negligible.

7. Field officers' ability to answer problems on crops: Extension officers' perceptions (mean=3.06) were significantly different from both field officers' and farmers' perceptions (mean=2.44 and 2.20, respectively).

8. Field officers' ability to answer livestock questions: Extension officers' perceptions (mean=2.93) were significantly different from farmers' perceptions (mean=2.20) but not from field officers' perceptions (mean=2.69).

9. Field officers' ability to answer farm implement questions: Extension officers' perceptions (mean=3.33) were different from field officers' and farmers' perceptions (means=2.55 and 2.20, respectively).

10. Field officers' ability to handle machinery questions: Extension officers' perceptions (mean=3.33) were different from field officers' and farmers' perceptions (means=2.69 and 2.20, respectively).

11. Field officers' ability to handle problems on soils: Extension officers' perceptions (mean=3.26) were significantly different from

farmers' perceptions (mean=2.20) and not from field officers' perceptions (mean=2.69).

12. Too much information to transfer: Both field and extension officers' perceptions (means=3.39 and 3.20) were significantly different from the farmers' perceptions (mean=2.37).

13. Incentives' availability in AEE: Farmers' perceptions (mean=4.00) were consistently different from field and extension officers' perceptions (means=3.19 and 3.20, respectively).

14. The quality of pre-service training: Field officers' perceptions (mean=3.40) were significantly different from farmers' perceptions (mean=2.72) but not different from extension officers' perceptions (mean=3.20).

15. Frequent transfers of field officers: Farmers' perceptions (mean=3.09) were significantly different from field officers' perceptions (mean=4.02) but not from extension officers' perceptions (mean=3.66).

Program objectives according to gender

In Table 30, means and standard deviations of perceptions held regarding objectives of AEE based on gender are presented. A t-test was used to determine similarities and differences in perceptions of the listed objectives. There were no significant statistical differences between how male and female respondents perceived all the rated objectives.

Table 30. Comparisons of means and standard deviations of perceptions held regarding program objectives based on gender^a

Potential program objectives (extent)	Gender				t value	t prob.
	Male		Female			
	n	<u>Mean</u> SD	n	<u>Mean</u> SD		
1. Transferring technical information	65	<u>4.55</u> 0.73	37	<u>4.72</u> 0.60	-1.24	.217
2. Assisting farmers to shift	66	<u>4.65</u> 0.51	38	<u>4.55</u> 0.64	0.86	.391
3. Assisting farmers to raise livestock	66	<u>4.59</u> 0.52	38	<u>4.44</u> 0.55	1.31	.192
4. Assisting farmers to raise yielding crops	66	<u>4.80</u> 0.50	38	<u>4.68</u> 0.47	1.19	.238
5. Teaching farmers to diversify	66	<u>4.33</u> 0.93	38	<u>4.34</u> 0.74	-0.05	.961
6. Encouraging farmers to form cooperatives	66	<u>4.43</u> 1.04	38	<u>4.57</u> 0.59	-0.87	.387
7. Improving marketing	65	<u>4.60</u> 0.60	38	<u>4.36</u> 0.63	1.84	.069
8. Teaching keeping accurate records	66	<u>4.62</u> 0.48	38	<u>4.50</u> 0.60	1.12	.267
9. Linking researchers with farmers	66	<u>4.50</u> 0.66	37	<u>4.27</u> 0.76	1.59	.114
10. Helping farmers make intelligent decisions	67	<u>4.53</u> 0.65	37	<u>4.54</u> 0.65	-0.02	.981
11. Encouraging use of locally available resources	67	<u>4.64</u> 0.51	37	<u>4.54</u> 0.60	0.90	.369
12. Teaching soil conservation methods	67	<u>4.76</u> 0.43	37	<u>4.72</u> 0.50	0.33	.738

^aRating scale: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree.

Table 30. Continued

Potential program objectives (extent)	Gender				t value	t prob.
	Male		Female			
	n	<u>Mean</u> SD	n	<u>Mean</u> SD		
13. Encouraging application for farm loans	67	<u>3.64</u> 1.17	37	<u>3.67</u> 1.20	-0.14	.889
14. Encouraging farmers to plan farming	67	<u>4.71</u> 0.48	37	<u>4.56</u> 0.50	1.48	.143
15. Encouraging proper maintenance of farm machinery	67	<u>4.64</u> 0.48	37	<u>4.56</u> 0.50	0.74	.461
16. Helping farmers to locate farm inputs	67	<u>4.52</u> 0.56	37	<u>4.51</u> 0.90	0.05	.957
17. Teaching prioritization	67	<u>4.80</u> 0.43	37	<u>4.72</u> 0.45	0.85	.400
18. Teaching farmers to use references	66	<u>3.84</u> 0.82	36	<u>3.58</u> 0.77	1.58	.116
19. Enforcing government production goals	67	<u>2.92</u> 1.52	37	<u>2.94</u> 1.49	-0.07	.947
20. Regulating farming practices	66	<u>2.93</u> 1.46	37	<u>2.89</u> 1.50	0.16	.876
21. Encouraging production of commercials	67	<u>1.93</u> 0.95	37	<u>2.05</u> 1.22	-0.59	.555
22. Encouraging farming for consumption	67	<u>1.49</u> 0.78	36	<u>1.88</u> 1.14	-1.86	.068

Program principles according to gender

Comparisons of means and standard deviations of perceptions

(Table 31) held regarding principles based on gender showed no significant statistical difference on how male and female respondents perceived nearly all the principles. Regarding the principle on using appropriate summative evaluation procedures, there was a significant difference on how male and female respondents perceived it.

Teaching methods according to gender

Regarding perceptions of teaching methods (Table 32), there was a significant statistical difference on how male and female respondents viewed 1) lectures, 2) panel discussions, 3) on-farm trials, and 4) focus groups. With regard to the remaining teaching methods, there were no significant statistical differences in the perceptions held by males and females.

Teaching tools according to gender

As can be observed in Table 33, information on how male and female field officers and extension officers perceived the listed items as teaching tools to be used in AEE meetings is presented. There were no significant statistical differences in how they perceived the teaching tools. With the use of tours, there was a significant statistical difference on how male and female field and extension officers perceived the use of this tool.

Table 31. Comparisons of means and standard deviations of perceptions held regarding program principles based on gender^a

Program principles (extent)	Gender				t value	t prob.
	Male		Female			
	n	<u>Mean</u> SD	n	<u>Mean</u> SD		
1. Voluntary participation by farmers	66	<u>4.04</u> 1.31	37	<u>3.97</u> 1.36	0.26	.792
2. Use grass-roots approach	66	<u>4.60</u> 0.52	36	<u>4.55</u> 0.73	0.37	.716
3. Provide educational services	67	<u>4.56</u> 0.85	37	<u>4.56</u> 0.80	0.00	.998
4. Reliance on applied research	67	<u>3.88</u> 0.93	37	<u>3.56</u> 0.80	1.72	.088
5. Encourage teamwork among FOs	67	<u>4.73</u> 0.64	37	<u>4.81</u> 0.39	-0.78	.438
6. Promote use of opinion leaders	67	<u>4.26</u> 0.89	36	<u>4.36</u> 0.83	-0.51	.611
7. Encourage consultation among farmers	67	<u>4.55</u> 0.55	37	<u>4.59</u> 0.59	-0.36	.719
8. Cooperation between and among agencies' extension officers	66	<u>4.81</u> 0.39	36	<u>4.72</u> 0.51	1.06	.291
9. Use suitable extension teaching methods	67	<u>4.77</u> 0.45	36	<u>4.75</u> 0.43	0.28	.779
10. Programs to foster self-reliance	67	<u>4.64</u> 0.62	37	<u>4.64</u> 0.67	-0.05	.958
11. Develop farmers' problem-solving skills	67	<u>4.73</u> 0.47	37	<u>4.70</u> 0.52	0.28	.778
12. Use formative evaluation	65	<u>4.21</u> 0.57	37	<u>4.05</u> 0.78	1.10	.276

^aRating scale: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree.

Table 31. Continued

Program principles (extent)	Gender				t value	t prob.
	Male		Female			
	n	<u>Mean</u> SD	n	<u>Mean</u> SD		
13. Use summative evaluation	65	<u>4.09</u> 0.60	36	<u>3.80</u> 0.62	2.26	.026*
14. Farmer needs basis for program development	67	<u>4.74</u> 0.56	36	<u>4.75</u> 0.43	-0.03	.972
15. Farmers' needs be given priority	67	<u>4.77</u> 0.54	36	<u>4.80</u> 0.40	-0.31	.756
16. Farmers' participation in AEE meetings be compulsory	67	<u>2.91</u> 1.70	36	<u>3.02</u> 1.71	-0.33	.740

*Significant at the .05 level.

Table 32. Comparisons of means and standard deviations of perceptions held regarding teaching methods based on gender^a

Teaching methods (extent)	Gender				t value	t prob.
	Male		Female			
	n	<u>Mean</u> SD	n	<u>Mean</u> SD		
1. Method demonstration	67	<u>4.77</u> 0.59	36	<u>4.77</u> 0.42	-0.02	.987
2. Result demonstration	67	<u>4.61</u> 0.79	36	<u>4.69</u> 0.62	-0.54	.592
3. Individual visit	66	<u>4.30</u> 1.05	36	<u>4.22</u> 1.07	0.37	.713
4. Agricultural shows	67	<u>4.26</u> 0.89	36	<u>4.16</u> 0.94	0.54	.590
5. Short courses	66	<u>4.57</u> 0.52	36	<u>4.30</u> 0.85	1.72	.091
6. Field days	66	<u>4.60</u> 0.49	36	<u>4.63</u> 0.54	-0.31	.757
7. Workshops	66	<u>4.62</u> 0.48	36	<u>4.47</u> 0.60	1.35	.181
8. Seminars	66	<u>4.51</u> 0.58	36	<u>4.47</u> 0.60	0.35	.729
9. Lectures	64	<u>4.07</u> 0.91	34	<u>3.67</u> 0.80	2.15	.034*
10. Lecture-discussions	64	<u>4.20</u> 0.91	32	<u>4.20</u> 0.74	0.92	.358
11. Group discussions	64	<u>4.51</u> 0.61	32	<u>4.31</u> 0.69	1.46	.148

^aRating scale: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree.

*Significant at the .05 level.

Table 32. Continued

Teaching methods (extent)	Gender				t value	t prob.
	Male		Female			
	n	<u>Mean</u> SD	n	<u>Mean</u> SD		
12. Panel discussions	62	<u>4.08</u> 0.83	31	<u>3.74</u> 0.63	1.99	.050*
13. Buzz groups	61	<u>3.21</u> 0.85	32	<u>2.87</u> 0.75	1.88	.063
14. Role play	63	<u>3.96</u> 0.74	32	<u>3.68</u> 0.82	1.68	.095
15. Case studies	64	<u>3.92</u> 0.99	32	<u>3.84</u> 0.84	0.38	.705
16. Questioning	62	<u>4.11</u> 0.63	31	<u>4.06</u> 0.62	0.35	.728
17. Problem solving	64	<u>4.64</u> 0.57	32	<u>4.40</u> 0.79	1.48	.145
18. On-farm trials	62	<u>4.64</u> 0.56	32	<u>4.06</u> 0.80	2.55	.014*
19. Brainstorming	62	<u>4.03</u> 0.86	32	<u>3.96</u> 0.89	0.66	.511
20. Tours	62	<u>4.45</u> 0.53	32	<u>4.31</u> 0.59	1.15	.252
21. Focus groups	62	<u>3.83</u> 0.72	32	<u>3.50</u> 0.71	2.15	.035*
22. Nominal group technique	54	<u>3.85</u> 0.85	27	<u>3.59</u> 0.88	1.27	.208

Table 33. Comparisons of means and standard deviations of perceptions held by Swaziland field officers and extension officers regarding teaching tools based on gender^a

Teaching tools (extent)	Gender				t value	t prob.
	Male		Female			
	n	<u>Mean</u> SD	n	<u>Mean</u> SD		
1. Field support guides	40	<u>4.60</u> 0.54	17	<u>4.61</u> 0.60	-0.29	.774
2. Advisory bulletin	40	<u>4.42</u> 0.59	16	<u>4.62</u> 0.50	-1.19	.240
3. Agricultural research reports	40	<u>4.65</u> 0.53	17	<u>4.38</u> 0.87	1.05	.306
4. Films	40	<u>4.27</u> 0.84	17	<u>4.52</u> 0.98	-0.98	.331
5. Exhibits and displays	40	<u>4.07</u> 0.91	17	<u>4.17</u> 0.72	-0.40	.687
6. Real objects	39	<u>4.20</u> 0.83	17	<u>4.29</u> 0.92	-0.36	.723
7. Chalkboard	40	<u>3.92</u> 0.76	17	<u>3.88</u> 0.69	0.20	.844
8. Models	39	<u>3.97</u> 0.87	17	<u>3.76</u> 0.66	0.88	.381
9. Flip charts	40	<u>4.20</u> 0.64	17	<u>4.11</u> 0.60	0.45	.656
10. Radio	38	<u>4.47</u> 0.76	17	<u>4.47</u> 0.51	0.02	.988
11. Videotapes	40	<u>4.37</u> 0.83	17	<u>4.17</u> 0.88	0.81	.424
12. Television	39	<u>3.92</u> 1.13	17	<u>4.00</u> 1.00	-0.24	.810

^aRating scale: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree.

Table 33. Continued

Teaching tools (extent)	Gender				t value	t prob.
	Male		Female			
	n	<u>Mean</u> SD	n	<u>Mean</u> SD		
13. Computer aided	40	<u>3.32</u> 1.04	16	<u>3.00</u> 1.15	1.02	.313
14. Bulletin boards	38	<u>3.81</u> 1.03	15	<u>3.20</u> 1.01	1.96	.055
15. Posters	39	<u>4.00</u> 0.82	17	<u>3.76</u> 0.90	0.95	.345
16. Flannelboard	40	<u>3.70</u> 0.93	17	<u>3.76</u> 0.56	-0.32	.750
17. Satellite	39	<u>3.05</u> 0.99	16	<u>2.81</u> 0.75	0.86	.394
18. 35 mm slides	40	<u>3.77</u> 1.05	17	<u>3.76</u> 1.03	0.03	.973
19. Tours	40	<u>4.60</u> 0.49	17	<u>4.88</u> 0.33	-2.15	.036*
20. Newsletter	40	<u>4.12</u> 0.75	17	<u>4.23</u> 0.83	-0.49	.627
21. News stories	40	<u>3.82</u> 0.93	17	<u>3.94</u> 0.80	-0.45	.658
22. Village drama	38	<u>4.13</u> 0.90	17	<u>4.23</u> 0.83	-0.40	.689

*Significant at the .05 level.

Problems according to gender

Regarding the perceptions of problems impacting AEE (Table 34), there were no significant statistical differences between how males and females perceived most of the listed problems. There was a significant difference on how males and females perceived 1) farmers' reluctance to attend extension meetings, 2) difficulty to translate technical information into SiSwati, 3) adequacy of backup support by SMS, 4) farmers' reluctance to accept new ideas, 5) recognition of field staff for outstanding performance, 6) FO's ability to answer livestock questions, and 7) FO's ability to handle farm machinery questions.

Program objectives according to marital status

In Table 35, information on the comparison of perceptions of objectives is presented. As can be observed in the table, there were five items in which significant statistical differences were found on how single and married respondents perceived the objectives of AEE. These items include 1) teaching farmers to diversify their farming, 2) helping farmers to make intelligent decisions, 3) enforcing government production goals, and 4) regulating farming practices.

Program principles according to marital status

Perceptions of single and married respondents are contained in Table 36. Significant statistical differences were found on the perceptions of six principles: 1) voluntary farmers' participation in agricultural extension meetings, 2) promote the use of opinion leaders,

Table 34. Comparisons of means and standard deviations of perceptions held by Swaziland field officers, extension officers, and farmers regarding problems impacting AEE based on gender^a

Problems (extent)	Gender				t value	t prob.
	Male		Female			
	n	<u>Mean</u> SD	n	<u>Mean</u> SD		
1. Wide area to cover	67	<u>4.61</u> 0.87	37	<u>4.67</u> 0.88	-0.36	.723
2. Lack of supervision	67	<u>3.22</u> 1.38	37	<u>3.29</u> 1.26	-0.27	.790
3. Shortage of trans- portation	67	<u>4.89</u> 0.35	37	<u>4.64</u> 0.94	1.52	.135
4. Farmers' reluctance to attend AEE meetings	67	<u>3.89</u> 1.22	38	<u>4.44</u> 0.86	-2.76	.008*
5. Inadequate in-service	66	<u>3.36</u> 1.19	35	<u>3.31</u> 1.18	0.20	.844
6. Shallow information at in-service courses	67	<u>3.01</u> 1.24	35	<u>2.88</u> 1.10	0.52	.607
7. Difficult to translate technical information	67	<u>2.38</u> 1.18	34	<u>2.94</u> 1.04	-2.31	.023*
8. Adequacy of backup from SMS	67	<u>3.04</u> 1.03	35	<u>3.48</u> 0.95	-2.10	.038*
9. Farmers' tendency to avoid program ownership	66	<u>3.72</u> 1.14	34	<u>3.55</u> 1.23	0.68	.499
10. Farmers' reluctance to accept new ideas	67	<u>3.79</u> 1.32	36	<u>4.30</u> 1.00	-2.04	.044*
11. Cultural events coincide with planned meetings	64	<u>3.84</u> 1.28	35	<u>3.77</u> 1.30	0.27	.791

^aRating scale: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree.

*Significant at the .05 level.

Table 34. Continued

Problems (extent)	Gender				t value	t prob.
	Male		Female			
	n	Mean SD	n	Mean SD		
12. Recognition of FO for outstanding performance	65	<u>3.61</u> 1.18	35	<u>4.08</u> 0.98	-2.01	.047*
13. Shadow of the predecessor	65	<u>3.70</u> 1.08	35	<u>3.48</u> 1.14	0.96	.341
14. FO experiencing burnout	63	<u>3.04</u> 1.14	36	<u>3.13</u> 1.17	-0.31	.756
15. Farmers' ability to keep accurate records	65	<u>3.96</u> 0.93	37	<u>3.94</u> 1.05	0.12	.908
16. Farmers lost confidence in AEE	65	<u>3.06</u> 1.15	37	<u>3.16</u> 1.42	-0.39	.699
17. Adequacy of support from researchers	63	<u>3.15</u> 0.90	36	<u>3.13</u> 0.79	0.11	.913
18. FO's ability to answer problems on crops	65	<u>2.52</u> 1.17	37	<u>2.27</u> 1.22	1.06	.291
19. FO's ability to answer questions on livestock	65	<u>2.72</u> 1.15	37	<u>2.16</u> 0.95	2.51	.014*
20. FO's ability to answer questions on implements	65	<u>2.67</u> 1.17	37	<u>2.24</u> 1.01	1.88	.063
21. FO's ability to answer questions on machinery	65	<u>2.75</u> 1.17	37	<u>2.27</u> 0.99	2.11	.037*
22. FO's ability to answer questions on soils	65	<u>2.72</u> 1.24	37	<u>2.29</u> 0.99	1.78	.078
23. Too much information to transfer	65	<u>3.06</u> 1.41	37	<u>2.64</u> 1.29	1.46	.147
24. Incentives available	64	<u>3.65</u> 1.46	35	<u>3.40</u> 1.03	1.01	.314

Table 34. Continued

Problems (extent)	Gender				t value	t prob.
	Male		Female			
	Mean		Mean			
	n	SD	n	SD		
25. Quality of pre-service training	64	<u>3.07</u> 0.96	36	<u>3.08</u> 0.99	-0.03	.980
26. Frequent transfers of FOs	65	<u>3.58</u> 1.29	35	<u>3.57</u> 1.48	0.05	.963

Table 35. Comparisons of means and standard deviations of perceptions held by Swaziland field officers, extension officers, and farmers regarding program objectives based on marital status^a

Potential program objectives (extent)	Marital status				t value	t prob.
	Single		Married			
	n	<u>Mean</u> SD	n	<u>Mean</u> SD		
1. Transferring technical information	20	<u>4.25</u> 0.96	82	<u>4.70</u> 0.57	-2.03	.054
2. Assisting farmers to shift	21	<u>4.57</u> 0.59	83	<u>4.62</u> 0.55	-0.40	.691
3. Assisting farmers to raise livestock	21	<u>4.57</u> 0.50	83	<u>4.53</u> 0.54	0.31	.755
4. Assisting farmers to raise yielding crops	21	<u>4.61</u> 0.59	83	<u>4.79</u> 0.46	-1.47	.144
5. Teaching farmers to diversify	21	<u>3.95</u> 0.86	83	<u>4.43</u> 0.84	-2.32	.022*
6. Encouraging farmers to form cooperatives	21	<u>4.47</u> 0.68	83	<u>4.49</u> 0.95	-0.08	.936
7. Improving marketing	21	<u>4.28</u> 0.71	82	<u>4.57</u> 0.58	-1.91	.059
8. Teaching keeping accurate records	21	<u>4.47</u> 0.68	83	<u>4.60</u> 0.49	-0.80	.431
9. Linking researchers with farmers	21	<u>4.57</u> 0.67	37	<u>4.37</u> 0.71	1.12	.266
10. Helping farmers make intelligent decisions	22	<u>4.18</u> 0.73	82	<u>4.63</u> 0.59	-3.00	.003*
11. Encouraging use of locally available resources	22	<u>4.72</u> 0.52	83	<u>4.56</u> 0.54	1.62	.107

^aRating scale: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree.

*Significant at the .05 level.

Table 35. Continued

Potential program objectives (extent)	Marital status				t value	t prob.
	Single		Married			
	n	<u>Mean</u> SD	n	<u>Mean</u> SD		
12. Teaching soil conservation methods	22	<u>4.81</u> 0.50	82	<u>4.73</u> 0.44	0.79	.433
13. Encouraging application for farm loans	22	<u>3.59</u> 1.00	82	<u>3.67</u> 1.22	-0.28	.780
14. Encouraging farmers to plan farming	22	<u>4.77</u> 0.42	82	<u>4.63</u> 0.50	1.17	.245
15. Encouraging proper maintenance of farm machinery	22	<u>4.68</u> 0.47	82	<u>4.59</u> 0.49	0.72	.476
16. Helping farmers to locate farm inputs	22	<u>4.27</u> 0.93	82	<u>4.58</u> 0.60	-1.49	.149
17. Teaching prioritization	22	<u>4.72</u> 0.55	82	<u>4.79</u> 0.40	-0.62	.538
18. Teaching farmers to use references	21	<u>3.85</u> 0.72	81	<u>3.71</u> 0.82	0.71	.477
19. Enforcing government production goals	22	<u>3.68</u> 1.12	82	<u>2.75</u> 1.55	2.61	.010*
20. Regulating farming practices	21	<u>3.57</u> 1.16	82	<u>2.74</u> 1.49	2.35	.021*
21. Encouraging production of commercials only	22	<u>2.09</u> 1.10	82	<u>1.91</u> 1.02	0.71	.482
22. Encouraging farming for consumption only	22	<u>1.59</u> 0.90	81	<u>1.65</u> 0.95	-0.28	.780

Table 36. Comparisons of means and standard deviations of perceptions held by Swaziland field officers, extension officers, and farmers regarding program principles based on marital status^a

Program principles (extent)	<u>Marital status</u>				t value	t prob.
	<u>Single</u>		<u>Married</u>			
	n	<u>Mean</u> SD	n	<u>Mean</u> SD		
1. Voluntary participation by farmers	21	<u>3.47</u> 1.25	82	<u>4.14</u> 1.31	-2.10	.038*
2. Use grass-roots approach	21	<u>4.47</u> 0.68	81	<u>4.61</u> 0.58	-0.96	.342
3. Provide educational services	22	<u>4.40</u> 0.66	82	<u>4.60</u> 0.87	-1.00	.318
4. Reliance on applied research	22	<u>3.81</u> 0.79	82	<u>3.74</u> 0.91	0.35	.729
5. Encourage teamwork among FOs	22	<u>4.72</u> 0.45	82	<u>4.76</u> 0.59	-0.30	.764
6. Promote use of opinion leaders	21	<u>3.71</u> 0.95	82	<u>4.45</u> 0.78	-3.66	.000*
7. Encourage consultation among farmers	22	<u>4.13</u> 0.56	82	<u>4.67</u> 0.52	-4.20	.000*
8. Cooperation between and among agencies' extension officers	22	<u>4.63</u> 0.58	80	<u>4.82</u> 0.38	-1.44	.162
9. Use suitable extension teaching methods	21	<u>4.57</u> 0.50	82	<u>4.81</u> 0.42	-2.29	.024*
10. Programs to foster self-reliance	22	<u>4.31</u> 0.89	82	<u>4.73</u> 0.52	-2.08	.048*
11. Develop farmers' problem-solving skills	22	<u>4.50</u> 0.67	82	<u>4.78</u> 0.41	-1.86	.074

^aRating scale: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree.

*Significant at the .05 level.

Table 36. Continued

Program principles (extent)	<u>Marital status</u>				t value	t prob.
	<u>Single</u>		<u>Married</u>			
	n	<u>Mean</u> SD	n	<u>Mean</u> SD		
12. Use formative evaluation	21	<u>4.23</u> 0.70	81	<u>4.12</u> 0.64	0.72	.475
13. Use summative evaluation	21	<u>3.85</u> 0.72	80	<u>4.01</u> 0.58	-1.03	.306
14. Farmers' needs basis for program development	22	<u>4.63</u> 0.58	81	<u>4.76</u> 0.50	-1.03	.307
15. Farmers' needs be given priority	22	<u>4.63</u> 0.72	81	<u>4.82</u> 0.41	-1.18	.249
16. Farmers' participation in AEE meetings be compulsory	22	<u>3.59</u> 1.40	81	<u>2.76</u> 1.72	2.06	.042*

3) promote consultation among farmers (networking), 4) use suitable extension teaching methods, 5) lead farmers to self-reliance, and 6) farmers' participation in extension meetings be compulsory.

Teaching methods according to marital status

A comparison of perceptions held by single and male respondents regarding extension teaching methods is presented in Table 37. Out of the 22 extension teaching methods identified, significant statistical differences between perceptions held by single and married respondents were observed in five methods. These methods are: 1) panel discussions, 2) buzz groups, 3) case studies, 4) tours, and 5) nominal group technique. Regarding the remaining teaching methods, there were no significant statistical differences between how single and married respondents perceived these teaching methods.

Teaching tools according to marital status

Twenty-two extension tools to be used in extension meetings were identified. A comparison of perceptions held by single and married respondents regarding the potential use of the teaching tools in AEE revealed no significant statistical differences (Table 38).

Problems according to marital status

In Table 39, information is presented on the comparison of perceptions held regarding problems in AEE based on marital status. Significant statistical differences were found in perceptions of the

Table 37. Comparisons of means and standard deviations of perceptions held by Swaziland field officers, extension officers, and farmers regarding teaching methods based on marital status^a

Teaching methods (extent)	Marital status				t value	t prob.
	Single		Married			
	n	<u>Mean</u> SD	n	<u>Mean</u> SD		
1. Method demonstration	22	<u>4.68</u> 0.47	81	<u>4.80</u> 0.55	-0.93	.356
2. Result demonstration	22	<u>4.63</u> 0.58	81	<u>4.64</u> 0.78	-0.03	.975
3. Individual visit	21	<u>4.04</u> 1.16	81	<u>4.33</u> 1.02	-1.11	.271
4. Agricultural shows	22	<u>4.18</u> 0.90	81	<u>4.24</u> 0.91	-0.30	.768
5. Short courses	22	<u>4.50</u> 0.74	80	<u>4.47</u> 0.65	0.15	.878
6. Field days	22	<u>4.63</u> 0.49	80	<u>4.61</u> 0.51	0.19	.846
7. Workshops	22	<u>4.63</u> 0.49	80	<u>4.55</u> 0.54	0.67	.506
8. Seminars	22	<u>4.59</u> 0.50	80	<u>4.47</u> 0.61	0.81	.419
9. Lectures	21	<u>4.04</u> 0.97	77	<u>3.88</u> 0.87	0.75	.457
10. Lecture-discussions	21	<u>4.09</u> 0.83	75	<u>4.13</u> 0.87	-0.18	.859
11. Group discussions	21	<u>4.38</u> 0.74	75	<u>4.46</u> 0.62	-0.53	.594

^aRating scale: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree.

Table 37. Continued

Teaching methods (extent)	Marital status				t value	t prob.
	Single		Married			
	n	Mean SD	n	Mean SD		
12. Panel discussions	21	<u>3.57</u> 0.74	72	<u>4.06</u> 0.75	-2.66	.009*
13. Buzz groups	21	<u>2.71</u> 0.84	72	<u>3.19</u> 0.79	-2.39	.019*
14. Role play	21	<u>3.66</u> 0.79	74	<u>3.90</u> 0.76	-1.26	.212
15. Case studies	21	<u>3.38</u> 0.80	75	<u>4.01</u> 0.93	-2.81	.006*
16. Questioning	21	<u>3.95</u> 0.74	72	<u>4.12</u> 0.60	-1.09	.277
17. Problem solving	21	<u>4.47</u> 0.51	75	<u>4.57</u> 0.70	-0.59	.556
18. On-farm trials	20	<u>4.20</u> 0.61	73	<u>4.35</u> 0.69	-0.91	.364
19. Brainstorming	20	<u>3.75</u> 0.96	74	<u>4.05</u> 0.84	-1.39	.169
20. Tours	21	<u>4.61</u> 0.49	74	<u>4.33</u> 0.55	2.09	.039*
21. Focus groups	20	<u>3.70</u> 0.86	74	<u>3.75</u> 0.71	-0.30	.765
22. Nominal group technique	15	<u>3.26</u> 0.79	65	<u>3.86</u> 0.84	-2.48	.015*

*Significant at the .05 level.

Table 38. Comparisons of means and standard deviations of perceptions held by Swaziland field officers and extension officers regarding teaching tools based on marital status^a

Teaching tools (extent)	Marital status				t value	t prob.
	Single		Married			
	n	<u>Mean</u> SD	n	<u>Mean</u> SD		
1. Field support guides	20	<u>4.45</u> 0.60	37	<u>4.68</u> 0.52	-1.65	.104
2. Advisory bulletin	19	<u>4.57</u> 0.50	37	<u>4.42</u> 0.60	0.91	.369
3. Agricultural research reports	20	<u>4.45</u> 0.60	37	<u>4.62</u> 0.68	-0.67	.507
4. Films	20	<u>4.50</u> 0.94	37	<u>4.27</u> 0.87	0.92	.360
5. Exhibits and displays	20	<u>4.15</u> 0.81	37	<u>4.08</u> 0.89	0.29	.776
6. Real objects	20	<u>4.20</u> 0.89	36	<u>4.25</u> 0.84	-0.21	.836
7. Chalkboard	20	<u>3.70</u> 0.86	37	<u>4.02</u> 0.71	-1.62	.111
8. Models	19	<u>3.78</u> 0.78	37	<u>3.97</u> 0.83	-0.79	.430
9. Flip charts	20	<u>4.15</u> 0.67	37	<u>4.18</u> 0.61	-0.22	.825
10. Radio	20	<u>4.50</u> 0.51	35	<u>4.48</u> 0.78	0.07	.942
11. Videotapes	20	<u>4.35</u> 0.81	37	<u>4.29</u> 0.87	0.22	.825
12. Television	20	<u>4.20</u> 0.89	36	<u>3.80</u> 1.16	1.31	.195

^aRating scale: 1-Strongly disagree, 2-Disagree, 3-Neutral, 4=Agree, 5=Strongly agree.

Table 38. Continued

Teaching tools (extent)	<u>Marital status</u>				t value	t prob.
	<u>Single</u>		<u>Married</u>			
	n	<u>Mean</u> SD	n	<u>Mean</u> SD		
13. Computer aided	19	<u>3.26</u> 1.04	37	<u>3.24</u> 1.14	0.06	.950
14. Bulletin boards	19	<u>3.68</u> 1.05	34	<u>3.61</u> 1.07	0.22	.829
15. Posters	19	<u>3.84</u> 0.89	37	<u>3.97</u> 0.83	-0.54	.590
16. Flannelboard	20	<u>3.75</u> 0.71	37	<u>3.72</u> 0.93	0.08	.933
17. Satellite	19	<u>3.10</u> 0.99	36	<u>2.97</u> 0.97	0.48	.634
18. 35 mm slides	20	<u>3.95</u> 0.94	37	<u>3.67</u> 1.08	0.95	.344
19. Tours	20	<u>4.70</u> 0.47	37	<u>4.67</u> 0.47	0.19	.854
20. Newsletter	20	<u>4.30</u> 0.86	37	<u>4.08</u> 0.72	1.02	.313
21. News stories	20	<u>4.00</u> 0.91	37	<u>3.78</u> 0.88	0.87	.389
22. Village drama	20	<u>4.05</u> 0.75	36	<u>4.22</u> 0.92	-0.71	.482

Table 39. Comparisons of means and standard deviations of perceptions held by Swaziland field officers, extension officers, and farmers regarding problems impacting AEE based on marital status^a

Problems (extent)	Marital status				t value	t prob.
	Single		Married			
	n	Mean SD	n	Mean SD		
1. Wide area to cover	22	<u>4.68</u> 0.89	82	<u>4.60</u> 0.87	0.34	.733
2. Lack of supervision	22	<u>2.86</u> 1.28	82	<u>3.36</u> 1.32	-1.59	.116
3. Shortage of trans- portation	22	<u>4.95</u> 0.21	82	<u>4.76</u> 0.70	2.06	.042*
4. Farmers reluctant to attend AEE meetings	22	<u>4.04</u> 0.99	83	<u>4.09</u> 1.16	-0.19	.852
5. Inadequacy of in-service	21	<u>3.80</u> 1.25	80	<u>3.20</u> 1.13	2.15	.034*
6. Shallow information at in-service courses	21	<u>2.95</u> 1.32	81	<u>2.96</u> 1.16	-0.04	.971
7. Difficult to translate technical information	21	<u>2.47</u> 1.43	80	<u>2.60</u> 1.08	-0.43	.666
8. Adequacy of backup from SMS	21	<u>3.71</u> 0.90	81	<u>3.09</u> 0.99	2.57	.012*
9. Farmers' tendency to avoid program ownership	20	<u>3.55</u> 0.99	80	<u>3.68</u> 1.21	-0.47	.642
10. Farmers' reluctance to accept new ideas	21	<u>3.90</u> 0.99	82	<u>3.98</u> 1.30	-0.27	.786
11. Cultural events coincide with planned meetings	20	<u>3.65</u> 0.98	79	<u>3.82</u> 1.36	-0.53	.597

^aRating scale: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree.

*Significant at the .05 level.

Table 39. Continued

Problems (extent)	Marital status				t value	t prob.
	Single		Married			
	n	<u>Mean</u> SD	n	<u>Mean</u> SD		
12. Recognition of FO for outstanding performance	21	<u>3.47</u> 1.03	79	<u>3.83</u> 1.17	-1.28	.204
13. Shadow of the predecessor	20	<u>3.20</u> 1.10	80	<u>3.72</u> 1.09	-1.92	.058
14. FO experiencing burnout	20	<u>2.90</u> 1.11	79	<u>3.15</u> 1.14	-0.88	.379
15. Farmers' ability to keep accurate records	21	<u>3.80</u> 0.98	81	<u>4.01</u> 0.96	-0.85	.396
16. Farmers lost confidence in AEE	21	<u>2.76</u> 1.09	81	<u>3.16</u> 1.28	-1.30	.197
17. Adequacy of support from researchers	21	<u>3.04</u> 0.92	78	<u>3.20</u> 0.84	-0.75	.458
18. FO's ability to answer problems on crops	21	<u>2.33</u> 1.15	81	<u>2.33</u> 1.15	-0.35	.727
19. FO's ability to answer questions on livestock	21	<u>2.47</u> 0.98	81	<u>2.53</u> 1.15	-0.20	.842
20. FO's ability to answer questions on implements	21	<u>2.52</u> 1.03	81	<u>2.49</u> 1.15	0.11	.914
21. FO's ability to answer questions on machinery	21	<u>2.76</u> 1.17	81	<u>2.53</u> 1.11	0.83	.406
22. FO's ability to answer questions on soils	21	<u>2.61</u> 1.28	81	<u>2.53</u> 1.14	0.31	.759
23. Too much information to transfer	21	<u>2.95</u> 1.43	81	<u>2.88</u> 1.36	0.19	.851
24. Incentives available	20	<u>3.25</u> 1.25	79	<u>3.65</u> 1.31	-1.25	.215

Table 39. Continued

Problems (extent)	<u>Marital status</u>				t value	t prob.
	<u>Single</u>		<u>Married</u>			
	n	<u>Mean</u> SD	n	<u>Mean</u> SD		
25. Quality of pre- service training	19	<u>3.57</u> 1.21	81	<u>2.97</u> 0.89	2.52	.013*
26. Frequent transfers of FOs	19	<u>3.36</u> 1.34	81	<u>3.66</u> 1.33	-0.88	.383

following items: 1) shortage of transportation, 2) inadequacy of in-service training, 3) adequacy of backup support by subject matter specialists, and 4) the quality of pre-service training. Regarding the remaining items, there were no significant statistical differences found between how single and married respondents perceived these items.

Relationships between Respondents' Perceptions of Extension and Selected Demographic Variables

In this study, the relationship between age, academic qualifications, and farm/work experience of field officers, extension officers, and farmers and their perceptions of program objectives, program principles, teaching methods, teaching tools, and problems impacting AEE were identified and described using Hinkle et al. (1988) descriptors.

<u>Coefficient</u>	<u>Description</u>
.90 to 1.00	Very high correlation
.70 to 0.90	High correlation
.50 to 0.70	Moderate correlation
.30 to 0.50	Low correlation
.00 to 0.30	Little if any correlation

(Hinkle et al., 1988).

Program objectives and age, academic qualifications, and farm/work experience

In Table 40, the relationship between age, academic qualifications, and farm/work experience and perceptions of program objectives revealed little to moderate correlations. Age and academic qualifications and perceptions of 1) enforcing government production goals and 2) regulating farming practices revealed low to moderate correlation.

Table 40. Relationships between selected personal characteristics and perceptions of field officers, extension officers, and farmers in Swaziland regarding program objectives

Objectives	Age (r)	Academic qualifications ^a (rs)	Farm/work experience (r)
1. Transferring technical information	.203	-.246	-.048
2. Assisting farmers to shift	-.136	.039	.007
3. Assisting farmers to raise livestock	-.270	.260	-.037
4. Assisting farmers to raise yielding crops	.106	-.096	.066
5. Teaching farmers to diversify	.315	-.257	-.001
6. Encouraging farmers to form cooperatives	.000	-.053	.005
7. Improving marketing	.347	-.302	.118
8. Teaching keeping accurate records	.055	-.085	.003
9. Linking researchers with farmers	-.084	.069	.146
10. Helping farmers make intelligent decisions	.370	-.274	.004
11. Encouraging use of locally available resources	.129	-.164	-.059
12. Teaching soil conservation methods	-.012	-.071	-.002

^a1-No formal education; 2-Sebenta education; 3-Lower/higher primary; 4-Secondary/high school; 5-Certificate in Ag.; 6-Diploma in Ag./Ed.

Table 40. Continued

Objectives	Age (r)	Academic qualifications (rs)	Farm/work experience (r)
13. Encouraging application for farm loans	.137	-.044	.093
14. Encouraging farmers to plan farming	.070	-.060	.070
15. Encouraging proper maintenance of farm machinery	.071	-.134	-.095
16. Helping farmers to locate farm inputs	.374	-.254	-.051
17. Teaching prioritization	.203	-.222	.001
18. Teaching farmers to use references	-.015	-.111	-.133
19. Enforcing government production goals	-.500	.493	-.187
20. Regulating farming practices	-.525	.529	-.169
21. Encouraging production of commercials only	-.169	.205	-.119
22. Encouraging farming for consumption only	-.094	.120	-.201

Program principles and age, academic qualifications, and farm/work experience

In Table 41, the relationship between selected characteristics of respondents and their perceptions of principles of AEE is described. As can be observed from the table, little to moderate correlations were revealed. The relationship between age and academic qualifications and their perceptions of 1) promoting use of opinion leaders, 2) encouraging consultation among farmers, and 3) farmers' participation in AEE meetings should be compulsory revealed low to moderate correlation.

Teaching methods and age, academic qualifications, and farm/work experience

Table 42 presents the relationship between selected personal characteristics of respondents and their perceptions of teaching methods of AEE. The relationship revealed between the selected characteristics and their perceptions of listed methods was little to low correlation. Age and perceptions of problem solving and nominal group technique revealed a low correlation of .419 and .471, respectively.

Teaching tools and age, academic qualifications, and farm/work experience

In Table 43, the relationship between the selected personal characteristics and their perceptions of teaching tools is presented. As can be observed from the table, little to low correlations were revealed between age, academic qualifications, and farm/work experience and the respondents' perceptions of teaching tools in AEE.

Table 41. Relationships between selected personal characteristics and perceptions of field officers, extension officers, and farmers regarding program principles

Principles	Age (r)	Academic qualifications ^a (rs)	Farm/work experience (r)
1. Voluntary participation by farmers	.200	-.220	-.048
2. Use grass-roots approach	.288	-.266	-.012
3. Provide educational services	.183	-.016	.094
4. Reliance on applied research	-.273	.187	.012
5. Encourage teamwork among FOs	.108	-.096	-.122
6. Promote use of opinion leaders	.478	-.346	.141
7. Encourage consultation among farmers	.449	-.334	-.042
8. Cooperation between and among agencies' extension officers	.223	-.051	.188
9. Use suitable extension teaching methods	.274	-.244	.153
10. Programs to foster self-reliance	.245	-.156	.175
11. Develop farmers' problem-solving skills	.340	-.295	.076
12. Use formative evaluation	.101	-.100	-.070
13. Use summative evaluation	.214	-.122	-.040

^a1-No formal education; 2-Sebenta education; 3-Lower/higher primary; 4=Secondary/high school; 5-Certificate in Ag.; 6-Diploma in Ag./Ed.

Table 41. Continued

Principles	Age (r)	Academic qualifications (rs)	Farm/work experience (r)
14. Farmer needs basis for program development	.135	-.189	.120
15. Farmer needs be given priority	.230	-.231	-.012
16. Farmer participation in AEE meetings be compulsory	-.475	.560	-.211

Table 42. Relationships of selected personal characteristics and perceptions of field officers, extension officers, and farmers regarding teaching methods of AEE

Methods	Age (r)	Academic qualifications ^a (rs)	Farm/work experience (r)
1. Method demo	.275	-.232	.144
2. Result demo	.238	-.198	.058
3. Individual visit	.299	-.210	-.053
4. Agricultural shows	.177	-.159	-.008
5. Short courses	.108	-.212	.092
6. Field days	-.022	-.088	.091
7. Workshops	.054	-.208	.187
8. Seminars	-.010	-.125	.072
9. Lectures	-.085	-.058	.103
10. Lecture-discussions	-.082	.033	.155
11. Group discussions	.053	.002	.188
12. Panel discussions	.387	-.230	.353
13. Buzz groups	.078	-.030	-.035
14. Role play	-.082	.133	.155
15. Case studies	.302	-.191	.145
16. Questioning	.140	-.033	.148
17. Problem solving	.419	-.348	.156
18. On-farm trials	-.067	.103	.050

^a1=No formal education; 2=Sebenta education; 3=Lower/higher primary; 4=Secondary/high school; 5=Certificate in Ag.; 6=Diploma in Ag./Ed.

Table 42. Continued

Methods	Age (r)	Academic qualifications (rs)	Farm/work experience (r)
19. Brainstorming	.298	-.232	.101
20. Tours	-.285	.372	.101
21. Focus groups	-.023	.046	.074
22. Nominal group technique	.471	-.242	.186

Table 43. Relationships between selected personal characteristics and perceptions of field officers and extension officers regarding teaching tools

Tools	Age (r)	Academic qualifications ^a (rs)	Farm/work experience (r)
1. Field support guides	.070	.072	-.066
2. Advisory bulletin	-.120	.007	-.078
3. Agricultural research reports	.175	-.067	-.009
4. Films	-.101	-.006	-.148
5. Exhibits and displays	-.037	.046	-.091
6. Real objects	.139	-.129	.104
7. Chalkboard	.246	-.191	.203
8. Models	.001	-.086	-.091
9. Flip charts	.052	-.031	-.054
10. Radio	.040	-.100	.087
11. Videotapes	.185	-.227	.251
12. Television	.094	-.198	.090
13. Computer aided	.016	-.006	-.121
14. Bulletin boards	-.081	.095	-.085
15. Posters	.109	-.062	.004
16. Flannelboard	.115	-.264	.023
17. Satellite	-.146	.101	-.163
18. 35 mm slides	.101	-.045	.020

^a1-No formal education; 2-Sebenta education; 3-Lower/higher primary; 4-Secondary/high school; 5-Certificate in Ag.; 6-Diploma in Ag./Ed.

Table 43. Continued

Tools	Age (r)	Academic qualifications (rs)	Farm/work experience (r)
19. Tours	-.139	.120	-.079
20. Newsletter	-.072	-.014	-.059
21. News stories	-.061	-.044	-.041
22. Village drama	.082	-.193	.259

Problems and age, academic qualifications, and farm/work experience

Information regarding correlation between selected demographic variables and the respondents' perceptions of problems which could stifle AEE is summarized in Table 44. It can be observed from the table that the relationship revealed between the selected variables and the respondents' perceptions of problems was little to low correlation.

Added Statements of the Aspects of Extension

The respondents added different statements to the listed program objectives, program principles, teaching methods, teaching tools, and problems. In this regard, it was decided that the added statements should be listed.

Regarding program objectives, the respondents stated that the following should be included:

1. Helping farmers to embark on income-generating agricultural enterprises.
2. Encouraging farmers to form farmers' associations.
3. Encouraging farmers to rotate crop production.
4. Encouraging farmers to plant in time.
5. Encouraging farmers to practice soil conservation.
6. Government to subsidize farm inputs.
7. Helping farmers with government tractors.
8. Encouraging farm mechanization.

Table 44. Relationships of selected personal characteristics and perceptions of field officers, extension officers, and farmers regarding problems impacting AEE

Problems	Age (r)	Academic qualifications ^a (rs)	Farm/work experience (r)
1. Wide area to cover	-.049	.198	.041
2. Lack of supervision	.087	-.093	.203
3. Shortage of transportation	-.064	-.029	.322
4. Farmers reluctant to attend AEE meetings	.054	-.068	-.023
5. Inadequacy of in-service	-.336	.228	-.039
6. Shallow information at in-service courses	-.209	.215	.043
7. Difficult to translate technical information	.160	-.169	.018
8. Adequacy of backup from SMS	-.232	.079	-.215
9. Farmers' tendency to avoid program ownership	.235	-.230	.160
10. Farmers' reluctance to accept new ideas	.097	-.147	-.038
11. Cultural events coincide with planned meetings	-.092	-.146	-.043
12. Recognition of FO for outstanding performance	.120	.054	.120
13. Shadow of the predecessor	.191	-.249	.152
14. FO experiencing burnout	.063	-.115	.096

^a1-No formal education; 2-Sebenta education; 3-Lower/higher primary; 4-Secondary/high school; 5-Certificate in Ag.; 6-Diploma in Ag./Ed.

Table 44. Continued

Problems	Age (r)	Academic qualifications (rs)	Farm/work experience (r)
15. Farmers' ability to keep accurate records	.075	-.105	.191
16. Farmers lost confidence in AEE	.215	-.158	.018
17. Adequacy of support from researchers	-.019	-.135	-.019
18. FO's ability to answer problems on crops	-.105	.016	.127
19. FO's ability to answer questions on livestock	-.154	.044	.146
20. FO's ability to answer questions on implements	-.143	.013	.179
21. FO's ability to answer questions on machinery	-.157	.006	.199
22. FO's ability to answer questions on soils	-.151	.015	.169
23. Too much information to transfer	-.209	.113	-.105
24. Incentives available	.257	-.256	.248
25. The quality of pre-service training	-.360	.170	-.166
26. Frequent transfers of FOs	.281	-.243	.068

With regard to program principles, the respondents stated that the following should undergird AEE activities:

1. Penalizing farmers for failing to attend planned AEE meetings.
2. Providing farmers with enough information by field officers.
3. Ensuring that planned meeting dates suit farmers' schedules.
4. Compulsory schemes for farmers.
5. Involving community leaders in AEE activities.
6. Adopting a staff development plan.
7. Provision of demonstration inputs to field officers.
8. Regular visits to farmers by field officers.

Two teaching methods were added:

1. Games.
2. Simulation exercises.

The respondents added three teaching tools to be used in AEE:

1. Competitions.
2. Magnetic boards.
3. Turnover charts.

Finally, the respondents added 16 items that could impact AEE activities:

1. Lack of training plan for field officers.
2. Field officers' welfare status (poor).
3. Lack of support from supervisors.

4. Poor accommodation for field officers.
5. Field officers' length of stay in one area.
6. Shortage of visual/teaching aids.
7. Lack of cooperation among farmers.
8. Unsuitable sites for AEE meetings.
9. Absence of alternative transportation for field officers.
10. Farmers' fear to take up farm credit or loans.
11. Poorly planned in-service courses.
12. Chiefs call farmers for other royal duties.
13. School duties conflict with AEE meetings.
14. Leadership disputes among the communities.
15. Chiefdom boundary disputes.

General Suggestions and Comments to Improve Extension

1. The Government of Swaziland should train more and upgrade educational qualifications of extension staff.
2. The Government of Swaziland should provide incentives to help boost the work morale of extension staff.
3. There should be an improvement in the transport facilities for both supervisors and field staff in AEE.
4. Farmers should be involved in planning all AEE activities.
5. Priority farmer needs should be basis for planning all AEE activities.
6. We should ensure that field extension staff are not overloaded with nonextension related activities.

7. The Government of Swaziland should consider including AEE into the school curriculum so that the Swazi youth could learn more about the philosophy and primary mission of AEE.

8. There should be formal introductions of new field staff to the area of placement, particularly to the chief's kraal.

9. A resource center should be developed for designing and production of teaching aids.

10. Workshops should be conducted for extension supervisors on management and supervision of resources and support staff.

11. Transfer of field staff should be reviewed and implemented systematically.

12. Encourage cooperation and consultation between government field extension staff and nongovernmental organizations (NGO's) agents.

13. Ensure that extension field staff reports are well written and read for future planning of AEE activities.

14. The Government of Swaziland should consider recognizing outstanding performance among extension staff.

15. Workshops should be conducted to orient chiefs and their counselors on the philosophy, mission, and objectives of AEE.

16. The Government of Swaziland should ensure that subject matter specialists are available at the RDA level to provide immediate backup support to field staff.

17. We should encourage farmers to organize themselves so that extension field staff's job would be guiding organized groups.

18. The Government of Swaziland should consider frequent sharing of research results by researchers and field staff.

19. We need to improve the communication between field staff and headquarters and between field staff and farmers. A telephone system could be one communication means.

20. Senior extension officers should consider frequent visits to the field officers at area level.

21. The Government of Swaziland should consider reinstating agricultural education films to show to farmers.

22. The Government of Swaziland should consider reviewing some of the cultural activities, especially those which could impact AEE activities.

23. Encourage farmers to attend short courses and workshops in AEE.

CHAPTER V. DISCUSSION OF FINDINGS

The overall purpose of this study was to identify and analyze perceptions of field officers, extension officers, and farmers regarding selected aspects of Agricultural Extension Education (AEE) in Swaziland.

The study was specifically designed to: 1) identify the demographic characteristics of field officers, extension officers, and farmers, 2) describe perceptions of field officers, extension officers, and farmers regarding program objectives, program principles, teaching methods, teaching tools, and problems impacting AEE activities, 3) compare perceptions of field officers, extension officers, and farmers and their selected demographic variables regarding AEE, 4) determine if there is a relationship between perceptions of field officers, extension officers, and farmers regarding the selected aspects of AEE and their age, academic qualifications, and farm/work experience, and 5) elicit suggestions and comments of respondents on how AEE could be improved in Swaziland.

The study employed a descriptive design and was considered appropriate for describing the perceptions of respondents held regarding AEE in Swaziland. The survey questionnaire's high reliability from the field testing for each of the five categories of AEE and the overall reliability suggested that all aspects of AEE within the major category related to each other.

This chapter presents a discussion of the findings reported in Chapter IV, implications of the findings, and a suggested program planning and delivery model for AEE activities in Swaziland. The discussion is

organized around the objectives which guided this study. The chapter is divided into the following sections: 1) demographic information, 2) program objectives, 3) program principles, 4) teaching methods, 5) teaching tools, 6) problems, 7) aspects of AEE based on selected demographic variables, 8) relationships between respondents' perceptions and selected demographic variables, 9) general suggestions and comments, 10) proposed program planning model, and 11) implications of the findings.

Demographic Information

Demographic characteristics of most stakeholders in AEE provide critical information. According to Belloncle (1984-85), Gajian and Lawrence (1986), Swanson et al. (1989), Dutia (1989), and Programme Advisory Note (1991), some of these critical demographics include 1) gender of employed extension staff, 2) age, 3) level of education, 4) farm/work experience of both extension staff and recipients of AEE programs. These demographic characteristics were among those identified in this study. Are these demographic variables an issue in Swaziland? If so, why should they be a major concern?

Most of these demographic characteristics were found to be critical in the Swaziland AEE system. It was determined that there were more male extension staff and male farmers than females. Yet, it has been consistently argued that there is a need to have a balance between male and female extension staff. Swanson et al. (1989) stated that Africa has the second highest number of male extension staff to Asia and Pacific. The imbalance of females in extension activities from the standpoint of

extension staff and farmers could impact agricultural development. Females do not have access to government credit, do not attend off-farm meetings, and are not visited by male extension workers. Moris (1984-85) stated that as long as we fail to recognize the fact that females are involved in agriculture, the fundamental national goal of improving the production of food might not be achieved. Increasing training and employment of female extension staff could help correct the imbalance of females in AEE in Swaziland.

As for farmers, females have not been accorded the significant recognition of the role they play in agricultural development. Instead, any changes which have occurred have often added to their already burdensome tasks of carrying water and wood, processing crops, and preparing food (Belloncle, 1984-85). The negligence of female farmers was further confirmed by the Programme Advisory Note (1991) when it stated that major demonstrations by extension staff are seldom carried out in female operated agricultural schemes or by a disadvantaged minority group.

The level of education for all the groups was low. The field officers and extension officers had a certificate in agriculture and a diploma in agriculture. Yet, it is generally believed that having an adequate number of well-trained extension staff (Swanson et al., 1989; Programme Advisory Note, 1991) is a prerequisite to an efficient and sustainable AEE system. Swanson et al. (1989) further stated that it is the quality of human resources available to serve in AEE activities that could make the necessary impact. This assertion by Swanson et al. (1989) has to be accepted with caution. According to the Programme Advisory Note

(1991), an increase in education does not directly translate into improved job performance. The reason for this is that most educational programs are not job specific. In this regard, mounting appropriate in-service courses for the extension staff in Swaziland could provide additional technical and professional skills and knowledge that extension personnel need to be on the cutting edge.

Regarding educational qualifications of farmers in Swaziland, some farmers had no basic education while others had some form of education. The high illiteracy rate among farmers could be a serious handicap. According to Belloncle (1984-85), farmers are supposed to have extraordinary ability to analyze their situation. However, with less education, farmers' ability to make those informed decisions could be weakened. In this regard, the need to mount and intensify farmer literacy programs in Swaziland could be a justified course of action. In the Programme Advisory Note (1991), it was stated that as farmers' educational level increases, extension staff would get a chance to focus more on technology transfer than on basic learning skills. Also, being able to read, count, and write, farmers would be able to select and use extension information more efficiently.

Age and farm/work experience of the field officers, extension officers, and farmers were not found to be extensive in Swaziland. The field officers, extension officers, and farmers were found to be much younger, middle-aged, and older, respectively. Also, their farm/work experience varied from about 9 to 20 years. These findings are partly

similar to the results from the Gajian and Lawrence (1986) study regarding age of farmers in Zanzibar.

A majority of the farmers indicated that they were farming for both family consumption and marketing purposes. The tendency for the majority of farmers to farm mainly for family consumption has been found to be a common practice especially in developing countries (Moris, 1984-85). Some people believe the tendency of most farmers to farm for family consumption has caused agricultural development to lag behind. Small farmers have been unable to adopt high technologies in their farms and cannot afford it.

Producing enough food for the family has to be a priority goal. The World Health Organization Commission on Health and Environment (1992) stated that every country should expend available resources to produce food crops first in order to feed the swelling population. This is not to suggest that production of commercial crops should be neglected. Commercial crops could help governments and farmers to purchase farm machinery, equipment, and other inputs for the following farming season.

Most farmers were found to be producing maize in Swaziland. The high numbers of farmers who were maize producers confirmed the fact that maize is a staple food for the Swazi people. Other crops are subsidiary, except commercial crops like cotton and tobacco which are solely income-generating crops. These commercial crops demand high inputs and are labor intensive. Thus, many farmers tend to avoid growing such crops. As for livestock, very little interest was shown except by a few farmers who were raising poultry.

Information regarding decision making about farming in a household could be interpreted to mean that farming in Swaziland is a family affair. In most instances, the husband and wife were likely to make a decision about farming in the household. In other cases, where the wife made a decision, chances were that the husband was away at work or was less interested in farming, especially income-generating agricultural projects. According to the Report of the Global Consultation on Agricultural Extension (1989), farming should be a family affair. In this regard, it would not be surprising to find every member of a family being involved in decision making regarding farming in a household.

In the case of Swaziland, it should be reiterated that all the members in most households should be involved in making decisions about farming. However, there are cultural and policy factors which limit the involvement of some family members like women and children. These individuals cannot get access to farm credit without the husband as head of the family. His approval is significantly important. Such an arrangement could impact agricultural production in many ways. According to Moris (1984-85), as long as women and their children have limited involvement in decision making regarding farming, food production will lag behind.

Program Objectives

Most AEE systems and programs especially in developing countries are believed to be misguided (Belloncle, 1984-85). The Programme Advisory Note (1991) underscored the same view when it stated that AEE objectives

are influenced by the source of funds and the type of organization responsible for planning and implementing extension activities. The questions that should be asked are: 1) What should be the appropriate program objectives of any AEE program? 2) Who should formulate these objectives? 3) Would input from farmers and the field extension staff make a difference?

The findings of this study were that the respondents rated highly 70 percent of the listed objectives. Helping farmers to raise high quality yielding crops, teaching farmers to conserve the soil, and teaching farmers to prioritize received the highest ratings.

It could be postulated that Swazi field officers, extension officers, and farmers are capable of deciding what should be the major objectives of AEE in Swaziland. Also, these findings could be used against the common "top-down" approach in which the government together with a donor agency decide on what should be the primary objectives of the AEE system. Baxter et al. (1989) have cautioned that objectives which are formulated without the involvement of the main actors, in this case, extension staff and farmers, could not be achieved to their fullest potential. The Report of the Global Consultation on Agricultural Extension (1989) urged that the public should be involved in formulation of AEE objectives so that as key actors they are made aware of what a planned AEE program attempts to do.

It would be interesting to have the three groups participate in the formulation of program objectives rather than to have program objectives decided at another level. In this regard, it could be proposed that Swaziland might want to try out a new system of AEE in which field

officers, extension officers, and farmers would participate in formulation of program objectives. The proposed planning and delivery model attempts to respond to that very situation in which field extension staff and farmers would have an input.

The findings regarding the extent to which participants rated the following program objectives very high: 1) helping farmers to raise high yielding crops, 2) teaching farmers to conserve the soil, and 3) teaching farmers to prioritize, could be interpreted as suggesting that extension staff and farmers are capable of formulating program objectives. Most of the items were not rated high and a few were rated very low. The ones which were rated very low included: 1) enforcing government production goals, 2) regulating farming practices, 3) encouraging farmers to produce commercial crops only, and 4) encouraging farmers to farm for family consumption only.

These results could lead one to speculate that what the MOAC in Swaziland endorses as major program objectives of AEE might not be highly regarded by field officers, extension officers, and farmers. Also, such a top-down approach could be met with resistance from the farmers and thus even affect the field officers' effort to guide and advise farmers. A wide criticism of the Swaziland AEE system could be aggravated by a top-down approach. Also, enforcement of program objectives which would serve the interests of government and donor agencies could lead to deteriorating program quality (Report of the Global Consultation on Agricultural Extension, 1989).

There could be a high risk in a situation where the main actors have different program objectives from those of government. The main actors are likely not going to exert more effort in conducting AEE programs vis-a-vis recipients of AEE programs. Kouzes and Posner (1990) confirmed the same view when they stated that the main actors are likely to perform exceptionally well in discharging those duties whose objectives they support as main actors.

Program Principles

It is generally believed that for any AEE program to be successful, the program needs to have principles that would help in planning and implementing AEE activities. According to Ogola (1982) and Dusenberry (1966), principles are needed to undergird any AEE program. In this regard, they have stated that the 16 items rated should be major principles guiding an AEE system. Also, they claimed that without clearly defined principles to guide the conduct of AEE activities, any planned AEE program is likely to be a waste of time and resources.

The participants in this study rated the following program principles fairly high: 1) encouraging team work among extension staff, 2) encouraging consultation of other agencies' extension staff with government officers, 3) using suitable teaching methods, 4) developing problem-solving skills, 5) farmers' needs should be basis for program planning, and 6) meeting farmers' needs. The respondents did not support compulsory farmer participation in agricultural extension meetings.

These findings could be interpreted to illustrate the power of extension staff and farmers to carefully isolate principles which should guide AEE programs. The respondents' low ratings of some principles further point to the potential of some of the principles not to be appropriate for undergirding the conduct of AEE. One such example is making farmers' participation in extension meetings to be compulsory. The question is should farmers be forced to attend and participate in AEE activities? According to Coombs (1972), farmers as adults should not be coerced to participate in adult education programs. Instead, persuasive means as advised by Rogers (1983) should be employed.

Teaching Methods

The need to strengthen AEE systems by selecting and using appropriate teaching methods has been widely discussed (Bembridge & Steny, 1984; Dutia, 1989; Swanson et al., 1989; Programme Advisory Note, 1991). However, it seems that very little effort has been expended to decide who should select or have input in the selection of those methods believed to be appropriate.

In this study, the extension staff and farmers were asked to rate 22 extension teaching methods. The respondents gave high ratings to:

1) method demonstrations, 2) result demonstrations, and 3) field days. A great majority of the teaching methods were rated as moderately effective.

The participants did not rate the following methods very high:

1) lectures, 2) panel discussions, 3) buzz groups, 4) role play, 5) case studies, 6) focus groups, and 7) nominal group techniques.

These findings of the perceptions of participants regarding the teaching methods could lead one to believe that practitioners in AEE have a wide range of teaching methods to choose from and use in conducting AEE meetings. Further, that the choice of methods to use in conducting agricultural extension meetings should be a real challenge.

Creswell (1990) confirmed the frequent use of some of these methods in Iowa. A question could be posed: Do extension staff in Swaziland use these teaching methods? Also, are they familiar with all these methods? Perhaps this is what should receive further research. The perceptions held regarding these teaching methods might not be enough evidence regarding frequency of use of the methods. It is widely believed that one's perceptions often influence behavior (Rubin, 1985). Therefore, a study of perceptions by subjects regarding a particular phenomenon should be a starting point of investigation.

Teaching Tools

The findings indicate that field and extension officers thought most of the listed tools were useful in conducting agricultural extension meetings. The respondents did not rate the following teaching tools very high: 1) the use of computer and 2) satellite.

Such findings cause the researcher to postulate that most of the teaching tools could be used in extension meetings. The ones which the respondents rated low could be those teaching tools which were either not readily available or appropriate for use in most extension meetings. Second, farmers did not have access to power or electricity which could

make it possible for them to access information via those means. A question that seemed to be consistently surfacing in these results is: Do the extension staff use these teaching tools? Are they adequately taught how to use them at pre-service and in-service training? Unless answers to these questions are provided, the use of any of these teaching tools could leave much to be desired.

It would have been interesting to ascertain which of the teaching tools were mostly used by field officers during extension meetings. According to Swanson et al. (1989), the use of any teaching tools is dependent among other things, the type of audience, teaching method selected, and availability of other supporting resources. Therefore, one could hypothesize that the ratings of the teaching tools by field officers and extension officers could have been influenced by some of the factors mentioned above.

Problems in Extension

Many problems have been reported to impact AEE activities in Swaziland. However, very little effort seems to have been expended to curb most of the problems impacting AEE activities. At the time the study was conducted, a series of extension meetings were held. The general complaint from the extension staff and the public was that apart from the drought crisis, there were too many problems which impacted AEE activities in Swaziland.

According to the Global Consultation of Agricultural Extension (1989) and Baxter et al. (1989), some of the problems in AEE are complex and

deep-seated. Shortage of funds for extension programs, interference by donor agencies, and government's tendency to narrow goals to technology transfer are common examples of the complex and deep-seated problems. The Programme Advisory Note (1991) further stated that 1) high farmer illiteracy rate, 2) low attention to minority groups like women farmers, 3) poorly trained extension staff, 4) limited input by the client group during the planning of AEE programs, and 5) poor organizational communications are among the many problems impacting AEE activities worldwide.

In this study, the findings indicate that the respondents perceived the following items to be the most persistent problems in AEE: 1) wide area to cover, 2) shortage of transportation, and 3) farmers' reluctance to attend extension meetings. The respondents rated the following: 1) farmers' tendency to avoid program ownership, 2) farmers' reluctance to accept new ideas, 3) cultural events coinciding with planned events, 4) recognition of field officers for outstanding performance, 5) shadow of the predecessor, 6) farmers' inability to keep accurate records, 7) availability of incentives in AEE, and 8) frequent transfers of field officers as another set of problems which impact AEE activities in Swaziland.

The results of this study regarding perceived problems impacting AEE are similar to the findings by Msitsini (1987), Moris (1984-85), Samarasinghe et al. (1990), and the Programme Advisory Note (1991). Some of the findings were intriguing in the current study in the case of Swaziland. First, some cultural events conflict with planned extension

meetings. A question regarding this issue could be: Which cultural activities are these? What could be done to avoid a conflict between cultural events and AEE meetings? If the Swaziland Government is seriously committed to promoting agricultural development through AEE, this alleged conflict between agricultural extension meetings and cultural activities should be resolved.

Transfer of field officers, if done systematically, could be a legitimate action; however, abrupt and frequent transfers might lead to other problems. Field officers need to develop a rapport with the farmers if they are to be successful. The shadow of the predecessor syndrome could be aggravated by abrupt transfers, especially if the former officer had been less effective than the new officer. The deployment of extension staff in a systematic manner should be given special attention. Bahal et al. (1990) stated that a systematic deployment of manpower in AEE worldwide is very important and should be maintained.

Perceptions in Relation to Selected Demographic Variables

A discussion is presented in this section relevant to field officers', extension officers', and farmers' perceptions of program objectives, program principles, teaching methods, teaching tools, and problems based on region, academic qualifications, position, gender, and marital status.

Overall, the findings of this study using a one-way analysis of variance and the Scheffé and Duncan procedure (Bowerman & O'Connell, 1990) to isolate the differences, revealed not many surprises. Respondents from

the four regions consistently rated some of the objectives, principles, teaching methods, teaching tools, and problems as have other respondents in related studies (Gajian & Lawrence, 1986). However, it would be interesting to make a follow-up of those items where significant differences were observed.

For a small country like Swaziland, one would not expect a wide difference of opinions regarding AEE. Also, one could speculate that the image of AEE is projected the same to the Swazi people in the four regions. However, the small differences in perceptions of field officers, extension officers, and farmers could be indicative of the need to find an alternative way of program planning in agricultural extension which could be suitable to a specific area and target group. Furthermore, current programming procedures especially in developing countries have been criticized as being a top-down approach (Report of the Global Consultation on Agricultural Education, 1989).

According to Gajian and Lawrence (1986), academic qualifications had a significant influence on how progressive farmers with different educational levels in Zanzibar rated agricultural extension agents and AEE activities. In this study, the findings were not exactly similar to the Gajian and Lawrence (1986) results. However, the field officers', extension officers', and farmers' ratings of the program objectives, program principles, teaching methods, and problems revealed the tendency of farmers in particular to rate the items differently from the other two groups.

One could further postulate that academic qualifications and position of respondents could explain the significant differences found on how each group rated the aspects of AEE. Rubin (1985), for instance, stated that teachers are good at analyzing the classroom environment. Using this example, regardless of one's educational background and position, an individual should be able to judge a phenomenon. Belloncle (1984-85) supported the same view when he stated that farmers have a remarkably extraordinary ability to analyze their situation and judge it as it impacts them.

The likelihood of gender influencing how field officers, extension officers, and farmers would rate program objectives, program principles, teaching methods, teaching tools, and problems cannot be ruled out. There is evidence that women (Belloncle, 1984-85; Swanson et al., 1991; Moris, 1984-85) in agriculture have been treated as a minority client group. In this regard, it would be no surprise to see them rating very low most of the listed aspects of AEE anywhere.

In this study, male respondents tended to rate most of the categories of AEE very high. Perhaps these findings indicate to the Swaziland Government that it should begin to review AEE services rendered to female clients. It could be further suggested that there is a need for the government to improve the training and recruitment of female extension staff. Their significant role in agriculture has been documented. In this century, the role of women in agriculture is becoming widely recognized (Programme Advisory Note, 1991). Whether or not it is being

accepted by most governments like that of Swaziland, is a subject for further investigation.

Overall, married respondents tended to rate most of the items higher than did single respondents. Based on the reviewed literature and the researcher's experience, the rating of any phenomenon should be based on one's interest in the item rated and also on how that item impacts that individual. According to Belloncle (1984-85), every person regardless of age, gender, and marital status, should view the various aspects of agricultural extension to be very important as long as it could in some way affect the individual's life.

Relationships between Respondents' Perceptions of AEE and Selected Demographic Variables

The respondents' perceptions of program objectives, program principles, teaching methods, teaching tools, and problems and their age, academic qualifications, and farm/work were correlated to determine if there was any relationship.

The findings of this study regarding relationships between the respondents' perceptions of the aspects of AEE and their age, academic qualifications, and farm/work experience revealed low, little to moderate correlations. The low, little, and moderate correlations could be interpreted to mean that there was very little association between the respondents' perceptions of AEE and their age, academic qualifications, and farm/work experience.

Due to the varied responses of AEE systems to different clientele groups, the researcher was not surprised by the low, little to moderate

association between the respondents' perceptions regarding AEE and their age, academic qualifications, and farm/work experience. According to the Global Consultation on Agricultural Extension (1989), some clientele groups often deserve special attention in most countries. In this regard, determining how selected demographic characteristics associate with the clientele groups' perceptions of, say, AEE could not give an accurate picture. Therefore, one is inclined to believe that the findings in this study could be attributed to that distortion factor.

General Suggestions and Comments to Improve Extension

The need for governments to continue searching for most effective ways to improve AEE systems has been widely discussed (Claar et al., 1984; Dutia, 1989; Rivera et al., 1983; Rivera, 1990; Programme Advisory Note, 1991). Different authors approach the need for governments to improve AEE systems from different perspectives. The common denominator is "revitalization" of AEE systems by all possible means.

In this study, the respondents were asked to forward their suggestions and comments regarding ways to improve AEE in Swaziland. Some of the suggested ways are not new and have for decades been forwarded in many research reports worldwide. However, very little effort has been expended to take the necessary actions to institute the suggestions.

A close analysis of the suggestions forwarded by the respondents revealed that some are related to administration, management, supervision, motivation of extension staff and farmers, empowerment of public participation in planning extension programs, job description, and

sustainable support to farmers. The factors have been endorsed by Belloncle (1984-85), Moris (1984-85), and the Global Consultation on Agricultural Extension (1989) as critical factors for the success of any extension system.

In this regard, it is proposed that the Government of Swaziland should consider these suggestions. The suggestions should be critically reviewed. Those which could be implementable should be treated with urgency. Some examples include: 1) further training of extension staff, 2) mounting national conferences to explain the philosophy and mission of AEE, 3) empowerment of public participation in developing AEE programs and activities, 4) identifying motivational factors for extension staff and farmers, and 5) improving pre-service and in-service training programs.

Proposed Model for Planning AEE Activities in Swaziland

The essence of this study was to determine the importance field officers, extension officers, and farmers attach to selected aspects of AEE in Swaziland. The ultimate goal of this study was to use the findings to help the Ministry of Agriculture and Cooperatives in its continuing endeavor to make the AEE system in Swaziland more effective and efficient.

The model of planning AEE activities (Figure 4) is proposed for consideration by the Ministry of Agriculture and Cooperatives. This model was prepared against the background of the theoretical framework of the study. Bolman and Deal (1991) stated that "reframing" is a means to improve an organization's efficiency and effectiveness. Further, that through the reframing approach, all key components of an organization are

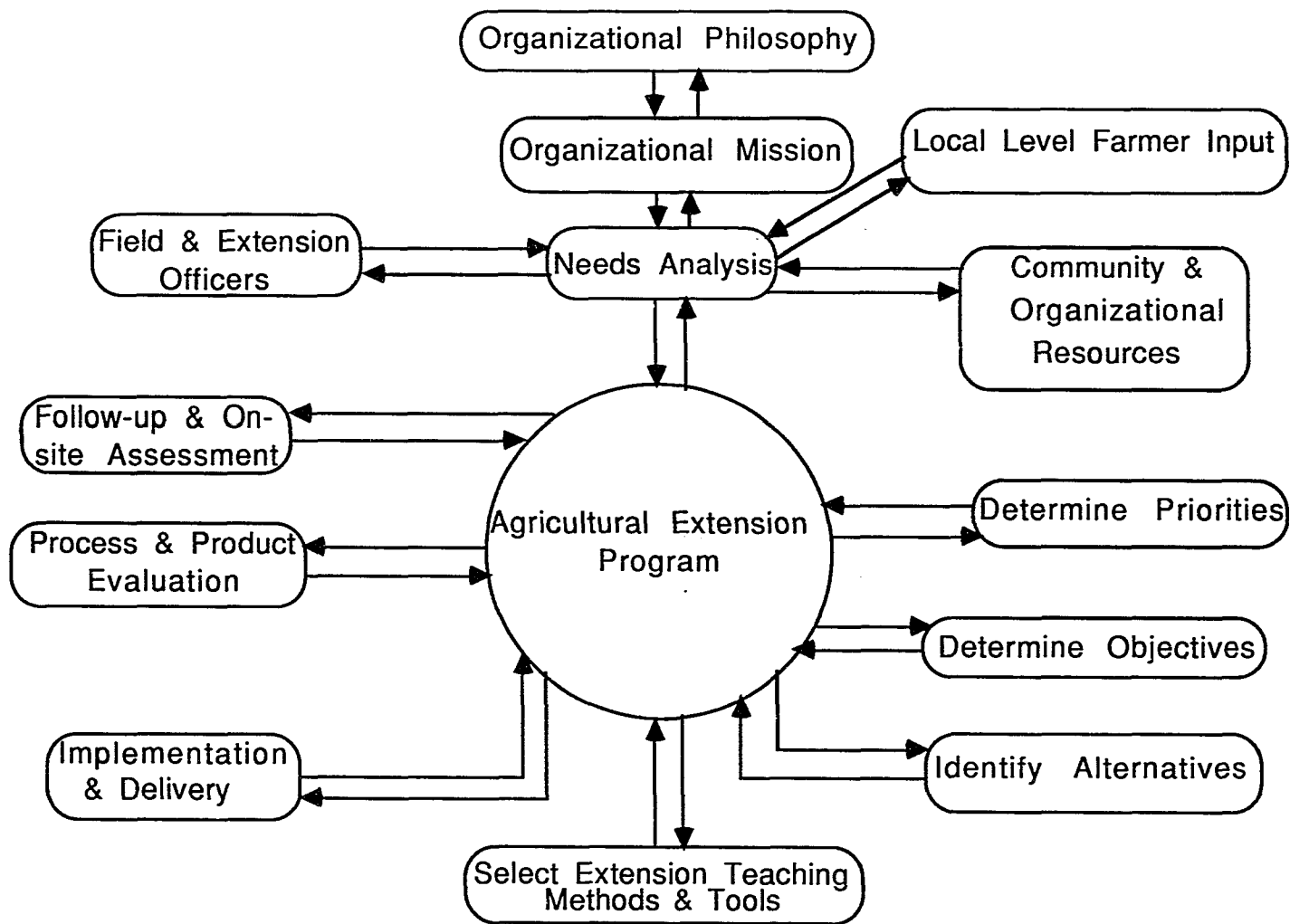


Figure 4. Proposed model for planning agricultural extension activities in Swaziland

clearly mapped. In this model, the key elements in planning and delivering of extension activities are laid out. It is believed that with such a model, the detracting factors and misguidance of the AEE system in Swaziland could be avoided. According to Belloncle (1984-85) and the Programme Advisory Note (1991), lack of systematic program planning and delivery systems of extension activities has caused many AEE programs to be less effective and efficient.

The model further seems to be in line with the general approach to planning and delivering extension activities. While AEE should have a philosophy and mission, these two should be blended in with the "needs analysis" in which local farmer input, field extension staff, community, and organizational resources are taken into account. According to the Minnesota Program Development Model in Prawl et al. (1984), it is very important to recognize the needs of the target clientele. Boyle (1981) supported the same view when he stated that needs analysis should be the first step in program development.

In view of this proposed model, what is the relationship between it and the findings of this study? The findings in this study demonstrate the ability of officers, extension staff, and farmers to carefully judge the importance of selected aspects of AEE in Swaziland relative to making the AEE system more effective and efficient. The relationship between the findings and the model is that all five aspects of AEE which were rated are directly related and part of the AEE planning process. At each stage, one or a combination of the aspects rated are very important. The need

for the Ministry of Agriculture and Cooperatives to consider this model cannot be overemphasized.

Implications

The essence of the study was to determine the importance field officers, extension officers, and farmers attached to program objectives, program principles, teaching methods, teaching tools, and problems regarding AEE in Swaziland.

The findings of this study provided useful information which has significant implications for the Ministry of Agriculture and Cooperatives in Swaziland. Field officers', extension officers', and farmers' input into planning and delivering AEE activities should be taken into account. Failure to take advantage of opinions of the main actors in AEE activities is likely going to nurture a top-down approach, which has for decades weakened the impact of AEE systems.

CHAPTER VI. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter presents the summary, conclusions, and recommendations of the study in four major subheadings: 1) purpose, objectives, and procedures, 2) summary of major findings, 3) conclusions, and 4) recommendations.

Purpose, Objectives, and Procedures

The purpose of this study was to identify and analyze the perceptions of field officers, extension officers, and farmers regarding Agricultural Extension Education (AEE) in Swaziland.

Specifically, this study attempted to 1) identify the demographic characteristics of field officers, extension officers, and farmers, 2) describe perceptions of field officers, extension officers, and farmers regarding program objectives, program principles, teaching methods, teaching tools, and problems impacting AEE, 3) compare perceptions of field officers, extension officers, and farmers and their selected demographic variables regarding AEE, 4) determine the relationship between perceptions of field officers, extension officers, and farmers and their selected demographic variables regarding program objectives, program principles, teaching methods, teaching tools, and problems impacting AEE, and 5) elicit suggestions and comments of field officers, extension officers, and farmers on how AEE could be improved.

The sample for the study was proportionately selected from the four regions of Swaziland. This procedure was considered to allow for a

representative sample of the respondents. The sample included 50 field officers, 20 extension officers, and 50 farmers, making a total study sample of 120. Usable questionnaires were obtained from 106 (88.3%) participants including 43 (86%) field officers, 15 (75%) extension officers, and 48 (96%) farmers.

The study was conducted using a descriptive survey method. A survey questionnaire was developed and used to collect the data. The survey instrument was designed using the experiences of the researcher, his major professor, the reviewed literature, and ideas from survey instruments developed by other researchers. The questionnaire was reviewed by experts from the Pennsylvania State University who were familiar with the AEE system in Swaziland, the major professor, and approved by the Iowa State University Human Subjects Research Committee. The instrument was field-tested with former extension agents who were studying at the University of Swaziland, College of Agriculture, and international graduate students who were studying at Iowa State University. These procedures were followed to establish validity and readability of the instrument.

The survey instrument included the following sections: 1) program objectives, 2) program principles, 3) teaching methods, 4) teaching tools, 5) problems impacting AEE, 6) demographic characteristics of respondents, and 7) general suggestions and comments regarding ways to improve AEE in Swaziland.

A Likert-type scale was used for Part I as follows: 1=Strongly disagree (SD), 2=Disagree (D), 3=Neutral (N), 4=Agree (A), and 5=Strongly agree (SA). Respondents were asked to circle the letter (s) closest to

their selection. For Part II, the same Likert-type scale (1-5) was used and respondents were asked to place a check mark (✓) indicating their selection. The change in the way respondents were asked to complete the survey form was to avoid respondents from completing the survey form without reading each item very closely. In Part III, participants were asked to either place a check mark (✓) or fill in information regarding their demographic information. Finally, in Part IV, participants were asked to write their suggestions regarding ways to improve AEE in Swaziland.

Statistical procedures used to analyze and summarize the data included percentages, frequencies, means, standard deviations, one-way analysis of variance, Scheffé and Duncan procedures, t-tests, and Pearson product-moment correlations.

Summary of Major Findings

A review of the findings of this study resulted in the following major observations:

1. The average ages for the field officers, extension officers, and farmers were 33.3 years, 40.5 years, and 50.6 years, respectively.
2. The average farm/work experience for the field officers was 9.9 years, extension officers 17.2 years, and 20.8 years for farmers.
3. The average field officer, extension officer, and farmer was male and married.
4. All the field officers had a certificate in agriculture, and extension officers had a diploma in agriculture.

5. The average farmer had at least some form of formal education.

6. The majority of the farmers surveyed were farming for both family consumption and marketing purposes.

7. The majority of the farmers surveyed were growing maize as a major enterprise.

8. Few farmers were raising livestock as an enterprise.

9. Over one-half of the farmers surveyed indicated that decision making about farming in a household was made by husband and wife.

10. Field officers, extension officers, and farmers tended to give high ratings to the following program objectives to: 1) helping farmers to raise quality crops, 2) teaching farmers to conserve the soil, and 3) encouraging farmers to plan their farming.

11. The respondents tended to give high ratings to the following program principles: 1) encouraging teamwork among extension staff, 2) using suitable teaching methods, 3) developing problem-solving skills, and 4) using farmers' needs as a basis for program planning.

12. Of the teaching methods studied, the following had the highest ratings: 1) method demonstration, 2) result demonstration, and 3) field days.

13. Field officers and extension officers reported high ratings for the following teaching tools: 1) field support guides, 2) agricultural research results, and 3) tours.

14. Field officers, extension officers, and farmers reported high ratings for the following problems in AEE: 1) wide area to cover,

2) shortage of transportation, and 3) farmers' reluctance to attend extension meetings.

15. There was no statistically significant difference among the means of perceptions of respondents from Manzini, Hhohho, Lubombo, and Shiselweni regarding their rating of teaching methods. Significant differences were found on how the respondents rated some program objectives, program principles, teaching tools, and problems.

16. The respondents with lower education tended to rate some program objectives, program principles, teaching methods, teaching tools, and problems impacting AEE higher than did respondents with higher education.

17. Of the three groups of respondents, farmers consistently rated most of the program objectives, program principles, teaching methods, and problems impacting AEE high.

18. Gender of respondents had little influence on how participants rated program objectives, program principles, teaching methods, teaching tools, and problems impacting AEE.

19. Marital status of respondents had some influence on how respondents rated program objectives, program principles, teaching methods, teaching tools, and problems impacting AEE.

20. There was little to moderate relationship between rating of program objectives, program principles, teaching methods, and problems impacting AEE and selected demographic characteristics of field officers, extension officers, and farmers.

Conclusions

Based on the results of the study, reviewed literature, experiences of the researcher, and the objectives which guided the study, several conclusions were drawn. The major conclusions were as follows:

1. Demographic characteristics of field officers, extension officers, and farmers in Swaziland indicated several differences among the groups but very few practical differences in the perceptions of respondents regarding program objectives, program principles, teaching methods, teaching tools, and problems in AEE.

2. Females are not involved in extension programs to the extent males are. More male farmers participated in this study than females, however, this is not an indication of a lack of female farmers in Swaziland.

3. Educational levels of extension staff were very low in Swaziland.

4. Farmers in Swaziland were not highly educated although some had at least some form of education.

5. Teaching farmers to raise quality crops, conserve the soil, and encourage them to plan their farming were rated high program objectives.

6. The program principles rated high were encouraging teamwork among extension staff, using suitable methods, developing problem-solving skills, and using farmers' needs as a basis for programming.

7. The respondents rated high the following teaching methods: method demonstration, result demonstration, and field days.

8. The following teaching tools were rated high: field support guides, agricultural research reports, and tours.

Recommendations

This study was designed to identify and analyze the perceptions of field officers, extension officers, and farmers regarding AEE in Swaziland. Based on the literature reviewed, findings of this study, the realization that AEE is very important, the Government of Swaziland's commitment to the improvement of AEE, and the conclusions drawn from this study, the following recommendations were made:

1. The Government of Swaziland should upgrade educational qualifications of field and extension officers to at least a diploma and a bachelor's degree through pre-service training.
2. The Government of Swaziland should train and employ more extension staff in order to improve the ratio between field officers and farmers.
3. The Government of Swaziland should constantly review the objectives, principles, teaching methods, and teaching tools for the AEE programs in Swaziland by holding joint review meetings of AEE with the field officers, extension officers, and farmers. This practice will help AEE programs to be more focused and even detect any unique problems which could be impacting AEE activities.
4. More female field and extension officers should be trained and recruited to improve the number of female extension staff. The shortage of female extension staff in Swaziland is as low as it is in other countries.
5. More in-service training courses should be conducted and should be preceded by a learning needs assessment so that what is taught during

the in-service courses will be based on the needs of the extension staff. The University of Swaziland personnel should be used during the in-service courses.

6. A series of regional meetings to be initiated and coordinated by the MOAC inviting all the stakeholder groups of AEE should be conducted to discuss the conduct of AEE in Swaziland.

7. The proposed model for planning and delivering AEE activities should be tried out on a pilot basis in Swaziland. This model could infuse a new dimension in which field officers, extension officers, and farmers would have more input.

Recommendations for Further Research

1. A similar study to include all the extension interest groups such as top administrators, trainers or educators, and nongovernmental extension staff should be conducted.

2. A study to determine whether or not the highly rated teaching methods and teaching tools are used by extension staff should be conducted.

3. There is a need to conduct a study regarding problems faced by farmers in using AEE information.

4. A study to assess pre-service and in-service training programs in Swaziland should be conducted.

5. A study to document the historical evolution of AEE in Swaziland should be conducted.

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My heartfelt appreciation goes to the senior staff of the Ministry of Agriculture and Cooperatives for allowing me to conduct this study. Field officers, extension officers, and farmers should also be thanked for providing data for the study.

I wish to also thank Bonnie Trede for doing such a wonderful job in typing the manuscript. To my sweet wife Thandi, words cannot express any better my heartfelt appreciation for her love and support she gave me over all these years of my graduate study program.

APPENDIX A.

INDIVIDUAL GROUP DEMOGRAPHIC CHARACTERISTICS

Table A.1. Individual group demographic characteristics

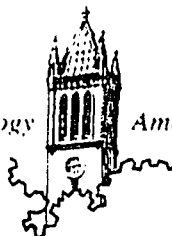
Variable	<u>Field officers</u>		<u>Extension officers</u>		<u>Farmers</u>	
	n	%	n	%	n	%
<u>Region:</u>						
Manzini	11	25.6	3	20.0	12	25.0
Hhohho	11	25.6	5	33.3	12	25.0
Lubombo	9	20.9	3	20.0	9	18.7
Shiselweni	<u>12</u>	<u>27.9</u>	<u>4</u>	<u>26.7</u>	<u>15</u>	<u>31.3</u>
Totals	43	100.0	15	100.0	48	100.0
<u>Age:</u>						
<30 years	10	23.3	--	--	1	2.1
31-40 years	25	58.1	7	46.7	8	16.7
41-50 years	2	4.7	4	26.7	15	31.3
51-60 years	--	--	1	6.7	9	18.7
Over 60 years	--	--	--	--	12	25.0
Missing cases	<u>6</u>	<u>13.9</u>	<u>3</u>	<u>20.0</u>	<u>3</u>	<u>6.2</u>
Totals	43	100.0	15	100.0	48	100.0
<u>Academic qualification:</u>						
No formal education	--	--	--	--	11	22.9
Sebenta	--	--	--	--	4	8.3
Lower and higher primary	--	--	--	--	18	37.5
Secondary and high school	--	--	--	--	12	25.0
Certificate in Agriculture	43	100.0	--	--	--	--
Diploma in Agriculture	<u>--</u>	<u>--</u>	<u>15</u>	<u>100.0</u>	<u>3</u>	<u>6.2</u>
Totals	43	100.0	15	100.0	48	100.0
<u>Farm/work experience:</u>						
<5 years	10	23.3	--	--	11	22.9
6-10 years	14	32.6	1	6.7	14	29.1
11-20 years	17	39.5	8	53.3	12	25.0
21-30 years	--	--	3	20.0	3	6.2
>30 years	--	--	--	--	5	10.4
Missing cases or ed.	<u>2</u>	<u>4.6</u>	<u>3</u>	<u>20.0</u>	<u>3</u>	<u>6.2</u>
Totals	43	100.0	15	100.0	48	100.0
<u>Gender:</u>						
Male	30	69.8	10	66.7	27	56.2
Female	12	27.9	5	33.3	21	43.8
Missing cases	<u>1</u>	<u>2.3</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
Totals	43	100.0	15	100.0	48	100.0

Table A.1. Continued

Variable	<u>Field officers</u>		<u>Extension officers</u>		<u>Farmers</u>	
	n	%	n	%	n	%
<u>Marital status:</u>						
Single	19	44.2	1	6.7	2	4.2
Married	23	53.5	14	93.3	46	95.8
Missing cases	<u>1</u>	<u>2.3</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
Totals	43	100.0	15	100.0	48	100.0

APPENDIX B.

LETTER TO THE SENIOR AGRICULTURAL OFFICER



Department of Agricultural Education
201 Curtiss Hall
Telephone: 515-294-5872

August 27, 1991.

Mr. Patrick K. Lukhele
Director
Ministry of Agriculture and Cooperatives
P.O.Box 162,
Mbabane. Swaziland.

Attention: Mr. Willard Nxumalo
Senior Agricultural Officer

Re: Request for Conducting A Study in Agricultural Extension

We are planning to conduct a research study regarding the role of the Agricultural Extension Service in Swaziland as perceived by field officers, extension officers and farmers. The study is to be conducted between May and August in 1992. We have chosen this time because officers can be easily found either at area/regional shows or at in-service workshops.

The overall purpose of the study is to analyze the role of the Agricultural Extension Service and to elicit suggestions and recommendations which, if adopted could be used by the Ministry of Agriculture and Cooperatives to improve the image and function of Agricultural Extension in Swaziland.

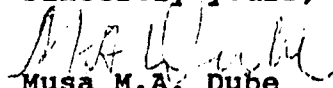
In this connection, we are kindly requesting permission to conduct this study. Data from this study will be used to complete a Ph. D. Dissertation at Iowa State University. However, we feel that the information could also assist the Ministry of Agriculture and Cooperatives in Swaziland to develop a more effective Agricultural Extension Service program in the coming decade and beyond.


We would very much appreciate the cooperation of the Senior Agricultural Officers (Extension and Technical); information department; training officer; senior extension officers; field staff; and farmers.

We would be very grateful if we were allowed to conduct this study. We would appreciate receiving written approval from you before the end of September, 1991, so that we can make all the necessary preparations.

Thank you for your consideration of this matter.

Sincerely yours,


Musa M.A. Dube
Graduate Student


Robert A. Martin, Ph. D.
Associate Professor

APPENDIX C.

LETTER FROM THE SENIOR AGRICULTURAL OFFICER



MINISTRY OF AGRICULTURE AND CO-OPERATIVES

TELEPHONE: 42731-9
TELEGRAMS: MINAGRIC
TELEX: 2343 WD

P.O. BOX 162
MABANE

REF:

23 September, 1991

Mr. Musa M.A. Dube
Department of Agriculture Education
201 Curtiss Hall
Iowa State University
AMES, IOWA 50011.

Dear Mr. M. Dube,

Re: REQUEST FOR CONDUCTING A STUDY IN AGRICULTURAL EXTENSION.

Please refer to your letter of August 27, 1991 on the above subject.

This is to inform you that the Ministry of Agriculture and Cooperatives has no objection to your conducting the study as requested. Furthermore, you are assured of ready cooperation from the staff in the Department of Agriculture and Extension in carrying out your assignment.

Yours sincerely,


D. KHUMALO

FOR: PRINCIPAL SECRETARY.

cc : D.A.
SAO (Ext.)
PS - TO SEE ON FILE.

APPENDIX D.

COVER LETTER TO SURVEY INSTRUMENT

Iowa State University of Science and Technology Ames, Iowa 50011



Department of Agricultural Education
201 Curtiss Hall
Telephone: 515-294-5872

May 25, 1992

Dear Field officer / Extension Officer / Farmer:

The need to continue searching for the most effective ways to conduct Agricultural Extension Education (AEE) programs is becoming a concern in agricultural extension worldwide. However, in Swaziland, there is very little information about how field officers, extension officers and farmers perceive AEE. Any amount of research regarding AEE in Swaziland without your involvement would be a waste of time. Hence, it was decided to conduct this survey to study AEE in Swaziland.

We are collecting information from field officers, extension officers and farmers. We hope that you will assist us in the analysis of the AEE in Swaziland. Your response to this questionnaire is essential for developing program objectives and principles, selecting extension teaching methods and teaching tools and identifying problems encountered in conducting AEE programs. It should take one hour to complete this instrument or interview.

Your responses will be held in strict confidence and used for statistical analysis purposes only. The code number assigned to the instrument will be used only to identify those people who have not responded to the instrument so that we may contact them to encourage return of the instrument. Please be informed that you are free to withdraw your participation at any time during the project activity. We are interested in group data only. All instruments will be destroyed after the data is collected. Data from this study will be used to complete a Ph. D. Dissertation at Iowa State University. However, we feel the information could assist the Ministry of Agriculture and Cooperatives in Swaziland to develop a more effective agricultural extension service program in the coming decade and beyond.

Thank you for your assistance.

Sincerely,

Musa A. Dube
Musa M. A. Dube
Graduate Student

Robert A. Martin
Robert A. Martin
Associate Professor

APPENDIX E.
SURVEY QUESTIONNAIRE

AN ANALYSIS OF THE AGRICULTURAL EXTENSION EDUCATION PROGRAM IN SWAZILAND

PART I

PROGRAM OBJECTIVES, PRINCIPLES, TEACHING METHODS AND TEACHING TOOLS

INSTRUCTIONS:

Please read each statement carefully and circle only the one response that best reflects your opinion regarding program objectives, principles, teaching methods, and teaching tools. The rating scale is designed as follows: SA=Strongly Agree, A=Agree, N=Neutral, D=Disagree, SD=Strongly Disagree.

EXAMPLE:

The AES should provide farm production inputs to farmers.

SA A N D SD

SD Means that I strongly disagree that extension should provide farm inputs to farmers.

SA A N D SD

A. PROGRAM OBJECTIVES

Indicate the extent to which you agree or disagree with the following potential objectives of the Agricultural Extension Education Program in Swaziland:

- | | |
|---|---------------------|
| 1. Transferring technical subject matter to farmers. | SA A N D SD |
| 2. Assisting farmers to shift from subsistence to commercial farming. | SA A N D SD |
| 3. Helping farmers to raise quality livestock. | SA A N D SD |
| 4. Helping farmers to raise higher yielding crops. | SA A N D SD |
| 5. Teaching farmers to diversify their farming. | SA A N D SD |
| 6. Encouraging farmers to form cooperatives. | SA A N D SD |
| 7. Improving marketing of farm produce. | SA A N D SD |
| 8. Teaching farmers how to keep accurate records. | SA A N D SD |
| 9. Linking researchers with farmers. | SA A N D SD |

(The rating scale is: SA=Strongly Agree, A=Agree, N=Neutral, D=Disagree, SD=Strongly Disagree).

- | | | | | | |
|--|----|---|---|---|----|
| 10. Helping farmers to make intelligent decisions. | SA | A | N | D | SD |
| 11. Encouraging farmers to use locally available agricultural resources. | SA | A | N | D | SD |
| 12. Teaching farmers to conserve the soil by using proper farming methods. | SA | A | N | D | SD |
| 13. Encouraging farmers to apply for farm loans. | SA | A | N | D | SD |
| 14. Encouraging farmers to plan their farming. | SA | A | N | D | SD |
| 15. Helping farmers to properly maintain their farm implements. | SA | A | N | D | SD |
| 16. Helping farmers locate farm-input sources. | SA | A | N | D | SD |
| 17. Teaching farmers to prioritize their farm needs. | SA | A | N | D | SD |
| 18. Teaching farmers to use reference literature. | SA | A | N | D | SD |
| 19. Enforcing the government's production goals. | SA | A | N | D | SD |
| 20. Regulating farming practices. | SA | A | N | D | SD |
| 21. Encouraging farmers to produce commercial crops only. | SA | A | N | D | SD |
| 22. Encouraging farmers to farm for family consumption only. | SA | A | N | D | SD |
| Others (please list) | | | | | |
| 23. | SA | A | N | D | SD |
| 24. | SA | A | N | D | SD |

B. PROGRAM PRINCIPLES

To what extent do you agree or disagree with the following principles of the Agricultural Extension Education in Swaziland:

- | | | | | | |
|--|----|---|---|---|----|
| 1. Farmers' participation in agricultural extension meetings is voluntary. | SA | A | N | D | SD |
| 2. Extension should use a grassroots approach to farmers' problems. | SA | A | N | D | SD |

(The rating scale is: SA=Strongly Agree, A=Agree, N=Neutral, D=Disagree, SD=Strongly Disagree).

- | | | | | | |
|--|----|---|---|---|----|
| 3. Extension should provide educational services to farmers on non-discriminatory basis. | SA | A | N | D | SD |
| 4. Extension should put reliance on applied research. | SA | A | N | D | SD |
| 5. Extension should encourage team-work among field officers. | SA | A | N | D | SD |
| 6. Extension should promote the use of opinion leaders. | SA | A | N | D | SD |
| 7. Extension should promote consultation among farmers (networking). | SA | A | N | D | SD |
| 8. Other agencies should cooperate with extension staff and vice-versa. | SA | A | N | D | SD |
| 9. Programs should be presented using suitable extension teaching method(s). | SA | A | N | D | SD |
| 10. Programs should lead farmers toward self-reliance. | SA | A | N | D | SD |
| 11. Farmers should develop problem-solving skills. | SA | A | N | D | SD |
| 12. Formative evaluation procedures should be used. | SA | A | N | D | SD |
| 13. Appropriate summative evaluation procedures should be used. | SA | A | N | D | SD |
| 14. Farmers' needs should be the basis for program planning. | SA | A | N | D | SD |
| 15. Meeting farmers' needs should be the priority goal. | SA | A | N | D | SD |
| 16. Farmers' participation in agricultural extension meetings should be compulsory. | SA | A | N | D | SD |
| Others (please list) | | | | | |
| 17. | SA | A | N | D | SD |
| 18. | SA | A | N | D | SD |

(The rating scale is: SA=Strongly Agree, A=Agree, N=Neutral, D=Disagree, SD=Strongly Disagree).

C. EXTENSION TEACHING METHODS

Indicate the extent to which you agree or disagree with the following extension teaching methods to conduct Agricultural Extension Education in Swaziland:

1. Method demonstrations	SA	A	N	D	SD
2. Result demonstrations	SA	A	N	D	SD
3. Individual farmer visits (individualized instruction)	SA	A	N	D	SD
4. Agricultural shows	SA	A	N	D	SD
5. Short courses	SA	A	N	D	SD
6. Field days	SA	A	N	D	SD
7. Workshops	SA	A	N	D	SD
8. Seminars	SA	A	N	D	SD
9. Lectures	SA	A	N	D	SD
10. Lecture-discussions	SA	A	N	D	SD
11. Group discussions	SA	A	N	D	SD
12. Panel discussions	SA	A	N	D	SD
13. Buzz groups	SA	A	N	D	SD
14. Role playing	SA	A	N	D	SD
15. Case studies	SA	A	N	D	SD
16. Questioning	SA	A	N	D	SD
17. Problem-solving (decision-making)	SA	A	N	D	SD
18. On farm trials	SA	A	N	D	SD
19. Brainstorming	SA	A	N	D	SD
20. Tours	SA	A	N	D	SD
21. Focus Groups	SA	A	N	D	SD

(The rating scale is: SA=Strongly Agree, A=Agree, N=Neutral, D=Disagree, SD=Strongly Disagree).

22. Nominal Group Technique SA A N D SD

Others (please list)

23. SA A N D SD

24. SA A N D SD

D. TEACHING TOOLS

Indicate the extent to which you agree or disagree with using the following teaching tools in Agricultural Extension Education in Swaziland:

1. Field Support Guides	SA	A	N	D	SD
2. Advisory Bulletin	SA	A	N	D	SD
3. Agricultural Research Reports	SA	A	N	D	SD
4. Films	SA	A	N	D	SD
5. Exhibits and displays	SA	A	N	D	SD
6. Real objects	SA	A	N	D	SD
7. Chalkboard	SA	A	N	D	SD
8. Models	SA	A	N	D	SD
9. Flip charts	SA	A	N	D	SD
10. Radio	SA	A	N	D	SD
11. Video tapes	SA	A	N	D	SD
12. Television	SA	A	N	D	SD
13. Computer aided instruction	SA	A	N	D	SD
14. Bulletin boards	SA	A	N	D	SD
15. Instructional posters	SA	A	N	D	SD
16. Flannel board	SA	A	N	D	SD
17. Satellite	SA	A	N	D	SD
18. 35 mm slides	SA	A	N	D	SD

(The rating scale is: SA=Strongly Agree, A=Agree, N=Neutral, D=Disagree, SD=Strongly Disagree).

19. Tours	SA	A	N	D	SD
20. Newsletter	SA	A	N	D	SD
21. News stories	SA	A	N	D	SD
22. Village drama	SA	A	N	D	SD

Others (please list)

23.	SA	A	N	D	SD
24.	SA	A	N	D	SD

PART II

PROBLEMS ENCOUNTERED IN CONDUCTING AGRICULTURAL EXTENSION

EDUCATION

PROGRAMS

There are several issues which are considered to be hindrances to the conduct of AEE worldwide. What do you consider to be the problem areas in conducting the AEE in Swaziland?

INSTRUCTIONS:

Indicate the extent to which these items serve as a problem in conducting of the AEE in Swaziland by placing a check mark () under the number closest to your opinion. The rating scale is designed as follows: 5=Strongly Agree, 4=Agree, 3=Neutral, 2=Disagree, 1=Strongly Disagree.

	5	4	3	2	1
1. wide area to cover	()	()	()	()	()
2. lack of supervision	()	()	()	()	()
3. shortage of transportation	()	()	()	()	()
4. farmer's reluctance to attend extension meetings	()	()	()	()	()
5. inadequacy of in-service training	()	()	()	()	()
6. shallow information at in-service training	()	()	()	()	()
7. difficult to translate technical information into SiSwati	()	()	()	()	()
8. adequacy of back-up support by SMS	()	()	()	()	()

(The rating scale is: 5=Strongly Agree, 4=Agree, 3=Neutral, 2=Disagree, 1=Strongly Disagree)

	<u>5</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>
9. farmer's tendency to avoid program ownership	()	()	()	()	()
10. farmer's reluctance to accept new ideas	()	()	()	()	()
11. cultural events coinciding with planned extension meetings	()	()	()	()	()
12. recognition of FO for outstanding performance	()	()	()	()	()
13. shadow of the predecessor (former FO)	()	()	()	()	()
14. FO experiencing mental fatigue (burnout)	()	()	()	()	()
15. farmer's ability to keep accurate records	()	()	()	()	()
16. farmers have lost confidence in AEE	()	()	()	()	()
17. adequacy of support from researchers	()	()	()	()	()
18. FO's ability to answer problems on crops	()	()	()	()	()
19. FO's ability to answer livestock questions	()	()	()	()	()
20. FO's ability to answer farm implements questions	()	()	()	()	()
21. FO's ability to handle farm machinery questions	()	()	()	()	()
22. FO's ability to handle problems on soils	()	()	()	()	()
23. too much information to transfer	()	()	()	()	()
24. incentives availability in AEE	()	()	()	()	()
25. the quality of pre-service training	()	()	()	()	()
26. frequent transfers of FO's	()	()	()	()	()
Others (please list)					
27.	()	()	()	()	()
28.	()	()	()	()	()

PART III

PERSONAL DATA

INSTRUCTIONS:

Please provide your personal data by placing a check mark () or writing the appropriate information. This information will be used for analysis and will be held in the strictest confidence.

1. Name of your region:

Manzini () Rhohho () Lubombo () Shiselweni ()

2. Your age in years: _____

3. Your academic qualifications (highest attained):

No formal education	()
Sebenta Adult literacy	()
Lower primary education	()
Higher primary education	()
Secondary school education	()
High school education	()
Certificate in agriculture	()
Diploma in agriculture	()
Bachelor of science (agriculture)	()
Master of science (agriculture)	()
Other (specify)	()

4. Years of farming/working experience ()

5. Gender: Male ()
 Female ()

6. Marital Status: Single ()
 Married ()

7. Present position:

Field officer	()
Extension officer	()
Farmer	()

Note: Extension staff need not complete numbers 9-11.

8. What is the major purpose of your farming operation?
 Family Consumption ()
 Marketing ()
 Both family consumption and marketing ()

9. What farming enterprize(s) are you engaged in ?

CROP PRODUCTION:

Maize ()
 Cotton ()
 Tobacco ()
 Others (please list)..... ()

LIVESTOCK:

Beef ()
 Dairy ()
 Breeding ()
 Others (please list)..... ()

POULTRY:

Broiler ()
 Layer ()
 Others (please list)..... ()

10. Who makes decisions about farming in your house?

Husband ()
 Wife ()
 Husband and wife ()
 Others (please specify)..... ()

PART IV

GENERAL SUGGESTIONS AND COMMENTS

INSTRUCTIONS:

Please write general suggestions and comments on your perceptions of AEE in Swaziland which can be used to improve the image of agricultural extension.

[illegible]

APPENDIX F.

HUMAN SUBJECT RESEARCH APPROVAL FORM

Checklist for Attachments and Time Schedule

The following are attached (please check):

12. ☒ Letter or written statement to subjects indicating clearly:
- ☒ a) purpose of the research
 - ☒ b) the use of any identifier codes (names, #'s), how they will be used, and when they will be removed (see Item 17)
 - ☒ c) an estimate of time needed for participation in the research and the place
 - ☒ d) if applicable, location of the research activity
 - ☒ e) how you will ensure confidentiality
 - ☒ f) in a longitudinal study, note when and how you will contact subjects later
 - ☒ g) participation is voluntary; nonparticipation will not affect evaluations of the subject
13. ☐ Consent form (if applicable)
14. ☐ Letter of approval for research from cooperating organizations or institutions (if applicable)
15. ☒ Data-gathering instruments

16. Anticipated dates for contact with subjects:

First Contact

Last Contact

May 25, 1992July 31, 1992.

Month / Day / Year

Month / Day / Year

17. If applicable: anticipated date that identifiers will be removed from completed survey instruments and/or audio or visual tapes will be erased:

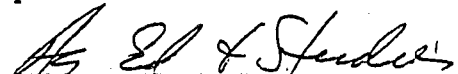
August 31, 1992

Month / Day / Year

18. Signature of Departmental Executive Officer

Date

Department or Administrative Unit

3/5/91

19. Decision of the University Human Subjects Review Committee:

☒ Project Approved☐ Project Not Approved☐ No Action RequiredPatricia M. Keith

Name of Committee Chairperson

3/14/91

Date



Signature of Committee Chairperson