UNIVERSITY OF CAPE COAST

THE ACT OF TEACHING AGRICULTURAL SCIENCE IN THE JUNIOR HIGH SCHOOL: A CASE STUDY OF ASSIN DISTRICT IN THE CENTRAL REGION

EVANS KWESI AMOAH

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BY

EVANS KWESI AMOAH

DISSERTATION SUBMITTED TO THE INSTITUTE OF EDUCATION, OF THE FACULTY OF EDUCATION, UNIVERSITY OF CAPE COAST IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF EDUCATION DEGREE, IN MANAGEMENT

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CANDIDTATE'S DECLARATION

I hereby declare that this dissertation is the result of my own original research and that no part of it has been presented for another degree in this University of elsewhere.

Candidate's Name Evans Kwesi Amoah

Signature ……

Date ……

SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by the University of Cape Coast.

Principal Supervisor's Name: Professor Emmanuel Kwashie Tamakloe

Signature ……

Date……

ABSTRACT

The study focused on the act of teaching Agricultural science in the Junior High Schools after the implementation of the new education reforms in 1987. The study was a descriptive survey. The sample consisted of all the agricultural science teachers in the Assin North District of the Central Region of Ghana. The result indicated that all Agricultural Science teachers in the district were professionals and experienced who were using the right method of teaching but they devoted more time for theory than practical lessons. Textbooks, syllabus, farm tools were insufficient in the schools. Farm assistants, library and laboratories were not available in all the schools. The results pointed out clearly that within the academic year theory topics in the syllabus were fairly treated and practical topics (activities) were unsatisfactorily handled.

As a result it was recommended that the Agricultural science teachers should devote equal time for theory and practical lessons. Land sited for schools should be large enough so that part can be demarcated for agricultural activities.

Agricultural sciences teachers should be encouraged and supported to write different agricultural textbooks to supplement the one provided by the CRDD of GES. Animal enterprise which is not popular with the schools should be encouraged by GES, DEO, PTA and other organizations for the students to gain practical skills on animal rearing. Simple farm tools, equipment, library, laboratory and farm assistance should be provided by the GES in sufficient quantities to help students gain interest in the subject.

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DEDICATION

To my elder brother S.L. Amoah and my late mother Adjoa Benyiwah.

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LIST OF ACCRONYMS

CRDD	Curriculum Research Development Division
JHS	Junior High School
MOE	Ministry Of Education
PTA	Parent Teacher Association
ERP	Economic Recovery Programme
PNDC	Provision National Defence Council
GES	Ghana Education Service
SMC	School Management Committee
NRC	Nation Redemption Council

CHAPTER ONE

INTRODUCTION

Background of the Study

Education is the key to national development in every country. Improving the quality of education has been a major concern for every government and educational planners as well as policy makers in every country. The need for a purposeful education system coupled with the dissatisfaction and unproductive system of education inherited from our colonial government led to the formation of the Education Advisory Committee under the chairmanship of Rev. (Dr.) N.K. Dzobo (Awuku, 1962; Dzobo, 1972)

The committee's terms of reference included consideration of proposal on a new structure and content of Education for Ghana which was later accepted by the National Redemption Council (NRC) government in 1974 for implementation within the same year. The implementation, however, never went beyond the experimental stage until 1986, when under the Economic Recovery Programme (ERP), the PNDC government initiated discussions to implement the reform on a large scale (Ministry of Education, 1988). This resulted in a nation-wide implementation in September 1987 of the Junior Secondary School (JSS) Programme, which served as the impetus of the new Educational Reform Programme.

The reform package of Basic Education of which the Junior Secondary School programme is a part, offers opportunity that will predispose pupils to

acquire the knowledge, skills and prevocational experience, that will enable them discover their aptitudes and potentialities and to develop a longing for further improvement (Ministry of Education , 1994). The pre-vocational subject, which would be the focal point of this study, is Agricultural Science Education, an important subject in the development of the nation. According to the Agricultural Science Education Programme, content teaching and learning should be practical-oriented. Before the new Agricultural Science Education, the subject was not on its own. It was fused with Science, Geography and History in the middle school curriculum. It was not even examinable in the secondary school curriculum.

The new programme which was designed to replace the old programme on paper is quite laudable. However in practice, it was necessary to find out whether it was better or worse than or the same as the old. There was the need to find out whether this new programme was actually being thought adequately by the teachers to help ensure the elimination of the shortcomings of the old programme. There is the need for critical examination of the teaching of the subject. How teachers of Agriculture go about teaching with special regard to the aims and objectives of:-

1. The new Agricultural Science Programme.

2. Qualities of Agricultural Science Teachers.

3. Practical activities involved (incorporated) in the main programme.

4. Teaching methods in Agricultural Science.

5. The availability of teaching/learning resources and materials.

6. Assessment of theory and practical work procedures.

7. Problem related to teaching of the new Agriculture Programme.

Statement of the Problem

According to the new Agricultural science programme, content teaching and learning should be practical-oriented as stated above. Again, having a good programme on paper is one thing and implementation is another. The success of any new programme depends to a large extent, on the suitability of the personnel involved to implement, sustain and direct the programme to achieve its desired goals. For that reason the teacher of Agricultural science should have a new orientation. He should be a true agent of change in order to reflect the new expectation of society.

As the curriculum of the new Agricultural Science Education is more enriched and expanded, the teacher of Agricultural science has to be more innovative in order to implement the programme. He should be ready to adopt the new techniques that are geared towards achievement of quality education. However, comments on the low achievement by pupils in Junior High Schools suggest a closer study of how the teachers are handling the subject. The question is “are the teachers of Agricultural science in JHS exhibiting the expected teaching performance expected of them?

Purpose of the Study

The study attempts to find out the way Agricultural Science is taught under the current education reforms at the Junior High Schools. Specifically, the study is to determine whether the observed teacher factors like qualification and experience, facilities as well as environmental factors could affect pupils' achievement in JHS.

Research Questions

Having identified a problem that needs in-depth investigations and analysis, certain questions need to be answered. In this regard, the following sets of research questions were formulated to guide the research.

1. To what extent do agricultural science teachers have adequate knowledge and training to handle the subject effective at the JHS?
2. What teaching-learning interactions are employed by teachers of Agricultural Science in the JHS?
3. What resources and facilities are available for teaching theory and practical agriculture in the JHS?
4. To what extent do Agricultural Science teachers treat the theory topics and practical activities in the Agricultural Science Syllabus for JHS?
5. What methods/criteria are used for assessing performance in practical lesson in the JHS?
6. What problems are related to the teaching of Agricultural Science in the JHS?

Significance of the Study

The results of the study would assist the teachers to identify the major aspects and characteristics of the JHS Agricultural Science Education programme. The results would equally assist the teachers in the JHS to identify their strengths and weaknesses, and strive to determine the way and means of improving their teaching skills in their individual schools.

It is expected that the results of the study would also enable teacher educators concerned with JHS Agricultural Science Education, especially Agricultural Science coordinators at the District Education offices to plan for the future and make adjustment or restructure the course where necessary to make it more functional. The findings would also inform the Teacher Education Division of the Ministry of Education learn about the current state of Agricultural Science Education in the JHS and help them plan better by offering them insight into the content to which the objectives of the JHS Agricultural Science Education programme have been achieved.

Finally, it is hoped that the study would serve as a useful basis for future research on the implementation of Agricultural Science Educational Programmes in Ghana.

Delimitation of the Study

The study was carried out in the Junior High Schools in the Assin District of Central region of Ghana. This was because the researcher teaches at Foso College of Education which is the district capital and could therefore travel to undertake the study in the schools with less difficulty. The study was structured to

find out how teaching of Agricultural Science is done in Junior High Schools after the implementation of JHS concepts in 1987. It therefore involved only agricultural science teachers in the district.

Limitation

Some respondents (Agricultural science teachers) were reluctant to answer the questionnaire for the fact that Agricultural Science teachers are not taken for workshops but always called and served with questionnaires. Also, in the course of the study the district was divided into two (Assin North and South) but the findings from the research can be generalized across the two district from the sample selected.

Organization of the Study

The dissertation consists of five chapters. The first focuses on the background of the study, statement of the problem, purpose of the study, research questions, significance of the study, and the organization of the study.

Chapter two contains a review of literature relevant to the study. The method used in collecting data in this study is discussed in chapter three. The main focus of chapter four is on the presentation, analysis and discussion of data collected.

Finally, summary, main findings, interpretation, implementation of the findings, recommendation and suggestions for further research are presented in chapter five.

CHAPTER TWO

LITERATURE REVIEW`

Introduction

This chapter presents a review and discussion of the literature related to the problem under study. A search through the literature revealed that a considerable number of articles and studies concerning attitudes and achievement in Agriculture science have appeared in the past two decades. Some studies, specifically pertaining to the attitudes of teachers and students instructional activities and facilities toward the teaching of agriculture science have been found. For the purpose of this study the review of the literature has been treated and discussed under the following sub headings:-

1. Features and objectives of the JHS Agricultural Science course (programme)
2. The Agricultural science teachers' knowledge and competence, attitudes, perception and personal qualities.
3. Facilities for teaching JHS agriculture science
4. Instructional activities in JHS Agricultural science programme
5. The relationship between theories and practical activities in Agricultural Science lesson.
6. Assessing procedures used for teaching Agricultural Science at the JHS

7. Problems of teaching agriculture in JHS

Features and objectives of the JHS Agricultural Science course (programme)

The JHS Agricultural Science is a three-year integrated course which is to follow directly from the primary school science course (Ghana Science Series JSS Teachers' Book 1, 1983). According to the J.H.S 1 Agricultural Science Teacher's Handbook (1986) the course is so structured that topics discussed in the first year are developed further in the second and third years. This is known as the spiral or cyclic approach. The course is designed to enhance learning in the cognitive, affective and psychomotor domains (CRDD, 1987). This is made manifest in the general objectives of the Agricultural Science course which is listed in the syllabus as including the development of:

1. Desirable Attitudes and Interests (Affective domain)
2. Mental Skills (Thinking Processes) (Cognitive Domain)
3. Practical Physical Sills (Psychomotor Domain)
4. Basic Scientific Knowledge (Cognitive Domain)

Apart from the syllabus, which covers the three-year course, there are pupils' textbook and teacher's handbook for each year of the course. The pupils' books were written to cover the Junior High School Agricultural Science syllabus (CRDD, 1987). The general objectives in the Agricultural Science syllabus are expanded further to show broad areas of learning the Agricultural Science

Curriculum. The Agricultural Science Teachers Handbook specifies the type of activities to be performed, the method to be used, the objectives and the list of materials and equipment required for each lesson. The activities in each lesson take their orientation from the objectives stated in the teacher's handbooks. Teachers are, however, encouraged to design other relevant activities to supplement those outlined in the pupils' books and the Agricultural Science syllabus.

The Agricultural Science Teacher's Knowledge and Competence, Attitude, Perception and Personal Qualities

The Teachers' Knowledge and Competence

A teacher is a person engaged in interactive behavior with one or more students for the purpose of effecting a change in those students. The change, be it attitudinal, cognitive or motor, is intentional on the part of the teacher, and is thus a most adequate means to use in assessing teaching effectiveness.

Early emphasis on teacher qualification was for occupational experience (Miller, 1985). Even then the function of instruction and teaching was not overlooked or minimized. Miller notes that emphases on the teaching function were based on four assets: the teacher must:-

a. Be competent in the specialty that is to be taught

b. Know how to teach

c. Deal with a group of problems that involves knowing children and be able to deal sympathetically and intelligently with children, adolescents and adults, and

d. Have a broad viewpoint of his position as teacher.

The Perception of Agricultural Science Teacher

A teacher of agriculture is not only a teacher but also a technician in agriculture. Olaitan (1984) suggests that his role differs to some extent from that of other teacher's in the school systems. He is expected to deal with both the cognitive psychomotor and effective outcomes of the subject and he is looked

upon as a master of definite skills. This means therefore that he educates pupils as well as helping them to acquire definite skills in agriculture. Olaitan (1984) further stated that the agriculture teacher is viewed by other teachers in the school as having even greater freedom than they enjoy because he is free to move into the community. Most of his responsibilities within and outside the school are not well executed because he is afraid of being criticized.

According to Olaitan (1984) pupils fear and respect the agriculture teacher and regard him as disciplinarian, particularly where physical work is involved. Laziness is not tolerated and complaints largely ignored. He is also seen to be responsible for various outdoor activities such as such as compound cleaning, mainly by virtue of his responsibilities for the upkeep of the environment. A survey conducted showed that he is not as interested in social activities as the other teachers, rarely spent any appreciable time in the staff from and is viewed not always well dressed. And possibly, most importantly, he is viewed as being less well educated than the teachers of mathematics and biology, based on the assumption that one did not need an education to big the soil and grow crops. His close relationships with the school head alienated him from his colleagues as he had access to school farm products.

In contrast to these opinions the teacher of Agricultural science is held in the highest esteem in the community. Next to the school headmaster, he is the person most capable of solving the agricultural problems. It is obvious from this range of opinion that there is general lack of understanding of the tasks carried out by the teacher of agriculture.

Agriculture Teachers' Personal Qualities

The teacher of agriculture is an educational leader especially in a rural community. He is educated and as such should exhibit the characteristics of an educated person in all areas of life. He should possess broad interests and participate in intellectual discussion and social activities with members of staff. Olaitan (1984) suggests five personal qualities that should be exhibited by agricultural science teacher at the JHS.

These personal qualities are:-

i. *Character and personality*: The teacher must maintain a high ethnical standard while enjoying good relationships with colleagues and pupils. A teacher with a pleasing personality can do a great deal to develop acceptable community attitudes towards agriculture, through contact and meaningful interruption with the village farmers. He should be diplomatic and courteous in all such relationships and mindful of local customs and practices.

ii. *Appearance*: the teacher of agriculture should endeavor to dress as neatly as other member of staff and encourage his pupils to keep classroom and tools clean and tidy.

iii. *Confidence*: The teacher should have absolute self confidence to teach successfully. This requires careful preparation of lesson beforehand so that he can impart his knowledge efficiently. He should know his abilities and recognize his limitation and be capable of accepting the emotional

challenges he will face in his teaching career.

iv. *Commitment*: The agriculture science teacher must be willing to dedicate himself to his job and carry it out to the best of his ability.

v. *Attitude*: The teacher of agriculture must adopt the right attitude towards work, colleagues, pupils and community. He should be co-operative within the school, accept criticism and praise alike and work for the benefit of the school rather than for personal interest.

Teaching Methods in Agricultural Science

A variety of teaching methods and techniques can be adopted to make teaching agriculture effective. Olaitan (1984) suggest that teaching of agricultural science include demonstration, discussion and lecture methods, problem solving, field trips, role playing exhibition and projects.

Facilities for Teaching JHS Agricultural Science

Since agriculture education comprises both theory and practical learning experiences, there should be facilities in the Junior High Schools designed for that purpose for both classroom instructions and practical work. Awuku (1962) indicates that facilities required for good classroom teaching include housing and equipment such as laboratories, shops, up-to-date books, charts, farm records, bulletins, and well equipped classrooms.

For practical lessons in agriculture, Awuku (1962) found that the school farm is regarded as the most important and effective facility for teaching school

children practical agriculture in Ghana. There is also the necessity for tools, farm equipment and inputs to be available for use of the farm. According to Awuku (1962), teachers find the school farm as the best facility needed for relating theory to practice in prevocational agriculture. Other means considered for providing facilities to teach practical agriculture are visits to agricultural stations and model farms; the use of audio-visual gadgets; computers, talks and demonstrations by resource persons.

In a survey, Awuku (1962) found the school agricultural science club plays a major role in the teaching of agriculture in Ghanaian Schools. According to the survey, there are three basic instructional roles played by School agricultural clubs, namely;

a. Serving as a means of instructions;

b. Being the basis for practical work and

c. Helping to train future independent farmers

Thus, for a successful Agricultural Science programme in which theory and practical lessons are meaningfully related, facilities for theory and practical lessons are needed in adequate quantities, and the formation of a school agricultural club is an advantage.

Instructional Activities in JHS Agriculture Science

According to Hammonds (1950) the type and amount of instructional activities that go into pre-vocational agriculture must be considered against the background of the description given to agriculture. He described agriculture as both an "art" and a "science". The "art" of agriculture consists of the use of manipulative skills for production. The "science" of agriculture refers to its composition as an organized body of knowledge which is deeply rooted in the related sciences like botany, chemistry and zoology. Any agricultural instructional programmes should, therefore, include a balanced and interrelated forms of the two sides of agriculture, in the form of practical and theory lessons.

Brinkley and Hammonds (1970) support the use of the problem-solving method in instructions in agriculture education. This consolidates the belief of Dewey (1939) that learning by doing is the most useful way of learning. He states that all genuine education comes through experience. Arguing along the same pattern, Phipps (1972) suggests that teaching of agriculture should make use of farming programmes, which provide problems for use in classroom teaching, and opportunities to learn by doing in order to make the whole agricultural education functional. This calls for the abrogation of the tradition of designating agriculture into separate courses as crop science, soil science, and the others. Phipps (1972) again suggests that if problems are used as the central theme for instructions in agricultural education, then the problems must be related to the true-to- life problems which will be encountered by the pupils. He observed that pupils in U.S.A are interested in developing skills and abilities needed to help them solve

true-to-life problems which they will encounter in life. Similarly, Biard, Lazorowitz and Allman (1984) observed that students of the present day prefer to acquire both knowledge and skills which will be of worth to them either in their vocational decisions or in solving their personal problems, in which practical lessons play an important role. In conducting pre-vocational education in agriculture, Yardley (1968), indicated that children in particular could only learn successfully from things they did and experience practically. Kamii (1974) also points out that the priority of intellectual activity should be placed on actual experiences rather than language.

To sum up therefore, instructional activities in teaching agriculture should include balanced and interrelated theory and practical activities based on real life problems and relevant to the learner's immediate and future needs.

Relationship of Theory and Practical Lessons in Agricultural Science

The importance of relating and supporting classroom instruction in agricultural education with practical experiences has been recognized by Hammond (1950). He noted that practical work in agricultural education is not done for students to put what they have learned in theory into practice, but primarily in order to learn through doing. Similarly, Phipps (1972) observes that practical work in the form of students' farming programmes is not an end in itself. It is a means of achieving practical skills in agriculture.

Blege (1986) describes the promotion of theoretical knowledge at the expense of application as unsatisfactory. According to Phipps (1972), classroom

instruction in agriculture must be based on agricultural activities, and what is learned in class should be used in performing these activities. According to him, learning by doing is closely associated with use and readiness.

Patel (1959) reviewed available literature on principles of agricultural education and a summary from them indicate that any from of agricultural education must have a component of a practical programme supporting the classroom instruction. This practical component serves the purpose of providing the student with the desired orientation towards agriculture. Thus, theory and practical learning experiences in agriculture must relate to, and practical learning experiences in prevocational agriculture must relate to, and support each other in order to help students to learn, to form the right attitude toward occupations in agriculture.

Despite the acclamation of the relevance of relating and supporting classroom instruction in agriculture with relevant practical activities, various studies show a considerable gap and mismatch between theory and practical lessons therein. Dexter (1967) states that with a few exceptions, there is no necessary correlation between activities which are assessed in schools and those for particular skills needed for employment. Lawton (1973) also observes that one of the major problems of curriculum is the “enormous gap” between theory and practice. These observations have been emphasized by Hammond (1950), stating that making provision for theory lessons to be properly related to and supported by teaching practical skills is a major perennial problem in the teaching of agriculture in schools. He states that some intellectuals regard the teaching of

manipulative skills as below the dignity of college.

Awuku (1962) has made similar observations on instructional activities in agriculture in Ghanaian Middle Schools. He noted that agriculture in the Middle schools were more theoretical than practical. Again, Awuku (1987) emphasizes that the main teaching method employed in teaching agriculture in Ghana has been the "chalk and talk" method, thus depriving pupils of many opportunities to act and solve real farming problems. He further states that classroom teaching and farm activities in schools are most of the time unrelated. In effect the literature indicates that there is much more to be done in closing the existing gab between theory and practical instructions in agricultural education in Ghana. This constitutes one of the challenges thrown to the reformed structure and content of education in the country.

Gall (1970) found that both pace and sequence of the instructional program affect the effectiveness of teaching. The implication is that if theory and practical lessons are not systematically arranged in terms of sequence and pace of instruction, it will not be easy for students to identify and grasp the necessary link between related theory and practical lessons. Again, in relation to time, Hammonds (1950) observed that making good use of seasonal opportunities is a factor that contributes to the determination of when certain classroom lessons and when certain field work should be done. It is most advantageous to teach certain aspects of agriculture in a time of the year when conditions and facilities required for such teachings are most favorably prevalent. He therefore, advocates for an organization of subject matter in which reasonable amounts of consecutive

teaching time will be followed. Again, in order that classroom teaching can contribute meaningfully to practical work, and vice-versa, related instructions in theory and practical should follow each other as immediately as possible. Hammonds (1950) again notes that the amount of content to be taught by a teacher in agriculture depends on his time allocated. There is thus, the need for proper appropriation of time for agriculture on the official timetable.

The correlation of various courses related to agriculture among each other has been found to have influence on the degree to which theory and practical are related. For instance, the sciences related to agriculture are taught in such a way, sequence and pace, that students do not perceive the linkages they have with productive agriculture. The result is that whatever is learned is not useable by the student when he gets to the point where he should apply that knowledge.

Another factor influencing the theory/practical lesson relationship in agricultural education is the educative environment. Hammond (1950) defines the educative environment as the totality of the surrounding and conditions external to the learner that influences his learning. These conditions include teaching and learning facilities, teaching and administrative personnel, daily and annual schedules, the total curricular offerings, and the social and natural conditions prevailing in and around the school. A favorable educative environment, according to Hammond is one that provides for all the conditions and requirements ideal for successful vocational and other programmes in agricultural education.

Evaluation of Agriculture Science Programme in the JHS

The importance of objectives and evaluation in curriculum planning and development, and the close relationship between the two have been established by all curriculum workers and writers. Davies (1975) depicts the use of clearly stated objectives by teachers as an important step in determining the necessary association between theory and practical contents of their lessons. According to him, the content, procedure, the resources to be used, the environment, and the evaluation procedure, are all dependent on the stated objectives. The clarity and appropriateness of the objectives directly affects the entire curriculum. Similar assertions on the need for clear objectives in agricultural education have been made by Binkley and Hammond (1970) and Mager & Beach (1976). Beaty & Woolnough (1982) recommend from a study conducted on the activities of children between 11 and 13 years old that objectives in a curriculum should be stated in terms of activities most enjoyable and suitable to the pupils.

Teaching is evaluated by the learning that takes place as a result of the teaching. The objectives determine what and how the teacher teaches. They also indicate how to assess what is taught, for evaluation. Phipps (1972) states that evaluation procedures must be designed to measure changes in ability in terms of the objectives developed. On the other hand, the teacher finds the usefulness and effectiveness of his objectives only when he evaluates the outcomes of his teachings (Hammonds, 1950).

In evaluating pupils in what they have learned in agriculture, Phipps

(1972) mentions, among other things, changes in:

a. Knowledge

b. Managerial and manipulative skills' and

c. Personality traits such as interest, habits and attitudes

This implies that criteria for evaluation in prevocational agriculture are expected to cover the cognitive, affective and psychomotor domains.

The use of paper and pencil test for assessing achievement in agricultural education has been described as unsatisfactory by Macdonald-Ross (1972) indicates that although paper and pencil test is easy, the result should be used only after a more valid and reliable results are available.

The need for a more comprehensive assessment of pupils' progress has further been pointed out by Gibby (1978). He says records should be kept on individual pupils performances in continuous assessment exercises. Hammond (1950), Brinkley and Hammond (1970) and Phipps (1972) all have supported the use of individual records on pupils. Gibby (1978) suggests four assessment procedures from ways which may be devised to assess work in prevocational agriculture in the Ghanaian Junior High School.

1. A continuous assessment of a full range of skills, abilities, interests and reactions in school farm work.

2. An assessment of two kinds of a group work, each done over quite a long period of time.

3. An assessment of a representative sample of work, which would be completed in relatively short period of time.

4. An examination set at the end of a pupil's course as a measure of his final attainment.

Hammond (1950) suggests that manipulative skill can be measured objectively by comparing speed and accuracy of the process with set standards. Also, material products can be compared with those of a competent producer. Phipps (1972) has listed a number of real-life situations which may be used to measure changes in pupil's abilities in agriculture, namely.

1. Performance or practical tests
2. Written test and examinations
3. Oral responses
4. Daily evaluations
5. Notebooks and/or records books
6. Self evaluation
7. Completed jobs
8. Personal interviews and observations

Many of these procedures, though easily practicable in the Ghanaian situation, are hardly used to any extent in our schools. It can be inferred from the

literature that objectives for instructional activities in prevocational agriculture have to be clearly stated to provide a sound basis for evaluation. Also, evaluation is essential for testing the level to which the objectives have been achieved. It also reveals that assessment has to cover all aspects of learning. Paper and pencil tests are therefore, not adequate to provide a full assessment in Agricultural Science. Several modes of evaluation have been identified, which may be used individually in combination with others to obtain a meaningful evaluation results.

Problems of Teaching Agricultural Science in the JHS

Hammond (1950) reports that perennial problems with which agricultural colleges are confronted are making provisions for the teaching of practical skills and bringing about a proper relationship between theory lessons and practical activities in agricultural education. He also mentions the unpreparedness of teachers to teach Agricultural Science as a major obstacle. Again, he reports that teachers of agriculture are usually over-worked with other teaching duties. This reduces their efficiency. Insufficient time of the teaching of agriculture, according to him, is another important problem.

Dodd (1969) cites five sources of failure of the implementation of the Middle School Agricultural programme in Tanganyika (now Malawi) in the 1950s. These were educational reasons, political reasons and agriculture being too rigid. It made no provision for regional and local variations. He further mentions inadequate guidance programme and specialist advice. Other educational

problems cited by Dodd include the shortage of very important books, the wrong use of agricultural activities as punishment in the schools by some school authorities, and the status of agriculture as a "non-examination" subject. In the Junior High Schools in Ghana, fortunately Agricultural Science is an "examination" subject. However, the possible existence of the other educational problems cannot be ruled out. Awuku (1962) identified inadequate of financial support as a major problem.

Mwingira (1969) states that the difficulties of implementing the school agricultural policy results from the following factors.

a. Shortage of textbooks, materials and equipment.

b. Lack of detailed agricultural knowledge, and shortage of implements.

c. The intellectual limitations of teacher.

d. Non-commitment, inability and inimical attitudes of members of administration towards agricultural education, and

e. Inefficient structures for effective decision-making within the Ministry of Education.

From the literature, it may be admitted that common problems run throughout the developing world in agricultural education in the form of inadequate facilities, low professional and efficiency levels of teachers, poor attitudes of teachers, school administrators and parents towards agricultural education, and political lapses.

CHAPTER THREE

METHODOLOGY

Overview

This chapter discusses the steps that are pursued and the procedures that have carried out in order to gather data relevant for the study. Specific parts that have covered are research design, sampling, research instrument, pilot testing of instrument, administration of instrument and data analysis.

Research Design

The research design selected for the study is the descriptive survey. A descriptive involves collecting data in order to test hypothesis or answer questions concerning current status of the subject of study. It determines and reports the way things are points out that the descriptive survey is very useful for generalizing from a sample to a population so that inferences can be made about the characteristic attributes or behavior of the population. Gay (1992) further maintains that a descriptive survey is useful for investigating a variety of educational problems including assessment of attitudes, opinions, demographic information, conditions and procedure.

The study was conducted in the Assin North educational district. There were 51 JHS within the 10 circuits. The district was chosen for the study in consideration of the limited time and finance that were available for the study and for its proximity to Foso College of Education where the researcher was teaching.

Population and Sample

The population for a study was all the subjects involved in the study. That is the group of interest to the researcher. Therefore the population for the study comprised all Agricultural Science teachers in all JHS in the Assin district. There were 51 agric science teachers in the district.

A sample, according to Fink (2001) is a portion or subset of a larger group. It must be representative of the population with important characteristics such as age, gender and status which should be distributed proportionately in both groups. The importance of a sample lies in the accuracy with which it represents or mirrors the target population.

For this study, the sample consisted of a total of 51 JHS Agricultural Science teachers. The population was used as a sample because it was small. Nwana (1992) supports this when he says that the entire population should be studied "when the entire size of the population is small" (p. 58). However 47 teachers, constituting 96% of the respondents returned their questionnaire which was used for the study.

Research Instrument

To obtain data pertinent to the research questions, one main instrument was used. That is the questionnaire. The questionnaire had 40 items most of which were close ended. There were a few open-ended items.

Structure of Research Instrument

The research instrument was divided into two sections (Section A and Section B). these sections were further broken down into 2 and 4 parts respectively.

Section A

Part i: Background information of respondents (items 1-6)

Part ii: Teachers Knowledge and Competence (items 7-12)

Section B

Part i: Teaching -Learning interactions used for Agricultural Science (item 13)

Part ii: Facilities and Resources available for teaching Agricultural Science (item 31).

Part iii: The extent to which theory and practical topics were treated within the academic year (items 32-35)

Part iv: Methods of assessing practical and theoretical test items (36-38)

Part v: Problems of teaching Agricultural Science and suggested steps to reduce the problems (items 39-40).

Pilot Testing of Research Instrument

The questionnaire was pre-tested on Agricultural Science teachers in Foso Demonstration schools and Foso Junior High Schools. The pilot study enabled the researcher to revise the instrument to enable it become more meaningful and appropriate for the actual fieldwork which lasted for three weeks. The cronbach co-efficient alpha was used to test the internal validity and reliability of the instrument. This generated a co-efficient alpha of 0.725.

Administration of Instrument

Questionnaire for the data were hand-delivered issued by the researcher to the 51 respondents during the first term of 2006/7 academic year. They were collected through the same process in the middle of the third term. A time interval was allowed in order to give the teachers enough time to cover at least two-thirds (2/3) of the syllabus for the year, to enable them provide valid responses for sections 2, 3 and 4 of the questions. Forty seven (47; 96%) of the questionnaire were retrieved.

CHAPTER FOUR

RESULTS AND DISCUSSION

Overview

This chapter presents the results of the study. Most of the data have been analyzed into simple frequency distributions. Computed statistical values have been indicated below the appropriate tables.

Background Information of Agricultural Science Teachers

Background information collected about respondents. i.e. the agricultural science teachers in the Junior Secondary Schools in the Assin Districts include data on sex and age distribution, level of education in agriculture, and teaching experience.

The sex distribution of Agricultural Science teachers in the Assin District has been shown in Table 1.

Table 1: ***Sex Distribution of Agricultural Science Teachers***

Sex	**Frequency**	**Percentage %**
Male	40	85.1
Female	7	14.9
Total	47	100

Table 1 show that there were almost six times as many male teachers as females. There were 40 contributing 85.1% male teachers as against 7 female teachers.

Table 2 shows the age distribution of Agricultural Science teachers in the district.

Table 2: ***Age Distribution of Agricultural Science Teachers***

Age	**Frequency**	**Percentage %**
Below 20	0	0
20-23	1	2.1
24-27	13	27.7
28-31	14	29.8
32-35	9	19.1
36-39	2	4.3
40-43	4	8.5
44-47	3	6.4
48-52	1	2.1
Total	47	100%

It can be seen in Table 2 that none of the teachers was below 20 years of age. The largest age group was between 24-35 years (76.6%) There were 8.5% of the teachers above 44 years. The mean age was approximately 28 years. This indicates that must of the Agricultural Science teachers were young and they can teach the subject for a very long time.

Table 3: ***Number of pupils/students in JHS 1 and JHS 2 (Class Size)***

Number of pupils/students (class size)	Freq. JHS 1	JHS 2	Total	%
Below 15	0	1	1	1
15-20	1	1	2	2
21-25	3	5	8	8
26-30	8	8	16	16
31-35	6	8	14	14
36-40	11	9	20	20
41-45	8	6	14	14
46-50	2	3	5	5
57-55	2	2	4	4
56-60	1	1	2	2
61-70	2	1	3	3
71-75	2	1	3	3
76-80	1	1	2	2

Table 3 indicates that the average class size was between 36-40 students. There were 8 schools which had abnormal class size between 61-72 pupils. This is abnormal class because the ideal class size for effective teaching and learning in the Basic School is between 35-45 pupils. Class size above 50 will make teaching and learning very difficult, class control, marking of exercise etc will be very cumbersome for a teacher.

Table 4: ***Professional Qualification of Agricultural Science Teachers***

Professional Qualification	**Frequency**	**Percentage %**
'A' 4 year post middle	7	14.9
'A' 3 year post secondary	30	63.8
Diploma in Agriculture	8	17.0
B.Sc. Agric Education	2	4.3
Total	47	100

It can be seen from Table 4 that 63.8% of the JSS agricultural science teachers had obtained A 3 year Post Secondary training in agriculture. There were however, 17% holders of Diploma in Agricultural science. Two teachers were graduates with Bachelor of Science degree in Agriculture. There were 14.9% teachers who held 'A' 4-year Post Middle Certificate. The above information indicates that there were qualified teachers handling the subject in the district.

Teaching Experience

Teaching experience of agricultural science teachers was measured in this study as the total number of years the teacher has taught. Teaching experience ranged from one year to eleven years and above.

Table 5: ***Teaching Experience***

Years of Experience	Frequency	Percentage %
1-2	13	27.7
3-4	8	17.0
5-6	4	8.5
7-8	9	19.1
9-10	4	8.5
11 and above	9	19.1

It can be seen from Table 5 that about 52% of teachers have taught for 6 years or less. 19% of teachers have taught for more than 11 years. It was also evident that about 44.7% of the Agric teachers have taught the subject for more than two years on full time basis.

Methods of Teaching Agricultural Science

Agricultural Science teachers were asked to rank methods in descending order of effectiveness. The methods of teaching were to find out the teaching-learning interaction employed by the Agricultural Science teachers in the district

Table 6: ***Method of teaching theory in the JHS***

Method of teaching	Ranking	1st position freq.	% 1st position ranking	Mean ranking
Discussion	1st	21	44.7	1.7
Lecture	2nd	20	42.6	2.68
Demonstration	3rd	4	8.5	3.68
Discovery/Enquiries	4th	1	2.1	4.62
Project work	5th	1	2.1	5.23
Study/field trip	6th	0	0	5.49
Role play	7th	0	0	5.83
Simulation	8th	0	0	6.81
Total		47	100%	

Table 6 indicates the methods of teaching and the corresponding ranking for theory lessons in the JHS. It can be seen clearly that Discussion method was ranked 1st for teaching theory in the JHS. It was followed by lecture, demonstration in that order 44.7% of the respondent ranked. Discussion method was 1st and it mean ranking was 1.7 followed by lecture method which recorded mean ranking of 2.68. Discovery and project work were 4th and 5th respectively. Though each of them recorded only one respondent for the 1st position, their mean rankings were 4.62 and 5.13 respectively. No teacher ranked study field trip, role play and simulation on the 1st position but their mean were 5.49, 5.83 and 6.84 respectively.

Table 7: ***Method of teaching practical Agriculture lesions with JHS***

Number of pupils/students (class size)	Ranking	1st position ranking	% 1st position	Mean ranking
Demonstration	1st	23	8.9	2.00
Discussion	2nd	5	10.6	3.53
Project work	3rd	5	10.6	3.64
Discovering	4th	4	8.5	3.72
Study Field Trip	5th	1	2.1	4.55
Lecture	6th	2	4.3	5.09
Role Play	7th	2	4.3	5.64
Simulation	8th	0	0	6.74
No response	9th	5	10.6	
Total		47	100%	

Table 7 illustrates the method of teaching and its ranking for practical Agric teaching in the JHS. It can be clearly said that demonstration methods ranked the best method for teaching practical in Agricultural Science lesson. Twenty three respondents ranked it on the 1st position and its mean ranking was 2.00.

Discussion and project work followed in order of effective methods of teaching practical in agriculture. Both had 5 respondents at the 1st position but their mean rankings were 3.53 and 3.64 respectively. Simulation had no 1st

position ranking by any of the teachers. It was regarded as the worse method of teaching agric practical in the JHS. Its mean ranking was 6.74 eighteen respondents ranked it on 8th position.

Facilities and Resources available for teaching lessons in agriculture in the JHS

Facilities and resources available for teaching agricultural science lessons in the schools were also studied in this project. These included time available for teaching agriculture, availability of laboratory, test books, crop and animal enterprise, source of water, farm assistance, tools and equipment and others.

Total time for Agricultural Science in school for JHS 1and JHS 2

The time allocation for the teaching of agriculture science on the school time-table contributes to the number of topics that can be covered and the depth of treatment within the topic.

The study showed that 93.6% (44) of the schools in the district allocate 140 minutes (4 periods) per week (Appendix 1).

Normally, it is the responsibility of the agricultural science teacher to beak the time for agricultural science lessons into theory and practical periods. The table below shows a frequency distribution of ratio of “time for theory” to time for practical in the Junior High Schools in the districts.

Table 8: ***Frequency distribution of ratio of time for theory to time for practicals***

Ratio Theory: Practical	Number of Schools (Freq.)	Percentage
1.1	2	4.3
2.1	44	93.6
1.2	1	2.1
Total	47	100

Table 8 demonstrates frequency distribution of ratio of time for theory to time for practical. It can be seen from Table 8 that 93.6% of the Agricultural Science teachers devoted more time to theory than practical lessons. This gives a maximum of 105 minutes per week for theory and 35 minutes for practical lessons. Only two schools (4.3%) devoted equal proportions of time of theory to practical lesson. Only 2.1% spent more time for practical than theory.

Land Availability

Table 9 explains the land available to the school for Agricultural activities

Table 9: ***Land available in schools for agriculture***

Ratio Theory: Practical	Number of Schools (Freq.)	Percentage
Less than 1	13	27.7
1-2	16	34.0
3-4	11	23.4
5-6	4	8.3
7-8	1	2.1
9-above	2	43
Total	47	100%

Land availability to the school is an indication of how effective agricultural practical are carried on in the school. From table 9 it can be observed that the land available to many schools is very small in size. About 85.1% of the schools had land below 5 acres for agricultural activities. This places a restriction on the kind of crops which can be cultivated by the pupils in the garden.

Table 10: ***Cultivated Land***

Land Cultivated (acres)	Frequency (school)	Percentage
Less than 1	16	34
1-2	25	53.2
3-4	5	10.6
5-6	1	2.1
7 –above	0	0
Total	47	100

It was found that the main uses of the school farms were for specimen collections, demonstrations of practical activities and pupils practice in farming.

From the Tables 9 and 10 it can be seen that not all land available to the school for agriculture had been cultivated. Table 9 shows that 7 schools had land above 5 acres much of which had been cultivated.

Textbooks

Investigations indicated that all the selected JHS in the district use the same kind of textbooks and the syllabus for agricultural science lesson, all the schools use Agricultural Science for Junior High Schools published by the Curriculum Research and Development Division (CRDD) of the Ghana Education Service of Ministry of Education. Meanwhile there are few teachers who indicated certain additional agriculture books written by Akintola, Akinsami, K. Awuku and Baafour Awuah (Appendix 2).

Out of the 47 schools, 44 of the schools indicated that there were no sufficient number of the books in the schools, while 6.4% said there were enough textbooks. Thus it can be said that the JHS in the district were not well supplied with the Agricultural Science Textbooks. (Appendix 3)

Animal Enterprise

Table 11: ***Kinds of Animal***

Enterprise	Frequency	Percentage	Average Number of animal
Poultry	2	4.3	150
Piggery	1	2.1	65
Sheep/Goats	3	6.4	43
None	41	87.2	None
Total	(47)	100%	

All kinds of farm animals were investigated in the study. Table 11 indicates that only 12.8% of the schools in the district had facilities for animal rearing. Only one school (Foso Catholic JHS) was rearing pigs. About 4.2% of the schools have poultry farms and 6.4% of the schools rear sheep and goats. From table 11 average numbers of birds, pigs and sheep/goats were 150, 65 and 43 respectively.

Laboratory

There was no agricultural science laboratory in any of the schools. Only one school stated that there is a laboratory used for both General and Agricultural Science. Schools without agricultural science laboratories either discuss practical in class without any experiment or apparatus are brought into the regular classroom for experiment

Table 12: ***Crop Enterprise***

Crop enterprise	Frequency	Percentage
Vegetable farming	8	1 7.0
Food crop farming	17	36.2
Raising of seedlings	4	8.5
Cash crop farming	5	10.5
None	13	27.7
Total	47	100

Crop enterprise was popular with the JHS schools. Food crop farming dominates the crop enterprise. Table 12 indicates that 36.2% of the schools cultivate food crop like maize, cassava, plantain usually during the major farming season. Vegetable farming is second most popular crop enterprise with 17% of the schools engaged in this business. About 8.5% were raising seedlings like oil palm, cocoa and citrus for sale to nearby farmers. About 10.5% were having permanent

cash crops like cocoa, oil palm and citrus whilst 27.7% of the schools in the district did not engage in any crop business.

From the study, however, it was observed that average numbers of acreage cultivated ranges from 0.5 to 4 Cash crop farming (Tree crops) were found to be having the highest acreage of 4 whilst the seedling raising recorded the lowest acreage of 0.5

Farm Tools

Table 13: ***Quantity of Tool/ Implement***

Kind of tool or implement	None	1-5	6-10	11-above	Total
Cutlass	35	12	0	0	47
Garden Fork	29	17	2	0	47
Rake	25	20	2	0	47
Shovel	32	14	1	0	47
Shears	44	3	0	0	47
Mattock	38	9	0	0	47
Ranging poles	44	3	0	0	47
Ranging pole	43	4	0	0	47
Spraying machine	43	4	0	0	47
Buckets	28	17	2	0	47
Hoe	34	13	0	0	47
Axe	21	20	6	0	47
Hand trowel	23	20	4	0	47

Measuring Tape	33	14	0	0	47
Watering can	38	9	0	0	47
Garden line	27	20	0	0	47
Baskets	41	5	1	0	47

Table 13 shows the kinds of farm tools and their distribution in the Junior High Schools in the district. The table also shows all kinds of tools that were found to be present in the schools for agricultural activities and the quantities of each.

It can be observed from the Table 13 that differences among the schools in terms of the quantities of each tool or implement available were slight. Also, it can be observed that the number of all the tools and implements were not spread over a wide range, except in isolated cases, such as the quantities of hand trowel hand and garden fork and hoe. The most available tools were: Garden Fork, Rake, Hoe, Hand fork and Hand trowel. The average number of tool available ranges from 5 to 8.

Farm Assistance

Only one farm assistant was found in the district. He was attached to Foso Catholic JHS piggery of 65 pigs. (Appendix 4).

Other facilities

Other available facilities which were investigated and reported under this

section were structure for keeping poultry and livestock, beehives, pig-style crop nursery and tools/store room. Two animal keeping structures found in the study were poultry house and pig-style. Ten schools (21.3%) had store rooms for keeping tools, chemicals and other farm materials. Crop nurseries, identified in the study were 8.5% these produce seedlings for local use in gardens and a few for sale to nearby farmers.

Section B

This section tries to explain the extent to which theory and practical topics are treated in the syllabus for JHS 1 by the Agricultural Science teacher within the academic year. Here, the mean treatment of the various topics was computed by the sum of the product of each depth scores and its frequencies response for each topic divided by the total response. And also the mean of means of the various topics was also computed by summing all the treatment means for each topic and divided by the total number of topics. The mean depth treatment is compared to the mean ranges to determine whether the topics is not treated (0-0.5); little treated 0.5-1.5; moderately treated 1.5-2.5 or in-depth treated above 2.5.

$$\text{Mean depth treatment for each topic} = \frac{\sum \text{treatment scores} \times \text{Total response}}{\text{Total response}}$$

$$\text{Mean of mean} = \sum \frac{\text{mean for each topic}}{\text{Total number of topics}}$$

Table 14: ***Level of treatment of JHS 1 theory topics***

Topics	No T.(0) No.(%)	Little.T.(1) No. (%)	Fairly T.(2) No.(%)	V.well T.(3) No.(%)	Mean
Stages of agricultural development	6(12.8)	3(6.4)	19(40.4)	19(40.4)	2.09
Types of tool used	0(0.0)	3(6.4)	8(17.0)	8(17.0)	2.70
Maintenance of tools	3(6.4)	6(12.8)	20(42.6)	20(42.6)	2.13
Factors for choice of site for crop production	0(0.0)	7(14.9)	14(29.8)	19(40.4)	2.21
Soil preparation for crop production	7(14.9)	17(36.2)	17(36.2)	13(27.7)	1.49
Raising of seedlings	8(17.0)	19(40.4)	17(36.2)	13(27.7)	1.72
Care for transplanted seedlings	11(23.4)	19(40.4)	16(34.0)	14(29.8)	1.68
Composition of soil (soil profile)	5(10.6)	8(17.0)	18(38.3)	16(34.0)	2.02
Soil fertility (loss fertility)	7(14.9)	7(14.9)	20(42.6)	13(27.7)	1.83
Manuring and fertilizer application	4(8.5)	10(21.3)	20(42.6)	13(27.7)	1.83
Cover cropping and mulching	5(10.6)	11(23.4)	19(40.4)	12(25.5)	1.85
Crop rotation, avoiding over grazing	5(10.6)	8(17.0)	17(36.2)	17(36.2)	1.91

Erosion (definition and causes)	3(6.4)	5(10.6)	10(21.3)	29(61.7)	2.51
Erosion (prevention and control)	1(2.1)	4(8.5)	12(25.5)	30(63.8)	2.40
Economic importance of farm animals	2(4.2)	12(25.5)	11(23.4)	22(46.8)	2.02
Breeds of farm animals	10(21.3)	8(17.0)	15(31.9)	14(29.8)	1.70
Records Keeping (importance)	14(29.8)	14(29.8)	10(21.3)	9(19.1)	1.23
Types of farm records	17(36.2)	9(19.4)	9(19.1)	12(25.5)	1.17

Mean ranges: no treatment 0.50-1.40; little treated 1.50-2.40; fairly treated 2.40-3.40; well treated 3.50-4.00 mean of means =1.78

Table 14 shows the extent of theory topics in the syllabus treated in the JHS 2 by the Agricultural Science teachers. This was measured by finding the mean of the responses to each treatment. Form Table 14 it was found that type of tool uses (mean of 2.7) and erosion prevention and control i.e. mean of 2.5 wee very well treated. Except Record Keeping (its importance) which recorded mean below 1.5 i.e. unsatisfactory. The rest of the topics were fairly treated. Summarily, the mean of means of 1.78 which is the average of all the means, indicates that theory topics ere little treated.

Table 15: ***Level of Treatment JHS 2 Theory Topics***

Topic	No T.(0) No. (%)	Little T.(1) No. (%)	Fairly T.(2) No. (%)	V.well T.(3) No. (%)	Mean
Land used/land tenure	2(4.3)	6(12.6)	27(57.4)	23(48.9)	2.19
Government policies on agriculture	2(4.3)	10(12.2)	27(57.4)	8(17.0)	1.72)
Farming systems	1(2.1)	5(10.6)	9(19.1)	32(68.9)	2.49
Cropping practices	1(2.1)	4(8.5)	7(14.9)	35(74.5)	2.60
Planning a crop plot	25(53.2)	7(14.9)	6(12.8)	9(19.1)	1.15
Cultivation of food crops	5(10.6)	10(21.3)	12(25.5)	20(42.6)	1.81
Fertilizing and liming in crop production	22(46.8)	14(29.8)	8(17.0)	3(6.4)	1.04
Weed control in crop production	12(25.5)	5(10.6)	13(27.1)	17(36.2)	1.47
Control of pest in crop production	13(27.1)	10(21.3)	12(25.5)	12(25.5)	1.47
Control of diseases in crop production	14(29.8)	13(27.7)	13(27.7)	13(27.7)	1.21
Management of cattle rearing	19(40.4)	13(27.7)	13(27.7)	2(4.2)	1.06
Management of sheep/goat rearing	17(36.2)	11(23.4)	15(31.9)	4(8.5)	1.15
Management of poultry	12(28.3)	11(23.4)	16(34.0)	8(17.0)	1.36
Management of pigs rearing	19(40.4)	12(25.5)	12(25.5)	4(8.5)	1.09

Systems of keeping animals	5(10.6)	2(14.9)	9(19.1)	26(56.3)	2.29
Housing of farm animals	15(31.9)	11(23.4)	12(25.5)	15(31.9)	1.85
Elements of climate and its effects on agriculture	4(8.5)	10(21.6)	19(40.4)	14(20.6)	1.29 1.28
Types and ecological distribution of crops in Ghana	14(20.6)	13(27.7)	14(29.8)	6(12.8)	1.38
Uses of forest products and by-products	12(25.4)	16(34.0)	12(25.5)	7(14.9)	1.87
Farm machinery	4(8.5)	11(23.4)	17(36.2)	15(31.9)	1.96
Farm equipment	2(4.3)	12(25.5)	16(34.6)	17(36.2)	1.00
Reasons for fish farming	21(44.7)	10(21.6)	7(14.9)	9(19.1)	0.81
Pond fishes characteristics	27(57.4)	10(21.6)	4(8.57)	6(12.8)	0.77
Maintenance of fish pond	26(55.3)	6(12.6)	7(14.9)	6(12.6)	0.94
Preservation	22(45.8)	13(27.6)	5(10.6)	7.49	

Mean ranges: No treatment 0.50-1.50; little treated 1.60-2.50; fairly treated 2.60-3.50; well treated 3.60-4.00 Mean of means = 1.50.

On JHS 2 theory topics, it is clear from Table 14 that only Farming Systems (mean 2.49) and crops practice (mean of 2.6) were very well treated. In all the schools, apart from fish farming, management of sheep/goat, poultry, pig and cattle, planning a crop plot, types and ecological distribution of crops, uses of forest products. Elements of climate and its effect on agriculture, fertilizer and liming of crop which received unsatisfactory treatment i.e. below 1.5, the rest of the topic recorded fairly well or moderate treatment between (1.5-2.4). On the whole the theory topics in JHS 2 received moderately treated with a mean of 1.5

Table 16: ***Practical for JHS 1 Practical Topics***

Topics	No T.(0) No. (%)	Little T. (1) No. (%)	Fairly T. (2) No. (%)	V.well T.(3) No. (%)	Mean
Identification of garden tools	0(0.0)	3(6.4)	14(29.8)	30(6.8)	2.6
Maintenance of garden tools	0(0.0)	5(10.6)	19(40.4)	23(48.9)	2.36
Preparation of seed beds & seed boxes	10(21.3)	11(23.4)	15(31.9)	11(23.4)	1.62
Transplanting of seedling	10(21.3)	8(17.0)	17(36.2)	12(25.5)	1.17
Prickling and thinning out	16(34.0)	14(29.8)	9(19.1)	8(17.0)	1.17

Watering of seedlings	10(21.3)	8(17.0)	13(27.7)	16(34.0)	1.53
Determination of constituent of the soil	19(40.4)	7((14.9)	13(27.7)	8(17.0)	1.46
Identification of soil profile	6(12.8)	14(29.8)	16(34.0)	11(13.4)	1.30
Mulching of vegetable bed around crops	16(34.0)	10(21.8)	12(25.5)	9(17.0)	1.48
Fertilization application by hand	19(40.4)	12(25.5)	8(17.0)	8(17.0)	1.85
Observation of the effect of erosion	6(12.8)	14(29.8)	16(34.0)	11(23.4)	1.30
Practicing some erosion control measures	16(34.0)	8(17.0)	20(42.6)	13(27.7)	1.15
Identification of breeds of farm animals	19(40.4)	12(25.5)	8(17.0)	8(17.0)	1.85

Observation of castration, debeaking and dehorning being done	6(12.8)	8(17.0)	20(42.6)	13(27.7)	1.15
Keeping of farm records	3(6.4)	11(23.4)	21(44.7)	12(25.5)	0.70
Observation of pest and diseases on crop	13(27.7)	11(23.4)	14(29.8)	9(1.91)	0.85

Mean ranges: No treatment 0.50-1.40; little treated 1.50-2.40; fairly treated 2.50-3.40;

Well treated 3.5-4.00. Mean of means =1.31

On JHS 1 practical topics, Table 16 demonstrates that only identification of garden tools was very well treated with an average mean of 2.6. Maintenance of garden tools, preparation of seed bed and boxes, transplanting, watering of seedlings, determination of various soil constituents, mulching of vegetable bed around crops and fertilizer application by hand were fairly well treated with a mean above 1.5.

From the table, a pricking out and thinning, identification of soil profile, castration, debeaking, dehorning, keeping farm records, identification of common breeds of farm animals and observation of farm diseases were unsatisfactorily

treated (mean below 1.5). With a mean of means 1.31 it can be concluded that the practical topics were unsatisfactorily treated.

Table 17: ***Practical for JHS 2***

	No. T.(0) No. (%)	Little T.(1) No. (%)	Fairly T.(2) No. (%)	V.well T(3) No. (%)	Mean No. (%)
Land clearing	0(0.0)	8(17.0)	13(27.7)	26(55.3)	2.26
Laying out of farm plot	17(36.2)	8(17.0)	13(27.7)	26(55.3)	1.11
Preparation of mounds, ridges or garden bed	16(34.0)	12(25.5)	10(21.3)	8(17.0)	1.26
Application of fertilizer and liming	23(48.9)	10(21.3)	11(23.4)	10(21.3)	0.91
Identification and control, prevention of pest of crops	21(44.7)	13(27.7)	5(10.6)	6(12.8)	0.81
Identification, control and prevention of diseases of crops	9(19.1)	11(23.4)	15(31.9)	12(25.5)	1.62

Harvest of cereals, legumes and roots (any)	11(23.4)	8(17.0)	24(51.1)	4(8.5)	1.45
Storage of cereals, legumes and root crops (any)	15(31.9)	11(23.4)	18(38.3)	3(6.4)	1.17
Observation of the effect of pest attack on some crops	14(29.8)	11(23.4)	13(27.7)	9(19.1)	1.32
Observation of the effect of disease attack on some corps	13(27.7)	18(34.0)	12(25.5)	6(12.8)	1.17
Preparation of feed for poultry birds	27(57.4)	11(29.4)	5(10.6)	4(8.5)	0.62
Observation and identification of different breeds of birds	27(57.4)	6(12.8)	10(21.3)	4(8.5)	0.77

Construction of simple house for farm animal	34(72.3)	3(6.4)	3(6.4)	7(14.9)	0.43
Observation and identification of pests of livestock (lice, tick , mites etc)	21(44.7)	7(14.9)	16(34.0)	3(6.4)	0.87
Identification of whether forecasting instrument (as rain guage, wind vane etc)	33(70.2)	7(14.9)	4(8.5)	3(6.4)	0.47
Visit to an agro-based industry to identify raw material, product and by-product.	38(80.9)	7(14.9)	2(4.3)	0(0.0)	0.23
Observation and identification of farm machinery	13(27.7)	10(21.3)	15(31.9)	9(19.9)	1.40
Observation and identification of farm equipment	10(21.3)	16(34.0)	9(19.1)	12(25.5)	1.45

Construction of a simple water enclosure for keeping fishes	30(63.8)	9(19.1)	5(10.6)	3(6.4)	0.66
Visit to an established fish pond	29(61.7)	9(91.1)	6(12.8)	3(6.4)	0.62
Keeping records on livestock production	22(46.8)	11(23.4)	9(19.1)	5(10.6)	0.91

Mean ranges: No treatment 0.50-1.40; little treated 1.50-240; fairly treated 2.50-3.40; well treated 3.50-4.00 Mean if means 1.02

For JHS 2 practical topics, land clearing, identification, control and prevention of diseases of crops, harvesting of crops and observation and identification of farm equipment received moderate treatment (mean above 1.5). None of the topics recorded very well treated (i.e. above 2.5).

Apart from construction of simple house for farm animals and visit to an agro-based industry to identify raw materials, products and by products received no treatment at all (mean below 0.5). The rest of the practical topics were treated but unsatisfactory (i.e. below 1.5). The mean of 1.02 indicated that the practical topics in JHS 2 were unsatisfactorily treated.

Major Problems of Teaching Agricultural Science

This section consists of a summary of the various problems stated by the Agricultural Science teachers which affect the teaching of theory and practical lessons in their schools. Most problems stated were centered on unavailability or insufficient teaching and learning facilities. Thirty six teachers cited this problem. Items listed include tools, textbooks and land availability. No teacher mention lack of library and school farm as a problem 85% of the teachers cited lack of laboratory as a major problem.

Steps taken by the teachers to solve at least some of the problem(s) available include:

1. Borrowing of equipment from sister school and Unit committee.
2. Use of pamphlets written by other Agricultural Science teachers.
3. Apportion the time to suit both theory and practical lesson.
4. Appeal to the PTA, SMC and TDC, District Education Office for assistance.
5. Pupils sharing little text books available or bringing tools for practical work, e.g. cutlass, hoe etc.
6. Arranging for piece of land or using part of the school compound for practical work.

Suggestions for Improving Agricultural Science Teaching in JHS

The following are the summary of suggestions given by agricultural science teachers for the improvement of Agricultural Education in the Junior High Schools.

1. There is the need to provide fund, tools and teaching facilities for teaching Agriculture in JHS by the Ministry of Education (Ministry of Education) in sufficient quantities.
2. Teachers should be trained to use acceptable methods of teaching Agricultural Science that can make the subject interesting and acceptable.
3. Teachers should receive in-service training at the district level to upgrade their knowledge in agriculture and teaching skills.
4. There should be effective supervision and assistance from the District Education Office by qualified Agricultural Science co-coordinator.
5. Agricultural Science teachers should be appointed on the basis of a sound academic background in Agricultural Science and a professional training in the teaching of Agricultural.
6. Practical lessons should be conducted to complement theory lessons.

Table 18: ***Assessment of Practical Work***

% Mark for Practical Work	Frequency	Percentage
Zero	14	29.8
Less than 30%	15	31.9
30-40%	14	29.8
41-50	4	8.5
Total	47	100

Table 18 shows the total marks awarded to practical agricultural work. Results or the study shows that 29.8% of the school, do not award marks for practical work. In other words there is no assessment for practical work. About 32% and 30%

Less their 30% and 29.8% award between 30-40% respectively to practical work. Only 8.5% award most between 41 to 50%.

The criteria for the Agricultural Science Teachers awarding marks for practical test were varying from behavioral, attitude, creativity and many more. About 48.9% of the teachers talk about how experiment or project work is being done. Punctually to work, care and maintenance of the farm crops or animals. Other theoretical examination scores, class text, homework, attitude to work, creativity and equipment handling were used to award marks for practical work.

Method of assessing theoretical work was quite clear. Class exercises, assignment, class test, understanding and application of knowledge, examination score and class participation were used by the teachers to award theoretical marks.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter provides a summary of the main findings from which some conclusions have been drawn. It also points out some of the implications of the findings and makes suggestions as to how to assess and improve the quality and relevance of Agricultural Education in the JHS. It further highlights the problems faced in the teaching of Agriculture and the derived recommendations on how to minimize them.

Summary of Research Technique

The descriptive survey method was used for the study. The study sample includes 51 Agricultural science teachers in the Assin North District, one for each JHS. The instrument for the collection of data was questionnaire. Fifty one copies of questionnaire were given out and 47 were received, meaning that there was about 96% rate of retrieval.

The study was guided by six research questions. Data collected were analyzed and discussed using mostly frequencies and percentage distributions. The study was guided by six research questions.

Main Findings

Agricultural Science teachers' adequate knowledge and training

The results of the study showed that 85% of JHS Agricultural Science teachers were professional teachers. Out of these, two were graduates with a Bachelor of Science degree in Agriculture. Almost all the teachers experienced teachers who have taught for not less than 6 years.

Teaching learning interaction employed by the teachers

Discussion method was ranked first by the respondents in the teaching of Agricultural Science theory in the JHS. This method was followed by lecture and demonstration. In other words most teachers of Agriculture used discussion, lecture and demonstration methods in the classroom for theory lessons; study field trip, role play and simulation were least used in the classroom for theory lessons.

On the practical teaching, demonstration method was the best method for teaching practical in the JHS. This was followed by discussion and project work. Role play and simulation were least methods used for practical teaching in the JHS.

Facilities and Resources for Teaching Theory and Practical's in JHS

Total time for teaching Agricultural Science on the time table was 140 minutes (4 periods) per week and the ratio of "time for theory to "time for practical" in the JHS was 2:1 (105 minutes per week for theory to 35 minutes for practical). This shows that Agricultural Science teachers devoted more time for

theory than practical lesson. Land available to the schools was very small (below 5 acres) for agricultural activities and not all had been cultivated.

Agricultural Science teachers in the district used one main text book and syllabus published by the CRDD of Ghana Education Service (GES) of the Ministry of Education (MOE). These text books and syllabuses were not sufficient for the schools. Only few teachers used additional books.

Only few schools in the district (12.8%) had facilities for rearing animals. These were restricted to poultry, pigs, sheep and goats. Actually, crop farming was very popular with the JHS schools in the District. Food farming dominated the crop enterprise. Food crops like maize, cassava and plantain were cultivated during the major farming season.

Vegetable farming and seedling raising like oil palm, cocoa and citrus were also done by a few schools in the District. Some of the schools were having plantations of these seedlings.

Farm tools and equipment were not available in the schools. Tools and equipment available in the schools were hand fork, garden fork and hoe. The average number of tools ranged from 5 to 8 in the schools. There was no farm assistant for the schools. Only one farm assistant was found in the District who happened to be in charge of the Fosco Demonstration JHS piggery. Only one of the schools in the District had a laboratory used for both General Science and Agricultural Science. Other facilities investigated were poultry houses, beehives, pig-style, crop nursery and tools room. These facilities were restricted to only a

few schools which practiced these enterprises.

The extent to which Agricultural Science teachers taught theory and practical activities in syllabus within the Academic year

Findings from the mean of the responses to each topic in the syllabus revealed that the type of tools and its uses' and' of these erosion (definitions and causes) were very well treated in all the schools, however, prevention and control of erosion were fairly treated. Except farm records which received unsatisfactory treatment, the theory topics for JHS Agricultural science were fairly treated. With JHS theory topics in the syllabus, farming systems and cropping practices were very well treated in all the schools. Apart from fish farming which recorded unsatisfactory treatment, the rest of the topics in the syllabus were fairly treated.

On the practical topics in JHS 1 only identification of garden tools was very well treated in all the schools. Maintenance of tools, preparation of seed bed and boxes, transplanting, watering of seedling, determination of various soil constituents, mulching of vegetable beds and fertilizer application were fairly treated. The rest of the topics recorded unsatisfactory treatment.

On the JHS 2 practical topics, only land clearing was very well treated. Identification, control and prevention of diseases of crops, harvesting of crops and observation and identification of farm equipment were moderately treated.

Methods of assessing performance in practical activities

29.8% of the school did not award marks for practical work. 31.9% awards less

than 30%. Only 29.8% awarded between 30-50%. The criteria for awarding marks for practical work varied from behavioral, attitude and creativity. Most teachers talked about how experiment or project works was assessed punctuality to work, care and maintenance of farm crops or animals. Other theoretical examination scores, class tests, homework, attitude to work, creativity and equipment handling were used to award marks.

Major Problem of Teaching Agricultural Science

Most problems stated by respondents were centered on unavailability or insufficient teaching and learn facilities-like tools, text books, land availability, library, laboratory, school farm and many more. These problems were in conformity with what Mwangira (1969) and Awuku (1962) found as a major problem in implementation of school agricultural programmes.

Some of the respondent tried to reduce these challenges by borrowing equipment from sister schools and unit committees, use of pamphlet to supplement the existing text books and apportioned their time to suit both theory and practical lessons. Others appealed to the PTA, SMC, TDC, and District Education Office for assistance. Pupils shared the few available textbooks by grouping them or bringing tools from their various homes for practical lessons. They sometimes arranged for pieces of land or used part of the school compound for practical.

Conclusions

1. Almost all the Agricultural Science teachers in the district were professionally trained and experienced teachers' methods.

2. Discussion, demonstration, lecture were the best for teaching both theory and practical in the JHS

3. Agricultural Science teachers devoted more time for theory than practical lessons.

4. Land available for agricultural activities was insufficient and most school had none.

5. All the schools in the district used the same kind of text book and syllabus for Agricultural Science approved by the CRDD of the Ghana Education Services .However the textbooks were not enough for the students.

6. Animal enterprise was not popular with the schools in the District only a few schools had facilities for rearing animals.

7. Crop farming was very popular with the schools in the District-food crop farming like maize, cassava, plantain were done during the major farming season.

8. Farm tools, laboratory and farm assistants were not available in the schools in the District.

9. Within the academic year JHS theory topics in the syllabus were fairly treated.

10. Within the academic year JHS practical topics were unsatisfactorily treated.

11. Most Agricultural Science teachers in the District did not award marks for practical lessons. Those who gave marks for practical lessons awarded marks below 30%, the criteria for awarding practical marks varied from behavioral attitude and creativity.

13. The major problems of teaching agricultural Science in the District were centered on availability and insufficient teaching and learning facilities-like tools, textbooks, land availability, library, school farm and farm assistants.

Recommendations

1. Agricultural Science teachers should devote equal time for theory and practical lessons.

2. Land sited for schools should be large enough so that part can be demarcated for agricultural practical work.

3. The use of different text books written by other Agricultural Science tutors should encourage and supported to supplement the one provided by the CRDD of GES of the Ministry of Education.

4. Animal enterprise which is not popular with the schools should be encouraged by G.E.S, DEO, PTA, TDC and other benevolent organizations to help the students gain practical skills in animal rearing.

5. Simple farm tools and equipment should be provided in sufficient quantities by the GES District Assembly, PTA and other organizations to enhance practical skills in the schools.

6. Simple laboratory and store rooms should be attached to the school block.

7. Farm assistants should be employed by the G.E.S to help take care of practical activities, maintenance of farm tools and equipment in the schools.

8. Agricultural teachers should be motivated by giving them special allowance to treat practical topics in the syllabus very well within the academic year.

9. Agricultural teachers should be given in-service training how to assess practical activities. Behavioral, attitude and creativity are not enough to evaluate practical.

10. There should be effective supervision and assistance from the DEO by qualified agricultural science co-coordinators.

It is hoped that if these recommendations are well implemented, there will be a dramatic improvement in the teaching of Agricultural Science in the Junior High Schools.

Suggestions for Further Research

Since this research was only limited to Assin North District which is a forest zone the findings cannot be generalized to cover the whole of Ghana because of the different ecological zones. It is therefore suggested that a research be conducted to cover other ecological zones in Ghana. A comparative study should be conducted to assess the teaching of Agricultural Science in JHS in Ghana.

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APPENDIX

QUESTIONNAIRE FOR AGRICULTURAL SCIENCE TEACHERS

Dear Sir/Madam,

The purpose of this questionnaire is to elicit information the Art of Teaching Agricultural Science in the Junior Secondary Schools in the Assin District. You have therefore been selected to react to these items as honestly, frankly as possible. The information provided will be treated with strict confidentially. I count on your cooperation.

SECTION A

Please respond to each of the items by ticking (√) the number appropriate in your situation.

1. Name of the School: ……
2. Circuit: ……..
3. Gender: Male [ ] Female [ ]
4. Age: 20-23 years [ ] 24-27 years [ ] 28-31years [ ]
   32-35 years [ ] 36-39 years [ ] 40-43 years [ ]
   44-47 years [ ] 48-52years [ ] 50 and above [ ]

5. How many classes does your school have? JHS 1 [ ] JHS 2 [ ] JHS 3 [ ]

6. Please indicate the number of pupils in JHS 1 and JHS2

JHS1 ……. JHS 2……..

PART 2: TEACHERSS ADEQUATE KNOWLEDGE

7. Professional Qualification knowledge:

4 Year Post Middle [ ] 2 Year Post Secondary [ ]

3 Year Post Secondary [ ] Specialist in Agricultural Science [ ]

Diploma in Agricultural Science [ ] B. Sc Agricultural Education [ ]

8. Education Qualification: SSCE/O' Level [ ] Diploma [ ]

A' Level [ ] First Degree [ ] Second Degree [ ]

9. Teaching Experience: 1-2years [ ] 3-4 years [ ]5-6 years [ ]

7-8years [ ] 9-10years [ ] Above 11 years [ ]

10. For how long have you been teaching agricultural Science in this school?

Less than one term [ ] 1-3 terms [ ]

4-6 terms [ ] above 2 years [ ]

11. Do you teach Agricultural Science in the school as?

Full time [ ] Part-time [ ]

SECTION B

PART 1: TEACHING/LEARNING INTERACTIONS

Below is a list of 8 suggested methods for teaching agricultural science theory and practical lessons in the JHS. Carefully read through the methods and Rank them 1 as the most effective and 8 as the least effective according to your own teaching methods in Agricultural Science.

NB: Rank the methods of teaching Agriculture in the table below with one (1) as the most effective method and (8) as the least effective.

12.

Method of Teaching Agricultural	Theory	Practical
Lecture/Expository		
Discussion		
Demonstration		
Project		
Study field trip		
Discovery/Enquiry/Activity		
Role play		
Simulation		

PART 2: FACILITIES AND RESOURCES AVAILABLE FOR TEACHING AGRICULTURE

13. Please indicate the time (in minutes) allocated for Agricultural Science in your school each class on the table below.

Class	Total Time for Agriculture	Total time theory	Total time for practical work
JHS 1			
JHS 2			
JHS 3			

14. Complete the following table about land available (in acres) to the school for Agricultural activities.

Total size of land	Size of land cultivated

15. What source(s) of water do you have for farming purposes on your school farm?

Tick as many as apply

Rainfall [ ] Stream/River/Lake [ ]

Dugout pond/wall [ ] pipe-borne water [ ]

16. If you use any source of water apart from rainfall, how would you describe the distance from the school farm to the water source?

Very near [ ] near [ ] far [ ] very far [ ]

17. which of the following condition (s) is true of your school?

i. There is no laboratory in the school [ ]

ii. There is only one laboratory used for both general and Agric Science [ ]

iii. There is separate lab for Agric. Science and General Science [ ]

18. If the school has no laboratories, then in which of the following ways are laboratory experiments carried out?

a) They are discussed in class without doing any experiment [ ]

b) The apparatus are brought into the regular classroom for experiment to be carried out there [ ]

c) The laboratory of neighboring school is used [ ]

19. Which books have you been using as text book (s) for your agricultural Science lessons?

Give details on the table below.

	Title of Book	Author
1		
2		
3		
4		

20. Are there enough textbooks for all pupils? Adequate enough [ ]

Enough [ ] Fairly enough [ ] nor enough [ ]

21. What animal enterprise(s) have you engaged your pupils in?

Rearing of cattle [ ] Rearing of sheep/goats [ ] Poultry [ ]

Rabbitery /grasscuttery [ ] Bee-keeping [ ] none [ ]

22. Please provide the following details about livestock available to the school for agriculture science.

	Types of Livestock	Number available
1		
2		

3		
4		

23. What crop enterprise (s) has you engage your pupils in?

Vegetable farming [ ] Rearing of Seedlings [ ]

Food-crop farming [ ] Cash crop farming [ ] none [ ]

24. Please provide the following details about crop(s) available to the school for agriculture science.

	Type of crop(s)	Number available or in hectares
1		
2		
3		

25. Indicate by ticking (√) in the space provided against each of the facilities in the table below which is available in your school.

Vegetable farm [ ] Goat/sheep pens [ ]

Crop nursery [ ] Rabbit/guinea pig/hatches [ ]

26. If your school has none of the items listed in Questions 22 to 27, do you find it possible to undertake practical lesson with your pupils? Yes or No (tick)

27. If your answer to question 27 is ‘yes’ where do you carry out your practical lesson……

……

……

28. The following table presents a list of arm tools and equipment, recommended in the JHS agricultural science syllabus, for practical activities in Agriculture Science. State in each item the number that is available in your school.

Equipments	Qty	Equipments	Qty
Cutlass		Hoe	
Garden fork		Axe	
Rake		Hand fork	
Spade/shovel		Hand trowel	
Shears		Measuring tape	
Mattock		Watering can	
Ranging poles		Garden line	
Spraying machine		Basket	
Buckets		Basket	
Buckets			

29. How many farm assistances do you have in the school?

None [ ] one [ ] two [ ] three [ ]

above four[ ]

30. What specific duties are performed by the farm assistance(s) if the school has any…….

……

……

SECTION C

PART 3: THEORY TOPICS AND PRACTICAL ACTIVITIES

Below is a list of some agricultural science topics suggested in the syllabus for agricultural science for JHS (2000) to be treated in the JHS 1 and 2 classes. Tick (√) against each topic in the space provided under 0, 1, 2, 3, to indicate weather in the 2001/2002 academic year, you did not treat that topic with your pupils, treated but not satisfactorily, fairly well treated or very well treated respectively, in the classroom as theory lesson.

The topics have been grouped under JHS 1 and JHS 2 separately.

0 Not treated at all (no treatment)

1 Treated but unsatisfactory (little treatment)

2 Fairly well treated (moderate treatment)

3. Very well treated (in-depth treatment)

4. JHS 1 Theory Topics

a. Stages of Agricultural development form gathering to common farming 0 1 2 3

b. Types of tools and uses

c. Maintenance of tools

d. Factors for choice of site for crop production

e. Soil preparation for crop production

f. Raising of seedlings

g. Care for transplanted seedlings

h. Composition of soil (soil type, profile)

i. Soil fertility (loss fertility) Maintenance and Conservation of soil fertility

j. Manuring and fertilizer application 0 1 2 3

k. Cover cropping and mulching

l. Crop rotation, avoiding over grazing

m. Erosion (definition and causes)

n. Erosion (prevention and control)

o. Economic importance of farm animals

p. Breeds of farm animals

q. Record keeping (importance)

r. Types of farm records

32. JHS 2 Theory Topics

a. Land uses/land tenure 0 1 2 3

b. Government policies on Agriculture

c. Farming systems (shifting cultivation, land rotation,

d. mixed farming etc)

e. Cropping practices (crop rotation, mono cropping,

f. mixed cropping)

g. Planning a crop plot

h. Cultivation of food crops, maize legume, root crop (any

i. Fertilizing and liming in crop production

j. Weed control of diseases in crop production

k. Management of cattle rearing

l. Management of sheep/goat rearing

m. Housing of farm animals

n. Elements of climate and its effects on Agriculture

o. types and ecological distribution of crops in Ghana 0 1 2 3

p. Uses of forest products and by-products

q. Farm machinery

r. Farm equipment

s. Reasons for fish farming

t. Pond fishes characteristics (tilapia, mudfish)

u. Maintenance of fish ponds

v. Preservation of fishes

33. Practical for JHS 1

a. Identification of garden tools

b. Maintenance of garden tools

c. Preparation of seed beds and seed boxes

d. Transplanting of seedlings

e. Picking-out and thinning out

f. Watering of seedlings

g. Determination of various constituents of the soil

h. Identification of soil profile

i. Mulching of vegetable bed and around crops

j. Fertilization application by land

k. Observation of the effect of erosion

l. Practicing some erosion control measures

m. Identification of common breeds of farm animals

n. Observation of castration, debeaking and dehorning being done

o. Keeping of farm records

p. Observation of pest on crop

q. Observation of disease on crops

Practical for JHS 2

a. Land clearing 0 1 2 3

b. Laying our of farm plot

c. Preparation of mounds, ridges or garden bed

d. Application of fertilizer and liming

e. Identification and control, prevention of pest of crops

f. Identification, control and prevention of diseases of crops

g. Harvesting of cereals, legumes and root crops (any)

h. Storage of cereals, legumes and root crops (any)

i. Observation of the effect of pest attack on some crops

j. Observation of the effects of disease attack on some crops.

k. Preparation of feed for poultry birds

l. Observation and identification of different breeds of poultry birds.

m. Construction of simple house for farm animals

n. Observation and identification of pest of livestock (lice, tick, mites, etc)

o. Identification of whether forecasting instruments (as rain gauge, wind

vane, etc)

p. Visit to an agro-based industry to identify raw material, product and by-product

q. Observation and identification of farm machinery

r. Observation and identification of farm equipment

s. Construction of a simple water enclosure for keeping fishes

t. Visit to an established fish pond

u. Keeping records on livestock production

PART 4: METHOD OF ASSESSING PRACTICAL LESSON

35. What percentage of the total mark for agricultural science do you allocate to practical work? Zero [ ] less than 30 [ ] 30-40% [ ]

41-50% [ ] Over 50% [ ]

36. Briefly describe your criteria for awarding marks for practical work.

……

……

……

37. Briefly describe your method of assessing theoretical work

……

……

PART 5: PROBLEMS OF TEACHING AGRICULTURE

38. Briefly state the major problems you faced during the 2002/2003academic year in connection with the teaching of agriculture in the school.

……

……

……

39. What steps did you take to solve at least some of the problems you have stated in item 38?

……

……

……

40. What suggestions would you make for the improvement of the relationship between theory and practical work in the JHS Agriculture?

……

……

……

APPENDIX 1

TIME (PERIOD) FOR AGRIC LESSONS

Time (Minutes)	Frequency	%
70	2	43
90	2	43
105	35	74.2
130	1	2.1
140	3	6.4
180	2	4.2
	47	100

APPENDIX 2

TEXTBOOKS

Textbooks (Author)	Frequencies	%
CRDD	41	87.2
Abbey	2	4.3
Akinsani	3	6.4

Others (authors)	1	2.1
	47	100

APPENDIX 3

QUANTITIES OF TEXTBOOKS

Quantity of Textbooks	Frequencies	%
Adequate enough	1	2.1
Fairly enough	2	4.3
Not enough	44	93.6
	47	100

APPENDIX 4

FARM ASSISTANCE

Farm Assistance	Frequency	%
None	46	97.9
One (1)	1	2.1
	47	100