UNIVERSITY OF CAPE COAST

PROFESSIONAL AND TECHNICAL COMPETENCIES NEEDED BY AGRICULTURAL EXTENSION AGENTS IN THE WESTERN AND ASHANTI REGIONS OF GHANA

BY

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THESIS SUBMITTED TO THE DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION, SCHOOL OF AGRICULTURE, UNIVERSITY OF COAST COAST IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF PHILOSOPHY DEGREE IN AGRICULTURAL EXTENSION

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DECLARATION

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this University or elsewhere. All references to other peoples work have been acknowledged

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ABSTRACT

The purpose of this study was to identify the professional and technical competencies needed by Agricultural Extension Agents (AEAs) in the Western and Ashanti Regions of Ghana as perceived by the extension agents and their supervisors. It also compared the self-perceived competencies of the AEAs with their competencies as perceived by their supervisors.

Additionally, the self-perceived competencies of the AEAs in the Western and Ashanti Regions were also compared and the best time for the AEAs to acquire the competencies also ascertained. The study also investigated the relationship between demographic characteristics of the AEAs and their perceived levels of professional and technical competencies.

A descriptive correlational survey design was used. Self-administered questionnaires covering 104 professional and 133 technical competencies items that AEAs are expected to possess were used to collect data from the AEAs and their supervisors. The study covered six districts each in the Western and Ashanti Regions of Ghana. In all, 144 AEAs and 35 supervisors took part in the study.

Overall, the perception of the respondents was that the AEAs possessed a moderate level of competency in the eight professional and ten technical competency categories. The self-perceived competencies of the AEAs were similar to their competencies as perceived by their supervisors and the comparison between the Western and Ashanti Region AEAs showed no significant difference in their competencies. Out of the 104 professional

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competency items, 76.9% were rated above moderate level and 23.1% below the moderate level. Out of the 133 technical competency items, 36.1% were rated above moderate level and 63.9% below moderate level. Only 'the production of cereals' competency item was rated above the high level Therefore, there is the need for improvement in all the others, especially those rated below moderate level of competency. The perception of respondents was that most of the competency items (76%) are best acquired by AEAs during in-service training sessions.

Sex, highest educational qualification, working experience, number of in-service training courses attended and former technical department of AEAs showed significant relationship with their competency levels. Males rated themselves higher than female AEAs, AEAs who possessed certificate in Agriculture and Diploma in Agriculture rated themselves higher than those who possessed MSLC; AEAs with over 10 years experience rated themselves higher than those with less than 10 years experience, AEAs who had attended over 20 in-service training courses rated themselves higher than those who had attended 1-5 in-service training courses, while AEAs with Extension Services, Crops Services and PPMED and PPRSD as their former departments rated themselves higher than those from Veterinary or WIAD. This suggests that different groups have different needs and so the sex, highest educational level, working experience, number of in-service training courses attended, and former technical department of AEAs should be taken into consideration when planning and developing training programmes for AEAs.

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Among the recommendations offered are that more female AEAs should be recruited into the ministry, that the professional and technical competency levels of AEAs should be frequently assessed to enable appropriate training programmes put in place for them, that in-service training courses be organised to upgrade AEAs competency in all the competency categories in this study, and that other incentive packages like means of transport, payment of T & T allowance, adequate logistics and timely promotions should also be given to AEAs.

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DEDICATION

I dedicate this work to my beloved wife, Yaa Gyamfuah Appiah and children, Eunice Anima Appiah, Caleb Appiah Kubi, Ruth Pokuah Appiah and Priscilla Birago Appiah.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

The contribution of agriculture to the overall socio-economic growth and development of developing countries including Ghana cannot be over emphasized. According to the Institute of Statistical, Social and Economic Research (1999), agriculture contributed 36.8 per cent to the Gross Domestic Product (GDP) in 1998 and employs about 70 per cent of the labour force. It also accounts for about 60 per cent of export earnings and directly or indirectly supports 80 per cent of the total population economically through farming, distribution of farm produce and provision of other services to the agricultural sector (Ministry of Food and Agriculture, 1991).

According to a World Bank study on Sub-Saharan Africa (Pier Landel-Mills et al, 1989), African economies must grow by 4-5 per cent per annum if hunger is to be averted and productive jobs and rising incomes secured for their growing populations. And this can only be achieved if agriculture is regarded as a major priority area by African governments.

Arokoyo (1998) states that a nation's agricultural research and extension system is the most important single determinant of its agricultural and rural development. He further stressed that no country is known to have achieved any meaningful progress in agricultural growth without sustained investment in agricultural research and extension.

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Agricultural extension has emerged over the past century as a central mechanism in the agricultural development process-first in the industrially developed countries and more recently in developing countries. It is estimated that in excess of US$ 6 billion are expended annually on extension worldwide, involving more than 60,000 trained extension workers (Swanson, 1990). These extension workers are expected to reach about 1.2 billion economically active people with appropriate technology and useful educational programmes.

The effectiveness of such extension systems depends, to a large extent, on the field staff who are responsible for the actual delivery of a wide range of agricultural and related services to farm families (Seepersed, 1986). According to Swanson (1990), 40 per cent of extension personnel (about 225,000 agents) in developing countries have inadequate technical and professional training. Consequently, the potential for extension to play an important role in agricultural development is severely limited. Improving the quality of extension personnel should, therefore, be a high priority for all national extension organisations.

Ogunbamera, Adepoju and Iievbaoje (1999) observe that the greatest danger to effective agricultural extension is the accelerating obsolescence of its human resource, involving all categories of extension workers. They further contended that evidence is mounting that the extension workers ability to cope with his her ever-changing farming system and technologies is lagging further and further behind the changing world. And in the 21st century, we face newer challenges as agriculture becomes more developed and other socio-economic and technological advancement occur in the production environment. So they recommended that the

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manpower needs of extension programme need to be constantly reviewed and updated if we are to keep pace with these challenges, adding that embarking on a serious man-power development programmes that will retool the extension staff with competence required to function adequately is the way out.

1.2 STATEMENT OF THE PROBLEM

The performance and output of the national agricultural research and extension systems in most developing countries, including Ghana, have not been commensurate with the size, scope and level of investment in the systems. This is evidenced by farmers' poor productivity, incessant and intractable food shortages and accompanying high food prices (Arokoyo, 1998). Many studies have identified the incompetence of staff as a major cause of the poor performance of extension organisations in developing countries (Radhakrishna and Yoder, 1996; Alawy and Safrit, 1994; Bansal, 1991; and Swanson, 1990).

Waldman and Spangler (1989) indicate that part of an organisations' overall effectiveness is influenced by the job knowledge and skills possessed by organisational employees. Therefore extension personnel must possess the necessary professional and technical skills in order to be effective in servicing the needs of their clients (Buford, Bedein and Lindner, 1995; Leagans and Loomis, 1977).

Even though both professionally and technically competent agricultural extension agents are a necessary pre-requisite for the success of any agricultural development effort, several studies and writers have concluded that one major

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limitation of most extension organisations in developing countries in their approaches to training extension personnel has been the over emphasis on technical competence to the partial neglect of professional competence (Boone, 1989; Easter, 1985; MacDonald and Hearle, 1984; Hondale, 1982).

MacDonald and Hearle (1984) stated that no matter how well technologies work under researcher management, if farmers do not use them due to the inability of extension agents to communicate the necessary information to them as they lack skills in effective extension communication methods, their efforts are in vain.

The Ministry of Food and Agriculture (MOFA) has recently undergone a restructuring and decentralization exercise and plans are also far advanced to unify the Cocoa Services Division of Cocoa Board (Cocobod) with MOFA. These exercises mean that agricultural extension agents who were hitherto not doing extension work or only working with a few commodities will now be doing full scale extension work with all activities that farmers and other clients are involved in. So assessing their level of professional and technical competency would be very crucial so that appropriate training programmes and policies could be put in place to ensure the success of these exercises.

But not many studies have been done in Ghana as a whole, and Western and Ashanti Regions in particular, to identify the level of professional and technical competency of agricultural extension agents. It is therefore the intention of this researcher to identify the competency levels of the extension agents in the two regions.

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1.3 OBJECTIVES OF THE STUDY

The overall objective of the study was to identify the professional and technical competencies needed by agricultural extension agents (AEAs) in the Western and Ashanti Regions of Ghana.

1.3.1 SPECIFIC OBJECTIVES

The specific objectives of the study were:

1. To describe the demographic characteristics of the respondents
2. To identify the level of professional and technical competencies of AEAs in the Western and Ashanti Regions of Ghana as perceived by the AEAs and their supervisors.
3. To compare the perception of AEAs and that of their supervisors regarding the level of professional and technical competencies of the AEAs.
4. To identify the professional and technical competency needs of the AEAs in the Western and Ashanti Regions of Ghana
5. To compare the perceptions of AEAs in the Western Region with those of AEAs in the Ashanti Region regarding their levels of professional and technical competencies.
6. To determine the best time for AEAs to acquire the professional and technical competencies from the AEAs themselves and their supervisors.
7. To investigate the relationships between demographic characteristics of the AEAs and their perceived levels of professional and technical competencies.

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1.4 RESEARCH QUESTIONS

Questions to be answered in this study include the following:

1. What is the level of professional and technical competencies of AEAs in the Western and Ashanti Regions of Ghana as perceived by the AEAs and their supervisors?
2. Is there any significant difference between the perceptions of the AEAs and their supervisors regarding the level of professional and technical competencies of the AEAs?
3. What is the professional and technical competency needs of AEAs as perceived by the AEAs and their supervisors?
4. Is there any significant difference between the perceptions of the AEAs in Western Region and those in the Ashanti Region regarding their level of professional and technical competencies?
5. What are the demographic characteristics of the AEAs and their supervisors?
6. Is there any relationship between the demographic characteristics of the AEAs and their self-perceived level of professional and technical competencies?
7. What is the preferred time for the acquisition of the various professional and technical competencies?

1.5 RESEARCH HYPOTHESES

The following hypotheses, based upon the research questions were tested at the 0.05 alpha level:

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1. H_o: There is no significant difference between the perceptions of AEAs and their supervisors, regarding the level of professional and technical competencies of AEAs

   H_1: There is significant difference between the perceptions of AEAs and their supervisors regarding the level of professional and technical competencies of AEAs.

2. H_o: There is no significant difference between the perceptions of AEAs in the Western Region and those in the Ashanti Region regarding the level of professional and technical competencies of AEAs.

   H_1: There is significant difference between the perceptions of Western Region AEAs and Ashanti Region AEAs regarding the level of professional and technical competencies of AEAs.

3. H_o: There is no significant difference between the perceptions of older AEAs and the younger AEAs regarding the level of professional and technical competencies of AEAs

   H_1: There is significant difference between the perceptions of older AEAs and those of younger AEAs regarding the level of professional and technical competencies of AEAs

4. H_o: There is no significant difference between the perceptions of male and female AEAs regarding the level of professional and technical competencies of AEAs

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H_1: There is significant difference between the perceptions of male and female AEAs regarding the level of professional and technical competencies of AEAs

5. H_o: There is no significant difference between the perceptions of AEAs in respect of marital status regarding their level of professional and technical competencies of AEAs.

H_1: There is significant difference between the perceptions of AEAs in respect of marital status regarding their level of professional and technical competencies of AEAs.

6. H_o: There is no significant difference between the perception of AEAs in respect of years of experience in extension regarding their level of professional and technical competencies.

H_1: There is significant difference between the perceptions of AEAs in respect of years of experience in extension regarding their level of professional and technical competencies.

7. H_o: There is no significant difference between the perceptions of AEAs in respect of highest educational qualification regarding their level of professional and technical competencies

H_1: There is significant difference between the perceptions of AEAs in respect of highest educational qualification regarding their level of professional and technical competencies

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8. H_o: There is no significant difference between the perceptions of AEAs in respect of the number of in-service training attended regarding their level of professional and technical competencies.

   H_1: There is significant difference between the perceptions of AEAs in respect of the number of in-service training attended regarding their level of professional and technical competencies.

9. H_o: There is no significant difference between the perceptions of AEAs in respect of their former technical department regarding their level of professional and technical competencies.

   H_1: There is significant difference between the perceptions of AEAs in respect of their former technical department regarding their level of professional and technical competencies.

1.6 JUSTIFICATION FOR THE STUDY

The Ministry of Food and Agriculture will be seriously limited in its ability to plan and execute educational programmes and other technology transfer activities without an adequate number of well-trained, professionally and technically competent extension agents (Chizari, Pishbin and Linder, 1997). Even though many training programmes have been undertaken by MOFA for its staff, especially during the National Agricultural Extension Project (NAEP), not many studies have been conducted to assess the level of competency of the extension agents in the whole country and the Western and Ashanti Regions in particular. So this study seeks to provide such information.

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The results of the study will also enable MOFA to plan useful and appropriate training programmes for its staff, especially those doing extension work now as a result of the decentralization exercise and the unifying of Cocoa Services Division with MOFA.

The result of this study will help the agricultural faculties of the country's universities, the agricultural colleges of MOFA and other training institutions in Ghana to provide more appropriate pre-service training for its students to enable them acquire competencies in each of their job related areas in order to cope with challenges they may face in their extension duties.

The results will also enable comparison to be made regarding the level of competency of AEAs in the two regions and also with that of other studies (Osei-Owusu, 2000 and Ogoe, 1998) in this country.

It will also provide information on the best times for AEAs to acquire the various competencies needed for them to perform efficiently.

1.7 LIMITATIONS OF THE STUDY

Resource constraints, especially those of finance and time were serious limitations of the study. For this reason, the study could cover only the Western and Ashanti regions of Ghana instead of the whole country.

1.8 DEFINITION OF TERMS

Agricultural Extension Agents: In this study, agricultural extension agents (AEAs) refers to staff of the Ministry of Food and Agriculture (MOFA) at the

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district level who work directly with farmers and other clients and are responsible for the implementation of extension programmes at the field level.

Supervisors: These are officers of MOFA at the district level responsible for supervision and support of the field level extension agents. They include District Directors of Agriculture and District Agricultural Development Officers.

Professional Competence: This refers to the ability to perform effectively, all the professional tasks appropriate to the position of extension agents to the level that is generally acceptable. This includes administration, programme planning, programme execution, teaching, communication, understanding human behaviour, maintaining professionalism and evaluation.

Technical Competence: This refers to the ability to perform effectively, all the technical functions of an extension worker that is sound knowledge about agricultural subject areas. This includes animal production, animal health and diseases, fish farming, crop production, plant protection, agroforestry, land and water management, mechanization, women in agricultural development (WIAD) activities and farm management.

Pre-Service Training: This means training received before entering the extension service or during formal education.

In-Service Training: This denotes training received after entering the extension service or Ministry of Food and Agriculture or during the period of work as an extension agent.

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1.9 Outline of the Remaining Chapters

The organization of the rest of the thesis is as follows: Chapter Two reviews the literature under these areas; the agricultural extension agent, training of agricultural extension agent, competence, self and independent evaluation, independent variables relating to extension agents competency level and summary of the literature review. Chapter Three presents the research methodology, which covers the following; research design, the study area, the target population, sampling procedure, research instruments, research variables, data collection, processing and analysis. The results and discussions of the study are outlined in chapter Four while Chapter Five presents the summary, conclusions and recommendations.

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CHAPTER TWO

LITERATURE REVIEW

The purpose of this study was to identify the professional and technical competencies needed by agricultural extension agents in the Western and Ashanti regions of Ghana. This chapter reviews the literature under five broad areas: The agricultural extension agent, training of agricultural extension agents, competence, self and independent evaluation of competence, and independent variables relating to extension agents' competency level.

2.1 THE AGRICULTURAL EXTENSION AGENT

The Agricultural Extension Agent (AEA) is responsible for the implementation of extension programmes at the field level. Indeed, the effectiveness of the AEA can often determine the success or failure of an extension activity (Arokoyo, 1998; Adams, 1994; Radhakrishna and Yoder, 1994; Oakley and Garforth, 1985). Oakley and Garforth (1985) and Benor, Harrison and Baxter (1984) have asserted that the responsibility of all other extension staff is ultimately to make the AEA more effective in his or her work.

Vijayaragavan and Singh (1997) assign three basic functions to the AEA:

- Make regular and systematic visits to villages and farms to develop rapport with the clientele to understand their problems
- Undertake educational activities in the form of meetings, campaigns, demonstrations, field days, training sessions and exhibitions.

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- Provide advisory services to the farmers and solve their production problems

The job description for AEAs as prescribed by MOFA under its decentralization policy (Appendix 1) shows that the responsibilities of the AEA are really very demanding. Nagel (1997) reports that while working conditions of AEAs have deteriorated, expectations with regards to their role are increasing. They are no longer to be simply transmitters of technical knowledge. They are to practice participatory meetings, recognize and respect gender issues, identify indigenous need and solutions to problems and serve as a link to the world outside the village The emerging role is closer to that of a "socio-economic community worker" (Blackburn and Flaherty, 1994) than a technical expert, but their training is insufficient for either. So, according to Nagel (1997), the AEA is still the weakest link within the system.

In their study of the number of extension personnel world wide, Swanson, Farner and Bahal (1990) found out that 79 percent were field staff or AEAs. 14 percent were subject matter specialists (SMS) and 7 percent were administrative staff, with important regional differences. In Africa, the distribution was 82 percent AEAs, 13 percent SMS and 5 percent administrative staff, while in North America, was 64 percent AEAs, 31 percent SMS and 5 percent administrative staff. In the same study, they found 13 percent of all AEAs world wide to be females. In Africa, there were only 7 percent females while North America had 15 percent females. But given the major importance of women farmers in African agricultural production and development a greater effort is needed to increase the number and

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quality of female agricultural extension personnel in Africa who can more effectively transfer technical and managerial skills to rural farm women.

There are remarkable deficiencies in knowledge, skills and ability among extension personnel, particularly those in Africa, Asia and Latin America. Regarding their educational qualification, Swanson et al (1990) found that 39 percent of extension personnel worldwide have secondary level educational qualification, with another 33 percent with post secondary technical training, 23 percent with university degree and 5 percent with post graduate degrees. In Africa, the educational level was 56 percent of extension personnel had secondary level education, 32 percent with post secondary level, 9 percent with university degree and 3 percent with postgraduate degree. These findings highlight the very low level of educational qualifications and training of field-level extension personnel in most developing countries. In Africa, nearly all of the AEAs have only a secondary school diploma, while many SMS and most of the extension supervisors in the field have only an intermediate level diploma.

On the AEA to farmer ratio, Swanson et al (1990) found a ratio of 1:1,800 for Africa, 1:430 for Europe and 1:325 for North America. Benor et al (1984) recommended a ratio of 1:800 under Training and Visit extension (T&V) approach. But the World Bank caution that the ratio will differ from country to country, depending on the local circumstances.

So the low education level of AEAs in most developing countries and the relatively large number of farmers they are expected to reach (measured by agent to

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farmer ratio) may help explain why extension organisations do not function to the full expectation in many of these countries.

Assessing the educational needs of AEAs is therefore, a critical factor in the success of any extension system. In fact, extension will be seriously limited in its ability to plan and execute effective educational programmes and other technology transfer activities without adequate number of well trained AEAs (Chizari et al, 1997). So in the 21st Century where we face newer challenges as agriculture becomes more developed and other socio-economic and technological advancement occur in the production environment, the importance of effective staff training programme to retool AEAs and other extension personnel with the competencies required to function adequately become more evident (Ogunbamera et al, 1999; Buford et al, 1995).

2.2 TRAINING OF AGRICULTURAL EXTENSION AGENTS

The Longman Dictionary of Contemporary English (1995) defines the word training as the process of teaching someone the skills of a particular job or activity. Jucious (1963) defines it as the process of acquiring specific skills to perform a job better. According to Dahama (1979), training helps people to become qualified and proficient in doing some jobs. Van Dersal (1962) also defines it as the process of teaching, informing or educating people so that (1) they may become as well qualified as possible to do their job and (2) they become qualified to perform in positions of greater difficulty and responsibility. Usually, an organisation facilitates the employees' learning through training so that their

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modified behaviour contributes to the attainment of the organization's goals and objectives.

Flippo (1961) differentiates between education and training, locating these at the two ends of a continuum of personnel development ranging from a general education to specific training. While training is concerned with those activities, which are designed to improve human performance on the job, that employees are at present doing or are being hired to do, education is concerned with increasing general knowledge and understanding of the total environment. Education is the development of the human mind, and it increases the powers of observation, analysis, integration, understanding, decision-making and adjustment to new situations.

Halim and Ali (1997) categorizes training into two broad types: pre service training and in service training.

2.2.1 PRE-SERVICE TRAINING

Pre-service training is a process through which individuals are made ready to enter a certain kind of professional job such as agriculture, medicine or engineering. They have to attend regular classes in a formal institution and need to complete a definite curriculum and courses successfully to receive a formal degree or diploma. They are not entitled to get a professional job unless they can earn a certificate, diploma, or degree from the appropriate institution. Pre-service training contents emphasize mostly technical subject matter such as crops, animal husbandry, and fisheries as well as pedagogical skills to prepare the students to

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work in agriculture. In Ghana, three types of pre-service training are available to agricultural staff. These are degree and diploma level, usually offered for two to four years by the universities and certificate level, offered for three years by the agricultural colleges.

2.2.2 IN-SERVICE TRAINING

In-service training is a process of staff development for the purpose of improving the performance of an incumbent holding a position with assigned job responsibilities. It promotes the professional growth of individuals. Malone (1984) defines it as a programme designed to strengthen the competencies of extension workers while they are on the job. According to Halim and Ali (1997), in-service training is a problem-centered, learner oriented, and time-bound series of activities which provide the opportunity to develop a sense of purpose, broaden perception of the clientele, and increase capacity to gain knowledge and mastery of techniques. They categorized in-service training into five different types: (1) Induction or orientation training (2) Foundation training, (3) on-the-job training (4) refresher or maintenance training and (5) career development training.

Induction or Orientation Training:- Induction training is given immediately after employment to introduce the new extension staff members to their positions. It begins on the first day the new employee is on the job (Rogers and Olmsted, 1957). This type of training is aimed at acquainting the new employee with the organisation and its personnel. Induction training for all new personnel should develop an attitude of personal dedication to the service of people and the

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organization. This kind of training supplements whatever pre-service training the new personnel might have had (Halim and Ali, 1988).

Concerning the characteristics of a new employee, Van Dersal (1962) states that when people start to work in an organization for the first time, they are eager to know what sort of outfit they are getting into, what they are supposed to do, and whom they will work with. They are likely to be more attentive and open-minded than experienced employees. In fact, the most favourable time for gaining employee's attention and for moulding good habits among them is when they are new to the job.

Foundation Training: - Foundation training is in-service training, which is also appropriate for newly recruited personnel. Besides technical competence and routine instruction about the organization, every staff member needs some professional knowledge about various rules and regulations of the government, financial transactions, administrative capacity, communication skills, leadership ability, coordination and cooperation among institutions and their linkage mechanism, report writing and so on. Foundation training is made available to employees to strengthen the foundation of their service career. This training is usually provided at an early stage of service life.

Maintenance or refresher training: - This training is offered to update and maintain the specialized subject-matter-knowledge of the incumbents. Refresher training keeps the specialists, administrators, subject-matter officers, extension supervisors and frontline workers updated and enable them to add to the knowledge and skills they have already. Maintenance or refresher training usually

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deals with new information and new methods as well as review of older materials This type of training is needed both to keep employees at the peak of their possible production and to prevent them from getting into a rut (Van Dersal. 1962)

On-the-job Training: - This is ad hoc or regularly scheduled training, such as fortnightly training under the training and visit (T &V) system of extension and is provided by the superior officer or the subject matter specialist to the subordinate field staff. This training is generally a problem or technology oriented and may include formal presentations, informal discussion and opportunities to try out new skills and knowledge in the field. The superior officer, administrator, or subject-matter specialist of each extension department must play a role in providing on-the-job training to the staff while conducting day-to-day normal activities.

Career or Development Training: - This type of in-service training is designed to upgrade the knowledge, skills and ability of employees to help them assume greater responsibility in higher positions. The training is arranged departmentally for successful extension workers, at all levels for their own continuing education and professional development. Malone (1984) opines that extension services that provide the opportunity for all staff to prepare a plan for career training will receive the benefits of having longer tenured and more satisfied employees, which increases both the effectiveness and efficiency of an extension service. Malone stated that career development is the act of acquiring information and resources that enables one to plan a programme of life-long learning related to his or her work life. Although extension workers are

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responsible for designing their own career development education, the extension organization sometimes sets some criteria and provides opportunities for the staff by offering options.

Most studies on the best time for the acquisition of competencies by extension workers show that most of them perceived them to be best acquired during in-service rather than pre-service training. Osei-Owusu (2000) found out that most the extension agents he studied in the Central and Northern Regions of Ghana acquired their competencies through in-service training. Ogoe (1998) in his study of extension supervisors' competencies in Ghana found out that only 11% of the competency items were acquired before the job (pre-service training).

In their study of the professional competencies needed by extension specialists and agents in Iran, Pezeshki-Raad, Yoder and Diamond (1994) found that only 3% of the competencies items were preferred to be acquired during pre-service training, with the rest preferred during in-service training.

Even though most studies show that agents perceived that most of their competencies should be acquired during in-service training, Pezeshki-Raad et al (1994), contend that many current extension employees report perceptions based upon what they experienced. They however recommended that a core of credible currently employed extension personnel serve in advisory capacity to university and other personnel responsible for developing pre-service extension programmes. This is to ensure that the most appropriate competencies would be used as the critical core in designing pre-service programmes to help lend credibility to the emerging pre-service programmes of the training institutions.

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These results also imply that even after pre-service programmes are implemented, there still remains a substantial need for continuing education programmes for extension personnel.

2.3 COMPETENCE

This section looks at competence under competency theory, developing competence, assessing competence and integrating competence.

2.3.1 COMPETENCY THEORY

The Chambers 21st Century Dictionary (1996) defines the word competence as: capability; efficiency; having sufficient skill or training to do something, while the Cambridge International Dictionary (1996) defines it as the ability to do something to a level that is acceptable. Webster's New World Dictionary of the American Language (1980) identifies 'compete' as the root of competence as it has a pertinent etymology. It defines 'compete' as: to strive together for, contend; contest; competence picks up the striving connotation with its refined definitions such as "meeting agreement", 'power', the quality of being competent'

Fagan (1984) observes that the current usage of the term competence in education suggests that its precise meaning is of less importance to many people than its use for purely rhetorical purposes. He stated that the term has been used in such a variety of ways that meaningful communication on the subject of competence has been exceeding difficult, if not impossible. Even educational practices involving the idea of competence frequently embody such different

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conceptions of competence that little relationship can be detected among them There is the common sense notion that an academic credential represents at least a minimal level of competence, despite significant empirical evidence that credentials are not causally related to, and often not even correlated with performance in the world of work. (Hogan, 1977; Heath, 1976; White and Frances, 1976; McClelland. 1973; Hoyt, 1965).

Klemp (1977) states that the competence of a person is judged by his or her performance. He emphasized that a competent person irrespective of his or her profession is one who can meet or surpass performance standards, either implicit or explicit. In the world of education, a truly competency-based curriculum is designed to ensure that graduates can perform acceptably in their chosen occupations. In the past, apprenticeships existed in which a student worked with a professional until some criterion of performance was achieved. Gradually, however, competence began to be attributed on the basis of how much a person know; thus, knowledge of business, science or literature was taken as an indication of a person's ability as a manager, chemist or writer. Knowledge, of course is a key part of an individuals ability to perform or possessing the aptitude for performance, rather than demonstrating that knowledge or aptitude. Knowing has been distinguished from doing.

The dictionary definition of competence suggests that a competency, or aspect of competence, cannot be measured directly, but can only be induced from the analysis of demonstrated behaviour. A good test should, therefore, present a situation that would allow us to infer the same competencies as those to be

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inferred from the behaviour of interest, both competencies of knowledge (content) and use (process).

With the foregoing as a background, Klemp (1977) gives a definition of competency, which will allow one to be more accurate about the attributes he or she will want to assess. He defined competency as a generic knowledge, skill, trait, self schema or motive of a person that is causally related to effective behavior referenced to external performance criteria, where;

- Knowledge is a set of usable information organized around a specific area (for example, knowledge of mathematics).
- Skill is the ability to demonstrate a set of related behaviours or processes (for example, logical thinking)
- Trait is a disposition or characteristic way of responding to an equivalent set of stimuli (for example, initiative)
- Self-schema is a person's image of himself or herself and his or her evaluation of that image (for example, self image as a professional)
- Motive is a current concern for a goal state or condition which drives, selects and directs behaviour of the individual (for example, the need for efficacy)

For knowledge, skill, trait, self-schema or motive to be generic it must manifest itself in a number of ways. A useful analogy can be drawn between a competency and a tool, both of which may be used to operate on different situations with different results. Just as the nature of the tool is seldom evident in the finished product, so too the nature of the competency is seldom evident from

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observed behaviour. Though competency can be inferred from behaviour, the two are not equivalent and there is seldom a one to one correspondence between them Therefore, to define competencies as lists of specific repeated skills, tasks and actions is to confuse outcomes with process that enable them to occur.

The idea that a competency is causally related to effective performance means that the development of a competency should lead to increased effectiveness; that is to say, competence precedes performance.

Doll (1984) conceives of competence as much more than behaviour or performance, rather, as a state of being, a capacity or an intellectual power. He criticized the competency-based movements for equating competence with performance wrongly. Hall and Jones (1976), advocates of competency-based education, define competency as a statement that describes the observable demonstratives of a component of the specific skills; "that competency is a description of performances." Performances that somehow are "integrated with a set of related skills and knowledge". Doll explains that this definition by the competency based movement advocates implies that despite their equating competence with performance they realized somehow that competence was not merely performance but at least "a composite ....greater than the sum of the individual skills." He argues further that the two words, competence and performance are of different origin and different thrusts or senses. Performance refers essentially to a "doing", particularly to a "doing " which is "completed, finished, achieved". It originated as a word to distinguish between promises made but not completed and those completed. Hence performance is a task finished. It

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carries no judgment of value as to how well the task is done, just that it is done Competence on the other hand refers essentially to a state of being or to a capacity. One who is competent is one who has a certain "fitness, sufficiency, or aptitude;" or to take the word's Latin derivation a competent person is one who possess a certain confluence, "symmetry, conjunction, or meeting together" of powers which allow him or her "to adequately deal with a situation". In short performance is the outward and public manifestation of underlying and internal powers. The problem of course lies in determining just what these powers are and in determining the relationship, which exists between them. Unfortunately, these powers cannot be directly, but must always be inferred from observable performances. According to Doll (1984), some radical behaviourists have chosen to deny the efficacy of the competence concept and rather work exclusively at the level of performance. As far as he was concerned those in the competency movement have not made any such strong theoretical statement, but they were operating out of a similar framework. That is they are simplistically equating competence with performance and assuming that those who perform well are competent and those who perform poorly are incompetent. This is evidenced in their development of performance checklists as indicators of competence.

Doll (1984) and Chomsky (1971) both agree that there are internal structures of competence underlying performance but competence cannot be assessed easily or directly from performance. According to Noddings (1984) performance is neither a necessary nor a sufficient criterion for competence. Yet the two are related and to possess or pursue one without the other is to possess or pursue little.

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2.3.2 DEVELOPING COMPETENCE

Most authors subscribe to the idea that some degree of competency is required before individuals can establish themselves in the world of work (Doll, 1984; Benor et al, 1984). Doll argues that competence can and should be developed in the schools, and that the curriculum design needed for such development will be radically different from the design now in use. So there is the need for some pre-service training before one can competently discharge his or her duties irrespective of the profession one finds him or her self.

What competence must professionals in the various fields possess to ensure efficient performance? And how are the competencies determined, developed and formulated into their various pre-service and in-service curricula?

According to Adewumi (1976) various approaches to curriculum development have been adopted by authors and researchers. The most common classification includes the subject approach, integrated approach, job or occupational analysis approach, and function of industry approach.

Curriculum workers, irrespective of their approaches to curriculum development have utilized one or a variety of procedures for selecting their subject matter content, that is for pre-training decisions on competencies that they consider as essential for adequate post-training occupational performance of the trainees (Adewumi, 1976). The common procedures are judgmental, experimental, analytical and consensual.

- Judgmental procedure is based on the decision of the curriculum worker. He decides on what should be included in the curriculum. This requires that the

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curriculum worker has a good knowledge of desirable objectives, subject matter, etc. and must be prepared and be able to exercise on unbiased judgment This technique has the risk of errors of misjudgment and may reflect individual bias

- Experimental procedure helps to clarify the suitability of a particular subject matter. It provides an avenue for detecting changes that are necessary before adapting or re-designing curriculum to meet desired levels of competency. Major limitation of the experimental procedure is in the difficulty or inability to control certain factors of variation, hence the chances of error. The procedure is also costly and time consuming.

- The analytical procedure is about the most widely used and it consists of analyzing things that people do in an occupation. Analytical procedure is useful to planners of subject matter requirements of curriculum. It includes an analysis of the job, a determination of the useful skills and knowledge for the performance of tasks and functions in the job. The procedure forms the building block for determination of competencies. Critics of the analytical procedure say that it breaks a "whole" into "pieces" which recombined, may not necessarily yield a whole. Analysis is asserted to concentrate on "what is" and not "what should be" hence should not be over-emphasized for developmental purposes. At the worst, analytical procedure is useful when combined with other procedures.

- Consensual procedure yields an aggregate of people's opinion about what they believe the curriculum or situation should be. This procedure derives its nutrition from the opinion of outstanding leaders of the appropriate profession, representatives of the community to be affected, specialists and experts in the

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profession, etc. This procedure is exposed to opinions that may be dictated by vested interest, unexamined prejudice, occupational bias and insufficiently or wrong choice of experts.

Since each of the procedures has its merits and demerits, a combination of several of the procedures produces a complementary and compensatory effect that helps reduce the risks of errors and enhance advantages.

Knowledge, skills, abilities and other characteristics that constitute competence at one level of a profession may be quite different from those that constitute competence at another level. Other changes in the profession can be expected as a result of scientific and technical developments or the changing needs of society (Loveland, 1976). Differences among the variety of settings in which practitioners perform is another dynamic aspect of professional practice. Research in recent years has demonstrated that environmental variables, which characterize various occupational settings, are powerful mediators of job performance (Franklin, 1973). Different working climates in occupational settings will elicit very different performance in response to these environments. So the notion that a profession or occupation is homogenous is simplistic. Also any professional competence domain is individualistic, so different practitioners may competently manage the same problem in different ways.

Fortune (1976) finds three principal causes of failure by professionals to provide competent services: failure to stay current in their field, failure to make personal day-to-day adjustments to practice, and failure in one or more fundamental areas needed for competent practice. But Klemp (1977) indicates

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that the willingness and ability to adapt to certain kinds of occupational requirements could prevent these failures.

Several studies have examined when AEAs should develop professional and technical competencies. Most of the studies show that most professional competencies should be developed during in-service training. In his study of professional competencies of AEAs in the Central and Northern Regions of Ghana, Osei-Owusu (2000) found that most of the AEAs generally acquired their competencies through seminars on the job as compared to acquiring them from faculty/college/institute and self-study or colleagues.

Ogoe (1988) in his study of extension supervisors in Ghana, identified 70 out of the 100 competencies studied as suitable to be acquired on the job (in-service) compared to 7 which were identified as suitable to be acquired before entering the job (pre-service). Pezeshki-Raad et al (1994) in their study of professional competencies needed by extension specialist and agents in Iran reported that 121 out of 125 competencies should be developed during the in-service training while the remaining four were to be at the pre-service level.

Reynolds (1993) also reported similar findings for AEAs in Louisiana Co-operative Extension Service, where 77.9% of the competencies were acquired on the job. Ayewoh (1983) reported that AEAs in Bandel state of Nigeria identified 59 out of the 61 professional competencies to be acquired on the job through workshops, seminars, orientation programme, induction, symposia, conferences, training sessions and demonstrations. Gonzalez (1982) identified 144 competencies needed by AEAs in Pennsylvania, out of which 26 were identified

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as appropriate for development before entering the job, 6 during a graduate programme and the remaining 113 through in-service education. Easter (1985) also had a similar report for AEAs in Swaziland. On the contrary, Ongondo (1984) found that for majority of AEAs in Kenya, most competencies should be developed before entering the job.

Ogunbameru et al (1999) and van den Ban and Hawkins (1996) have concluded that systematic training of AEAs should be a top priority of management of extension organization for them to develop the appropriate competencies to enable them deliver. This training could be achieved through regular short or long-term programmes, including in-house, in-country and overseas training.

2.3.3 ASSESSING COMPETENCE

The way competence is ascribed to a person and the way it is assessed, are often two different things. Somewhere along the line psychologists defined certain knowledge, skills and personality traits and developed measures for them.

They found that these measures often correlated with judgments of competency and decided, therefore that the measures and the competency were the same thing. Granted, it appears that test scores, college grades, and career performance inventories do predict entry into a given occupation. Nevertheless, once a person enters that occupation, none of these measures will reliably predict that person's performance (McClelland, 1973). So according to Klemp (1977), competence is a

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cause of effective performance, not a synonym of it. Therefore teaching and assessing competence may be different from teaching and assessing academic skills. So the traditional ways of assessing competence do not go far enough; we must know about attitudinal and behavioural competencies (The National Centre for the Study of Professions, 1978).

Klemp states that the method by which we measure a competency becomes the operational definition of that competency. Once the effort has been invested in defining a competency at the conceptual level, the assessment process should reflect the way in which the competency, as defined is demonstrated. The goal of most competency selection tests is to measure specific, detailed need for a job rather than the competencies which underlie them. Competency assessment in education also risks the same error by sampling aspects of competency that are limited to course content. The effect of this limitation is that things other than the intended competency are measured. Knowledge competencies are the only ones which can be measured by reference to a specific content area. All others must be separable from the knowledge component.

So according to Klemp, not all problems relevant to a competency are amenable to presentation in standardized tests. Popular testing technology is rather limited in scope, considering the variety of situations other than "reading and writing" exercises in which competencies can be demonstrated. Classroom demonstration, group role-plays, videotapes and films and field situation provide problem settings that translate the conceptual definition of a competency into a practical operationalization.

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In a paper presented at the Annual Convention of the American Association of Higher Education, Klemp (1977) identifies three cognitive skills related to competent performance in a broad array of occupations. The first is the ability to see thematic consistence in diverse information and the ability to organize and communicate those differences. The second related cognitive skill is the ability to conceptualize the many sides of a controversial issue. According to Klemp, "conflicting information results in a kind of cognitive dissonance which some people are better at resolving than others. Those who are able to see things conceptually, and therefore understand both the underlying issue as well as the different perspectives on it, are better at resolving informational conflict for themselves and for others than people who are unable to conceptualize in this way". The third cognitive skill that Klemp finds often taken for granted is the ability to learn from experience. He writes: "Regarding in particular, the most effective process consultants and workers in human services, this means in conceptual terms, the ability to inductively translate observations from work experience into a theory which is then used to generate behavioural alternatives. Here the information that is conceptualized looks very different from facts and figures gleaned from memoranda, articles, or lectures. This skill relates first to being involved and participating in an experience and second to analyzing ones behaviour in the context of that of others. People who excel at experimental learning not only tend to be more astute observers of behaviour but also tend to recognise the fact that direct experience is an important primary learning mode, for example, in situations involving helping and counseling.

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As a more practical way of assessing competence, Klemp rather recommends what he calls operant measures in the stead of traditional measures where the individual structures the situation and the response can take various forms like real daily situations. Operant test or measure, according to Klemp (1977) might present a problem that does not provide expectations of a certain response. It can therefore give evidence that the individual is able to use what he or she has learned. It does not measure an individuals ability to access particular facts, but do permit a greater degree of confidence that what has been accessed will be used. There are few "correct" responses that people can make in this world, but there are many that are effective. Operant measures provide situations which allow different responses, depending upon the knowledge, skills and other competencies, unique to the individual. One cannot hope to gain more than limited insight into human competence when all the responses to a measure involve writing answers to questions or in reaction to other stimuli.

In addition to the nature of the test being appropriate to the competency being measured, Klemp (1977) raises five other areas of concern when a test is designed to measure a competency. These are the sensitivity, utility, uniqueness, reliability and validity of the instrument. Each area has its own range of values that are acceptable to the assessor, depending on the relative importance of each factor to the meaning of the measure. Demanding high standards in one area may mean having to accept lower standards in another, so that our goals should be to achieve an optimal balance among these factors. And according to Klemp, his recommended operant measures for assessing competence have the greatest

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potential for satisfying the criteria of sensitivity, utility uniqueness and validity Operant measures however do not have the same reliability potential as respondent measures, through proper development of standardized problems and systems for coding responses can provide comparable reliability levels.

A number of studies have identified professional competencies needed by extension personnel in several countries (Osei-Owusu, 2000; Ogoe 1998; Chizari et al, 1997; Pezeshi-Raad et al, 1994; Agunga & Ntifo-Siaw, 1994; Reynolds, 1993; Najjingo-Kasujja, 1991; Randavan & Vaughan, 1991; Easter, 1985; Ongondo, 1984; Ayewo, 1983; and Gonzalez, 1982; Umuhak, 1980; Al-Zaidi, 1979; Karami, 1979; Sabihi, 1978; and Boonruang, 1973) The findings from these studies indicate that extension agent in developing countries should possess professional competence in the areas of administration, programme planning, programme execution, teaching, communication and extension methods, understanding human behaviour, maintaining professionalism and evaluation. The handbook of AEAs, (MoFA, 1999) shows that AEAs in Ghana should possess technical competence in the areas of animal production, animal health and diseases, fish farming, crop production, plant protection, agroforestry, land and water management, mechanization, women in agricultural development (WIAD) activities and farm management.

Depending on the particular circumstances of these authors and researchers, a certain number of competency items under these categories were used in rating AEAs, using a scale that ranged from 1=very low, 2=Low, 3=Moderate, 4=high to 5=very high. For example, Osei-Owusu (2000) in his study on the professional

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competencies of AEAs in the Central and Northern regions of Ghana used 50 competency items to rate AEAs professional competencies in nine categories, while Ogoe (1998) used 100 competency items to rate extension supervisors' professional competencies in eight categories in his study in Ghana. Awang and Martin (1995) in their study of AEAs in service training needs in Malaysia used 123 competency items to rate the AEAs professional competencies in seven categories. Pezeshki-Raad et al (1994) used 125 competency items in their study of extension specialists and agents in Iran, while Reynolds (1993) included 141 professional competency items in his study of AEAs in Lousiana Co-operative Extension Service in the United States. Osei-Owusu (2000) found out that the perceptions of both AEAs and their supervisors were that AEAs in both the Central and Northern Regions of Ghana had medium or average level of competency in all the nine categories. Awang and Martin (1995) revealed in their study that both AEAs and their supervisors rated the AEAs as having moderate too high competency in all the seven competency categories.

In their Iran study, Pezeshki-Raad et al (1994) reported that both AEAs and their supervisors perceived AEAs as having high level of competency in all the eight competency categories.

2.3.4 INTEGRATING COMPETENCE

Competencies do not exist in isolation from each other, nor does a person use only one competency when responding to a situation. But according Klemp (1977) we tend to measure knowledge, skills and other personnel characteristics

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independently of each other, assuming that the sum of scores from individual tests presents a picture of the competent person. This is much like saying that the measure of a competent driver can be taken by separately testing for the ability to turn the steering wheel, to depress the accelerator and brake, and to recall the rules of the road. The art of driving requires an integration of these components. Competencies should be assessed not in a vacuum, but in the context of the complexity of the criterion for effectiveness.

Klemp suggests the use of a competency model to ensure that its assessment is not done in a vacuum but in integrated manner. He defined competency model as a functional clustering of individual competencies that tend to co-occur in situations where effective performance is demonstrated. The number of competencies in a particular model will vary depending on the complexity of the criterion for effectiveness. An individual may perform according to a number of different competency models, depending upon the number of outcomes at which he or she succeeds. In addition, there are certain enduring competency groups, which co-occur in relation to a variety of external performance criteria. These competencies are the most universal or generic, among which are cognitive skills, interpersonal skills, motives, and self-schemata that guide, organize and form the substance of effective behaviour in a wide range of work and life situations (Klemp, 1977). Their co-occurrence is both unconscious and compensatory, so that two people possessing different mixes of individual competencies may automatically produce functionally equivalent behaviour.

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The common assumption behind certification on the basis of skill testing is that a person needs to achieve above some criteria score in each test to be awarded a credential. This assumption would be correct if the component skills were independent, which in the case of competencies, they are not. As there are different behavioural manifestations of a given competency, so there are different competency manifestations of a given outcome. No human being can possibly possess all the competencies that educators would find desirable, but we can at least try to ensure that the competencies that are possessed function well together.

2.4 SELF AND INDEPENDENT EVALUATION OF COMPETENCY

Evaluation is essential for assessing the success or failure of an objective. It is a continuous process, which all human beings perform, more subconsciously than consciously.

Evaluation is defined as the systematic process of judging the worth, desirability, effectiveness, or adequacy of something according to definite criteria and purpose (Harris, 1968). The judgment is based upon a careful comparison of observation data with criteria standards.

Stufflebeam (1971) refers to evaluation as a science of providing information for decision-making. It has tremendous value if properly and carefully conducted. This usually requires trained evaluators. However, some of the major problems facing educational evaluation include a lack of trained evaluators, a lack of appropriate evaluation instrument and procedures, and lack of adequate evaluation theory.

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Adewumi (1976) asserts that so long as objective and scientific data are required for planning and development, formal evaluation will remain a necessity But the question researchers face is who is to perform the evaluation? Should a professional be asked to evaluate himself of should a researcher or outsider evaluate him? There are several arguments for and against either of the alternatives.

According to Stufflebeam (1971), even under the best of circumstances, judgmental processes are subject to human bias, prejudice, and vested interest. Competence, like truth, beauty and contact lenses, is in the eye of the beholder. The risk exists for the observer to over-depend upon personnel experiences, hearsay evidence, authoritative opinion and others. Furst (1972) explains that there are usually too many things going on at a time for an observer to observe all at once. Therefore, the observer concentrates mostly on those things which interest him or that he considers important. So he argues that an individual is in a better position to observe his own activities than an outside observer is. This notion is important most particularly if we consider that an individual is the most privileged to assess temporary favourable or traumatic factors that might have contributed or affected his immediate level of competency as perceived by any observer. But there are flaws in self-assessment too.

Furst (1972) explains that the validity and usefulness of self-assessment rests on the premise that the subject knows himself and his own behaviour well enough to be able to report the truth. He must also be willing to tell the truth rather than distort it. Apart from the factor of truthfulness, different individuals have different

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criteria standards for measuring competence. This difference may lead to over-assessment and/or under assessment when one instructor is compared to another The above becomes more critical and would influence the judgment of the instructors if they conceive evaluation as affecting their personal prestige. Herzberg (1974) describes the idea that every school system or every teacher can today be regarded as capable of meaningful evaluation of his/her own performance as absurdity. He rather suggests the use of academic and/or professional evaluators as independent judges.

Adewumi (1976) states that since there are myriad of arguments for and against self and independent evaluation, the probable third alternative is to combine both. A combination of self and independent assessment would strengthen the advantages of both while each also compensates for the disadvantages of the other. Again, Campbell and Fiske (1959) have documented the common sense motion that the more one increases different perspectives and techniques in measuring a phenomenon, the better will be the measurement. Those competencies which show no significant differences under the two evaluation approaches can reasonably be assumed to represent the truth. Further investigation might be necessary in those competencies where divergent results were obtained. Curriculum planners may utilize the findings and recommendations of those competencies where the two evaluations show no significant difference for planning curricula that are aimed at improving the competencies of instructors.

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This combine approach of evaluation has been used by several researchers in assessing the professional competencies of extension personnel and other agricultural professionals (Osei - Owusu, 2000; Ogoe 1998; Awang & Martin, 1995; Budke & Padde, 1994; Mallah, Williams & Miller, 1995; and Adewumi, 1976)

In his study of the professional competencies of AEAs in the Central and Northern Regions of Ghana, Osei-Owusu (2000) found similarities and differences in the self-evaluation of AEAs and that of their supervisors. In the Central Region, AEAs rated themselves significantly higher in seven out of the nine competency categories than the ratings of the supervisors while there was no significant difference between the two groups in all the nine categories in the Northern Region. He concluded that the relatively high disagreement between the perceptions of the agents and supervisors with regard to the level of competency of the agents suggests that the agents in the Central Region's performance might be poor. Ogoe (1989) found in his study that it was only in seven out of the 100 competency items that the self-evaluation of the extension supervisors was significantly higher than the independent ratings by the extension agents. So he concluded that assessment by the agents confirmed that the self-evaluation by the supervisors were correct. Budke and Padde (1994) in their study of the relationship between supervisory techniques of extension supervisors and organisational outcomes in Uganda, showed that there were significant differences between the perceptions of the leaders and those of their subordinates (extension agents) on all but one leadership style, that is, six out of seven

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categories. The AEAs rated their supervisors significantly lower in leadership styles than did the supervisors themselves, explaining that supervisors appear to be distanced from their subordinates as they viewed their leadership style as more effective than the AEAs saw them. Adewumi (1976), in comparing the self-perceived levels of competency of vocational agricultural instructors with that perceived by independent observers in Wisconsin found that there was positive agreement in 64 competency items and negative agreement in the remaining 25 competency items.

2.5 INDEPENDENT VARIABLES RELATING TO AGRICULTURAL EXTENSION AGENTS' COMPETENCY LEVELS

Most of the studies reported in the preceding pages also examined the relationship between selected demographic characteristics of extension personnel and their perceived level of competency. Findings from these studies indicate that variables such as age, gender, marital status, highest educational level, area of responsibility, position, years of experience and number of in-service training courses attended are significantly related to the perceived competency levels of extension personnel.

2.5.1 AGE

In their studies, Osei-Owusu (2000), Gonzalez (1982) and Sabihi (1978) found that older AEAs rated themselves significantly higher than younger AEAs in their professional competencies. Osei-Owusu reported that AEAs who were

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above 50 years rated themselves higher in programme planning and evaluation, adult education and farm record keeping competencies, that is three out of the nine competency categories. On the contrary, Ogoe (1998) Pezeshki Raad, (1994), Budke and Padde, (1994) and Adewumi (1976) all found in their studies that younger personnel rather rated themselves significantly higher than the older ones in some of the competencies. In Ogoe's work, younger supervisors (20-40 years) rated themselves 3.9 in programme planning compared to 3.4 by the older ones (41-60 years), while in Adewumi's (1976) study instructors above 45 years significantly rated themselves lower than those below 45 years in one competency item; judging students performance or products in relation to instructional goals. Others like Awang and Martin (1995) Agunga and Ntifo-Siaw (1994), Randway and Vaughan (1991) and Easter (1985), however, did not find any significant relationship between age and perceived competency level of extension personnel.

2.5.2 SEX

Osei-Owusu (2000) found in his studies that sex had a significant relationship with the level of competence of AEAs. Out of the nine competency categories, males rated themselves significantly higher in eight of them than their female counterparts, while there was no significant difference in the emerging issues category between the males and females. However, in his work with extension supervisors in Ghana, Ogoe (1998) found females rather rating themselves significantly higher in two of the eight categories than their male counterparts. It was in administration and programme planning competency

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categories. Agunga and Ntifo-Siaw (1994) however, did not find any significant difference between sex and supervisors' competency levels.

2.5.3 HIGHEST EDUCATIONAL LEVEL

Generally, it is expected that extension personnel with a higher level of educational qualification will have significantly higher levels of competency both professionally and technically, but results from several studies do not show that clearly. While some studies show that those with higher qualification rated themselves higher (Ogoe, 1998; Gonzalez, 1982; Sabihi, 1978 and Adewuni, 1976), other like Osei-Owusu (2000) found the contrary and others also did not find any significant difference between level of education and competency levels (Agunga and Ntifo-Siaw, 1994; Randavay and Vaughan, 1991).

Osei-Owusu (2000) found in his study that AEAs with a certificate in Agriculture qualification rated themselves significantly higher than their counterparts holding a Diploma in Agriculture in three out of the nine competency categories he studied. These were adult education, record keeping and need assessment. Ogoe (1984) on the other hand, found that extension supervisors with MSc. in Agriculture rated themselves significantly higher than those holding B.Sc and Diploma in Agriculture qualifications in five out of the eight competency categories. These were administration, teaching, communication, understanding human behaviour and evaluation. Adewumi (1976) found that secondary school agriculture instructors with M.Sc degrees rated themselves significantly higher

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than those with B.Sc degrees in five out of the eighty-nine competencies items he studied in Wisconsin.

2.5.4 WORKING EXPERIENCE

Review of the literature does not show a definite pattern of the effect of years of experience as an extension personnel on ones level of professional competence, even though it was expected that the longer ones working experience, the higher his/her perceived competency level. Some researchers (Budke and Paddie, 1994; Pezeeshi-Raad et al, 1994; and Adewumi, 1976) found that the extension personnel with more years of working experience rated themselves lower than their colleagues with less years of working experience in their levels of competency. Pezeeshki-Raad et al (1994) report that AEAs and specialists with less than three years experience rated themselves significantly higher in administration programme execution, communication and maintaining professionalism competency categories than those with three or more years experience. Budke and Paddie (1994) explain that personnel who held their position for a long period of time tended to generate less extra effort hence their lower level of competence. Adewumi (1976) also explains that experience will be a liability if it is indiscriminately equated and substituted for quality and skill.

Osei-Owusu (2000) and Sabihi (1978) report in their studies that AEAs with more working experience significantly rated themselves higher then those with less experience in some of the competency categories. However, Ogoe (1988), Awang and Martin (1995) and Agunga and Ntifo-Siaw (1994) did not find any

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significant difference between years of working experience and ones competency level. According to Awang and Martin (1995), a group of AEAs may have served in extension for varied years, but they all may have similar levels of competency in those areas which they had received inadequate or no training at all.

2.5.5 NUMBER OF IN-SERVICE TRAINING ATTENDED

The number of in-service training courses one has attended is supposed to impact greatly on ones competency levels, as the rationale behind almost all such training sessions is to enable the staff attending to perform better in whatever area the training was geared towards. But review of the literature indicates that it was not in all cases that the number of in-service training attended significantly affected the competency level of extension personnel.

Osei-Owusu (2000) in his study in the Central and Northern Regions of Ghana found that AEAs who had attended more than 15 training courses had a significantly higher competency levels than their counterparts who had attended less than 15 training courses in eight out of the nine competency areas he studied. Buake and Padde (1994) also found a significant relationship between the number of courses attended and the extension agents' perception. The more courses the agents had attended, the more critical they seem to be critical of their supervisors' capability in organizational effectiveness. However, Ogoe (1998) and Agunga and Ntifo-Siaw (1994) did not find any significant relationship between the perceived levels of competencies of extension personnel and the number of training courses they had attended. Agunga and Ntifo-Siaw (1994) explained that increased days

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of in-service training under T&V, for example did not increase officers' administrative and related skills because the in-service training and workshops focused mainly on technical agricultural subjects, to the detriment of social science skills such as communication, administration, and teaching methods.

2.6 SUMMARY OF REVIEWED LITERATURE

From the reviewed literature, the important role AEAs play in any agricultural development effort, especially in developing countries cannot be overemphasized. The success or otherwise of any agricultural project revolves around the AEA, who is the most critical link in the system. So the AEA needs to be professionally and technically competent to be able to meet the challenges he/she faces in his/her work. The view of various researchers is that for the AEA to be able to perform or deliver, he/she needs to be trained properly, both during pre-service era or formal education and the in-service era. But no matter the pre-service training, a well planned, effective and continuous in-service training for the AEA is a must, if he is to meet the challenges of his profession.

Generally, it is agreed by various authors that the AEA needs to possess a high level of both professional and technical competencies in certain areas in order to appropriately perform the task of his demanding position. The professional competency areas include administration, programme planning, programme execution, teaching, communication, understanding human behaviour, maintaining professionalism and evaluation. The technical competency areas include animal production, animal health and diseases, fish farming, crop

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production, plant protection, agroforestry, land and water management, mechanization, WIAD activities and farm management. All these areas need to be integrated properly during training sessions so that AEAs could function efficiently, meeting the diverse needs of their clientele.

Even though it is the view of many that AEAs should acquire most of these competencies during in-service training sessions, a well-developed pre-service training programme is a necessity if the in-service ones are to be very beneficial to AEAs. As to how competency assessment of AEAs is to be done, the view of many is that a combination of both self and independent evaluations achieves the best results.

The review also revealed that certain demographic characteristics of extension personnel have a bearing on the levels of their competencies, and so these should be considered when training programmes are being planned and developed for them.

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CHAPTER THREE

RESEARCH METHODOLOGY

The research methodology covers the following areas: research design, study area, the target populations, sampling procedure, research instruments, research variables, data collection, data processing and analysis.

3.1 RESEARCH DESIGN

A descriptive-correlational survey design was used to gather data concerning the professional and technical competencies of agricultural extension agents in the Western and Ashanti regions of Ghana. This design is appropriate for collecting perception data to describe existing conditions and relationships (Fraenkel and Wallen, 1990). Two reasons favouring the use of opinions and perceptions in survey research are that perceptional data are easy and less costly to collect and there is positive correlation between perceptional data and objective fact (Forgus and Melamed, 1976).

3.2 THE STUDY AREA

The study was undertaken in the Western and Ashanti Regions of Ghana (Figure 3.1). This was to ensure a wide coverage and also enable comparative analysis to be made.

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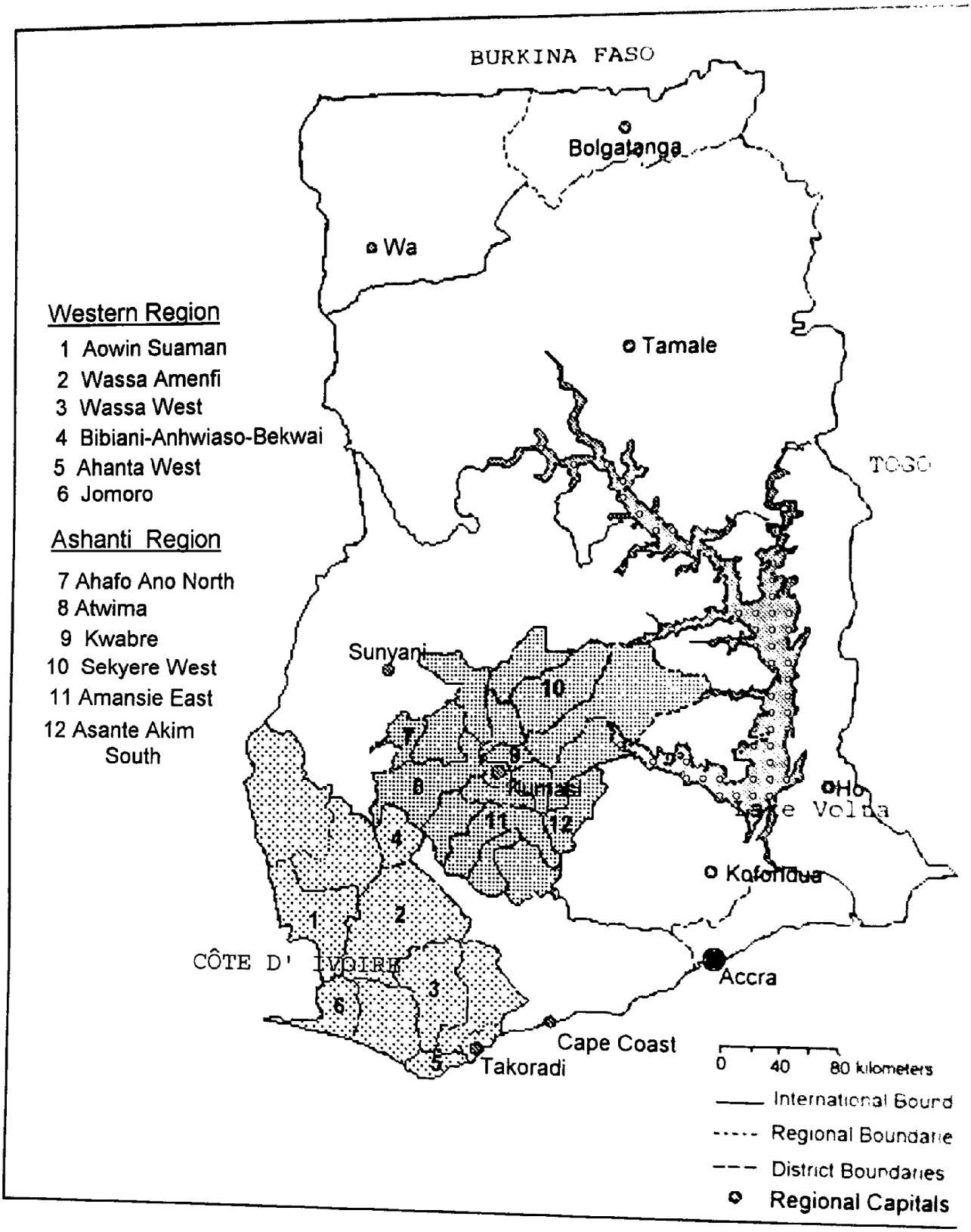


Figure 3.1: Map of Ghana showing the Administrative Regions (shaded) covered in the study

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3.2.1 THE WESTERN REGION

The Western Region is made up of eleven administration districts. The region shares borders with Central, Ashanti and Brong Ahafo Regions. It also shares a border with the Republic of La Cote d'ivoire on its Western side and the Gulf of Guinea on the Southern side. The region records the highest amount of rainfall in Ghana with an annual amount of over 1500mm. Some of the major rivers in the country including Rivers Pra, Tano and Bia can be found in the region.

The region has a population of 1,842,878 (Ghana Statistical Service, 2000) with majority of the people living in the rural areas. The population is predominantly agricultural with a high percentage earning their livelihood through farming and fishing. Four of the eleven districts are along the coast of the Gulf of Guinea. Plantation crops like cocoa, coconut, oil palm and rubber dominate the region. Other crops include maize, rice, yams, cocoyam and plantain.

3.2.1. ASHANTI REGION

The Ashanti Region is made up of eighteen (18) administrative districts. It shares borders with the Brong Ahafo, Eastern, Central and Western regions.

It is the most populous region in Ghana with a population of 3,187,601 (Ghana Statistical Service, 2000). Majority of this population lives in the rural areas, earning their living through farming activities. It has a bimodal rainfall pattern with annual amounts of over 1500mm. The major crops produced include cocoa, oil palm, maize, rice, yams, plantain, cassava, and cocoyam. Poultry

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production is also a major activity, especially around Kumasi and its surrounding environs.

3.3 TARGET POPULATION

The target populations for the study were the Agricultural Extension Agents and their supervisors (that is, the District Directors of Agriculture and District Development Officers of MOFA) in the Western and Ashanti Regions of Ghana. The lists of the target populations were obtained from the Western and Ashanti Regional Directorates of Agriculture.

3.4 SAMPLING

The two regions for the study were purposively selected. This is because no such study has been undertaken in these regions and also because of inadequate resources. Six (6) districts from each region were selected using simple random sampling. In the selected districts, all the AEAs and their supervisors were involved in the study. The districts selected in the Western Region were Bibiani - Anhwiaso-Bekwai, Aowin-Suaman, Wassa Amenfi, Wassa West, Ahanta West and Jomoro Districts. In the Ashanti Region, the selected districts were Ahafo Ano North, Atwima, Kwabre, Sekyere West, Amansie East and Ashanti Akim South districts.

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3.5 RESEARCH INSTRUMENTATION

Two separate questionnaires were developed and used to collect data from agricultural extension agents and their supervisors (Appendix II). Review of the literature and the experiences of the researcher as District Extension Officer with MOFA were used to develop the questionnaires. The questionnaires for the AEAs and their supervisors were the same except that while the AEAs used them to rate themselves, their supervisors used them to rate the AEAs under them as a group.

The questionnaires consisted of two (2) sections. Section one contained a comprehensive list of eighteen professional and technical competency areas containing a total of 237 competency items. The professional competency statements were divided into eight (8) identified major areas of agricultural extension. These were administration, programme planning, programme execution, teaching, communication, understanding human behaviour, maintaining professionalism and evaluation. The technical competency statements were divided into ten (10) major areas of agricultural production. These were animal production, animal health and disease, fish farming, crop production, plant protection, agro forestry, land and water management, mechanization, women in agricultural development (WIAD) and farm management

Extension agents and their supervisors, using a five-point likert type scale rated items in this section in terms of AEAs current perceived competency level. The scale ranged from 1=very low competency, 2=low competency, 3=moderate competency, 4=high competency, 5=very high competency.

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In addition, perception about the best time the professional and technical competencies should be acquired was also determined (that is whether pre-service or in-service).

Section two of the questionnaire was used to seek selected demographic information from the agents and their supervisors. These include age, sex, marital status, region, highest educational qualification, total years of experience in extension, number of in-service training and former technical departments.

Suitability and content validity of the instruments was established using a panel of experts consisting of four extension education specialists from the Department of Agricultural Economics and Extension, University of Cape Coast and three extension professionals from Ministry of Food and Agriculture.

Pre-testing of the instrument was carried out with nine AEAs and two supervisors in the Ahafo Ano South District of the Ashanti Region who were not included in the sampled districts but whose general characteristics were similar to the sampled population. The results of the pre-testing did not indicate a need for modifications of the instruments in order to improve their quality.

Table 3.1 shows the reliability coefficients of the eighteen professional and technical competency categories. The Cronbach's alpha co-efficients ranged from 0.81 to 0.96 showing that the instrument was internally consistent and reliable.

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Table 3.1: Cronbach's Alpha Reliability Test Results for Summated Subscales

Competency Category	No. of Items	Cronbach's Alpha
Administration	13	0 88
Programme Planning	9	0 92
Programme Execution	14	0.92
Teaching	20	0.92
Communication	15	0.90
Understanding Human Behaviour	14	0.88
Maintaining Professionalism	4	0.89
Evaluation	15	0.88
Animal Production	15	0.93
Animal Heath and Diseases	12	0.96
Fish Farming	17	0.95
Crop Production	21	0.95
Plant Protection	14	0.96
Agroforestry	9	0.95
Land and Water Management	6	0.90
Mechanization	11	0.81
WIAD	18	0.96
Farm Management	10	0.94

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3.6 RESEARCH VARIABLES

In this study the dependent and independent variables are as follows:

Dependent Variables

The dependent variables in the study were the perceived professional and technical competency levels expressed in the following eighteen (18) competency areas:

- Administration
- Programme Planning
- Programme Execution
- Teaching
- Communication
- Understanding Human Behaviour
- Maintaining Professionalism
- Evaluation
- Animal Production
- Animal Health and Diseases
- Fish Farming
- Crop Production
- Plant Protection
- Agroforestry
- Land and Water Management
- Mechanization

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- Women in Agricultural Development (WIAD)
- Farm Management

Independent Variables:

The independent variables of the study included

- Age
- Sex
- Marital status
- Region
- Highest educational qualification
- Total years of experience in extension
- Number of in-service training in the last five years
- Former technical department.

3.7 DATA COLLECTION PROCEDURE

The researcher contacted the Regional Directors of Agriculture in the Western and Ashanti Regions and they sent letters to the District Directors in the twelve selected districts in the two regions, requesting them to assist in the administration of the questionnaires and data collection.

The questionnaires were sent personally to the District Directors of Agriculture in the twelve selected districts. They in turn administered them to the agricultural extension agents and development officers in their districts. They were returned to the District Directors after completing and the researcher

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collected them from the Directors. Telephone calls and personal visits were made to some of the districts during data collection to ensure greater response rate. The questionnaires were administered in January 2000 and most of them returned by March 2000. A total of 179 respondents out of the estimated total number of 206 in the twelve districts of the two regions took part in the study (Table 3.2). This represents a response rate of 86.9%.

Table 3.2: Return Rates for the Questionnaires Distributed in the Western and Ashanti Regions

Respondents	Western			Ashanti			Overall		
	Sample	Returned	%	Sample	Returned	%	Sample	Returned	%
AEAs	83	69	83.1	83	75	90.4	166	144	86.7
Supervisors	19	15	78.9	21	20	95.2	40	35	87.5
Total	102	84	82.2	104	95	91.3	206	179	86.9

3.8 DATA PROCESSING AND ANALYSIS

The data collected were brought back to the University of Cape Coast. They were screened, coded and edited before being used for the analysis, using the Statistical Package for the Social Sciences (SPSS/PC+) software.

Descriptive statistics, which included frequencies, percentages, means, standard deviations and ranking, were used to summarize the data about the demographic characteristics of respondents and the professional and technical competencies items. T-test was performed to test the differences of means between the ratings by the extension agents and their supervisors of the selected competency areas and also between the ratings of extension agents in Western and Ashanti regions.

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T-test was also performed to test the significance between agricultural extension agents ratings and their age, sex and experience while one-way ANOVA was used to test their rating and their marital status, highest educational qualification, former technical department and number of training courses attended. The alpha level was established at 0.05 for all tests.

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CHAPTER FOUR

RESULTS AND DISCUSSION

The major findings of the study are presented and discussed in this chapter. The following are the main sections:

4.1 Demographic characteristics of respondents

4.2 AEAs level of professional and technical competencies and difference in competencies as perceived by AEAs and their supervisors

4.3 Professional and technical competencies needed by AEAs

4.4 Comparison of the mean perceptions of AEAs in the Western and Ashanti Regions

4.5 The best time for the acquisition of the professional and technical competencies

4.6 Relationship between the demographic characteristics of AEAs and their perceived competency level

4.7 Suggestions for improving the professional and technical competencies of AEAs

4.1 DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

This section presents the findings that were made as regards the demographic characteristics of Agricultural Extension Agents and their supervisors who took part in this study. These characteristics include age, sex, marital status, highest level of education attained, years of experience as extension agents, former

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technical department and number of training sessions attended by AEAs in the last five years.

4.1.1 AGE

The overall age distribution of the respondents showed that 2.1% of AEAs were between 20-29 years, 53.1% between 30-39 years, 34.3% between 40-49 years and 10.5% between 50-59 years, while 30.2% of supervisors were between 30-39 years, 48.5% between 40-49 years and 21.3% between 50-59 years (Table 4.1). The mean age of the AEAs was 40.0 years and that of their supervisors was 44.2 years.

In the Western Region, 2.9% of AEAs were between 20-29 years, 50.0% between 30-39 years, 39.7% between 40-49 years and 7.4% between 50-59 years; while for the supervisors, 30.8% were between 30-39 years, 46.1% between 40-49 years and 23.1% between 50-59 years. Their mean ages were 40.0 years for AEAs and 45.3 years for supervisors.

There was a similar trend of age distribution of the respondents in the Ashanti Region. While 1.3% of AEAs were between 20-29 years, 56.0% between 30-39 years, 29.4% between 40-49 years and 13.3% between 50-59years, 30.0% of supervisors were between 30-39 years, 50% between 40-49 years and 20.0% between the ages of 50-59 years. Their mean ages were 40.1 years for AEAs and 43.5 years for supervisors. This implies the AEAs and their supervisors have 20 and 15 more years respectively for active service; therefore any resources used to

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improve their competencies will be very beneficial to the ministry and not a waste.

Table 4.1: Age Distribution of Respondents in the Western and Ashanti Regions

	Western				Ashanti				Overall			
Age	AEAs	%	Sup	%	AEAs	%	Sup	%	AEA	%	Sup	%
20-29	2	2.9	-	-	1	1.3	-	-	3	2.1	-	-
30-39	34	50.0	4	30.8	42	56.0	6	30.0	76	53.1	10	30.2
40-49	27	39.7	6	46.1	22	29.4	10	50.0	49	34.3	16	48.5
50-59	5	7.4	3	23.1	10	13.3	4	20.0	15	10.5	7	21.3
Total	68	100	13	100	75	100	20	100	143	100	33	100
Means(SD)	40.0(6.0)		45.3(7.8)		40.1(7.2)		43.5(6.1)		40.0(6.6)		44.2(6.8)	

Sup = Supervisors

Source: Survey Data, 2000

4.1.2 SEX

Out of the 144 AEAs in the study, 93.1% were males and 6.9% females, while 88.6% of the 35 supervisors were males and 11.4% females (Table 4.2). In the Western Region, all the AEAs and their supervisors were males. In the Ashanti Region, 86.7% of the AEAs were males and 13.3% were females, while 80.0% of the supervisors were males and 20.0% were females.

This confirms the low number of female AEAs compared to males in most developing countries, including Ghana (Swanson et al, 1990). Generally, female enrolment in schools is low and this coupled with high drop out rate leaves a few girls entering colleges, including agricultural colleges, hence this results. Socially, husbands feel comfortable and do not become hostile or

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antagonistic if their wives are found in the company of female AEAs and therefore would allow their wives to be trained by female AEAs. It is the reverse when wives are found in the company of male AEAs. Therefore the low number of female AEAs in both the Ashanti and Western Regions will negatively affect effective transfer of technical and managerial skills to rural farm women whose importance to Ghana's agricultural production and development cannot be overemphasised.

Table 4.2: Sex of Respondents

	Western				Ashanti				Overall			
Gender	AEAs	%	Sup	%	AEAs	%	Sup	%	AEAs	%	Sup	%
Male	69	100	15	100	65	86.7	16	80.0	134	93.1	31	88.6
Female	0	0	0	0	10	13.3	4	20.0	10	6.9	4	11.4
Total	69	100	15	100	75	100	2	100	144	100	35	100

Sup = Supervisors

Source: Survey Data, 2000

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4.1.3 MARITAL STATUS

The majority (93.8%) of the AEAs in the study were married, 4.8% were single, 0.7% were divorced and another 0.7% widowed. 97.1% of the supervisors were married and 2.9% of them were single (Table 4.3).

In the Western Region, 95.7% of the AEAs were married and 4.3% single, while all the supervisors were married. In the Ashanti Region, 92.0% of the AEAs were married, 5.4% single 1.3% divorced and 1.3% widowed, while 95% of the supervisors were married and 5% were single.

The majority of AEAs being married suggests that they will be respected members of their communities as married people are generally respected in the society. This has a bearing on the perception of the public on the status of the AEA, and therefore agriculture. So his or her views, including technical messages or information will be accepted by the community, and when applied to their farming activities will lead to improvement in their agricultural productivity and development.

Table 4.3: Marital Status of Respondents

Marital Status	Western				Ashanti				Overall			
	AEAs	%	Sup	%	AEAs	%	Sup	%	AEA	%	Sup	%
Married	66	95.7	15	100	69	92.0	19	95.0	135	93.8	34	97.1
Single	3	4.3	0	0	4	5.4	1	5.0	7	4.8	1	2.9
Divorced	0	0	0	0	1	1.3	0	0	1	0.7	0	0
Widowed	0	0	0	0	1	1.3	0	0	1	0.7	0	0
Total	69	100	15	100	75	100	20	100	144	100	35	100

Sup = Supervisors

Source: Survey Data, 2000

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4.1.4 HIGHEST LEVEL OF EDUCATION ATTAINED BY RESPONDENTS

Table 4.4 shows that most of the AEAs in the study (91.0%) possessed Certificate in Agriculture, 7.6% possessed Diploma in Agriculture and 1.4% possessed Middle School Leaving Certificate (MSLC). The supervisors' educational level on the other hand, ranged from Certificate in Agriculture to Master of Science (M.Sc.) in Agriculture. These were 5.7%, 37.1%, 42.9% and 14.3% respectively for Certificate in Agriculture, Diploma in Agriculture, Bachelor of Science (B.Sc.) in Agriculture and M.Sc in Agriculture.

In the Western Region, 2.9% of AEAs possessed MSLC, 87.0% possessed Certificate in Agriculture and 10.1% possessed Diploma in Agriculture. However, majority of the supervisors (46.7%) possessed B.Sc in Agriculture, 33.3% possessed Diploma in Agriculture, 13.3% possessed M.Sc in Agriculture and 6.7% possessed Certificate in Agriculture. In the Ashanti Region, 94.7% of AEAs possessed Certificate in Agriculture and 5.3% possesed Diploma in Agriculture. Among the supervisors, 40% possessed Diploma in Agriculture, 40% possessed B.Sc., 15% possessed M.Sc. and 5% possessed Certificate in Agriculture.

Table 4.4: Highest Level of Education Attained by Respondents

Educational level	Western				Ashanti				Overall			
	AEAs	%	Sup	%	AEAs	%	Sup	%	AEA	%	Sup	%
MSLC	2	2.9	0	0	0	0	0	0	2	1.4	0	0
Cert.	60	87.0	1	6.7	71	94.7	1	5.0	131	91.0	2	5.7
Diploma	7	10.1	5	33.3	4	5.3	8	40.0	11	7.6	13	37.1
B.Sc.	0	0	7	46.7	0	0	8	40.0	0	0	15	42.9
M.Sc.	0	0	2	13.3	0	0	3	15.0	0	0	5	14.3
Total	69	100	15	100	75	100	20	100	144	100	35	100

MSLC= Middle School Leaving Certificate Cert= Certificate in Agriculture Sup = Supervisors

Source: Survey Data, 2000

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In the Western Region, 2.9% of AEAs possessed MSLC, 87.0% possessed Certificate in Agriculture and 10.1% possessed Diploma in Agriculture. However, majority of the supervisors (46.7%) possessed B.Sc in Agriculture, 33.3% possessed Diploma in Agriculture, 13.3% possessed M.Sc in Agriculture and 6.7% possessed Certificate in Agriculture. In the Ashanti Region, 94.7% of AEAs possessed Certificate in Agriculture and 5.3% possesed Diploma in Agriculture. Among the supervisors, 40% possessed Diploma in Agriculture, 40% possessed B.Sc., 15% possessed M.Sc. and 5% possessed Certificate in Agriculture.

Table 4.4: Highest Level of Education Attained by Respondents

Educational level	Western				Ashanti				Overall			
	AEAs	%	Sup	%	AEAs	%	Sup	%	AEA	%	Sup	%
MSLC	2	2.9	0	0	0	0	0	0	2	1.4	0	0
Cert.	60	87.0	1	6.7	71	94.7	1	5.0	131	91.0	2	5.7
Diploma	7	10.1	5	33.3	4	5.3	8	40.0	11	7.6	13	37.1
B.Sc.	0	0	7	46.7	0	0	8	40.0	0	0	15	42.9
M.Sc.	0	0	2	13.3	0	0	3	15.0	0	0	5	14.3
Total	69	100	15	100	75	100	20	100	144	100	35	100

MSLC= Middle School Leaving Certificate Cert= Certificate in Agriculture Sup = Supervisors

Source: Survey Data, 2000

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This result agrees with several other studies (Swanson et al, 1990, Ogoe, 1998; and Osei-Owusu, 2000) which confirm the low level of education of AEAs in most developing countries. This partly accounts for their poor performance Therefore serious efforts must be initiated to upgrade their educational levels, like the B.Sc. (Extension) programme currently underway at the University of Cape Coast for middle level extension personnel.

4.1.5 YEARS OF EXPERIENCE OF AGRICULTURAL EXTENSION AGENTS

Table 4.5 presents information regarding years of experience of AEAs. The number of AEAs who had served between 1-5 years was 46.2%, while 9.7% had served for between 6-10 years, 16.8% between 11-15 years, 15.4% between 16-20 years, 9.1% between 21-25 years and 1.4% each between 26-30 years and 31-35 years. The mean years of experience of all the AEAs was 9.7 years.

Table 4.5: Years of Experience of Agricultural Extension Agents

Years of Experience	Western			Ashanti			Total		
	Freq.	%	cumm.%	Freq.	%	Cumm.%	Freq.	%	cumm.%
1-5	33	48.5	48.5	33	44.0	44.0	66	46.2	46.2
6-10	7	10.3	58.8	7	9.3	53.3	14	9.7	55.9
11-15	9	13.3	72.2	15	20.0	73.3	24	16.8	72.7
16-20	14	20.5	92.6	8	10.7	84.0	22	15.4	88.1
21-25	4	5.9	98.5	9	12.0	96.0	13	9.1	97.2
26-30	1	1.5	100	1	1.3	97.3	2	1.4	98.6
31-35	0	0		2	2.6	100	2	1.4	100
Total	68	100		75	100		143	100	
Mean (SD)	9.1(7.7)			10.2(8.5)			9.7(8.1)		

Source: Survey Data, 2000

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In the Western Region, 58.8% of AEAs had served between 1-10 years, 33.8% between 11-20 years and 7.4% between 21-30 years. In the Ashanti Region, 53.3% of them had served between 1-10 years, 30.7% between 11-20 years, 13.3% between 21-30 years and 2.6% between 31-35 years (Table 4.5). While the mean years of experience was 9.1 years for AEAs in the Western Region, that of AEAs in Ashanti Region was 10.2 years.

This suggests that the AEAs have held their positions for quite a time and this is an asset to the ministry in the sense that they have acquired experience and naturally have become more skilful in the discharge of their duties. Coupled with staff motivational factors like regular in-service training, high remunerations, provision of means of transport, payment of travelling and transport allowance and timely promotions among others (Awang and Martin, 1995; Moris, 1991 and Adewumi, 1976) the AEAs would assist a lot of farmers improve upon their farm business and thus contribute to moving agriculture forward.

4.1.6 FORMER TECHNICAL DEPARTMENT OF AEAS

Table 4.6 shows the Technical Departments AEAs belonged to before the decentralization of the Ministry of Food and Agriculture (MOFA) in 1997. More than half of the AEAs (55.2%) belonged to the Extension Services, 14.0% were with the Crop Services, 18.2% were with the Policy Planning Monitoring and Evaluation Department (PPMED), 4.9% each were with the Plant Protection and Regulatory Services Department (PPRSD) and Veterinary Services Department (VSD). 1.4% were with Women in Agricultural Development (WIAD), 0.7% with

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Animal Production Department (APD) and 0.7% with Agricultural Engineering Services Department.

In the Western Region, 56.5% of the AEAs were formerly with the Extension Services, 13.0% with the Crops Services, 17.4% with the PPMED, 7.3% with the PPRSD and 5.8% with the Veterinary Services Department. In the Ashanti Region the majority of them were with Extension Services (54.1%), 14.9% with Crop services, 18.9% with PPMED, 2.7% each with PPRSD and WIAD, 4.1% with the Veterinary Services Department and 1.3% each with the Animal Production and Agricultural Engineering Services.

Table 4.6: Former Technical Departments of Extension Agents

Former Technical Department	Western		Ashanti		Total	
	Freq.	%	Freq.	%	Freq.	%
Extension Services	39	56.5	40	54.1	79	55.2
Crop Services	9	13.0	11	14.9	20	14.0
PPMED	12	17.4	14	18.9	26	18.2
PPRSD	5	7.3	2	2.7	7	4.9
Veterinary Services	4	5.8	3	4.1	7	4.9
Animal Production	0	0	1	1.3	1	0.7
WIAD	0	0	2	2.7	2	1.4
Agric. Engineering	0	0	1	1.3	1	0.7
Total	69	100	74	100	143	100

Source: Survey Data, 2000

The 44.8% of AEAs who were not formerly with the Extension services implies that their professional competency and technical competency in areas outside their own will be low. Hence their ability to extend technical messages in agriculture would be flawed and not auger well for agricultural development. The need therefore exists for intensified training for this category of officers to ensure effectiveness

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4.1.7 NUMBER OF TRAINING SESSIONS ATTENDED BY EXTENSION AGENTS IN THE LAST FIVE YEARS

More than half of the AEAs (52.1%) had attended over twenty training sessions in the last five years (Table 4.7). Over twenty four per cent (24.3%) attended between 1-5 trainings, 9.7% attended 6-10 trainings, 6.3% attended 11-15 trainings and 5.6% attended 16-20 training's. The trend of training sessions was similar in the two regions. In the Western Region, 53.6% attended over 20 training sessions, 20.3% attended between 1-5, 14.5% attended between 6-10, 8.7% attended between 11-15 and 2.9% between 16-20 trainings. In the Ashanti Region, 52.8% attended over twenty training sessions, 29.2% attended between 1-5 trainings, 5.6% attended between 6-10 trainings, 4.2% attended between 11-15 trainings and 8.3% had attended between 16-20 trainings.

Table 4.7: Number of Training Session Attended by Extension Agents

No. of Training Attended	Western		Ashanti		Total	
	Freq.	%	Freq.	%	Freq.	%
1-5	14	20.3	21	29.2	35	24.3
6-10	10	14.5	4	5.6	14	9.7
11-15	6	8.7	3	4.2	9	6.3
16-20	2	2.9	6	8.3	8	5.6
>20	37	53.6	38	52.8	75	52.1
Total	69	100	72	100	141	100

Source: Survey, Data, 2000

The AEAs who have attended over 20 in-service trainings in the last five years (52.1%) could be those who were formerly with Extension Services Department as can be in Table 4.6 and therefore benefited from a lot of training

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programmes under the National Agricultural Extension Project (NAEP). This implies that the rest of the AEAs, especially those who had attended less than six trainings in the last five years (24.3%) will not be able to effectively extend proven agricultural messages to farmers thereby hampering increased agricultural production.

4.2 LEVEL OF PROFESSIONAL AND TECHNICAL COMPETENCIES OF EXTENSION AGENTS AND DIFFERENCE IN COMPETENCIES AS PERCEIVED BY AEAS AND THEIR SUPERVISORS

Two of the specific objectives of the study were to identify the professional and technical competency levels of AEAs as perceived by the AEAs and their supervisors and to compare the perceptions of AEAs and their supervisors regarding the level of professional and technical competency of AEAs. This section presents the results and discussion. Differences between the AEAs and supervisors ratings were determined using the t-test at the 0.05 level of significance.

4.2.1 ADMINISTRATION

The AEAs rated themselves as having moderate competency in all the 13 items under the administration competency (2.72 to 3.48) Table 4.8. The grand mean for the competency was 3.11. They rated 'managing time effectively' as highest (3.48) followed by 'receiving official visitors to your area of operation'

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(3.45) and 'ability to manage scarce resources for optimum productivity' (3.38). The least rated (2.72) was 'budget preparation'.

The supervisors rated the AEAs as having moderate to high competency (2.65-3.77). The grand mean of the administration competency was 3.21. Their highest rank competency was 'receiving official visitor to your area of operation' (3.77), followed by 'orienting new staff under studying you' (3.51) and 'providing recognition for clients' (3.46). They also ranked 'budget preparation' as the least (2.65).

The AEAs and the supervisors generally did not show any significant difference in their ratings except three of the 13 items. These were 'orienting new staff under studying you', 'providing recognition for clients' and 'receiving official visitors to your area of operation' in which the supervisors ratings were higher than the AEAs themselves. This result is in contrast to that of Osei-Owusu (2000). In his study, AEAs self-ratings were higher than that of their supervisors in the administration competency. But both studies agreed, however, that the AEAs administration competency level was moderate. This result could be due to the fact that most training programmes for AEAs exclude administration competency areas, as this is normally reserved for their supervisors and directors. This suggests that management of agricultural development programmes at the field level will be poor, leading to only fleeting improvements by these programmes (Eicher, 1986; Kubr & Wallace, 1983).

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Table 4.8: Means, Standard Deviation and Ranking of Administration Competency Position Title of all Respondents

Administration Competency	AEAs N=144			Supervisors N=35			t - value	Total N=179		
	Mean	SD	Rank	Mean	SD	Rank		Mean	SD	Rank
1. In-depth knowledge and understanding of government agricultural policies (e.g. decentralization)	3.02	0.84	10	3.20	0.68	6	-1.27	3.06	0.81	11
2. Writing realistic goals for the extension programme	3.09	0.84	6	3.03	0.75	11	0.41	3.08	0.82	9
3. Ability to manage scarce resources for optimum productivity	3.38	0.95	3	3.33	0.74	4	0.24	3.37	0.91	3
4. Coordinating the use of equipments, facilities and resources with office staff	3.05	0.94	9	3.11	0.80	9	-0.37	3.06	0.91	10
5. Budget preparation	2.72	1.03	13	2.65	0.88	13	0.36	2.70	1.00	13
6. Managing time effectively	3.48	0.91	1	3.14	0.88	7	1.96	3.41	0.91	2
7. Promoting inter office communications	2.86	0.98	12	3.09	0.89	10	-1.25	2.90	0.96	12
8. Orienting new staff under studying you	3.00	1.02	11	3.51	0.74	2	-2.85*	3.10	0.99	7
9. Providing recognition for clients	3.06	0.95	7	3.46	0.78	3	-2.26*	3.14	0.93	5
10. Preparing job description/specification	3.13	0.93	5	3.00	0.95	12	0.76	3.12	0.93	6
11. Managing conflicts	3.06	1.03	8	3.23	0.84	5	-0.92	3.10	1.00	8
12. Receiving official visitors to your area of operation	3.45	0.89	2	3.77	0.69	1	-2.00*	3.51	0.87	1
13. Delegating responsibility and authority	3.21	1.00	4	3.12	0.91	8	0.49	3.20	0.98	4
GRAND MEAN	3.11	0.60		3.21	0.57		-0.82	3.13	0.59	

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*$P \leq 0.05$

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4.2.2 PROGRAMME PLANNING

Table 4.9 shows that the level of AEAs programme planning competency was moderate (3.26). The ratings of AEAs and their supervisors did not show any significant difference except in one item; 'determining the needs of clientele for extension programmes', though the supervisors' ratings were generally higher than that of the AEAs. The grand mean of all the respondents together was 3.26.

The AEAs ranked 'preparing annual programme of work for your area of responsibility' as first (3.58) followed by 'developing a calendar of extension activities' (3.57) and 'determining objectives of the programme' (3.38) with 'planning for resources' as the least ranked item (2.93). The supervisors on the other hand rated 'developing a calendar of extension activities' highest (3.74) followed by 'preparing annual programme of work for your area of operation' (3.60) and 'determining the needs of clientele for extension programmes' (3.54). 'Preparing a long-range programme of work' was the lowest rated item (2.85). The only competency item that showed significant difference between the ratings of AEAs and supervisors was 'determining the needs of clientele for extension programmes'. The grand mean of AEAs rating for the 9 competency items was 3.25 while that of their supervisors was 3.45. This result is at variance with the findings of Osei-Owusu (2000) who in comparing the perceptions of AEAs and their supervisors in the Central and Northern Regions regarding programme planning competency level, established that the AEAs perceptions were significantly higher than that of the supervisors. Both studies though, found this competency level as moderate for the AEAs.

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Table 4.9: Means, Standard Deviation and Ranking of Programme Planning Competency by Position Title of all Respondents

Programme Planning Competency	AEAs N=144			Supervisors N=35			t - value	Total N=179		
	Mean	SD	Rank	Mean	SD	Rank		Mean	SD	Rank
1. Developing a calendar of extension activities	3.57	0.88	2	3.74	0.78	1	-1.04	3.61	0.87	1
2. Determining the needs of clientele for extension programmes	3.15	0.90	6	3.54	0.70	3	-2.41*	3.22	0.87	6
3. Determining objectives/goals of the extension programme	3.38	0.91	3	3.49	0.82	4	-0.62	3.40	0.89	3
4. Establishing programme priority	3.27	0.90	4	3.46	0.85	5	-1.14	3.30	0.89	4
5. Preparing annual programme of work for your area of responsibility	3.58	0.84	1	3.60	0.95	2	-0.10	3.59	0.86	2
6. Preparing a long-range programme of work	3.06	0.96	7	2.85	0.93	9	1.11	3.02	0.96	7
7. Involving co-workers in programme planning	3.25	1.04	5	3.23	1.03	6	0.11	3.25	1.04	5
8. Planning for resources (human and material)	2.93	0.98	9	3.03	0.95	7	-0.53	2.95	0.98	9
9. Involving extension support groups and clientele in programme planning	3.02	0.97	8	3.00	1.11	8	0.26	3.01	1.00	8
GRAND MEAN	3.25	0.73		3.45	0.60		-0.55	3.26	0.72	

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*P ≤ 0.05

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Since programme planning is very vital for the success of any extension activity (Van den Ban and Hawkins, 1996) the moderate level of AEAs competency in this area implies that activities to be carried out by AEAs would not be thoroughly planned to achieve optimum results or outcome.

4.2.3 PROGRAMME EXECUTION

AEAs level of competency in programme execution as found in the study was moderate with a total grand mean of 3.42 (Table 4.10). The grand means for the AEAs and their supervisors were 3.42 and 3.45 respectively, which was not significantly different. There was also no difference between the two groups in all the 14 competency items under the programme execution category.

The three highest rated competency items in this area by AEAs were 'conducting home/farm visits' (3.98), ' completing monthly or annual reports' (3.84) and 'conducting demonstrations' (3.84). Those of the supervisors were the same three items, with the second and third changing positions. The lowest rated item by the AEAs was 'facilitating groups of people having great diversity and multiple perspectives' (3.03) and that of supervisors was 'ability to organise simulation and role-play' (3.00)

Osei-Owusu (2000), in a similar study in the Central and Northern Regions, also found the AEAs competency level in programme execution as moderate but there was significant difference between the AEAs and their supervisors' ratings, the latter's rating being lower. The items of this competency being what the AEAs mostly do on the field, their moderate level of competency

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Table 4.10: Means, Standard Deviation and Ranking of Programme Execution Competency by Position Title of all Respondents

Programme Execution Competency	AEAs N=144			Supervisors N=35			t – value	Total N=179		
	Mean	SD	Rank	Mean	SD	Rank		Mean	SD	Rank
1. Utilizing a calendar of activities / events	3.48	0.89	6	3.59	0.74	4	-0.66	3.50	0.86	6
2. Following a written programme of work	3.51	0.91	5	3.50	0.93	6	0.04	3.51	0.91	5
3. Providing leadership for programme planning and execution	3.06	0.92	13	3.35	0.77	9	-1.74	3.11	0.90	12
4. Developing a working relationship with clientele	3.59	0.84	4	3.47	0.86	7	0.72	3.57	0.84	4
5. Completing monthly or annual reports	3.84	0.87	2	3.79	0.88	3	0.26	3.83	0.87	3
6. Involving others in executing plans	3.20	0.84	10	3.32	0.88	10	-0.75	3.23	0.85	10
7. Conducting home/farm visits	3.98	0.90	1	3.88	0.64	1	0.59	3.96	0.86	1
8. Conducting demonstrations	3.84	0.95	3	3.85	0.74	2	-0.08	3.84	0.91	2
9. Organizing clientele into groups (group formation)	3.47	0.99	7	3.53	0.86	5	-0.31	3.48	0.97	7
10. Facilitating groups of people having great diversity and multiple perspectives.	3.03	0.87	14	3.21	0.69	12	-1.11	3.06	0.84	14
11. Ability to organise simulation and role-playing	3.08	0.89	12	3.00	0.89	14	0.45	3.06	0.89	13
12. Ability to recognize errors in the course of programmes	3.26	0.83	9	3.26	0.86	11	-0.03	3.26	0.83	9
13. Monitoring of extension programmes	3.36	0.86	8	3.38	0.92	8	-0.12	3.37	0.87	8
14. Co-ordinating extension programmes and that of other groups (e.g. NGOs, Churches, etc.)	3.13	1.00	11	3.15	0.82	13	-0.07	3.14	0.96	11
GRAND MEAN	3.42	0.63		3.45	0.59		-0.28	3.42	0.62	

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*P ≤ 0.05

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suggests that AEAs execution of extension programmes will be flawed, leading to low productivity by our farmers and therefore agricultural development generally will be poor.

4.2.4 TEACHING

The level of the teaching competency category of the AEAs in the study areas as perceived by both AEAs themselves and their supervisors was moderate (3.18). There was no significant difference between the two groups in all the twenty items, making up this competency category (Table 4.11).

Both AEAs and their supervisors rated 'listening to questions and suggestions from audience' as the highest (3.66) followed by 'presenting information in a meeting' (3.64). But while AEAs ranked 'conducting group discussions' as third (3.59), supervisors ranked "judging exhibits at agricultural shows' as third (3.62). Also AEAs and their supervisors ranked 'presenting information with an overhead projector' and 'presenting information with slides' as the last two competency items.

This result could be due the fact that most of the AEAs do not get the opportunity of using most of the teaching aids or facilities in their work due to their unavailability in most district offices. So AEAs' teaching of farmers will be poorly done resulting in low adoption of improved farming practices by the farmers and therefore agricultural production will be poor.

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Table 4.11: Means, Standard Deviation and Ranking of Teaching Competency by Position Title of all Respondents

Teaching Competency	AEAs N=144			Supervisors N=35			t - value	Total N=179		
	Mean	SD	Rank	Mean	SD	Rank		Mean	SD	Rank
1. Using principles (basic ideas or rules) of learning or teaching	3.33	0.91	9	3.41	0.56	9	-0.48	3.35	0.85	10
2. Using teaching materials (e.g. flip charts, folders training guides, etc.)	3.27	1.05	12	3.18	1.09	14	0.49	3.26	1.05	12
3. Ability to select non-formal methods/techniques for particular situations	3.10	1.03	14	3.39	0.79	10	-1.55	3.15	0.99	14
4. Presenting information in a lecture	3.31	0.94	10	3.44	0.66	8	-0.78	3.33	0.90	11
5. Presenting a concept, principle or skill through method demonstration	3.37	0.93	8	3.61	0.66	5	-1.40	3.41	0.89	8
6. Presenting information in a meeting	3.64	0.83	2	3.65	0.81	1	-0.05	3.64	0.83	2
7. Presenting information in a seminar	2.98	1.06	16	2.91	0.90	17	0.34	2.97	1.03	16
8. Presenting information at a field day	3.44	0.99	7	3.61	0.75	4	-0.92	3.47	0.95	7
9. Presenting information with an overhead projector	2.09	1.08	19	2.12	1.04	19	-0.13	2.10	1.07	19
10. Presenting information with slides	2.08	1.02	20	2.03	0.98	20	0.24	2.07	1.01	20

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5=V. High Competency

*P ≤ 0.05

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Table 4.11: Means, Standard Deviation and Ranking of Teaching Competency by Position Title of all Respondents

Teaching Competency	AEAs N=144			Supervisors N=35			t - value	Total N=179		
	Mean	SD	Rank	Mean	SD	Rank		Mean	SD	Rank
11. Presenting information with charts	2.91	1.01	17	2.85	1.08	18	0.29	2.90	1.02	17
12. Presenting information with chalk board	3.14	1.05	13	3.24	0.85	13	-0.50	3.16	1.01	13
13. Conducting group discussions	3.59	0.86	3	3.47	0.75	7	0.75	3.57	0.84	3
14. Using the problem solving approach to teaching	3.09	0.93	15	3.09	0.83	15	0.02	3.09	0.91	15
15. Encouraging audience to ask questions	3.51	0.88	5	3.38	0.74	11	0.79	3.49	0.85	6
16. Planning, organizing and conducting tours and field trips	2.66	1.10	18	3.03	0.87	16	-1.84	2.73	1.07	18
17. Judging exhibits at agricultural shows	3.29	1.02	11	3.62	0.70	3	-1.76	3.36	0.97	9
18. Ability to recognize the importance of punctuality	3.55	0.88	4	3.55	0.88	4	1.18	3.51	0.89	5
19. Listening to questions and suggestions from audience	3.66	0.80	1	3.66	0.80	1	0.20	3.65	0.77	1
20. Organizing seating arrangement for audience	3.51	0.96	6	3.51	0.96	6	-0.30	3.52	0.91	4
GRAND MEAN	3.18	0.65		3.18	0.65		-0.39	3.19	0.63	

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*P ≤ 0.05

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4.2.5 COMMUNICATION

Table 4.12 presents the mean perceptions of AEAs and their supervisors regarding the communication competency category. There was no significant difference between the ratings of the AEAs and supervisors in all the fifteen items making up this competency. Their ratings ranged from very low competency to high competency. The grand mean for all respondents combined was 2.91.

The AEAs ranked 'speaking to individuals' as highest (3.96), followed by 'speaking to groups' (3.68) and 'establishing communication among extension staff' (3.41) was the third item.. They ranked 'the use of computer' (1.35) as the least. The supervisors also ranked 'speaking to individuals' as highest (3.91) followed by 'establishing communication among extension staff' (3.63) and 'speaking to groups' (3.56). 'The use of computer' was also ranked as the least (1.43) by the supervisors. Osei-Owusu (2000), however, found significant difference between the mean rating of AEAs and their supervisors in this communication competency in his study. Since the work of AEAs basically involves communicating with their clientele, the moderate level of communication competency suggests that they are not adequately conversant with communication skills. The AEAs inability to properly communicate technical messages would impact negatively on the farmers' productivity.

4.2.6 UNDERSTANDING HUMAN BEHAVIOUR

The level of AEAs competency in understanding human behaviour as perceived by the AEAs themselves and their supervisors was moderate (3.31) as

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Table 4.12: Means, Standard Deviation and Ranking of Communication Competency by Position Title of all Responded

Communication competency	AEAs N=144			Supervisors N=35			t - value	Total N=179		
	Mean	SD	Rank	Mean	SD	Rank		Mean	SD	Rank
1. Establishing communication among extension staff	3.41	0.96	3	3.63	0.69	2	-1.27	3.65	0.80	2
2. Writing letters and / or memos	3.01	0.91	9	3.31	0.72	5	-1.86	3.07	0.88	9
3. Writing and / or completing special reports	3.09	0.93	7	3.29	0.62	6	-1.56	3.13	0.88	6
4. Speaking to groups	3.68	0.83	2	3.56	0.66	3	0.47	3.65	0.80	2
5. Speaking to individuals	3.96	0.84	1	3.91	0.67	1	0.29	3.95	0.81	1
6. Using non-verbal communications	2.83	1.07	11	2.86	1.00	11	-0.14	2.83	1.05	11
7. Possession of listening skills	3.16	1.00	5	3.34	0.73	4	-1.02	3.20	0.95	5
8. Preparing extension publications	2.47	1.04	12	2.53	0.83	12	-0.30	2.48	1.00	12
9. Act on correspondence promptly	3.11	0.97	6	3.03	0.75	10	0.44	3.09	0.92	7
10. Establishing working relationships with other governmental organizations	2.97	0.96	10	3.24	0.82	7	-1.47	3.02	0.94	10
11. The use of camera and / or other photographic equipment	1.89	1.15	14	1.83	0.98	14	0.28	1.88	1.11	14
12. The use of tape recorder	2.23	1.29	13	2.11	1.16	13	0.46	2.20	1.26	13
13. The use of the computer	1.35	0.78	15	1.43	0.85	15	-0.5	1.37	0.79	15
14. Interacting with personnel of higher position	3.04	1.01	8	3.23	0.84	8	-1.00	3.08	0.98	8
15. Establishing working relationship with strangers	3.30	0.91	4	3.23	0.73	9	0.45	3.29	0 87	4
GRAND MEAN	2.90	0.64		2.97	0.52		-0.61	2.91	0 62	

Source: Survey Data, 2000

Scale: 1 -Very Low Competency, 2--Low Competency, 3-- Moderate Competency, 4 = High Competency, 5 - Very High Competency

* $P \leq 0.05$

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Table 4.13: Means, Standard Deviation and Ranking of Understanding Human Behaviour Competency by Position Title of all Respondents

Understanding Human Behaviour Competency	AEAs N=144			Supervisors N=35			t - value	Total N=179		
	Mean	SD	Rank	Mean	SD	Rank		Mean	SD	Rank
1. Application of principles of motivation	3.14	0.87	10	2.97	0.98	11	0.98	3.10	0.90	11
2. Identification of factors that influence people become involved	3.04	0.94	12	2.94	0.87	12	0.57	3.02	0.92	12
3. Determine the effect of pressure groups on people's behaviour	2.87	0.92	13	2.83	0.86	13	0.24	2.86	0.90	13
4. Applying factors affecting behaviour of people	2.86	0.91	14	2.74	0.89	14	0.66	2.83	0.90	14
5. Ability to influence people to accept change	3.53	0.85	6	3.34	0.76	7	1.20	3.49	0.83	5
6. Ability to identify the power structure within the community	3.08	0.86	11	3.29	0.67	8	-1.34	3.12	0.83	10
7. Ability to identify pressure groups in the community	3.19	0.86	9	3.24	0.70	9	-0.28	3.20	0.83	9
8. Utilizing knowledge of interaction of people in groups	3.21	0.80	8	3.23	0.73	10	-0.13	3.21	0.79	8
9. Recognizing differences in age groups	3.55	0.82	3	3.57	0.70	5	-0.12	3.56	0.80	4
10. Recognizing traditional culture and its effect	3.33	0.83	7	3.62	0.65	3	-1.90	3.38	0.80	7
11. Ability to accommodate religious differences	3.65	0.94	2	3.76	0.61	1	-0.69	3.67	0.88	2
12. Ability to accommodate other social groups	3.54	0.81	4	3.71	0.68	2	-1.09	3.57	0.79	3
13. Understanding your own nature (strengths and weaknesses)	3.82	0.89	1	3.51	0.78	6	1.83	3.76	0.88	1
14. Recognizing the role of different sexes and how it influences change	3.46	0.88	6	3.60	0.77	4	-0.87	3.49	0.86	6
GRAND MEAN	3.31	0.86		3.31	0.54		0.05	3.31	0.65	

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*$P \leq 0.05$

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shown in Table 4.13. And there was no significant difference between the mean ratings of the two groups in any of the fourteen items making up the competency.

The AEAs ranked as the three highest competency items, the following; 'understanding your own nature' (3.82), recognising the role of different sexes and how it influences change' (3.82), ' ability to accommodate religious differences' (3.65) and 'recognising differences in age groups' (3.55). The supervisors ranked as the highest three competency items, the following; ' ability to accommodate religious differences' (3.76), 'ability to accommodate other social groups' (3.71) and 'recognising traditional culture and its effect' (3.62). Both AEAs and supervisors ranked these two items as the least; 'determine the effect of pressure groups on people's behaviour' and 'applying factors affecting behaviour of people'. The results could partly be due to the fact that most of their in-service training programmes are on technical competency areas, while professional competency areas, especially understanding human behaviour are hardly addressed. The moderate level of competency of AEAs in this category will adversely affect their performance as their work, deals mostly with understanding issues bothering on human behaviour.

4.2.7 MAINTAINING PROFESSIONALISM

The AEAs and their supervisors in the Western and Ashanti regions perceived the AEAs as having moderate competency in the maintaining professionalism category. The grand mean of the AEAs rating was 2.93 and that

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Table 4.14: Means, Standard Deviation and Ranking of Maintaining Professionalism Competency by Position Title of all Respondents

Maintaining Professionalism Competency	AEAs N=144			Supervisors N=35			t - value	Total N=179		
	Mean	SD	Rank	Mean	SD	Rank		Mean	SD	Rank
1. Identifying opportunities for professional improvement	3.09	0.97	1	3.34	0.73	1	-1.44	3.14	0.93	1
2. Developing a plan for professional competency improvement	2.80	0.91	4	2.83	0.79	4	-0.16	2.81	0.89	4
3. Maintaining professional organizations and activities	2.86	0.93	3	2.85	0.78	3	0.03	2.86	0.90	3
4. Participation in professional organization and activities	2.98	0.93	2	2.91	0.74	2	0.37	2.97	0.93	2
GRAND MEAN	2.93	0.83		2.99	0.62		-0.37	2.94	0.79	

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*P ≤ 0.05

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of supervisors was 2.99, with their combine grand mean being 2.94 (Table 4.14). There was no significant difference between the ratings of the AEAs and their supervisors in all the four items under this maintaining professionalism competency.

The AEAs ranked 'identifying opportunities for professional improvement' as the highest (3.09), followed by 'participation in professional organisations and activities' (2.98) and maintaining professional organisations and activities (2.86). The supervisors' ratings were just like the AEAs with these means; 3.34, 2.91 and 2.85. In his study in the Central and Northern Regions, Osei-Owusu (2000) found significant differences between the AEAs and their supervisors' perceptions of the level of AEAs maintaining professionalism competency with AEAs' ratings being higher than the supervisors. This result implies that AEAs have inadequate knowledge on how to maintain their professionalism as extensionists, thereby affecting their performance and social status.

4.2.8 EVALUATION

Table 4.15 shows that AEAs and the supervisors both perceived the AEAs as having a moderate competency (3.04) level in the evaluation competency category. Out of the 15 competency items making the evaluation competency category, it was only in one item, 'cooperating with research stations' that significant difference was observed between the mean ratings of the AEAs and their supervisors.

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Table 4.15: Means, Standard Deviation and Ranking of Evaluation Competency by Position Title of all Respondents

Evaluation Competency	AEAs N=144			Supervisors N=35			t-value	Total N=179		
	Mean	SD	Rank	Mean	SD	Rank		Mean	SD	Rank
1. Evaluating the effectiveness of a district or local extension programme	3.30	0.83	4	3.11	0.90	9	0.63	3.20	0.84	6
2. Evaluating your own performance	3.71	0.79	1	3.43	0.85	1	1.85	3.65	0.81	1
3. Interpreting the impact of change and or trend upon the clientele	3.21	0.87	5	3.17	0.62	7	0.25	3.20	0.83	4
4. Using questionnaires to seek information	3.17	1.07	7	2.83	0.95	11	1.72	3.10	1.05	7
5. Using observation method to seek information	3.20	0.97	6	3.20	0.87	6	0.01	3.20	0.94	5
6. Using interviews to seek information	3.30	0.98	3	3.35	0.81	2	-0.32	3.31	0.95	3
7. Interpreting results of questionnaires	2.84	0.98	12	2.63	1.03	12	1.13	2.80	0.99	13
8. Evaluating the results of an extension activity	3.34	0.86	2	3.23	0.84	5	0.69	3.32	0.86	2
9. Analyzing report/data	2.91	0.98	10	2.54	1.12	14	1.95	2.84	1.02	12
10. Interpreting research findings from research stations/university	2.57	1.08	14	2.54	1.07	13	0.15	2.57	1.08	14
11. Applying research findings when making recommendation to clientele	3.05	1.01	8	3.03	0.92	10	0.11	3.04	0.99	8
12. Cooperating with research stations	2.81	1.10	13	3.31	1.13	3	-2.40*	2.91	1.12	11
13. Identifying problems requiring additional research	2.84	1.05	11	3.26	0.89	4	-1.92	2.96	1.03	10
14. Keeping up-to-date with current research findings	3.00	1.07	9	3.11	0.83	8	-0.59	3.02	1.03	9
15. Conducting a literature search using library resources	2.36	0.98	15	2.20	0.99	15	0.86	2.33	0.98	15
GRAND MEAN	3.04	0.68		3.05	0.71		-0.12	3.04	0.68	

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*P ≤ 0.05

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The AEAs ranked 'evaluating your own performance' as highest (3.71), followed by 'evaluating the results of an extension activity' (3.34) and 'using interviews to seek information' (3.30), while the supervisors ranked 'evaluating your own performance' as highest (3.43), followed by 'using interviews to seek information' (3.35) and 'cooperating with research stations' (3.31). They both ranked 'conducting a literature search using library resources' as the lowest ranked competency item. Osei-Owusu (2000) found significant difference between the ratings of AEAs themselves and their supervisors in the Central and Northern Regions of Ghana with AEAs' rating been higher than the supervisors'.

The moderate competency level of AEAs in evaluation could be due to the fact that this area is not usually covered during their in-service training programmes and they also do not usually have the opportunity of practicing or taking part in evaluating extension programmes. So competency items in this category must be included in their pre- and in-service trainings so that they can evaluate extension programmes and their own performances.

4.2.9 ANIMAL PRODUCTION

The level of AEAs competency in animal production as perceived by the AEAs themselves and the supervisors was moderate (2.88) with no significant difference between their grand means. It was only in 'detection of female animals on heat and ensuring successful service by males' that the ratings of the AEAs and that of their supervisors showed significant differences among the fifteen items making the animal production competency (Table 4.16).

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Table 4.16: Means, Standard Deviation and Ranking of Animal Production Competency by Position Title of all Respondents

Animal Production Competency	AEAs N=144			Supervisors N=35			t-value	Total N=179		
	Mean	SD	Rank	Mean	SD	Rank		Mean	SD	Rank
1. Producing sheep and goats	3.42	0.88	1	3.26	0.74	2	1.03	3.39	0.85	1
2. Producing poultry	3.39	0.93	2	3.26	0.61	1	0.79	3.36	0.88	2
3. Producing pigs	3.30	0.91	5	3.14	0.73	3	0.94	3.27	0.88	4
4. Producing cattle	2.76	1.05	9	2.86	0.77	7	-0.52	2.78	1.00	8
5. Producing grasscutters and rabbits	2.37	1.07	14	2.31	0.90	14	0.27	2.36	1.04	14
6. Snail production	2.60	1.02	12	2.83	1.10	9	-1.00	2.64	1.12	12
7. Apiculture (bee-keeping for honey)	2.17	1.09	15	2.20	1.05	15	-0.14	2.18	1.08	15
8. Formulation of animal feed and feed management	2.74	1.04	11	2.46	0.78	12	1.49	2.18	1.00	11
9. Animal improvement through controlled breeding	2.79	1.05	8	2.54	0.78	11	1.28	2.74	1.01	10
10. Pasture management for livestock	2.59	1.05	13	2.34	0.76	13	1.33	2.54	1.00	13
11. Appropriate housing for livestock and poultry	3.37	0.92	3	3.09	0.56	4	1.77	3.32	0.87	3
12. Routine management practices in poultry (e.g. proper handling of day-old-chicks, brooding, debeaking)	3.18	1.07	6	3.06	0.84	5	0.65	3.16	1.03	6
13. Routine management practices in livestock (e.g. dehorning, hoof trimming, creep feeding, castration)	2.75	1.10	10	2.77	0.81	10	-0.12	2.75	1.05	9
14. Mating ratio for poultry and livestock	2.91	1.07	7	2.83	0.86	8	0.44	2.90	1.03	7
15. Detection of female animals on heat and ensuring successful service by males (especially in pigs)	3.31	1.08	4	2.91	1.01	6	1.98*	3.23	1.07	5
GRAND MEAN	2.91	0.75		2.79	0.52		0.87	2.88	0.71	

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*$P \leq 0.05$

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The AEAs ranked the following as the three highest competency items; 'producing sheep and goats' (3.42), ' producing poultry' (3.39) and 'appropriate housing for livestock and poultry' (3.37). The supervisors ranked ' producing poultry' as the highest (3.26) followed by 'producing sheep and goats' (3.26) and 'producing pigs' (3.14). Both the AEAs and their supervisors ranked 'apiculture' as the lowest competency item.

This result could be due to the near neglect of animal production activities in the work of most AEAs and also in their in-service training programmes. Most activities and trainings tend to centre on crop production. This suggests that AEAs would be limited in their extension of animal production technologies to farmers to enable them to increase animal production to increase the protein intake in our diets and create the need for importation of animal products.

4.2.10 ANIMAL HEALTH AND DISEASES

The perceptions of the AEAs themselves and their supervisors were that AEAs in the Western and Ashanti regions have a low competency level (2.42) in animal health and diseases competency category. And there were no significant differences between the ratings of the AEAs and supervisors in all the twelve competency items except two of them; 'management of diseases in general' and 'dressing of carcass' in which the AEAs ratings were higher than the supervisors' (Table 4.17).

The AEAs rated 'identification of signs of good and ill-health in farm animals' as the highest (3.38), followed by 'general management of ecto-parasites

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Table4.17: Means, Standard Deviation and Ranking of Animal Health and Diseases by Position Title of all Respondents

Animal Health and Diseases Competency	AEAs N=144			Supervisors N=35			t - value	Total N=179		
	Mean	SD	Rank	Mean	SD	Rank		Mean	SD	Rank
1. Identification of signs of good and ill-health in farm animals	3.38	0.89	1	3.31	0.76	1	0.42	3.37	0.86	1
2. Ability to prescribe recommended drugs for the treatment of common diseases and pests of animals	2.53	1.09	6	2.31	0.83	5	1.12	2.49	1.05	6
3. Giving oral medication to animal	2.72	1.06	5	2.46	0.92	4	1.32	2.66	1.04	4
4. Use of hypodermic syringes on animal (injection)	2.04	1.19	10	1.97	1.06	9	0.32	2.03	1.16	10
5. Ability to manage wounds fractures burns, etc.	2.24	1.08	7	2.11	0.87	8	0.63	2.21	1.04	7
6. General management of ecto-parasites in animals	2.99	1.06	2	2.79	0.91	2	0.97	2.95	1.04	2
7. General management of endo-parasites in animals	2.76	1.10	3	2.63	0.94	3	0.67	2.74	1.07	3
8. Management of diseases in general	2.73	0.98	4	2.31	0.74	6	2.24*	2.65	0.95	5
9. Ability to follow pre-slaughter procedure in the abattoir	1.85	1.07	12	1.50	0.75	12	1.81	1.79	1.03	12
10. Dressing of carcass	2.00	1.05	11	1.62	0.74	11	2.00*	1.93	1.01	11
11. Cutting carcasses into parts/portion	2.11	1.09	9	1.74	0.93	10	1.85	2.04	1.07	9
12. Ability to identify wholesome and unwholesome meat	2.21	1.08	8	2.15	1.08	7	0.30	2.20	1.08	8
GRAND MEAN	2.46	0.88		2.25	0.69		1.32	2.42	0.85	

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*$P \leq 0.05$

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in animals' (2.99) and 'general mangement of endo-parasites' (2.76). They rated 'dressing of carcass' (2.00) and 'ability to follow pre-slaughter procedure in the abattoir' (1.85) as the lowest competency items. The mean ratings of the supervisors for the three highest and two lowest competency items were the same as the AEAs, with lower values.

The low competency level of the AEAs in the animal health and disease category as found in this study could be due to the fact that before the decentralization of MOFA, animal health and disease activities were carried out only by the staff of Veterinary Services, so all the AEAs in the other departments were not trained in this area. But now that all AEAs are expected to carry out basic animal health and diseases extension to our farmers, this result implies that the AEAs will perform poorly until they are better trained and this will adversely affect animal production, leading to importation of animal products and possibly to low intake of animal protein in our diet.

4.2.11 FISH FARMING

Table 4.18 presents the results of the level of AEAs competency in fish farming as perceived by the AEAs and their supervisors. Both AEAs themselves and their supervisors perceived the AEAs as having low competency rating in fish farming (2.20 and 2.07). There was no significant difference between their grand means and also between their ratings in all the seventeen items under the fish-farming competency.

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Table 4.18: Means, Standard Deviation and Ranking of Fish Farming Competency by Position Title of all Respondents

Fish Farming Competency	AEAs N=144			Supervisors N=35				Total N=179		
	Mean	SD	Rank	Mean	SD	Rank	t - value	Mean	SD	Rank
1. Ability to identify site for pond construction	2.89	1.06	1	2.80	0.93	1	0.47	2.87	1.04	1
2. Construction of fish pond	2.57	1.10	3	2.54	0.92	2	0.14	2.57	1.06	3
3. Identification of fish types cultured in Ghana	2.61	1.00	2	2.43	0.78	4	1.01	2.57	0.96	2
4. Techniques in stocking fish pond	2.45	1.04	6	2.40	0.85	5	0.24	2.44	1.01	6
5. Production of fingerlings	2.06	1.01	12	1.77	0.81	14	1.56	2.00	0.97	12
6. Techniques in transporting fingerlings	2.24	1.03	9	2.03	0.86	8	1.10	2.19	1.00	8
7. Techniques in assessing the stock of fish in a pond	2.09	0.96	10	1.88	0.77	11	1.19	2.05	0.93	10
8. Formulating feed for fishes in a pond	2.24	1.01	8	1.94	0.87	9	1.61	2.18	0.99	9
9. Techniques in feeding fishes	2.55	1.04	4	2.34	0.94	6	1.06	2.51	1.02	4
10. Ability to identify disease conditions in fishes in a pond	1.74	0.89	15	1.56	0.70	17	1.08	1.70	0.86	16
11. Managing disease situation in a pond	1.71	0.85	16	1.57	0.74	16	0.91	1.69	0.83	17
12. Techniques in harvesting fishes	2.28	1.00	7	2.20	0.80	7	0.44	2.26	0.96	7
13. Fish preservation processing techniques	2.50	1.02	5	2.51	0.85	3	-0.08	2.50	0.99	5
14. Construction of chorkor ovens and trays	1.69	0.93	17	1.83	0.89	12	-0.80	1.72	0.92	15
15. Maintenance of smoking ovens and trays	1.77	0.92	14	1.80	0.83	13	-0.18	1.78	0.90	14
16. Management of fish storage pests (e.g. insects, rodents)	1.94	0.89	13	1.71	0.67	15	1.38	1.89	0.85	13
17. Proper handling of wet fish	2.09	0.99	11	1.89	0.87	10	1.09	2.05	0.97	11
GRAND MEAN	2.20	0.74		2.07	0.85		0.96	2.18	0.71	

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*$P \leq 0.05$

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The AEAs and their supervisors both rated 'ability to identify site for pond construction' as the highest item (2.89 and 2.80). The AEAs rated identification of fish types cultured in Ghana as second (2.61), followed by construction of fish pond' (2.57). On the other hand, the supervisors rated 'construction of fishpond' as second (2.54), followed by 'fish preservation and processing techniques' (2.51). The AEAs ranked 'construction of chorkor ovens and trays' as lowest (1.69) item, while the supervisors ranked 'ability to identify disease conditions in fishes in a pond' as the lowest (1.56) item. This result could be due to inadequate aquaculture experts in the ministry, especially at the district level resulting in less trainings and low fish farming activities by AEAs. This implies that the AEAs will not be able to assist farmers adequately in their fish farming activities to increase fish production. This creates the need for fish imports to satisfy domestic demand and thus depleting scarce foreign exchange.

4.2.12 CROP PRODUCTION

The level of AEAs crop production competency as perceived by AEAs themselves and their supervisors was moderate (3.21). There was no significant difference between the ratings of the AEAs and their supervisors in all the twenty-one competency items (Table 4.19).

The AEAs ranked 'production of cereals' as the highest (4.00) followed by 'production of vegetables' (3.97) and 'production of root and tubers crops' (3.91). Their least ranked competency item was 'mushroom production' (2.05). The supervisors ranked 'production of root and tuber crops' as highest (4.14) followed

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Table 4.19: Means, Standard Deviation and Ranking of Crop Production Competency by Position Title of all Respondents

Crop Production Competency	AEAs N=144			Supervisors N=35			t - value	Total N=179		
	Mean	SD	Rank	Mean	SD	Rank		Mean	SD	Rank
1. Production of cereals	4.00	0.86	1	4.09	0.78	2	-0.54	4.02	0.84	1
2. Production of root and tuber crops	3.91	0.87	3	4.14	0.77	1	-1.45	3.96	0.85	2
3. Production of legumes	3.85	0.92	4	4.00	0.84	3	-0.86	3.88	0.90	4
4. Production of vegetables	3.97	0.77	2	3.86	0.85	6	0.73	3.94	0.79	3
5. Production of cocoa	3.22	1.09	12	2.85	0.82	14	1.85	3.15	1.05	13
6. Production of coffee	2.60	1.05	17	2.51	0.78	17	0.44	2.58	1.00	17
7. Production of citrus	3.31	1.00	11	3.37	0.94	11	-0.32	3.32	0.99	11
8. Production of oil palm	3.74	0.96	7	3.89	0.90	5	-0.80	3.77	0.95	7
9. Production of coconut	2.77	1.20	14	3.00	0.97	12	-1.06	2.81	1.16	14
10. Production of rubber plant for latex	2.07	1.12	20	2.03	0.79	21	0.20	2.06	1.06	21

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*P ≤ 0.05

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Table 4.19 (cont'd): Means, Standard Deviation and Ranking of Crop Production Competency by Position Title of all Respondents

Crop Production Competency	AEAs N=144			Supervisors N=35			t - value	Total N=179		
	Mean	SD	Rank	Mean	SD	Rank		Mean	SD	Rank
11. Production of plantain and banana	3.81	1.00	5	3.91	0.70	4	-0.57	3.83	0.95	5
12. Production of pineapple	3.21	1.08	13	2.94	0.68	13	1.39	3.16	1.02	12
13. Production of other fruit plants (mango, cashew)	2.77	1.08	15	2.57	0.98	16	0.97	2.73	1.06	15
14. Production of pasture and forage crops	2.56	1.02	18	2.21	0.81	18	1.86	2.49	0.99	18
15. Crop breeding (crop improvement)	2.33	1.02	19	2.18	1.03	21	0.77	2.30	1.02	19
16. Ability to perform effective grafting and budding	2.66	1.02	16	2.60	0.81	15	0.31	2.65	0.98	16
17. Appropriate post harvest handling of produce	3.65	0.97	8	3.80	0.63	7	-0.85	3.68	0.92	8
18. Ventilated narrow crib construction	3.51	1.10	10	3.66	0.76	9	-0.76	3.54	1.05	10
19. Nursery management of oil palm	3.63	0.98	9	3.58	1.03	10	0.28	3.62	0.98	9
20. Nursery management of vegetables	3.78	0.89	6	3.71	0.96	8	0.41	3.77	0.90	6
21. Mushroom Production	2.05	1.08	21	2.20	1.02	19	-0.75	2.08	1.07	20
GRAND MEAN	3.21	0.71		3.21	0.71		0.10	3.21	0.69	

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*P ≤ 0.05

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by 'production of cereals' (4.09) and 'production of legumes' (4.0). They ranked 'production of rubber plant for latex' (2.03). The result shows that AEAs have room for improvement in this competency category, despite the fact that most in-service training programmes tend to be in crop production. The implication of this is that other areas other than in-service training will need to be looked at if their competency levels are to improve. These areas, among others, include proper planning, better supervision, and a reward system that rewards good work.

4.2.13 PLANT PROTECTION

Table 4.20 shows the level of AEAs plant protection competency as perceived by AEAs themselves and their supervisors. They rated it moderate (3.22). And there were no significant differences between the self-ratings of the AEAs and that of their supervisors in all the fourteen competency items. The AEAs and their supervisors both ranked 'spraying of pesticides using the knapsack sprayer' (3.77 and 3.74) and 'general management of farm to protect crop against pests and diseases' (3.75 and 3.71) as the two highest competency items. They also ranked 'management of viral and bacterial diseases' (2.91 and 2.85) and 'Integrated Pest Management' (2.87 and 2.54) as the two least competency items.

The implication of this moderate plant protection competency among the AEAs is that pests and diseases, which constitute a major constraint in agricultural production, will continue to hamper efforts at increasing agricultural production as AEAs' support to farmers will be limited.

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Table 4.20: Means, Standard Deviation and Ranking of Plant Protection Competency by Position Title of all Respondents

Plant Protection Competency	AEAs N=144			Supervisors N=35			t - value	Total N=179		
	Mean	SD	Rank	Mean	SD	Rank		Mean	SD	Rank
1. Ability to identify different crop pests	3.19	0.90	7	3.20	0.72	7	-0.09	3.19	0.86	7
2. Ability to identify different damage cause by different pests	3.05	0.84	10	3.00	0.73	9	0.32	3.04	0.82	9
3. Identify different disease conditions and their causal agents	2.98	0.88	11	2.97	0.75	10	0.05	2.98	0.86	11
4. Management of insect pests	3.14	0.86	8	3.29	0.57	6	-0.94	3.17	0.82	8
5. Management of nematodes	2.92	0.98	12	2.88	0.64	11	0.23	2.92	0.92	2
6. Management of fungal diseases in crops	3.21	0.94	6	3.34	0.68	5	-0.78	3.24	0.90	6
7. Management of viral and bacterial diseases	2.91	0.95	13	2.85	0.87	13	0.37	2.90	0.94	13
8. Ability to prescribe recommended pesticides for common diseases of crops and stored produce	3.49	1.05	3	3.37	0.77	4	0.62	3.47	1.00	3
9. Mixing of pesticides (emulsion and powdered form)	3.39	1.00	5	3.14	0.73	9	1.37	3.34	0.95	5
10. Spraying of pesticides using the knapsack sprayer	3.77	0.87	1	3.74	0.74	1	0.19	3.77	0.85	1
11. Spraying of pesticides using the mist-blower	3.08	1.08	9	2.86	0.94	12	1.14	3.04	1.05	10
12. General management of farm to protect crop against pests and diseases (e.g. weed control)	3.75	0.98	2	3.71	0.75	2	0.18	3.74	0.94	2
13. Knowledge of common pesticides on the local market	3.43	0.90	4	3.49	0.82	3	-0.31	3.44	0.88	4
14. Integrated Pest Management (IPM)	2.87	0.96	14	2.54	1.04	14	1.76	2.80	0.98	14
GRAND MEAN	3.23	0.77		3.18	0.55		0.37	3.22	0.73	

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*$P \leq 0.05$

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4.2.14 AGROFORESTRY

The AEAs and their supervisors perceived the AEAs as having a moderate competency level in agroforestry, the supervisors' grand mean (2.93) being higher than the AEAs' (2.65), though not significantly different. Out of the nine competency items, the supervisors rated two of them significantly higher than the AEAs' ratings. These were 'woodlot production' and 'techniques and management of coppice' (Table 4.21).

The AEAs and the supervisors both rated 'prevention of bush fires as the highest (3.16 and 3.44) competency item. The AEAs then rated 'windbreak practices' (2.87) and alley cropping practices' (2.78) as the next highest items, while the supervisors also rated 'woodlot production' (3.12) and alley cropping practices (3.03) as the next highest items. They both ranked 'techniques and management of coppice' as the lowest (2.20 and 2.59). This result implies that very little extension on agroforestry would be done by AEAs to enable our farmers practice sustainable agriculture to conserve the environment for posterity.

4.2.15 LAND AND WATER MANAGEMENT

The level of AEAs' land and water management competency as perceived by the AEAs themselves and their supervisors was moderate (3.11). There was no significant difference between the grand means of the AEAs (3.15) and supervisors (2.92) ratings. Among the six competency items only 'ability to carry out a proper land survey' item was significantly different between the AEAs and supervisors ratings (Table 4.22). The AEAs and their supervisors both ranked

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Table 4.21: Means, Standard Deviation and Ranking of Agroforestry Competency by Position Title of all Respondents

Agroforestry Competency	AEAs N=144			Supervisors N=35			t-value	Total N=179		
	Mean	SD	Rank	Mean	SD	Rank		Mean	SD	Rank
1. Ability to identify major agro forestry species	2.60	1.03	6	2.97	0.82	4	-1.97	2.68	1.00	6
2. Alley cropping practices	2.78	1.00	3	3.03	0.96	3	-1.31	2.83	0.99	3
3. Woodlot production	2.65	1.10	4	3.12	0.98	2	-2.26*	2.74	1.09	4
4. Lives staking practices	2.54	1.06	7	2.80	1.02	7	-1.34	2.59	1.05	7
5. Windbreaks practices	2.87	0.98	2	2.97	0.98	5	-0.55	2.89	0.98	2
6. Agrisilvipasture (rearing animals under plantation crops)	2.37	1.00	8	2.69	0.86	9	-1.72	2.43	0.98	8
7. Pruning of agroforestry trees	2.65	1.10	5	2.68	0.85	6	-1.06	2.69	1.06	5
8. Techniques and management of coppice	2.20	0.98	9	2.59	0.86	9	-2.13*	2.27	0.97	9
9. Prevention of bush fires	3.16	1.03	1	3.44	0.88	1	-1.42	3.21	1.01	1
GRAND MEAN	2.65	0.87		2.93	0.71		-1.77	2.70	0.85	

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*$P \leq 0.05$

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Table 4.22: Means, Standard Deviation and Ranking of Land and Water Management Competency by Title of all Respondents

Land and Water Management Competency	AEAs N=144			Supervisors N=35			t-value	Total N = 179		
	Mean	SD	Rank	Mean	SD	Rank		Mean	SD	Rank
1. Ability of carry out a proper land survey	2.58	1.10	5	2.15	0.86	5	2.16*	2.50	1.07	5
2. Ability to carry out soil fertility analysis	2.35	1.02	6	2.03	0.83	6	1.71	2.29	0.99	6
3. Preparation and application of compost and farmyard manure	3.26	0.98	4	3.18	0.90	3	0.47	3.24	0.96	4
4. Use and application of fertilizers	3.85	0.92	1	3.68	0.84	1	1.03	3.82	0.91	1
5. Managing soil erosion (use of erosion control methods)	3.36	0.89	3	3.03	0.90	4	1.95	3.30	0.90	3
6. Managing soil water (e.g. mulching)	3.50	1.01	2	3.48	0.84	2	0.08	3.50	0.97	2
GRAND MEAN	3.15	0.81		2.92	0.68		1.54	3.11	0.79	

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3=Moderate Competency , 4=High Competency , 5=Very Competency

*P ≤ 0.05

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'use and application of fertilizers', followed by 'managing soil water' as the highest competency items. They both also ranked 'ability to carry out soil fertility analysis' as the lowest competency item.

The result could be due to the fact that this competency category is not covered in most of their activities and programmes. The implication is that the AEAs will not be able to support our farmers to manage their land and water properly to increase their productivity in a sustainable manner.

4.2.16 MECHANIZATION

Table 4.23 shows that the AEAs rated themselves as having a low competency level in mechanization (2.72) and their supervisors also perceived them as having a low competency level in mechanization (2.45) and the two values were significantly different.

Out of the eleven items in this competency category, the AEAs significantly rated themselves higher than their supervisor's ratings in four of the items. These were 'construction of simple farm drainage system', 'field operation of a tractor and power tiller', maintenance and simple repairs of farm machinery and equipments', and 'ability to construct simple farm structures'.

The AEAs ranked 'using motorbike' as the highest (3.82), followed by 'use of simple farm tools' (3.77) and 'ability to construct storage barns for cereals and tubers' (3.37). The supervisors also ranked these same items as top three with these values 3.74, 3.36 and 3.26. While the AEAs ranked 'using an incubator' as

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Table 4.23: Means, Standard Deviation and Ranking of Mechanization Competency by Position Title of all Respondents

Mechanization Competency	AEAs N=144			Supervisors N=35			t - value	Total N=179		
	Mean	SD	Rank	Mean	SD	Rank		Mean	SD	Rank
1. Use of simple farm tools	3.77	0.99	2	3.36	0.84	2	0.77	3.74	0.96	2
2. Construction of simple farm drainage system	2.85	1.01	6	2.46	0.85	6	2.13*	2.78	0.99	6
3. Use of irrigation equipment (e.g. sprinklers)	2.24	1.05	7	1.91	0.89	7	1.70	2.18	1.03	7
4. Field operation of a tractor and a power filler	2.04	1.06	8	1.63	0.81	9	2.12*	1.95	1.03	8
5. Maintenance and simple repairs of farm machinery and equipment	1.99	0.96	9	1.46	0.61	11	3.15*	1.89	0.93	10
6. Using motorbike	3.82	1.32	1	3.74	0.95	1	0.32	3.80	1.26	1
7. Using a motor sprayer	2.92	1.18	5	2.89	0.83	4	0.14	2.91	1.11	5
8. Ability to construct simple farm structures (pens, hatches, water and feeding trough, etc)	3.13	0.89	4	2.57	0.70	5	3.50*	3.02	0.88	4
9. Ability to construct storage barns for cereal and tubers (e.g. narrow cribs and yam barns)	3.37	0.98	3	3.26	0.81	3	0.64	3.35	0.93	3
10. Operating milling machines (e.g. for cereals, roots and tubers, oil palm and coconut)	1.90	1.04	10	1.86	0.81	8	0.24	1.89	1.00	9
11. Using an incubator	1.68	0.99	11	1.57	0.78	10	0.61	1.66	0.95	11
GRAND MEAN	2.72	0.66		2.45	0.42		2.25*	2.67	0.63	

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*$P \leq 0.05$

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the lowest (1.68), the supervisors ranked 'maintenance and simple repairs of farm machinery and equipment' as the lowest (1.46).

Even though there is significant difference between the ratings of AEAs and their supervisors in this category, the ratings of both indicate that the AEAs need to improve upon their low competency level in this area. The low level could be due to the fact that most of the areas covered in the study do not undertake mechanized or irrigated farming and therefore some of the items in this competency are not covered in their training programmes. So AEAs would be lacking in skills in this category to enable them assist farmers in their operations, especially now that increasing agricultural production through mechanization and irrigation is being promoted.

4.2.17 Women In Agricultural Development (WIAD)

The level of AEAs' WIAD competency level as perceived by the AEAs and their supervisors was moderate. And there was no significant difference between the ratings of AEAs (2.97) and their supervisors' (2.87). Out of the eighteen competency items only 'parboiling of rice' showed significant difference between the AEAs' ratings and that of their supervisors (Table 4.24)

The AEAs ranked 'techniques in ensuring hygienic home' as the highest (3.37), followed by 'leafy vegetable utilization' (3.32) and 'legume utilization' (3.30) while the supervisors ranked 'leafy vegetable utilization' as the highest (3.51) followed by 'legume utilization' (3.37) and 'techniques for ensuring hygienic home' (3.29).

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Table 4.42: Means, Standard Deviation and Ranking of WIAD Competency by Position Title of all Respondents

WIAD Competency	AEAs N=144			Supervisors N=35			t - value	Total N=179		
	Mean	SD	Rank	Mean	SD	Rank		Mean	SD	Rank
1. In-depth knowledge on population issues and how these effect food security	2.86	1.02	13	2.97	0.89	6	-0.60	2.88	1.00	11
2. In-depth knowledge on family planning methods	2.98	1.00	7	2.86	0.81	8	0.67	2.96	0.96	8
3. Improved kitchen practices	2.90	0.98	11	2.71	0.71	14	1.06	2.86	0.94	12
4. Preparation of basic but recommended dishes for lactating mothers and babies	2.65	1.10	16	2.60	0.91	16	0.24	2.64	1.04	16
5. Techniques in budgeting at home	3.04	1.00	6	2.72	0.83	13	1.85	2.98	0.95	6
6. Techniques in ensuring a hygienic home	3.37	0.94	1	3.29	0.75	3	0.47	3.35	0.91	2
7. Observing safety measures in the home	3.23	0.96	4	3.17	0.82	4	0.30	3.21	0.93	4
8. Legume utilization	3.30	0.98	3	3.37	0.81	2	-0.41	3.31	0.95	3
9. Leafy Vegetable utilization	3.32	1.04	2	3.51	0.85	1	-1.00	3.36	1.01	1

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*P ≤ 0.05

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Table 4.24 (cont'd): Means, Standard Deviation and Ranking of WIAD Competency by Position Title of all Respondents

WIAD Competency	AEAs N=144			Supervisors N=35			t - value	Total N=179		
	Mean	SD	Rank	Mean	SD	Rank		Mean	SD	Rank
10. Weaning food utilization	2.91	1.03	10	2.80	0.83	10	0.61	2.89	0.99	10
11. Root / tuber crops preservation and processing	2.98	0.96	8	2.94	0.73	7	0.21	2.97	0.91	7
12. Oil preservation	2.85	0.95	14	2.76	0.82	11	0.46	2.83	0.92	15
13. Vegetables preservation and processing	2.90	0.97	12	2.71	0.75	12	1.06	2.86	0.93	13
14. Fish / meat preservation and processing	2.94	0.98	9	2.69	0.83	15	1.43	2.89	0.96	9
15. Parboiling of rice	2.54	1.03	17	2.06	0.84	18	2.50*	2.43	1.01	18
16. Soap making	2.44	1.14	18	2.43	0.85	17	0.04	2.44	1.09	17
17. Skills in working with clientele of the opposite sex (e.g. male agents working with female farmers)	3.18	1.01	5	3.17	0.82	5	0.06	3.18	0.97	5
18. Assessment / analysis of gender issues for planning extension activities for women farmers	2.84	0.93	15	2.85	0.87	9	-0.03	2.84	0.91	14
GRAND MEAN	2.97	0.81		2.87	0.59		0.74	2.94	0.73	

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*$P \leq 0.05$

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'Parboiling of rice' (2.54) and 'soap making' (2.44) were ranked as lowest by AEAs while the supervisors ranked 'soap making' (2.43) and 'parboiling of rice' (2.06) as the lowest.

This result could be due to the fact that most items in this category are considered to be women-related but over 93% of the respondents were males (Table 4.2). Socio-culturally, males are not expected to be doing these things. So the ability of AEAs to perform these activities would be poor resulting in our farmers not adopting them.

4.2.18 FARM MANAGEMENT

The AEAs and their supervisors perceived the AEAs in the study as having moderate competency level in farm management and there was no significant difference between the grand means of the AEAs (3.04) and the supervisors (2.96). Among the ten competency items, two of them showed significant difference between the ratings of the AEAs and that of their supervisors. While the AEAs rated 'knowledge of basic profitability criteria for evaluation of farm development projects' significantly higher (2.94) than the supervisors (2.51), the supervisors rated 'knowledge of the conditions for loans from non-banking financial institutions' significantly higher (2.86) than the AEAs (2.50). All the others were not significantly different (Table 4.25).

The AEAs and supervisors both ranked 'knowledge about marketing centres for agricultural produce in operational area, your district and beyond as the highest. AEAs ranked 'knowledge of the conditions for loans from non-banking

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Table 4.25 Means,Standard Deviation and Ranking of Farm Management Competency by Position Title of all Respondents

Farm Management Competency	AEAs N=144			Supervisors N=35			t-value	Total N=179		
	Mean	SD	Rank	Mean	SD	Rank		Mean	SD	Rank
1. Knowledge of basic profitability criteria for evaluation of farm development project	2.94	0.89	6	2.51	0.78	10	2.56*	2.85	0.87	7
2. Advising potential borrower to examine alternative sources of finance before making a loan application to banks	2.95	0.90	5	2.69	0.90	8	1.56	2.90	0.90	5
3. Knowledge of the requirement for agricultural loan of major bank in Ghana (e.g. ADB)	2.76	1.03	9	2.77	0.88	7	-0.05	2.76	1.00	9
4. Knowledge of the conditions for loans from non banking financial institution (e.g. susu collectors)	2.50	0.98	10	2.86	0.85	6	-2.01*	2.57	0.96	10
5. Preparing budget for specific programme operations or purposes	2.87	0.94	8	2.94	0.80	5	0.40	2.89	0.91	6
6. Estimation of partial budget of a typical farm enterprise (cost benefit analysis)	2.88	0.99	7	2.54	0.95	9	1.80	2.81	0.99	8
7. Guiding farmers in keeping accurate records on their farm enterprise	3.51	0.87	2	3.29	0.83	3	1.41	3.47	0.86	2
8. Knowledge about marketing centres for agricultural produce in operational area, your district and beyond	3.53	0.95	1	3.60	0.69	1	-0.40	3.55	0.90	1
9. Knowledge about market information from other parts of the country (e.g. through radio and T.V)	3.23	1.00	4	3.06	0.73	4	0.97	3.20	0.95	4
10. Knowledge about movement of agricultural produce within your district, region and other parts of the country	3.30	0.92	3	3.31	0.90	2	-0.09	3.30	0.92	3
GRAND MEAN	3.04	0.70		2.96	0.55		0.66	3.02	0.67	

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*P ≤ 0.05

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financial institutions' as the lowest (2.50) while the supervisors ranked as the lowest, 'knowledge of basic profitability criteria for evaluation of farm development project' (2.51). The moderate competency level in this category could be due to the fact that most of their in-service training programmes do not including the items in this category and therefore most of their field activities do not cover these. So their ability to assist farmers to manage their enterprises well will be poor and this will result in farmers not efficiently managing their farming businesses leading to low productivity.

4.3 PROFESSIONAL AND TECHNICAL COMPETENCY NEEDS OF AGRICULTURAL EXTENSION AGENTS

The overall mean scores of all the 179 respondents were used to determine the professional and technical competency needs of the agricultural extension agents. As shown in Table 4.26, 0.4% of all the competency items was rated high, 53.6% was rated moderate, 40.5% was rated low and 5.5% was rated very low. In the professional competency area, 76.9% was rated moderate, 21.2% was rated low and 1.9% was rated very low. In the technical competency area, 0.8% Of the items was rated high, 35.3% was rated moderate, 55.6% was rated low and 8.3% was rated very low.

The ideal situation is for agricultural extension agents to possess 'high' to 'very high' competency levels in all the 104 professional and 133 technical competency items. Therefore all the 80 professional and 47 technical competency

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Table 4.26: Summary of Extension Agents' Competency Levels

Scale	Professional Competency		Technical Competency		All Competencies	
	Freq.	%	Freq.	%	Freq.	%
Very high	0	0	0	0	0	0
High	0	0	1	0.8	1	0.4
Moderate	80	76.9	47	35.3	127	53.6
Low	22	21.2	74	55.6	96	40.5
Very low	2	1.9	11	8.3	13	5.5
Total	104	100	133	100	237	100

Source: Survey Data, 2000

items that were rated 'moderate' need improvement. Those that were rated below 'moderate' level need urgent attention. The 13 items that were rated 'very low competency' and the 96 rated 'low competency' are the following:

Administration:

- Promoting inter office communications (2.90)
- Budget preparation (2.70)

Programme Planning

- Planning for human and material resources (2.95)

Teaching:

- Presenting information in a seminar (2.97)
- Presenting information with an overhead projector (2.10)
- Presenting information with slides (2.07)
- Presenting information with charts (2.90)
- Planning, organizing and conducting tours and field trips (2.73)

Communication:

- Using non-verbal communication (2.83)

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- Preparing extension publications (2.48)
- The use of camera and/or other photographic equipments (1.88)
- The use of tape recorder (2.20)
- The use of computer (1.37)

Understanding Human Behaviour

- Determine the effect of pressure groups on people's behaviour (2.86)
- Applying factors affecting behaviour of people (2.83)

Maintaining Professionalism:

- Developing a plan for professional competency improvement (2.81)
- Maintaining professional organizations and activities (2.86)
- Participation in professional organisations and activities (2.97)

Evaluation:

- Interpreting results of questionnaires (2.80)
- Analyzing report/data (2.84)
- Interpreting research findings from research stations/university (2.57)
- Cooperating with research stations (2.91)
- Identifying problems requiring additional research (2.96)
- Conducting a literature search using library resources (2.33)

Animal Production:

- Producing cattle (2.78)
- Producing grasscutters and rabbits (2.36)
- Snail production (2.64)
- Apiculture that is bee-keeping for honey (2.18)

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- Preparing extension publications (2.48)
- The use of camera and/or other photographic equipments (1.88)
- The use of tape recorder (2.20)
- The use of computer (1.37)

Understanding Human Behaviour

- Determine the effect of pressure groups on people's behaviour (2.86)
- Applying factors affecting behaviour of people (2.83)

Maintaining Professionalism:

- Developing a plan for professional competency improvement (2.81)
- Maintaining professional organizations and activities (2.86)
- Participation in professional organisations and activities (2.97)

Evaluation:

- Interpreting results of questionnaires (2.80)
- Analyzing report/data (2.84)
- Interpreting research findings from research stations/university (2.57)
- Cooperating with research stations (2.91)
- Identifying problems requiring additional research (2.96)
- Conducting a literature search using library resources (2.33)

Animal Production:

- Producing cattle (2.78)
- Producing grasscutters and rabbits (2.36)
- Snail production (2.64)
- Apiculture that is bee-keeping for honey (2.18)

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- Formulation of animal feed and feed management (2.18)
- Animal improvement through controlled breeding (2.74)
- Routine management practices in livestock (2.75)
- Mating ratio for poultry and livestock (2.90)

Animal Health and Diseases:

- With the exception 'identification of signs of good and ill health in farm animals (3.37), all the other 11 competency items ranged from 1.74 to 2.95, the grand mean being 2.42.

Fish Farming:

- All the 17 competency items under fish farming were rated below 'moderate' level, ranging from 1.69 to 2.84. The grand mean was 2.18.

Crop Production:

- Production of coffee (2.58)
- Production of coconut (2.81)
- Production of rubber plant for latex (2.06)
- Production of other fruit plants (mango, cashew) (2.73)
- Production of pasture and forage crops (2.49)
- Crop breeding (2.30)
- Ability to perform effective grafting and budding (2.65)
- Mushroom production (2.08)

Plant Protection:

- Identification of different disease conditions and their causal agents (2.98)
- Management of nematodes (2.92)

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- Management of viral and bacterial diseases (2.90)
- Integrated Pest Management (2.80)

Agroforestry:

- With the exception of prevention of bush fires (3.21), all the other 8 competency items ranged from 2.27 to 2.89, the grand mean being 2.70

Land and Water Management:

- Ability to carry out a proper land survey (2.50)
- Ability to carry out soil fertility analysis (2.29)

Mechanization:

- Construction of simple farm drainage system (2.78)
- Use of irrigation equipments (2.18)
- Field operation of a tractor and/or a power tiller (1.95)
- Maintenance and simple repairs of farm machinery and equipment (1.89)
- Using a motor sprayer (2.91)
- Operating milling machines (1.89)
- Using an incubator (1.66)

WIAD

- In-depth knowledge on population issues and how these affect food security (2.88)
- In-depth knowledge of family planning methods (2.96)
- Improved kitchen practices (2.86)
- Preparation of basic but recommended dishes for lactating mothers and babies (2.64)

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- Techniques in budgeting at home (2.98)
- Root/tuber crops preservation and processing (2.97)
- Oil preservation (2.83)
- Vegetables preservation and processing (2.86)
- Fish/meat preservation and processing (2.89)
- Parboiling of rice (2.43)
- Soap making (2.44)
- Assessment/analysis of gender issues for planning extension activities for women farmers (2.84)

Farm Management:

- Knowledge of basic profitability criteria for evaluation of farm development project (2.85)
- Advising potential borrowers to examine alternative sources of finance before making a loan application to banks (2.76)
- Knowledge of the requirement for agricultural loan of the major banks in Ghana (2.76)
- Knowledge of the conditions for loans from non-banking financial institutions (2.57)
- Preparing budget for specific programme operations or purposes (2.89)
- Estimation of partial budget of a typical farm enterprise (2.81)

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4.4 COMPARISON OF THE MEAN PERCEPTIONS OF AGRICULTURAL EXTENSION AGENTS IN THE WESTERN AND ASHANTI REGIONS

In this section, the perceptions of all the AEAs in the Western Region are compared with those of the AEAs in the Ashanti Region, using the t-test at the 0.05 level of significance.

4.4.1 ADMINISTRATION

The mean perceptions of AEAs in all the 13 administration competency items did not show any significant differences between those from Western and Ashanti Regions (Table 4.27). While the AEAs in the Western Region ranked 'managing time effectively' (3.55) as their highest item, those in Ashanti ranked 'receiving official visitors to your area of operation as their highest (3.47). Those in Western Region rated the other 12 items between 2.64 to 3.55 while AEAs in Ashanti Region rated them 2.77 to 3.4. 'Budget preparation' was ranked lowest (2.64) by AEAs in Western Region and 'promoting' inter office communications' as lowest (2.77) by those in Ashanti Region. This result could be due to the similarity in the demographic characteristics of the AEAs in the two regions (Tables 4.1-4.7). Since their educational level (Table 4.4), working experience (Table 4.5), former technical department (Table 4.6) and number of in-service trainings sessions attended (Table 4.7) are about the same, their level of Administration competency will be similar (Awang and Martin, 1995). This suggests that the AEAs in the two

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Table 4.27: Means, Standard Deviation and Ranking of Administration Competency by AEAs in the Western and Ashanti Regions

Administration Competency	Region of AEAs						t - value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
1. In-depth knowledge and understanding of government agricultural policies	3.06	0.75	9	2.99	0.93	10	0.19
2. Writing realistic goals for the extension programme	3.07	0.90	8	3.11	0.79	5	-0.24
3. Ability to manage scarce resources for optimum productivity	3.37	0.94	3	3.38	0.97	3	-0.10
4. Coordinating the use of equipments, facilities and resources with office staff	3.03	0.91	11	3.07	0.98	7	-0.26
5. Budget preparation	2.64	1.03	13	2.79	1.03	12	-0.89
6. Managing time effectively	3.55	0.87	1	3.41	0.96	2	0.91
7. Promoting inter office communications	2.96	1.01	12	2.77	0.94	13	1.15
8. Orienting new staff under studying you	3.03	1.07	10	2.96	0.97	11	0.41
9. Providing recognition for clients	3.12	0.95	7	3.01	0.95	8	0.65
10. Preparing job description/specification	3.19	0.88	5	3.08	0.98	6	0.67
11. Managing conflicts	3.13	0.95	6	2.99	1.10	9	0.83
12. Receiving official visitors to your area of operation	3.42	0.86	2	3.47	0.92	1	-0.35
13. Delegating responsibility and authority	3.32	0.99	4	3.12	1.00	4	1.26
GRAND MEAN	3.14	0.57		3.09	0.62		0.58

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*P≤0.05

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regions will have the same or similar level of training needs in Administration competency.

4.4.2 PROGRAMME PLANNING

Table 4.28 shows that there was no significant difference between the grand means of the Western and Ashanti Region AEAs on their perceptions of their level of competency in programme planning. There was however, a significant difference between the two regions in 'preparing a long range programme of work' competency items. The Ashanti Region AEAs rating was higher (3.21) than their Western Region counterparts (2.88). Both ranked ' preparing annual programme of work for your area of responsibility' as the highest competency item followed by 'developing a calendar of extension activities' and 'determining objectives/goals of the extension programme'. Whiles AEAs in Western Region ranked 'preparing a long range programme of work' as the lowest (2.88), their Ashanti Region counterparts ranked 'planning for human and material resources as the lowest (2.95). This result could also be due to the similarity in the demographic characteristics of AEAs in the two regions as shown in Tables 4.2-4.7. This also implies that the AEAs in the two regions have similar training needs in Programme Planning competency.

4.4.3 PROGRAMME EXECUTION

There were no significant differences between the ratings of the Western Region AEAs and their Ashanti Region counterparts in all the 14 programme

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Table 4.28: Means, Standard Deviation and Ranking of Programme Planning Competency by AEAs in the Western and Ashanti Regions

Programme Planning Competency	Region of AEAs						t -value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
1. Developing a calendar of extension activities	3.55	0.87	2	3.59	0.91	2	-0.03
2. Determining the needs of clientele for extension programmes	3.22	0.84	4	3.08	0.95	7	0.911
3. Determining objectives/goods of the extension programme	3.33	0.87	3	3.43	0.95	3	-0.62
4. Establishing programme priority	3.14	0.91	5	3.38	0.87	4	-1.55
5. Preparing annual programme of work for your area of responsibility	3.57	0.83	1	3.60	0.85	1	-0.27
6. Preparing a long range programme of work	2.88	0.91	9	3.21	0.99	6	-2.08*
7. Involving co-workers in programme planning	3.13	1.03	6	3.36	1.05	5	-1.33
8. Planning for resources (human and material)	2.91	0.84	8	2.95	1.11	9	-0.20
9. Involving extension support groups and clientele in programme planning	3.01	0.99	7	3.03	0.99	8	-0.08
GRAND MEAN	3.19	0.64		3.30	0.80		-0.86

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*P≤0.05

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Table 4.29: Means, Standard Deviation and Ranking of Programme Execution Competency by AEAs in the Western and Ashanti Regions

Programme Execution Competency	Region of AEAs						t - value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
1. Utilizing a calendar of activities / events	3.38	0.88	7	3.58	0.90	5	-1.33
2. Following a written programme of work	3.50	0.80	5	3.51	1.01	6	-0.09
3. Providing leadership for programme planning and execution	3.01	0.88	14	3.09	0.95	12	-0.52
4. Developing a working relationship with clientele	3.58	0.88	4	3.59	0.81	4	-0.11
5. Completing monthly or annual reports	3.58	0.81	3	3.79	0.93	3	-0.61
6. Involving others in executing plans	3.17	0.8	10	3.23	0.84	10	-0.38
7. Conducting home/farm visits	3.87	0.84	1	4.08	0.95	1	-1.41
8. Conducting demonstrations	3.70	0.96	2	3.97	0.93	2	-1.75
9. Organizing clientele into groups (group formation)	3.43	0.88	6	3.51	1.09	7	-0.43
10. Facility groups of people having great diversity and multiple perspectives.	3.06	0.78	13	3.00	0.94	4	0.40
11. Ability to recognize simulation and role-playing	3.10	0.83	12	3.05	0.95	13	0.33
12. Ability to recognize errors in the course of programmes	3.19	0.78	9	3.32	0.88	9	-0.95
13. Monitoring of extension programmes	3.27	0.81	8	3.45	0.91	8	-1.22
14. Co-ordinating extension programmes and that of other groups	3.15	0.93	11	3.12	1.06	11	0.15
GRAND MEAN	3.38	0.56		3.45	0.69		-0.63

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4=High Competency, 5=Very High Competency

*P≤0.05

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execution competency items, their grand means being 3.38 and 3.45 respectively for Western and Ashanti Region AEAs (Table 4.29).

While the Western Region AEAs ranked 'conducting home/farm visits' as the highest item (3.87), followed by 'conducting demonstrations' (3.70) and 'completing monthly or annual reports' (3.58), their Ashanti Region counterparts also ranked these same items as the highest but with higher values (4.08, 3.97 and 3.79). 'Providing leadership for programme planning and execution' was the lowest (3.01) rated by Western Region AEAs while 'facilitating groups of people having great diversity and multiple perspectives' was rated as lowest (3.00) by Ashanti AEAs. This lack of significant difference between the AEAs in the two regions could also be due to the similarity in their demographic characteristics. This also means that the AEAs in the Western and Ashanti Regions will have similar Programme Execution training needs.

4.4.4 TEACHING

Even though there was no significant difference between the grand means of the Western and Ashanti Region AEAs perceptions on the level of their competence in teaching, four of the 20 items of this competency showed significant differences, the ratings of the Ashanti Region AEAs being higher than their Western Region counterparts. These items were 'presenting information with an overhead projector' 'presenting information with slides', 'presenting information with charts', and ' planning, organizing and conducting tours and field trips' (Table 4.30). The AEAs from Western Region ranked 'listening to

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Table 4.30: Means, Standard Deviation and Ranking of Teaching Competency by AEAs in the Western and Ashanti Regions

Teaching Competency	Region of AEAs						t - value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
1. Using principles (basic ideas or rules) of learning or teaching	3.39	0.84	7	3.28	0.97	12	0.73
2. Using teaching materials (e.g. flip charts, folders training guides, etc.)	3.19	1.05	12	3.35	1.05	10	-0.87
3. Ability to select non-formal methods/techniques for particular situations	2.99	1.03	15	3.20	1.03	15	-1.25
4. Presenting information in a lecture	3.23	0.93	10	3.38	0.96	9	-0.93
5. Presenting a concept, principle or skill through method demonstration	3.38	0.95	8	3.35	0.93	11	0.20
6. Presenting information in a meeting	3.51	0.85	3	3.76	0.80	1	-1.83
7. Presenting information in a seminar	2.88	0.96	16	3.21	0.99	14	-1.04
8. Presenting information at a field day	3.35	0.99	9	3.5	1.00	7	-0.96
9. Presenting information with an overhead projector	1.84	0.96	19	2.33	1.14	19	-2.74*

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4=High Competency, 5= Very High Competency

*P≤0.05

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Table 4.30(cont'd): Means, Standard Deviation and Ranking of Teaching Competency by AEAs in the Western and Ashanti Regions

Teaching Competency	Region of AEAs						t - value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
10. Presenting information with slides	1.84	0.93	20	2.29	1.05	20	-2.73*
11. Presenting information with charts	2.71	1.02	17	3.09	0.98	16	2.31*
12. Presenting information with chalk board	3.04	0.99	14	3.23	1.10	13	-1.05
13. Conducting group discussions	3.49	0.83	4	3.68	0.87	2	-1.31
14. Using the problem solving approach to teaching	3.13	0.91	13	3.05	0.96	17	0.48
15. Encouraging audience to ask questions	3.43	0.85	5	3.58	0.91	4	-0.99
16. Planning, organizing and conducting tours and field trips	2.45	1.12	18	2.85	1.06	18	-2.21*
17. Judging exhibits at agricultural shows	3.20	1.04	11	3.38	1.00	8	-1.03
18. Ability to recognize the importance of punctuality	3.57	0.83	2	3.53	0.92	6	0.27
19. Listening to questions and suggestions from audience	3.71	0.73	1	3.61	0.87	3	0.72
20. Organizing seating arrangement for audience	3.42	0.88	6	3.55	1.03	5	-1.04
GRAND MEAN	3.10	0.59		3.26	0.70		-1.42

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4=High Competency, 5= Very High Competency

*P≤0.05

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questions and suggestions from audience' as their highest (3.71) and 'presenting information with slides' as their lowest (1.84), while their Ashanti Region counterparts ranked 'presenting information in a meeting' as their highest (3.76) and 'presenting information with slides' as their lowest (2.29). This result could be due the similarity in the educational level (Table 4.4), working experience (Table 4.5), former technical department (Table 4.6) and number of in-service training sessions attended (Table 4.7) of the AEAs in the two regions. This suggests that the AEAs in both regions have similar training needs in Teaching competency.

4.4.5 COMMUNICATION

The perceptions of AEAs from Western and Ashanti Regions on their level of Communication competency showed no significant difference, even though the Ashanti Region AEAs grand mean ratings (2.93) was higher than the Western Region AEAs (2.86). Among the 15 items of the competency, only 'using non-verbal communications' showed a significant difference between the two groups, Ashanti Region AEAs being higher (3.01) than their Western Region counterparts (2.64) as shown on Table 4.31. Both groups ranked 'speaking to individual' and 'speaking to groups' as the two topmost items of the Communication competency, and again ranked 'the use of camera and/or other photographic equipment' and 'the use of the computer' as the two lowest competency items. This result could be due to the similarity in educational level (Table 4.4), working experience (Table 4.5), former technical department (Table 4.6) and number of in-service

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Table 4.31: Means, Standard Deviation and Ranking of Communication Competency by AEAs in the Western and Ashanti Region

Communication Competency	Region of AEAs						t - value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
1. Establishing communication among extension staff	3.25	0.97	4	3.55	0.94	3	-1.90
2. Writing letters and / or memos	2.90	0.88	10	3.11	0.93	6	-1.38
3. Writing and / or completing special reports	3.13	0.85	6	3.06	1.01	7	0.50
4. Speaking to groups	3.71	0.73	2	3.65	0.91	2	0.41
5. Speaking to individuals	3.89	0.84	1	4.01	0.84	1	-0.84
6. Using non-verbal communications	2.64	0.98	11	3.01	1.11	9	-2.12*
7. Possession of listening skills	3.06	1.00	8	3.26	0.99	5	-1.19
8. Preparing extension publications	2.43	0.95	12	2.51	1.12	12	-0.41
9. Act on correspondence promptly	3.19	0.89	5	3.03	1.03	8	1.02
10. Establishing working relationships with other governmental organizations	3.04	0.91	9	2.91	1.01	11	0.86
11. The use of camera and / or other photographic equipment	1.83	1.08	14	1.95	1.20	14	-0.62
12. The use of tape recorder	2.09	1.25	13	2.36	1.33	13	-1.25
13. The use of the computer	1.43	0.94	15	1.28	0.61	15	1.09
14. Interacting with personnel of higher position	3.13	0.99	7	2.96	1.03	10	1.02
15. Establishing working relationship with strangers	3.35	0.88	3	3.26	0.94	4	0.30
GRAND MEAN	2.86	0.61		2.93	0.67		-0.59

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4=High Competency, 5= Very High Competency

*P≤0.05

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training sessions attended (Table 4.7) of the AEAs in the two regions. This suggests that the Communication competency needs of the AEAs of the two regions is similar and could be addressed with similar programmes.

4.4.6 UNDERSTANDING HUMAN BEHAVIOUR

Table 4.32 shows that both Western Region AEAs and their Ashanti Region counterparts perceived themselves as having 'moderate' competency in Understanding Human Behaviour, with no significant difference between their grand means (3.39 and 3.25). All the 14 competency items did not show any significant differences between the ratings of the Western and Ashanti Region AEAs.They both ranked 'understanding your own nature' as the highest, followed by 'ability to accommodate religious differences'. The AEAs from Western Region ranked 'determine the effect of pressure groups on people's behaviour' as the lowest (2.85), while their Ashanti Region counterparts rated 'applying factors affecting behaviour of people' as the lowest (2.79). This result could also be due to the similarity in the demographic characteristics of the AEAs in the two regions as shown in Table 4.2 to Table 4.7. The implication of this is that the AEAs in the two regions will have similar training needs in the Understanding Human Behaviour competency.

4.4.7 MAINTAINING PROFESSIONALISM

Table 4.33 shows that the perceptions of AEAs in Western and Ashanti Regions regarding their level of Maintaining Professionalism competency did not

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Table 4.32; Means, Standard Deviation and Ranking of Understanding Human Behaviour Competency by AEAs in the Western and Ashanti Regions

Understanding Human Behaviour Competency	Region of AEAs						t - value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
1. Application of principles of motivation	3.16	0.75	10	3.11	0.98	9	0.35
2. Identification of factors that influence people become involved	3.07	0.86	12	3.01	01.01	12	0.38
3. Determine the effect of pressure groups on people's behaviour	2.85	0.93	14	2.89	0.92	13	-0.23
4. Applying factors affecting behaviour of people	2.93	0.80	13	2.79	0.99	14	0.87
5. Ability to influence people to accept change	3.59	0.75	4	3.47	0.92	5	0.86
6. Ability to identify the power structure within the community	3.10	0.79	11	3.05	0.93	11	0.32
7. Ability to identify pressure groups in the community	3.29	0.82	8	3.10	0.88	10	1.35
8. Utilizing knowledge of interaction of people in groups	3.28	0.68	9	3.15	0.90	8	0.94
9. Recognizing differences in age groups	3.61	0.76	3	3.50	0.88	4	0.81
10. Recognizing traditional culture and its effect	3.38	0.79	7	3.28	0.87	7	0.67
11. Ability to accommodate religious differences	3.69	0.82	2	3.61	1.04	2	0.53
12. Ability to accommodate other social groups	3.58	0.76	5	3.51	0.87	3	0.53
13. Understanding your own nature (strengths and weaknesses)	3.93	0.85	1	3.71	0.92	1	1.43
14. Recognizing the role of different sexes and how it influences change	3.54	0.84	6	3.38	0.92	6	1.12
GRAND MEAN	3.39	0.60		3.25	0.74		1.26

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4=High Competency, 5= Very High Competency

*P≤0.05

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Table 4.33: Means, Standard Deviation and Ranking of Maintaining Professionalism Competency by AEAs in the Western and Ashanti Regions

Maintaining Professionalism Competency	Region of AEAs						t - value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
1. Identifying opportunities for professional improvement	3.21	0.86	1	2.99	0.86	1	1.36
2. Developing a plan for professional competency improvement	2.84	0.80	4	2.77	1.01	4	0.46
3. Maintaining professional organizations and activities	2.94	0.80	3	2.78	0.93	3	1.02
4. Participation in professional organization and activities	3.16	0.19	2	2.81	1.00	2	2.18*
GRAND MEAN	3.04	0.72		2.84	0.94		1.45

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4=High Competency, 5= Very High Competency

*P≤0.05

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show any significant difference between their grand means, even though Western Region AEAs' rating (3.04) was higher than Ashanti Region AEAs' rating (2.84). However, one of the competency items, 'participation in professional organization and activities' showed significant difference between the two groups, Western Region AEAs' ratings being higher (3.16) than their Ashanti Region counterparts (2.81). Both groups ranked the four competency items in the same order, 'identifying opportunities for professional improvement' being highest and 'developing a plan for professional competency improvement' being the lowest.

The significantly higher ratings of the Western Region AEAs than their Ashanti Region counterparts in the item 'participation in professional organization and activities' could be due to the high percentage of their AEAs who were formerly with Extension Department (56.5 %) as compared to Ashanti Region counterparts (54.1%) as shown in Table 4.6. The AEAs who were formerly with the Extension Department participated in a lot of extension professional organization and activities, especially during the implementation of the NAEP, hence their high level of competency in this item. The implication of this is that Ashanti AEAs may need more attention when it comes to improving Maintaining Professionalism competency.

4.4.8 EVALUATION

There was no significant difference between the ratings of Western Region AEAs and Ashanti Region AEAs regarding their level of Evaluation competency, their grand means being 3.03 and 3.04 respectively (Table 4.34). Out of the 15

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Table 4.34: Means, Standard Deviation and Ranking of Evaluation Competency by AEAs in the Western and Ashanti Regions

Evaluation Competency	Region of AEAs						t - value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
1. Evaluating the effectiveness of a district or local extension programme	3.20	0.76	4	3.23	0.89	6	-0.17
2. Evaluating your own performance	3.75	0.72	1	3.67	0.86	1	0.66
3. Interpreting the impact of change and or trend upon the clientele	3.28	0.77	3	3.15	0.96	7	0.89
4. Using questionnaires to seek information	3.00	0.91	10	3.32	1.18	4	-1.80
5. Using observation method to seed information	3.07	0.88	7	3.32	1.03	3	-1.55
6. Using interviews to seek questionnaires	3.15	0.85	5	3.43	1.07	2	-1.75
7. Interpreting results of questionnaires	2.76	0.96	12	2.91	0.99	11	0.87
8. Evaluating the results of an extension activity	3.38	0.81	2	3.30	0.91	5	0.56
9. Analyzing report/data	3.14	0.80	6	2.72	1.09	13	2.56*
10. Interpreting research findings from research stations/university	2.68	0.95	14	2.47	1.20	14	1.15
11. Applying research findings when making recommendation to clientele	3.06	0.82	8	3.04	1.16	8	0.11
12. Cooperating with research stations	2.71	1.03	13	2.91	1.16	10	-1.07
13. Identifying problems requiring additional research	2.90	0.98	11	2.88	1.12	12	0.11
14. Keeping up-to-date with current research findings	3.06	1.08	9	2.95	1.07	9	0.63
15. Conducting a literature search using library resources	2.35	0.97	15	2.37	0.99	15	-0.13
GRAND MEAN	3.03	0.58		3.04	0.76		-0.14

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4=High Competency, 5= Very High Competency

*P≤0.05

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evaluation competency items it was only in 'analyzing report/data' that the ratings of the AEAs from Western Region was significantly higher (3.14) than those in Ashanti Region (2.72). The Western Region AEAs ranked 'evaluating your own performance' as the highest (3.75) just like their Ashanti Region counterparts (3.67) and both again rated 'interpreting research finding from research stations/universities' and 'conducting a literature search using library resources' as the lowest ranked items.

The significantly higher rating of Western Region AEAs than those in Ashanti Region in the item, 'analyzing report/data' could be due to the higher percentage of their AEAs who possessed Diploma in Agriculture (10.1%) compared to those in Ashanti Region (5.3%) as shown in Table 4.4 (Highest Level of Education Attained by Respondents). These AEAs by virtue of their university education, which involved among other things, project work, enabled them to analyze data practically hence their high competency in this item. This suggests that AEAs in Ashanti Region would not be able to analyze reports and data very well, even though this is a critical activity when it comes to evaluating extension programmes.

4.4.9 ANIMAL PRODUCTION

The grand means of the ratings of the Western and Ashanti Region AEAs regarding their level of Animal Production Competency did not show any significant difference (Table 4.35). However, in 'producing cattle', 'producing grasscutters and rabbits' and 'snail production' competency items, Ashanti

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Table 4.35 : Means, Standard Deviation and Ranking of Animal Production Competency by AEAs in the Western and Ashanti Regions

Animal Production Competency	Region of AEAs						t - value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
1. Producing sheep and goats	3.35	0.85	2	3.49	0.90	2	-0.99
2. Producing poultry	3.41	0.90	1	3.37	0.96	4	0.23
3. Producing pigs	3.35	0.82	3	3.25	.98	6	0.69
4. Producing cattle	2.57	0.98	11	2.93	1.10	7	-2.04*
5. Producing grasscutters and rabbits	2.17	0.97	14	2.55	1.13	14	-2.11*
6. Snail production	2.35	1.01	13	2.84	1.18	9	-2.64*
7. Apiculture (bee-keeping for honey)	2.15	1.07	15	2.19	1.12	15	-0.26
8. Formulation of animal feed and feed management	2.81	0.90	8	2.67	1.16	13	0.83
9. Animal improvement through controlled breeding	2.78	0.90	9	2.79	1.18	11	-0.10
10. Pasture management for livestock	2.43	0.95	12	2.75	1.11	12	-1.85
11. Appropriate housing for livestock and poultry	3.33	0.70	5	3.41	1.09	3	-0.50
12. Routine management practices in poultry (e.g. handling of day-old-chicks)	3.18	0.96	6	3.18	1.17	7	0.06
13. Routine management practices in livestock (e.g. dehorning, hoof trimming)	2.73	1.05	9	3.77	1.16	1	-0.21
14. Mating ratio for poultry and livestock	3.00	0.97	7	2.83	1.16	10	0.93
15. Detection of female animals on heat and ensuring successful service by males	3.35	0.91	4	3.27	1.23	5	0.43
GRAND MEAN	2.86	0.62		2.95	0.85		-0.73

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4=High Competency, 5= Very High Competency

*P≤0.05

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Region AEAs significantly rated themselves higher than their Western Region counterparts. In all the other 12 items, the ratings of the two groups were not significantly different from one another. The Western Region AEAs rated 'producing poultry' as their highest (3.41) while the Ashanti Region AEAs rated 'routine management practices in livestock' (3.77) as their highest. The lowest items was 'apiculture' for both groups, Western Region AEAs rating it 2.15 and their Ashanti Region counterparts rating it 2.19.

The significantly higher ratings of the Ashanti Region AEAs in 'producing cattle' than the Western Region AEAs could be due to the high cattle numbers in the former region than the latter (MOFA, 1991) and therefore, Ashanti Region AEAs having had more training in response to the demands of cattle farmers than the Western AEAs. Also the significantly higher ratings of Ashanti Region AEAs in 'producing grasscutter and rabbits' and 'snail production', these being non-traditional animals in the sector, could be due to high interest shown by farmers in this region in their rearing and therefore challenging AEAs to improve their skills in this area through training. The implication of these is that AEAs in the Western Region may not do well in sending improved messages to farmers in the rearing of these animals which is fast catching up as a cheaper source of protein for people and also checking the destructive way of hunting these animals traditionally through bush burning.

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4.4.10 ANIMAL HEALTH AND DISEASES

The perceptions of the Western Region AEAs and their Ashanti Region counterparts regarding their level of competency in Animal Health and Diseases was low, with no significant difference between their two ratings, 2.45 and 2.48 (Table 4.36). None of the 12 competency items of the two groups ratings showed any significant differences. They both ranked 'identification of signs of good and ill-health in farm animals' as the highest (3.35 and 3.41), and also rated 'ability to follow pre-slaughter procedure in the abattoir' as the lowest (1.87 and 1.84).

The result could be due to the similarity in the demographic characteristics of AEAs in the two regions. This means that AEAs in both regions would have difficulty in assisting farmers in the animal health and diseases aspect of their farming business.

4.4.11 FISH FARMING

Table 4.37 shows that the perceptions of the AEAs from Western Region did not differ significantly from those from the Ashanti Region regarding their level of fish farming competency. They both gave it a low rating of 2.23 and 2.18 respectively. All the 17 items

under the fish farming competency also did not show any significant differences between the ratings of the two groups. While the Western Region AEAs ranked 'ability to identify site for pond construction' as their highest (2.93), followed by 'techniques in feeding fishes' (2.65) and 'identification of fish types cultured in Ghana' (2.58), their Ashanti Region counterparts also ranked 'ability to identify

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Table 4.36: Means, Standard Deviation and Ranking of Animal Health and Diseases Competency by AEAs in the Western and Ashanti Regions

Animal Health and Diseases Competency	Region of AEAs						t - value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
1. Identification of signs of good and ill-health in farm animals	3.35	0.76	1	3.41	0.99	1	-0.44
2. Ability to prescribe recommended drugs for the treatment of farm animals	2.49	1.02	6	2.57	1.15	6	-0.44
3. Giving oral medication to animal	2.62	1.03	5	2.80	1.09	4	-1.00
4. Use of hypodermic syringes on animal (giving injection)	1.93	1.10	11	2.41	1.26	9	-1.11
5. Ability to manage wounds, fractures burns, etc.	2.23	1.03	7	2.24	1.14	7	-0.08
6. General management of endo-parasites in animals	3.04	0.98	2	2.93	1.14	2	0.62
7. General management of endo-parasites in animals	2.70	1.03	4	2.83	1.17	3	-0.71
8. Management of diseases in general	2.82	0.89	3	2.64	1.06	5	1.10
9. Ability to follow pre-slaughter procedure in the abattoir	1.87	1.08	12	1.84	1.08	12	0.15
10. Dressing of carcass	1.97	1.02	10	2.03	1.09	11	-0.32
11. Cutting carcasses into parts/portion	2.13	1.07	9	2.09	1.12	10	0.203
12. Ability to identify wholesome and unwholesome meat	2.20	1.08	8	2.21	1.09	8	0.06
GRAND MEAN	2.45	0.80		2.48	0.95		-0.23

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4=High Competency, 5= Very High Competency

*P≤0.05

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Table 4.37: Means, Standard Deviation and Ranking of Fish Farming Competency by AEAs in the Western and Ashanti Regions

Fish Farming Competency	Region of AEAs						t - value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
1. Ability to identify site for pond construction	2.93	1.02	1	2.86	1.01	1	0.35
2. Construction of fish pond	2.55	1.03	4	2.59	1.16	3	-0.20
3. Identification of fish types cultured in Ghana	2.58	1.00	3	2.64	1.00	2	-0.34
4. Techniques in stocking fish pond	2.45	1.09	6	2.44	1.01	6	0.12
5. Production of fingerlings	2.02	0.97	12	2.10	1.04	11	-0.47
6. Techniques in transporting fingerlings	2.33	1 .05	8	2.15	1.01	8	1.02
7. Techniques in assessing the stock of fish in a pond	2.07	0.96	11	2.11	0.97	10	-0.22
8. Formulating feed for fishes in a pond	2.13	0.94	9	2.34	1.07	7	-1.22
9. Techniques in feeding fishes	2.65	1.03	2	2.45	1.04	4	1.14
10. Ability to identify disease conditions in fishes in a pond	1.69	0.91	17	1.78	0.87	14	-0.63

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4=High Competency, 5= Very High Competency

*P≤0.05

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Table 4.37(cont'd): Means, Standard Deviation and Ranking of Fish Farming Competency by AEAs in the Western and Ashanti Regions

Fish Farming Competency	Region of AEAs						t - value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
11. Managing disease situation in a pond	1.73	0.83	16	1.70	0.88	15	0.23
12. Techniques in harvesting fishes	2.43	0.97	7	2.14	1.01	9	1.74
13. Fish preservation processing techniques	2.55	0.96	5	2.45	1.08	5	0.58
14. Construction of chorkor ovens and trays	1.82	1.00	15	1.58	0.86	17	1.51
15. Maintenance of smoking ovens and trays	1.86	0.94	14	1.68	0.90	1	1.19
16. Management of fish storage pests (e.g. insects, rodents)	1.96	0.82	13	1.92	0.95	13	0.25
17. Proper handling of wet fish	2.12	1.02	10	2.05	0.97	12	0.38
GRAND MEAN	2.23	0.70		2.18	0.78		0.40

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4=High Competency, 5= Very High Competency

*P≤0.05

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site for pond construction' as their highest (2.86), followed by 'identification of fish types cultured in Ghana' (2.64) and 'construction of fish pond' (2.59). 'Ability to identify disease conditions in fishes in a pond '(1.69) was the lowest rated by Western Region AEAs while their Ashanti Region counterparts rated 'construction of chorkor ovens and trays' (1.58) as their lowest.

This result could be due to the similarity in the demographic characteristics of the AEAs in the two regions especially, their highest level of education (Table 4.4) and number of training sessions they have attended (Table 4.7). This suggests that the AEAs in the two regions would be found wanting when it comes to doing fish farming extension leading to less fish protein in the diet of the populace. The catch from the traditional sources will keep dwindling if competency training in fish farming is not improved.

4.4.12 CROP PRODUCTION

There was no significant difference between the grand mean ratings of the Western Region AEAs (3.24) and the Ashanti Region AEAs (3.18) regarding their level of crop production competence (Table 4.38). Out of the 21 competency items, only two of them showed significant differences between the ratings of the two groups. These are 'production of coconut' and 'production of rubber plant for latex' in which the Western Region AEAs significantly rated themselves higher (3.04 and 2.39) than their Ashanti Region counterparts (2.51 and 1.77). While the AEAs in Western Region rated 'production of vegetables' as the highest item (4.00) followed by 'production of cereals' (3.99) and 'production of root and

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Table 4.38: Means, Standard Deviation and Ranking of Crop Production Competency by AEAs in the Western and Ashanti Regions

Crop Production Competency	Region of AEAs						t - value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
1. Production of cereals	3.99	0.90	2	4.01	0.81	1	-0.20
2. Production of roots and tuber crops	3.91	0.87	3	3.91	0.87	4	0.04
3. Production of legumes	3.77	0.89	8	3.93	0.93	3	-1.08
4. Production of vegetables	4.00	0.71	1	3.93	0.83	2	0.51
5. Production of cocoa	3.35	1.14	11	3.42	1.05	12	1.33
6. Production of coffee	2.72	1.06	15	2.48	1.03	18	1.41
7. Production of citrus	3.25	1.03	12	3.73	0.97	7	-0.76
8. Production of oil palm	3.87	0.87	4	3.63	1.02	8	1.53
9. Production of coconut	3.04	1.20	14	2.51	1.15	17	2.69*
10. Production of rubber plant for latex	2.39	1.15	19	1.77	1.01	21	3.43*

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= V. High Competency

*P≤0.05

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Table 4.38(cont'd): Means, Standard Deviation and Ranking of Crop Production Competency by AEAs in the Western and Ashanti Regions

Crop Production Competency	Region of AEAs						t - value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
11. Production of plantain and banana	3.81	0.91	6	3.81	1.09	5	-0.01
12. Production of pineapple	3.20	0.99	13	3.21	1.17	13	-0.04
13. Production of other fruit plants (mango, cashew, etc.)	2.63	0.98	16	2.89	1.15	14	-1.46
14. Production of pasture and forage crops	2.54	0.95	18	2.57	1.09	16	-0.22
15. Crop breeding (crop improvement)	2.28	0.91	20	2.37	1.12	19	-0.57
16. Ability to perform effective grafting and budding	2.59	0.99	17	2.72	1.05	15	-0.17
17. Appropriate Post harvest handling of produce (cereals)	3.74	0.85	9	3.57	1.07	9	1.02
18. Ventilated narrow crib construction	3.51	0.96	10	3.51	1.22	10	0.03
19. Nursery management of vegetables	3.79	0.89	7	3.48	1.03	11	1.94
20. Nursery management of vegetables	3.81	0.90	5	3.76	0.90	6	0.35
21. Mushroom production	1.91	1.09	21	2.17	1.06	20	-1.46
GRAND MEAN	3.24	0.66		3.18	0.76		0.54

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= V. High Competency

*P≤0.05

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tuber crops (3.91), those in Ashanti Region rated 'production of cereals' as highest (4.01), followed by 'production of vegetables' (3.93) and 'production of legumes' (3.93). The Western Region AEAs rated 'crop breeding' (2.28) and 'mushroom production (1.91) as the lowest two items while their Ashanti Region counterparts rated 'mushroom production' (2.17) and 'production of rubber plant for latex (1.77) as the lowest two items.

The significantly higher ratings of Western Region AEAs in 'production of coconut' and 'production of rubber plant for latex' could be due to the fact that coconut and rubber are predominantly found in the Western Region but not Ashanti Region. This suggests that the idea to introduce rubber to other regions like Ashanti will suffer if appropriate measures are not taken to equip their AEAs with skills to do extension in rubber production.

4.4.13 PLANT PROTECTION

Table 4.39 shows that the perceptions of Western Region AEAs and Ashanti Region AEAs regarding their level of Plant Protection competency did not differ significantly from one another in both their grand means and in all the 14 competency items. They both ranked 'spraying of pesticides using the knapsack sprayer' as the highest followed by 'general management of farm to protect crop against pests and disease' and 'ability to prescribe recommended pesticides for common diseases of crops and stored produce'. While the Western Region AEAs rated 'management of nematodes' (2.96) and Integrated Pest Management (2.80) as the lowest items their Ashanti Region counterparts rated 'management of

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Table 4.39: Means, Standard Deviation and Ranking of Plant Protection Competency by AEAs in the Western and Ashanti Regions

Plant Protection Competency	Region of AEAs						t - value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
1. Ability to identify different crop pests	3.26	0.89	7	3.12	0.91	7	0.93
2. Ability to identify different damages caused by different pests	3.13	0.83	9	2.97	0.86	11	1.12
3. Identification of different disease conditions and their causal agents	2.97	0.80	12	2.99	0.96	10	- 0.10
4. Management of insect pest	3.16	0.84	8	3.12	0.89	8	0.28
5. Management of nematodes	2.96	0.96	13	2.89	1.00	13	0.39
6. Management of fungal diseases in crops	3.28	0.84	6	3.15	1.04	6	0.79
7. Management of viral and bacterial diseases	2.99	0.99	11	2.85	0.92	14	0.83
8. Ability to prescribe recommended pesticides for common diseases	3.61	0.89	3	3.38	1.18	3	0.31
9. Mixing of pesticides (emulsion and powdered form)	3.47	0.95	5	3.32	1.18	5	0.92
10. Spraying of pesticides using the knapsack sprayer	3.81	0.82	1	3.74	0.93	1	0.47
11. Spraying of pesticides using the mist-blower	3.04	1.04	10	3.12	1.12	9	-0.43
12. General management of farm to protect crop against pests and diseases	3.81	0.90	2	3.68	1.05	2	0.77
13. Knowledge of common pesticides on the local market	3.49	0.82	4	3.38	0.98	4	0.76
14. Integrated Pest Management (IPM)	2.80	0.92	14	2.93	0.94	12	-0.84
GRAND MEAN	3.27	0.72		3.19	0.82		0.64

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*P≤0.05

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nematodes' (2.89) and 'management of viral and bacterial diseases' (2.85) as the lowest items.

The similarity in the demographic characteristics of AEAs in both regions especially their former technical department (Table 4.6) could account for this result. This implies that similar training programme will be needed for AEAs in both regions to enable them adequately support farmers to produce healthy crops.

4.4.14 AGROFORESTRY

The perceptions of AEAs from Western and Ashanti Regions regarding their level of Agroforestry competency did not show any significant difference between their grand means of 2.72 and 2.59 (Table 4.40). Of the nine items making up the agroforestry competency, two of them showed significant difference between the Western and Ashanti Region AEAs' ratings. These were in 'woodlot production' and 'live staking practices' in which Western Region AEAs rated themselves significantly higher (2.84 and 2.72) than their Ashanti counterparts (2.48 and 2.37). Both Western and Ashanti Region AEAs ranked 'prevention of bush fires' as the highest (3.20 and 3.12). Both also rated 'techniques and management of coppice' as their lowest (2.19 and 2.21).

The significantly higher ratings of the Western Region AEAs in the two items, 'woodlot production' and 'live stalking practices' could be due to the interest of farmers in that region in these items, thereby challenging the AEAs to improve on their skills in these areas. This suggests that AEAs in Ashanti Region would be

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Table 4.40: Means, Standard Deviation and Ranking of Agroforestry Competency by AEAs in the Western and Ashanti Regions

Agroforestry Competency	Region of AEAs						t - value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
1. Ability to identify major agro forestry species	2.77	0.99	5	2.45	1.04	6	1.86
2. Alley cropping practices	2.80	0.96	4	2.77	1.03	3	0.14
3. Woodlot production	2.84	1.09	3	2.48	1.08	5	1.99*
4. Live staking practices	2.72	0.97	6	2.37	1.11	8	1.95*
5. Windbreaks practices	2.96	0.84	2	2.79	1.09	2	1.03
6. Agrisilvipasture (rearing animals under plantation crops)	2.32	0.97	8	2.41	1.04	7	-0.53
7. Planning of agro forestry trees	2.65	1.04	7	2.64	1.15	4	0.07
8. Techniques and management of coppice	2.19	0.92	9	2.21	1.04	9	-0.09
9. Prevention of bush fires	3.20	0.98	1	3.12	1.08	1	0.48
GRAND MEAN	2.72	0.80		2.59	0.94		0.89

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*P≤0.05

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disadvantaged in their agroforestry extension activities compared to their Western Region counterparts.

4.4.15 LAND AND WATER MANAGEMENT

Table 4.41 shows that there was no significant differences between the perceptions of Western and Ashanti Region AEAs regarding their level of Land and Water Management competency. They both rated it 'Moderate', Western Region AEAs' being higher (3.23) than the Ashanti Region AEAs' (3.08). All the six items under this competency also did not show any significant differences. The Western and Ashanti Region AEAs both ranked all the six items in the same order, 'use and application of fertilizers' being the highest and 'ability to carry out soil fertility analysis' being the lowest.

This similar level of competency by AEAs in both regions could be accounted for by the fact that their educational level (Table 4.4) and attendance to in-service training sessions (Table 4.7) were similar. This implies that the same training programme could be put in place for the AEAs in both regions to improve their competency in land and water management.

4.4.16 MECHANIZATION

There was no significant difference between the perception of the Western Region and Ashanti Region AEAs regarding their level of Mechanization competency, both rating their grand means as low (2.69 and 2.75). There was also no significant difference between the two groups in the eleven competency items

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Table 4.41: Means, Standard Deviation and Ranking of Land and Water Management Competency by AEAs in the Western and Ashanti Regions

Land and Water Management Competency	Region of AEAs						t – value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
1. Ability of carry out a proper land survey	2.70	1.02	5	2.47	1.17	5	1.33
2. Ability to carry out soil fertility analysis	2.48	0.97	6	2.40	1.05	6	1.39
3. Preparation and application of compost and farmyard manure	3.26	0.95	4	3.25	1.01	4	0.05
4. Use and application of fertilizers	3.90	0.83	1	3.81	1.01	1	0.55
5. Managing soil erosion (use of erosion control methods)	3.38	0.75	3	3.35	1.01	3	0.20
6. Managing soil water (e.g. mulching)	3.64	0.86	2	3.37	1.12	2	1.58
GRAND MEAN	3.23	0.69		3.08	0.91		1.08

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*P≤0.05

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Table 4.42: Means, Standard Deviation and Ranking of Mechanization Competency by AEAs in the Western and Ashanti Regions

Mechanization Competency	Region of AEAs						t – value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
1. Use of simple farm tools	3.72	1.01	2	3.81	0.97	1	-0.54
2. Construction of simple farm drainage system	2.82	0.92	5	2.88	1.09	6	-0.33
3. Use of irrigation equipment (e.g. sprinklers)	2.10	0.96	7	2.37	1.12	7	-1.56
4. Field operation of a tractor and a power filler	1.88	0.96	9	2.17	1.13	8	-1.65
5. Maintenance and simple repairs of farm machinery and equipment	1.95	0.87	8	2.03	1.04	9	-0.34
6. Using motorbike	3.9	1.30	1	3.71	1.34	2	1.06
7. Using a motor sprayer	2.76	1.22	6	3.05	1.13	5	-1.48
8. Ability to construct simple farm structures (pens, hatches, etc)	3.12	0.88	4	3.15	0.90	4	-0.18
9. Ability to construct storage barns of cereal and tubers (narrow cribs)	3.40	0.90	3	3.35	1.06	3	0.31
10. Operating milling machines (e.g. for cereals, oil palm and coconut)	1.87	1.04	10	1.93	1.04	10	-0.39
11. Using an incubator	1.58	0.90	11	1.77	1.06	11	-1.19
GRAND MEAN	2.69	0.56		2.75	0.75		-0.54

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*P≤0.05

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(Table 4.42). While the Western Region AEAs rated 'using motorbike' as their highest item (3.90) followed by 'use of simple farm tools' (3.72) and 'ability to construct storage barns for cereals and tubers' (3.40), their Ashanti Region counterparts rated 'use of simple farm tools' as highest (3.81), followed by 'using motorbike' (3.71) and 'ability to construct storage barns for cereals and tubers' (3.35). Both rated 'using an incubator' as the lowest item (1.58 and 1.77).

The similarity in the background of the AEAs in both regions and that of the vegetation of the two regions could account for this result, as the drier regions lend themselves more to agricultural mechanization. This suggests that the AEAs in both regions will need similar training to be able to support farmers in their activities should the two regions become more mechanized.

4.4.17 Women In Agricultural Development (WIAD)

Table 4.43 shows that the perceptions of AEAs in the Western Region regarding their level of WIAD competency was not significantly different from those in Ashanti Region. Ashanti Region AEAs' grand mean rating of 3.08 was higher than the Western Region AEAs' rating of 2.86. However, four of the eighteen WIAD competency items showed significant difference between the ratings of the two groups, the Ashanti Region AEAs being higher in all four. These were 'in-depth knowledge on family planning methods', 'preparation of basic but recommended dishes for lactating mothers and babies', 'weaning food utilization' and 'root/tuber crops preservation and processing'. Both the Western

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Table 4.43: Means, Standard Deviation and Ranking of WIAD Competency by AEAs in the Western and Ashanti Regions

WIAD Competency	Region of AEAs						t - value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
1. In-depth knowledge on population issues and how these effect food security	2.86	0.94	9	2.86	1.10	14	-0.05
2. In-depth knowledge on family planning methods	2.75	0.93	14	3.19	1.02	6	-2.67*
3. Improved kitchen practices	2.91	0.84	7	2.89	1.11	13	0.12
4. Preparation of basic but recommended dishes for lactating mothers and babies	2.44	0.94	16	2.85	1.21	15	-2.19*
5. Techniques in budgeting at home	2.94	0.86	6	3.14	1.06	9	-1.20
6. Techniques in ensuring a hygienic home	3.36	0.87	1	3.37	1.01	1	-0.05
7. Observing safety measures in the home	3.19	0.91	4	3.26	1.01	5	-0.44
8. Legume utilization	3.22	0.83	3	3.37	1.11	3	-0.09
9. Leafy Vegetable utilization	3.28	0.95	2	3.37	1.12	2	-0.54
10. Weaning food utilization	2.68	0.92	15	3.14	1.08	8	-2.71*

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*P≤0.05

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Table 4.43(cont'd): Means, Standard Deviation and Ranking of WIAD Competency by AEAs in the Western and Ashanti Regions

WIAD Competency	Region of AEAs						t - value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
11. Root / tuber crops preservation and processing	2.80	0.87	12	3.15	1.01	7	-2.23*
12. Oil preservation	2.77	0.93	13	2.92	0.97	12	-0.94
13. Vegetables preservation and processing	2.85	0.89	11	2.95	1.05	11	-0.56
14. Fish / meat preservation and processing	2.87	0.95	8	3.01	1.01	10	-0.87
15. Parboiling of rice	2.40	0.96	17	2.64	1.07	14	-1.43
16. Soap making	2.29	1.10	18	2.58	1.17	18	-1.50
17. Skills in working with clientele of the opposite sex	3.12	0.88	5	3.25	1.12	4	-0.77
18. Assessment / analysis of gender issues for planning	2.86	0.79	10	2.83	1.05	16	0.14
GRAND MEAN	2.86	0.60		3.08	0.95		-1.57

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*P≤0.05

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Region AEAs and their Ashanti Region counterparts ranked the same items as the highest and lowest. 'Techniques in ensuring a hygienic home' was first, followed by 'leafy vegetables utilization' and 'legume utilization'. 'Soap making' was the lowest.

The Ashanti Region AEAs significantly rating themselves higher than the Western Region AEAs in four of the items and also generally having higher grand mean (3.08) than those in Western Region (2.86) could be attributed to the fact that there were no female AEAs among the Western Region respondents compared to the ten in Ashanti Region (Table 4.2). Again, while Ashanti Region had 2.7% of the respondents being formerly with the WIAD department, Western Region had none (Table 4.6).

This result implies that Western Region AEAs may be disadvantaged when it comes to doing WIAD extension, leading to poor performance of their farmers in these matters.

4.4.18 FARM MANAGEMENT

There was no significant difference between the grand mean ratings of Western and Ashanti Region AEAs regarding their level of Farm Management competency, both rating it as 'moderate'. The ten competency items making the Farm Management competency also did not show any significant differences between them (Table 4.44).

The highest rated competency item by the Western Region AEAs was 'knowledge about marketing centres for agricultural produce in your operational

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Table 4.44. : Means, Standard Deviation and Ranking of Farm management Competency by AEAs in the Western and Ashanti Regions

Farm Management Competency	Region of AEAs						t - value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
1. Knowledge of basic profitability criteria for evaluation of farm development project	3.00	0.87	5	2.88	0.91	6	0.82
2. Advising potential borrower to examine alternative sources of financing before making a loan application to banks	2.97	0.85	6	2.93	0.94	5	0.25
3. Knowledge of the requirement for agricultural loan of major bank in Ghana (e.g. ADB)	2.83	1.04	9	2.70	1.02	9	0.72
4. Knowledge of the conditions for loans from non banking financial institution (e.g. susu)	2.57	0.97	10	2.43	0.99	10	0.90
5. Preparing budget for specific programme operators or purposes	2.90	0.83	7	2.85	1.04	7	0.30
6. Estimation of partial budget of a typical farm enterprise (cost benefit analysis)	2.90	0.91	8	2.85	1.06	8	0.27
7. Grinding farmers in keeping accurate records on their farm enterprise	3.52	0.78	2	3.51	0.95	1	0.10
8. Knowledge about marketing centres for agricultural produce in operational area, your district	3.63	0.79	1	3.44	1.07	2	1.22
9. Knowledge about market information from other parts of the country (e.g. through radio)	3.29	0.93	4	3.18	1.07	4	0.66
10. Knowledge about movement of agricultural produce within your district, region and other parts of the country	3.29	0.87	3	3.33	0.97	3	-0.41
GRAND MEAN	3.09	0.61		3.00	0.77		0.73

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*P≤0.05

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Table 4.44. : Means, Standard Deviation and Ranking of Farm management Competency by AEAs in the Western and Ashanti Regions

Farm Management Competency	Region of AEAs						t - value
	Western N=69			Ashanti N=75			
	Mean	SD	Rank	Mean	SD	Rank	
1. Knowledge of basic profitability criteria for evaluation of farm development project	3.00	0.87	5	2.88	0.91	6	0.82
2. Advising potential borrower to examine alternative sources of financing before making a loan application to banks	2.97	0.85	6	2.93	0.94	5	0.25
3. Knowledge of the requirement for agricultural loan of major bank in Ghana (e.g. ADB)	2.83	1.04	9	2.70	1.02	9	0.72
4. Knowledge of the conditions for loans from non banking financial institution (e.g. susu)	2.57	0.97	10	2.43	0.99	10	0.90
5. Preparing budget for specific programme operators or purposes	2.90	0.83	7	2.85	1.04	7	0.30
6. Estimation of partial budget of a typical farm enterprise (cost benefit analysis)	2.90	0.91	8	2.85	1.06	8	0.27
7. Grinding farmers in keeping accurate records on their farm enterprise	3.52	0.78	2	3.51	0.95	1	0.10
8. Knowledge about marketing centres for agricultural produce in operational area, your district	3.63	0.79	1	3.44	1.07	2	1.22
9. Knowledge about market information from other parts of the country (e.g. through radio)	3.29	0.93	4	3.18	1.07	4	0.66
10. Knowledge about movement of agricultural produce within your district, region and other parts of the country	3.29	0.87	3	3.33	0.97	3	-0.41
GRAND MEAN	3.09	0.61		3.00	0.77		0.73

Source: Survey Data, 2000

Scale: 1=Very Low Competency, 2=Low Competency, 3= Moderate Competency, 4= High Competency, 5= Very High Competency

*P≤0.05

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area, your district and beyond '(3.63) followed by 'guiding farmers in keeping accurate records on their farm enterprise' (3.52) and 'knowledge about movement of agricultural produce within your district, region and other parts of the country' (3.29). The Ashanti Region AEAs on the other hand rated 'guiding farmers in keeping accurate records on their farm enterprise' as their highest (3.51), followed by 'knowledge about marketing centres for agricultural produce' (3.44) and 'knowledge about movement of agricultural produce within your district, region and other parts of the country' (3.33). Both groups rated ' knowledge of the conditions for loans from non-banking financial institutions' as the lowest.

This result could be due to the similarity in the demographic characteristics of the AEAs in the two regions, especially their educational level (Table 4.4), attendance in in-service training sessions (Table 4.7), and their former technical department (Table 4.6) where 17.4% and 18.9% respectively, belonged to the PPMED. This suggests that the AEAs in the two regions may require similar training programmes to improve their farm management competency to enable them support farmers manage their farm enterprises properly.

4.5 THE PERCEPTION OF AGRICULTURAL EXTENSION AGENTS AND SUPERVISORS AS THE BEST TIME FOR AEAs TO ACQUIRE COMPETENCIES

Among the objectives of the study was to determine the best time for AEAs to acquire the professional and technical competencies from the AEAs and their

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supervisors. So the AEAs and their supervisors were asked to indicate when they perceived as the best time (pre-service or in-service) for the AEAs to acquire the various competency items. Percentage distribution of the respondents was used and the results derived are discussed in this section.

4.5.1 ADMINISTRATION

The agricultural extension agents and their supervisors both perceived that all the 13 administration competency items should be acquire after AEAs have been employed, that is, during in-service training (Table 4.45). The AEAs percentage distribution for acquisition of competency items during in-service ranged from 51.1% for 'managing time effectively' to 76.5% for 'coordinating the use of equipments facilities and resources with office staff'. The supervisors' percentage distribution for acquisition of competency items during in-service training ranged from 57.6% for 'managing times effectively' to 85.3% for 'orienting new staff under studying you'.

4.5.2 PROGRAMME PLANNING

Table 4.46 shows that both the AEAs and the supervisors perceived that the best time for the acquisition of the nine programme planning competency items is during in-service training. While the AEAs percentage distribution for acquisition of competency items during in-service training ranged from 62.4% for 'planning for resources' to 75.4% for 'involving co-workers in programme planning', that of the supervisors ranged from 61.8% for 'determining the needs of clientele for

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Table:4.45 Percentage distribution in respect of when AEAs and their Supervisors perceived as the best time for AEAs to acquire Administration Competency

Administration Competency	Best time to acquire competency					
	AEAs			Supervisors		
	Pre-service		In-service	Pre-service		In-service
	N	%	%	N	%	%
1. In-depth knowledge and understanding of government agricultural policies	137	28.5	71.5	34	29.4	70.6
2. Writing realistic goals for the extension programme	137	29.2	70.8	34	29.4	70.6
3. Ability to manage scarce resources for optimum productivity	136	36.8	63.2	33	42.4	57.6
4. Coordinating the use of equipments, facilities and resources with office staff	136	23.5	76.5	33	18.2	81.8
5. Budget preparation	133	40.6	59.4	32	31.3	68.8
6. Managing time effectively	137	48.9	51.1	33	42.4	57.6
7. Promoting inter office communications	136	29.4	70.6	34	23.5	76.5
8. Orienting new staff under studying you	135	28.9	71.1	34	14.7	85.3
9. Providing recognition for clients	132	23.5	76.5	33	27.3	72.7
10. Preparing job description/specification	136	25.4	74.6	33	27.5	72.7
11. Managing conflicts	135	43.7	56.3	33	39.4	60.6
12. Receiving official visitors to your area of operation	135	29.6	70.4	34	26.5	73.5
13. Delegating responsibility and authority	134	31.3	68.7	33	36.4	63.6

Source: Survey Data, 2000

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Table 4.46: Percentage distribution in respect of when AEAs and their supervisors perceived as the best time for AEAs to acquire Programme Planning Competency

Programme Planning Competency	Best time to acquire competency					
	AEAs			Supervisors		
	Pre-service	In-service		Pre-service	In-service	
	N	%	%	N	%	%
1. Developing a calendar of extension activities	136	29.4	70.6	34	29.4	70.6
2. Determining the needs of clientele for extension programmes	135	29.6	70.4	34	38.2	61.8
3. Determining objectives/goods of the extension programme	136	29.9	70.1	34	32.4	67.6
4. Establishing programme priority	135	28.9	71.1	34	32.4	67.6
5. Preparing annual programme of work for your area of responsibility	136	25.7	74.3	34	26.5	73.5
6. Preparing a long range programme planning	134	34.3	65.7	34	26.5	73.5
7. Involving co-workers in programme planning	134	26.6	75.4	34	32.4	67.6
8. Planning for resources (human and material)	133	37.6	62.4	34	52.9	47.1
9. Involving extension support groups and clientele in programme planning	129	27.9	72.1	33	27.7	72.7

Source: Survey Data, 2000

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extension programmes', to 73.5% for 'preparing a long-range programme of work'. The supervisors however perceived that 'planning for resources' should be acquired before the job, that is, pre-service (52.9%).

4.5.3 PROGRAMME EXECUTION

The percentage distribution in respect of when AEAs and their supervisors distribution perceived as the best time for AEAs to acquire programme execution competency (Table 4.47) shows that the AEAs perceived that all the fourteen items under programme execution competency should be acquired on the job, that is' during in-service training. The distribution ranged from 61.8% for 'ability to recognize simulation and role-playing' to 77.8% for 'coordinating extension programmes and that of other groups'. The supervisors on the other hand perceived that thirteen of the competency items should be acquired on the job and one during pre-service training. Those to be acquired during in-service ranged from 57.6% for 'conducting home/farm visits' and 'ability to recognize simulation and role playing' to 78.8% for 'competing monthly or annual reports' and 'coordinating extension programmes and that of other groups.' They, however, perceived that 'facilitating groups of people having great diversity and multiple perspective' should be acquired before entering the job (55.4%).

4.5.4 TEACHING

Table 4.48 presents the results of the percentage distribution in respect of when AEAs and their supervisors perceived as the best time for AEAs to acquire

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Table 4.47: Percentage distribution in respect of when AEAs and their Supervisors perceived as the best time for AEAs to acquire Programme Execution Competency

Programme Execution Competency	Best time to acquire competency					
	AEAs			Supervisors		
		Pre-service	In-service		Pre-service	In-service
	N	%	%	N	%	%
1. Utilizing a calendar of activities / events	139	28.1	71.2	33	24.2	75.8
2. Following a written programme of work	139	31.7	68.3	33	36.4	63.6
3. Providing leadership for programme planning and execution	137	36.5	63.5	33	33.3	66.7
4. Developing a working relationship with clientele	136	27.2	72.8	33	39.4	60.6
5. Completing monthly or annual reports	137	24.8	75.2	33	21.2	78.8
6. Involving others in executing plans	134	26.9	73.1	33	33.3	66.7
7. Conducting home/farm visits	134	33.6	66.4	33	42.4	57.6
8. Conducting demonstrations	137	29.9	70.1	33	39.4	60.6
9. Organizing clientele into groups (group formation)	135	28.9	71.1	33	39.4	60.6
10. Facilitating groups of people having great diversity.	137	32.8	67.2	33	55.4	44.6
11. Ability to recognize simulation and role-playing	136	38.2	61.8	33	42.4	57.6
12. Ability to recognize errors in the course of programmes	137	37.2	62.8	32	40.6	59.4
13. Monitoring of extension programmes	136	27.9	72.1	33	33.3	66.7
14. Co-ordinating extension programmes and that of other groups	135	22.2	77.8	33	21.1	78.8

Source: Survey Data,2000

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Table 4.48: Percentage distribution in respect of when AEAs and their supervisors perceived as the best time for AEAs to acquire Teaching Competency

Teaching Competency	Best time to acquire competency					
	AEAs			Supervisors		
	Pre-service		In-service	Pre-service		In-service
	N	%	%	N	%	%
1. Using principles (basic rules) of learning or teaching	137	44.5	55.5	32	53.1	46.9
2. Using teaching materials (e.g. flip charts, etc.)	135	42.2	57.8	32	43.8	56.3
3. Ability to select non-formal methods/techniques	135	34.8	65.2	31	38.7	61.3
4. Presenting information in a lecture	136	44.1	55.9	32	53.1	46.9
5. Presenting a concept, principle or skill through method demonstration	134	32.1	67.9	31	41.9	58.1
6. Presenting information in a meeting	135	35.6	64.4	32	53.1	46.9
7. Presenting information in a seminar	136	35.3	64.7	32	53.1	46.9
8. Presenting information at a field day	135	26.7	73.3	31	35.5	64.5
9. Presenting information with an overhead projector	134	40.3	59.7	32	40.6	59.4
10. Presenting information with slides	134	38.8	61.2	31	41.9	58.1
11. Presenting information with charts	136	35.3	64.7	32	43.8	56.2
12. Presenting information with chalkboard	137	48.9	51.1	32	53.1	46.9
13. Conducting group discussions	133	33.8	66.2	32	34.4	65.6
14. Using the problem solving approach to teaching	133	33.8	66.2	31	51.6	48.4
15. Encouraging audience to ask questions	134	41.8	58.2	32	53.1	46.9
16. Planning, organizing and conducting tours and field trips	136	38.2	61.8	32	56.3	43.8
17. Judging exhibits at agricultural shows	135	25.9	74.1	32	31.3	68.8
18. Ability to recognize the importance of punctuality	136	46.3	53.7	32	56.3	43.7
19. Listening to questions and suggestions form audience	136	38.2	61.8	32	53.1	46.9
20. Organising seating arrangements for audience	135	40.7	59.3	31	32.3	67.7

Source: Survey Data, 2000

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Teaching Competency. While the AEAs perceived that all the twenty competency items are best acquired during in-service training, their supervisors perceived that 50% of the items are best acquired during pre-service training and the other 50% during in-service training. The AEAs percentage distribution for the in-service training ranged from 51.2% for 'presenting information with chalk board' to 74.1% for 'judging exhibits at agricultural shows. The supervisors percentage distribution for the Teaching Competency items to be acquired during in-service training ranged from 56.2% for 'presenting information with charts' to 68.8% for 'judging exhibits at agricultural shows', while those to be acquired during pre-service training ranged from 51.6% for 'using the problem solving approach to teaching' to 56.3% for 'ability to recognize the importance of punctuality' and 'planning, organizing and conducting tours and field trips'.

4.5.5 COMMUNICATION

The AEAs perceived that all the fifteen communication competency items are best acquired during in-service training but their supervisors on the other hand perceived that six (40%) of the items should be acquired during pre-service training and eight (53.3%) during in-service training (Table 4.49). The AEAs percentage distribution for the in-service training ranged from 50.4% for the 'use of the computer' to 72.8% for 'establishing working relationship with other government organizations'. The supervisors percentage distribution for in-service training ranged from 52.9% for 'writing and or completing special reports' to 78.8% for 'establishing working relationships with other governmental

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Table : Percentage distribution in respect of when AEAs and their Supervisors perceived as the best time for AEAs to acquire Communication Competency

Communication Competency	Best time to acquire competency					
	AEAs			Supervisors		
	Pre-service		In-service	Pre-service		In-service
	N	%	%	N	%	%
1. Establishing communication among extension staff	137	29.9	70.1	34	26.5	73.5
2. Writing letters and / or memos	136	41.9	58.1	34	52.9	47.1
3. Writing and / or completing special records	134	34.3	65.7	34	47.1	52.9
4. Speaking to groups	136	37.5	62.5	33	45.5	54.5
5. Speaking to individuals	131	42.7	57.3	33	57.6	42.4
6. Using non-verbal communications	130	46.9	53.1	33	57.6	42.4
7. Possession of listening skills	135	44.4	55.6	34	55.9	44.1
8. Preparing extension publications	134	40.3	59.7	33	54.5	45.5
9. Act on correspondence promptly	136	37.5	62.5	34	41.2	58.8
10. Establishing working relationships with other governmental organizations	136	27.2	72.8	33	21.2	78.8
11. The use of camera and / or other photographic equipment	134	43.3	56.7	34	41.2	58.8
12. The use of tape recorder	133	40.6	59.4	34	41.2	58.8
13. The use of the computer	135	49.6	50.4	33	57.6	42.4
14. Interacting with personnel of higher position	132	37.1	62.9	34	50.0	50.0
15. Establishing working relationship with strangers	130	40 8	59.2	33	36.6	63.3

Source: Survey Data, 2000

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organizations', while that for pre-service training ranged from 52.9% for 'writing letters and/or memos' to 57.6% for 'using non-verbal communication', 'possession of listening skills' and 'the use of computer'. The supervisors were, however, divided in thought as to when 'interacting with personnel of higher position' should be acquired.

4.5.6 UNDERSTANDING HUMAN BEHAVIOUR

Table 4.50 shows that while the AEAs perceived that eleven (78.6%) of the fourteen understanding human behaviour competency items are best acquired during in-service training, the supervisors perception was that 57.1% of them are best acquired during in-service training. The three items the AEAs perceived as best acquired during pre-service training are 'recognizing traditional culture and its effects; 'ability to accommodate religious differences' and 'recognizing the role of different sexes and how it influences change', while the four competency items the supervisors perceived as best acquired during pre-service training are 'application of principles of motivation', 'ability to accommodate religious differences', 'ability to accommodate other social groups' and recognizing the role of different sexes and how it influences change'. The supervisors were, however, divided in thought as to when two of the items, 'applying factors affecting behaviour of people' and 'recognizing differences in age groups' should be acquired.

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Table 4.50: Percentage distribution in respect of when AEAs and their Supervisors perceived as the best time for AEAs to acquire Understanding Human Behaviour Competency

Understanding Human Behaviour Competency	Best time to acquire competency					
	AEAs			Supervisors		
	Pre-service		In-service	Pre-service		In-service
	N	%	%	N	%	%
1. Application of principles of motivation	131	38.9	61.1	33	54.5	45.5
2. Identification of factors that influence people become involved	133	29.3	70.7	34	47.1	52.9
3. Determine the effect of pressure groups on people's Behaviour	131	39.7	60.3	34	47.1	52.9
4. Applying factors affecting Behaviour of people	132	40.9	59.1	34	50.0	50.0
5. Ability to influence people to accept change	137	43.8	56.2	34	44.1	55.9
6. Ability to identify the power structure within the community	135	40.0	60.0	34	47.1	52.9
7. Ability to identify pressure groups in the community	134	41.8	58.2	33	39.4	60.6
8. Utilizing knowledge of interaction of people in groups	135	43.7	56.3	33	36.4	63.6
9. Recognizing differences in age groups	134	41.8	58.2	34	50.0	50.0
10. Recognizing traditional culture and its effect	136	55.1	44.9	33	42.4	57.6
11. Ability to accommodate religious differences	135	50.4	49.6	33	51.5	48.5
12. Ability to accommodate other social groups	135	47.4	52.6	33	51.5	48.5
13. Understanding your own nature (strengths and weaknesses)	132	47.2	52.3	34	47.1	52.9
14. Recognizing the role of different sexes and how it influences change	133	56.4	43.6	34	55.9	44.1

Source: Survey Data, 2000

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4.5.7 MAINTAINING PROFESSIONALISM

The percentage distribution in respect of when AEAs and their supervisors perceived as the best time for AEAs to acquire Maintaining Professionalism Competency (Table 4.51) shows that both the AEAs and their supervisors perceived that all the four items under this competency are best acquired during in-service training. While the AEAs percentage distribution ranged from 64.4% for 'identifying opportunities for professional improvement to 70.9% for 'maintaining professional organizations and activities' that of the supervisors ranged from 69.7% for 'developing a plan for professional competency improvement' to 78.8% 'participation in professional organization and activities'.

4.5.8 EVALUATION

The AEAs perception was that all the fifteen Evaluation Competency items are best acquired by them during in-service training while the supervisors also perceived all but one of the fifteen items are best acquired by the AEAs during in-service training (Table 4.52). The one item the supervisors perceived as best acquired during pre-service training is 'interpreting results of questionnaires'. The percentage distribution of the AEAs perception in respect in-service training ranged form 60.3% for 'conducting literature search using library resources' to 74.8% for 'evaluating the effectiveness of a district or local extension programme'. That of the supervisors ranged from 52.9% for conducting a

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Table 51: Percentage distribution in respect of when AEAs and their supervisors perceived as the best time for AEAs to acquire Maintaining Professionalism Competency

Maintaining Professionalism Competency	Best time to acquire competency					
	AEAs			Supervisors		
	Pre-service		In-service	Pre-service		In-service
	N	%	%	N	%	%
1. Identifying opportunities for professional improvement	135	35.6	64.4	34	29.4	70.6
2. Developing a plan for professional competency improvement	133	29.3	70.7	33	30.3	69.7
3. Maintaining professional organizations and activities	134	29.1	70.9	32	25.0	75.0
4. Participation in professional organization and activities	134	30.6	69.4	33	21.2	78.8

Source: Survey Data, 2000

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Table : Percentage distribution in respect of when AEAs and their supervisors perceived as the best time for AEAs to acquire Evaluation Competency

Evaluation Competency	Best time to acquire competency					
	AEAs			Supervisors		
	Pre-service		In-service	Pre-service		In-service
	N	%	%	N	%	%
1. Evaluating the effectiveness of a district or local extension programme	135	25.2	74.8	34	35.3	64.7
2. Evaluating your own performance	133	30.1	69.9	34	32.4	67.6
3. Interpreting the impact of change and or trend upon the clientele	133	30.8	69.2	33	30.3	69.7
4. Using questionnaires to seek information	136	36.0	64.0	34	47.1	52.9
5. Using observation method to seed information	136	33.1	66.9	34	41.2	58.8
6. Using interviews to seek questionnaires	134	34.3	65.7	34	44.1	55.9
7. Interpreting results of questionnaires	135	38.5	61.5	34	58.8	41.2
8. Evaluating the results of an extension activity	136	28.7	71.3	34	41.2	58.8
9. Analyzing report/data	134	35.8	64.2	34	47.1	52.9
10. Interpreting research findings from research stations/university	136	38.2	61.8	34	47.1	52.9
11. Applying research findings when making recommendation to clientele	136	27.9	72.1	33	33.3	66.7
12. Cooperating with research stations	136	27.2	72.8	34	14.7	85.3
13. Identifying problems requiring additional research	135	25.9	74.1	34	20.6	79.4
14. Keeping up-to-date with current research findings	134	25.4	74.6	34	26.5	73.5
15. Conducting a literature search using library resources	136	39.7	60.3	34	47.1	52.9

Source: Survey Data, 2000

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literature search using library resources' to 79.4% for 'identifying problems requiring additional research'.

4.5.9 ANIMAL PRODUCTION

Table 4.53 presents the results of percentage distribution of AEAs and supervisors in respect of when they perceived as the best time for AEAs to acquire Animal Production Competency. The AEAs perceived that seven (46.7%) of the fifteen items under this competency are best acquired during pre-service training while they were divided over the best time for the acquisition of 'routine management practices in poultry' competency item. The supervisors on the other hand perceived that six (40%) of the competency items should best be acquired during in-service training and nine (60%) during pre-service training.

4.5.10 ANIMAL HEALTH AND DISEASES

The AEAs perceptions was that eight (66.7%) of the twelve competency items under Animal Health and Diseases are best acquired during in-service training, three (25%) during pre-service training and were divided over the best time to acquire 'general management of ecto-parasites in animals' (Table 4.54). The supervisors on the other hand perceived that six (50%) of the competency items are best acquired during in-service training, four (33.3%) of them during pre-service training and they were divided over when two (12.7%) of them should be acquired. The two were 'use of hypodermic syringes on animal' and 'cutting carcasses into parts/portion'.

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Table 4.53: Percentage distribution in respect of when AEAs and their supervisors perceived as the best time for AEAs to acquire Animal Production Competency

Animal Production Competency	Best time to acquire competency					
	AEAs			Supervisors		
		Pre-service	In-service		Pre-service	In-service
	N	%	%	N	%	%
1. Producing sheep and goats	136	52.2	47.8	34	58.8	41.2
2. Producing poultry	136	52.2	47.8	34	70.6	29.4
3. Producing pigs	137	51.1	48.9	34	70.6	29.4
4. Producing cattle	134	54.5	45.5	34	64.7	35.3
5. Producing grasscutters and rabbits	135	49.6	50.4	34	55.9	44.1
6. Snail production	136	34.6	65.4	34	47.1	52.9
7. Apiculture (bee-keeping for honey)	136	41.2	58.8	34	41.2	58.8
8. Formulation of animal feed and feed management	136	47.8	52.2	34	58.8	41.2
9. Animal improvement through controlled breeding	133	54.9	45.1	34	55.9	44.1
10. Pasture management for livestock	135	57.0	43.0	34	55.9	44.1
11. Appropriate housing for livestock and poultry	135	46.7	53.3	34	47.1	52.9
12. Routine management practices in poultry (e.g. proper handling of day-old-chicks, brooding, debeaking)	134	49.3	50.7	34	47.1	52.9
13. Routine management practices in livestock (e.g. dehorning, hoof trimming, creep feeding, castration)	134	50.0	50.0	34	41.2	58 8
14. Mating ratio for poultry and livestock	132	52.3	47.7	34	58.8	41 2
15. Detection of female animals on heat and ensuring successful service by males (especially in pigs)	131	48.1	51.9	34	47 1	52 9

Source: Survey Data, 2000

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Table 4. 54: Percentage distribution in respect of when AEAs and their supervisors perceived as the best time for AEAs to acquire Animal Health and Diseases Competency

Animal Health and Diseases Competency	Best time to acquire competency					
	AEAs			Supervisors		
	Pre-service		In-service	Pre-service		In-service
	N	%	%	N	%	%
1. Identification of signs of good and ill-health in farm animals	139	48.9	51.1	34	47.1	52.9
2. Ability to prescribe recommended drugs for the treatment of common diseases and pests of farm animals	138	44.9	55.1	33	36.4	63.4
3. Giving oral medication to animal	139	43.2	56.8	33	42.4	57.6
4. Use of hypodermic syringes on animal (giving injection)	135	45.2	54.8	32	50.0	50.0
5. Ability to manage wounds, fractures burns, etc.	137	46.0	54.0	33	51.5	48.5
6. General management of ecto-parasites in animals	138	50.0	50.0	33	51.1	48.9
7. General management of endo-parasites in animals	134	52.2	47.8	33	51.5	48.5
8. Management of diseases in general	137	51.1	48.9	33	57.6	42.4
9. Ability to follow pre-slaughter procedure in the abattoir	134	47.8	52.2	32	46.9	53.1
10. Dressing of carcass	135	54.1	45.9	32	43.8	56.3
11. Cutting carcasses into parts/portion	137	48.2	51.8	32	50.0	50.0
12. Ability to identify wholesome and unwholesome meat	135	48.1	51.9	32	43.8	56.3

Source: Survey Data, 2000

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4.5.11 FISH FARMING

The perception of both the AEAs and their supervisors is that all the seventeen (100%) fish farming competency items are best acquired by AEAs during in-service training sessions (Table 4.55). The percentage distribution of the AEAs perceptions ranged from 53.7% for 'ability to identify disease conditions in fishes in a pond to 69.0% for 'techniques in transporting fingerlings. That of the supervisors ranged from 52.9% for 'ability to identify disease conditions in fishes in a pond' to 73.5% for 'techniques in harvesting fishes' and 'proper handling of wet fish'.

4.5.12 CROP PRODUCTION

Percentage distribution in respect of when AEAs and their supervisors perceived as the best time for AEAs to acquire crop production competency items is presented in Table 4.56. The AEAs perceived that seven (33.3%) of the twenty-one competency items are best acquired during in-service training while the remaining fourteen (66.7%) items are best acquired during per-service training. The percentage distribution of those to be acquired during pre-service ranged from (51.9%) for 'production of pineapple' to 59.1% for 'production of other fruit plants'. The supervisors perception was that five (23.8%) of the twenty one crop production competency items are best acquire during in-service training and fifteen (71.4%) of them during the pre-service training. They were divided over when 'nursery management of vegetables' should be acquired.

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Table 4. 55: Percentage distribution in respect of when AEAs and their supervisors perceived as the best time for AEAs to acquire Fish Farming Competency

Fish Farming Competency	Best time to acquire competency					
	AEAs			Supervisors		
	Pre-service	In-service		Pre-service	In-service	
	N	%	%	N	%	%
1. Ability to identify site for pond construction	135	40.0	60.0	34	44.1	55.9
2. Construction of fish pond	132	43.2	56.8	34	38.2	62.8
3. Identification of fish types cultured in Ghana	131	40.5	59.5	34	44.1	55.9
4. Techniques in stocking fish pond	134	41.8	58.2	34	35.3	64.7
5. Production of fingerlings	134	38.8	61.2	34	41.2	58.8
6. Techniques in transporting fingerlings	134	41.0	69.0	33	30.3	69.7
7. Techniques in assessing the stock of fish in a pond	134	38.8	61.2	34	38.2	61.8
8. Formulating feed for fishes in a pond	134	43.3	56.7	34	38.2	61.8
9. Techniques in feeding fishes	134	38.8	61.2	34	35.3	64.7
10. Ability to identify disease conditions in fishes in a pond	134	46.3	53.7	34	47.1	52.9
11. Managing disease situation in a pond	134	44.0	56.6	34	44.1	55.9
12. Techniques in harvesting fishes	135	41.5	58.5	34	26.5	73.5
13. Fish preservation processing techniques	132	39.4	60.6	33	27.3	72.7
14. Construction of chorkor ovens and trays	131	37.4	62.6	34	29.4	70.6
15. Maintenance of smoking ovens and trays	133	33.8	66.2	34	29.4	70.6
16. Management of fish storage pests (e.g. insects, rodents)	132	36.4	63.6	34	35.3	64.7
17. Proper handling of wet fish	133	39.8	60.2	34	26.5	73.5

Source: Survey Data, 2000

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Table 4.56: Percentage distribution in respect of when AEAs and their supervisors perceived as the best time for AEAs to acquire Crop Production Competency

Crop Production Competency	Best time to acquire competency					
	AEAs			Supervisors		
	Pre-service		In-service	Pre-service		In-service
	N	%	%	N	%	%
1. Production of cereals	134	58.2	41.8	34	67.6	32.4
2. Production of roots and tuber crops	134	58.2	41.8	34	64.7	35.3
3. Production of legumes	134	56.7	43.3	34	67.6	32.4
4. Production of vegetables	134	57.5	42.5	34	64.7	35.3
5. Production of cocoa	135	58.5	41.5	33	63.6	36.4
6. Production of coffee	135	57.0	43.0	34	61.8	38.2
7. Production of citrus	134	56.7	43.3	34	64.7	35.3
8. Production of oil palm	133	53.4	46.6	34	64.7	35.3
9. Production of coconut	133	53.4	46.6	34	61.8	38.2
10. Production of rubber plant for latex	133	54.9	45.1	34	61.8	38.2
11. Production of plantain and banana	134	54.5	45.5	34	61.8	38.2
12. Production of pineapple	133	51.9	48.1	34	55.9	44.1
13. Production of other fruit plants (mango, cashew)	132	59.1	40.9	34	55.9	44.1
14. Production of pasture and forage crops	133	54.1	45.9	33	51.5	48.5
15. Crop breeding (crop improvement)	134	43.3	56.7	33	57.6	42.4
16. Ability to perform effective grafting and budding	134	42.5	57.5	34	47.1	52.9
17. Appropriate post harvest handling of produce	133	34.6	65.4	32	43.8	56.3
18. Ventilated narrow crib construction	134	27.6	72.4	34	26 5	73.5
19. Nursery management of vegetables	133	38.3	61.7	33	48.5	51.5
20. Nursery management of vegetables	133	47.4	52.6	34	50.0	50.0
21. Mushroom production	135	34.1	65.9	34	41 2	58 8

Source: Survey Data, 2000

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4.5.13 PLANT PROTECTION

Table 4.57 shows that out of the fourteen Plant Protection Competency items, AEAs perceived that thirteen (92.8%) of them are best acquired during in-service training and only one (7.2%) of them during pre-service training. The supervisors also perceived that eight (57.1%) of the competency items are best acquired during in-service training, two (14.3%) during pre-service training and were divided in thought as to when the remaining four (28.6%) items should be acquired. While the AEAs perceived that 'management of viral and bacteria diseases' is best acquired during pre-service training the supervisors perceived that 'ability to identify different crop pests and management of fungal diseases in crops' are best acquired during pre-service training. The four competency items that the supervisors were divided in thought were 'management of insect pests', 'management of nematodes', 'management of viral and bacterial diseases' and 'general management of farm to protect crop against pests and diseases'.

4.5.14 AGROFORESTRY

Percentage distribution in respect of when AEAs and their supervisors perceived as the best time for AEAs to acquire Agroforestry Competency shows that the AEAs perception was that eight (88.9%) out of the nine Agroforestry Competency items are best acquired during in-service training, while the supervisors perception was that all the nine (100%) items, are best acquired during pre-service training (Table 4.58). It was 'wind break practices' that the

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Table: 4. 57: Percentage distribution in respect of when AEAs and their supervisors perceived as the best time for AEAs to acquire Plant Protection Competency

Plant Protection Competency	Best time to acquire competency					
	AEAs			Supervisors		
	Pre-service		In-service	Pre-service		In-service
	N	%	%	N	%	%
1. Ability to identify different crop pests	138	45.7	54.3	34	52.9	47.1
2. Ability to identify different damages caused by different pests	138	44.2	55.8	34	38.2	61.8
3. Identification of different disease conditions and their causal agents	136	48.5	51.5	34	50.0	50.0
4. Management of fungal diseases in crops	136	44.9	55.1	34	50.0	50.0
5. Management of fungal diseases in crops	136	47.1	52.9	34	38.2	61.8
6. Management of fungal diseases in crops	134	48.5	51.5	34	52.9	47.1
7. Management of viral and bacterial diseases	135	50.4	49.6	34	50.0	50.0
8. Ability to prescribe recommended pesticides for common diseases of crops and stored produce	136	41.2	58.8	34	32.4	67.6
9. Mixing of pesticides (emulsion and powdered form)	137	38.7	61.3	34	41.2	58.8
10. Spraying of pesticides using the knapsack sprayer	135	35.6	64.4	34	44.1	55.9
11. Spraying of pesticides using the mist-blower	138	38.4	61.6	34	38.1	61.8
12. General management of farm to protect crop against pests and diseases (e.g. weed control)	137	41.6	58.4	34	50.0	50.0
13. Knowledge of common pesticides on the local market	136	35.3	64.7	34	41.2	58.8
14. Integrated Pest Management (IPM)	135	34.8	65.2	34	47.1	52.9

Source: Survey Data, 2000

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Table: 4 . 58: Percentage distribution in respect of when AEAs and their supervisors perceived as the best time for AEAs to acquire Agroforestry Competency

Agroforestry Competency	Best time to acquire competency					
	AEAs			Supervisors		
	Pre-service	In-service		Pre-service	In-service	
	N	%	%	N	%	%
1. Ability to identify major agro forestry species	135	37.0	63.0	34	32.4	67.6
2. Alley cropping practices	136	41.9	58.1	34	32.4	67.6
3. Woodlot production	136	42.6	57.4	34	35.3	64.7
4. Lives stalking practices	135	48.1	51.9	34	32.4	67.6
5. Windbreaks practices	136	51.5	48.5	34	35.3	64.7
6. Agrisilvipasture (rearing animals under plantation crops)	134	47.0	53.0	34	32.4	67.6
7. Planning of agro forestry trees	136	40.4	59.6	34	32.4	67.6
8. Techniques and management of coppice	136	39.7	60.3	34	23.5	76.5
9. Prevention of bush fires	136	41.9	58.1	34	47.1	52.9

Source: Survey Data, 2000

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AEAs perceived is best acquired during pre-service training. Their percentage distribution for the in-service training ranged from 51.9% for 'live staking practices to' 63% for 'ability to identify major agroforestry species'. That of the supervisors ranged from 52.9% for 'prevention of bush fires' to 76.5% for 'techniques and management of coppice'.

4.5.15 LAND AND WATER MANAGEMENT

Table 4.59 presents the results of the percentage distribution in respect of when AEAs and their supervisors perceived as the best time for AEAs to acquire Land and Water Management Competency. Both the AEAs and their supervisors perceived that all the six (100%) competency items of Land and Water Management are best acquired during in-service training.

4.5.16 MECHANIZATION

The AEAs perception was that four (36.4%) of the eleven Mechanization Competency items are best acquired during in-service training and the remaining seven (63.6%) competency items during pre-service training (Table 4.60). The supervisors on the other hand perceived that eight (72.7%) of the eleven competency items are best acquired during in-service training and two (18.2%) of them during pre-service training. The supervisors were however divided as to when one of the items, 'maintenance and simple repairs of farm machinery and equipment' should be acquired.

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Table: 4.59 Percentage distribution in respect of when AEAs and their supervisors perceived as the best time for AEAs to acquire Land and Water Management Competency

Land and Water Management Competency	Best time to acquire competency					
	AEAs			Supervisors		
	Pre-service		In-service	Pre-service		In-service
	N	%	%	N	%	%
1. Ability of carry out a proper land survey	135	47.4	52.6	33	48.5	51.5
2. Ability to carry out soil fertility analysis	137	46.0	54.0	33	45.5	54.5
3. Preparation and application of compost and farmyard manure	134	49.3	50.7	33	45.5	54.5
4. Use and application of fertilizers	136	49.3	50.7	33	45.5	54.5
5. Managing soil erosion (use of erosion control methods)	136	44.9	55.1	33	42.4	57.6
6. Managing soil water (e.g. mulching)	133	48.1	51.9	32	46.9	53.1

Source: Survey Data, 2000

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Table: 4.60 Percentage distribution in respect of when AEAs and their supervisors perceived as the best time for AEAs to acquire Mechanization Competency

Mechanization Competency	Best time to acquire competency					
	AEAs			Supervisors		
	N	Pre-service %	In-service %	N	Pre-service %	In-service %
1. Use of simple farm tools	135	63.7	36.3	34	55.9	44.1
2. Construction of simple farm drainage system	134	51.5	48.5	33	45.5	54.5
3. Use of irrigation equipment (e.g. sprinklers)	134	54.8	45.2	34	41.2	58.8
4. Field operation of a tractor and a power filler	136	54.4	45.6	34	52.9	47.1
5. Maintenance and simple repairs of farm machinery and equipment	134	56.0	44.0	34	50.0	50.0
6. Using motorbike	128	36.7	63.3	33	39.4	60.4
7. Using a motor sprayer	133	52.6	47.4	33	42.4	57.6
8. Ability to construct simple farm structures (pens, hatches, water and feeding trough, etc)	135	46.7	53.3	34	41.2	58.8
9. Ability to construct storage barns of cereal and tubers (e.g. narrow cribs and yam barns)	136	39.7	60.3	33	39.4	60.6
10. Operating milling machines (e.g. for cereals, roots and tubers, oil palm and coconut)	133	47.4	52.6	34	38.2	61.8
11. Using an incubator	132	53.8	46.2	34	41.2	58.8

Source: Survey Data, 2000

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4.5.17 Women In Agricultural Development (WIAD)

The percentage distribution in respect of when AEAs and their supervisors perceived as the best time for AEAs to acquire WIAD Competency is shown in Table 4.61. The AEAs perception was that all the eighteen (100%) WIAD Competency items are best acquired during in-service training. Their percentage distribution ranged from 50.4% for techniques in ensuring a hygienic home' to 63.4% for 'improved kitchen practices'. The supervisors also perceived that seventeen (94.4%) of the competency items are best acquired during in-service training and the remaining one, 'techniques in budgeting at home' acquired during pre-service training. Their percentage distribution for those to be acquired during in-service training ranged from 51.5% for 'in-depth knowledge on population issues and how these affect food security' to 72.7% for 'soap making'.

4.5.18 FARM MANAGEMENT

Table 4.62 shows that the AEAs perception was that all the ten (100%) Farm Management Competency items are best acquired by AEAs during in-service training. The percentage distribution ranged from 54.5% for estimation of partial budget of a typical farm enterprise' to 73.4% for 'knowledge about movement of agricultural produce within your district, region and other parts of the country'. The supervisors on the other hand perceived that eight (80%) of the competency items are best acquired during in-service training and the other two (20%) during

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Table: 4.61 Percentage distribution in respect of when AEAs and their supervisors perceived as the best time for AEAs to acquire WIAD Competency

WIAD Competency	Best time to acquire competency					
	AEAs			Supervisors		
	Pre-service	In-service		Pre-service	In-service	
	N	%	%	N	%	%
1. In-depth knowledge on population issues and how these effect food security	135	43.7	56.3	33	48.5	51.5
2. In-depth knowledge on family planning methods	135	40.7	59.3	33	42.4	57.6
3. Improved kitchen practices	134	36.6	63.4	34	29.4	70.6
4. Preparation of basic but recommended dishes for lactating mothers and babies	135	37.8	62.2	34	32.4	67.6
5. Techniques in budgeting at home	136	44.1	55.9	34	52.9	47.1
6. Techniques in ensuring a hygienic home	135	49.6	50.4	34	44.1	55.9
7. Observing safety measures in the home	134	47.8	52.2	34	38.2	61.8
8. Legume utilization	135	40.7	59.3	34	38.2	38.2
9. Leafy Vegetable utilization	135	42.2	57.8	34	35.3	64.7
10. Weaning food utilization	135	43.7	56.3	34	32.4	67.6
11. Root / tuber crops preservation and processing	134	38.1	61.9	34	38.2	61.8
12. Oil preservation	134	43.3	56.7	34	38.2	61.8
13. Vegetables preservation and processing	135	43.0	57.0	34	35.3	64.7
14. Fish / meat preservation and processing	135	45.9	54.1	34	35.3	64.7
15. Parboiling of rice	133	45.9	54.1	34	38.2	61.8
16. Soap making	135	40.0	60.0	33	27.3	72.7
17. Skills in working with clientele of the opposite sex (e.g. male agents working with female farmers)	132	40.9	59.1	34	38.2	61.8
18. Assessment / analysis of gender issues for planning extension activities for women farmers	134	38.8	61.2	32	37.5	62.5

Source: Survey Data, 2000

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Table 4. 62: Percentage distribution in respect of when AEAs and their supervisors perceived as the best time for AEAs to acquire Farm Management Competency

Farm Management Competency	Best time to acquire competency					
	AEAs			Supervisors		
	Pre-service	In-service		Pre-service	In-service	
	N	%	%	N	%	%
1. Knowledge of basic profitability criteria for evaluation of farm development project	136	44.1	55.9	33	60.6	39.4
2. Advising potential borrower to examine alternative sources of financing before making a loan application to banks	137	36.5	63.5	33	48.5	51.5
3. Knowledge of the requirement for agricultural loan of major bank in Ghana (e.g. ADB)	138	31.9	68.1	33	36.4	63.6
4. Knowledge of the conditions for loans from non banking financial institution (e.g. susu collectors)	136	36.8	63.2	33	30.3	69.7
5. Preparing budget for specific programme operations or purposes	36	41.9	58.1	33	36.4	63.6
6. Estimation of partial budget of a typical farm enterprise (cost benefit analysis)	134	45.5	54.5	33	51.5	48.5
7. Grinding farmers in keeping accurate records on their farm enterprise	135	34.1	65.9	33	42.4	57.6
8. Knowledge about marketing centres for agricultural produce in operational area, your district and beyond	131	35.1	64.9	33	18.2	81.8
9. Knowledge about market information from other parts of the country (e.g. through radio and T.V)	130	29.2	70.8	33	24.2	75.8
10. Knowledge about movement of agricultural produce within your district, region and other parts of the country	128	26.6	73.4	33	21.2	78.8

Source: Survey Data, 2000

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pre-service training. These two items were 'knowledge of basic profitability criteria for evaluation of farm development project' and 'estimation of partial budget of a typical farm enterprise'.

4.6 RELATIONSHIP BETWEEN DEMOGRAPHIC CHARACTERISTICS OF AGRICULTURAL EXTENSION AGENTS AND THEIR SELF-EVALUATION OF COMPETENCY LEVELS

The selected demographic characteristics for this relational analysis were age, sex, marital status, highest educational qualification, years of experience as extension agent, former technical department and the number of in-service training sessions attended in the last five years.

T-test and one-way analysis of variance (ANOVA) were used for the analysis, depending on the number of independent variable categories. Only those characteristics that showed significant differences are reported for the purpose of this presentation. Age and marital status of respondents did not show any significant relationship with their competency levels.

4.6.1 SEX

As shown in Table 4.63, sex of the agricultural extension agents showed a significant relationship with their competency levels.

Out of the eighteen professional and technical competency categories, nine of them showed significant relationship. It was only in WIAD competency that

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Table 4.63: T-test for Differences in Ratings of AEAs for the Competency categories by Sex

Competency Category		Sex			
		N	Mean	SD	t-value
Administration	Male	133	3.13	0.60	1.045
	Female	10	2.92	0.56	
Programme Execution	Male	134	3.25	0.72	-0.174
	Female	10	3.29	0.86	
Programme Execution	Male	133	3.44	0.63	1.521
	Female	10	3.12	0.60	
Teaching	Male	134	3.21	0.65	1.933
	Female	10	2.80	0.59	
Communication	Male	133	2.91	0.65	1.155
	Female	10	2.67	0.59	
Understanding Human Behaviour	Male	134	3.34	0.66	1.505
	Female	10	3.01	0.81	
Maintaining Professionalism	Male	133	2.97	0.82	1.885
	Female	9	2.44	0.73	
Evaluation	Male	134	3.06	0.68	1.716
	Female	10	2.68	0.63	

Source: Survey Data, 2000

*P≤0.05

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Table4.63(cont'd): T-test for Differences in Ratings of AEAs for the Competency categories by Sex

Competency Category		Sex			
		N	Mean	SD	t-value
Animal Production	Male	133	2.94	0.73	2.002*
	Female	9	2.43	0.91	
Animal Health and Diseases	Male	134	2.51	0.87	2.393*
	Female	10	1.83	0.71	
Fisheries	Male	131	2.20	0.75	0.071
	Female	9	2.19	0.57	
Crop Production	Male	134	3.25	0.70	
	Female	10	2.65	0.68	2.609*
Plant Protection	Male	134	3.26	0.87	2.064*
	Female	9	2.72	0.60	
Agro forestry	Male	134	2.70	0.87	2.476*
	Female	10	2.00	0.60	
Land and Water Management	Male	134	3.19	0.81	2.125*
	Female	10	2.63	0.57	
Mechanization	Male	134	2.76	0.66	2.942*
	Female	10	2.14	0.41	
WIAD	Male	133	2.92	0.74	1.985*
	Female	10	3.41	0.95	
Farm Management	Male	134	3.09	0.68	
	Female	10	2.44	0.68	2.925*

Source: Survey Data, 2000
*P≤0.05

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females AEAs rated themselves higher than their male counterparts. (3.41 and 2.92), but in the eight categories, the male AEAs rated themselves higher than their female colleagues. These were Animal Production, Animal Health and Diseases, Crop Production, Plant Protection, Agroforestry, Land and Water Management, Mechanization and Farm Management. Osei-Owusu (2000) in his study also found significant difference between the sexes, with the males rating themselves higher than females in all the categories except emerging issues. This suggests that the sex of AEAs should be considered when training programmes are being developed for them to meet their peculiar need.

4.6.2 EDUCATIONAL QUALIFICATION

Highest educational qualification attained by agricultural extension agents had a significant relationship with their competency levels as shown on Table 4.64. In seven out to the eighteen competency areas, AEAs holding Middle School Leaving Certificate (MSLC) rated themselves significantly lower than their counterparts with certificate in agriculture and Diploma in agriculture. In Evaluation and Mechanization Competencies, the MSLC holders rated themselves as having very 'low competency' (1.97 and 1.95), and 'Low Competency' in the other five competency areas, namely Programme Execution (2.07), Communication (2.00), Understanding Human Behaviour (2.21), Plant Protection (2.11) and Farm Management (2.00). There was however no significant difference between the ratings of AEAs with certificate in Agriculture and those with Diploma in Agriculture. This is however in disagreement with Osei-Owusu

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Table 4.64: ANOVA Test for the Differences in Ratings of AEAs for the Competency categories by Highest Educational Level

Competency Category	Highest Educational Level			
	MSLC	Cert in Agric	Diploma in Agric	F-Value
Administration	2.50	3.14	2.92	1.76
Programme Planning	2.78	3.27	3.06	0.86
Programme Execution	2.07[ab]	3.46[a]	3.14[b]	6.15*
Teaching	3.20	3.20	3.02	0.38
Communication	2.00[a]	2.92[a]	2.79	2.21*
Understanding Human Behaviour	2.21[a]	3.35[a]	3.11	3.41
Maintaining Professionalism	2.00	2.92	3.16	1.07
Evaluation	1.97[ab]	3.05[a]	3.02[b]	2.59*
Animal Production	2.00	2.91	3.02	1.61
Animal Health and Diseases	2.08	2.43	2.88	1.50
Fisheries	2.38	2.17	2.59	1.55
Crop Production	2.52	3.21	3.36	1.17
Plant Protection	2.11[ab]	3.23[a]	3.40[b]	2.44*
Agro forestry	2.00	2.64	2.91	1.13
Land and Water Management	2.25	3.17	3.14	1.27
Mechanization	1.95[a]	2.70	3.02[a]	2.58*
WIAD	2.00	2.98	3.08	1.75
Farm Management	2.00[ab]	3.03[a]	3.31[b]	3.18*

Source: Survey Data, 2000 MSLC – Middle School Leaving Certificate

Note: Means with common alphabets differ significantly from each other.

*P≤0.05

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(2000) study in the Central and Northern regions of Ghana in which the ratings of AEAs with certificate in Agriculture were significantly higher than their colleagues with Diploma in Agriculture in three of the nine competency areas he looked at. This implies that the highest educational qualification of AEAs should be taken into consideration when planning training programmes for them so that appropriate ones are designed for each.

4.6.3 WORKING EXPERIENCE

Table 4.65 shows that in three out of the eighteen Professional and Technical Competency areas, work experience as an agricultural extension agent significantly affected the competency levels of the AEAs. In Programme Planning, Fish Farming and WIAD competency areas, AEAs with more than ten years work experience rated themselves higher than their counterparts with less than ten years experience. However, both groups' ratings had 'moderate competency' in Programme Planning (3.42 and 3.08) 'low competency' in Fish Farming (2.41 and 2.02). In the WIAD competency area, those with over 10 years experience rated it 'moderate' (3.10) while those with less than 10 years experience rated it 'low competency' (2.83).

Osei-Owusu (2000) found the AEAs with more work experience rating themselves higher than those with lower work experience in all the nine competency areas he studied. This suggests that the experiences of AEAs should be considered and appropriate training programmes designed to suit them.

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Table 4.65: T-test for Differences in Ratings of AEAs for the competency categories by Years Experience

Competency Category		Years of Experience as AEA			
		N	Mean	SD	t-value
Administration	Below 10 years	72	3.05	0.62	1.26
	Above 10 years	70	3.18	0.58	
Programme Planning	Below 10 years	72	3.0	0.72	2.86*
	Above 10 years	71	3.42	0.70	
Programme Execution	Below 10 years	72	3.32	0.70	
	Above 10 years	71	3.52	0.54	1.93
Teaching	Below 10 years	72	3.13	0.68	
	Above 10 years	71	3.25	0.62	1.15
Communication	Below 10 years	71	2.86	0.67	
	Above 10 years	71	2.93	0.62	0.66
Understanding H.Behaviour	Below 10 years	72	3.27	0.63	
	Above 10 years	71	3.36	0.72	0.73
Maintaining Professionalism	Below 10 years	71	2.86	0.77	1.003
	Above 10 years	70	3.00	0.89	
Evaluation	Below 10 years	72	2.98	0.67	
	Above 10 years	71	3.09	0.69	0.97

Source: Survey Data, 2000

*P≤0.05

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Table 4.65(cont'd): T-test for Differences in Ratings of AEAs for the competency categories by Years of Experience

Competency Category	Years of Experience as AEA			
		N	Mean	SD	T-Value
Animal Production	Below 10 years	71	2.90	0.72	0.14
	Above 10 years	70	2.92	0.79	
Animal Health and Diseases	Below 10 years	72	2.55	0.92	-1.03
	Above 10 years	71	2.40	0.83	
Fisheries	Below 10 years	72	2.02	0.65	3.17*
	Above 10 years	67	2.41	0.79	
Crop Production	Below 10 years	72	3.13	0.72	1.44
	Above 10 years	71	3.30	0.70	
Plant Protection	Below 10 years	72	3.21	0.84	0.30
	Above 10 years	70	3.25	0.69	
Agro forestry	Below 10 years	72	2.69	0.85	-0.42
	Above 10 years	71	2.62	0.91	
Land and Water Management	Below 10 years	72	3.14	0.84	0.19
	Above 10 years	71	3.16	0.79	
Mechanization	Below 10 years	72	2.74	0.70	-0.46
	Above 10 years	71	2.70	0.64	
WIAD	Below 10 years	71	2.83	0.74	2.18*
	Above 10 years	71	3.10	0.75	
Farm Management	Below 10 years	72	3.05	0.71	-0.05
	Above 10 years	71	3.05	0.67	

Source: Survey Data, 2000
*P≤0.05

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4.6.4 NUMBER OF TRAINING COURSES ATTENDED

Analysis of Variance (ANOVA) test was used for this analysis and the results is shown in Table 4.66. With the exception of Animal Production competency area, all the other 17 competency areas showed statistically significant relationship between AEAs rating and the number of training courses attended in the last five years. AEAs who had attended more than twenty in-service trainings rated themselves higher than those who had attended 1-5 in-service trainings. While those who had attended over twenty training courses rated themselves as having 'moderate' competency in thirteen of the eighteen competency areas, and 'low' competency (2.41-2.95) in the remaining five competency areas, those who had attended only 1-5 trainings rated themselves as having 'moderate' competency (3.02 and 3.13) in only two competency areas and 'low' competency (2.31-2.99) in fifteen competency areas and 'very low' competency (1.95) in one area.

This result is similar to Osei-Owusu's (2000) study in which AEAs who had attended (16-30) trainings rated themselves higher in eight of the nine competency areas he looked at than those who had attended less than sixteen trainings. Rue and Byars, 1980, observed that growth within an organization (extension inclusive) could be achieved principally through training, hence the higher competence of AEAs who have had more trainings in this study will promote growth in the Extension Service.

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Table 4.66: ANOVA Test for the Differences in Ratings of AEAs for the competency categories by the Number of Training Courses Attended in the last 5 years

Competency Category	Number of Training Course Attended					F-Value
	1-5	6-10	11-15	16-20	> 20	
Administration	2.90^{ab}	3.05	3.21	3.43^{a}	3.21^{b}	2.36*
Programme Planning	2.93^{ab}	3.04^{c}	3.27	3.41^{b}	3.44	3.76*
Programme Execution	3.13^{ab}	3.26	3.43	3.67^{a}	3.56^{b}	3.71*
Teaching	2.99^{ab}	2.90^{cd}	3.26	3.53^{bd}	3.30^{ac}	2.76*
Communication	2.67^{abc}	2.61^{def}	3.16^{cf}	3.19^{be}	3.01^{ad}	3.45*
Understanding H. Behaviour	3.02^{ab}	3.33	3.44	3.57^{b}	3.43^{a}	2.75*
Maintaining Professionalism	2.60^{a}	2.85	2.94	2.88	3.13^{a}	2.64*
Evaluation	2.79^{a}	3.12	3.13	3.24	3.13^{a}	1.85*
Animal Production	2.74	2.99	3.21	3.15	2.95	1.11
Animal Health and Diseases	2.41^{a}	2.45	3.09	2.59	2.41	1.28*
Fisheries	1.95^{a}	2.25	2.41	2.00	2.32^{a}	1.78*
Crop Production	2.86^{ab}	3.24	3.22	3.43^{b}	3.36^{a}	3.40*
Plant Protection	2.98^{ab}	3.26	3.28	3.68^{b}	3.30^{a}	1.86*
Agro forestry	2.31^{abc}	2.66	3.06^{c}	3.04^{b}	2.73^{a}	2.49*
Land and Water Management	2.81^{abc}	3.08	3.46^{c}	3.75^{b}	3.23^{a}	3.38*
Mechanization	2.41^{abc}	2.74^{d}	3.33^{cd}	3.08^{b}	2.78^{a}	5.23*
WIAD	2.46^{abc}	2.88	3.10^{c}	3.07^{b}	3.20^{a}	6.06*
Farm Management	2.73^{abc}	3.16	3.30^{c}	3.59^{b}	3.09^{a}	3.73*

Source: Survey Data, 2000

Note: Means with common alphabets differ significantly from each other.

*$P \leq 0.05$

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4.6.5 FORMER TECHNICAL DEPARTMENT

Table 4.67 presents the result of the relationship between former Technical Department of AEAs and their perceived level of competency. There were significant relationships in eleven out of the eighteen competency areas studied.

AEAs who had Extension Services as their former technical department rated themselves significantly higher in all the eleven competency areas than those from Veterinary Services or Women In Agricultural Development (WIAD). In animal production and animal health and diseases competency areas, AEAs from the Veterinary rated themselves higher than all those from the other departments. But in almost all the other competency areas, AEAs from Veterinary rated themselves lower than the others. This pattern could be explained by the fact that before the decentralization of MOFA, only Extension AEAs and occasionally PPRSD AEAs received regular in-service training. Those from the Veterinary Services concentrated on only animal health and diseases mostly and animal production. The significantly higher ratings of former PPRSD AEAs in Plant Protection, Crops AEAs in agroforestry and land and water management is also explained by their specialization in those areas before the decentralization of MOFA. The implication of this result is that the AEAs have special training needs, depending on their former technical department and so the planning of any training programme for them should take this into consideration to enable them deliver efficient extension services to their clientele.

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Table 4.67: ANOVA Test for the Differences in Ratings of AEAs for the competency categories by Former Technical Department

Competency Category	Former Technical Department						F-Value
	EXT	CROPS	PPMED	PPRSD	VET	WIAD	
Administration	3.20	3.02	3.09	3.15	2.89	2.50	1.04
Programme Planning	3.42^{a}	3.16^{b}	3.16^{c}	3.08	2.41^{abc}	2.72	3.33*
Programme Execution	3.52^{a}	3.43^{b}	3.34	3.28	2.84^{ab}	3.04	1.90*
Teaching	3.25^{a}	3.12	3.26	2.73^{b}	2.92	2.63	1.47*
Communication	2.96	2.95	2.93	2.58	2.57	2.42	1.12
Understanding H. Behaviour	3.39	3.23	3.32	3.20	3.00	2.46	1.23
Maintaining Professionalism	3.04	2.68	2.90	2.86	2.89	2.00	1.20
Evaluation	3.08^{a}	2.97	3.09^{b}	2.95	2.86	3.87^{ab}	1.20*
Animal Production	2.93^{a}	2.82^{b}	2.90^{c}	2.48^{d}	3.55^{abcde}	2.10^{e}	2.16*
Animal Health and Diseases	2.38^{a}	2.37^{b}	2.35^{c}	2.25^{d}	4.45^{abcde}	2.08^{e}	10.11*
Fisheries	2.37^{a}	2.03	2.09	1.97	1.65^{a}	2.15	2.13*
Crop Production	3.32^{a}	3.37^{b}	3.21^{c}	2.97^{d}	2.05^{abcd}	2.60	5.38*
Plant Protection	3.25^{ab}	3.37^{g}	3.15^{ce}	3.90^{bcdf}	2.50^{aefg}	2.68^{d}	2.85*
Agro forestry	2.64^{abc}	3.13^{ade}	2.67^{f}	2.37^{bd}	1.91^{aefg}	2.33	2.52*
Land and Water Management	3.1^{a}	3.28^{b}	3.30^{c}	2.95^{d}	1.88^{abcd}	2.67	4.50*
Mechanization	2.76	2.70	2.74	2.69	2.64	2.27	0.24
WIAD	3.13	2.71	2.78	3.02	2.52	3.33	1.84
Farm Management	3.05	3.05	3.05	3.06	3.07	2.85	0.03

Source: Survey Data, 2002

Note: Means with common alphabets differ significantly from each other

*P≤0.05

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4.7 SUGGESTIONS FOR IMPROVING PROFESSIONAL AND TECHNICAL COMPETENCIES OF AEAS

This section looks at some of the suggestions the respondents made for improving the professional and technical competency of agricultural extension agents. They include in-service training, provision of motorbikes, regular payment of travelling and transport allowance, provision of logistics, timely promotion and opportunities for further studies.

Table 4.68: Percentage Distribution of Respondents in Respect of Suggestions for Improving Professional and Technical Competencies of AEAs

Suggestion	No. of respondents	%
In-service Training	89	65.4
Provision of means of transport	58	42.6
Regular payment of sufficient travelling and transport allowances	49	36.0
Provision of logistics	41	30.1
Timely Promotion	33	24.3
Opportunities for further studies	29	21.3

Respondents gave multiple answers, therefore, the sum is more than 100%.

Source: Survey Data, 2000

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4.7.1 IN-SERVICE TRAINING

As Table 4.68 shows, 65.4% of the respondents suggested that regular in-service training be organised for AEAs in order to improve their professional and technical competency levels. In-service training is a programme designed to improve or strengthen the competencies of extension workers while they are on the job (Malone, 1984). Explaining what it entails, Halim and Ali, (1977) said in-service training is a problem-centred, learner-oriented and time bound series of activities which provide the opportunity for AEAs to develop a sense of purpose, broaden perception of the clientele, and increase capacity to gain knowledge and mastery of techniques.

Studies in Ghana and Uganda have shown that AEAs who attended a greater number of in-service training sessions also exhibited higher levels of professional competencies (Osei-Owusu, 2000; Buake and Padde, 1994). In fact, providing in-service training regularly to AEAs is one of the surest and quickest ways to improve their professional and technical competencies and also prevent them from getting into a rut. Halim and Ali (1997) categorized in-service training into five different types and AEAs need all these if their competencies are to be improved. These types are (1) induction or orientation training (2) foundation training, (3) on-the-job training (4) refresher or maintenance training and (5) career development training.

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4.7.2 PROVISION OF MEANS OF TRANSPORT

Forty three percent of the respondents also suggested that AEAs should be provided with means of transport if their professional and technical competencies are to be improved (Table 69). Moris (1991) asserted that gaining regular access to a scattered and poverty stricken clientele is crucial for agricultural extension and therefore safeguarding staff mobility should be a high priority concern. There is the common adage that 'practice makes a man perfect'; therefore AEAs need to put whatever competencies they have acquired through whatever means into practice if they are to improve upon them. And they can do this if they are able to interact regularly with their clientele through home and farm visits, hence the need for them to have means of transport, preferably motorbikes. In the rural areas where most of their clientele are, public transport to and from most farmsteads is either non-existent or very irregular and inefficient. In order to ensure that AEAs take proper care of the motorbikes, they should be given to them on credit and deductions made on their salaries every month till repayment is completed.

4.7.3 REGULAR PAYMENT OF SUFFICIENT TRAVELLING AND TRANSPORT AND MAINTENANCE ALLOWANCES.

Thirty six percent of the respondents also suggested that AEAs should be paid sufficient and regular travelling and transport allowance in order to improve their professional and technical competencies. This suggestion is closely linked with that provision of means of transport. This is due to the fact that without

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regular payment of sufficient travelling and transport, and maintenance allowances, the means of transport will not be very helpful in improving the competencies of AEAs. This allowance is used to fuel motorbikes or pay for public transport to and from visits to farmers. It is also used to maintain the bikes so that they are always roadworthy to be used. Several studies have revealed that non-payment of these allowances are among the major causes of non performances by AEAs in developing countries (Radhakrishna and Yoder, 1996; Vilalne and Dube, 1996; Alawy and Safrit, 1994; Seepersad, 1986) Even though there are resource constraints in the economies of most developing countries, efforts must be made to ensure that sufficient and regular travelling and transport and maintenance allowances are paid to AEAs if their professional and technical competencies are to be improved to ensure agricultural development.

4.7.4 PROVISION OF LOGISTICS

Table 4.68 shows that thirty percent of the respondents suggested that provision of logistics will improve the competencies of AEAs. Logistics like teaching aids, field boots, inputs for trials, field notebooks, raincoats among others were some of the logistics respondents suggested when provided will improve the competencies of AEAs. These logistics tend to enhance the effectiveness of the AEAs in the performance of their duties. Vijayaragavan and Singh (1997) and Radhakrishna andYoder (1996) reported poor logistics as a major constraint to effective technology transfer by extension personnel as it results in poor motivation and morale.

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4.7.5 TIMELY PROMOTION

Twenty four percent of the respondents suggested that ensuring timely promotion is one of the avenues for improving the competencies of AEAs (Table 4.68). Promotions normally are accompanied by increase in salaries and future social security benefits and therefore delay in promotions means low salaries and stagnated social security pension. This then compounds the problem of the generally low remunerations of AEAs in most developing countries and its perceived inequity compared with what people with similar training and experience receive in the surrounding job market (Vijayaragavan, 1994; Swanson et al, 1990; Seepersad, 1986). These are among the factors, which result in poor work motivation and morale of AEAs as they derive less job satisfaction (Vijiyaragavan and Singh, 1997). There have been instances where AEAs have been on the same grade for over ten years without any promotion. Under such circumstances, other measures taken to improve the competencies of AEAs tend to yield very minimal or disappointing results. According to Vijiyaragavan and Singh, career advancement, which gives a picture of future opportunities in terms of promotion, is a motivating factor for performance and development of skills.

4.7.6 OPPORTUNITIES FOR FURTHER STUDIES

Twenty one percent of the respondents also suggested that providing opportunities for further studies by AEAs is another way of improving their professional and technical competencies (Table 4.68). A worldwide analysis of

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the status of agricultural extension reveals the low level of formal education and training of AEAs in developing countries (Swanson et al, 1990). This unsatisfactory educational level of extension staff is one of the most serious problems of extension in most developing countries (Blanckenburg, 1984). So affording AEAs the opportunities to further their studies will greatly improve their competencies. It will also enable them to develop their technical and managerial skills to enable them to occupy higher positions. Further studies also come with promotion to a higher grade and its consequent increase in salary and other benefits.

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CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter outline the purpose of the study, the summary of the methodology, results and discussions, and also presents the conclusions and recommendations arrived at.

5.1 PURPOSE OF THE STUDY

The study examines the professional and technical competencies needed by AEAs in the Western and Ashanti Regions of Ghana. It is guided by the following specific objectives:

- To describe the demographic characteristics of the respondents
- To identify the level of professional and technical competencies of AEAs in the Western and Ashanti Regions of Ghana as perceived by the AEAs and their supervisors.
- To compare the perception of AEAs and that of their supervisors regarding the level of professional and technical competencies of the AEAs.
- To identify the professional and technical competency needs of the AEAs in the Western and Ashanti Regions of Ghana
- To compare the perceptions of AEAs in the Western Region with those of AEAs in the Ashanti Region regarding their levels of professional and technical competencies.

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- To determine the best time for AEAs to acquire the professional and technical competencies from the AEAs themselves and their supervisors.
- To investigate the relationships between demographic characteristics of the AEAs and their perceived levels of professional and technical competencies.

5.2 METHODOLOGY

A descriptive correlational survey design was used. Self-administered questionnaires covering 104 professional and 133 technical competencies items that AEAs are expected to possess were used to collect data from the AEAs and their supervisors. The study covered six districts each in the Western and Ashanti Regions of Ghana. In all, 144 AEAs and 35 supervisors took part in the study.

5.3 SUMMARY OF THE RESULTS AND DISCUSSION

5.3.1 Demographic characteristics of respondents

- The mean ages of all the AEAs and the supervisors were 40.1 and 44.2 years respectively.
- Females formed 6.9% of the AEAs and 11.4% of the supervisors, while 93.1% and 88.6% of the AEAs and Supervisors respectively were males.
- A total of 93.1% of the AEAs and 97.1% of supervisors were married, while 4.8% and 2.9% of the AEAs and supervisors respectively were single.
- Most of the AEAs had certificate in Agriculture (91%), 7.6% had Diploma in Agriculture, and 1.4% Middle School Leaving Certificate holders. Forty

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three percent of the supervisors were holders of Bachelor of Science (Agriculture) degree, 37% were Diploma in Agriculture holders, 14% were Master of Science holders and 6% had Certificate in Agriculture

- The mean years of experience of the AEAs was 10 years.
- Majority of the AEAs (55%) were formerly with the Department of Agricultural Extension Services. Eighteen percent were formerly with PPMED, 14% with the Crop Services, 5% with PPRSD, 5% with Veterinary Services and 1% with WIAD
- Majority of the AEAs (52.1%) had attended over 20 training sessions, while 24.3% had attended between 1-5 training sessions, while 24.3% had attended between 1-5 training sessions. The rest had attended between 6-20 training sessions.

5.3.2 PERCEIVED LEVELS OF PROFESSIONAL AND TECHNICAL COMPETENCIES OF AEAs

This assessment was based on the perceptions of AEAs themselves and their supervisors. The summary is in relation to the eight professions competencies and ten technical competency categories. The means of the all the professional competency categories ranged from 2.91 (low level) to 3.42 (moderate level). There was no significant difference between the self-ratings of the AEAs and that of the supervisors in all the eight categories. In the ten technical competency categories, the means ranged from 2.18 (low level) to 3.22 (moderate level). There was no significant difference between the self-ratings of the AEAs and the Supervisors in nine of the ten categories. It was only in

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mechanization competency category that AEAs self-ratings were significantly higher than that of supervisors (2.72 and 2.45). The assessment by the supervisors confirmed the self rating by the AEAs.

5.3.3 PROFESSIONAL AND TECHNICAL COMPETENCY NEEDS OF AEAs

The overall mean scores of the 179 respondents were used to determine the competency needs of the AEAs. Of the 104 professional competency items, none was rated above 'High' level. Eighty were rated between 'Moderate' and 'High'! Twenty-four were rated below 'Moderate level'. Out of the 133 technical competency items, only 'production of cereals' was rated above ' High level' 74 were rated between 'Low' and 'Moderate', while 11 were rated between 'Very Low' and 'Low'. So 48 were rated above 'Moderate' and 85 below 'Moderate'.

The ideal situation is for AEAs to possess 'High' to 'Very High' competencies in all the 104 professional and 133 technical competency items. Therefore all the 80 professional and 47 technical competency items that were rated 'Moderate' need improvement, while the 24 professional and 85 technical competency items that were rated below 'moderate' level need urgent attention.

5.3.4 COMPARISON OF THE MEAN PERCEPTIONS OF AEAs IN THE WESTERN AND ASHANTI REGIONS.

This comparison was based on the mean perceptions of the 69 AEAs from Western Region and the 75 AEAs from Ashanti Region, who took part in the study, and t-test was used. In all the eighteen professional and technical

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competency categories, there was no significant difference between the perceptions of AEAs in the Western and Ashanti Regions. In the professional competency category, AEAs from Western Regions rated seven out of the eight categories above the 'moderate' level (3.03 – 3.39) and one below the 'moderate level' (2.86), while the Ashanti Region AEAs rated six out of the eight categories above the 'moderate' level (3.04 – 3.45) and two below the 'moderate' level (2.84 and 2.93). In the technical competency category, AEAs from Western Region rated six out of the ten categories below the 'moderate' level (2.23 – 2.86) and four above the 'moderate' level (3.09 – 3.23) while those in Ashanti Region rated five below the 'moderate' level (2.18 – 2.95) and five below the 'moderate' level (3.00 – 3.19).

This shows that AEAs in Western and Ashanti Regions have similar levels of professional and technical competencies.

5.3.5 BEST TIME FOR AEAs TO ACQUIRE PROFESSIONAL AND TECHNICAL COMPETENCIES

Percentage distribution of the respondents was used for this. The perceptions of the AEAs were that almost all the professional competency items (101 out of 104) should be acquired during in-service training sessions. The perception of the supervisors was that 78 of the professional competency items should be acquired by AEAs during in-service training and 23 of them during pre-service training. For the technical competencies, AEAs perception was that 98 of the 133 items should be acquired during in-service training and 33 of them during pre-service training. The supervisors' perception was that 90 of the technical items should be acquired during in-

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service training and 35 of them during pre-service training.

5.3.6 RELATIONSHIP BETWEEN DEMOGRAPHIC CHARACTERISTICS OF AEAs AND THEIR SELF-PERCEIVED COMPETENCY LEVELS

T – test and one-way analysis of variance (ANOVA) were used for the analysis to determine the relationships between the AEAs demographic characteristics and their self-evaluation. Sex, highest educational qualification, working experience, number of training courses attended and former technical department of AEAs showed significant relationships with their competency levels.

Male AEAs rated themselves higher than their female counterparts in eight out of the nine competency categories that showed significant relationship. These were animals' production, animal health and diseases, crop protection, plant protection, agro forestry, land and water management, mechanization and farm management competency categories. Females rated themselves higher in WIAD competency category. AEAs holding certificate in agriculture and diploma in agriculture qualifications significantly rated themselves higher than those with MSLC in seven of the competency categories. These were in programme planning, communication, understanding human behaviour, evaluation, plant protection, mechanization and farm management. AEAs with over 10 years working experience rated themselves higher than those with below 10 years experience in three of the competency categories. These were programme planning, fish farming and WIAD categories.

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AEAs who had attended more than 20 in-service trainings rated themselves higher than those who had attended 1-5 in-service trainings in all the eighteen competency categories except animal production.

AEAs who had Extension Services as their former technical department rated themselves higher than those from veterinary services or Women in Agricultural Development in eleven of the eighteen competency categories. Those with Crop Services and PPMED as their former departments also rated themselves higher than those from veterinary services or WIAD in eight of the competency categories, while those from PPRSD also rated themselves higher than those from veterinary or WIAD in seven competency categories.

5.3.7 SUGGESTIONS FOR IMPROVING COMPETENCY LEVELS OF AEAs

The suggestions by respondents for improving the professional and technical competencies of AEAs included the following: 65.4% of respondents suggested in-service training, 42.6% suggested provision of means of transport, 36% suggested regular payment of sufficient T&T and maintenance allowance, 30.1% suggested supply of adequate logistics; 24.3% suggested timely promotion of AEAs and 21.3% suggested that AEAs should be given opportunities for further studies.

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5.2 CONCLUSIONS

From the findings of the study, the following conclusions are drawn

1. (a) Any resources used to improve the competencies of AEAs will be beneficial to the ministry as they have about 20 years more for active service before retirement.

   (b) The number of female AEAs is very low compared to their male counterparts.

   (c) The educational level of the AEAs is low, as most of them possess certificate in agriculture as their highest level.

   (d) Most of the AEAs have held their positions for quite a time and this is an asset to the ministry as they have acquired experience and naturally have become more skilful in the discharge of their duties.

   (e) A sizeable number of the AEAs (44%) were not formerly doing extension work so their output as extension agents now under decentralisation will be low if they not adequately trained.

2. The level of professional competencies of the AEAs and their technical competencies were both similar ranging from low level to moderate level This suggests that both areas need to be catered for in planning and developing training programmes for AEAs.

3. The self-ratings of AEAs and the independent evaluation by supervisors show agreement in almost all the competency categories. This means the self-ratings of the AEAs are true.

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4. All the eighteen major professional and technical competency categories of agricultural extension are not only important in performing extension activities but also AEAs need more training in these areas as their level of competencies ranged from low level to moderate level.
5. There is no difference between the levels of professional and technical competency of AEAs in the Western and Ashanti Regions and, therefore, the region of AEAs should not be taken into consideration when planning and developing training programmes for them.
6. That most of the professional and technical competencies should be acquired or developed after the AEAs are employed. This suggests that even after pre-service programmes are implemented, there remains a substantial need for continuing education programmes for AEAs.
7. Demographic characteristics of AEAs such as sex, highest educational qualification, working experience, number of training courses attended and former technical department bear significant relationship with certain competencies. Considering such factors give evaluation a fuller meaning and may also suggest that different groups have different needs and so they should be taken into consideration when planning and developing training programmes for AEAs in these regions.
8. Apart from training programmes, other incentive packages like provision of means of transport, regular and prompt payment of travelling and transport allowances adequate logistics and timely promotion will also greatly improve the competencies of AEAs. This means that any programme or project

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designed to enable AEAs perform effectively should not neglect these other factors.

5.3 RECOMMENDATIONS

Based on the findings and conclusion, the following recommendations are made:

1. (a) That more female AEAs should be recruited into the ministry to increase the number of females doing extension work as the role of women farmers in Ghana's agricultural production and development is very important and crucial.

   (b) That serious effort must be initiated to upgrade the educational levels of all the AEAs to improve their competencies. The B.Sc. (Extension) and Diploma (Extension) programmes at University of Cape Coast and Kwadaso Agricultural College respectively for middle level extension personnel should be sustained through active support by the ministry as it is helping improve AEAs level of education.

   (c) That efforts should be made to specially train all the AEAs who were not formerly doing extension work so that their output as extension professionals could be raised.

2. The professional and technical competency levels of AEAs should be frequently assessed so that appropriate training programmes could be initiated to correct any shortfalls to enable them perform efficiently and effectively.

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3. That a combination of self and independent evaluations be used whenever the competencies of AEAs are to be assessed as it strengthens the advantages of both and also compensates for the disadvantages of each other. Those competencies, which show no significant differences between the two approaches can reasonable be assumed to represent the truth while investigation might be necessary in those competencies where divergent results were obtained.

4. As a matter of urgency, in-service training courses be organised to upgrade AEAs' competencies in all the competency categories. Emphasis must be placed on certain areas in which AEAs need urgent training.

   These include:

   a. The use of teaching aids including audio-visuals
   b. Preparing extension publications and use of communication equipments.
   c. Interpreting research findings and conducting a literature search using library resources.
   d. Production of grasscutters, rabbits and snails, bee-keeping, formulations of animal feed and pasture management for livestock
   e. Giving injection to animals, managing wounds, fractures and burns, abattoir procedures and ability to identify wholesome and unwholesome meat.
   f. All the fish farming competencies
   g. Production of rubber, pasture, forage crops and mushroom.

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h. Rearing animals under plantain crops and techniques and management of coppice.

i. Carrying out proper land survey and soil fertility analysis

j. Field operation of a tractor and power tiller, use and maintenance of simple farm machinery and equipments.

k. Soap making and par boiling of rice.

l. Knowledge of the requirements for credit from banking and non-banking institutions.

5. That the same training programmes should be organised for AEAs in the Ashanti and Western regions to improve their competency levels

6. That in-service training or continual education programmes be implemented for AEAs after their employment as it promotes their growth as extension professionals and also improves their professional and technical competencies.

7. That the sex of AEAs, their highest educational qualification, work experience and former technical department should be considered when planning and developing training programmes for them so that those with special needs are catered for.

8. That other incentive packages like provision of means of transport, regular and prompt payment of travelling and transport allowance, provision of adequate logistics and timely promotion should be given to AEAs apart from in-service training programmes. These will boost their morale, enable them put whatever they are taught into practice and thereby enhance their

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effectiveness in the performance of their duties and consequently lead to improvement in their professional and technical competencies

9. The findings of this study should be used as a guide in the planning and development of curriculum and training materials by agricultural colleges and universities for the pre-service training of extension personnel to give them strong foundation before their employment as extension agents
10. The findings of this study be made available to the Directorate of the Department of Agricultural Extension Services, Human Resource Development Department and other policy makers of MOFA to assist them to plan and develop more systematic and effective in-service training programmes for AEAs with the hope that they will become more competent and capable of discharging their professional obligations with maximum efficiencies.
11. The agricultural colleges and universities should review their curriculum regularly to met the challenges of present day agriculture, involving other relevant stakeholders in agriculture like professionals from MOFA and farmers so that their pre-service training of extension personnel will be responsive to the needs of farmers.

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APPENDIX 1: THE JOB DESCRIPTION FOR AGRICULTURAL EXTENSION AGENT OF THE MINISTRY OF FOOD AND AGRICULTURE

1.0 STRUCTURE

1.1	**POSITION TITLE**	AGRICULTURAL EXTENSION AGENT (AEA)
1.2	**IMMEDIATE SUPERIOR**	FIELD SUPERVISOR
1.3	**RELATION**	FARMERS, SMS, NGOs, INPUTS & CREDIT SUPPORT AGENTS, etc.

2.0 OBJECTIVE OF POSITION

To advice farmers in the application and adoption of appropriate technological know how with the objective of increasing their productivity, income and well being under sustainable environmental conditions.

3.0 RESPONSIBILITIES:

3.1 Compile base line geo-climatic, socio-cultural and economic (including agriculture) data on the area of operation.

3.2 Identify or establish contact farmer groups for purposes of achieving wide coverage in Crops, Livestock, Fisheries and related activities or services.

3.3 Prepare route maps and visit schedules in collaboration with the field supervisors.

3.4 Assist farmers in the diagnosis of farm and farming related problems and advise on solution to such problems.

3.5 Participate with researchers and SMS in the establishment of on-farm adaptive trials and collect relevant data for analysis by SMS or researcher.

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3.6 Assist farmers in the establishment of mini-demonstrations, arrange field days with contact groups and assess the results with farmers and SMS.

3.7 Participate with SMS and supervisors in the identification, prioritisation, and implementation of extension themes.

3.8 Identify and forecast crop, livestock, and fish pests and diseases and advise on means of control with the assistance of the relevant SMS.

3.9 Promote vigorously the development of all women specific programmes.

3.10 Assist farmers in farm management education and practice in order to have cost effective farming enterprise.

3.11 Participate with the Department of Cooperatives, NGOs, etc. in the process of group formation and organisation.

3.12 Identify with educational institutions (JSS/SSS) and NGOs, etc. in order to exchange views and collectively assist in the agricultural development in the locality.

3.13 Assist farmers with information on availability of farm inputs, credit support and marketing.

3.14 Undertake field level measurements, such as crop-cutting, etc. for purposes of productivity estimation, monitoring and evaluation.

3.15 Provide feedback from farmers or agricultural related operators for management decision.

3.16 Prepare daily log record of day's work and observation

3.17 Prepare and submit to the District Director of Food and Agriculture monthly/quarterly report through his/her field superior officer.

3.18 To undertake and other duties that may be assigned.

4.0 AUTHORITY

Exercise authority derived from the District Director of agriculture through the field supervisors.

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5.0 QUALIFICATION

5.1 The agricultural extension agent should have a minimum qualification of Agricultural Certification or its equivalent.

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APPENDIX II: QUESTIONNAIRES FOR AGRICULTURAL EXTENSION AGENTS AND THE SUPERVISORS

Serial # .....

TECHNICAL AND PROFESSIONAL COMPETENCIES NEEDED BY AGRICULTURALEXTENSION AGENTS IN THE WESTERN AND ASHANTI REGIONS OF GHANA

DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION

SCHOOL OF AGRICULTURE

UNIVERSITY OF CAPE COAST

DECEMBER, 1999

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GENERAL INSTRUCTIONS

Please respond to this questionnaire in terms of your most sincere beliefs and feelings. There are no right or wrong answers. The information you provide will be handled confidentially and all responses will be bulked together for analysis. The questionnaire code number, plainly written at the top right hand corner of this page is to help identify questionnaires during data processing and also to follow up those not returned

INSTRUCTIONS FOR AGRICULTURAL EXTENSION AGENTS

The spaces in the next pages show competencies and items related to the respective competencies. To the right side of the competency items are indicated numbers and letters corresponding to your current perceived competency level and best time to acquire competency.

Please indicate sincerely against each item your current perceived competency level and the best time to acquire the competency by ticking the appropriate corresponding number and letter

INSTRUCTIONS FOR SUPERVISORS

The spaces in the next pages show competencies and items related to the respective competencies. To the right side of the competency items are indicated numbers and letters corresponding to agricultural extension agents' current competency level and the best time for them to acquire the competency.

Please indicate sincerely against each item your perception of the current competency level of all agricultural extension agents under you bulked together and the best time for them to acquire the competency.

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Competency Areas (Skills, Knowledge & Attitude)	Current Perceived competency level					Best time to acquire competency	
	V. Low	Low	Moderate	High	V. High	Pre-Service	In-Service
Administration							
1 In-depth knowledge and understanding of government agricultural policies	1	2	3	4	5	P	I
2. Writing realistic goals for the extension programme	1	2	3	4	5	P	I
3. Ability to manage scare resources for optimum productivity	1	2	3	4	5	P	I
4. Coordinating the use of equipment, facilities and resources with office staff	1	2	3	4	5	P	I
5. Budget preparation	1	2	3	4	5	P	I
6. Managing time effectively	1	2	3	4	5	P	I
7. Promoting inter-office communications	1	2	3	4	5	P	I
8. Orienting new staff under studying you	1	2	3	4	5	P	I
9. Providing recognition for clients	1	2	3	4	5	P	I
10. Preparing job descriptions/specification	1	2	3	4	5	P	I
11. Managing conflicts	1	2	3	4	5	P	I
12. Receiving official visitors to your area of operation	1	2	3	4	5	P	I
13. Delegating responsibility and authority	1	2	3	4	5	P	I

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Competency Areas (Skills, Knowledge & Attitude)	Current Perceived Competency Level					Best Time To Acquire Competency	
	V. Low	Low	Mod.	High	V. High	Pre-Service	In Service
Programme Planning							
1. Developing a calendar of extension activities	1	2	3	4	5	P	I
2. Determining the needs of clientele for extension programme	1	2	3	4	5	P	I
3. Determining objectives/goals of the extension programme	1	2	3	4	5	P	I
4. Establishing programme priority	1	2	3	4	5	P	I
5. Preparing annual programme of work for your area of responsibility	1	2	3	4	5	P	I
6. Preparing a long-range programme of work	1	2	3	4	5	P	I
7. Involving co-workers in programme planning	1	2	3	4	5	P	I
8. Planning for resources (human and material)	1	2	3	4	5	P	I
9. Involving extension support groups and clientele in programme planning	1	2	3	4	5	P	I

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Programme Execution							
1. Utilizing a calendar of activities/events	1	2	3	4	5	P	I
2. Following a written programme of work	1	2	3	4	5	P	I
3. Providing leadership for program planning and execution	1	2	3	4	5	P	I
4. Developing a working relationship with clientele	1	2	3	4	5	P	I
5. Completing monthly or annual reports	1	2	3	4	5	P	I
6. Involving others in executing plans	1	2	3	4	5	P	I
7. Conducting home/farm visits	1	2	3	4	5	P	I
8. Conducting demonstrations	1	2	3	4	5	P	I
9. Organizing clientele into group (group formation)	1	2	3	4	5	P	I
10. Facilitating groups of people having great diversity and multiple perspectives	1	2	3	4	5	P	I
11. Ability to organise simulation and role-playing	1	2	3	4	5	P	I
12. Ability to recognize errors in the course of programmes	1	2	3	4	5	P	I
13. Monitoring of extension programmes	1	2	3	4	5	P	I
14. Co-ordinating extension programmes and that of other groups	1	2	3	4	5	P	I

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Teaching							
1. Using principles (basic ideas or rules) of learning or teaching	1	2	3	4	5	P	I
2. Using teaching materials (e.g. flip charts, folders and training guides)	1	2	3	4	5	P	I
3. Ability to select non-formal methods/ techniques for particular situations	1	2	3	4	5	P	I
4. Presenting information in a lecture	1	2	3	4	5	P	I
5. Presenting a concept, principle or skill through method demonstration	1	2	3	4	5	P	I
6. Presenting information in a meeting	1	2	3	4	5	P	I
7. Presenting information in seminar	1	2	3	4	5	P	I
8. Presenting information at a field day	1	2	3	4	5	P	I
9. Presenting information with an overhead projector	1	2	3	4	5	P	I
10. Presenting information with slides	1	2	3	4	5	P	I
11. Presenting information with charts	1	2	3	4	5	P	I
12. Presenting information with chalk board	1	2	3	4	5	P	I
13. Conducting group discussions	1	2	3	4	5	P	I
14. Using the problem solving approach to teaching	1	2	3	4	5	P	I
15. Encouraging audience to ask questions	1	2	3	4	5	P	I
16. Planning, organizing and conducting tours and field trips	1	2	3	4	5	P	I
17. Judging exhibits at agricultural shows	1	2	3	4	5	P	I
18. Ability to recognize the importance of punctuality	1	2	3	4	5	P	I
19. Listening to questions and suggestions form audience	1	2	3	4	5	P	I
20. Organizing seating arrangement for audience	1	2	3	4	5	P	I

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Communication							
1. Establishing communication among extension staff	1	2	3	4	5	P	I
2. Writing letters and/or memos	1	2	3	4	5	P	I
3. Writing and/or completing special records	1	2	3	4	5	P	I
4. Speaking to groups	1	2	3	4	5	P	I
5. Speaking to individuals	1	2	3	4	5	P	I
6. Using non-verbal communications	1	2	3	4	5	P	I
7. Possession of listening skills	1	2	3	4	5	P	I
8. Preparing extension publications	1	2	3	4	5	P	I
9. Act on correspondence promptly	1	2	3	4	5	P	I
10. Establishing working relationships with other governmental organizations and agencies	1	2	3	4	5	P	I
11. The use of camera and/or other photographic equipment	1	2	3	4	5	P	I
12. The use of tape recorder	1	2	3	4	5	P	I
13. The use of the computer	1	2	3	4	5	P	I
14. Interacting with personnel of higher position	1	2	3	4	5	P	I
15. Establishing working relationships with strangers	1	2	3	4	5	P	I
Understanding Human Behaviour							
1. Application of principles of motivation	1	2	3	4	5	P	I
2. Identification of factors that influence people become involved	1	2	3	4	5	P	I
3. Determine the effect of pressure groups on people's behavior	1	2	3	4	5	P	I
4. Applying factors affecting behaviour of people	1	2	3	4	5	P	I

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6. Ability to identify the power structure within the community	1	2	3	4	5	P	I
6. Ability to influence people to accept change	1	2	3	4	5	P	I
7. Ability to identify pressure groups in the community							
8. Utilizing knowledge of interaction of people in groups	1	2	3	4	5	P	I
9. Recognizing differences in age groups	1	2	3	4	5	P	I
10. Recognizing traditional culture and its effect	1	2	3	4	5	P	I
11. Ability to accommodate religious differences	1	2	3	4	5	P	I
12. Ability to accommodate other social groups	1	2	3	4	5	P	I
13. Understanding your own nature (strengths and weaknesses)	1	2	3	4	5	P	I
14. Recognising the role of different sexes and how it influences change	1	2	3	4	5	P	I

Maintaining Professionalism							
1. Identifying opportunities for professional improvement	1	2	3	4	5	P	I
2. Developing a plan for professional competency improvement	1	2	3	4	5	P	I
3. Maintaining professional organizations and activities	1	2	3	4	5	P	I
4. Participation in professional organization and activities	1	2	3	4	5	P	I

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Competency Areas (Skills, Knowledge and Attitude)	Current Perceived Competency Level					Best Time To Acquire Competency	
	V. Low	Low	Moderate	High	V. high	Pre-Service	In-Service
Evaluation							
1. Evaluating the effectiveness of a district or local extension programme	1	2	3	4	5	P	I
2. Evaluating your own performance	1	2	3	4	5	P	I
3. Interpreting the impact of change and/or trend upon the clientele	1	2	3	4	5	P	I
4. Using questionnaires to seek information	1	2	3	4	5	P	I
5. Using observation method to seek information	1	2	3	4	5	P	I
6. Using interviews to seek information	1	2	3	4	5	P	I
7. Interpreting results of questionnaire	1	2	3	4	5	P	I
8. Evaluating the results of an extension activity	1	2	3	4	5	P	I
9. Analyzing reports/data	1	2	3	4	5	P	I
10 Interpreting research findings from research stations	1	2	3	4	5	P	I
11. Applying research findings when making recommendations to clientele	1	2	3	4	5	P	I
12. Cooperating with research stations	1	2	3	4	5	P	I
13. Identifying problems requiring additional research	1	2	3	4	5	P	I
14. Keeping up-to-date with research findings	1	2	3	4	5	P	I
15. Conducting a literature search using library resources	1	2	3	4	5	P	I

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Competency Areas (Skills, Knowledge and Attitude)	Current Perceived Competency Level					Best Time To Acquire Competency	
	Very Low	Low	Moderate	High	V. high	Pre-Service	In-Service
ANIMAL PRODUCTION							
1. Producing sheep and goats	1	2	3	4	5	P	I
2. Producing poultry	1	2	3	4	5	P	I
3. Producing pigs	1	2	3	4	5	P	I
4. Producing cattle	1	2	3	4	5	P	I
5. Producing grasscutters and rabbits	1	2	3	4	5	P	I
6. Snail production	1	2	3	4	5	P	I
7. Apiculture (bee-keeping for honey)	1	2	3	4	5	P	I
8. Formulation of animal feed and feed management	1	2	3	4	5	P	I
9. Animal improvement through controlled breeding	1	2	3	4	5	P	I
10 Pasture management for livestock	1	2	3	4	5	P	I
11. Appropriate housing for livestock and poultry	1	2	3	4	5	P	I
12. Routine management practices in poultry	1	2	3	4	5	P	I
13. Routine management practices in livestock	1	2	3	4	5	P	I
14. Mating ratio for poultry and livestock	1	2	3	4	5	P	I
15. Detection of female animals on heat and ensuring successful service by males(especially in pigs)	1	2	3	4	5	P	I

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Competency Areas (Skills,Knowledge & Attitude)	Current Perceived Competency Level					Best Time To Acquire Competency	
	V. Low	Low	Moderate	High	Very High	Pre-Service	In-Service
Animal Health and Diseases							
1. Identification of signs of good and ill-health in farm animals	1	2	3	4	5	P	I
2. Ability to prescribe recommended drugs for the treatment of common diseases and pests of farm animals	1	2	3	4	5	P	I
3. Giving oral medication to animals	1	2	3	4	5	P	I
4. Use of hypodermic syringes on animals (giving injection)	1	2	3	4	5	P	I
5. Ability to manage wounds, fractures, burns, etc	1	2	3	4	5	P	I
6. General management of ecto-parasites in animals	1	2	3	4	5	P	I
7. General management of endo-parasites in animals	1	2	3	4	5	P	I
8. Management of diseases in general	1	2	3	4	5	P	I
9. Ability to follow pre-slaughter procedure in the abattoir	1	2	3	4	5	P	I
10. Dressing of carcass	1	2	3	4	5	P	I
11. Cutting carcasses into parts/portion	1	2	3	4	5	P	I
12. Ability to identify wholesome and unwholesome meat	1	2	3	4	5	P	I

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Competency Areas (Skills, Knowledge & Attitude)	Current Perceived Competency Level					Best Time To Acquire Competency	
	Very low	Low	Moderate	High	Very High	Pre-Service	In-Service
Fish Farming							
1. Ability to identify site for pond construction	1	2	3	4	5	P	I
2. Construction of fish pond	1	2	3	4	5	P	I
3. Identification of fish types cultured in Ghana	1	2	3	4	5	P	I
4. Techniques in stocking fish pond	1	2	3	4	5	P	I
5 Production of fingerlings	1	2	3	4	5	P	I
6. Techniques in transporting fingerlings	1	2	3	4	5	P	I
7. Techniques in assessing the stock of fish in a pond	1	2	3	4	5	P	I
8. Formulating feed for fishes in pond	1	2	3	4	5	P	I
9. Techniques in feeding fishes	1	2	3	4	5	P	I
10. Ability to identify disease conditions in fishes in a pond	1	2	3	4	5	P	I
11. Managing disease situation in a pond	1	2	3	4	5	P	I
12. Techniques in harvesting fishes	1	2	3	4	5	P	I
13. Fish preservation and processing techniques	1	2	3	4	5	P	I
14. Construction of chorkor ovens and trays	1	2	3	4	5	P	I
15. Maintenance of smoking ovens and trays	1	2	3	4	5	P	I
16. Management of fish storage pests (e.g.insects,rodents,etc)	1	2	3	4	5	P	I

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Crop Production 1. Production of cereals	1	2	3	4	5	P	I
2. Production of roots and tuber crops	1	2	3	4	5	P	I
3. Production of Legumes	1	2	3	4	5	P	I
4. Production of vegetables	1	2	3	4	5	P	I
5. Production of cocoa	1	2	3	4	5	P	I
6. Production of coffee	1	2	3	4	5	P	I
7. Production of citrus	1	2	3	4	5	P	I
8. Production of oil palm	1	2	3	4	5	P	I
9. Production of coconut	1	2	3	4	5	P	I
10. Production of rubber plant for latex	1	2	3	4	5	P	I
11. Production of plantain and banana	1	2	3	4	5	P	I
12. Production of pineapple	1	2	3	4	5	P	I
13. Production of other fruit plants (mango, cashew etc)	1	2	3	4	5	P	I
14. Production of pasture and forage crops	1	2	3	4	5	P	I
15. Crop breeding (crop improvement)	1	2	3	4	5	P	I
16. Ability to perform effective grafting and budding	1	2	3	4	5	P	I
17. Appropriate post harvest handling of produce (cereals)	1	2	3	4	5	P	I
18. Ventilated narrow crib construction	1	2	3	4	5	P	I
19. Nursery management of oil palm	1	2	3	4	5	P	I
20. Nursery management of vegetables	1	2	3	4	5	P	I
21. Mushroom production							

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Competency Areas (Skills,Knowledge & Attitude)	Current Perceived Competency Level					Best Time To Acquire Competency	
	V. Low	Low	Moderate	High	V. High	Pre-Service	In-Service
Plant Protection							
1. Ability to identify different crop pests	1	2	3	4	5	P	I
2. Ability to identify different damages caused by different pests	1	2	3	4	5	P	I
3. Identification of different disease conditions and their causal agents	1	2	3	4	5	P	I
4. General management of insect pest	1	2	3	4	5	P	I
5. Management of nematodes	1	2	3	4	5	P	I
6. Management of fungal diseases in crops	1	2	3	4	5	P	I
7. Management of viral and bacterial diseases	1	2	3	4	5	P	I
8. Ability to prescribe recommended pesticides for common diseases of crops and stored produce.	1	2	3	4	5	P	I
9. Mixing of pesticides (emulsion and powered form)	1	2	3	4	5	P	I
10. Spraying of pesticides using the knapsack sprayer	1	2	3	4	5	P	I
11. Spraying of pesticides using the mist-blower	1	2	3	4	5	P	I
12. General management of farm to protect crops against pests and diseases	1	2	3	4	5	P	I
13. Knowledge of common pesticides on the local market.	1	2	3	4	5	P	I
14. Integrated Pest Management (IPM)	1	2	3	4	5	P	I

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Competency Areas (Skills, Knowledge & Attitude)	Current Perceived Competency Level					Best Time To Acquire Competency	
	V. Low	Low	Moderate	High	V. High	Pre-Service	In-Service
Agroforestry							
1. Ability to identify major agroforestry species	1	2	3	4	5	P	I
2. Alley cropping practices	1	2	3	4	5	P	I
3. Woodlot production	1	2	3	4	5	P	I
4. Live staking practices	1	2	3	4	5	P	I
5. Windbreak practices	1	2	3	4	5	P	I
6. Agrisilvipasture (rearing animals under plantation crops)	1	2	3	4	5	P	I
7. Pruning of agroforestry trees	1	2	3	4	5	P	I
8. Techniques and management of coppice	1	2	3	4	5	P	I
9. Prevention of bush fires	1	2	3	4	5	P	I
Land and Water Management							
1. Ability to carry out a proper land survey	1	2	3	4	5	P	I
2. Ability to carry out soil fertility analysis	1	2	3	4	5	P	I
3. Preparation and application of compost and farmyard manure	1	2	3	4	5	P	I
4. Use and application of fertilizers	1	2	3	4	5	P	I
5. Managing soil erosion (use of erosion control methods)	1	2	3	4	5	P	I
6. Managing soil water (e.g. mulching)							

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Competency Areas (Skills,Knowledge & Attitude)	Current Perceived Competency Level					Best Time To Acquire Competency	
	V. Low	Low	Moderate	Hgh	V. High	Pre-Service	In-Service
Mechanization							
1. Use of simple farm tools	1	2	3	4	5	P	I
2. Construction of simple farm drainage system	1	2	3	4	5	P	I
3. Use of irrigation equipment (e.g. sprinklers)	1	2	3	4	5	P	I
4. Field operations of a tractor and a power tiller	1	2	3	4	5	P	I
5. Maintenance and simple repairs of farm machinery and equipment	1	2	3	4	5	P	I
6. Using a motorbike	1	2	3	4	5	P	I
7. Using a motor sprayer	1	2	3	4	5	P	I
8. Ability to construct simple farm structures	1	2	3	4	5	P	I
9. Ability to construct storage barns for cereals and tubers	1	2	3	4	5	P	I
10. Operating milling machines (e.g. for cereals, roots and	1	2	3	4	5		
11. Using an incubator	1	2	3	4	5	P	I

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WIAD							
1. In-depth knowledge on population issues and how these affect food security	1	2	3	4	5	P	I
2. In-depth knowledge on family planning methods	1	2	3	4	5	P	I
3. Improved kitchen practices	1	2	3	4	5	P	I
4. Preparation of basic but recommended dishes for lactating mothers/babies.	1	2	3	4	5	P	I
5. Techniques in budgeting at home	1	2	3	4	5	P	I
6. Techniques in ensuring a hygienic home	1	2	3	4	5	P	I
7. Observing safety measures in the home	1	2	3	4	5	P	I
8. Legume Utilization	1	2	3	4	5	P	I
9. Leafy vegetable utilization	1	2	3	4	5	P	I
10. Weaning food utilization	1	2	3	4	5	P	I
11. Root/tuber crops preservation and processing	1	2	3	4	5	P	I
12. Oil preservation	1	2	3	4	5	P	I
13. Vegetable preservation and processing	1	2	3	4	5	P	I
14. Fish/Meat preservation and processing	1	2	3	4	5	P	I
16. Parboiling of rice	1	2	3	4	5	P	I
17. Soap making	1	2	3	4	5	P	I
18. Skills in working with clientele of the opposite sex	1	2	3	4	5	P	I
19. Assessment/analysis of gender issues for planning extension activities	1	2	3	4	5	P	I

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Competency Areas (Skills, Knowledge & Attitude)	Current Perceived Competency Level					Best Time To Acquire Competency	
	V. Low	Low	Moderate	High	V. High	Pre-Service	In-Service
Farm Management 1. Knowledge of basic profitability criteria for evaluation of farm development project	1	2	3	4	5	P	I
2. Advising potential borrower to examine alternative sources of finance before making a loan application to banks	1	2	3	4	5	P	I
3. Knowledge of the requirements for agricultural loan of major banks in Ghana	1	2	3	4	5	P	I
4. Knowledge of the conditions for loans from non-banking financial institutions (e.g.susu collectors)	1	2	3	4	5	P	I
5. Preparing budget for specific programme operations or purposes	1	2	3	4	5	P	I
6. Estimation of partial budget of a typical farm enterprise (cost-benefit analysis)	1	2	3	4	5	P	I
7. Guiding farmers in keeping accurate records on their farm enterprise	1	2	3	4	5	P	I
8. Knowledge about marketing centres for agricultural produce in operational area, your district and beyond	1	2	3	4	5	P	I
9. Knowledge about market information from other parts of the country (e.g. through radio and T.V.)	1	2	3	4	5	P	I
10. Knowledge about movement of agricultural produce within your district, region and other parts of the country	1	2	3	4	5	P	I
	1	2	3	4	5	P	I

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PART TWO: BACKGROUND INFORMATION

DIRECTION: Please provide the correct answers to the following questions by completing the blanks or by ticking the responses that best describe your situation.

1. Region: .....

   District: .....

   Town/village: .....

2. Your age at your last birthday:..... years

3. Sex: Male..... Female .....

4. Marital status: Married..... Single ..... Divorced ..... Widowed .....

5. What is your highest educational qualification?

   Certificate in Agriculture:.....
   Diploma in Agriculture: .....
   B.Sc. degree in Agriculture:.....
   Masters degree in Agriculture or related field:.....
   Others (please specified): .....

6. How many years have you worked as an agricultural extension agent?

   ..... or with the Ministry of Food and Agriculture .....

7. What was your former Technical Department (i.e. before decentralization)?

   .....

8. How many training courses have you attended in the last five (5) years?

   1-5..... 6-10..... 11-15..... 16-20..... >20.....

9. What is your current job title ? .....

10. Other work experiences ? .....

11. Please list any suggestions/recommendations for improving the technical and professional competencies of AEAs in the spaces below.

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