CHAPTER ONE

GENERAL INTRODUCTION

The study from which this thesis emerged, can be conceptualised as 'an experience in the use of "Participative Learning"^2 as a means of improving agricultural production in the Hohoe district in Ghana'. In the thesis I explore the philosophical and methodological frameworks of participative learning in the context of agriculture and rural development. I present a case study of the small holder farming system from the Hohoe District in Ghana, in which farmers, staff of the Ministry of Food and Agriculture (MOFA) and of some non-governmental organisations (NGOs) were engaged in learning and taking action to improve their own situations.

Like in most developing economies, the main approach being adopted to develop agriculture in Ghana has been based on the 'researcher-knowledge-focused' transfer of technology model (TOT). TOT tasks researchers to develop technologies that are validated by 'objective scientific facts' and 'rational economic indicators' for transfer to farmers for adoption (Rhoades and Booth, 1982; Roger, 1983; Isaacson, 1987; Biggs, 1985; Donkor, 1989). In its application in Ghana, researchers located in the Council for Scientific and Industrial Research (CSIR) of the Ministry of Science and Technology (MIST) have the political mandate for technology development, while the subject matter departments (Crop Services, Animal Production, Fisheries and Engineering) of the Ministry of Food and Agriculture of Food and Agriculture (MOFA) are mandated to adapt this technology to farmers' needs in collaboration with the Department of Agricultural Extension Services (DAES) of MOFA that also has the responsibility of transferring these technologies to farmers (MOFA, PPMED, 1992). These efforts are presently being supported financially by the World Bank under two projects: the National Agricultural Research Project (NARP) based on the concept of Farming Systems Research and Development (FSR&D) and the National Agricultural Extension Project (NAEP) based on the Training and Visit (T&V)

^2 Participative Learning as used in this thesis, means a learning process involving action research, experiential learning and critical learning systems perspectives and practices.
concept of extension. However, low adoption rates of these technologies by farmers remain a major concern to these development agencies (Frempong-Asante, 1994).

Rhoades and Booth (1982) and Horton (1991) have attributed the low adoption rate of researcher-recommended technologies among small scale farmers to the ‘phenomenon of alienation’ associated with the implementation of TOT: farmers are alienated from the technology development process. Reason (1994) examined the subject of ‘inquiry and alienation’ in positivism and observed that the worldview based on the metaphor of ‘linear progress, absolute truth and rational planning’ is no longer a guide to wise action in an era of complex ecological, political and social crisis. Pretty (1995) has also argued that no scientific method can either ever ask all the relevant questions or find all the answers to the problems of sustainable food production. He observed that problems and interventions are subject to various interpretations by different people. This implies that the application of researcher-developed technologies cannot be the only way of (a) knowing farmers’ realities; and (b) solving farmers’ problems.

A number of contemporary agricultural scientists and rural development workers including Rhoades and Booth (1982), Whyte, Greenwood, and Lazes (1991), Maclure and Bassey (1991), Horton (1991) and Chambers (1993) have attributed the inability of researcher-manufactured technologies to solve farmers’ problems to the poverty of the underlying assumptions of TOT:

- that data generated through scientific experiments are infallible,
- that technologies developed from such data are always superior to farmer’s practices and
- that the only reason why farmers fail to adopt these technologies is their ‘conservatism.’

Horton (1991) has argued that the dominance of the idea that the farmer’s practices are unproductive and needed to be changed has overwhelmed the whole agricultural development process in developing economies, to the extent that scientists refuse to acknowledge the fact that farmers too might have some useful information and ideas that might be used in resolving agricultural development issues. Rhoades and Booth (1982), working with potato farmers in Peru, found out that most technologies
developed for farmers by researchers were unsuitable for the context of application. They observed that smallholder farmers are learners and innovators in their own right and should be involved actively in the search for further knowledge to improve their practices. Pretty (1995) has argued that involving farmers in learning to take action to improve their own practices is not only a better way to help them to adopt good practices, but also a necessary condition for increasing food and agricultural production on a sustainable basis.

The inadequacies of the positivist research and development paradigm in helping explain social realities and the improvement of 'human activity systems' has led to the emergence of 'process-oriented' approaches based on constructivist and critical paradigms in the field of agriculture and rural development (Korten, 1984; Kemmis and McTaggart, 1988; Bawden and Macadam, 1989; Bawden and Zuber-Skerrit, 1991). These approaches recognise all realities as 'social constructs' which can be improved through reflection and interpretation of experiences by stakeholders (Vickers, 1979; Kolb, 1984; Jackson, 1993). Involving stakeholders in learning to take informed action, has the potential of improving both the practice and the situation in which the practice is carried out (Bawden, 1989). Further encouraging stakeholders\(^3\) to critically reflect on their own constructs of reality also helps them to confront, challenge and become liberated from contextual issues of culture, power and historical precedence that predispose them to particular worldviews, knowledge or actions (Kuhn, 1970; Friere, 1972; Flood and Jackson, 1991). It has also been credited with the ability to empower practitioners, as well as increasing their self esteem and helping them become responsible for their own development (Kemmis and McTaggart, 1988; Reinhart, 1992; Messerschmidt, 1995; Chambers, 1997). Korten (1981) has argued that the key to successful development in developing economies, lies in learning with stakeholders, building new knowledge from the experiences of stakeholders and building institutional capacity through action. These observations underpin the need for agriculture and rural development agencies to learn with farmers and rural dwellers in order to develop common understanding of problems and what ought to be done in the name of improvement (Bawden, Ison, Macadam, Packard and Valentine, 1990).

\(^3\)Stakeholders include staff of all agricultural development institutions (CSIR, MOFA, banks, and NGOs), farmer's organisations, farmers and traders.
This present study was motivated by (a) the apparent limitations of TOT in the face of what is seen as the complex issues involved in food and agricultural production by smallholder farmers (Maclure and Bassey, 1991; Chambers, 1993); and (b) and the potential of 'participatory approaches' in helping stakeholders to take informed actions to improve their own situation (Maclure and Bassey, 1991; Russell and Ison, 1991; Turnbull, 1993). In this approach, rather than treating farmers as passive recipients of knowledge, they are engaged in the exploration of knowledge and action in their own context as the basis for future knowledge and actions (Macadam and Bawden, 1989). The key attributes for the success of such an approach as applied in learning with farmers and rural dwellers in developing countries as outlined by Horton (1991), Maclure and Bassey (1991), Fisher (1993), Turnbull (1993), and Mattock and Steele (1994) are shared (a) ownership by stakeholders; (b) improvement in knowledge through critical analysis of experiences; and (c) stimulation of relevant actions for improvement.

The critical self reflection associated with these approaches also impels stakeholders to learn not only about what they are engaged in but also about the learning process itself, as well as about the beliefs they hold concerning their relationships with their environment. Research and development efforts are therefore construed as the creation of self-referential inquiry systems 'which are continually learning to persist, where learning will perforse include learning about the process of learning itself, as well as the impact of learning on the nature of relationship between the learner and that which is being learnt.' (Bawden, 1997a:2).

This study was therefore undertaken to explore the questions of whether it was feasible to apply participative learning in the context of the smallholder farmers in Ghana and whether it could help stakeholders to improve food and other agriculture production situation in the study area. Answers to these questions, which were sought from engaging both farmers and agriculturists in participative inquiry and actions in the study area, form the basis of the thesis of this dissertation; that 'participative learning' is an appropriate and legitimate means of facilitating improvement in farming and agricultural development work in the Hohoe District of Ghana.
1.1 Structure of the Thesis

The field research work was conducted over 14 months in four separate but interrelated phases with farmers and agricultural development workers in the Hohoe district of Ghana. These included: (a) an exploratory survey in six villages; (b) village level learning or action research projects with farmers and village level extension workers in two villages; (c) a district workshop attended by farmers, MOFA staff (district and regional level) members of some NGOs; and (d) an evaluation phase in which participants reflected on their learning experiences. The dissertation also presents a literature review on the philosophical basis of the study as well as the methodological and theoretical traditions that informed the research. The literature review illustrates some circumstances in which action research and/or participative learning approaches have been used in agriculture and rural development. While the literature has strongly emphasised the potential of action research to improve human activity systems, there are only a few reported cases of the use of participatory approaches in agricultural development work in West Africa (Maclure and Bassey, 1991) and examples of its use in Ghana are very rare. This provides a justification for testing this approach in intervening in agricultural production and development in Ghana.

In Chapter 1 of this thesis, I give a general overview of the study. I briefly discuss why the study was relevant and describe the general outlay of the thesis.

In Chapter 2, I talk about the general background to the study and discuss the objectives of the study. I give reasons for the choice of methodology and describe the research questions. The research area is also described in this section to justify why it area was chosen for the study.

Chapter 3 represents my exploration of the philosophical basis of the study as well as the methodological and other related theoretical frameworks that informed the study. The debate on positivism and constructivism is briefly reviewed to show its relevance to action research and the need for stakeholders' participation in the study. The characteristics of action research that made it suitable for the study are outlined along
with examples of the application of action research in agriculture and rural development. I also discuss the criteria and the various strategies adopted to ensure the trustworthiness of interpretive research.

In Chapter 4, I provide a discussion of the process and outcomes of an exploratory survey done in six villages in Hohoe district. I discuss the details of the techniques of semi-structured interviewing and key informant interviews used for data collection. The outcomes of the survey (farmers' production practices, ecology, socio-economic context of the farmers and problems) are also presented in this chapter.

Chapter 5 embodies the story of how action research was used as a methodological framework to facilitate learning and action by farmers and development workers in two villages, Liat Soba and Fodomoe Ahor, both in the Hohoe district. I trace how the research problem was introduced to the communities, how the learning was undertaken what the research-participants obtained from the learning engagements.

In Chapter 6, I reflect on the district workshop organised as part of this study. The results of the village level engagements motivated me to find ways of introducing a larger audience, especially agricultural development agencies, to the logic and concept of participative learning as an approach to agricultural development. The workshop participants learnt about the concept, logic and practice of participative learning. It also helped stakeholders to critique the TOT model as implemented in the study area and suggested new strategies for improving farming and agricultural development work in the study area.

An evaluation of the research process and outcomes was carried out in concert with participants between April and June 1996 (about a year after the inception of the study). In Chapter 7, I report on the process and outcomes of that participative evaluation exercise. I discuss the learning experiences of participants and how these lessons could be used to further improve farming and participative learning in the study area. This is consistent with Abraham's (1994:4) concept of sustaining the action research process through repetition of the process in an ascending spiral of continuous improvement. I also draw on the literature to provide a case for the
rigour and validity (trustworthiness) of the study. I argue that the study was a social
inquiry and was also eclectic in nature, drawing from a wide range of research
methods, and cannot conform to established 'positivists' criteria for validity. I concur
with constructivist researchers that the trustworthiness of the study is ensured by the
research process and the usefulness of the outcomes to participants.

In Chapter 8, I present a general discussion of the process and results of the study
with particular emphasis on the literature on action research and other participatory
approaches to development. I show how the thesis developed through the research,
that 'participative learning is an appropriate way to intervene in, and improve,
farming and other agricultural development work in the study area', is supported by
research results and the literature. I also draw attention to possible challenges that
need to be confronted in operationalising participative learning as an approach to
agricultural development work in Ghana. In Chapter 9, I present a summary of the
study, the conclusions drawn from it and its implications for farming and agricultural
development work in Ghana.
CHAPTER TWO

BACKGROUND TO THE STUDY

2.1 Introduction

Agriculture and rural development have witnessed changes over the years in many developing countries. In the field of agriculture, the guiding theme has been to produce enough food to feed the burgeoning population (Rhoades, 1984; Kanwar, Virmani and Das, 1992; Pretty, 1995). In the bid to achieve food sufficiency, governments in most developing countries have become key players in trying to transform existing traditional agricultural systems into modern ones (Antholt, 1994; Maganya, 1994). This has been done mainly through the development of improved technologies which farmers have adopted to increase the yield of farm produce (Donkor, 1989; Carr, 1989; Maganya, 1994). According to Pretty (1995) these technologies include:

- high yielding varieties of crops and breeds of farm animals
- application of external inputs (fertilisers and other agro-chemicals)
- marketing and credit policies to integrate farmers into the market economy.

The technological approach, or 'technocentrism' in agricultural development, has been successful in helping farmers to increase the yield of wheat and rice through the Green Revolution of the 1960s and 1970s in some parts of the world including Latin America and Asia (Borlaug, 1995). However, these successes have been achieved on irrigated fields and by resource-rich farmers who can better simulate research station conditions (Busch, 1996). There has been no perceptible increase in grain yields in drier and more marginal lands or areas under rain-fed conditions (Kanwar et al, 1992). Similarly, the use of technology generated by scientists in sub-Saharan Africa, where the overall farming system is complex and risk-prone, has not been successful (Carr, 1989; Marfo, Ntow, Ohemeng- Dapaa and Osei, 1994; Frempong-Asante, 1995).
There is increasing recognition among agricultural development practitioners that the technologies developed based on scientific study alone may not be accepted and applied by most farmers. The complex and dynamic context in which smallholder farmers live and work mean that what they should do to improve their production, needs to be continuously defined and updated to conform to the changing times and environment (MacLure and Bassey, 1991; Horton, 1991; Chambers, 1997).

Pretty (1995:27) has noted that the TOT approach to agricultural development is grounded in, and driven by, the ‘enlightenment tradition of positivism’. In this philosophical context, researchers identify the problems of the farmers (with or without consultations with farmers) and set out to design technologies that farmers should adopt to solve the identified problems. Further, once the technology is developed and transferred, the development task is deemed to have been completed. The researchers do not typically follow up to reassess their technologies in the context of the farmer. They rather adopt the ‘design and defend’ attitude to their innovations. Because these technologies were validated on research stations with ‘hard scientific facts’, it is assumed that nobody can call the superiority of these practices into question. Modifications or rejection of these recommendations by farmers are not taken to be in any way related to the ‘contextual inappropriateness’ of these technologies. They are explained away as ‘farmer-conservatism’ (Hyden, 1986; Russell, 1991).

2.2 Limitations of Technocentrism

Technologies can be conceptualised as novel standards set by researchers based on scientific designs. In Ghana, like other developing countries, they have become standards that farmers must meet or against which farmer’s performances are measured. This is consistent with the modernisation theory of development in which all efforts are being made at changing ‘primitive peasant economies’ into modern ones via the adoption of ‘researcher-recommended’ technologies (Antholt, 1994). The assumption is that the technologies speak for themselves and can be accepted and adopted on an ‘as is’ basis irrespective of the context of application (Anderson 1987).
However, agricultural development agencies in most developing countries have found it difficult to persuade farmers to adopt these technologies while ‘farmer conservatism’ has outlived its usefulness in explaining the low adoption rate of technologies. It has been recognised that farmers do adopt technologies that are either of interest to them or of relevance to their situations (Rhoades, 1984; Maclure and Bassey, 1991; Horton, 1991; Russell and Ison, 1991). On the other hand, farmers do not adopt technologies that (a) do not fit their needs; (b) make extra demands on scarce resources; and (c) are conceived as being too risky (Chambers, 1993; Pretty, 1995). These observations call into question the contextual relevance of the technologies being transferred to farmers. Unfortunately, research and extension rarely question the relevance of their technologies outside the research stations. Pretty (1995) argues that one cannot cut off technology from the culture and traditions of the people who are to adopt them. Busch (1996) also asserted that a change in technology also implies a social change. The implication is that farm practices cannot be conceived or developed independent of the farmers whose practices are being targeted for improvement.

In the 1970s, many agricultural development practitioners began to recognise the limitations of alienating the farmer’s context from the technology development process (Biggs, 1985; Issacson, 1987). They therefore called into action a system approach to technology development that takes into account the socio-economic context of the farmer. This approach was labelled Farming Systems Research and Development or FSR&D (Merrill-Sands, 1986). In this approach, farmers act as collaborators in the diagnosis of problems (Biggs 1985). The researchers still assume their traditional role of designing and testing technologies to fit the socio-economic conditions of the various groups of farmers: the notion of recommendation domain in FSR&D (Simmonds, 1985; Kanwar et al, 1992).

FSR&D programs are still (a) researcher-centred and limited by the apparent difficulties of establishing a collegiate relationship between farmers and agriculturists (Biggs, 1985; Merrill-Sands, 1986; Remenyi, 1985); and (b) technocentric because it still deals with technology-driven problems and ignores the non-technological problems associated with the farmer’s environment (Bawden, 1990; Sriskandarajah,
Fisher and Packam, 1996). They are output-focused and fail to adequately deal with contextual issues and values that are of interest or of concern to farmers (Forbes, 1985). Consequently, an FSR&D approach often fails to help farmers make the necessary social and economic transformations necessary for the adoption of the prescribed technologies (Carr, 1989).

2.3 A New Paradigm for Research and Development

The frequently reported failure of the TOT model to stimulate agricultural production in developing economies has led to changes in worldviews and approaches to research and development in rural economies (Rhoades, 1984; Collinson, 1988; Whyte, 1991; Chambers 1993; Fisher, 1993). Contemporary literature on agriculture and rural development identifies effective involvement of both the context and rural people in the development process as a necessary ingredient for improvement (Korten, 1980; Chambers, 1993; Pretty and Chambers, 1993; Schoones and Thompson, 1994). This change in worldview and methodology has emerged from the field of social sciences and has been variously labelled as a new paradigm for research and development action research (Lewin, 1951), new paradigm for research and development (Rowan and Reason, 1981), a paradigm for co-operate inquiry (Heron, 1989), and participative worldview (Reason, 1994). This concepts and paradigms have been applied in (a) the field of adult education as action research (Kemmis and McTaggart, 1988); (b) agriculture as participatory action research (Whyte et al, 1991; Maclure and Bassey, 1991); and in rural development as the learning process approach to development (Korten, 1981). All these initiatives have in common the need to engage stakeholders in learning to take informed actions to improve their own 'social system'.

Methodologically, the emphasis is on establishment of social discourse among stakeholders to review multiple realities through group learning to generate contextually valid knowledge that can inform their own development practices (Rowan and Reason, 1981; Pretty, 1993; Turnbull, 1993). In agricultural development, the focus has shifted from looking for the best technology to that of
improving the cognitive processes that could lead to better understanding of problems and opportunities for interventions.

The goal of these people-centred approaches, is to facilitate the active involvement of stakeholders in the mutual discovery and planning that could be done to improve the situation (Korten, 1980; Whyte, 1991; Fisher, 1993). The active participation of stakeholders in the learning process provides the opportunity for greater understanding of social realities, and motivation for stakeholders to undertake interventions that could improve their own lives (Whyte, 1991; Ison, 1994). The focus is therefore on maintaining a flux between learning and action (Gilmour and Fisher, 1991).

These approaches do not neglect the adoption of good farm practices, but the emphasis is shifted from the development of the 'perfect technology', to learning with the people to build knowledge and institutional capacity through reflection on knowledge and action (Korten, 1980). It emphasises improving human potential and capabilities as a way of empowering communities to improve their own lives (Kemmis and McTaggart, 1988). In the case of action research and critical learning systems, critical thinking is introduced into the learning process to encourage stakeholders to question the contextual validity of generated knowledge. Critical thinking also empowers stakeholders to question and to re-construe their own beliefs about the process of knowing and acting as well as the politics and history of the context, to enable them to 'see things differently' (Friere, 1972; Flood and Jackson, 1991). The assumption is that if people begin to see things differently, they begin to construct their realities differently and begin to do things differently (Maturana, 1988; Jones, 1991; Senge, 1992).

In this thesis I describe participative learning done in the context of the smallholder farming sector of Ghana in which the major stakeholders (farmers and staff of MOFA) were engaged in their own development. This does not argue against positivism or conventional research but emphasises its limitations. I also posit that participative learning is an approach that is appropriate and useful in assisting
stakeholders to generate contextually relevant knowledge that can be applied to improve farming and other agricultural development work in Ghana.

2.4 The Problem Situation

Agricultural production is the mainstay of Ghana’s economy. However, the problem of low agricultural production has dogged the country since independence (Donkor, 1989; World Bank, 1992). Before independence, the British colonialists concentrated their agricultural development efforts on the growing and export of cocoa and coffee. The other agricultural commodities grown for consumption were ignored. In the process, only farmers who were growing cocoa and coffee for cash were reached by this development effort (Hill, 1970). This export-commodity approach was however de-emphasised just after independence in 1957, in favour of food crop development (Frempong-Asante, 1995). This move was made by the government to ensure increased food production to better meet the needs of the population.

The agricultural development approach taken by post independent Ghana was designed to modernise traditional farming cultures of the Ghanaian farmer (Hill, 1986; Donkor, 1989). The dominant idea was to increase agriculture productivity through the development and application of scientific knowledge. The government’s policy of modernising ‘peasant’ agriculture was implemented as the United States Agency for International Development (USAID) supported a ‘progressive-farmer program’ that was labelled the ‘Focus and Concentrate program’ (1960-1964). In this program, finance and technical advice was made available to a few progressive farmers who were then expected to act as models for other farmers to emulate (Donkor, 1989). Philosophically, this approach could be defended by the expected trickle-down effect on the majority of the small holder farmers (Rogers, 1983). The less progressive farmers or non-participating farmers were expected to learn from the progressive farmers (Maganya, 1994). Similarly, projects like the UNDP Fertiliser Use Project of 1970-1980, the Upper and Volta regional agricultural development projects (1975-1990), CIDA supported Ghana Grains Board Grains and Legumes Project (1981-1995), the GTZ Ghana-German Agricultural Development Project (ongoing) and the World Bank assisted national Agricultural Rehabilitation Project
(1987-1992) were all used for the purpose of developing and transferring technologies to small holder farmers (MOFA, 1992).

Present efforts at agricultural development include FSR&D and the Training and Visit (T&V) system of extension. (See Appendix 3 for details of Ghana's agriculture research and extension arrangements) FSR&D programs were initiated in Ghana by the Crop Research Institute (CRI) in collaboration with the International Agricultural Research Centres (IARCs) such as IITA (Nigeria), CYMMIT (Mexico) and ICRISAT (India). The focus of these efforts is on involving smallholder farmers in the generation of appropriate technology. This has been done by encouraging farmer-participation in the diagnosis of field problems, and the establishment of on-farm trials to help generate new technologies and to refine existing technologies to meet the needs of farmers (CRI, 1990). The responsibility of the research process and the outcome of the research is, however, still vested in researchers.

The Training and Visit System of extension, is presently being sponsored by the World Bank under the National Agricultural Extension Project. The T&V has a culture of a retinue of Front Line Staff (FLS) training sessions, research-extension review meetings and pre-scheduled farm visits by staff to transfer 'useful messages' and demonstrations to farmers (Benor and Harrison, 1977). These arrangements are put in place to improve interaction between research and extension on the one hand and extension and farmers on the other. The T&V system of extension, as being practised in Ghana, is therefore aimed at improving the flow of improved technology from the researchers to the farmers.

Government efforts at agricultural development are also being supplemented by Non-Governmental Organisations such as Sassakawa Global 2000 (SG 2000) and the World Vision International (WVI). SG 2000 project was started in Ghana in 1986 to support government efforts at technology delivery and to improve the farmers' ability to adopt such technology. The project financed technology generation and transfer but its main focus was on the provision of inputs and credits to farmers (SG 2000, 1991). The results of this project have shown that, given the necessary farm inputs, farmers are responsive to technical advice from extension (MOFA, 1996). WVI on
the other hand is involved in agriculture and rural development. In addition to the provision of infrastructure (schools and health posts) to needy communities, WVI is also involved in the training farming communities in agriculture and supplying farm inputs to selected groups of farmers (Kumahlor, 1995).

A survey carried out by Marfo et al (1994) to ascertain the effectiveness of the technology delivery system in Ghana shows that the researchers and the extension workers were able to develop and transfer technologies to farmers. However, farmer-adoptions of the technologies were found to be low. Similar observation was made by Carr (1989) where studied the adoption of researcher recommended technologies in nine countries in sub-Saharan Africa. Although farmers often fail to adopt these technologies, researchers and extensionists continue to develop and transfer them to farmers. The seemingly ineffectiveness of the technocentric approach to help improve agriculture production calls for the rethinking of agricultural development strategies in Ghana. It is necessary to move beyond the ‘technology salesmanship’ and product approach to agriculture development.

2.5 Objectives and Justification for the study

It can be inferred from the above discussion that the dominant development model, the transfer of technology approach, has not been responsive to the needs of smallholder farmers in Ghana. The agricultural development agencies are unable, in spite of expenditure of resources, to help the farmers improve upon their practices and production levels. As indicated in Appendix 2, the inadequacies of present approaches to agricultural development is reflected in (a) the general deterioration in food production (Tables 26 and 28); (b) reduction in the contribution of agriculture to the GDP (Table 27) and the high food import bills (Table 29).

There is a general belief among researchers and extensionists in Ghana that development would come only if farmers adopt researcher-recommended technologies (MOFA, 1992). In contrast, recent studies in the field of agriculture and rural development have shown that farmers in rural communities are innovators who are capable of learning and improving their own situation if given the opportunity and
encouragement (Rhoades and Booth, 1982; Horton, 1991; Russell and Ison, 1991; Fisher, 1993). Collaborative and participatory learning by different stakeholders enables all interested parties (a) to learn about the whole social system in which they operate; (b) to develop a simultaneous understanding of their own issues, problems and opportunities; and (c) to assist themselves to develop their own ideas as to appropriate actions to be taken to improve problematic situations (Korten, 1981; Whyte et al, 1991; Fisher, 1993; Jackson, 1993).

Maclure and Bassey (1991) who worked with small holder farmers in the Republic of Togo on a grain storage project observed that engaging stakeholders in learning about their own practices and lives is an effective way of helping them to improve their own situation. The need to involve farmers effectively in the development process also appears to be not only a viable proposition but is also ethically defensible because food production in developing economies like Ghana depends mostly on these farmers. They have considerable experience in farming and its problems in the Ghanaian context. They might therefore be conceived of as the 'living reference books' on the subject of 'smallholder farming' in Ghana. It might also be construed as unethical to continue to ignore this very important human resource in the agricultural development efforts all in the interest of 'objective and 'superior' scientific knowledge.

The low agricultural production in Ghana is not only a problem but also a challenge to all stakeholders. The question, however, arises as to how to face this challenge. The literature has indicated that participatory learning approaches are capable of facilitating improvement in complex and dynamic human activity systems like the one under study. It is appropriate, therefore, to promote a vision about developing a situation in Ghana in which farmers, extensionists and researchers come into harmony in thoughts and actions; where no one idea is intrinsically superior to any other, and where scientific truth is not worn as a badge; where all stakeholders learn to learn from their own experiences and to draw upon techno-science to continually improve upon their own practices and situations: the notion of sustainable development (Milbrath, 1989).
The study described here is about bringing that vision into reality. It is about (a) exploring an approach that places emphasis on social discourse; (b) interpretation of experiences of stakeholders as a basis of knowledge; (c) remoulding of ideas to inform action; (d) questioning of assumptions and worldviews as a way of judging the 'correctness' of knowledge generated and actions to be taken; and (e) encouraging stakeholders to become responsible for their own development through group learning and action. It is therefore the objective of this research to introduce and explore the use of 'participative learning' (learning by stakeholders informed by the concepts of action research, experiential learning and critical learning systems) as an approach to assist stakeholders involved in food and other agricultural production in the Hohoe district of Ghana, to become responsible for their own development.

2.5.1 Stating My Objectives

This study was therefore aimed at:

- exploring the general context of the study (the situation in which food and other agricultural production takes place in the study area)
- engaging stakeholders in learning about, and using participative learning to intervene in their own situation
- learning about the relationship between problems and contextual issues in collaboration of major stakeholders (research, extension and farmers)
- implementation of actions based on knowledge generated from the learning process
- learning from the research process and its outcomes, to guide future activities of stakeholders
- reflecting on and articulating the theoretical underpinning and lessons learnt from this research for the benefit of farmers and agricultural development workers in Ghana, as well as the broader scientific community.

2.6 The Question of a 'Research Question'

There is a great sense of unease among development agents with regard to the low adoption rate of researcher-recommended technologies among the farmers in Ghana. Surveys commissioned by the DAES of MOFA and carried out by Marfo et al (1994)
shows that the adoption of technologies being extended to farmers ranges between 10-30 per cent. The causes of the low adoption rates have been identified variously by the different stakeholder groups (Donkor, 1989; Nana Oware-Owusu, 1995; Togbe Kutor, 1995). Researchers have been accused of focusing on research that can be marketed to international journals instead of inquiring into issues that are relevant to farmers, while the agriculturists continue to hide behind reasons of the conservatism of the farmers to justify the low adoption rate. On the other hand, farmers blame lack of funds and non-relevant government interventions for their unwillingness to adopt the technologies.

As an agriculture extension officer employed by the Ministry of Agriculture, I was tempted at the start of the study, to inquire into and to design solutions to the ‘non-adoption-of-technology’ problem. That is, to find out the reasons why smallholder farmers were not adopting the proven technologies and make recommendations on how the related problems could be solved to improve technology adoption by farmers. However, that initial enthusiasm for treating technology transfer as an ontologically existing problem faded as I reviewed and learnt from the literature concerning the various views on (a) the nature of knowledge about human activity systems; (b) how social knowledge could be generated; (c) relationships between the researcher and the researched; (d) the contextual validity of knowledge generated; and (e) the responsibility for the consequences of the research.

The cognitive journey I took (Chapter Three) with regard to worldviews, theories and methodological traditions underlying social research and development, enabled me to question the validity and ethical defensibility of my initial idea of an outside inquirer posing and answering questions to capture the realities of people on whom research is being done. I came to the understanding that reality about a human activity system, as the one under study, is not fixed and is not ‘out there’ to be discovered but that such realities are social constructs which individuals hold as they go about making meaning out of their everyday experiences. This means that the low adoption rates of technology cannot be studied in isolation of the interpretations that stakeholders give to the interrelationships within the social system. Further, since, everyone has his or her own ‘worldview window’ through which reality is constructed or judged.
(Bawden, 1990), food and agricultural production in Ghana, related issues, problems and interventions for redress can be subjected to different interpretations by different people. As Pretty (1995:14) points out,

'All actors, and particularly those with a direct social or economic involvement and interest, have a different perspective on what is a problem and what constitutes improvement in an agricultural system'.

It follows that in the context of this study, the use of objective analysis by a detached researcher to pose and answer questions about adoption rates and low food production, has the possibility of sacrificing the holistic view and the multiple perspectives on agricultural production.

The stance being taken by this research is to support the need to seek problem identification and ownership by stakeholders through the sharing of their own experiences in the socio-cultural and political process of group learning (Attwater, 1996). At the heart of this group learning is the need to have a common understanding of the multiple views of reality that stakeholders hold about agricultural production in the study area. This learning also means re-ordering existing power relations in the social system to accommodate collegial relationship among stakeholders without which participative learning is impossible.

In this study therefore, I explored four distinct but interconnected questions with regard to the use of participative learning in assisting stakeholders to improve food and other agricultural production in the Hohoe district of Ghana;

- Is it possible and feasible to adopt participative learning with farmers and development workers in the study area?
- Can the approach contribute to any improvements in the problem situation in the study area?
- What are the lessons learnt from its use and what are the challenges of using this approach in the Ghanaian context?
• Is there the possibility that agriculturists, who have the political mandate for agricultural development, might embrace and continue to use this approach for their work, after this research input?

2.7 The Research Area

The research was done in the Hohoe district that is located in the Volta Region of Ghana. This district is bounded on the North by Jasikan district, in the south by Ho district, in the West by Kpandu district and in the East by the Republic of Togo. (See Appendix 1 for Maps of Ghana, Volta Region and the Hohoe district).

2.7.1 Selection of the Research Area

This area was chosen for the study because I stationed in the Volta Region of Ghana as an employed by the Department of Agricultural Extension Services. I therefore used this study as an input into the development of farming and agricultural development work in 'my' region of Ghana, while improving my own professional practice. Further, the CSIR of MIST is actively pursuing its FSR&D activities and MOFA is also implementing the Word Bank sponsored T&V system of the extension in the region. The majority of the population in the region is also engaged in farming as their vocation (Arnezhah and Humado, 1988).

The district in which the study was carried out was selected in collaboration with representatives of major stakeholders in food and other agricultural production in the region. The initial discussions to set the research protocols were conducted with the active participation of heads of departments of MOFA in the Volta Region, representative of the Ghana National Association of Farmers and Fishermen (GNAFF), and the Research officer in charge of the Ministry of Agriculture Research Station, Kpeve in the Volta Region. These preliminary discussions were centred on (a) the purpose of the study; (b) its location; (c) logistic support for the study; and (d) the proposed research process. The inclusion of regional level stakeholders in setting the research agenda provided institutional support and commitment for the research work.
From these initial discussions, the Hohoe and Nkwanta districts were suggested as possible districts for the study. This was because they represent the two most important agricultural districts in the Volta Region. The Nkwanta district is located in the northern wooded savannah zone, whereas the Hohoe district is in the central forest-savannah transition zone of the Region. It would have been interesting to investigate the problems and issues involved in farmer-decision making processes in these two very important ecological zones of the region, however, time constraints limited the research to only one district.

The Hohoe district was chosen for the study because in addition to having high agricultural potential in the Volta Region, it also has the following advantages:

- the Ministry of Agriculture Research Station is located at Kpeve on the border between the Hohoe and Kpando districts.
- the Crop Research Institute (CRI) of CSIR on-station trials are being carried out at Koloenu and Kpeve that are located in the Hohoe district.
- its proximity to the regional capital would facilitate the participation of the regional team and researchers in the learning activities.
- The researcher cannot speak the Adele or Kokomba languages spoken in the Nkwanta district but he is at home with the Eweh language spoken in the Hohoe district.

2.7.2 The Volta Region at a Glance

The Volta Region is the fifth largest of the 10 political regions in Ghana and has Ho as its administrative capital. (See Maps 1 and 3 of Appendix 1). It is about 205, 700 square kilometres in area and has a population of about 1.34 million people. The day to day administration is the responsibility of the Regional Minister who reports to the President (head of state of Ghana). The region is divided into 12 administrative districts, which are headed by District Chief Executive Officers. The 12 districts are Jasikan, Kadjebi, Nkwanta, Krachi (in the northern zone), Ho, Hohoe, Kpandu (central), and Ketu, Keta, Akatsi, Sogakope and Adidome (southern districts).

The rainfall pattern of the northern zone is unimodal with an annual rainfall of about 1370 mm. The rainfall pattern in the central and the southern zones of the Region are
bimodal and vary from 860 mm in the south to about 1440 mm per annum in the central zone. The vegetation is wooded savannah in the north while that of the central zone is transitory, consisting of degraded forest area and tall grasses. However forest strips occur along the mountain ranges. The vegetation is mainly coastal savannah in the south with patches of mangrove around the estuaries of the Volta river. The Region is drained by the Volta River, from which it draws its name.

The main staple crops cultivated in the region include maize, cassava and cowpeas. Tree crops like cocoa, plantain and bananas are also grown in the forest areas. Yam is an important crop grown in the north while shallot is an important crop for farmers on the coastal littorals. Fishing is also done in the Volta Lake and the sea.

2.7.3 The Hohoe District

Geographically, the Hohoe district is located in the central zone of the Volta Region in the south-eastern part of Ghana. (See Maps 3 and 4 of Appendix 1). It is one of the 200 administrative districts in Ghana. It has a total land area of 2,922,126 square kilometres and has an estimated population of about 96,000 of which 75 per cent is actively engaged in agriculture as a primary occupation.

2.7.3.1 Topography and Hydrology

The topography is undulating. It is moderately rolling from the eastern part of the district, becoming gently rolling to flat along the middle and western portions of the district. The eastern part of the district, in areas such as Nyangbo, Logba, Leklebi, Liati, Wli, Bledi, and Akpafu, is lined with part of the Akwapim-Togo mountain range that has an elevation ranging between 1000-1500 metres above sea level. This mountain range forms the boundary between the republic of Togo in the north eastern part of the district. The district has several streams that provide water for its people. These include the Agumatsa, Dayi, Feh, Koloe, and Nobui. The district has some dry valley bottom areas around Hohoe, Godenu and Golokwati that are used for rice cultivation.
2.7.3.2 Soils

Most of the soils found in the district are savannah ochrosols derived from voltaic sandstone decomposed under moderate rainfall associated with distinct dry seasons (Titriku, 1990; MOFA, 1992). They are light to medium textured, well drained and with adequate depth for a wide range of crops. Regolics found in the valley bottoms, and known as ground water laterites, have some tendency of seasonal water-logging can be found. These soils were derived from slates and mudstones. Both the ochrosol and the regolics are generally less leached and less acidic compared to the soils of the rain forest. These differences are manifested in the types of crops that are grown in these two ecological areas. Where the forest supports tree crops like cocoa, coffee and avocado pears, the grassland areas are suitable for cassava and grains only. The practice of slash and burn, especially on slopes, has led to soil erosion in the district (Titriku, 1990)

2.7.3.3 Climate

The climate is tropical with mean daily temperatures ranging between 24-35 degrees Celsius. The hottest month occurs in March-April whilst the coolest month is August. Relative humidity fluctuates between 70-80 per cent during the rainy season but can drop to 50-60 per cent in the dry Harmattan period (November-February). Rainfall is the most important climatic factor and agriculture is very dependent on its pattern. Seasonal fluctuations in the commencement and termination of rains dictate the planting dates, and labour use pattern while being the major determinant of the output of the farmers. The length of the major planting season, that extends from March-April through to July, is about 100-120 days while the minor season (from September through November to early December) is only about 60 days.

The rainfall here is bimodal in distribution and the mean rainfall is about 1300 mm with the maximum rains occurring in May-June and a second but minor peak in September-October. This climatic pattern allows for two growing periods annually. The major rainy season starts from March-June, peaks in May-June and tails off in August. Minor rains occurs in September-October. The minor season is quite short and is therefore suitable for the growth of short duration maize varieties and cowpeas.
November to February is a dry period, during which little farming is done. It is a time when Ghana comes under the influence of the North Easterly winds (harmattan) that originate in the Sahara desert. The moist South Westerly winds from the Atlantic Ocean, that affect the region from March to October bring rain. The rainfall regime described has the possibility of providing ample rain for a wide range of crops during the major growing season.

2.7.3.4 Vegetation
This district represents the transition of vegetation ecology from the moist deciduous forest to the Guinea savannah woodland. The forest is found along the eastern border of the district. The western boundary has scattered patches of wooded grassland. Most of the Hohoe district was once semi-deciduous forest, which had several tropical tree species. However, the activities of human beings (such as farming, lumbering, hunting) had led to widespread deforestation. This situation has been exacerbated by the rampant bush fires experienced over the last 15 years (MOFA, 1995).

The present vegetation could aptly be described as a forest-savannah transition. This is made up of the regrowth of fallow lands, relics of forest shrubs, small patches of virgin forest (scattered mainly on the mountain ranges), and derived savannah with pro-fire climax grasses like guinea and elephant grasses. Most of the forest is, however, situated in the highlands, probably because of the difficulty in farming the forest lands. Currently, due to the scarcity of fertile land on the flat, some farmers have resorted to making their farms on these hilly and erosion-prone areas.

2.7.3.5 The People
The district has about 20 traditional areas. In most cases these traditional areas also coincide with the agricultural sub-districts. Each sub-district is staffed with agricultural extension personnel, presently referred to as the Front Line Staff (FLS). The Ewehs forms the single largest ethnic group in the Hohoe district (though they are also divided into different sub-groups). However there are also small but distinct ethnic groups (with different languages) living in the district. These include,
Nyangbos, Lolobis, Logbas, Tafis and the Akpafus. These groups of people also speak Eweh as a second language.

It is noteworthy that almost all the small ethnic groups live on the Akwapim - Togo mountain ranges. History has it that these groups of people were living on the land before the Ewehs came from Notsie in Togo in about the thirteenth century (Asamoah, 1986). In those times, following migration and resettlement, wars were fought among these tribes and the incoming Ewehs and other tribes like the Asantes of the then Gold Coast (now Ghana). These people therefore settled on or took refuge in the highlands as a war strategy. It appears they could not come back onto the flat grounds when there were no longer any wars to be fought.

Each area has a distinct culture and is usually ruled by a chief or Fia. In most of the villages, the chief and his elders constitute the administration. The chiefs and other office bearers like the linguists, queen mother, fetish priest, youth leader and war lord may come from the royal clan or specific clans as dictated by tradition. These traditional offices are ascribed to individuals who are patrilineal descendants of designated clans.

2.7.3.6 The Smallholder Farmers
Most of the farmers have farms that are no more than about four acres (1.6 hectares) in any one farming season (Humado, Fiadjo and Armezah, 1990). The farmers also have several parcels of land located at different geographic positions. This has been attributed to the need to reduce risk or to make use of special characteristics of individual lands in the limits of resource constraints (Frempong-Asante, 1995). Using farm size as a criterion, these farmers could be described as small scale farmers. However, they are engaged in complex farming practices based on dynamic mixed-cropping techniques that have evolved in response to the socio-economic and ecological uncertainties of their environment (Norman, 1974). These farmers are the dominant producers of food such as maize, cowpea, cassava, rice, yam and vegetables. The production levels from these farms are generally low but because agricultural commodities are their only source of income, they also sell part of that produce to pay family bills.
2.7.3.7 Agricultural Infrastructure

There is one major tarred road that runs the length of the district as shown on Map 4 (Appendix 1). This road links the Hohoe district to the Kpando and the Ho districts in the south and Jasikan district in the north. There are also several feeder roads linking the other towns and villages to each other and to the district capital, Hohoe. These feeder roads are generally unpaved. This situation causes difficulty in the movement of people and farm produce to markets, especially during the rainy season, when they develop into muddy tracks. The major markets in the district are located at Logba Alakpeti, Fodome Helu, Ve Koloenu and Hohoe. Banking facilities are provided by the Hohoe district branches of the Ghana Commercial, Barclays, and Agricultural Development Banks located in the district capital, Hohoe. A community bank, Weto Rural Bank, is also situated at Kpeve (60 km south of the district capital).

The Department of Agricultural Extension Services of the Ministry of Food and Agriculture at Hohoe, presently has 15 agricultural extension officers or FLS stationed in various parts of the district to advise farmers on production technologies. They are also involved in credit disbursement and recovery under the Sasakawa Global 2000 farmer credit schemes. The front-line staff are supervised by the District Agricultural Extension Officer (DAEO) and her deputy. These two supervisors are charged with the monitoring of general extension activities in the district to ensure that FLS attend training sessions, visit farmers with messages and establish demonstrations on farmers' fields where necessary. The DAEO also doubles as the District Agricultural Co-ordinator (DAC) and functions to oversee the general agricultural administration of the district. In addition there are 20 staff of MOFA in the district belonging to various subject matter departments of MOFA (Crop Services, Fisheries and Veterinary). These staff are consulted on specific issues related to their areas of specialisation and also act as adaptive research departments for the MOFA. Some Non-Governmental Organisations involved in agriculture and rural development are also located in the district. These include the Evangelical Presbyterian Church and World Vision International. They are involved in agricultural extension and input supply to selected farmers.
2.8 Conclusion

Agricultural production in Ghana are, to say the least, discouraging (World Bank, 1992). These low levels are reflected in Table 29 of Appendix 2. Their improvement is critical to the economy of Ghana, not only because of the need to provide food for the population, but also because it is a sector that employs the majority of the working population. The main focus of agricultural development has been the transfer of researcher-recommended technologies to farmers for adoption. However, most of the technologies developed by the research institutions are not adopted by farmers 'as given' and can be conceived as becoming 'ends in themselves' rather than means of increasing agricultural production. The greatest challenge faced by the present TOT approach, therefore, is how to transform the concepts and knowledge embedded in the research messages into farmer-action.

This approach has been found to be unsatisfactory in solving farmer's problems in developing economies because in its implementation the agricultural 'experts' have failed to recognise, respect and use the knowledge and adaptive problem solving capabilities of all stakeholders. Korten (1981), has argued that the key to agriculture and rural development in developing countries lies in (a) learning with the people; and (b) the building of new knowledge and institutional capacity of stakeholders through participative action. In that context both local and scientific experiences and knowledge are used to construct the problems and opportunities for improvement.

The observations of many other contemporary rural development practitioners including Gilmour and Fisher (1991), Maclure and Bassey (1991) and Whyte (1991), appear to have confirmed Korten's claim. The present study was therefore designed and carried out in collaboration with all stakeholders as a way of exploring the potential and challenges of participative learning in the context of agricultural production in Ghana.
CHAPTER THREE

THEORETICAL AND METHODOLOGICAL FRAMEWORKS

3.1 Introduction.

In this chapter I explore the literature on the philosophical position, theoretical frameworks and methodological traditions that informed this study. I also discuss the issue of ‘trustworthiness and validity’ of interpretive inquiry as applied in this research. There is an acute awareness among constructivists that the philosophical positions or ‘paradigms’ taken by individuals provide the backdrop to our beliefs and values that control our interpretation, judgement, behaviour, and action (Kuhn, 1970; Spence, 1982; Russell, 1987; Maturana & Varela, 1988; Hall, 1994). Kuhn (1970) posited that our interpretations are guided by our paradigms and our constructs are interpretations that support our worldviews. Maturana and Varela (1988) have asserted that what we do in this world is determined by the way we see it, while the way we see it is controlled by our paradigm and yet that paradigm is in turn affected by the meaning we made of our experiences and actions. This implies that there is no reference point outside our view of the world from which to evaluate the truth of that viewpoint because knowledge is always a representation of reality within a particular perspective (Kim, 1983). This is a view supported by Hall (1994:6),

‘Always learning is framed by our current paradigm. We often cannot even hear, see or observe, that which does not fit within our frame of reference.’

Henderson (1991) has also argued that paradigms define the parameters of investigation, including what is observed, what questions are asked, what methods of inquiry are adopted, what interpretations are given to data, and what answers are accepted as valid. Spence (1982:20 ) has argued that:
'.....data do not speak for themselves; the organising theory of the observer—what Kuhn has called the paradigm—is always being brought to bear on the observed data and in a variety of subtle and not subtle ways affecting what we think he or she can see.

It is therefore my understanding that the way I go about collecting data, interpreting it and reporting my findings will be affected by the philosophical position that I take.

My aim in undertaking this research was to involve farmers and agricultural workers in investigating the meaning they attach to their practices and lives as a way of enabling them to transform these 'meanings' into purposeful action. My interest was in encouraging these stakeholders to question and critically reflect on their experiences, knowledge and actions as a way of generating contextually valid knowledge as well as the disposition to put the knowledge into action to improve their situation. This research project was therefore seen as a process of facilitating changes in stakeholders' consciousness and behaviour while generating knowledge about food and agricultural production in the Hohoe district of Ghana. It could also be conceptualised as following action research and experiential learning models of research and development as it embodies interpretive inquiry (based on personal experiences) leading to action by stakeholders. The critical introspective reflection associated with the process also places it in the realms of a critical systems paradigm that is associated with action research (Kemmis and McTaggart, 1986; Reinarz, 1992) and critical learning systems (Bawden, 1995).

Participative learning as a research methodology can be seen as being consistent with the tenets of integrating interpretive science and a critical systems paradigm: the notion of radical constructivism (Bird, 1990; Attwater, 1996). Morgan (1982) and Reinarz (1992) distinguish between interpretive and critical or 'praxis-oriented' research paradigms. However, Bird (1990) has argued that these two paradigms treat reality as social constructs but the call for the critical dimension in constructivism is
to make the constructivists self-critical of their ‘constructs’. The introduction of
critical dimension into adult education (Freire, 1972; Mezirow, 1981), action
research (Kemmis and McTaggart, 1986) and experiential learning model (Bawden,
1995) is conceptualised as being aimed at consciously challenging learners to (a)
justify the ‘correctness’ of their constructs (Guba and Lincoln, 1990); (b) to ascertain
the ‘contextual validity’ of their constructs (Marshall, 1981); (c) to reflect on how the
political forces or norms within the organisation shape their constructs (Argyris
and Schon, 1978; Flood and Jackson, 1991; Senge et al, 1992); (d) to reflect on the
process and beliefs held by stakeholders on knowledge and action (Bawden, 1995);
and (e) to seek mutual understanding, ‘grounds’ or consensus about actions to be
taken to improve the situation (Habermas, 1984). While some authors like Kemmis
and McTaggart (1988) and Checkland (1981) have assumed that critical reflection is
an integral part of action research, Flood and Jackson (1991) and Ulrich (1993) are of
the view that critical reflection must be explicit; failure to use it in interpretive
inquiry will consequently lead to endorsement of the status quo.

3.2 Reflection on Paradigms
The two mainstream paradigms that have dominated scientific research are
positivism and constructivism/interpretivism (Guba and Lincoln, 1989; Henderson,
1991; Rogers, 1996). Critical theory paradigm or radical constructivism emerged
from constructivism in reaction to the need to justify the worldview within which
reality is being constructed (Bird, 1990; Flood and Jackson, 1992).

3.2.1 Positivism and its Limitations
Christian teachings formed the core of people’s beliefs and actions in medieval
Europe (Coulson, 1958). These teachings also reflected the philosophical thoughts of
Socrates and Plato on the unity of body, soul and mind and the concept of idealism
that embraces elements of subjectivity and spiritual explanation to observed
phenomena (Rogers, 1996). However, the success of the Newtonian scientific
revolution based on Descartes’ paradigm of reason, changed the way people came to
think about the generation and use of knowledge (Jamieson, 1985). This represented
a shift from speculation and unquestioned acceptance of irrational traditional, religious, customary beliefs, and subjective analysis to empirical experimentation and rational logic (Hughes, 1971; Pearce, 1993): the notion of positivism.

The Newtonian-Cartesian philosophy of positivism is grounded in the belief that there is an external world that determines the singular convergent view that can be taken of it, independent of the process or circumstances of viewing (Pearce, 1993). The assumption is that scientific understanding comes through rational means and so nothing is accepted as reality without unbiased empirical evidence. It also means linearly proving that A leads to B: the notion of cause and effect (Henderson, 1991). Positivists therefore strive for value-free explanations and prediction through controlled experiments from which they are detached. In the pure sciences the researcher investigates bits of the world in order to discover or to establish ‘natural laws’ without reference to (a) other parts of the natural world; and (b) the social world (of which the researcher is part). It is assumed that other parts of the experimental set up (apart of the bit of the world or problem of importance to the researcher) are constant and the researcher has no influence on the research process and outcome (Rogers, 1996).

In practice, these ‘objective’ studies are done by developing research questions based on a priori theories, operationalising the theory to collect data, and analysing the data based on the questions asked to confirm or disprove the theory stated at the beginning of the research (Guba and Lincoln, 1989; Guba, 1990). The results of such a research are seen as supporting or failing to support the pre-established hypotheses so that the research has an all or nothing character to it (Russell, 1987). This process leads to theories that are used to explain natural occurrences. From this perspective, it is only those things that are observable in ‘nature’ that can be legitimated and used in explaining the world.
This paradigm is also applied in investigating human behaviour by the social scientists (economists, sociologists and psychologists). This has been alluded to by Uphoff (1993:8) when he said:

'Social scientists.....have been influenced by many of the concepts and assumptions of natural sciences – particularly their positivist epistemologies, their materialistic ontologies, and their linear, deterministic presuppositions of causation.'

The focus here is therefore is on social behaviour that is amenable to measurement. Most significantly, the ‘natural’ is separated from the ‘social’. The critical relationships between the physical world and subjective human influences are ignored (Hardiman, 1990). Applied to society, people are regarded as passive ‘objects of research’ who are investigated by an ‘expert’ researcher. The paradigm insists that people and their experiences be reduced to measurable ‘bits’ to be understood, instead of seeing and understanding life in terms of its inter-relatedness or as a holistic entity with multiple expressions (Bookchin, 1990). Positivism in social sciences therefore, divorces itself from the questions of motives, intentions, values and normative behaviours of society (Lincoln, 1990; Rogers, 1996).

For example in economics, the dominant theory is based on utilitarian beliefs (Drucker, 1992). The economists therefore set out to model human choice and human behaviour in terms of people having independent utility functions. The classical economists like Adam Smith and Keynes tried to develop the economic equivalent of the Newtonian laws, to predict rational decision making in social systems (Johnston and Clark, 1969). Economic activities become defined in terms of people's rational and self-interest maximising behaviour (Jamieson, 1989; Uphoff, 1993). In this philosophical context, the economists ‘...assume that people are each respectively trying to maximise a certain set of goals or values, independent of each other's welfare, not figuring other people's values and well being into their own
function, but instead trying to maximise or optimise their own values and well being.' (Uphoff, 1993:15).

Its influence on post war development of agriculture, particularly Green Revolution agriculture reflects a reductionist epistemology; that if we know enough about the different fragments of the world (natural and social), we can put them together and through that be able to know and understand the whole world (Checkland, 1981; Mollah, 1993). The emphasis therefore, is on knowing the parts but not (a) the whole; and (b) the vital relationships that exist between the parts. According to Russell (1987) the fundamental weakness of this philosophical tradition is that (a) it detaches itself from the realities of the researched and the necessary relationships; (b) the knowledge generated from this process is incomplete since the characteristics of the whole is different from the sum of its parts that were the focus of analysis in this tradition; and (c) by focusing on pre-established hypothesis, the learning process closes its doors to other realities that might have emerged from the study and lacks self-review.

In its application to agriculture, technologies (practices) are developed by scientists based on objective knowledge generated from experimenting on the natural behaviour of plants and animals. These technologies are then handed down to farmers to adopt ‘as is’ in order to improve the productivity of their agricultural enterprises: the notion of technocentrism (Sriskandarajah et al, 1991). The relationships between (a) the farmer and the agricultural commodities (management); and (b) the farmer and the context (social, political economy and culture) in which the farming is being done are ignored (Millar, 1993). The farmer’s views, values and experiences are also taken for granted (Awa, 1996). Based on the notion that the objective knowledge, discovered by studying an ontologically existing world, is infallible (Chambers, 1997), extension officers insist that farmers’ problems can be solved by applying these practices irrespective of the context of application (Horton, 1991). The development focus for extension therefore becomes how to change the behaviour and values of farmers to conform to the practices that have been designed
for them by the researchers. The farmer’s development level is then assessed as being ‘progressive or laggard’ based on the ease with which they adopt these technologies (Roger, 1983).

It is however evident from the literature that farmers are unable to adopt these technologies on an ‘as is’ basis (Simmonds, 1985; Carr, 1989; Titilola, 1990; Horton, 1991; Maclure and Bassey, 1991; Chambers, 1993; Messerschmidt, 1995); White (1989) attributed this observation to the fact that in the technology development process, (a) farmer’s knowledge and experiences were ignored; and (b) the statements of facts are separated from the statements of values that people attach to their lives. Consequently the technologies developed ends up not being applicable to the action context (Russell, 1987).

3.2.2 Constructivism

By the latter part of the nineteenth century a number of scientists began to critique the tenets of positivism (see Kuhn, 1970 and Guba, 1990). They questioned the concepts of cause (A) and effect (B) and value-free and objective knowledge that are enshrined in positivism. There arose a consciousness that A and B are constantly influencing each other and must be conceptualised as interrelated elements in the totality of an integrated system (Henderson, 1991). Further, it was also realised that researchers (a) learn in a value-laden environment, and (b) influence the research process by the decisions they take. They cannot therefore not be regarded as detached from what they are observing. Hardiman (1990) has pointed out, the way researchers observe or learn and their personal biases has consequences for how they learn, what they learn and the results they achieve. Kuhn (1970) has also rejected the notion of neutral observation language and argued that scientific change cannot take place independent of the social context. He emphasised the close relationship between theory and observation, and argued that understanding comes from the interpretation that is given to these interrelationships but not from objective knowledge generated based on ‘cause-and-effect-positivist’ paradigm. Knowledge (especially about a social system), then becomes an interpretation of reality by people
as they try to make sense of their interaction with their environment (Taylor and Bogdan, 1984). In other words, reality or understanding is an emergent property of how people define and interpret their world (Guba and Lincoln; 1989, Hardiman, 1990).

The argument of the critics of positivism is that since reality is multiple, divergent and dependent on individual viewpoints, there cannot be an ‘absolute truth’ that can explain the realities of all stakeholders (Marshall, 1981; Schoones and Thompson, 1994). They argue that reality needs to be constructed by stakeholders while using their experiences as inputs (Lather, 1986; Marshall, 1981; Hall, 1994). This is the basis for interpretive, constructivist or naturalistic paradigm (Guba and Lincoln, 1989; Bird, 1990; Jones, 1991). Attwater (1996:51) has posited that:

‘Constructivism, is based on a relativist ontology that realities are a multiplicity of mental constructions, formed from the social and experiential context of the individual. The epistemology is subjectivist, with the result of an inquiry created through the process of interaction between the inquirer and the focus of the inquiry’.

Constructivism is therefore the worldview that social reality cannot be known apart from the views expressed by stakeholders (Krippendorff, 1993). Interpretive researchers acknowledge that it is virtually impossible to remain objective because so much interaction occurs between the researcher and individuals being studied (Henderson, 1991). Facts are therefore regarded as meaningless except in the value framework bestowed on the interpretation process by stakeholders (Checkland, 1985; Carr and Kemmis, 1986; Bird, 1990; Drinan, 1991; de Zeeuw, 1992).

Constructivism places emphasis on lived experience of the researched as important factors in the interpretation process (Hall, 1981; Lincoln, 1990). The meaning that people ascribe to their experiences, is their reality and, as Henderson (1991) has pointed out, to ignore the meaning that people attach to their own experiences is to
falsify social reality and behaviour. However, it is understood that the subjective interpretation of phenomena leads to different possible perspectives on reality (Marshall, 1981). This implies that social reality cannot be the same for all and may not be the same for the same person under different circumstances. Interpretive research therefore emphasises multiple perspective, recursiveness and relationships in the interpretation of various actors (Rowan, 1981; Guba, 1990). The role of the researcher is to discover and explain these multiple perspectives of reality in collaboration with other stakeholders (Dick, 1993). Participation of stakeholders in the interpretation of issues that concern them is therefore central to constructivism (Brown and Kaplan, 1981; Reason 1981).

While the positivist researcher attempts to fit data to a theory, the constructivist seeks theory through discovery and interpretation of multiple realities and perceptions (Guba and Lincoln, 1990; Henderson, 1991; Pearce, 1993). Theory and research activities are therefore interwoven, with the result that theory guides research while research goes to reshape theory (Maturana, 1988; Jones, 1991). Constructivism rejects controlling and manipulative approaches for a dialectic process that takes account of the observer/observed interaction to construct realities that embrace the values of both the researcher and the researched (Guba and Lincoln, 1989; Reason, 1994).

This paradigm is applied in the field of adult education, agriculture and rural development as action research (Russell, 1991, Jackson, 1993; Sriskandarajah et al, 1996), participatory action research (Maclure and Bassey, 1991); systemic action research (Bawden and Macadam, 1989), experiential learning model (Kolb, 1984); and soft systems methodology (Checkland, 1981; Attwater, 1996). The focus of these methodologies is on involving stakeholders in the process of constructing their own realities: knowledge about their problems, plans and actions to be taken for improvement.
3.2.3 Systems Thinking and Systems Practice

Another dimension of the ontological and epistemological debate is the notion of systems thinking and systems practice (Checkland, 1981; Wilson, 1984; Squires, 1991; Mollah, 1993). Systems thinking has emerged this century to complement analytical thinking in natural sciences with two pairs of ideas: (a) emergence and hierarchy; and (b) communication and control (Checkland, 1981). In this sense, physical and social realities are regarded as 'wholes' in themselves and at the same time 'parts of a larger whole. This concept is seen as describing 'the hierarchical ordering (nested systems) and nature of all things, which exist in their own right and as components of superordinate systems' (Uphoff, 1993:17). The emphasis is on holism (emerging from the relationship of the various parts) instead of reductionism; and interrelationship (communication among the parts) instead of linear cause and effect (Bawden, 1987). This involves not only looking at the world as a whole entity, but also in terms of the various relationships from which reality about the world emerges: the notion of explaining the nature of the world and acting in the world in terms of relationships (Bateson, 1972).

In reductionism, the focus is on specific issue or specific parts of the whole system. The relationship of this specific part under study to the whole system is ignored in the process. The idea here is that by getting information about the component parts, one can put them together in the end and understand the whole (Bawden, 1987). However, Squires (1991) has argued that issues in the world or subsystems (parts of the whole system) coexist in an environment, and are interrelated and constitute 'reality' as a whole, that is not expressed by consideration of separate constituents. This is amplified by the notion that the whole is different from the sum of its parts (Checkland, 1981; Mollah, 1993). The implication here is that a better understanding and appropriate actions are taken on the whole by focusing on understanding the interrelationships (Bawden, 1997b).

Two strands of ideas have emerged over the years within the systems movements: the 'hard systems' thinking and 'soft systems' thinking. The 'hard system' represents a
systematic tradition of the system thinking based on the belief that a system ontologically exists and can be formulated and optimised (Checkland, 1985). In this case the researcher is positive about the existence of a system that can be modelled, analysed and improved by testing and implementation of models designed by the systems expert (Biggs, 1985). Further, the researcher is regarded as an objective observer who is trying to observe and analyse an object which in this case is the predetermined relationships in the system (Bawden, 1987).

This is a notion of combining ‘holism’ and ‘objective knowledge’ generation and was labelled by Bawden (1987) as ‘ecocentrism’. This idea of the certainty or existence of particular relationships within the whole is illustrated in systems engineering, systems analysis and operational research. According to Bawden (1987:45) in such an analysis the system is conceptualised as ‘having clearly definable characteristics such as boundaries, inputs, outputs and major processes and functions that leads to transformation’.

In the field of agriculture this ‘hard system’ idea is implemented as Farming Systems Research and Development (Isaacson, 1985; Merrill-Sands, 1986), and Agroecosystem Analysis (Conway, 1986; Squire, 1991). The agriculturists interact with farmers and other scientists (natural and social) to gather information about ‘existing’ relationships to model a preferred system to be imitated by the farmer to achieve efficiency. The objective knowledge generated about the system by the ‘systems scientists’ is therefore expected to direct the actions of the farmers in order to optimise outputs from the whole farming system (Biggs, 1985; Carr, 1989).

The ‘hard’ system might be applicable to engineering mechanical systems but it might be inappropriate for ‘human activity systems’ like agriculture (Bawden, 1991). Vickers (1981) has argued that human systems are different and that the social engineering of human behaviour may not bring about desired understanding or relevant social actions. White (1989) has also posited that social systems are heavily mediated by human values. This view was subscribed to by Parlett (1981) who was
of the opinion that the unpredictable nature of human behaviour makes it impossible to have an absolute certainty about the interpretation of relationships in a social system. It is for reasons of the effect of human value judgement in the interpretation of relationships in a social system that Checkland (1981) has argued that human activity systems have 'soft' problems or problems that are not easily amenable to 'object solutions'. He has therefore argued that '....system is not the name of something in the world, rather the name of an abstract concept in the head of the observer as he or she tries to make meaning out of the world' (Checkland, 1985: 5).

The argument here is that the relationship between the various issues, problems and solutions emerge from a social discourse involving stakeholders or system actors (Vickers, 1981; Checkland and Scholes, 1990; Pretty and Chambers, 1993;). In this case systemicity emerges from the inquiry process through the definition of stakeholders of what constitutes the system, its problems and desired interventions (Checkland, 1981).

The researcher and the researched are seen as forming a researching system within which they act together in a dynamic relationship to learn and to act together for the improvement of the relationships within their 'constructed system' (Bawden, 1987). The idea of 'soft system' can therefore be seen as part of constructivism with emphasis on encouraging stakeholders to construct their realities in terms of relationships between stakeholders, ideas and issues. This idea has been explored and used by researchers within the School of Agriculture and Rural Development of the University of Western Sydney, Hawkesbury as Systemic Action Research Methodology (Bawden and Macadam, 1989) and by organisational management practitioners as the Soft Systems Methodology (Checkland, 1981).

A further development to constructivism and the 'soft' systems thinking is the need to critique (a) the realities and/or relationships constructed; and (b) the construction process in relation to the context (Habermas, 1971; Jackson, 1982). The perspective taken is to subject the construction process to public critique. The intention here is to critically create a model of reality that frames the conduct of stakeholders involved in
the ‘social system’ in order to justify the need for the people to act according to the
new relationships developed through the construction process (Flood and Jackson
1991, Outhwaite, 1994). This therefore introduces another worldview, critical
systems paradigm, into the debate to support the exploration of the relationship
between the knowledge generated, the learning process and the context within which
the learning is taking place (Meredith et al, 1989; Bawden, 1995).

3.2.4 Critical Systems Paradigm
Interpretive science has been criticised for (a) ignoring the inherent characteristics of
the context and/or (b) for helping to perpetuate the *status quo* in so far as it does not
typically question the social context and power relations that shapes the interpretive
process (Habermas, 1971, 1982; Meredith et al, 1989; Ulrich, 1993). Similar
criticisms were levelled against the Soft Systems Methodology by Jackson (1982).
Russell (1987) has argued that our reflections and the way we generate knowledge
are shaped by our beliefs about the context. Similarly actions are performed in
accordance with a set of beliefs about how learning and social change should take
place (Hall, 1994). Meredith et al (1989) has therefore argued that without
questioning the ‘validity’ of the assumptions on which the interpretations of our
realities and actions are based, ‘the construct’ may lead to knowledge that is
constrained by existing social norms and values. The critical system paradigm
therefore emerged in response to a need to create opportunity and encouragement for
stakeholders to critique their own assumptions about the relationship between their
knowledge and their context (Habermas, 1971, Freire, 1972; Mezirow, 1990). It can
be therefore conceptualised as a paradigm that supports a process of establishing a
dialectic relationship between our worldviews and the knowledge generation process
(Flood and Jackson, 1991; Ulrich, 1993). These dialectics can be seen as influencing
stakeholders to change their worldviews with reference to the knowledge generated
and vice versa (Jones, 1991). The understanding here is that the exploration of the
relationships between what is learnt, the process of learning and the beliefs that
inform our learning, might enable stakeholders to change with regard to (a) what is
learnt, (b) how it is learnt; and (c) the worldviews held about what is learnt and how it is learnt (Bawden, 1997a).

Okri (1989) has argued that knowledge vested in one worldview may not explain and absorb all that can be seen, known or explained about a phenomenon. The idea of critical systems paradigm can therefore be conceptualised as a system of ideas that encourages stakeholders to critically explore the various perspectives of the relationship between content, process, and context of learning in order to understand the various 'faces' of the phenomena under study. It could therefore be seen as a further development in constructivism, with the focus on encouraging people to question the contextual validity of their constructs.

This paradigmatic domain is associated with conceptual and methodological traditions such as action research and critical social science (Carr and Kemmis 1986); learning organisation (Argyris and Schon, 1991; Senge, 1992); critical heuristic epistemology (Ulrich, 1993); total systems intervention (Flood and Jackson, 1991) and critical learning systems (Bawden, 1995). These concepts and methodological traditions encourage researchers to critically examine their entire set of beliefs about the world, about their practices, and about their knowledge about the world.

3.3 Theoretical Framework

In research, theories inform strategies for collecting and describing data. According to Henderson (1991), theories are shaped by the researcher's worldviews (paradigms) which are also reflected in the methods employed in the collection, description and interpretation of data. In action research projects, the phenomenological data (data based on experience and action) is coupled with the hermeneutic data (how stakeholders make sense or interpret their experiences) as a basis for planning actions for improvement (Guba and Lincoln, 1989). Critical reflection on the phenomenological data, hermeneutic interpretation, is seen as a means of creating critical social knowledge with regard to interpersonal relationships and strategies to be
adopted to the needs of complex and changing situations (Carr and Kemmis, 1986). The three interrelated theories that provided the framework within which the descriptions, interpretations and critical reflection on constructs were done in this action research project are phenomenology, hermeneutics and critical theory.

### 3.3.1 Phenomenology

Phenomenology is the framework that supports the direct investigation of phenomena as experienced, without theories about their causal explanation, and free from unexamined preconceptions and presuppositions (Spiegelberg, 1975; Marton, 1992; Trigwell, 1997). It supports the description of a situation stripped of preconceived values and beliefs (Oiler, 1982; Prosser et al., 1994), and aims to identify people's qualitatively different experiences and understandings of their worlds (Trigwell, 1997). Phenomenology therefore encompasses all efforts on the part of the researcher or researcher at describing human existence as it is lived (Smith, 1997). The focus is therefore on people to describe their own lives as they see them. Phenomenology therefore recognises 'the importance of the context and the individual construction of perception and meaning in that context' (Smith, 1997: 75).

The use of phenomenology in supporting this study is justified by its focus on understanding the internal subjective experience associated with observable reality (Burnard, 1985; Henderson, 1991). I had worked with farmers, researchers and extension workers for 12 years and have developed my own views and ‘theories’ about agricultural production in the study area. However, phenomenology impels me to listen to the life stories of all stakeholders, without influencing the process with any of my preconceived theories about the life and activities of the research participants. In terms of adult learning, it supports the use of concrete experiences of learners as building blocks in the construction of social reality (Kolb, 1984).

### 3.3.2 Hermeneutics

Hermeneutics is the process by which individuals attach meaning to everyday experiences (Van Manen, 1990; Pearce, 1993). Hermeneutics can also be described as
the theory and practice of interpreting text (Henderson, 1991; Smith, 1997). Hermeneutics respects the belief that everybody is capable of consciously creating social theories to describe their own worlds (Rogers, 1996). According to Rowan and Reason (1981:135),

'The standpoint of modern hermeneutics is that interpretive method is not a special process, totally different from everyday human understanding; it is just one example of an everyday process through which persons make sense of their world. All understanding is hermeneutical, taking place and to a large extent determined by our finite existence in time, history and culture'.

The emphasis of hermeneutics is on the interpretation of reality as seen and lived by people. It is therefore closely associated with phenomenology. Some authors like Smith' (1997) and Trigwell (1997) have argued that hermeneutics is a type of phenomenology in which the described text is interpreted to be understood.

In hermeneutics, the positivist position in legitimising value-free and de-contextualised knowledge is rejected in favour of inquiry that engages subjects as interpreters in an inter-subjective way (Marshall, 1981; Reason, 1981; Rogers, 1996). According to Habermas (1984), human intentions and actions are conveyed through interpretations. This implies that knowing must occur through the interpretations by stakeholders (Pearce, 1993). This theory therefore reinforces the importance of involving the subjects of the action research project as co-researchers of their own situation (Whyte et al, 1991; Chambers, 1997).

Hermeneutics does not aspire to give a universally accepted interpretation of reality, but rather a tentative construction that can be used as raw material for further criticism and construction (Guba, 1990; Pearce, 1993). Rogers (1996:17) has posited that;
Hermeneutics argues that through interpretation, the meaning of a text can be uncovered and an understanding can be reached. Interpretation is defined as the process of the interaction between the interpreter and the text.

In action research, the text is the experience of stakeholders who also act as coresearchers or interpreters of their own experiences (Russell, 1991). Group critique of various interpretations by stakeholders has the potential of enriching the knowledge generated, improving understanding of participants and acting as the basis for evaluation and validating of the learning outcomes (Marshall, 1981; Guba and Lincoln, 1990; Reason, 1994). As Pearce (1993:31) has posited:

'A hermeneutic process of ongoing inquiry is a flow, seeking an evolving understanding of meaning in a cyclic re-evaluation of its own conclusion'.

Hermeneutics does not discount the value of scientific data or knowledge, but questions the positivist’s assumptions about what can be learnt, the nature of data and the relationship between the researcher and the data (Rogers, 1996). Rogers (1996) has argued that the alienation of stakeholders from exercising this power of interpretation, as is the case in positivist research, is tantamount to constraining the understanding of the realities in the social system. Involving stakeholders in the critical interpretation of their own reality means placing the content of human knowledge and actions into context (Bawden, 1995). This therefore has the potential of leading to a ‘better’ understanding of their own situations. This is similar to using hermeneutics as critical interpretive inquiry to enable participants to generate critical knowledge about their practices and lives (Guba, 1990). This introduces critical thinking into the hermeneutic process (Rogers, 1996).

3.3.3 Critical Theory
That interpretation of reality is always clouded by the normative context (beliefs, values, norms, power relations) of the interpreter has been noted by many critical theorists like Berger and Luckmann (1966) Kuhn (1970), Friere (1972), Mingers
(1980), Flood and Jackson (1991), and Hall (1994). Interpretive science has been criticised for ignoring the context of learning or not questioning the contextual validity of 'correctness' of interpretations (Morgan, 1982; Lather, 1986; Flood and Jackson, 1991). This critique of constructivism or interpretive science came with the understanding that the research context has consequences for how people interpret their realities (Maturana and Varela, 1988). This has brought to the fore the need to question the interpretation in relation to the context, as a way of exposing contextual issues that predispose particular viewpoints and actions (Lather, 1986; Brookfield, 1987). This process of making explicit the political and ethical basis as well as the socio-political implications of knowledge and actions, lies in the domain of critical theory (Freire, 1974, Mezirow, 1981; Reinharz, 1992). The relevance of critical theory to this research therefore lies in its focus on the political, ethical, and moral implications and responsibilities of this research and development process.

Critical theory can be seen as framework for questioning beliefs, assumptions, interests, policies, languages and metaphors used in describing and interpreting phenomena, options and our very way of living (Freire, 1974; Mezirow 1983, Brookfield, 1987). This is a conscious effort at making science self-reflective and having socio-political and historical contexts openly influencing the construction of realities by stakeholders (Russell, 1991). The critique of the context in interpretation is relevant because it enables people to develop new belief systems with which they can come to appreciate their 'worlds' differently (Vickers, 1983; Hall, 1984). They therefore become emancipated from historical precedence, norms and power relations that has conditioned them to their present views of the world (Friere, 1972; Hall, 1994). This process of critical reflection also empowers stakeholders to put what they learn into action (Korten, 1980).

The critical process have been seen as enabling learners to see things differently or change their own assumptions and beliefs about the context, making it possible for them to develop new interpretations to observed phenomena (Mingers, 1980; Morgan, 1982). Vickers (1983) argued that changes in the way people think and see
things come when they change their appreciation of the phenomena under observation. Similarly, people’s worldviews change with their changes in the experience they have with their environment.

![Diagram](image)

**Figure 1 The Recursive Relationship between Experience and Worldviews**

As shown in Fig. 1, reality then becomes a recursive relationship between our experiences and beliefs about nature. The change in paradigm or world view therefore comes when people start to ‘critically reflect’ on their own interpretation of experiences and the forces that predispose them to those interpretations (Mezirow, 1981; Jones, 1991).

### 3.4 Methodology

Participative learning as done in this study is concerned with encouraging farmers and agricultural development workers to (a) generate critical knowledge about their experiences in order to take informed actions to improve their own situation; and (b) to develop the mental framework to be able to collaborate with each other to learn to improve their own situations on a continuous basis. The overall strategy adopted to support participants to achieve this ends included encouraging research-participants to:

- recall and create a rich picture of their own experiences
• interpret these experiences with reference to the lives and other sources of information made available during the learning process
• critically reflect on the knowledge generation process and the knowledge generated with reference to existing beliefs and contextual issues to create knowledge that can be judged as being contextually valid
• use knowledge generated to (a) plan relevant actions; (b) implement these actions to improve the situation; and (c) learn from the learning experience as a way of informing future actions.
• take necessary steps to make this learning process an integral part of the agricultural development effort in the study area.

This strategy is supported by the theories of phenomenology, hermeneutics, critical theory as it involves describing and interpreting personal experiences as well as bringing the learning process and knowledge generated to informed public critique. Further, methodological traditions like action research, experiential learning model, systemic action research and critical learning system provided the conceptual framework for informing and developing the overall research strategy adopted in this study. The importance of the concepts of action research and experiential learning model to this research reflects my intention of linking the theories created by stakeholders with their actions as a means of developing agriculture in the study area. It also stemmed from the importance of engaging stakeholders to actively participate in researching about, and improving their own situations (Russell, 1987). Systemic action research and critical learning systems that emerged from the work of Bawden and Macadam (1989) and Bawden (1995) have also been found to be relevant for this study, because of (a) the focus on systemicity of human activity systems; and (b) the importance of critical dimension of learning to empowerment, emancipatory action and organisational change; and (c) the need to establish a network of critical conversation among stakeholders to enable them learn into sustainable development.
3.4.1 Action Research

Many authors whose works were reviewed including, Kemmis (1981), Carr and Kemmis (1986), Abraham (1994) and Williams (1995), referred to Kurt Lewin as the founder or at least an early proponent of action research. Lewin’s interest was on narrowing the gap between theory and practice in social science. According to Lewin (1951), action research consist of analysis, fact finding, conceptualisation, planning, execution and evaluation. See Figure 2 for Lewin’s representation of the idea of action research.

The tenor of his work on, and with action research was that knowledge generated by social scientists would be more useful if theory and practice inform each other (Lewin, 1951). This view has been echoed by Kemmis and McTaggart (1988:6) who have argued that ‘action research provides a way of working which links theory and practice into the one whole: ideas in action’.

Although the basic idea of maintaining an effective relationship between theory and practice remains an integral part of action research, many other authors argue that action research must focus on a group of people with vested interest in issues under consideration, all who participate in the action research cycle (Whyte et al, 1991; Zuber-Skerrit, 1991; Turnbull, 1993; Fisher, 1995). Action research therefore has a dual goal of improving practical problem situation and the discovery of knowledge about the way people live and act in their own context (Kemmis, 1981). Action research can also be conceptualised as a research methodology in which phenomenological and hermeneutic approaches are applied to society’s behaviour and action by engaging individuals in society to describe and interpret the meaning they attach to their own social theories and actions (Guba and Lincoln, 1989; Rogers, 1996; Russell, 1991; Pearce, 1993). While there are several definitions of action research, the common idea that flows through all of them is the process intertwining theory and practice through a conscious and deliberate spiral of cycles of action and research. Kemmis and McTaggart (1990) have identified four processes; planning, acting, observing, reflecting. This underpin the importance of linking theory with
action as a continuous process of knowing and doing (Carr and Kemmis, 1986). Dick (1993) provides a general description of action research as 'an action to bring about change in some community', and as 'research to increase understanding on the part of the researchers and the client'.

Figure 2: A Representation of Lewin's Action Research Cycle
(Source: Kemmis, 1981)
Action research also focuses on supporting people to be as critical about their actions as they are of their social theories. Kemmis and McTaggart (1988:24-25) describe action research as a process 'that involves people in making critical analysis of the situations in which they work', and as a process that 'establishes self-critical communities'. Similarly, Whyte et al (1991) view participatory action research as a process of enhancing local people's awareness and empowering them into action, while Argyris et al (1985) defined action science as a process in which professionals act and reflect on (a) what they do; (b) how they do it; and (c) why they do it. Chambers (1997:108) also has also argued that action research approaches 'have challenged established interests, whether professionally (raising questions of values, knowledge and how we learn) and politically (raising issues of exploitation, equity and how we change)'. The implication here is that, individual actions and knowledge become understandable or more meaningful when seen in their historical, socio-political and ideological contexts (Parlett, 1981). This reflects the importance of being critical in action research projects (Carr and Kemmis, 1986; Kemmis and McTaggart, 1988).

Table 1 Habermas' Three “Knowledge-Constitutive’ Interests

<table>
<thead>
<tr>
<th>Interest</th>
<th>Knowledge</th>
<th>Medium</th>
<th>Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical</td>
<td>Instrumental (causal explanation)</td>
<td>Work</td>
<td>Empirical-Analytical (natural sciences)</td>
</tr>
<tr>
<td>Practical</td>
<td>Practical (Understanding)</td>
<td>Language</td>
<td>Hermeneutic or 'interpretive science'</td>
</tr>
<tr>
<td>Emancipatory</td>
<td>Emancipatory (reflection)</td>
<td>Power</td>
<td>Critical Sciences</td>
</tr>
</tbody>
</table>

(Source: Carr and Kemmis, 1986: 136)

Carr and Kemmis (1986), influenced by the work of Jurgen Habermas of the Frankfurt school of critical theorists, have argued a case for the emancipatory interests of action research. Habermas (1984) has submitted that knowledge is not
merely produced for its own sake but is an outcome of human activity motivated by needs and interests or the ‘knowledge-constitutive interests’ as shown in Table 1. He was of the opinion that three distinct but interrelated areas of humans social existence (work, interaction with others and power) guide the way knowledge is constituted in human activities (Carr and Kemmis, 1986).

According to Habermas (1971), ‘humans approach knowledge with an orientation towards technical control, towards mutual understanding in the conduct of life (practical) and towards emancipation from seemingly natural constraints (Habermas, 1971:31). Habermas, however, considers progress in technical knowledge to be constrained by the passive nature of positivism because detached objective ideas alone cannot guide action. Similarly he has argued that interpretive science is not a sufficient basis for knowledge and action because the subjective meanings attached to phenomena by people, are also influenced by the context (ideology, culture, politics, history, etc.). As has been stated by Carr and Kemmis (1986:135), the context can limit ‘both the scope of individual’s intentions and the possibility of their realisation’. It follows that achieving the very disposition for researcher and clients to plan and act, observe and reflect in an action research project, goes beyond the narrow concerns of acquiring ‘knowledge of the objective framework in which communication and social action occur ‘(Carr and Kemmis 1986:136).

Carr and Kemmis (1986:184) also argue that thought and action by individuals arise from practice in a particular situation and in a society. In follows that action research can be viewed as a dialectic relationship between two pairs of entities: (a) theory and practice; and (b) individual and society. The tenor of their writing is that ‘theory and practice are socially constructed and historically embedded.’ Consequently, what is known and done by an individual in a particular socio-historical context needs to be resolved by a ‘self -critical community of action researchers’, in order to address how the situations are constrained, and to explore how they can be changed to allow for action and social theory formation (Carr and Kemmis, 1986). This places
knowledge and actions in historical, socio-political, ethical, and ideological contexts (Carr and Kemmis, 1986).

This dialectic relationship between learning (theory and action) and the context of learning can also be understood in terms of Habermas 'communicative action', Friere's concepts of *conscientisation* and praxis, Mezirow's idea of perspective transformation or Bawden's critical learning systems. The work of these critical theorists involves learners becoming critically aware of how their beliefs about their worlds, their way of thinking, seeing and acting, can constrain their development. Freire (1972) for example has noted that an uncritical learning process has the potential for generating de-contextualised interpretation of reality, leading to 'false consciousness'. Habermas (1984) was also concerned about dialogue between stakeholders in seeking mutual understanding or 'grounds' for which particular actions should be undertaken to improve social phenomena. In doing that stakeholders call into the conversation the content and context of their knowing and actions. In proposing the concept of critical learning systems, Bawden (1995) has argued that the description and interpretation of realities by stakeholders should be organised and implemented as 'critical conversations' that deal with the content, process and context of learning. In this way action researchers and adult learners are able to explore not only the ways by which specific issues and problems can be addressed, but also focus on how best to live better by challenging themselves to understand how existing power relations affect how they know and act. This process of critical learning is therefore the disposition to investigate the social, political and moral environments in which knowledge generation and action are taking place to achieve critical consciousness and emancipatory action (Habermas, 1984).

3.4.2 Experiential Learning Model

The experiential learning model described by Kolb (1984) is a process in which individuals generate knowledge from their own experiences to inform future actions. Bawden (1995:11) views it as a *flux of mutual interaction between finding out and taking action*. The main focus of experiential learning as defined by Kolb (1984) is
to learn to create knowledge through the transformation of experience. Knowledge generated therefore becomes the personal construct of the individual. However, a group of people can use the experiential learning model to generate propositional knowledge (social constructs) that is grounded in experiential and practical knowledge of all the subjects in the inquiry to inform future action (Jackson, 1993).

As interpreted by Bawden and Macadam, (1990:147), when used in group situations, experiential learning involves participants in the following processes:

- Developing a holistic view of a problem and its context and avoiding prematurely defining a problem. To do this, the researcher develops a rich picture of the situation by using diverging techniques such as brainstorming and through discussions with a wide range of people involved in the situation.
- Reflecting on the situation and from this recognising linkages and developing patterns and themes. The outcome of this is explanations, hypotheses and theories.
- Selecting items worth pursuing or planning with stakeholders as a means of overcoming problems, and
- Undertaking actions to test plans and being prepared to modify plans to accommodate needs as required.

I have come to understand experiential learning as a process in which individuals or groups of people ‘find out’ to ‘take action’ to change social reality (Heron, 1989). Experiential learning can also be conceived of as a process by which experience and insights are transformed into meaning. It is an individual process of inquiry for action for adaptation that can be seen as a recursive relationship between changes in the world of concrete experience that is sensed, and the abstract world that is conceptualised (Bawden, 1995).

### 3.4.3 Action Research and Experiential Learning Cycle Compared

The basic ideas involved in Lewin’s action research model and Kolb’s experiential learning model were recapitulated by Zuber-Skerrit (1991). The process of action
research is seen as spiral of cycles of action and research which are executed in four phases of planning, acting, observing and reflecting, which may lead to the identification of new problems for which new plans, actions, observations and reflection are repeated (Kemmis and McTaggart, 1988). This is a process of creating shared meaning about specific social situations through the study of deliberate change to the situation. It therefore leads to the creation of new experience about which new knowledge is generated (Kemmis and McTaggart, 1988), and new actions indicated. Kolb’s experiential learning model involves individuals using immediate concrete experience as the basis for observation and reflection, to form abstract concepts, theories and designs that can be tested in new situations.

Action research focuses on social action to improve problematic situations and the research is a conscious effort at formulating concepts that can be tested (Kemmis, 1981). Experiential learning on the other hand is a process by which experience and insights are transformed into meaning or individual knowledge based on personal experience that may be tested by the learner. Learning in action research therefore starts from the conceptual and extends to the sensual domain of the learning spectrum, while that of experiential model can be seen as starting from the sensual and extends to the conceptual (Bawden, 1995). An action researcher then is a ‘reflective practitioner’ while an experiential learner is a ‘reflective learner’.

Action research is also committed to involving a group of people in collective planning and action (Kemmis and McTaggart, 1988; Zuber-Skerrit, 1991). It is practical task oriented (as distinct from mere learning) in that the knowledge generated using personal experiences gained from acting is transformed into theory that then goes to inform social change. Knowledge generated in the experiential learning process can be construed as personal constructs that are validated by an individual learner whilst that in action research needs to be validated by ‘members’ of the ‘self-critical community’ involved in the action research project (Carr and Kemmis, 1986; Zuber-Skerrit, 1991). This shows the critical elements of action research process with the intent of empowering learners to be able to understand and
be able to do something to improve their own social situations (Carr and Kemmis, 1986; Whyte et al, 1991). Theoretically, the political action⁴ of organising people to learn for social action that is inherent in action research, is not explicit in the experiential model. The summary comparison of the experiential learning model and action research is as shown in Table 2.

Table 2  Comparison between Action Research and Experiential Learning

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Action Research</th>
<th>Experiential Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who is involved?</td>
<td>Group of people</td>
<td>Individual/Group</td>
</tr>
<tr>
<td>Process of Learning</td>
<td>Conceptual to Sensual</td>
<td>Sensual to Conceptual</td>
</tr>
<tr>
<td>Purpose</td>
<td>The disposition is for doing'</td>
<td>Meaning for adaptive action</td>
</tr>
<tr>
<td></td>
<td>knowing, and empowerment</td>
<td></td>
</tr>
<tr>
<td>Validation of</td>
<td>Subject to public criticism</td>
<td>Personal validation</td>
</tr>
<tr>
<td>knowledge</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It should also be appreciated that although the experiential learning cycle has the intent to help people develop their own personal constructs (Heron, 1979), some authors view Kolb’s (1984) experiential learning cycle as an action research model (Zuber-Skerrit, 1991; Jackson, 1993). Zuber-Skerrit (1991: xiii) has argued that ‘action research was first conceptualised by Lewin (1952) and further developed by Kolb (1984), Carr and Kemmis (1986)’ and others’¹ Jackson (1993:7) also posited that:

‘The experiential learning cycle is an action research model that can be used to generate knowledge and action in rural development context’.

It is however worthwhile to note that action research has an intent of socio-political action aimed at improving a social system while learning from such action (Carr and Kemmis, 1986; Kemmis and McTaggart, 1988) as opposed to the intent of learning

⁴In practice research participants using the experiential model can use it to achieve socio-political change if so desired.
from personal experiences which is associated with experiential learning (Kolb, 1984).

Figure 3 The Experiential Learning Cycle (Kolb, 1984)

Figure 4 The Experiential Learning system (After Bawden, 1995)
The idea of experiential learning was given a systemic and epistemic dimension by systems scientists in the School of Agriculture, University of Western Sydney, Hawkesbury, Australia, by way of their proposed systemic action research and critical learning systems approaches (Bawden and Macadam, 1989; Bawden, 1991; Bawden, 1995). These developments introduce not only the systemic nature of the various phases of experiential learning as a human activity system, but also the critical dimensions of knowing and social knowledge into the learning process.

3.4.4 Systemic Action Research.

Bawden et al (1985) have drawn on Kolb’s (1984) experiential learning model and Checkland’s (1981) SSM methodology concept (of informed debate about desirable and feasible changes in complex human activity systems) to develop the concept of systemic action research. This concept impels stakeholders to be involved in ‘finding out’ and ‘taking action’ about ‘soft’ human issues in system terms (Bawden et al, 1985). According to Bawden (1997b:12), the ‘focus is on the application of systems principles to sets of human activities that need to be accomplished to result in the improvement of a complex and ‘messy’ situation’.

As shown in Figure 4, the original learning cycle of Kolb (1984) became constructed into an experiential learning system with observation, planning, reflection and acting as sub-systems of it (Bawden, 1995). The learning process becomes systemic instead of being systematic, with the emphasis shifting from the original idea of the cyclic process of ‘finding out’ and ‘taking action’ to a recursive relationship among the various sub-systems which mutually influence each other. The intention of the model is to enable learners to conceptualise and operate at any part of the system while being conscious of the mutual influence among the various sub-systems (Bawden, 1995). The experiential learning system therefore deals with the recursivisity of four profoundly different but interrelated subsystems of the inquiry system.

The assumption here is that the process of inquiry can be organised as a system of inquiry to find out about improving the basic relationship between people and their
biophysical and socio-cultural environment while learning about how this relates to their own practices and experiences (Bawden, 1991, 1997a). This present research project involves different people with different ways of knowing. The appropriateness of systemic action research model to this study therefore lies in its emphasis on tracing and improving the interrelationships between the various ways of learning.

3.4.5 Critical Learning System

Kitchener (1983) has developed a three level model of cognitive processing:--cognition, metacognition and epistemic cognition. He has argued that these three cognitive processing levels account for complex monitoring when individuals are faced with ill-structured problems. He posited that, at the first level (cognition), individuals can engage in primary tasks of reading, computing and problem solving. At the metacognitive level the individuals are able to monitor their own progress when engaged in the first order tasks. At the epistemic level, the individual reflects on the assumptions that influences their understanding of issues and problems.

Bawden (1995) has drawn on this discrimination among the three cognitive levels to further develop the concept of systemic development into that of critical learning systems. He has proposed that the discourse to create meaning to direct meaningful actions for change in the human activity systems can be conceptualised as a 'three-order' system of inquiry; learning system (to learn about the matter to hand), meta-learning system (to learn about learning) and epistemic learning system (to learn about beliefs held about both knowledge and the process of learning): the notion of critical learning systems (Fig 5). He has posited that:

'...even as we go about learning about the matter to hand, we can also be learning about how that is being learnt (referred to as meta-learning). Equally, while we are engaged in these two levels of inquiry we can also be learning about the sort of philosophical foundation of world-view (referred to as epistemic learning) Bawden (1997a:4)
Figure 5  A Nested Hierarchy of Inquiring Systems
(Modified after Bawden, 1995)

This makes the research process both critical and systemic. This concept of interacting hierarchy of learning systems is of particular significance to the study of human activity systems like agriculture because of its potential for enabling stakeholders to appreciate the holistic perspective about their practices (farming and agricultural development work) and the situation in which these practices are taking place with regard to what they do and how they do it while recognising the related contextual assumptions (Bawden, 1991). In other words, stakeholders become engaged in the reconstruction of their abstract thoughts and theories (a) with their expectations and beliefs; and (b) with their everyday experiences and practices while trying to achieve mutual understanding about what needs to be done to improve their own situations.

Argyris and Schon (1978) have also expressed the importance to adult learning and organisational development, of learning at different cognitive levels. They proposed that individuals in an organisation can learn to improve their knowledge and practices within the context of existing norms and values—‘single loop learning’. Single loop
learning appears to be synonymous to the experiential learning model proposed by
Kolb (1984). Argyris and Schon (1978) further argued that the individuals can also
learn at a higher level of conception to question and learn about existing norms and
values within which learning and action are taking place and to design new working
strategies- ‘double-loop’ learning. This concept of ‘double-loop’ learning appears to
combine Bawden’s concept of meta and epistemic learning.

The implication of this concept is that in addition to reflecting, observing, planning
and acting, learners need to learn about the learning process (meta learning) and the
beliefs about the context that inform what is known and the learning process
(epistemic). Bawden (1993) has also equated organisational learning to critical
learning systems and defined it as 'inquiry-for-action which embraces and integrates
"learning" (knowing what), "meta learning" (knowing how) and ... ."epistemic
learning" (believing what). These three levels are therefore seen as interrogating and
contextualising each other.

‘Each “level” of systems in turn interrogates as well as contextualises the
system(s) which it boundaries. In other words the inquirer/researcher learns to
inquire into the methods and contexts of inquiry, as that inquiry is proceeding.
Each “level” of inquiry is therefore open to the influence of the others: Each
can be changed as a result of the outcomes of inquiry at the other “level”.’

What emerges from the ideas of Argyris and Schon (1978) and Bawden (1995) is that
individuals in an organisation should continuously be in search of new metaphors to
describe what they are engaged in as well as new organisational norms and
paradigms that can provide the context for new learning (Argyris and Schon, 1978;
Jones, 1991). Senge (1992) has also argued that it is in a ‘learning organisation’ that
individuals in an organisation can learn to manage the complex, systemic and
dynamic changes that they are faced with on a sustainable bases: the notion of what
Bawden (1995) sees systemic development as the ability of the system to initiate and maintain ‘critical conversation’ among stakeholders. In the words of Bawden (1995), the development process is about establishing

‘...a network of conversation between people learning with and from each other (a) about the organisation itself, its purpose and visions its strategies and culture, its practices and rituals and (b) about the world around them: coherent system of ideas and actions lying within “fields” of other ideas and actions with which they wish to be connected’ Bawden (1995:4).

The focus on critiquing the beliefs held by learners about their context means that critical learning system shares the critical and emancipatory characteristics of action research. Kemmis and McTaggart (1986) has argued that action research is critical because it helps develop a ‘critical community’ of participants who not only search for improvement in their practice in a given context but also act as critical and self-critical agents of those constraints.

3.5 Rationale for Methodology

I consider it appropriate to use the concepts of participative learning which was based on the logic and concepts of action research, experiential learning and critical learning systems because it appears to be relevant to the problematic situation being explored in this study, namely:

- how to achieve beneficial change in food and agricultural production and organisation of agricultural development efforts through collaborative purposeful actions
- how to generate knowledge about the use of participative learning approach from experience gained through its application (‘learning by doing’)
- how to establish the framework within which stakeholders can continue to learn themselves into development even after the end of this particular research involvement.
I would not say that I have used any of these methodological strands in their 'purest' form. What I was concerned with was to use the philosophies, theories and concepts contained in the literature to build an overall methodological strategy appropriate for the research context. The methodology was experiential, as we (the stakeholders and I) were engaged in learning to use 'participative learning' to improve farm production and agricultural development work. At the same time it is an action research methodology as we had the intent of taking actions to improve the problematic situations in food production and agricultural development work. It was also conceptualised as being a critical learning process because the process of learning and the knowledge generated were subjected to public criticism. The methodology is therefore eclectic, with considerable overlap between experiential learning as described by Kolb (1984) and its further transformation via systemic paradigms (Bawden, 1991, 1995) and action research, as described by Carr and Kemmis (1986), Kemmis and McTaggart (1988), Zuber-Skerritt (1991) and Dick (1993). The thoughts of these authors alongside those of critical theorists and adult educationists like Friere (1972, 1974), Vickers (1981) and Mezirow (1990) provided the cognitive guidance for the overall strategy (methodology) adopted in this research.

These methodological frameworks were also relevant to the search for personal improvement as well as improvement in the social activities in which we were engaged at the time; namely: food production and agricultural development. Of particular importance was the emphasis on stakeholder participation and collaboration, action orientation and problem solving, educative and learning orientation, empowerment of stakeholders, ethical defensible and the potential for bringing about change in organisational behaviour to support individual and group learning on a continuous basis.
3.5.1 Stakeholder Participation and Collaboration

Collaboration between researchers and stakeholders, or the participation of stakeholders in the research process, is an important characteristic of action research (Bawden et al, 1985; Kemmis and McTaggart; 1988; Whyte, 1991; Macrurle and Bassey, 1991; Nayaran, 1993; Williams 1995). The nature of action research is one of its strengths because it allows stakeholders to explore the various perspectives held by participants about the social system (Jackson, 1993; Turnbull, 1993). Most action research practitioners therefore seek to create a stimulating and responsible environment in which all stakeholders can express their views and reflect on their own experiences (Russell, 1991; Reason, 1994).

The practice of collaboration is premised on the idea that knowledge and action depend on prior understanding and perceptions of learners (Rowan and Reason, 1981). Group dynamics has the potential of enabling participants to become informed by the various perspectives held about the issues under consideration (Marshall, 1981). This collaboration also means that knowledge generated will better reflect the values and realities of participating stakeholders (Korten, 1981; Dunn, 1984; Chambers, 1997). This is also indicative of greater support for the implementation of results if people involved in the learning process have also to implement the results of their learning (Friedman, 1984; Russell, 1991). The participation of problem owners in the learning process encourages stakeholders to re-perceive and re-construe their own mental images about their practices and situations (Kolb, 1984; Kemmis and McTaggart, 1988). In experiential learning terms, the participation and collaboration of stakeholders in learning has the potential of leading to the personal development of participants (Ison, 1994). When viewed in terms of action research, collaboration leads to the generation and validation of social knowledge through social action: the notion of group decision leading to responsible social change (Lewin, 1981; Bawden, 1995).
3.5.2 Action Orientation and Problem Solving

The various authors reviewed, agree that action research involves actually taking actions to redress real problems in everyday life of human activity systems (Lewin, 1951; Kemmis and McTaggart, 1988; Checkland, 1984; Kolb, 1984; Jackson, 1993; Gilmour and Fisher, 1991; Turnbull, 1993). Bawden et al (1985) observed that action research models are concerned with research as an active process of problem solving where the focus is on action to solve problems that are of concern to stakeholders. This appears to be consistent with Lewin’s (1951) idea of making knowledge meaningful, by always accompanying analysis with action for fundamental social change.

Dick (1993:11) argues that the purpose of action research is to allow stakeholders to develop simultaneously an understanding of the social system and the best opportunities for change. The understanding and empowerment that accompany the learning process encourage stakeholders to become committed to taking agreed actions for improvement (Bawden and Macadam 1989). Ison (1994) observed that meaningful learning is a personal transformation that could lead to change in behaviour of learners. He observed that the improvement or ‘the emergent property of such a system is the capacity for participating individuals to pursue actions for which they have developed enthusiasm’ (Ison, 1994:376).

3.5.3 Educative and Learning Orientation

Experiential learning supports inquiry in which experience is explored, transformed and made meaningful for adaptive action (Kolb, 1984). Action research is also a learning process in which a group of people generate knowledge from the actions that they have taken (Kemmis and McTaggart, 1988; Whyte et al, 1989; Williams, 1995). Some authors (Jackson, 1993; Abraham, 1994) have mentioned that learning through ‘conscious reflection on action and knowledge’ is an inherent characteristics of action research. Whyte et al (1989) mentioned that action research leads to the cognitive transformation of the researcher because of its potential of leading him or her into previously unfamiliar pathways. They posited that during the action research
process, the researcher is constantly confronted and challenged by the experiences of the process and the realities of participants.

'Since PAR leads researchers into previously unfamiliar pathways, involvement in the process is likely to stimulate us to think in new ways about old and new theoretical problems, thus generating provocative new ideas.' (Whyte et al, 1989:537)

The educational function of action research is when the problem owners collaborate to learn about their own situation (Abraham, 1994). According to Kemmis and McTaggart (1988) engagement in informed debate on various themes is a learning process that helps in the transformation of perspective among stakeholders.

The individual’s interpretation of his or her own relationships or realities depends on the worldviews that he or she holds about the context (Hall, 1981; Vickers, 1979; Maturana and Varela, 1988; Bawden 1994). Maturana and Varela (1988) argue that what the individual does, depends on the way he or she thinks and see reality. If development is conceptualised as ‘changing for the better, then it follows that the individuals need to change their ways of thinking and seeing ‘for the better’. What is ‘better’ therefore emerges from the critical social discourse which constitutes empowered development.

The learning and re-educative characteristics of action research make it an appropriate methodology in this context because the study has an objective of creating knowledge about farming and agricultural development work, as well as about the research process. The critical self reflection aspect is therefore viewed as important in helping stakeholders become more informed about their own practices and what could done to improve those practices. It also has the potential for leading to changes in the organisation of agricultural development work in the study area.
3.5.4 An Emancipatory Process

A review of the literature suggests that an action research and critical learning system has the potential to empower participating stakeholders to learn to take action to improve their own situations (Korten, 1980; Kolb, 1984; Kemmis and McTaggart, 1988; White, 1988; Bawden and Zuber-Skerrit, 1991). Ackoff (1974) has attributed this empowerment to the development of self esteem and generation of enthusiasm that accompanied the learning process. This is because critical reflection on knowledge, actions and beliefs leads stakeholders to gain confidence from the examination of change to their social theories and practices in relation to their own context (Brockett, 1988). Encouraging stakeholders to question and reflect on their own process of learning and beliefs about knowledge, leads to critical self understanding, improvement in self esteem and acceptance of personal responsibility (Ison, 1994). Empowerment associated with learning is therefore reflected in stakeholders’ increased ability to influence processes that affect their decision making-process (Arendt, 1970). This has to do with encouraging stakeholders to learn to explore, assert their own realities and take informed development decisions (Fisher, 1995).

Action research and the critical learning systems approaches would also enable stakeholders to question and confront historical and socio-political issues that predispose them to current ways of thinking and doing things. Friere (1974) was concerned with false consciousness. He argued that the prerequisite of emancipation or transformative development lies in the development of critical awareness and practical involvement of actors in the learning process. Participative learning, based on the ideas of action research and critical learning systems, can help stakeholders to be ‘emancipated’ from assumptions about their context which could lead them to set new priorities, organisational norms and develop new strategies to do things different into improvement (Argyris and Schon, 1978).
3.5.5 Ethical Defensibility

According to Freire (1974), the ethical basis allowing adult learners to participate in dialogue is to give opportunity to problem owners to interpret their own world in order to change it. This view is shared by Turnbull (1993) who used action research to facilitate improvement in the Australian Lamb industry. He indicates that;

"The ethical base of using action research on intervening into the Australian Lamb Industry was to take a stance to empower people to take action on their own situation rather than manipulation of the individual for the sake of the system" (Turnbull, 1993:15).

It is understood that research results have both social and political implications for the researched and the researcher (Carr and Kemmis, 1986; Lather, 1986; Reinharz, 1992). The stance taken in action research is that the correctness or the validity of what is ‘right’ to be explored or done in the name of development is achieved through a social discourse established between concerned stakeholders (Guba and Lincoln, 1989; Tandon, 1981). This is consistent with the notion of encouraging stakeholders to develop into being through praxis instead of being manipulated for interest of the politically powerful in the social system (Freire, 1974; Chambers, 1997). This is because action research leads to self disclosure by the researcher and the researched and shared decision making by all stakeholders (Lamport, 1985; Reinharz, 1992). By seeking to actively involve people in the generation of knowledge about their own situation, action research and critical learning systems provide suitable frameworks within which stakeholders can confront and address the historical, socio-political implications of their knowledge and actions. The focus is on changing the way people (a) see their lives; and (b) live their lives, by facilitating the process of self-reflection for deeper understanding, instead of persuading them to accept and adopt values transferred to them by researchers.
3.5.6 Change in the Organisational Behaviour

The goal of this research is not to design any set of arrangements, which development in the social system can follow, but to institute a process of continuous change through critical learning by stakeholders (Milbrath, 1989). This involves moving beyond the need to uncover the immediate needs of stakeholders and how to improve the situation. Rather it is about questioning the historical and political bases of knowledge and action as a way of changing the condition in which people live and work on a sustainable basis (Rienharz, 1992; Ison, 1994). Rienharz (1992) observed that action research can be used to inform political action to make sure that policies are put in place to ensure that changes observed through the action research process, are carried out and reviewed in accordance to changes in the environment. Similarly organisational learning and critical learning systems support the questioning and structuring of beliefs held by stakeholders about both social and political relationships in their organisations. Stakeholders are therefore encouraged by these learning models to learn to improve the institutional context or the politics of the practices and to participate in learning to design a new development strategy that has learning as its focus: the notion of critical learning systems in which stakeholders are involved in ‘critical conversation’ about their own development (Bawden, 1997a).

3.6 Methods

This thesis is made up of four distinct but interrelated learning projects; exploratory survey, village level learning, district workshop, and evaluation of learning. The methods or specific techniques adopted to collect data are described as part of the learning done at each of these phases (Chapters 4, 5, 6 and 7). Suffice it to mention here that the emphasis of these methods was on involving and encouraging stakeholders in (a) the description of their situation; (b) learning about their own situation; (c) planning and taking actions; and (d) learning from actions taken for the purpose of improving the organisation and production of agricultural products in the study area.
3.7 Some Previous Studies using Action Research

Action research has been used by several researchers and development practitioners to research into and to improve agriculture and rural situations (Maclure and Bassey, 1991; Russell and Ison, 1991; Forbes, 1985; Turnbull, 1993; Williams; 1995; Attwater, 1996). Turnbull used the process of action research based on Kemmis and McTaggart's (1988) cyclic model of planning-action-observation and reflection to involve researchers, extension workers and farmers in the development of the Elite Lamb industry in Australia. The focus of his work was on establishing suitable processes and relationships within the lamb industry in Australia. The use of action research in this context was found to help (a) sustain and develop the working relationship between people and organisations involved; and (b) to encourage the use of existing industry skills, knowledge and institutions to enhance information exchange and actions to the benefit of the industry.

Checkland's (1981) Soft System Methodology (SSM) had also been applied in the context of catchment management in a province of Thailand by Attwater (1996). In this case the process of participatory inquiry based on SSM was used to draw upon locally legitimate relationships between stakeholders while focusing upon activities which support local livelihood. What was evident from this study was the realisation by participants that sustainable management of catchment resources (soil, water and forest) lies in the ability of the development agency representatives and the communities to develop structures to support collaborative learning.

The success of participatory learning recorded by Rhoades (1984) and Horton (1991) with potato farmers in Peru, and participatory action research by Maclure and Bassey (1991) with small holder farmers in the Republic of Togo, West Africa have highlighted the ineffectiveness of the dominant top-down technocentric approach to agriculture development in the context of small holder farmers. Maclure and Bassey (1991) noted that the technocentric approach failed to address farmers' problems because the underlying assumptions on which researchers develop technologies are
not subjected to contextual criticism. They noted that 'the underlying assumptions of previous research, “that major changes in traditional storage methods were required to improve grain storage”, had never been fully verified (Mac lure and Bassey, 1991:190). The improved grain storage systems designed for farmers by researchers, based on these researcher experiments, were not accepted by farmers. However, later attempts using participatory action research were accepted and adopted by farmers. Another outcome of that research is the need for the ‘power’ centres to agree with and participate in the process. This is important for the reorientation of existing socio-political relationships to support the collaboration and participation of all stakeholder groups.

Action research was also used as a working strategy for improving forest resources management and utilisation in Nepal under the Australian financed Nepal-Australian Community Forest Project (NACFP) (Jackson, 1993). The forest resources of Nepal have been managed by government bureaucracies since 1957 (Sriskandarajah et al, 1996). However, Fisher (1993) has observed that the top-down approach to forest resources management adopted under this regime mitigated against constructive forest management strategies. The focus of NACFP was on bringing the villagers, who are the users of the forest resources, into the planning and implementation process (Gilmour and Fisher, 1991). Similarly, Sriskandarajah et al, (1996) described a project in which SSM (Checkland, 1981) was used to improve the management of forest resources in Kerala, India. The emphasis of this work was on the forest users becoming the focus for developing appropriate management strategies: the notion of people-centred development (Korten, 1980). The main lesson learnt from the success of these two forest management projects was the need for development agents to change from a ‘policing’ role to embrace the ability to empower local communities living in, and depending on the forest resources to genuinely participate in the management of these resources.

Russell (1991) also reported an action research project that involved working directly with pastoralists north of the city of Broken Hill, in the semi-arid region of New
South Wales in Australia. The objective was to establish a scientific dialogue among pastoralists to empower them to identify their own enthusiasm for taking action. Through this process, it was also expected that these groups would ‘constitute “user-initiated R&D groups” responsible for the generation, management and subsequent evaluation of action designed to benefit themselves as pastoralist community’ (Russell, 1991:134). This concept of stakeholders becoming their own researchers is consistent with the idea of the ‘emancipatory action research’ in which the researcher become only an initiator of the process (Zuber-Skerrit, 1991).

In the case of Russell’s research, the process ignored existing traditional institutional structures for research and development. This is in contrast to the work of Fisher (1993), Gilmour and Fisher (1991), Maclure and Bassey (1991), and Turnbull (1993) in which they engaged all stakeholders including representatives of related development institutions in the learning process. This concept might be of limited value in situations where formal development organisations have considerable influence on decision making process of participating communities. In such cases engaging all the stakeholders in the learning process might be an effective way of confronting and addressing existing power relations and other socio-cultural influences.

3.7.1 Farmer-Participation in Agricultural Development in Ghana
Most examples of farmer-participation in agricultural development in Ghana were with FSR&D projects that were initiated by CSIR and MOFA. Farmers were mainly consulted in the diagnosis of their problems which then enable the researchers to develop technologies to solve the problems for them (CRI, 1990; Magrath, 1995). They were also involved in the on-farm testing of these technologies. One of the major FSR&D projects undertaken by CSIR was the CIDA sponsored Grains and Legumes Project in which farmers collaborated with farmers in testing varieties of grains and legumes as well as farm management practices. Another example of farmer involvement in the development of agricultural technology was the ODA/LGB project that was undertaken in conjunction with the Crop Services Department
of MOFA in the Volta Region. See section A 7. 6 of Appendix 7 for summary of activities carried out by the ODA/LGB project in the Volta Region of Ghana.

The various research institutions of CSIR also collaborate with various subject matter departments and the extension department of MOFA to involve farmers in setting up on-farm adaptive research trials and technology demonstration plots. One of the well known on-farm technology development projects, the CIDA/GGDB grains and legumes development project was undertaken by CRI and financed by the Canadian International Development Agency (CIDA). In the on-farm trials carried out by this project, farmers provide knowledge about their problems and resources (land and labour), but the design, analysis and recommendation of what should be done with the results, are determined by the researchers. The need for effective involvement of farmers in the whole process has been identified (Gibbon and Okali, 1993), however in practice technology development and adaptation in Ghana has remained the domain for researchers and agriculturists from the MOFA.

World Vision International, is also trying to involve rural people in their own development (Kumahlor, 1995). However it appears that communities participate in these programs in order to get either farm input and infrastructure development project from this NGO. There is no focus on on-going learning by the beneficial community after the initial input from the NGO.

3.8 Criteria and Strategies for Research Trustworthiness

The purpose of social inquiry is to produce knowledge about the relationship between humans and their worlds to be used in furthering the development of humanity (Goodfellow, 1997). It is therefore necessary for such a knowledge to be judged as valid and reliable (Tandon, 1981) or trustworthy (Guba and Lincoln, 1994). Tandon (1981) describes validity of knowledge as an authentic representation of reality. The question therefore arises as to the strategies to be applied to ensure and to assess the
validity (trustworthiness) of social research (Guba and Lincoln, 1989; Smith, 1990; Higgs and Adams, 1997).

Research in the positivist or empirico-analytical paradigm, reflects a realist ontology which views reality as independent of anyone conceiving it (the researcher and the researched). This realist philosophy therefore supports the 'received view' of what counts as knowledge (Higgs and Adams, 1997). In this perspective, valid knowledge is one that is objectively produced to be capable of being used in predicting the occurrences of 'objectifiable' phenomena (Guba and Lincoln, 1989). Positivists ensure the quality of inquiry by adhering to a priori theories, strict experimental designs, and verifiable statistics computed from quantitative data (Burnard, 1991; Higgs and Adams, 1997). The judgement about the validity of positivist research is in effect a judgement about methodology. Valid studies therefore are taken as those which are procedurally correct. Further, objectivism aims for neutrality and requires a demonstration that a given inquiry is free of bias, values and prejudice for judging goodness (Smith, 1990).

The positivist paradigm employ four criteria as necessary for the credibility of its research (Henderson, 1991).

- Internal validity which is the 'statistical truthfulness' (i. e. the degree to which the results of the inquiry portray the phenomena under study)
- External validity (i. e. the ability of the outcomes to be generalised to similar settings
- Reliability (i. e. the extent to which the research results can be reproduced by other researchers, and
- Objectivity (i. e. how far the outcomes are free of researcher’s subjective biases)

The constructivist paradigm rejects the idea that certitude is possible (Coulson, 1958; Smith, 1990). In this perspective, inquiry is conceptualised as a process in which the researcher and the researched, subject and object, content and context interact to produce an emergent 'reality'. The social knowledge generated from the inquiry
process therefore encompass the various meanings and understandings stakeholders have of the observed phenomena (Krippendorf, 1991). It follows that reality is not only a mere descriptive variation of underlying phenomenon, as the positivists would claim, but embodies contextual meanings attached to these phenomena by beholders. There is therefore no ‘universal truth’ that can be discovered or verified independent of the research participants. Interpretive research therefore adopts a more flexible approach to learning about a social system and it is for reasons of its inherent flexibility that interpretive research is criticised for lacking rigour (Smith, 1980).

Interpretive research is criticised for failing to employ a methodology that is conceptually clear and consistent, for lack of precise descriptions, for embracing the researcher’s biases and for its suggestive rather than definite conclusions, its questionable reliability, and lack of generalisability (Smith, 1980; Guba and Lincoln, 1989; Henderson, 1991). However, Guba (1990) have argued that by emphasising generalisation and the application of universal knowledge to social phenomena, knowledge based on positivist paradigm are unable to be validated by (a) local meaning; (b) value-laden nature of facts; and (c) the interactive nature of the researcher and the researched, and the context of the research. Further, the critical perspective employed in this study also holds that the task of inquiry is to illuminate the meaning of historical processes and bring this knowledge to the practical task of emancipation (Habermas, 1984). This implies that knowledge must be historically situated and can neither assume universality nor timelessness. Smith (1990:175) has pointed out that;

‘The concept of rigour and relevance of an inquiry has no fixed or timeless meaning because they cannot be delineated apart from the actual historical constraints of the inquiry as what is known and how knowledge is obtained are mutually influencing and intertwined within a historical context’.

Differences in worldviews about research methodology therefore necessitated the development of criteria for measuring the credibility of interpretive research, which
differ but parallel the imperial falsification used within positivist inquiry (Reason, 1981; Guba and Lincoln, 1989; Goodfellow, 1997). Guba and Lincoln (1989) have argued that the criteria for assessing the quality of interpretive research are its:
(a) trustworthiness. This encompasses its credibility (replacing internal validity); transferability (paralleling internal validity); dependability (relating to its reliability) and confirmability (paralleling objectivity)
(b) authenticity i.e., fairness, ontological authenticity (improvement in personal constructs), catalytic authenticity (ability to stimulate action), educative authenticity (resulting in enhanced understanding of other people's realities) and tactical authenticity (ability to empower people into action).

Similarly, Goodfellow (1997) talked of the quality\(^5\) of interpretive research in terms of trustworthiness and authenticity. Tandon (1981) has also posited that the validity of an interpretive research depends on its authenticity and the usefulness of such knowledge to stakeholders. This is also similar to Guba and Lincoln's (1994), authenticity criteria of fairness of representation, improvement in the understanding of stakeholders, and the ability for social inquiry to empower participants to take informed actions.

Higgs and Adams (1997) have argued that trustworthiness is achieved when the sources of data agree to honour and recognise the researchers' reconstruction of the data collected. They further argued that the authenticity of an interpretive inquiry is reflected by the degree to which participants' understanding have been represented by the researcher. Guba and Lincoln (1990) also agree by positing that the trustworthiness of a research is achieved when there is a 'good fit' between what the study reports and the context of the inquiry (resonance). In judging the credibility of interpretive research, the focus is on establishing a match between the constructed realities of respondents and the realities as represented by the researcher and attributed to the various research participants (Higgs and Adams, 1997). The validity

\(^{5}\) Validity and trustworthiness appear to be used interchangeably in the literature to describe the quality of interpretive research.
(trustworthiness) in interpretive research is therefore assured by adopting techniques that can help to increase the probability of achieving isomorphism in representation of social realities between the researcher and the researched (Smith, 1997). Some of the strategies for ensuring and verifying the rigour and validity of interpretive research as suggested by Guba and Lincoln (1981, 1989), Smith (1990), and Pretty (1994) include:

- Prolonged engagement with stakeholders in the inquiry in order (a) to allow for personal involvement between the researcher and the researched; (b) to overcome effects of misinformation and distortions; (c) to establish the rapport; and (d) to build the trust necessary to construct stakeholders realities.

- Persistent and parallel observation of the phenomena and its relationships with the context to have an in depth understanding of the elements that are relevant to the problem or issues being pursued.

- Triangulation of sources of information and methods of investigation in order to cross-check on the various perspectives of data especially those of factual nature.

- Extended and extensive discussion of one’s judgement and conclusions with a disinterested peer or people who were not involved in the inquiry (peer-debriefing or peer checking). This is done to explore implicit biases held by the researcher.

- Participants checking or a process of continuously testing hypotheses, data, preliminary categories and interpretation with members of the stakeholder-groups. This is important in establishing and verifying that the constructions collected are those that have been offered by respondents.

- Negative case assessment or a process of revising and refining of working hypothesis until it accounts for all cases explored in the inquiry.

- Analysis and expression of the different perspectives expressed by various research-participants.

- Positive subjective monitoring of researcher: This involve operating a reflective journal on feelings, hunches and methodological decisions taken by the researcher. It also includes introspection and self reflection to account for the researcher’s response to the data collected.
• Impact of the research on research-participants’ capacity to know and act, through demonstrated impact on increased sense of own constructed reality, other stakeholders’ construction, and understanding of various opportunities and possible activities to improve their own situations.

What is evident from the works of the authors reviewed is that validity in interpretive research is achieved through commitment to (a) personal involvement between the researcher and the researched; (b) introspection and critical self-reflection to provide for the research participants’ response to the data and data interpretation; and (c) focusing on relevant problems and opportunities in the context of the study.

3.9 Conclusion

This study involves the integrated use of action research, experiential learning and critical learning systems to improve food and agriculture production in the study area. Based on constructivism and critical systems paradigms, the methodology draws on phenomenology, hermeneutics and critical theory as used in action research and critical learning systems traditions, to facilitate the generation of contextually relevant knowledge to inform farming and agricultural development activities in the Hohoe District of Ghana. What emerged from the literature reviewed, is that all human beings are capable of learning when given the opportunity, or when encouraged to interpret and reflect on experiences that are of importance to their own lives. Action research has been shown through the literature to be a research strategy for facilitating social learning and action.

It was also evident from the literature that the cognitive transformation that is needed for individuals to put knowledge into action comes from the development of (a) deep understanding; (b) self-esteem; and (c) personal fulfilment that comes with their participation in the learning process. Critical-reflection-on-actions generated through the action research and critical learning processes was also indicated as necessary for confronting and changing the worldview of stakeholders and for encouraging
stakeholders to embrace learning as part of the development routine. The process and outcome of such a social discourse was also seen as providing the criteria and strategies for ensuring the trustworthiness and authenticity of data collected and knowledge generated.

The current paradigm of agricultural development in Ghana is based on the dominant ‘mechanistic-product’ approach to development. However, this research has identified the need for critical collaborative learning to enable stakeholders to learn how to deal with the inherently complex and changing situations in the social system. This also means the development of institutional frameworks to support this participative world view. I therefore see the concepts of action research, critical learning system and organisational learning as providing frameworks for stakeholders to learn to develop the mental framework for collaborative learning on a sustainable basis.

The thesis being argued in this study therefore is that ‘participative learning is an appropriate and legitimate way of improving farming and agricultural development work in the Hohoe district of Ghana. It is also conceptualised that the legitimacy and validity of knowledge generated and action taken as a result of this study is assured by engaging stakeholders in the learning process. This thesis was explored by engaging farmers, adaptive researchers and extension workers from the Ministry of Food and Agriculture (MOFA) in learning about their own situations and practices. It was not possible to fully involve researchers from the Council for Scientific and Industrial Research (CSIR). However, the initial exploration of the context of this study (Chapter 4) that explored the views of all stakeholders provided the contextual grounding of the participative learning done (Chapters 5, 6 and 7), was used to solicit views from a cross section of all major stakeholder groups involved in agricultural production in the study area(including staff of CSIR). The evaluation of the learning process and outcomes (Chapter 7) by stakeholders can be conceived as a second cycle of the action research loop in which participants reflected on the process and outcomes of learning and actions undertaken form earlier inputs to plan for future
actions. The study described in this thesis can therefore be seen as a case study of the use of action research informed by critical theory in the context of the smallholder farmer development in Ghana.
CHAPTER FOUR

INITIAL EXPLORATION OF THE CONTEXT OF THE STUDY

4.1 Introduction

This chapter describes the process and outcomes of an initial exploratory survey that I carried out in the study area. The focus of the survey was on exploring the meaning that a cross section of major stakeholders attaches to their lives and practices as farmers and agricultural development workers. This was done through:

- semi-structured interviews with some members of selected households in six villages in the Hohoe district of the Volta Region of Ghana (Map 4 of Appendix 1).
- informal interviews with key informants drawn from a cross section of major stakeholder groups (farmers, staff of MOFA, staff of CSIR, NGOs) working in food and agriculture development. (See Appendix 8 for the names of the key informants I interacted with.)
- Review of ministerial and departmental reports and documents were found to be relevant to this study.

The initial survey was designed to encourage stakeholders to describe and give meaning to their worlds, and thus the two interrelated theories of phenomenology and hermeneutics were relevant to it. These theories were considered relevant, not only because they acknowledge the centrality of the 'subjects of the research' in data collection and interpretation (Burnard, 1991; Pearce, 1993; Rogers, 1996) but also, because it is my understanding that human activity systems, such as agricultural production systems under study, are complex with issues and problems that are socially constructed by stakeholders (Bawden and Macadam, 1989; Guba and Lincoln, 1990). It is therefore impossible to understand them independently of those who are in them. The fundamental submission here is that my singular view (description and
interpretation) of food and agricultural production and its development cannot capture all the 'realities' of all of the stakeholders. A better understanding of the situation as it exists at the beginning of this research input was therefore sought by actively engaging the stakeholders in the description and analysis of their own situations. It was therefore appropriate to work from a theoretical perspective with the intent of encouraging stakeholders to attach meaning to their own worlds instead of trying to discover them as if these 'realities' were 'detached' from the stakeholders who experience them.

The conceptualisation and implementation of this survey is consistent with Checkland’s (1981) view of engaging stakeholders in drawing a ‘rich picture’ of their own situation and the concept of participatory rural appraisal (Chambers, 1993; Pretty, 1995) in which researchers learn about social realities in collaboration with other stakeholders. Reflection on the results of this survey helped in the design of subsequent phases of the research. Further, the results obtained from this exploratory engagement also became enriched by the further insights gained from the subsequent phases of the study.

4.2 The Design and Organisation of the Survey

This survey was designed to generate information about experiences, views, observations and beliefs held by stakeholders with regard to farming and its development in the study area. It was however impractical, in terms of time and logistics, to involve all households in the survey. A stratified sampling procedure was therefore adopted to select respondents from six villages for the study. The selection of the study villages was done in consultation with the district agricultural co-ordinator for Hohoe, while the responding households were selected in consultation with the local FLS and executives of the Ghana National Association of Farmers and Fishermen (GNAFF) at the village level.
4.2.1 Selection of study Villages

Respondents in this survey were chosen from six villages representing six of the existing fifteen sub-districts\(^6\) in the Hohoe. During the selection exercise, the sub-districts were classified according to differences in (a) ecology and (b) accessibility of the various sub-districts to the district capital, Hohoe.

<table>
<thead>
<tr>
<th>Accessibility</th>
<th>Ecology</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grassland</td>
<td></td>
</tr>
<tr>
<td>Relatively Easy</td>
<td>Koloemu, Tafi, Gbi</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Hohoe Central. (2)(^7)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Akpafu, Weto/Have, Logba, Nyagbo, Fodome, (2)</td>
<td>(4)</td>
</tr>
<tr>
<td>Relatively</td>
<td>Ve-Agome</td>
<td>7</td>
</tr>
<tr>
<td>Difficult.</td>
<td>Alavanyo (1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Leklebi, Liati, Lolobi, Likpe.</td>
<td>(2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>

This classification was based on the assumption that differences in the ecology and relative accessibility of a place would have profound effects on the production and marketing of agricultural produce (Vordzogbe, 1988). Areas that fall into the forest and transition zones appear to have higher population than the grassland regions (MOFA, 1994) and differences in population were noted by Fiadjo (1993) to have socio-economic implications for agricultural production (resource availability and use, marketing and consumption of produce). Though there might be other factors that could be used in the classification, these two criteria were regarded as useful in selecting farmers with regard to identified ecological and socio-economic constraints. The distribution of the sub-districts according an ecology/accessibility matrix is shown in Table 3.

\(^6\)A sub-district corresponds to the operational area of a Technical Officer (TO) otherwise known as Front Line Staff (FLS) of Ministry of Agriculture (MOFA). A sub-district can be regarded, in administrative terms, as the basic unit of formal agricultural development in Ghana. FLS have the mandate to oversee agricultural development in their respective sub-districts.

\(^7\) () Represents the number of sub-districts selected from each classification.
Three sub-districts were selected from each of the grassland ecology and forest/transitional areas. One out of the selected sub-districts from each of these ecological areas was regarded as relatively inaccessible. In the next phase of the selection, a village was selected from each of these chosen sub-districts to form the 'survey villages'. The six villages selected from the chosen sub-districts are shown on Table 4.

<table>
<thead>
<tr>
<th>Sub-District</th>
<th>Village</th>
<th>No. of Households Selected</th>
<th>No. of Households Interviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liati</td>
<td>Soba</td>
<td>21</td>
<td>12</td>
</tr>
<tr>
<td>Fodome</td>
<td>Ahor</td>
<td>20</td>
<td>13</td>
</tr>
<tr>
<td>Likpe</td>
<td>Nkwanta</td>
<td>21</td>
<td>11</td>
</tr>
<tr>
<td>Tafi</td>
<td>Mador</td>
<td>20</td>
<td>11</td>
</tr>
<tr>
<td>Alavanyo</td>
<td>Kpeme</td>
<td>19</td>
<td>6</td>
</tr>
<tr>
<td>Logba</td>
<td>Adzakoe</td>
<td>20</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>121</strong></td>
<td><strong>64</strong></td>
</tr>
</tbody>
</table>

### 4.2.2 Selection of Respondents

The survey targeted households instead of individual farmers. This was done to help inquire into household structure and organisation in relation to farming activities. The responding households were selected using house numbers\(^8\). The households drawn became the survey household and the head of that household was regarded as the principal respondent. Most of the heads of households were men, however, there were a few cases where female heads of household were identified. These women were either unmarried, abandoned by polygamous husbands, divorced or widowed. These women therefore make their own decisions with regard to resource allocation, production and utilisation of produce without reference to any male partner or

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\(^8\)The houses in most of these villages are not normally numbered. However they were temporarily numbered at time for registration of voters for the 1996 presidential and parliamentary elections.
relative. Efforts were also made to get a balanced view from both males and females by interviewing wives and husbands together and by having informal discussions with women selected at random from the villages.

About 121 households were initially selected for the survey but only members of 64 households were interviewed (Table 5). The selected households were given prior information about the purpose and time of the survey, but in certain cases, members of selected households were unavailable at the time of the survey. However, the main reason for the contraction in the number of ‘respondent-households’ was because of the ‘theoretical sampling technique’ adopted in the interview (Douglas, 1985). This meant that themes and perspectives were sampled instead of respondents (Burnard, 1991). The themes that emerged from the conversation, were further explored in subsequent interviews for similarities and contradictions.

Interviews in each village were ended if the themes and perspectives being narrated by respondents begin to recur from household to household. For example, in Alavanyo Kpeme, the last village visited, interviews were stopped after the team talked with only six households because the themes, issues and problems identified and the interpretations being given to them at the time were similar to those given in by respondents in the previous five villages. In other words, the interviews were stopped when data collected reached the point of ‘theoretical saturation’ (Douglas, 1985; Henderson, 1991). The number of respondents was therefore not important in this study. What was important was the specific issues, perspectives, perceptions and explanations given by stakeholders at the time of the survey.

4.2.3 Training of Enumerators

This survey was carried out by four enumerators including the researcher. The other three enumerators were drawn from the Policy Planning Monitoring and Evaluation Department (PPMED) of MOFA and Crop Services Department (CSD). We all had previous experiences in carrying out structured agro-economic surveys but had never tried our hands at semi-structured interviews or studies that require learning with or from respondents. A three-day training session was therefore organised at which we
developed and tested an interview guide for the study. The first day’s session was attended by the District Crops Services Officer for Hohoe, the District Agricultural Extension officer for Hohoe and a representative from the Ghana National Association of Farmers and Fishermen (GNAFF) office at Hohoe. The purpose was to draw on the experience of these people to prepare a tentative interview guide. The initial guide that was drawn contained suggested questions on demographic background, resources and resource use, farm practices, social relationships, ecology, yield and problems that farmers face in their day to day farming lives (Table 5). On the second day this schedule was tested by interviewing 10 farmers selected at random from two Fodome villages (Hloma and Helu) in the Hohoe district

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Some areas Explored</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demography</td>
<td>Age, gender, resident status, educational level, labour use and availability.</td>
</tr>
<tr>
<td>Agricultural Production</td>
<td>Agricultural commodities, size and distribution of holdings, cropping pattern, farming practices and farming calendar.</td>
</tr>
<tr>
<td>Resource Availability and use</td>
<td>Land tenure arrangements, labour use, use of purchased input, credit availability and use. Agricultural technology use.</td>
</tr>
<tr>
<td>Household Economy</td>
<td>Management of resources, sources of income and food for the household, sales and consumption of agricultural products.</td>
</tr>
<tr>
<td>Social, culture, politics</td>
<td>Effect on resource and resource use, village administration agricultural development.</td>
</tr>
<tr>
<td>Technology</td>
<td>Farm practices and adoption of researcher recommended practices</td>
</tr>
<tr>
<td>Problems and expected interventions</td>
<td>Problems that farmers feel is affecting their activities and how they have been dealing with them or expect to deal with them.</td>
</tr>
</tbody>
</table>
Pre-test surveys were used to obtain data for estimating the validity of the interview schedule based on the specific objectives of the study (Fiadjo, 1993). However in this case, the pre-test survey was used for the purposes of testing our understanding and use of the interview guide as used in semi-structured interviews. The pre-test survey showed that the interview schedule could not cover all the topics that were of concern to all respondents. This brought to the fore the need to continuously modify the interview guide to take care of emerging themes and views (Burnard, 1991). This implies that the interview team need to sample the themes and interpretations that emerged from discussions with farmers and elucidated them by seeking views on them from the various respondents (Douglas, 1985).

4.3 Data Collection and Analysis

The data collection and analysis took place between February and April 1995. Data was collected by way of semi-structured interviews. The research team moved as a group from village to village under the guidance the researcher. The enumerators worked as two pairs. One member from each pair had the responsibility of taking detailed notes of all discussions with respondents. All interviews were also audio-taped for cross-checking purposes. Some data was also collected from key informants from the villages, MOFA, MIST and other secondary sources.

4.3.1 Semi-Structured Interview

The semi-structured interview (Spradley, 1979; Henderson, 1991) was the main method used in collecting data from respondents in the study villages. In these interviews, the interview guide was prepared based on discussions held with the staff of MOFA, the executives of GNAFF and farmers who participated in the pre-test survey, carried out as part of the training for the enumerators. The guide was however modified as different themes and perspective became unearthed during the interview process. (See Appendix 5 for an example of the interview guide used in the exploratory survey). One interview guide was used for each respondent or group of respondents (where other family members participated in the interview). This allowed the enumerators to make specific notes on individual interview sessions. During the
interview, open ended questions were used. An example of such question was; "What are your thoughts about the rainfall pattern in this village?" According to Spradley (1979) open ended questions are preferable to specific questions, as they allow the respondent greater freedom to express their thoughts and beliefs about topics under discussion. The interviews therefore followed the narration or themes that are of importance to respondents. The research team also made use of 'minimum prompts' like 'yes', 'go on' etc. and reflection (repeating the last few words used by respondents) to encourage respondents to develop their story lines without being influenced by leading questions from the researchers (Heron, 1989; Burnard, 1991).

The recorded tapes were transcribed at the end of each day's interview. This enabled us to note new themes and the different views expressed by respondents. These emergent themes and views were used to modify the interview schedule for subsequent interviews. In other words, they helped us to sample new cases and themes for further investigation: the notion of theoretical sampling (Henderson, 1991; Llewellyn, 1997). As the survey progressed from household to household and from village to village, the descriptions and interpretations became repetitive. Interviews were ended when no new themes or perspectives appeared to be emerging. According to Douglas (1985), the need to keep on interviewing people existed until one stopped getting new information and started to see the same issues emerging over and over again.

4.3.2 Key Informant Interviews

Key informants in the context of this study were individuals who were selected to give 'specialised' information on certain aspects of the farming and the agricultural development work being done in the study area. These key informants included farmers, researchers from the Council for Scientific and Industrial Research (CSIR) and staff of MOFA. They provided in-depth information about what they saw as occurring in their individual situations. The key informants were also involved in reviewing some of the instances of data gathered from the semi-structured interviews. This was done to help in investigating the properties and dimensions of the various issues identified by respondents. A list of the key informants interviewed during the course of this study is provided in Appendix 8.
Village key informants were suggested by the villagers and local FLS. They were normally old men and women who had spent most of their lives farming in the study villages. They gave valuable information on the changing face of farming in the villages and the role of existing socio-political structure (kinship, marriage, religion, political organisation) in agricultural development in the villages.

The key informants from government agencies were selected based on the positions they occupy in their organisations. Staff of the various government agencies interviewed include:

- MOFA Regional heads of department, Volta Region, Ho
- District Agricultural Co-ordinators for Ho, Kpando and Hohoe districts
- Research Officers from CRI and SRI
- Directors of DAES, CSD and Animal Production of National Offices of MOFA, Accra.
- GNAFF Executives, Ho and Hohoe
- Project management, ODA/MOFA LGB Project, Ho.
- The Project Officer (Agriculture) of World Vision International, Volta Region Ghana, Ho.
- Monitoring and Evaluation Officer of SCIMP, Kumasi.
- Project Officers of the Barclays and Agricultural Development Banks in Hohoe.

These informants provided information on the structure and operations of their various organisations. They discussed their working relationships with farmers and other organisations involved in agricultural development and also expressed their views on the problems being faced with smallholder farmers in Ghana.

4.3.3 Collection of Secondary Data

Few sources of secondary data existed on the state of agriculture in the Hohoe district at the time of this study. Those that were available included studies carried out in the Volta Region by the World Bank sponsored Volta Region Agricultural Development Project (VORADEP), SCIMP (Volta Region reports) performance records of
Sassakawa Global 2000 project, departmental reports of MOFA, meteorological reports from the meteorological services department, and marketing reports from Farmers Services Company (FASCOM), Hohoe. These were assessed, cross-checked and, where possible, discussed with schedule officers.

At the regional and national levels, information was sought at the Ministry of Finance and Economic Planning, Ministry of Trade, Ghana Statistical Services, Council for Scientific and Industrial Research (CSIR) of Ministry of Science and Technology (MIST) and MOFA. Information was also obtained from non-governmental organisations like the World-Vision International and the British Overseas Development Assistance (ODA) Larger Grains Borer Project both at Ho. Information was also sought from the head office of IFAD Smallholder Credit, Input Supply and Marketing Project (SCIMP) at Kumasi.

4.3.4 Analysis of Data

By adopting an interpretive approach, we were able to interact with the social realities of stakeholders. Data discovery occurred simultaneously with data analysis and both were on-going throughout the survey process. Respondents were encouraged to attach meaning to their experiences as they described them. However, I had to re-order these meanings into a coherent whole. A theme/category sorting technique (Burnard, 1985) was used for content analysis and data re-ordering and re-interpretation. This was referred to by Douglas (1985) as making inferences through the identification of characteristics of observe phenomena as interpreted by different respondents. I am aware that through this process, I might have introduced my personal biases into the interpretation. I accept this as a characteristic of the interpretive approach adopted in this study that require that I become part of the emerging data and interpretations (Guba and Lincoln, 1989).

The content analysis done on the transcript involved identifying the major themes that flowed through the whole interview process (Berg, 1989). This analysis was done to capture the meanings attached to various themes by respondents or to seek explanations for observed patterns and relationship that explicate the experiences of respondents
(Marshall and Rossman, 1989). This was also combined with frequency counts of the occurrence of categories that were noted in the data. However, this should not be seen as an attempt at combining positivist and interpretive research paradigms. The frequencies were not used to test hypothesis. They were rather used as an indication of how widespread particular observation or themes were among the respondents at the time of the study. It was as an attempt at grouping the themes and categories according to the meanings attached to experiences by respondents. This was also seen as a process of eliciting ‘quantified data’ from informal and semi-structured interviews (Burnard, 1991). The interpretations recorded here (qualitative and quantitative) therefore emerged from the construction of realities by respondents.

### 4.4 Results and Discussion

The results of the exploration survey as recorded here is a story of the social, economic, cultural, political and organisational lives of smallholder farmers and development workers as they support each other for the purposes of agricultural production in the study area. Farmer’s problems, as perceived by various stakeholders, are also presented.

#### 4.4.1 Household Structure and Organisation

The term household⁹ as used in the context of this study refers to a group of people who at the time of this study, ‘eat from the same pot’ (VORADEP, 1985; Fiadjoie, 1993). Of the 64 households sampled, 22 (38) were found to have 2-5 people, 37 (54 per cent) had five to ten people while five (eight per cent) had over 10 people in the household. Every household sampled however had less than 13 people. Members of most of the households consisted of husbands, wives, biological children, cousins, nephews, nieces, brothers and sisters and other members of the extended family. The households are, therefore, extended beyond the conjugal home through blood relationship.

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⁹Household here does not correspond to people living in the same house rather it is a group of people who co-operate together in production and consumption of farm produce. It is common to have different households' living in the same homestead, because it is a family house, but not taking management decisions together.
Social relationship in the study villages are defined through membership of extended families (fome). The fome is translated as all paternal relatives who attribute their descent (Dzidsime) to a recent patrilineal ancestor (Torgbe). This means that a family does not begin and end with marriage, as the children of any marriage joins an existing large ‘paternal family’. In fact there appears to be no particular word for members of a conjugal family in the study area. The word fometor (family member) is used to describe everyone in the extended family: the consanguineal, therefore, subsumes the conjugal family.

**Fome** is further nested in a supra-paternal structure called the clan (sa or hlor), which denotes a network of extended families who also trace their descent to an unknown mystical ‘forefather’ (Torgbega). It was observed that while the number of clans in the villages were constant, it was difficult to define or place numbers on the fome. This is because the number of clans were fixed at the time of first settlement. The genesis of the clans is shrouded in mystery, but they appear to represent the descendants of the first male leaders who founded these settlements. This was alluded to by Mr. Nteh of Fodome Ahor when he said:

> ‘Our forefathers migrated from Abutia near Ho. The individuals who came here first were also from different families. The different families represented at the time of arrival or the ‘founding families’ were the foundation of the clans we have in this village today.’ (Cosmos Nteh, 1995; pers. comm.)

However, there are no limits to the number of extended family or fome. The reason was provided by Torgbe Akoto II who is the chief (Dufia) of Liati Soba. He used the external morphology of a tree as a metaphor to explain the relationship between the individual, the extended family (fome) and the clan (sa or hlor). He explains that,

> ‘Like the tree, the clan is the trunk of the lineage and has the mystic fore-father (Torgbega) as the root. The trunk (clan) then send forth branches of the extended family (fome) and smaller branches (conjugal families). So, as people continued to be born into the clan, there is no limit to the number of branches.
added to the tree. So the number of fome will increase with the generation while the clan remains the same. Wherever the position of a branch, it still belongs to the tree." (Torgbe Akoto II, 1995; pers. comm.)

The inter-marriages between members of the different clans and extended family members in the villages make the community a complex network of ‘patrikins’.

These communities are similar to the social system identified by Kenny (1994) as *Gemeinschaft* or community that is self-contained, unified by kinship and common bonds. Social and economic transactions are guided in this system by sense of belonging through lineage, common values and beliefs (Olomola, 1994). There is a high incidence of social and economic interdependence among network members. Though there are cases of individual and contractual relationships in the system (hiring of labour, sale of produce, purchase of inputs and commodities), individual decision making is often linked with and affected by the broader extended family structure (Hill, 1970). The economic welfare of members of the kinship organisations are considered by network members but the social system places more emphasis on patronage and endurance of the lineage.

4.4.1.1 The Socio-economic and Political Roles of the Extended Family

The management operations of each ‘household’ is inter-woven into those of the community through a complex mesh of social and economic processes, mediated through the clan and the extended family system. The access to, and control over, resources by individuals are largely determined by kinship relationships and norms. It was observed that most of the respondents use family land and labour for their farming activities. Similarly, individuals are expected to contribute to, and participate in, all social activities of network members. The economic and social decision making of the individuals in the community is therefore affected by kinship norms and expectations.

It cannot be said that the extended family is a production and consumption unit in the western sense of the word but network members provide productive services for each other and can partake of the harvest from members’ fields (eating free from each other,
commitment of money). The involvement of external family members in such production and social activities follows no rules but is open to interpersonal negotiation and understanding. It is done mainly in the interest of maintaining kinship relationship. In the process, individuals are willing to divert ‘investible’ resources into patronage relations rather than into the expansion of directly productive activity: the notion of ‘social investment’ (Hyden, 1986). Hill (1986) denoted this as an ‘economy of affection’. However, this socio-economic organisation has come under serious threat with the introduction of a monetary economy. People are losing that communal spirit, and some of them may now participate in activities for monetary gains rather than for the strengthening of kinship or social relationships in the communities.

It was also noted that kinship plays a leading role in the administration of the villages. The clans are the primary body of identification, whose elders (*ametsitsiwo*) represent the clans in the village council that administers the village under the presidency of the chief. It was also learnt that certain administrative offices on the council are held by members of particular clans. For example in Liati Soba, every clan has an office on the village council. The Chief (*Dufia*) and/or the Queen (*Mamaga or Nyormufia*) of the village is chosen from the royal clans (*Fiafome*). Similarly other political positions like the spiritual leader (*Trynuad*), the linguist or the speaker of the council (*Tsiami*), youth leader (*Sorhefia*) and the war leader (*Awadada or Awafia*) come from specific clans, based on traditional norms. The *sa* or *fome* heads who serve on the board of elders and the various office holders from the respective families and clans form the link between the village administration and the people of the respective extended families and clans of the village. The significance of this institution to agriculture development lies in the settlement of land disputes between different clans, demarcation of land boundaries, ensuring the peace and tranquillity of the villages for economic activities and general community development.

The relationship between the formal administration and the traditional village level administration is not well defined but efforts are now being made to link the traditional grassroots administration to the district administration through the formation of non-partisan district assemblies. It is worth mentioning that the traditional administration
that is organised and operated by the villagers themselves is a common feature of Ghanaian politics. It is a respected institution in Ghana and complements rather than competes with the formal administration of the country.

4.4.1.2 Resident Status of Respondents

Because of the kinship system of inheritance, a person is regarded as a citizen of the father’s village. In that context, people who are even living permanently in other parts of the country are still regarded as citizens of their fathers’ villages. On the other hand, migrants and their descendants are regarded as ‘strangers’ (amedzro) in the village of sojourn, even if they stay in that village for life. The study revealed that majority of the respondents in the survey (78 per cent) were citizens of the study villages with the remaining 22 per cent mentioning that they were migrants. Some of these people migrated from other areas in the Volta Region of Ghana. However, there were some ‘international migrants’ residing in the forested areas like Likpe, Liat and Fodome. It was learnt that these ‘international migrants’ came to these areas, from the Republics of Togo and Benin, during the cocoa boom of 1960s and 1970s and have made their homes in these villages.

4.4.1.3 Gender-Division of Labour in Households.

Another feature of the households is the ‘gender-division-of labour’ as shown by intra-household gender specialisation of labour. The main job of the husband is that of land preparation, making storage barns and the building of houses. All other jobs on the farm are shared between all family members. Women, however, contribute more in planting of seed, harvesting and processing of food, sale of produce, and preparation of meals for the household. In spite of the general intra-house division of labour, it is common for family members to have their own individual farms.

There is also a gender crop-specialisation in the villages. The women produce vegetables and rice in addition to some maize and cassava whereas the men cultivate tree crops (cocoa, coffee and oil palm) and food crops like maize, cassava, yams and plantain for household consumption. The planting of tree crops is associated with men because of the patriarchal control of land. It is believed that if women plant tree crops,
their children would inherit the crops as well as the land on which the crops stand, thereby providing a possibility that the land may pass into the hands of another family. Historically, it was men who provided the staples for the table and the women planted the vegetables and the pulses that go into making the soup. This vegetable-production culture has been developed into an industry that provides women with extra income.

Although the head of the household is supposed to provide food for that household, other members also share in the cost of looking after the house. Arrangements are such that each member of the household can pursue individual economic activities, and in turn contribute part of their productions for the maintenance of the family. The remainder is usually kept as individual property. There is nothing like a ‘family budget’. The amount of food and money committed to the upkeep of the home depends on intra-household negotiation. Most of these are flexible and controlled by moral values and common sense (Hill, 1970).

4.4.1.4 The Employment Status of Household Members

Farming employs more people in the study area than any other vocation. Fifty-nine out of the 64 heads of households interviewed had farming as their primary occupation. Four heads of households, who happened to be women, had trading as their main occupation, while one head of household each had teaching and distillation of local beverages as the main occupation. Those respondents who were principally employed outside the farm also had farming as a secondary occupation. So all the respondents were engaged in farming to some extent.

Most of the respondents were found to be engaged in petty trading, preparation of local alcoholic beverages, weaving of cloth, tailoring, or charcoal burning as secondary sources of income. Processing and retailing of farm produce was found to be common among the women while labouring for money was a source of extra income for the able bodied males in the villages. It was quite difficult under the survey situation to estimate the amount of income that the household makes every year for lack of documentation of the household business. However, one thing was certain; the inhabitants in these villages depend on farming as the main source of food and income.
4.4.2 Agricultural Commodities

Although some of the households keep poultry and livestock, to most of the respondents, farming means tilling of the land, growing and harvesting of crops. Farmers depend mainly on crops from their farms as the main source of food for the family. It was also noted that market existed, in the district, for food crops produced by the farmers. The importance of these crops, to farmers, therefore lies in their food and income generating values.

4.4.2.1 Crops and Cropping Pattern

Agricultural production in the study area is based on food crops such as maize, cassava, plantain, bananas, cocoyam, yams, peanuts, cowpea and vegetables\textsuperscript{10}. Tree crops like cocoa, coffee, citrus, avocado pears and cola can be found in the forested areas in small quantities. Cocoa provided a lot of income for farmers in the forested areas of Ghana between 1960-1980. However, changes in the ecology\textsuperscript{11} over the years and government policy\textsuperscript{12} had led to a ‘farmer-shift’ from the planting of cocoa to the cultivation of the main staple food crops like maize and cassava, for both food and cash.

Table 6 Major Crops & Crop Mixture Cultivated by Farmers (1994)

<table>
<thead>
<tr>
<th>Types of Crops Cultivated.</th>
<th>Number of Farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize, Cassava</td>
<td>4</td>
</tr>
<tr>
<td>Maize, Cassava, Vegetables</td>
<td>31</td>
</tr>
<tr>
<td>Maize, Cassava, Yam, Plantain, Vegetables</td>
<td>7</td>
</tr>
<tr>
<td>Maize, Cassava, vegetables, plantain, cocoyam, Legumes.</td>
<td>8</td>
</tr>
<tr>
<td>Maize, Cassava, Vegetables, Rice</td>
<td>6</td>
</tr>
<tr>
<td>Maize, Cassava, Legumes, yams, Vegetables</td>
<td>4</td>
</tr>
</tbody>
</table>

\textsuperscript{10}Okra, garden eggs, pepper and tomatoes are the main vegetables produced, consumed and sold in the study area.

\textsuperscript{11}Rainfall (quantity and pattern), ambient temperature and general degradation of environment.

\textsuperscript{12}The government alien compliance order of 1970 starved the industry of cheap immigrant labour. Further, over-taxation of farmers by the COCOBOD led to price disincentive (Huq, 1989).
Maize, cassava, yams and plantain are usually planted as crop mixtures while, rice, beans and vegetables (tomatoes, okra and egg plant) are planted as ‘pure stand’ crops. It is also common for farmers to plant a few hills of vegetables and pulses among the main crops like maize, cassava and yam. These are normally harvested by the women for the household soup preparation. Maize is normally the first crop planted in the field and later inter-cropped with cassava, plantain or bananas. After the maize is harvested, the plot then becomes pure stand of cassava or cassava inter-cropped with plantain, bananas and or cocoyams.

As shown on Table 6, farmers planted between two and seven different crops for the 1994 cropping season. However, maize and cassava are the dominant crops cultivated by farmers. These crops may be planted in crop mixtures or as sole crops on different parcels of land. While this practice helped farmers to produce most of their food requirements, it also acted as a hedge against total crop failure. For example, if the maize crop fails because of poor rainfall, drought tolerant crops like cassava and cowpeas might provide some food for the family. These observations are similar to those made by Norman (1974) among smallholder farmers in Nigeria and by Carr (1989) in Nigeria and Zambia.

Crop production in the study area is rain-fed and so agricultural activities follow the local rainfall pattern. The rainfall regime in the study area is bi-modal (Meteorological Department, 1993), giving rise to two main farming seasons per year. The first season referred to as the ‘major’ season or Dzakpa coincides with the March-June rains. It is in this period that farmers do most of their farming for the year because the rains are supposed to come for a longer period then.

The minor season or Dzove coincides with the second but shorter rainfall regime of August to October. At the beginning of this season, farmers are usually faced with acute labour problems as they have to combine the harvesting and storage of the major season produce with the second season land preparation and planting. Consequently most farmers are only able to make smaller farms in the minor season of the year.
Further, since rains in this season last for only two to three months, the types of crops cultivated during this period are also limited, mainly, to short season maize varieties and legumes. At the time of this survey, the farmers complained that rainfall has become erratic and the amount of rain has decreased for the major season. The changes in rainfall intensity, periodicity and quantity have become a major threat to agricultural activities in the study area. See Appendix 4 for the 5-yearly average rainfall figures for the Hohoe district from 1967 to 1994.

4.4.2.2 Ownership of Poultry and Livestock.

Chicken, sheep and goats are the main animals of economic importance kept by farmers in the Hohoe district of Ghana. However, animal production is of limited importance to the households in terms of employment, food supply and as source of income. Most of the farmers keep few of these animals as 'back yard'\textsuperscript{13} ventures to provide the household with supplementary food and income. The main source of protein for the responding households appeared to be fish bought from the market, while the sale of crops remains the major source of household income.

The study revealed that chicken is the most common economic animal kept by households in the study villages. Fifty-two out of 64 households sampled were found to be keeping chicken whilst 16 and 20 kept sheep and goats respectively. The numbers kept were, however, low as the majority of the households only kept between one to ten animals in their backyards.

These animals were looked after mostly by women and children. Most of these animals are kept penned at night and released to fend for themselves during the day. Some farmers intimated that they cut and carry fodder for the sheep and goats during the dry season. The sheep are sometimes tethered to feed in the bush but goats, being quite intractable, are left to forage on their own. The animals are rarely fed any supplementary feeds. The chicken kept by the farmers are normally of non-descript low-meat-and-egg producing breeds. Similarly, the productive capacity of the ruminants found in the study area (the 'Forest Type' sheep and the West African Dwarf

\textsuperscript{13}The pens for these animals are made in the gardens or backyard of the farmers' houses.
goats) is also low. Similar observations were made by other authors such as Amezah (1982), VORADEP (1985), Humado et al (1990) and Twua (1994).

<table>
<thead>
<tr>
<th></th>
<th>Numbers</th>
<th>Chicken Frequency</th>
<th>Sheep Frequency</th>
<th>Goat Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-10</td>
<td>39</td>
<td>11</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>11-20</td>
<td>10</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>21-30</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>16</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

4.4.3 Resource Availability and Use

4.4.3.1 Land and Land Tenure Arrangement

Most of the farm land in the study villages is held and utilised within the traditional ‘patrilineal’ inheritance system (Table 8). In most cases, land is not individually owned but belongs to the lineage or clan, with the heads of the lineage or clan as custodians. Its use is regulated by cultural, moral and ritual values based on ancestral precedence. All members of the patrilineage have a ‘freehold’ right to cultivate portions of the family land, and can also move to any land belonging to the clan not presently farmed by any member of the clan.

The farmers have a strong attachment to their clan/family lands because of its spiritual embodiment. Most of the respondents interviewed believed that the land was a link between them and their ancestors. Land also serves as a symbol of security and power for clan members. The spiritual value and the importance of land as a focus of socio-political recognition in the villages was driven home by Mr. Kusorgbor of Likpe when he said:

'We regard inherited farmland as sacred trusts of our ancestors, and traditionally to pledge it is a slur and it is sacrilegious to sell it. Even in some cases where dire needs force people to sell family lands, such transactions take
place between kinsmen or between people from the same village. Our duty to our ancestors and the next generation is to protect family lands from being taken over by 'outsiders'. It is on land that we 'stand' before we talk in this village, so if a clan loses its land it loses its link with the ancestors and its social recognition.' (Kusogbor, 1995; pers. comm.)

Because of the importance attached to land by the villagers, it is quite difficult for members of the lineage to forfeit the ownership of their farmland through outright sale. Individuals of a clan are not allowed to dispose of any portion without expressed consultation with the clan through the custodian. However, the introduction of the cash economy in the late eighteenth century initiated major changes in the ownership, exchange and utilisation of agricultural resources (land and labour). Land transactions between non-family members are now done through money transactions.

In addition to the freehold\textsuperscript{14} land use by clan members, individual farmers can lease land for a fee\textsuperscript{15}. The charge for farming land for the 1994/95 farming season varied between 2500-3000 Cedis per acre per year. The land reverts to the landowner after one year unless further negotiations were entered into. With this arrangement the tenant has no right to plant tree crops on the land since planting of tree crops is conceived as conferring partial ownership of the land to the tenant. Another form of land tenure system practised in the study villages is share cropping, referred to as Dibi *madibi* meaning 'eat let me eat'. This arrangement is entered into by land owners who, because of sickness, old age or in paid employment outside the village, cannot do the farming themselves. It is also used by farmers who have no money to rent the land.

In this arrangement the farmer pays either half (*abumi*) or one-third of the produce (*abusa*) as the land rent. *Abumi* is common with tree crops like oil palm and cocoa while *abusa* is practised in relation to food crops. The rate for tree crops appears to be higher than for food crops because, the tenant farmer becomes a temporary land owner as long as the tree crop stands on the land. Under this arrangement the land owner

\textsuperscript{14} This includes lands cultivated without any financial obligation (family land, personal lands).

\textsuperscript{15} The cost of land is landlord specific. Some landlords charge more than others.
contributes nothing, apart from the land, toward the production cost of the farm. The cost of the land in this case is, therefore, determined by the amount of produce that the farmer gets from the plot and the ruling market price for the produce.

<table>
<thead>
<tr>
<th>Land Tenure Arrangement</th>
<th>Number of Farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family land only</td>
<td>39</td>
</tr>
<tr>
<td>Family + Rented Land</td>
<td>2</td>
</tr>
<tr>
<td>Purchased land only</td>
<td>1</td>
</tr>
<tr>
<td>Share cropped Land only</td>
<td>3</td>
</tr>
<tr>
<td>Sharecrop + Rented Land</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>55</strong></td>
</tr>
</tbody>
</table>

### 4.4.3.1.1 Farm Holdings

The Local Measurement of Area (LMA) used for assessing the size of farm holdings in the study area is the ‘abor’ or the ‘double-arm-stretch’. In the measurement exercise, 36 square abors is equated to one acre (eka deka) (VORADEP, 1985; Fiadjo, 1993). It was difficult for respondents to accurately report on the size of their holdings. In some cases the farmers prepared the land themselves and found it unnecessary to measure the fields. The farm sizes reported (Table 9) were therefore taken as crude estimates for the 1994 farming season, as reported by farmers.

<table>
<thead>
<tr>
<th>Acreage</th>
<th>No of farmers</th>
<th>Per cent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>15</td>
<td>42.8</td>
</tr>
<tr>
<td>3-4</td>
<td>16</td>
<td>45.4</td>
</tr>
<tr>
<td>5-6</td>
<td>4</td>
<td>11.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>35</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

---

16 Farm size means all lands cropped (major and minor seasons) by individual farmers without regard to land tenure arrangement.
The majority of the respondents (88.5 per cent) held farms that were less than five acres in 1994. Some previous investigators have attributed the small size of the farms to the fragmentation of the land by the inheritance system (Norman, 1974; Piniero, 1989; Humado et al, 1990). However, farmers in this study indicated that lack of money, lack of labour saving devices and labour shortage at the time of land preparation as factors to be blamed for their small farm sizes.

4.4.3.1.2 Fertility of the Land

Farmers normally judge the fertility of their land by the vigour and yield of crops planted on the fields. Most of the respondents know that their fields have become infertile through cultivation. However, only a few of them ever applied any form of fertilisers. Only 10 of the respondents applied fertilisers to any of their crops in 1994. The high cost of fertilisers was an important contributory factor to the farmers' inability to apply inorganic fertilisers to their crops. This was alluded to by Juliana Klu of Fodome when she said:

'Now the application of fertilisers is for the rich because prices of fertilisers are 'taller' than most of the farmers. Anyone who wants to apply fertiliser must have a 'deep' pocket. Only few of the farmers in this village can afford a bag of compound fertiliser for over 20,000 Cedis.' (Juliana Klu, 1995, pers. comm.)

These views were also shared by Madam Florence Yeyie (pers. comm.) who is the District Agricultural Extension Officer for Hohoe District. She intimated that when credit was made available to farmers through Farmer Credit Schemes like the Sassakawa Global 2000 and SCIMP programmes, farmers were able to apply fertilisers.

Most farmers practice bush fallow or 'land rotation' as a means of rejuvenating the soil. The fallow periods reported by farmers were between three to six years. However, lands in the study area need to be left fallow for at least 10 years to enable them recover their fertility (Titriku, 1995). The short fallow period regime being
followed by farmers in the face of their inability to apply fertilisers make poor soil fertility a major problem in the study area.

4.4.3.2 Labour: Availability and Use

Labour is a very important resource in the study villages because most of the farm chores are done manually. It was observed that most of the respondents hire labour but only few spent money on any other farm inputs. The survey identified three main sources of labour used by respondents. As shown in Table 10, these include family labour, hired labour and shared labour of which family labour was found to be the most important.

<table>
<thead>
<tr>
<th>Source of Labour</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Labour only</td>
<td>8</td>
</tr>
<tr>
<td>Family + Shared Labour</td>
<td>4</td>
</tr>
<tr>
<td>Family + Hired Labour</td>
<td>29</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
</tr>
</tbody>
</table>

Table 10 The Main Sources of Labour used by Farmers

Family labour comprises labour expended in tending the farm by husbands, wives, children and other extended family members. Family labour is generally free but where family members work on a reciprocal basis, work in return serves as payment.

Although family labour is the most important source of labour used by respondents in every stage of the farming process, most of the farmers also hire supplementary labour. Hired labour in this context encompasses all labour for which the household had to make payment either in cash or in kind. There are no permanent farm labourers in the study area. The labourers who work for farmers are also farmers who are willing to work temporarily as hired farm labourers to supplement their incomes. In certain cases some people work for fees as a way of assisting a friend or relative who might be in dire need of labour.

17Hired labour is used mainly for land preparation and weeding of farms.
The two forms of hired labour used by farmers in the study villages were identified as
- 'Daily Labour' (popularly called by the people as 'by-day')
- Contract Labour.

'By-day' type of labour is one that is employed on daily basis. The labourers normally work alongside the farmer or sometimes alone under the guidance of the farm owner. The labourers are given fixed daily wages of between 1000-1200 Cedis for a day's work. Contract labour is the most common type of hired labour used by farmers in the district. In this case cash\(^\text{18}\) payments are mainly made to the labourers based on the area of land weeded or planted. The labour cost per area also depends on the type of farm operation involved. Weeding with the hoe costs about one and half times the cost of 'machete-weeding'. Similarly the contract planting of maize costs about half the cost of weeding. People who are employed to harvest crops (maize, yam, pepper, cowpea) are given proportions of the harvest in lieu of cash payments. For example in Likpe Nkwanta, 1/6 of pepper harvested is given as payment to labourers.

Labour sharing is another form of labour arrangement in the study area. This occurs among groups of farmers who have reached an agreement to help each other during the farming season. This reciprocal working arrangement or working party (\emph{fidodo}), is based on the concept of 'all play all'. At the start of the 'party sessions' the group estimates the amount of work they could do in a day. They then work alternately on each "party-member's" farm until everyone has got the agreed work done. During the working party sessions the host farmer provides a cooked meal and in certain cases some drinks. This arrangement serves to expedite\(^\text{19}\) farm operations and cuts the cost of production. However, \emph{fidodo}, has ceased to be an important form of labour use because people have become more individualistic and are interested in taking money for the work they do on other people's farms.

\(^{18}\) Cost of machete weeding varies from 10,000 to 12000 Cedis.
\(^{19}\) It could take one person about eight days to clear one acre alone. However, a hard working group of five individuals can do the same job in one day.
4.4.3.3 Farm Financing

Most of the farmers in the study villages do not use much capital input. They depend on simple farm tools like an axe, machete, hoe, and sickles to accomplish their farm chores. The majority of farmers interviewed depend on their own resources to finance their farm operations. While some farmers finance their farm operations from income generated from secondary sources (petty trading, processing and sale of farm produce, charcoal burning, brewing of alcoholic beverages), the sale or pledging of farm produce remains the major source of capital for farmers interviewed.

As observed by Norman (1974) and Hill (1986), there appears to be a general understanding among development workers that small scale farmers sell only the surplus of their produce. It was however observed from this survey that, irrespective of the size of their harvests, most farmers always sell part of their produce to meet family commitments. The low level of agricultural production observed in the study area therefore means that farmers have very little to invest in their farms. This appears to explain why capital shortage or lack of finance was the main farmer-identified problem (Table 12). There were some cases where the only capital investment made into the farming venture is the money spent on the purchase of farm implements and food eaten when the farmer works on the field.

Money lenders are strongly criticised for cheating their clients (Adams, 1989). However, loans from friends, relatives, well-to-do farmers and traders constitute the main source of ‘external funding’ utilised by the respondents in the study. The majority of these loans are made to friends, relatives, spouses and occasionally to ‘strangers’ who must also be introduced or guaranteed by friends or relatives. In this case, the money lending is not purely for the economic benefit. It has a social dimension that strengthens social relations at the local level. Simplicity and flexibility are the hallmarks of this transaction. There is no official bureaucracy making it a faster and more efficient financial service.

This source of a loan has no fixed interest rate and is normally redeemed at the end of the farming season. The interest rate charged depends on the relationship between the
debtor and the creditor, but the terms are normally spelt out by the money lender. Interest rates charged in the 1994 farming season varied from about 20 percent to 100 percent per annum. Interest payable in the case of pledging of farm produce is not easily determined as it depends on the price at which the money lender buys the produce from the 'debtor-farmer' and the price at which s/he sells it at the market. These information is not easily divulged by the people involved in this type of transaction.

Money lending however, depends on the goodwill or the 'benevolence' of the money lenders. Further, the scale of operation of this source also appears to be small in relation to the financial needs of farmers in the study area. This source like the farmers personal sources, therefore, cannot be relied on to provide capital for the necessary investment.

The inability of farmers to invest money in their operations is a serious threat to agricultural development in the study area. This situation has also been aggravated by the inability of the formal credit system to provide any effective financial support to the small scale farmers in the study area. The banks operating in Hohoe District include the Agricultural Development Bank (ADB), Ghana Commercial Bank (GCB), Barclays Bank located at Hohoe and Weto Rural20 Bank located at Kpeve about 60 kilometres south of Hohoe. However, at the time of this study it was only the ADB, Hohoe that was granting loans to the small scale farmers in the Hohoe district. ADB is also acting as the administrator for the two NGO-supported farmer-credit schemes (IDA/MOFA SCIMP and SG 2000/MOFA) in the district. Between 1990-1995 ADB, Hohoe, granted about 2.5 million Cedis to about 330 individual farmers and 15 million Cedis to 50 groups under the group lending scheme. Within the same period 100 farmers benefited from credit under the SCIMP and SG 2000 programs. However only about 4 people interviewed mentioned having taken bank loans for the 1994/95 farming

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20Rural Banks were established in 1983 as means of extending formal banking services to the rural areas. They were to be owned by the people and act as source of mobilising savings for development in the locality. However, most of these Rural Banks are yet to make any impact on agricultural development in the country (ISSER, 1994).
season. The average amount received by each farmer in 1994/95 farming season was 20,000 Cedis which was barely enough to help farmers cultivate an acre of maize farm.

The amount of money loaned to smallholder farmers appeared to be low because these financial institutions consider most of the farms in the study area as not of ‘economic’ sizes to justify institutionalised financial assistance. Experiences with the smallholder farmers have taught the banks that the farmers cultivate what they eat, and since their scale of operation is small, they rarely have anything left after family commitment for the redemption of bank loans. Loan recovery rate\(^{21}\) from farmers was reported by ADB to have been quite unsatisfactory. While this situation can be attributed to the low productivity (SG 2000, 1991), there have been allegations that farmers use part of these loans on consumption expenditures (e.g., school fees, and other family debts) instead of on agricultural production.

Farmers blame the high interest rate of about 35 per cent for the phenomenon of low recovery rate. They also claimed that, because of the bureaucracy in the banking institutions, these loans are most often given to them after the planting season is gone. In such cases the loan becomes useless as a ‘production loan’ and become misapplied to other expenditure centres in the household. However, the general impression I gathered from the study is that the small scale farmers are marginalised by the financial market because of the high interest rate. It is difficult for farmers to get a gross margin of over 35 per cent from their small farms. Their small scale of operation coupled with low yields, the government’s SAP policy of abolishing both mandatory lending and concession on interest rate to farmers mean that they cannot afford the price of money from these financial institutions.

### 4.4.3.4 Agricultural Technology

Most respondents rely on knowledge acquired (a) through personal experience; (b) from parents; and (c) from friends for guidance in their farming activities. Most of them were unable to adopt the recommended practices that were being transferred to them by the staff of Department of Agricultural Extension Services (DAES) of MOFA.

\(^{21}\)ADB pleaded ‘the confidentiality of information’ and would not give the loan recovery rate.
at the time of this survey. Farmers in the study villages rely on land rotation for rejuvenation of the soil, plant their local varieties, adopt local husbandry practices and use traditional methods in post harvest management of crops. Farmers were found to be adopting practices that work for them and refused to be persuaded to adopt researcher recommended practices on an ‘as is’ basis. In other words, they do not have adoption of technology as a target.

Attendance at contact-farmers’ meetings, like the adoption rate of ‘researcher-recommended technologies’ has not been encouraging. It was revealed that farmers depend more on interpersonal relation (conversation between friends and relatives) for agricultural knowledge and rarely call on the local technical officers for advice. They normally discuss their farming experiences among themselves and only interact with FLS if they have to attend ‘contact-farmer’ meetings. Farmers share production technology with their friends and relatives and undertake or adopt farm practices that were found to have worked for their neighbours but not those promulgated by the FLS. While this study is not directed specifically at evaluating the technology delivery system, the results indicate that the technology delivery system in its present form, does not appear to be an important source of contextually relevant technology to farmers.

Only 18 of the 64 households interviewed had mentioned that they interacted with FLS in the 1994 season. This was not construed as the inability of the residing FLS to do their work. It was rather conceptualised as the inability of the technology delivery system to create the environment for mutual interaction between farmers and agricultural development workers. Each FLS was task to form between 16 to 25 contact groups per sub-district (MOFA, 1994). This implies that farmers who do not belong to any of these groups or who could not attend the group meetings would not have had contact with the front-line staff for the whole planting season. Further, the 15 FLS in the Hohoe District at the time of this survey were expected to work with a farmer population of about 500,000 (MOFA, 1994). The ‘face-to-face-communication-to-transfer- “perfect knowledge”-to-farmers’ involved in extension work in the study area means FLS have to increase their work load or MOFA have to increase the number of FLS for a better extension coverage.
Presently, the government, with the assistance of the World Bank, is implementing two agricultural development projects, the National Agricultural Extension Project (NAEP) and the National Agricultural Research Project (NARP). These projects are focusing on the development and transfer of technologies. Researchers are using FSR&D to involve farming in the generation of 'appropriate technologies' while MOFA is using the T&V system of extension to bridge the gap between farmers and extension workers. The belief is still based on the dominant model of sending 'the best technology from the research stations to farmers at the right time' to help farmers to solve their problems. However, it is becoming increasingly difficult to justify the amount of money being spent on the technology delivery system in the language of the present neo-liberal economic policy of the government: 'profitability and efficiency'. The failure of these technologies to influence farming activities in the study area has brought to the fore the need to adopt an approach from which practices that are acceptable to farmers can emerge. Horton (1991) and Maclure and Bassey (1991) who worked with smallholder farmers in Mexico and Togo respectively have demonstrated that an appropriate way to achieve this is to actively engage the farmers in the development process.

4.4.4 Farm Productivity

During the study, farmers were asked to state the quantity and monetary value of their agricultural production for the previous year (1994). This was very difficult for farmers to do because they rarely keep records of their farm operations. However some of the farmers gave an approximate value of their maize harvest for the 1994 farming season. This was possible because all the maize crop is harvested at one time and it has to be measured when it is being sold or milled for family consumption. In the case of cassava and other vegetables no definite estimate could be done since these products are harvested, consumed or sold continuously as and when the need arises.

Table 11 gives an estimate of the productivity of maize from the farms of 26 of the respondents for 1994 cropping season. Although I cross-checked these figures with some of the responding farmers to ascertain any discrepancies, the figures shown may
not reflect the true value of productivity on the field because of possible errors in the recall procedure. They are however used here to give an indication of what farmers thought they harvested from their field within the period under review.

The yield of maize as reported by farmers ranged between two to eight bags with the majority of farmers recording about three to four bags per acre. These figures fell short of the expected general productivity of maize in the Hohoe District of about 10-12 bags per acre (CRI, 1990). Although these figures may not be taken as the absolute figures for yield, there was a general agreement between agriculturists and farmers that farm productivity and level of food production in the study area was lower than expected. The inability of the farmers to produce enough to feed the household was manifested in the number of farmers who had to grapple with food shortages in 1994. During the survey, eight of the 64 households sampled mentioned that they suffered food shortages for between one to three months in 1994.

<table>
<thead>
<tr>
<th>No. bags (100 Kg.) harvested per acre.</th>
<th>Number of Farmers</th>
<th>Percentage of Farmers (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3</td>
<td>4</td>
<td>15.4</td>
</tr>
<tr>
<td>3-4</td>
<td>12</td>
<td>46.1</td>
</tr>
<tr>
<td>5-6</td>
<td>8</td>
<td>30.7</td>
</tr>
<tr>
<td>7-8</td>
<td>2</td>
<td>7.6</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The farmers blame low amount of rain and the lack of capital as the main contributory factors to low productivity and production levels. These views were echoed by Mr. Anthony Atiboli of Alavanyo Kpeme when he said:

"Our food production is low in this town. We now get less harvest from our fields than we used to get about 15 years ago. Last year I harvested about seven bags"
of maize from my two-acre farm. This is not enough to feed the family and pay for expenses’. This situation is brought about mainly by the poor rainfall we now have. Further, we do not have money to invest in the farm so we always have to depend on our labour alone.’ (Atiboli, pers. comm.)

However, the agriculturists believed that the low production and food shortages were due to the failure of farmers to adopt the recommended practices. This notion is reflected in the reaction of Mr. David Cofie, the FLS for Kpeve sub-district;

‘The low production level of the farmers is due to their inability to adopt our recommended practices. The technologies like improved crop varieties and management practices that we introduce to farmers are capable of helping them increase their farm productivity. Further, the farmers rarely practice the post harvest practices that we teach them. In the process, the amount of food produced is low and what is produced is also damaged through poor handling procedures.’ (Cofie, pers. comm.)

The above assertions by farmers and agriculturists show that they all agree on the problem of low agricultural production in the study area, but they are divided on what precipitated the problem as well as what could be done to ‘solve’ these problems. While farmers were concerned about getting money to invest in land preparation and weeding of the farm and trying to grapple with achieving synchrony of their farming activities with the local rainfall pattern, the agriculturists were worried about how to get farmers to adopt their ‘proven technologies’. This is a case of two myths describing the same reality.

4.4.5 Problems Identified by Farmers
During the interviews, respondents mentioned some problems that they think were affecting their farming operations. They also talked about how they have been coping with these problems and how they expected the problems to be addressed. As indicated in Table 12, finance appears to be the problem that was perceived by farmers as the most important. The farmers saw money as the denominator of all things. ‘With
money all things are possible' says Victoria Asama of Likpe Nkwanta. It was the belief of respondents that if they had enough money, they could prepare the land on time, expand their farms, buy fertilisers to fertilise the soil and employ labourers to weed the farm.

The farmers also identified lack of finance as the cause of their inability to adopt the recommended technologies. This claim may be justified against the background that most of the technologies being ‘transferred’ by the extension agents to farmers are capital intensive. Their adoption therefore calls for capital investment. However, farmers were unable to generate enough capital from their farms, because of their small farms and low productivity, to invest into these technologies.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Number of Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finance</td>
<td>62</td>
</tr>
<tr>
<td>Weather</td>
<td>33</td>
</tr>
<tr>
<td>High cost of inputs</td>
<td>31</td>
</tr>
<tr>
<td>Labour</td>
<td>23</td>
</tr>
<tr>
<td>Declining soil fertility</td>
<td>28</td>
</tr>
<tr>
<td>Availability of technology</td>
<td>3</td>
</tr>
<tr>
<td>Weed menace</td>
<td>5</td>
</tr>
<tr>
<td>Non-availability of inputs</td>
<td>5</td>
</tr>
<tr>
<td>Marketing of produce</td>
<td>3</td>
</tr>
</tbody>
</table>

Most farmers also saw government intervention, as the only solution to most of their problems. They were of the opinion that if the government is able to make money available to them at low interest rates they would be able to buy all the input needed for their work and thereby improve the performance of their farms. Leonard Ababio of Tafi Mador summarised farmers’ expectations of the government when he said, 'Dzidudue nye vito nye vino eyata miafe kuxiwo kata kpo efe nkume.' (‘The government is the father and the mother so all our problems ‘face’ the government). It might
therefore appear that the farmers were holding the government responsible for most of their problems. In other words most of them were of the opinion that the government owe them solutions to their problems.

The shifting of responsibility to the government appears to be reflection of the paternal relationship that has been established between development workers and the rural communities. It is an accepted belief that government agents are in charge of agricultural development in the country. Between 1957 and 1984, the government of Ghana subsidised agricultural inputs for farmers (Donkor, 1989). This appeared to have created a dependency culture in which farmers expect the government, through the agricultural agencies to provide not only technologies but also low priced farm inputs. However, under the present neo-liberal economic policy, where subsidies on agricultural products have been removed and the responsibility for the distribution of goods (including farm inputs and credit) and services has been transferred to ‘market forces’, the responsibility of agriculturists starts with the generation of technologies and ends with the transfer of the same technologies to farmers.

It is evident from Table 12 that most of the problems identified by farmers had to do with their relationships with their context (ecology, and socio-economic). This observation suggests that the ‘pushing of technologies’ alone might not be effective in solving these problems. I would like to argue that the farmers are part of the context in which they live and work. So whatever they think and do or can do may not be detached from their context. So any attempt at improving their activities must focus on their views and interpretations of the various interrelationships that are relevant to their practices.

4.5 Conclusion

There appeared to be a strong relationship between the social life, political organisation and farming activities in the study villages. The unifying factor between the various facets of the farmers’ lives within the study villages is blood relationship. Access to productive resources is negotiated by reference to one’s ancestry. The right to land is
acquired by membership of an extended family and the right to a particular portion, through one’s father. This is because ownership and use rights are claimed by specific ‘patrikins’ (Olomola, 1994). Although most households can hire labour in the course of their farming activities, the nature and the right to such labour is also mediated through a series of inter-personal family negotiations. Informal credits are more readily made to kinsmen than to people who are not relatives. Similarly where conflicts arise between individuals, inter or intra-clan, over the use and ownership of resources in the community, this is resolved by the council of elders through negotiation and arbitration rather than a formal court of law.

One of the main findings of the exploratory survey was that the economies of the villages involved in the study are based on the inter- and intra-household co-operative activities that have maintenance of social relations as a goal. Consequently, the internal dynamism of each household and the strength of existing social networks are relatively important and determine economics and social organisation in the villages. The nature and level of co-operation follows no predetermined pathway. It is guided by traditional moral values and interpersonal negotiation by network members. It may therefore be quite inappropriate to interpret or predict the behaviour of households from these communities using linear instrumentalist values such as ‘cost-benefit’ analysis of technology and ‘output-consumer ratio’ or efficiency of farm input use, that is based on conjugal notion of the household.

This brings into question the relevance of the present TOT approach with its accepted practices of analysing, planning and implementing agricultural development programs which disregard the inherent complex and dynamic characteristics of the social system within which local people live and farm. For example, the agriculturists continue to form ‘contact-farmer-groups’ that ignore existing social networks. In my opinion the framework for analysis for the development of these communities should be broadened to take care of all the subtleties that affect farmers’ decision making. The strengthening and supporting of existing social networks in the communities in learning and taking responsibility for their own development appear to be a possible way forward.
It was also observed that the farming done in the study villages is predominantly on a smallholder basis. There is little mechanised farming and the farmers depend mainly on the hoe, machete, sickle and axe. Although the farmers keep some poultry and small ruminants (sheep and goats), the main agricultural commodities grown in the study are crops that are the major staples eaten by the people. The need to increase food production is not in dispute. However, the main issue at stake is how to overcome the various problems that confront farmers in the study area to enable them increase their production. There were differences of opinion between farmers and agriculturists about ‘what constitutes the problems and what should be done to address them’. While farmers saw the problem as lack of finance and failure of the government to support farmers, the government agencies saw the problem as the failure of farmers to adopt the recommended practices designed by researchers. There is therefore that agreement among the stakeholders that agriculture in the study area is ‘sick’ but opinions are divided on what ‘medicine’ to administer for its healing.

Another important observation made through this study was that the present inflexible technocentric outlook on agricultural development, where both the development workers and the farmers have no freedom to explore their own world, but must adhere to externally determined activities, all in the interest of ‘superior knowledge’ and political mandate have not been successful in improving either the production and the standard of living of the farmers. By treating farmers as receivers of development resources (technology and in certain cases, farm inputs) from ‘above’, development agents cast themselves in the role of custodians and providers of superior knowledge and assistance to farmers. However, in the quest to develop the best objective knowledge they fail to appreciate the farmers’ context, ignore the values that are of importance to farmers and develop technologies based on purely agronomic and economic calculations. A situation is created where development workers are delivering messages that are not relevant to the farmers’ situation and farmers are expecting ‘help’ that is not available under the present neo-liberal government policy.
It is my view that, there is need to go beyond (a) the ‘preaching of technologies’; (b) having solace in indigenous knowledge; and (c) looking for ‘answers from external sources’ to building the problem solving capacity of the farmers and local development agents to enable them deal with the complex and dynamic issues and problems explored during this survey. This means that farmers need to be supported by new information as they are challenged with their own experiences to learn to improve their own situation. My conviction is that, inviting all stakeholders to participate in learning about what constitutes the problem and what might be done in the name of ‘solution’ could be an appropriate way into improving the performance of farmers and development workers. This was considered appropriate because of its potential to help stakeholders to develop a common understanding of their own situations and what could be done to improve them (Horton, 1991; Maclure and Bassey, 1991; Turnbull, 1993).

Mutual understanding by stakeholders is central to social change (Korten, 1980; Friedman, 1984, Turnbull, 1993). Krippendorf (1993) has argued that no one can faithfully act against his or her own understanding. The lack of common understanding between stakeholders with regard to the direction of developing food and agricultural production in the study area, therefore, provides the justification for creating an opportunity for stakeholders to collaborate in learning about their own problems, opportunities for improving the situation. Participative and collaborative learning by stakeholders has been established as an appropriate way into improving problematic situations in social systems (Rhoades, 1984; Whtye, 1991). This means co-opting the household members and the agricultural agents as (a) co-researchers and co-developers of their practices and situations; and (b) the re-ordering of the ‘giver-receiver’ framework embodied in the TOT development model into that of ‘learning-partnership-of-stakeholders’ (Korten, 1980, Friedman, 1984; Turnbull, 1993; Mattock and Steele, 1994). The subsequent phases of this study were therefore designed to explore the appropriateness and effectiveness of using participative learning as an approach to improving food production and agricultural development work in the Hohoe district of Ghana.
CHAPTER FIVE

PARTICIPATIVE LEARNING AT THE VILLAGE LEVEL

5.1 Introduction

The narration in the previous chapter represents an overview of the organisation of farming as well as its problems as seen through the eyes of selected farm families from six communities in the Hohoe district of Ghana. These were also supplemented with views gathered from the staff of MOFA, researchers located in CSIR of MIST and NGOs working in the field of agriculture and rural development. While these views might not be taken as the ‘absolute truth’ about what farming and agricultural development work in Hohoe district were at the time of the survey, it did provide ‘windows’ on the perceptions held by the stakeholders about their own situation.

What was evident from the initial survey was that both farmers and agriculturists did agree that agricultural production was constrained by problems that needed to be tackled to improve the livelihood of farmers. They were, however, divided on what constituted the problems, and what could be done in the name of improvement. Agriculturists viewed the problem as basically technological and saw the adoption of improved technologies as the only way to improve the productivity and overall output. However, farmers saw most of their problems (apart from rainfall) as related to lack of finance and saw direct government intervention as the only solution. It could be implied from this observation that the major stakeholders (farmers and agriculturists) saw the ‘answers’ to the problems as external to the farmers’ setting: technologies from research stations, and finance or inputs from the government.

These views are consistent with the ‘top down’ TOT development approach currently being adopted in Ghana. This model separates knowledge generation from the context of application and policy making from the people to which the policies are directed.

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22 Staff of CSIR, MOFA and NGOs trained in the field of agriculture and who are engaged in agricultural development work.
(Chambers, 1997). It also 'preaches' that all 'good things' come to the people from 'above.' The development agents are therefore always looking for the 'good things' to be delivered and the farmers are always waiting for 'good things': a dependency arrangement.

In recent years some development practitioners and researchers have raised objections and criticism to this 'giver-receiver', teacher-learner', 'knower-known' and government-governed' model of development (Rowan, 1981; Checkland, 1981; Chambers, 1993; Bawden, 1995; Pretty 1995). These authors have questioned the relevance and effectiveness of the 'top down' development models in complex and dynamic human activity systems like the one under study. They have proposed in its stead an approach that focuses on the process of learning and acting 'with' stakeholders as an appropriate way to improvement. In this process stakeholders are challenged and encouraged to recall and analyse their experiences in order to 'create their own truths' about problems, interventions and opportunities. In other words, the actions of stakeholders are informed by their own 'personal constructs' of reality.

I was therefore influenced by (a) my dissatisfaction at the present approaches to agricultural development in Ghana; (b) the literature on constructivism and its methodological applications of action research; and (c) the results of the exploratory survey, to hypothesise that involving stakeholders in generating their own knowledge to inform their practices is an appropriate way to intervene and improve farming and agricultural development practices in the Hohee district of Ghana.

While there have been attempts by the non-governmental organisations like World Vision International to involve rural people in their own development (Kumahlor, 1995), all other efforts made by agriculturists in involving farmers in agricultural development work were directed toward eliciting farmer-participation in the development of appropriate technology (CRI, 1990; MOFA, 1994; Magrath, 1995). There is little information on programs that focus on actively engaging farmers as co-learners and co-developers of their own situation and practices. This 'experiment' in participative learning with farmers and FLS was therefore designed to explore the use
of participative learning in intervening in the farming and extension activities in the Hohoe district of Ghana.

5.1.1 Methodological and Theoretical Framework
The methodological and theoretical frameworks that informed this research were discussed in Chapter 3. Suffice it to mention here that the approach adopted was based on the ideas of action research (Kemmis and McTaggart, 1988; Dick, 1993), experiential learning (Kolb, 1984) and critical learning systems (Bawden, 1995). These methodological and theoretical approaches support the active participation of stakeholders in the generation and use of knowledge through the interpretation and critique of their beliefs, knowledge and actions. While the focus is on the creation of knowledge by stakeholders for informed action, critical reflection on knowledge and actions is seen as being important in enabling stakeholders to develop the mental framework and the very disposition to:

- to learn and take action in concert with other stakeholders
- part with the familiar (in the face of its limitations) and embrace the unfamiliar
- live with consequences of the learning in which they were involved.

The overall strategy adopted was therefore meant for perspective transformation and empowerment of stakeholders (Korten, 1981; Mezirow, 1991).

5.2 Design and Strategy

A case study of two villages, Liati Soba and Fodome Ahor, both in the Hohoe district, were selected as being appropriate for investigating the use of participative learning as an overall strategy in supporting stakeholders to learn how to learn to improve their own situations. The focus of this case study was therefore on using both individual and group discussions as opportunities to learn to become responsible for their own development.

The conceptualisation and implementation of the research itself was influenced by
• my professional experience as an extension officer, and interest in the development of the smallholder farming system
• a literature search on ‘constructivism’, critical theory, action research, experiential learning and critical learning systems
• consultation with resource persons on constructivism and its application in agriculture and rural development, within the University of Western Sydney, Hawkesbury.

Methods adopted in the research (group discussions, participant observation, key informant interviews, field visits and informal interviews) were used to engage stakeholders in the generation of knowledge about their lives as farmers and agriculturists. This made the participants co-learners in the research process.

5.3 Assumptions

I was motivated by the literature and my experiences with the initial exploration of the context of the study, to theorise that the technology-focused top-down approach is unable to improve farmer’s conditions in the Hohoe district. I also assumed, based on a literature search, that a participative approach could:
• enable farmers and agriculturists to create personal knowledge that would improve their understanding of the farming system and their roles
• encourage farmers and agriculturists to learn to value their experiences as both generators and sources of knowledge
• generate ideas and interventions that are more relevant to the farmers
• lead to empowerment of stakeholders, enabling them to initiate and implement their own learning and take responsibility for the outcomes of the learning
• lead to changes in behaviour and actions that could help improve the farming system

These assumptions and theories can therefore be seen as constituting the personal biases that I brought to bear on the research process.
5.4 The Learning Process

The process included the formation of two learning teams in the two selected villages. Members of these groups were engaged in conversation about their lives as farmers and extension workers. This was supplemented by informal discussion with randomly selected farmers and other key informants in the study area. Information generated from these engagements formed the basis of decisions as to what could be done to improve food and agricultural production in the study villages.

5.4.1 Selection of the 'Participative Learning Villages'

Two villages, Soba and Ahor, were purposively selected from the Liati and Soba sub-districts respectively for the next phase of the study. These sub-districts were selected because all the major crops grown in the district are found in these two sub districts (MOFA, 1994). They also have the savannah, transitional vegetation and forest vegetation that are found in the Hohoe district. Another factor that influenced the selection process was language. Language is very important in the generation, processing and transformation of knowledge into action (Russell and Ison, 1991). Some sub-districts like Logba, Likpe, Nyagbo, Akpafu and Santrokofi have their own dialects, and speak the Eweh only as a second language. Their day-to-day transactions are therefore done in languages with which I was unfamiliar. It was therefore thought reasonable to undertake the learning in Eweh speaking areas, in order to avoid linguistic barriers.

5.4.2 Introducing the Research Problem

I had separate introductory meetings with the chiefs and elders of the selected villages to express my interest in, and reasons for doing the study. It was necessary to ask their permission for the study because the chiefs and elders wield a lot power by virtue of being the custodians and administrators of these villages. A meeting with them prior to the research engagement in the communities was therefore very important for the building of an effective working relationship between the stakeholders and myself. These meetings were also attended by the local FLS and the District Agricultural Co-
ordinator for Hohoe. As a result of these initial discussions days were selected on which I met groups of farmers from these two communities.

Introductory meetings were held separately in the two villages at which I introduced my research problem to the farmers. I opened up the discussion with the farmers by presenting my views on the present approaches to agricultural development and the need to look for new ways of doing farming and agricultural development work. This is an excerpt of what I said at the introductory meeting at Fodome Ahor.

"Thank you for attending this meeting. I am an employee of the Ministry of Agriculture who is presently researching into how we can improve our farming system. My recent interaction with some of you in this district has shown that our present efforts at agricultural development are not achieving the desired results. The general consensus of the people I talked with was that "the agriculturists are not doing enough to solve your problems" and "the government must do something" to help solve problems being faced by farmers.

I wish to say that we agriculturists are unable to solve the problems because we do not have all the answers. However, believe that we can "solve" most of these problems by collectively reflecting on the experience and knowledge that we already have about our environment and previous activities. My purpose for coming here today is therefore to ask you to assist in (a) finding out more about these problems; and (b) deciding what we can do together to "solve" them. My mission is therefore to learn with you to identify what we can learn and do together to improve our performances as farmers and agriculturists".

The community reacted by asking questions that developed into open discussion between us. Some of the questions asked and comments that acted as precursors to the discussions included:

- "The "agriculture people" have never learnt from us. What can you learn from us that you cannot get from your big books?"
• 'You have been trained to help us poor farmers. But your speech has betrayed you. It clearly showed that you the "agriculture people" have failed we the farmers'.

• 'Why not engage the leaders of this village to give you all you need? They represent us. They know all our problems so they can tell you everything'.

• 'Our expectations are that you could help us solve these problems. How can sharing of experiences help solve our problems?'

These questions and comments reflect the perceptions and expectations that farmers had about themselves and about the agriculturists. The agriculturists were regarded as 'farming physicians' who have the expertise to diagnose the 'disease' (farmer's problems), prescribe medicine to cure them and in certain cases give 'injections' to cure observed 'ailments'. The agriculturist therefore assumes the role of 'giving' whereas the farmers are at the 'receiving end' of the development spectrum. We therefore used the discussion with the communities to expose the poverty of this approach in solving the complex problems that confront the farmers.

By sharing some local proverbs like, 'Eta deka meade aadam o (two heads are better than one) and detsike be hamee wongna tsoa kpe (and there is strength in unity), they became conscious of the need to talk with the agriculturists and with each other, to dialogue with and understand (nyamedzodzro kpe gormese) each other as a necessary condition for decision making. It was also a means of establishing equality and trust with the villagers without whom effective participation would be difficult.

5.4.3 Forming the 'Learning Teams'

After establishing the problem and relevance of the study, I called for 'students' from amongst the communities to form the 'learning team' (the principal research-participants). In doing this, I took cognisance of the fact that rural communities are heterogeneous in terms of ethnicity, socio-economic condition, age and gender (Welbourn, 1992). This means that particular problems could mean different things to different groups of people, depending on their status in the community. It was therefore necessary to have the different groups represented in the 'learning team'. A register of farmers in the village was compiled by FLS in collaboration with the
executives of the local branch of the Ghana National Association of Farmers and Fishermen (GNAFF). The farmers were then classified by four key informants selected by the Chiefs and the GNAFF executives. The communities were classified using gender, age, citizenship of villages, wealth status (rich, normal or poor) and membership of contact groups as criteria.

Table 13 Farmer-Participants by Categories

<table>
<thead>
<tr>
<th>Classifications</th>
<th>Villages</th>
<th>Tota l</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Liati Soba</td>
<td>Fodome Ahor</td>
</tr>
<tr>
<td></td>
<td>Wealth Status</td>
<td>Wealth Status</td>
</tr>
<tr>
<td></td>
<td>Rich</td>
<td>Average</td>
</tr>
<tr>
<td>Female</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Male</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Migrant</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Citizen</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Contact-farmer</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Non-contact Farmer</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

There were differences of opinion among the key informants with regard to the citizenship of individuals who were regarded nyomviwovi (they are related to the villages ‘maternally’). This situation arose because a person is regarded as a member of the fathers’ clan and citizen of the fathers’ village. However, for the sake of this research, a person was regarded as a citizen if either of the parents was a citizen. This was on the understanding that such a person may easily access resources, paternally or maternally, whereas a migrant has to get them mainly through economic transactions (hiring it with money of through share cropping).

\[^{23}\text{This means their mothers are ‘citizens’ of the village but their fathers are not.}\]
There was also varied opinion as to who was rich or poor in the villages, the dispute arising from the varied criteria used by the various key informants in judging the wealth of the farmers. The criteria used included farm size, ownership of tree crops, material wealth (house, bicycle, vehicle, radio, motor vehicle), amount of farm produce, sale of farm produce, and the participation in other secondary employment like trading and distilling of alcoholic beverages.

After differences in classification were clarified and dealt with, a learning team of 20 was randomly selected from the identified categories for each village. (See Table 13 for the number of learning team members per category and Appendix 6 for names of members of the Village Learning Teams from the two participating communities). Selected farmers who, for various reasons could not participate in the learning activities were replaced by other farmers from similar categories. This was done with the conviction that the learning process would achieve the desired goal only if participants did it of their own free will. The local front line staff (FLS), DAEO, and District Crop Services Officer (DCSO) were also co-opted into the learning teams. The district officer in charge of agricultural policy planning, monitoring and evaluation was also invited to interact with the ‘learners’ on government policies and their effects on agriculture.

5.4.4 Group Discussions

Those who accepted the invitation met together for six sessions at Liati Soba and five times at Fodome Ahor. These meetings were held once every week in each of the villages and lasted for about two to three hours over a period of approximately three months (April to June 1995). The overall aim as understood by the group at the start of the learning was to explore, describe and critique the situation in which farming and extension was being done in the villages. It also explored the various practices involved in farming and extension work in the villages.

Participants were encouraged to share their experiences and make suggestions about issues that were relevant to them. They were encouraged to recall, describe and interpret relevant experiences in relation to production, consumption, marketing, and
off-farm activities. They were also asked to reflect on the impact of the socio-economic factors that affect their practices and on how they coped with them. Participants were encouraged to question the politics of farming and extension work. The inquiry therefore moved beyond conversation about experiences, to confronting the cultural, ideological and political forces through which the experiences were being expressed in the study villages (Shor and Friere, 1987). It was therefore similar to participatory action research that questions the politics of knowledge and action in social systems (Tandon, 1981; Whyte, 1991; Chambers, 1997).

Participants were requested to respect the views shared by other participants and were also encouraged to contribute to, or seek clarification of, points raised by other participants. Although, as the facilitator, I asked questions to enable participants to reinterpret or analyse data collected, the sessions were directed by the issues identified by participants. As shown on Table 14, the narration or interpretation from one participant initiated reactions from other participants, that helped to further explain or critique the preceding input.

Contradictions and points of departure on particular subjects were also noted and discussed further, to enable the group to appreciate the diversity of views. This also helped participants to reinterpret their experiences. Individuals in the learning session were requested, at random, to summarise ideas being tabled by other participants. This was done to encourage effective participation in all the deliberations. Further themes and explanations given at each session were summarised and fed into the group discussion in the following sessions. This helped participants to reflect on their stated points of view and to ascertain whether, participants were changing their views with the learning process. Further, I also raised these themes in informal discussions with other community members who were not part of the action research team.
Table 14  An Excerpt from the Group Discussion

**Farmer 1:** One of our major problems is lack of funds for our operations.

**Researcher:** Money appears to be what every farmer talks about. Can anyone explain why it is of such importance.

**Farmer 2:** Money is the seat of all that we do. We need money for labour and to buy farm inputs. In fact most of us cannot expand our farms because we do not have the funds to invest. This means that the food and money that we get from the farms are also be small. You see 'money begets money'.

**Farmer 3:** Another issue is the cost of the technologies being taught by the Technical Officers. Inputs are quite expensive now. So if we are going to adopt these technologies then we must get money from somewhere. The problem is not the money but where to get it. The banks would never give loans to people like us. Last year some of us spent our time and money, chasing loans from ADB in Hohoe. But we could not get any money from the bank.

**Farmer 4:** I do not want to hear about the banks again. You remember five years ago when they started the SG 2000 program, we were lucky to have been recommended by the FLS to benefit from the input loan of fertiliser, insecticides and maize. I was very unfortunate, when my maize reached the tasselling stage, the rains petered out and the maize was scorched. There was no produce but I had to repay the loan. I had to sell my radio and bicycle to repay the loan. Everyone would like to get money to improve their farm but if there is that risk of losing properties, then that is not the way to develop.

**Farmer 5:** But if you have a rich benevolent friend or relative, they might advance a soft loan to you. Such 'brotherly loans' are payable without interest. There are also some traders who are money lenders. The problem with these money lenders is that they normally take farm produce instead of cash and they decide how much to pay for the produce. So in some cases farmers are cheated out of their produce by these money trader-money lenders.

**FLS:** I think farmers are at mercy of the Banks and money lenders because they are not getting enough from their farms.

**Farmer 4:** I agree with that statement. Last year I harvested only 5 bags of maize from my field. What proportion of that can I sell? And how much can I invest if I have to depend on it for food and other things? ........................
5.4.5 Informal Interviews and Discussions

During the study period, I spent the greater part of the day in the two villages, observing, talking with and listening to the farmers. I attended social gatherings like communal labour and funerals. These informal settings were used to forge a closer relationship with the farmers, to get a feel for, and learn about the social life of the people. These encounters were also used to collect views from villagers who were not part of the learning team. Issues that emerged from these informal meetings were further used as points of discussion during the group meetings. The informal meetings and the group discussions held by the ‘village learning team’ members therefore informed each other. It was a way of seeking diversity, within the communities with regard to the issues at stake, by making conscious efforts at acknowledging and investigating contradictions and differences in the views expressed.

5.4.6 Field Visits

During the course of our discussions, the learning teams in the two villages did a ‘walk over’ survey of the fields surrounding the villages. Participants looked at the various field activities taking place at the time, the topography, soil conditions, vegetation and the growth of plants. The discussions held after these filed visits were used to explain and critique local perception of the environment. It also helped us (a) to use local knowledge in the assessment of resources; and (b) to critically reflect on specific changes and trends in weather conditions, resource use, resource availability and land degradation in the villages.

5.4.7 Community Meetings

Community meetings were held with the people of Liati Soba and Fodome Ahor to present the learning achieved in the two communities back to them. These meetings were led by members of the ‘learning teams.’ They were facilitated by the FLS while I acted as a participant/observer. The purpose of these meetings was to make the results of the participative learning available as community knowledge. It was also a way of soliciting public criticism of the findings. In addition to allowing the community to
make their contributions to the research process, these meetings were also ways of stimulating the community to reflect on, modify and implement the suggested interventions.

5.4.8 Planning, Implementation, Monitoring and Evaluation

Planning of what might or ought to be done formed part of the discussions held by the learning team. As the various issues were discussed, the group generated the possible and probable interventions that could be implemented to help improve the situation. Participants were aware that the interventions suggested were not 'cast in concrete' and could be modified in practice. The theme that became the guiding principle was that 'stakeholders should make a conscious effort to learn with and from each other, as a way of identifying the "right thing" to do under various situations'.

The implementation of interventions was carried out by the stakeholders in the study villages. These activities were monitored by the farmers and the local FLS. I evaluated the research input a year after its initiation, in collaboration with the stakeholders who participated in the learning process. The evaluation report is presented in Chapter 7.

5.4.9 Learning Beyond the Research Input

At the end of the deliberations, the groups agreed to have periodic meetings to discuss progress reports from individual farms and group activities. Committees were formed in each of the two villages to oversee the implementation of the decisions taken and to help convene meetings for further discussions. However, six months after implementation, the FLS in the two villages decided to hold periodic learning sessions with various clans within the villages. The District Agricultural Extension Officer also agreed that the FLS could use the present contact-groups in the other villages in their sub-districts as 'action research' groups. It is the hope that these moves would help the FLS and farmers continue to learn with each other well after the end of my research input.
5.5 Facilitating the Learning Process

I considered myself the initiator of the learning process. I am also, by virtue of being an extension officer, a co-owner of the problem. However, it is the farmers and the FLS who live and work with the problems in these villages. In that context they are the principal 'problem-solvers' whose knowledge and actions must be improved as a necessary condition for development. So in our interactions, I respected their views and gave minimum guidance or asked questions to help make issues clearer to the group. I was therefore also a co-learner with the other research-participants.

5.6 Keeping of Field Records

The main instrument for recording data was the keeping of a field notebook. Some of the sessions were also audio-taped. The tapes were used as a supplement to the field notes. It also helped me to cross-check the accuracy of my field notes. Records of previous meetings were summarised and translated and read to participants at subsequent meetings for their comments. Issues discussed at the group meetings were presented to randomly selected community members for their reaction. Similarly contributions from these people were recorded and discussed with the 'learning teams' for their views. This was a way of linking the various views and perspective to foster collective learning and a holistic appreciation of issues that are of concern to the farming communities.

5.7 Outcomes and Implications

The stakeholders were able to initiate and maintain a social discourse in which they used their own experiences as building blocks in the generation of knowledge. This section discusses the outcomes of this discourse and their implication for the research process and agricultural development in the study area.
5.7.1 Establishment of a Social Discourse

One of the major outcomes of the research is the establishment of social discourse within which stakeholders explored their own stories of farming and agricultural extension. My initial meetings with stakeholders in the study villages led to the appreciation of the idea that farmers and agriculturists are responsible human beings capable of choice and can be regarded as what Reason (1981), refers to as 'self acting agents.' This idea was nurtured and developed into a social discourse in which farmers and extension officers explored their (a) interpersonal relationships; (b) the relationships that might exist between their practices and their environment; and (c) how to improve these relationships. It was a way of creating social space for stakeholders to express themselves and recreate their worlds (Treleaven, 1994). As the discourse progressed, the participants came to appreciate the need for closer working relationship between the farmers and village level agricultural extension workers. Mr. Kwa, the FLS at Liati Soba conveyed this sentiment when he said,

'It is we the farmers and agriculturists who run and benefit from this farming system. It follows that it is our knowledge and activities that can make or unmake farming in this village. I therefore think this act of 'talking' towards a common understanding of what we have to do to improve our activities is a very good thing.' (Kwa, 1995; pers. comm.)

I had never facilitated any participatory learning sessions before and the participants had never attended one. We therefore had to learn the process of learning through the discovery of what has to be learnt, to enhance our understanding of the learning process as well as its outcomes. Field visits, for example, were undertaken in response to the need to learn about the changing trends in the relationship between land use, land degradation and food production. The 'discovery of how to discover' social realities of farming and extension work therefore emerged from the inquiry in which we were engaged. In other words the way the learning was done was in itself an outcome of the learning process. This is supported by a metaphor offered by a farmer at Liati Soba:
'The throwing of the machete goes with the cutting of the forest, one is not without the other. The farmer therefore goes to the forest with a dual purpose of throwing the machete and cutting the forest.' (G.K. Senoo, 1996; pers. comm.)

Another important aspect of this inquiry was the language used in the learning process. Russell and Ison (1991) asserted that language gives meaning to what we know. The Bible (John Chapter I verse. 1) describes the 'word' or language as the light for our path. It is the word that calls people to action (Krippendorf, 1993). It is a medium through which people describe actions that need to be taken to improve situations. Language and the reality of a situation are intertwined and influence each other (Freire, 1974). Since language reflects and shapes social realities (Ozanne and Murray, 1996), it is seen as an integral part of the context of the social discourse established. The learning sessions were therefore conducted in languages familiar to stakeholders. This was done to encourage all participants to express their views in ways that were consistent with their own values and special circumstances. During one of the discussion sessions one farmer said; 'Miele egbe deka dom azo' (we are now speaking the same language). Since we were all speaking the Eweh language, this can be regarded as a metaphorical comment. I interpreted this as the farmer’s way of saying ‘we are understanding each other now’. The importance of language to the discourse therefore lies in the ‘commonality’ of perceived meanings stakeholders have of the discussions.

The intellectual position of this study is concerned with improving or changing the situation and practices of farmers and extension workers for the ‘better’. However, if stakeholders are going to change their worlds and their practices for the better, then their way of looking at or expressing their world and practices and the meaning these have for them must change. This brings to the fore the relevance for forging close working relationship between extension and farmers to enable them to develop and use languages and values that can be seen as, and accepted as representing social realities in time and space by the interested parties. This study was therefore seen as having achieved the purpose of establishing a social discourse in which all interested
languages and values participated in describing and analysing ‘what is’ as a way of identifying ‘what could or ought to be done’ in the name of improvement.

5.7.2 A Better Understanding of the Situation in which Farming is done

By opening up the issues and problems of food and agricultural production to constructive public critique, participants were able to get a better understanding of issues and problems that affect farmers and extension workers. The issues and problems mentioned and discussed during the learning sessions are interrelated but for clarity, here they are presented under three main sections: ecology, socio-economic and technology delivery.

5.7.2.1 Ecology

The main ecological factors explored during the learning process in the villages were rainfall and soil fertility. These were discussed in relation to changes in the vegetation cover and agriculture production in the study villages.

5.7.2.1.1 Rainfall

Water for farming in the study area comes entirely from rain. This makes rainfall one of the most important climatic factors that affects agricultural production in the study villages. Most farmers I talked with complained about the erratic nature of rainfall pattern in the study area from 1983\(^24\) to 1996. Discussion with some farmers also revealed that there has been a subtle change in the rainfall pattern over the stated period. The rainfall figures for Hohoe (Appendix 4) shows that the total annual rainfall in the Hohoe district has remained almost constant for the past 25 years. However, there appears to be a gradual decline in the volume of the early rains that marks the beginning of the farming season in the study area. One farmer interpreted the implications of that observation when he said;

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\(^2\)1983 has become a reference date for most farmers because it marks a turning point in the ecology of the study villages. It has become known as ‘the year of the great drought’, a year in which most of the native forests got burnt down. It also brought about famine in the following year and marked the beginning of a change in the ‘established’ rainfall pattern of the area.
'I have observed that for the past five years the rains are no longer early. The rains that normally come to stay and provide the necessary moisture for crops now start in May and not in March as had been the 'established pattern'. I cannot say that the volume of rain has decreased, but what I have observed is that the rainfall pattern is changing from a two-season to a one-season rainfall.' (Gatze, 1995; pers. comm.)

It was apparent during the discussions that most of the farmers were aware of the changing trends in the rainfall pattern but could not change their farming calendar because of uncertainty and/or the 'loyalty' to established norms.

'We are aware of these changes in the rainfall pattern, but we continue to plant according to the established routine, against the hope that the rainfall pattern will return to normal. How can we be sure that the rainfall pattern was changing completely from the "normal"? ' (Christine Dogbe 1995; pers. comm.)

The reluctance of farmers to react to changes in the rainfall pattern was also found to be related to the need for farmers to provide food for the households. The major cropping season (March to July) is a very important season for farmers in the study villages because the preceding months of November to February are always dry. The food stock held by the household over the dry season, is almost finished by the time the major season starts. The need to produce food to augment family food reserves therefore took precedence over the consideration of subtle changes in the rainfall pattern. The problem of crop failure due to moisture stress has therefore become understood as being predicated by farmers' 'adherence to the old ways' of doing things. This realisation enabled participants to reflect on the need for farmers and extension workers to continuously learn about and adapt farm practices to the changing weather pattern. The importance of learning as a coping mechanism to the changes in the weather was revealed in the following exchange between two farmers at Fodome Ahor:
Francis Adoboe:

'It is evident from our discussions that we have to change our planting practices. We can plant either cowpea or cassava with the early rains. They can withstand the drought until the heavy rains start in May. Until such a time that the rainfall pattern changes to the previous regime, we have to do with one maize crop per year'.

Felicia Aborbi:

'What I have learnt from this discussion is that, the weather as we are discussing today can change tomorrow. So we must continue to study it to be able to make the necessary adjustments. It would also be useful to stagger our planting times so as that we avoid the risk of total crop loss. We cannot afford to put all our eggs into one basket'.

The understanding gained by participants through the discussions on the changing patterns of rainfall led them to conclude that:

- because of the late onset of the rains, the major season rains extend into the minor season period. The short rainy season (between July and August) used for drying of crops has ceased. Since the dry harmattan\textsuperscript{25} period still starts in November, the rainy season like the 'normal cropping season' has become one instead of two
- the planting of maize may be done in May. Maize or other drought sensitive crops planted before that period have a high risk of wilting off due to moisture stress
- crops that can withstand some drought, like cowpeas and cassava may be planted at the beginning of the year
- people who must plant maize early may have to stagger the planting dates as a way of spreading the risk of total crop failure
- all stakeholders (farmers, extension workers and researchers) must continue to study and share views on the weather condition
- forest crops, like plantain and bananas, that need a lot of water to grow well, would have to be de-emphasised and replaced with shorter duration and drought tolerant crops like maize, cowpeas, and cassava.

\textsuperscript{25}Harmattan is a drought period experienced normally between November and February. It is the time when the North Westerly dry winds from the Sahara desert blows across the West Coast of Africa.
5.7.2.1.2 Soil fertility

Another ecological problem discussed at the learning sessions was that of poor soil fertility. Most of the soils in the two villages was described by the farmers as being 'exhausted'. From our discussions, it became apparent to participants that the phenomena of 'exhausted soils' is related to the 'slash-and-burn' and the rotational land fallow (shifting cultivation) that is being practised by farmers in the study area. Under this practice, the farmer cultivates a plot of land until such a time as the crop yield begins to decline due to nutrient depletion. The land is then left to 'rest' for a period of time before its cultivation starts again.

The farmers believe that burning of the litter is necessary for crop development because it improves the soil fertility and makes the maintenance of farms easier. Kipo (1989) posited that the ash produced through burning of the field contains potash and exchangeable cations that enrich the soil. According to him cations have an immediate positive effect on plant growth. Further, the heat also destroys small weeds and insect pests (Areola, 1994). These observations might explain why farmers felt that crops would not do well without it. However, Nye and Greenland (1960) observed that burning the trash leads to rapid loss of organic carbon, nitrogen, phosphorous and sulphur through runoffs and leaching. They therefore concluded that, burning may have no lasting positive effect on crop growth.

Under the bush-fallow system, the nutrient status of the soils in the study villages is maintained through the decay and decomposition of litter provided by the vegetation cover on fallow land. Farmers therefore depend on the natural regeneration to restore soil fertility. It is ideal to leave a plot to fallow for about 10-15 years before re-cultivation to enable sufficient improvement in soil structure, soil life and soil fertility (Acquaye, 1971). Mr Leve of Liati Soba also agrees;

'When I was young, fallow fields were re-cultivated only when the secondary vegetation grows into a forest again. With good rainfall and no bush fires, this process can take over 10 years. But now, even with the poor rainfall and the
annual bush fires, farmers cannot afford to fallow their lands for more than 5 years.’ (Mr. Humphrey Leve, 1995; pers. comm.)

The increasing person/land ratio has been identified as a major contributory factor in the reduction of fallow period in Ghana. Titiriku (1995) observed that the population of Ghana has increased from about eight million in 1960 to 14 million in 1994. Since about 70 per cent of the population lives off the land, increase in the population means increased pressure on agricultural land. It has therefore become very difficult under this situation to maintain long fallow periods as explained by Mr Cleophas Nutsudza of Fodome Ahor.

‘The land area that our clan inherited is still the same. When I was a very small boy, I remembered that we were less than 20 households in the extended family. Presently we might be over 40 households living off the same land. What do you expect? If you fallow a piece of land for a very long time where would you farm? We cannot afford longer fallow periods any more because every household needs to produce food.’ (Cleophas Nutsudza, 1995; pers. comm.)

Another observation made was that most of the farmers use land belonging to the clan or extended family. This land may revert to the ‘family pool’ if it is kept fallow for a very long time. So some farmers ‘personalised’ the clan lands by maintaining short fallow periods. It is also less laborious and more economical to cultivate shorter fallow lands than matured secondary forest. A secondary forest may have to be ‘pollarded’, making land preparation quite difficult and expensive. Some farmers therefore make a trade-off between soil fertility and cost of land preparation in making decisions on the fallow periods. The shorter fallow periods observed in the study villages therefore appears to be a result of the interrelationship among ecological, social, demographic and economic factors.

Humus build up on fallow land is crucial to the improvement in the structure and nutrient status of the soil (Areola, 1994). Participants became critically aware that the shortening of the fallow periods in the study villages has the potential of constraining
humus production and soil fertility. Furthermore, these shorter cycles led to the replacement of woody trees like *odum* (*Milicia excelsa*), *afram* (*Terminalia superba*) and *papawu* (*Celtis zenkeri*) with gregarious herbaceous plants like *acheampong* (*Chromolaena odorata*) and grasses like guinea grass (*Panicum maximum*). Asare (1988) has suggested that trees are effective in nutrient recycling because of their deep root system and their ability to produce litter. Amanor (1994) also observed that herbaceous plants and grasses grow fast and achieve maximum growth early with the result that the rate of soil restoration by these plants is far less than that for trees. The dominance of *acheampong* and grasses in the vegetation of the study villages therefore has the potential of inhibiting nutrient recycling and fertility of the soil. The low fertility of soils in the study village could therefore be interpreted as a reflection of the relationship between low rainfall, short fallow periods and land degradation.

At the beginning of the discussions, farmers were of the opinion that the problems of soil fertility were related mainly to their inability to purchase and apply fertilisers. However, through our discussions, farmers came to link the issue of soil fertility to changes in the ecological processes that are related to the ‘rotational bush fallow’ system. Participants came to understand that the natural processes of restoring soil fertility and maintenance of soil water had become ineffective due to their land use and management practices. While it might be technically possible, to increase the nutrient level of the soil through the addition of inorganic fertilisers, most farmers cannot afford it, and them. The problem therefore became how to manage and utilise land resources in order to maintain an appreciable level of soil fertility and moisture to support crop growth.

This realisation motivated participants to brainstorm and suggest some ‘good’ practices that may be carried out to improve the present soil situation. These methods include:

- leaving fast growing woody plant in farms to improve the fallow
- planting of legumes in crop mixtures or on degraded fields with the purpose of improving soil fertility
• selection of seeds of early-maturing varieties of crops
• application of moderate amounts of organic fertiliser
• prevention and control of bush fires
• ‘slash and mulch’\textsuperscript{26}
• cover cropping and ‘slash and mulch’. The cover crop suggested by the District Crop services Officer was velvet beans (‘mucuna’). This plant is known to have the ability to develop a lot of litter that can help improve soil fertility and smother weeds.

5.7.2.2 Socio-Economic Issues

The socio-economic issues and problems discussed and learnt about by the learning teams included labour and labour availability, cost high of farm inputs, marketing and prices of farm produce and financing of farming ventures in the study area.

5.7.2.2.1 Labour and labour availability

Almost all farm production and processing of agricultural produce are done manually. This makes labour an important farm input in the study villages. Furthermore, because farming in the study villages is rain-fed, farming activities are seasonal. This means that all farmers are involved in similar operations at the same time. The absence of landless labourers in the study villages makes labour a scarce resource.

This situation is aggravated by the lack of labour-saving devices. The use of simple implements (machete, hoe, axe and the sickle) makes farming very tedious and limits both the rate and volume of work done by farmers. This therefore has implications on farm size, the timing of farming activities and for that matter, the very success of the farming ventures. It was noted that of the 40 farmers who participated in this study, only six have farms of more than three acres. Mr. Afed of Fodome Ahor observed that;

\textsuperscript{26}A practice in which the field is slashed but instead of burning, the farmer plants directly into the trash. The litter reduces evaporation of water from the soil, suppresses weed growth and fertilises the soil on decomposition.
'Working with machete is laborious. A hard working person, using the machete, can clear an acre of farm in eight days. This process is slow but we have to work to catch the weather. So the drudgery of the work we do limits the amount of land we can bring under cultivation' (Leopold Afedo 1995; pers. comm.)

The effect of labor availability also has gender and age biases. Because of labour intensity of land preparation, most women and old people are unable to prepare their own fields. They have to depend on the goodwill of the men and young people in the communities for that purpose. And because the physically stronger people are normally engaged on their own farms at the time of land preparation, the same time as their services might be needed by the 'weak', most women and the aged farmers are unable to cultivate large plots or in certain cases 'miss out completely' on planting on time.

'I am old' says Madam Sowlede Morkli of Liati Soba. 'I cannot prepare my field on my own. Some of the men in this village labour to supplement their household income or as a way of helping friends and relatives. But they would not do this before they have prepared and planted their own fields. By the time you get the help of such a person to prepare the field, you might be too late for the season' (Sowlede Morkli 1995; pers. comm.)

Labour availability also has effect on the adoption of certain technologies, such as planting in lines, application of fertilizers and agro-forestry practices. I visited some of the farmer managed agro-forestry trials on alley cropping and in-situ live staking of yams at Vakpo (Kpando District), Kledjo (Hohoe district) and Abewonkor (Nkwanta District). These technologies have the potential for increasing crop production (MOFA, 1992). However the farmers indicated that they do not have the labour to manage the trees as recommended by the agriculturists. The lesson learnt from these observations was that farmers may not adopt technologies that make extra demands on their limited labour resources.
There was not a clear intervention to this problem. The main suggestion by the group was to revitalise the community spirit of the people and to work in groups for each other in order to meet dead lines on production. Historically, farmers in the villages rely on social networking (kin and friends) to carry out most of their farm tasks. However, with the introduction of money into the village economy, the practice of working for each other, as a means of strengthening social ties, has given way to economic transactions. One farmer expressed this view as follows:

'We did most of their farm work through the organisation of 'working parties'. Because of the team spirit they were able to accomplish much in a short time. Further, since it does not involve any money transactions it was a cheap way of making farms. Working parties are no more common in this village because people have become individualistic. The sense of 'social obligation' that motivates the villagers to work in groups has died when money was born into this community.' (Jonas Akpatse, 1995; pers. comm.)

Some participants were, however, of the opinion that working parties hold a potential for improving their labour shortage situation. They came to identify ways to improve its effectiveness: selection of people who are committed to the cause and limiting membership to a small number per group.

Presently the only labour saving device in the two villages is the corn mill. It was observed that the use of simple machines could enable farmers to increase the cultivated areas and to complete their work on time. It was also observed that farmers in Fodome Ahor lose a lot of rice through the use of traditional processing methods. Farmers were therefore encouraged to contact the Intermediate Technology Transfer Unit (ITTU) of the Ministry of Science and Technology, who are designing simple agricultural tools and equipment, to get information on their use and possibility of acquiring some for trial in the villages.

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27It is a practice where two or more farmers come together to work for each other. The host farmer provides food during the working session. No money change hands. This party is held on every group members farm until everyone in the working party is worked for.
5.7.2.2.2 High Cost of Inputs

High cost of inputs is another important problem facing farmers in the study villages. Prices of fertilisers, agrochemical and farm implements have been on the increase since the start of the Structural Adjustment Program (SAP) in 1980. Farmers are therefore unable to afford farm inputs. Kporxa Kwaku of Liati Soba observed that:

‘Presently the price of the 'pebble'\textsuperscript{28} fertiliser at Hohoe is about 22,000 Cedis. By the time it is brought to this village, the cost might be about 23,000 Cedis. To be very frank with you, I cannot afford even a bag of fertiliser for my farm.’

(Kporxa, 1995; pers. comm.)

Until 1990 the price of imported farm inputs such as fertilisers and agro-chemical were relatively cheap because they were subsidised by the government. However, the removal of subsidies on farm inputs as part of World Bank conditions for the implementation of the Structural Adjustment Program (SAP) has led to price increases. This is further aggravated by the depreciation of the Cedi (Ghanaian currency), against the US Dollar (Table 25 of Appendix 2). As the Cedi depreciated against the US dollar, the nominal prices of these inputs increased. For example, although the value of a 50 Kg bag of compound fertiliser, NPK: 20-20-0, increased from about 13 US Dollars in 1990 to 15 US Dollars in 1994, the nominal cost of this fertiliser increased from 4,200 Cedis in 1990 to C 22,000 Cedis in 1994 (MOFA, 1994). This represents about a 424 per cent increase in price over a five year period. See Table 30 (Appendix 2) for details of changes in fertiliser prices from 1979-1994.

Similarly, interest rates charged by the Banks have been increased. In 1984 the interest charged by the Banks on agricultural loans was about 18.5 per cent but this was increased to about 35 per cent in 1994. In the face of low production and low market prices, it is hard for farmers to afford a loan with such high interest rates. These issues were addressed to the District Officer in charge of policy planning monitoring and evaluation, MOFA, Hohoe who came to explain the Ghana

\textsuperscript{28} Compound Fertiliser (NPK 20-20-0 or NPK 15 15 15)
government's agricultural policy to participants. This is a summary of what participants at Liati Soba put before him.

_The prices of all farm inputs are on the increase but the prices of our produce are static. This is not fair to farmers. You the policy makers should try to make sure that the price of farm produce is increased or the prices of the inputs should be reduced to enable us buy our farm inputs. If the present disparity between high input prices and low farm produce prices remains, all your efforts to improve our lives will be in vain._' (Liati Soba, May, 1995)

The problem here is therefore not only the high input prices, but also the low prices of farm produce. Farmers are therefore facing negative terms of trade. The problem therefore became how to improve farmers' terms of trade to enable them to participate more effectively in the market economy. This appears to be in the domain of government policy. However, participants came to the appreciation that in addition to ensuring productivity increases, farmers also need to improve their marketing strategy as a way of making improvement in their income levels.

5.7.2.2.3 _Marketing of Farm Produce_

In Ghana, all 'official' efforts are directed towards the development of technologies that farmers can adopt to improve productivity. However, this study has led farmers and extension workers to become critically aware that farmers, like any entrepreneurs, need appropriate incentives to improve earnings from their farms. This meant that for the farmer to be stimulated to produce more on a sustainable basis, he or she must be remunerated well through 'better' prices than what is now being offered to them. The prices of agricultural produce were found to be low whereas those of manufactured goods (including farm inputs) have been on the increase. The monthly sale prices of maize in Hohoe market between 1985 and 1994 (Tables 31 and 32 of Appendix 2) shows that while the price of a 50 kg bag of fertiliser increased from 440 Cedis in 1985 to 22,000 Cedis in 1994, the highest price of an estimated 100 Kg bag of maize rose from 3,300 Cedis in 1985 to 16,700 Cedis within the same period.
It was noted that the low prices of agricultural commodities also related to farmer’s inability to influence the marketing process. They have no control over either setting of the selling price or the measuring process. This was alluded to by Ms. Aborbi when she said:

'It is the traders who decide the measure and prices of our farm produce. The normal measure of maize in the market is the ‘olonka’. However, when the traders say the price of one ‘olonka’ is 100 Cedis, they end up taking more maize by ‘planting’ their hands at the top of the measuring tin to rob farmers of their produce.' (Felicia Aborbi, 1995; pers. comm.).

A visit to the Kpeve, Hohoe and Fodome Helu markets confirmed that the unstandardised ‘volumetric measurement’ used in marketing transactions of agricultural food products (olonka) is a major contributory factor to the low agricultural commodity prices. For example, during the sale of maize, the price per volume (olonka) is determined at the beginning of the marketing session by the traders in the market. However, the quantity of maize taken as being equivalent to an ‘olonka’ depends on the measurement technique of the trader and the ability of the maize seller in making sure that the trader does not cheat in the measurement.

In measuring, the trader pours the maize into a big basket or bowl, and uses the olonka to fetch the maize into another basket. The traders may cup their hands on the edge of the ‘olonka’, and in some cases, may extend their arms around the edge of the measuring bowl (olonka). The use of these techniques allows traders to transfer more maize than would be contained in the olonka for the price of an olonka. So the actual price paid to farmers per volume is always lower than the price advertised for the purchase. It is also difficult to know the actual price per measure because it varies from trader to trader and the time of the year. The cheating of farmers out of their

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29 16 olonka full of well dried maize (12 % moisture content) weigh about 50 Kg (MOFA, Ho 1995).
30 Most dry grains and legumes, and powdered agricultural products are normally sold by volumes.
produce through this mode of measurement is more prevalent at harvesting time when the supply of food is high.

This has great implications for the income of farmers and the development of farming in the study villages. Wolfgang (1985:26) has observed that:

'An increase in agricultural production depends on so many factors and conditions. Reasonable prices, certainly is of a decisive importance because, income gained from the sales of the produce is an important input for the production process.'

The measuring system cannot ensure that farmers get the revenue they needed as incentive for further production. It is therefore interesting that farmers, farmers' associations and policy makers never question a practice that (a) distorts the exchange rate of farm products; and (b) is a potential disincentive to farming in the study area.

Through the discussions, farmers became more concerned about the marketing of their produce. Participants came to understand that by opening up dialogue with the sellers, their terms of sale might gradually improve. Consequently they have requested the executives of GNAFF to hold a meeting with the Farm Produce Sellers Association in the local market to address the issue of fair price to farmers. Participants were however, conscious of the fact that, ensuring a 'fair go' for farmers, in terms of prices, may not be easy because it has become an established practice for traders to control the marketing process. But they have come to see it as a necessary step to improving their income levels and standards of living. On reflection one participant observed that:

'The money we get from the sale of our produce affects our lives, so if we are going to improve our lives, then we must improve what we get from our sales. Getting a fair price for our products is as important as the amount of produce we send to the market.' (Fidelis Gbogbo, 1995. pers. comm.)
This improved consciousness of the flaws in the marketing process, is important for the future of smallholder farmers because the neo-liberal policy being implemented by the government means that the previous social-welfare policy of subsidy and low interest rate for agricultural loans has given way to a situation where (a) market forces determine the shape of development; and (b) farmers must achieve efficiency in agricultural commodity production to be able to effectively participate in the market. We therefore saw improvement in the efficiency of the marketing of agricultural produce is therefore vital for development of agriculture in the study villages.

5.7.2.2.4 Finance

Low production levels, poor prices paid to farmers for their products reinforced by high input prices, means that farmers are always experiencing financial problems. It is therefore not a surprise that finance is the single most important problem identified by the research participants. Many farmers were of the opinion that money or the support they needed has to come from government. The farmers cast the government in the role of a 'parent' who must provide for the children (farmers). However, through our discussions, they came to understand that it would be difficult for the government to provide for all of them. They also came to recognise that their incomes were low because of the low level of production and low price they get for their products. In this case, improvements in their financial position would only be brought about by addressing the basic issues of improving production and marketing strategies.

The need for changes in government policies to address the negative terms of trade being faced with farmers was identified. While it was agreed that it might be necessary for farmers to get some production loans from the formal and informal sector at low interest rate, it became clear to participants that 'lack of money' cannot be addressed on a sustainable basis by 'hand outs' from external sources. The days of assuming the position of 'wards of state' has to be seen as a thing of the past and farmers came to see the importance of endeavouring to help themselves through co-operative learning and action. This also means extension workers have to assume the
role of opening up genuine participative learning with farmers as an on-going strategy for identifying what can be done, given the opportunities and constraints of farmers’ contexts, to improve relationships within which the farmers operate as a means of improving their production and revenue.

5.7.2.3 Technology Delivery

The transfer of technology for adoption by farmers has been the main approach adopted for agricultural development in the study area. The main technologies being suggested to farmers in these villages were crop based. They are based on high yielding varieties of few staple crops (maize, cassava and cowpeas), application of external inputs (to improve soil fertility, or to eradicate pest or weed) and the maintenance of ‘ideal crop population’. These technologies have been proven, by researchers, to be ‘better’ than the farmers’ practice (CRI, 1990). This raises the question of why it is difficult to persuade farmers to change their ‘farming behaviour’ from their own practices to the ‘improved’ ones.

The reason for the ‘non-adoption’ of these recommended practices appears to be related to the inability of the researchers to consider the social, economic and cultural situations that inform farmers’ decision making process. Evidences of the contextual irrelevance of some of these technologies was provided by the evaluation of some of these technologies by participants.

“In 1993 the technical officer came to my farm to teach me how to plant maize on a small plot on my farm. We planted more maize on that plot than I would normally have planted. I also had to buy some quantity of fertiliser for that plot. The yield of that plot was higher than from the rest of the farm. The following season I planted to the specification but I could not afford to apply fertiliser. The result was disastrous. The yield was so low, I had to discontinue the practice.’ (Mary Worname, 1995; pers. comm.).

Mr Afayo (1995; pers. comm.) also claimed that he was introduced to the ‘high yielding’ maize variety, Okomasa. He observed that the variety yielded almost twice
as much as his own variety but he could not continue planting the variety because it was not very suitable for preparation of the local dish, akple. Similarly, the farmers are also reluctant to plant the improved cassava varieties because they cannot be pounded into fufu (pounded boiled yam or cassava mixed with or without plantain and cocoyams). It was, however, observed migrant farmers, from the southern part of Volta region and the Republic of Togo, who use cassava dough (fermented cassava paste) in the preparation of their meals have adopted the practices of planting the improved varieties of cassava. The uptake of improved varieties of cassava was also reported among Kokomba and Adele farmers, in the Nkwanta district of the Volta region, who use cassava for dry chips (kotono) and gari processing (MOFA, 1988). Food value therefore provided a context within which researcher-recommended varieties of crop are adopted or rejected by farmers.

The present neo-liberal political economy of the Ghanaian government was also seen as affecting the adoption of technologies which involve the application of external inputs. The implementation of government policy that involves the removal of subsidies on agricultural inputs has seen the nominal prices of agricultural inputs soaring while the price of farm produce remain low. In this situation, not only were farmers unable to afford these technologies, but the technologies cannot pay for themselves. (See Table 33 of Appendix 2 for an estimated cost-benefit analysis for adopting the researcher-recommended maize production practices in the study area). Because of the comparable high input cost to farm produce price with its associated negative terms of trade to the farmers, it has become economically illogical for farmers to adopt external input technologies. This is reflected in what was said by Torgbe Yao Akorli III, Dufia of Fodome Ahor.

'If you apply the one bag compound fertiliser and one bag of sulphate of ammonia to one acre of maize farm as we were advised by our Technical Officer, you will surely increase not only your yield but also your debts.' (Torgbe Yao Akorli, 1995. pers. comm.).
The extension workers came to learn that the suitability of recommended technologies to farmers does not depend on yield alone, but depends also on other values (economic, cultural, etc.) that farmers placed on them. The utility of the technologies being transferred to farmers was therefore seen to be limited by the context within which they were supposed to be applied. This raises the issue of the need for the context of application to inform the technology development process. Some of the farmers have tried to address these 'contextual issues' raised by modifying or adapting these technologies to their situations. For example some farmers in Fodome Ahor have been planting a mixture of the 'improved variety' of maize' and the local variety on the same plot. This modification was found by the farmers to have helped them to improve their yield while at the same time obtaining the needed texture for the meals. Similarly, farmers have also embraced planting in lines (because it makes the management of their farms easier and helping them increase the plant population on the field) but they have increased the planting distances (in the case of maize) to compensate for their inability to apply the recommended amounts of fertilisers.

It was also noted that because of the low FLS to Farmer ratio in the study area the number of farmers covered by agricultural extension activity is low. The activities of the FLS have been limited, mainly, to farmers who were registered in the Contact-Farmer groups. Many farmers are therefore not being contacted by the FLS. For example, there are over 50 farm families in Liati Soba. However, because the FLS has to talk directly with the farmers, he can only work with some members of 15 of these households who were registered as Contact-Farmer groups members for the year 1995. It was appreciated that new contact farmer groups are formed every year so some other household members may become contact farmer in the following year. This would, however, not answer the question of inadequate coverage of extension activities in the study area.

It was also noted that the emphasis of MOFA's activity in the study area has been on the three major staples (maize, cassava, and cowpea), for which technologies were available from CRI. Consequently, other agricultural commodities have not been given much attention by the research-extension system. It is noteworthy that farmers
continue to produce crops for which no researcher-recommended technology existed. The practices adopted in the production of these crops that are marginalised by the development institutions emerged through farmers' own 'trial and error' experimentation and experiential learning from their practices. For example, farmers from Liati Soba are noted for the cultivation of garden eggs and okra that has not been given much attention by the researchers.

The lessons learnt here by participants were that:

- farmers would adopt technologies that are contextually relevant
- farmers may not adopt the recommended technologies on an 'as is' basis because no technology can totally capture all the values that are of interest to them
- farmers, like agriculturists, are capable of learning and making personal choices from their own experiments.

The implications of these lessons are that technologies being developed and transferred to farmers are not 'superior' on their own right and they can only be of use to farmers if they meet the 'value standards' of the context of application. There is therefore strong case for extension workers to learn with farmers and support them to adapt these technologies, and where necessary to improve on farmers own practices, instead of forcing them to adopt researcher recommended technologies 'as given' as the only way to develop agriculture. The argument here is that, the technologies developed by the researchers for extension to transfer should be used as inputs into a social discourse between farmers and extension workers to determine what is 'right' for farmers to do in their own situations. Extension therefore becomes a participatory learning activity, between farmers and extension personnel, in which personal experiences and available knowledge (irrespective of where acquired) are used to seek contextually relevant practices to improve farm production.

5.7.3 A Better Understanding of Farming and Agricultural Extension Work.

The social discourse in which stakeholders were engaged challenged them to reflect on 'why they do what they do' and 'why they chose particular practices instead of others'. In the process they came to understand their own practices better. In other
words they came to reconstruct theories that better explain their behaviour and attitudes with regard to farming and agricultural extension work. Specifically, discussions narrowed down to some specifics of farmers’ production system such as land preparation, planting time, soil and land management and the marketing of farm produce. Farmers were also exposed to some theoretical aspects of farm management such as nutrient depletion through slash and burn, positive effects of legumes on soil nutrients and the effect of land degradation on soil fertility. Farmers therefore came to have some theoretical perspectives to some of their farm practices. This is conceptualised as being consistent with the notion of action research as a process of linking theory to practice (Dick, 1993).

Agricultural extension workers also had the opportunity to listen to farmers free of all previous assumptions of the notions of the ‘superiority of scientific knowledge’ and the ‘unscientific’ nature of farmers knowledge. They came to appreciate the fact that they were not just ‘transferring useful technologies’ to farmers but they were rather communicating ‘values’ that represent the views of the researchers to farmers. They also learnt that communications between farmers and extension workers were ineffective because of the incompatibility of the values being conveyed and those held by farmers. This then brought to the fore the need for describing and interpreting differences in values with farmers as a way of placing extension work in the context of the farmers. This means getting into collegiate conversation with farmers with the intent of facilitating farmer’s decision making process with regard to what values should be upheld and pursued in order to improve the farmer’s food production situation.

5.7.4 Improvement in Practice of Stakeholders

The learning done in these villages was unable to generate any clear cut interventions to be adopted ‘as is’ by stakeholders to solve their problems. However, it did provide the opportunity for them to (a) reformulate their problems; and (b) critique their own practices to generate knowledge to inform their future actions. For example farmers talked of changing their planting pattern and adopting new soil management practices. The farmers learnt to convince themselves about the contextual validity of
the knowledge generated. Reason (1981) has posited that the development into ‘I am confident of what I want to do’ liberates energy to pursue the course about which knowledge is developed. Krippendorf (1991) was also of the view that no person can consciously act against his or her own conviction. By making farmers critically conscious of alternative ways of acting ‘better’, the participative learning done in the two villages was considered to have made a positive contribution to the practices of the farmers.

The dual purpose of extension in Ghana has been to improve communication with farmers and in the process teach farmers to adopt improved technologies recommended by researchers (Donkor, 1989). However, as discussed in previous sections, this approach, as being implemented by MOFA in the study area, is neither able to ‘model’ farmers’ behaviour nor effectively communicate the researcher-recommended technologies to farmers.

It was observed that by consciously learning with farmers, the agriculturists came to appreciate and make sense of farmers beliefs, subjective values, opportunities, resources and dilemmas. For example they came to know that farmers would not plant improved varieties because of food value, or they might not apply external input as recommended because the technology cannot pay for itself. Extension workers also came to (a) see the potentials and value of farmers’ knowledge system; and (b) to acknowledge that farmers are capable of interpreting their own experiences and designing ways or experiments to improve their practices. This consciousness was echoed by David Ahiadu, the FLS for Fodome Ahor.

'I have always believed that our technologies are better than the farmers own practices. However, it has become clear to me, through our learning sessions that our technologies cannot capture the diverse interests and values of farmers. Further, farmers have shown that they are capable of innovating new ways of doing their farming. What we need to be doing then is to forge a relationship with farmers in order to support each other in creating knowledge that is consistent with farmer’s context.' (Ahiadu, 1995; pers. comm.)
The response from the FLS to the learning was the need to change the modus operandi of their contact-farmer groups from ‘teaching groups’ to ‘action research groups’ where FLS and farmers have to learn together for better decision making and action. The argument here is that participative learning helped extension achieve its two interrelated objectives of ‘communication with farmers’ and ‘helping them to improve their practices.

5.7.5 Better Understanding of the Theory and Practice of the Research

This study brought together farmers and extension workers for the purpose of learning to learn how to improve the low agricultural production situation in the study villages. In other words the agriculturists and farmers were cast in the role of coresearchers. This engagement therefore gave me the opportunity to (a) experience the art of facilitating adult learning; and (b) improve my understanding of the theory and practice of action research while improving my practice as an agricultural extension officer. The other participants also learnt about the concept and practice of learning together to develop their own practices.

I had never undertaken an action research project before. The first meetings at the two villages were therefore a process of learning facilitation by ‘trial and error’. These initial meetings, were characterised by ambiguity, perplexity, conflict of direction and lack of coherence. Discussions were guided and some participants were even defensive in their presentations. It was a time when we were all trying to fathom out what was expected of us in the learning process. I tried to solicit participation from the learning teams by calling them by name to contribute. However, after these meetings I realised that if the people were going to participate freely, then I had to let the ‘discussion direct the people’.

What I did in subsequent meetings was to keep participants talking about what they thought about their environment and their practices and how these practices and situations could be improved. This was done by encouraging individuals to reflect on issues raised by other members of the group. The discourse developed when
participants began to identify themselves with their experiences and practices as farmers and extension workers. By reliving and reflecting on their experiences they were able to articulate their problems and opportunities in ways that they have not done before. The ‘taken-for-granted’ issues such as ‘slash and burn’ and selling of farm produce in the market emerged as real issues for consideration. In the process we were able to identify the different views and perceptions towards the present situation to enable us better understand our situation and practices. These provided the basis for defining and interpreting what is ‘better’ to be done to improve our practices and situation. Data generation, analysis and how the knowledge generated should be used were therefore interwoven into the discourse in which we were engaged.

I saw the task of facilitation as challenging people to reflect on alternative views, to disagree with each other without taking any special recognition of ‘winning or losing’ points as is the case in debates. However, it was not easy to assume that posture at the beginning as it took some time to realise the ‘advantageous’ position I was occupying. Here was I, a supervisor from the regional office, talking with farmers who regard the FLS and agricultural officers from Hohoe as experts in farming. These officers were also regarding me as their superior officer. My very presence at the place has a great influence on the behaviour of the farmers and the agricultural workers. In that position the participants were taking my points as suggestions or ‘official responses’ to the issues being raised. This placed me in a very awkward position as a facilitator of a participative inquiry. How can I get down from this position? The group was psychologically segregated into power and knowledge blocks. This was due to the hierarchical situation in which farmers and extension workers found themselves. Agriculturists were supposed to have access to specialised knowledge that is not available to farmers and the supervisors also have the political mandate to direct subordinates in what must be done. In this situation, there was no opportunity to share experiences or to value contributions of people who are below in the hierarchy.
The most significant step I took to attempt reducing the power and perceived knowledge differential was to directly address it. I made it clear that neither I nor the other extension officers were better experts on farmers’ problems than farmers were. I explained that while we, the agriculturists, had the privilege of going to learn about agriculture from the books, the farmers also have the advantage of experiencing farming and its problems first hand. In that case everyone has something to offer and every experience and ideas were very important. The emphasis was therefore placed on the narration of experiences, a common ground on which everyone can stand and participate in deliberations: the notion of focusing on the inquiry (Turnbull, 1993).

I had to desist from making judgements about narration or imposing my personal views on the group. I took a back-seat in the interpretation of what transpired in the learning sessions. I asked questions, however, to elicit further explanations or asked the group to reflect on presentations being made. I also invited the farmers and FLS to act facilitators for the community meetings. This is consistent with the concept of passing the stick to the problem owners (Chambers, 1997).

My conviction and my commitment to this approach made the agriculturists to be less defensive of their roles and practices. Traditionally the MOFA staff are supposed to implement government policies on agriculture. The views of agriculturists are therefore taken as those from the government. This was reflected in comments made by farmers with regard to my request to learn with them (Section 5.2.3 ). One farmer even mentioned that my coming to learn from them was the admission that we agriculturists have failed the farmers. Consequently the staff of MOFA always try to present the ‘good sides’ of their practices in order to defend and maintain their ‘status’. To shift from that position needs a lot of psychological courage and perspective transformation. This means going through a cognitive process that would enable one to develop what Reason (1994) refers to as ‘participative worldview’. Initially, the agriculturists were very uncomfortable with having their practices challenged openly by farmers. However, it was through this process that we the agricultural workers learnt to (a) value the farmer’s knowledge and capabilities; and
(b) the futility of trying to 'develop farmers' instead of supporting them learning to 'develop themselves'.

In retrospect, I saw my role as resembling that of a catalyst in initiating and nurturing trust and mutual relationship between farmers and MOFA staff for collaborative learning. It was also an opportunity for FLS to consciously learn with farmers as colleagues. I cannot claim that I have become an expert in the practice of action research. However, the project helped me to become more aware of the various theoretical perspectives and practices involved in participative learning as used in the context of agricultural extension.

5.7.6 Informed Critique of Results

Presentations from participants were exposed to critique during the discussion sessions. These open discussions enabled the research-participants to validate their descriptions and analyses. The community meeting held for the communities in which the learning took place was a way of opening up the results to public criticism. These were opportunities used by the villagers to review the results and to make some further contributions. Further, the week-long district workshop on participative learning organised after the village level learning was used to subject this results to informed public knowledge. This workshop also served the purpose of introducing the concept, the logic and the practice of participative learning to (a) other FLS in the Hohoe district; and (b) the supervisors and administrators from MOFA in the Volta Region.

5.8 Conclusion

Participative learning was found to be appropriate in learning about farming activities, farmers problems and extension activities in the Hohoe district of Ghana. This approach supports development as a process of social learning driven by real needs, resources and objectives of stakeholders. The facilitation of the process was difficult at the beginning because I was learning how to facilitate on the 'job'. However, by keeping to the inquiry I was able to guide research-participants to
establish and maintain a social discourse that helped us to generate knowledge that was validated by the participants as relevant.

Initially, it did not appeal to farmers who were looking for concrete answers to their problem. They had to participate in generating knowledge instead of listening to how the agriculturists were going to solve their problems for them. Similarly the agriculturists were not happy because the approach appeared to be a way of questioning their effectiveness and was a threat to their power over the knowledge delivery process. They were ‘forced’ by the design to contribute to discussions that exposed weaknesses of their practices instead of defending their ‘good work’ and status as ‘repositories of knowledge on agriculture’. The design enjoined all stakeholders to talk together with regard to their common concern about improving the problems of food and agricultural production in the selected villages. Through the social discourse that was instituted because of these interactions, they were then able to articulate their problems and opportunities by reflecting on their own experiences.

The major outcomes of this exercise was the understanding gained by stakeholders of their own situation in terms of (a) practices that they could undertake to improve their performances, and (b) the contextual issues (ecological, social, political, economic) that need to be addressed. The ‘realities’ constructed by participants might not be the ‘absolute truth’. However, they did provide realities that can be regarded as raw materials for further interpretation and decision making. It also helped them to generate diverse information that could help them to better understand and improve farming and extension practices. The results of the village level learning suggests that all practices needed to be understood and utilised in relation to the context of application. Improvement in farming and extension work came to be understood as the creation of a space for social discourse among stakeholders or the establishment of a ‘learning-partnership’ in which farmers and extension workers can co-influence decisions on what can be done in the name of agricultural development.
It therefore becomes an ethical and political responsibility of, and challenge for agriculturists, who have the mandate to develop farming, to create a space in which farmers and extension workers can be challenged by their own experiences of learning to better organise and act to improve food and agricultural production. This suggests shifting the focus from expending resources in perfecting technologies to participative learning with farmers. This implies making 'participative learning' a goal for development institutions instead of technology generation. This further requires that cognitive transformation into what Reason (1994) described as 'participative worldview'. This is what could enable individuals to focus on the establishment and maintenance of democratic discourse with emphasis on 'a learning partnership' between development agencies and rural communities in order to give farmers ownership of their problems and control over their solutions (Mattock and Steele, 1994; Martin and Woodhill, 1995).

I am also conscious of the fact that the development agents have to 'sacrifice' their political positions of power in order to activate and implement this learning process beyond this research input. It was therefore necessary to engage them in learning about the potentials and challenges of the process. 'Experiential learning about participative learning' was therefore thought as being an appropriate way of encouraging them to undergo the cognitive and perspective transformations that would enable them support the use of participative learning approach in their activities. This led to the organisation and implementation of the next phase of this research; 'A District Workshop on Participative Learning', to expand the action research team and to expose supervisors and administrators of MOFA from the (a) Volta Regional Office; and (b) Hohoe district office as well as all FLS from Hohoe district to the logic and the process of participative learning.
CHAPTER SIX

A DISTRICT WORKSHOP ON 'PARTICIPATIVE LEARNING'

6.1 Introduction

The exploratory survey carried out in the first phase of this study revealed:

- the complexity of the situation in which farming is done
- problems that farmers face in producing food and other agricultural products
- the low agricultural production level being experienced by farmers in the Hohoe district of Ghana.

Of special interest were the differences in opinion between farmers and the Ministry of Food and Agriculture with regard to how the problem of low production can be solved. There was a sense of disappointment among farmers who blamed the government for not doing enough to alleviate their main perceived problem of 'lack of money.' On the other hand there appeared to be a sense of unease among MOFA staff caused by the low adoption rate of technologies by farmers. The agriculturist believed that farmers could improve their production levels by adopting researcher recommended technologies. There appeared to be no indication that the approaches being adopted by stakeholders (the traditional practices of farmers and the perfect technologies developed by researchers) could help farmers to improve either their farm yields or their livelihoods.

The reflection on the outcomes of the survey, that is the senses of unease and dissatisfaction among stakeholders with regard to their own performances as farmers and agriculturists, and the usefulness of using action research and other participatory approaches to development as portrayed in the literature, influenced me to theorise that participative learning (learning informed by the concept and logic of action research, experiential learning and critical learning systems) has the potential of facilitating improvement in the farming sector of the study area. I took this stance

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through the conviction that better results are achieved when people become involved in learning about and taking action in their own situations (Korten, 1980; Gilmour and Fisher, 1991; White, 1988; Whyte, 1991; Jackson, 1993; Chambers, 1997). A second phase of the research was therefore designed to investigate the use of participative learning as a methodology to enable farmers and village level extension workers to learn how to act to improve their own problem situations.

During the application of this methodology, selected farmers from two villages and agriculturists working at the village level, created knowledge about their own situation and practices by reflecting on their own experiences and assumptions about those experiences. The knowledge they generated was not only different from technologies being transferred by agriculturists but also reflected things that farmers are capable of doing to improve their own situation. Participants also came to acknowledge participative learning as an appropriate and effective way of improving farming and agricultural extension work at the village level.

The result of this experience, as reported in Chapter 5, has confirmed my belief in the appropriateness and effectiveness of participative learning in helping stakeholders to understand and improve their own practices and situations. These results also led to further reflections on questions such as:

- Is it enough that only people in these two villages remain with this conviction?
- Is it possible for this work to continue after this research input?
- What can be done to enable other FLS and farmers make use of this approach?

The reflection on these questions has brought the fore the need to include more stakeholders in the learning process. In applying action research, Kemmis and McTaggart (1988) have argued that:

‘Action research starts with small groups of collaborators at the start, but widens the community of participating action researchers so that it gradually includes more and more of those involved and affected by the practices in question.’ (Kemmis and McTaggart 1988:25).
There was also the need for the concept and practice of participative learning to be introduced and explored by other stakeholders beyond the village level because the process and outcomes have political implications. The process questioned the present organisation of agricultural development work and threatened existing power relations. The results suggest that instead of depending on the words that come from the mouths of the experts or the politically powerful, local people should be empowered by development agents to enable them to define, express, analyse their own reality and define their own routes of improvement (Whyte et al, 1991; Chambers, 1997). There is also the need for development agents to acquire a participative world view to enable them to encourage local people’s participation in their own development.

Participative learning is not being conceptualised as only a new way of doing things, but also as a new way of thinking and seeing things. It might therefore be difficult, if not impossible, to teach or transfer the skills or personal attitudes necessary for the adoption of this approach. According to Kolb (1984), individuals need to be transformed by experiencing the process. This implies creating an opportunity for stakeholders to be confronted with their own worldviews, their understanding of their own situation and practices in order to reflect on their own ways of thinking, organisational norms and actions.

Involving agricultural development agents in learning about participative learning was thought as an appropriate way of enabling them to change their mental frameworks and attitudes with regard to the organisation and implementation of agricultural development in the study area. From the point of view of this study, the organisation and execution of a district workshop on participative learning was seen as being appropriate for creating a learning situation for stakeholders. It was thought as a means of enabling them to learn to see the need for changing the way they see, think, organise and act as development workers. In essence it was seen as being necessary for the initiation of Mezirow’s (1990) ‘perspective transformation’ in which the agriculturists come to learn to develop competency, disposition, tactics and language to learn from, and empower farmers instead of consolidating farmers’
position as 'passive recipients' of predetermined values. This is akin to a process of establishing a learning organisation through experiential learning. It can also be conceptualised as an attempt at laying the foundation of a critical learning system in which stakeholders become empowered by the learning process to establish and maintain a co-operative learning relationship with each other as a way of improving farming and agricultural development work in the study area.

6.1.1 Specific Objectives

The specific objectives of this workshop were to:

- create an environment conducive to participants' learning
- support the sharing and analysis of experiences and concerns by participants
- undertake collective reflection on these experiences in order to create knowledge and understanding about the situation and practices as they existed at the time
- introduce 'participative learning' as a new way of looking at farming and agricultural development work in the study area
- improve the understanding and the use of this approach by critically reflecting on present agricultural development efforts to create a new understanding, new strategies and new plans to improve the situation.

6.1.2 Theoretical Framework

The philosophical and methodological traditions that inform this study were discussed in Chapter 3. It is however worth mentioning here that action research (Carr and Kemmis, 1986; Kemmis and McTaggart, 1988), experiential learning (Kolb, 1984), organisational learning (Argyris and Schon, 1978; Senge, 1992; Garratt, 1994) and critical learning systems (Bawden, 1995) were found specifically useful for this workshop. Theoretically, these methodological traditions appear to be interconnected and they are used here complementarily to reinforce each other in helping to explain how observations and interpretations were undertaken during the workshop session.
During the workshop, individuals from different organisations participated in learning experientially about their problems as a way of planning to take action to improve the situation. In addition, attempts were made to encourage them to critically reflect on the present organisational behaviour as a means of creating a vision of a new organisational norm that would help stakeholders to better manage farming and agricultural development work. The focus on the workshop process was therefore about learning about actions to be taken to improve practices and organisation of food and agricultural production.

In terms of organisational learning, individual learners could be seen as having made conscious efforts to make observations about their own experiences, and make sense of their observations in order to design and implement new strategies and plans to improve their practices and norms that guide these practices (Argyris and Schon, 1978). Learning by being part of a phenomenon is at the heart of organisational learning because through it individuals in the organisation make conscious efforts to learn about their own activities as a way of improving the performance of the organisation (Bawden and Zuber-Skerrit, 1991). According to Bawden (1991) and Senge (1992), organisational learning also impels individuals to learn about their beliefs about knowledge they hold about the organisation. This introduces critical theory into the learning process making a learning organisation a critical learning system (Bawden, 1995). The workshop can therefore be conceived as an attempt at laying the foundations of a participative learning approach. The intention is to enable stakeholders to (a) explore the concept and logic of participative learning; and (b) develop the mental framework and commitment to use it as part of their organisational norms.

6.2 Organisation of the Workshop

The workshop originated from a series of discussions I held with the Regional Agricultural Extension officer and the Regional Director of Agriculture of the Volta Region, the Hohoe district agricultural co-ordinator. The discussions were centred on the possibilities of:
• making the results of the village level learning (Chapter 5) public knowledge
• introducing supervisors, trainers and FLS of MOFA, staff of NGOs involved in agriculture and rural development, and leaders of the farmers’ association to the logic and the process of participative learning.

Through these discussions, the protocol for the workshop was established. Participating organisations were identified and the date for the workshop was chosen. Logistic support was provided by the Head Office of the Department of Agricultural Extension Services, MOFA, Accra and the University of Western Sydney, Hawkesbury.

Participants to this workshop were selected from the Hohoe District and Volta Regional Office offices of the Ministry of Food and Agriculture (MOFA); the Hohoe district office of the Ghana National Association of Farmers and Fishermen (GNAFF); World Vision International/Volta Region, British Overseas Development Administration (BODA), Larger Grain Borer (LGB) Project, Volta Region and farmers. Participating farmers were selected from Hohoe district in consultation with the district agricultural co-ordinator and the Chair of GNAFF, Hohoe District.

The workshop was hosted by the District Agricultural Co-ordinator for Hohoe. Taking place over a period of five days (12-16 June 1995), the workshop was held on the premises of the St. Francis Teacher’s Training College, Hohoe and attracted 52 participants. See Table 39 of Appendix 7 for a list of stakeholders who participated in the district workshop.

6.2.1 The Workshop Program
The program evolved as the workshop progressed. A summary of the program is presented in Table 15. The program was composed of three interrelated cognitive activities or phases, each linking and providing a context for the other. The first phase of the workshop that took place on day one of the workshop, was devoted to encouraging participants to learn about the theoretical and methodological
foundation of the workshop. This was followed by presentations from various organisations.

Table 15 The Workshop Program

<table>
<thead>
<tr>
<th>Day</th>
<th>Item</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to the workshop</td>
<td>• Discuss rationale for workshop and workshop Methodology</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Review of activities of stakeholder groups</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Small groups to reflect on presentations</td>
</tr>
<tr>
<td>2</td>
<td>Plenary session</td>
<td>• Presentation and reflection of group work.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Discussion of the outcomes of village level learning.</td>
</tr>
<tr>
<td>3</td>
<td>Field visit &amp; collation of field report</td>
<td>Small groups to discuss field experiences</td>
</tr>
<tr>
<td>4</td>
<td>Group work</td>
<td>• Critique present ways of doing things as farmers and development workers.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Develop new strategies to improve the situation.</td>
</tr>
<tr>
<td>5</td>
<td>Plenary session</td>
<td>• Reflect on lessons learnt</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Evaluation of workshop</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Closure</td>
</tr>
</tbody>
</table>

The purpose of these presentations was to all various stakeholder groups to give an overview of their activities, performances and problems. The third phase was used by the various groups to critically reflect on their own activities in the light of the workshop experiences, to develop new strategies and plans that could be implemented to improve their performances. The discussions made of the results of the workshop were left to be implemented by the participants and their organisations.
6.3 The Workshop Process

The workshop process involved learning about the concept and logic of participative learning. It was then used in group situations to learn about the situation to generate knowledge that could guide stakeholders in their actions to improve their own situations.

6.3.1 Learning about the Theoretical Framework and Methodology

I presented a discussion paper to introduce the concept of participative learning to the workshop participants. (See section 7.7 of appendix 7 for a summary of the paper presented.) The concept and logic of action research and the experiential learning model were introduced and discussed with participants. It was, however, difficult for participants to appreciate and understand the underlying paradigms and their applications to the workshop in languages that have been used in the literature. Local proverbs and myths were therefore used as metaphors, to make it easier for participants to create their own mental images or appreciation of the idea of participative learning. Some of the proverbs shared, and the relevance of the themes they conveyed to participative learning are shown in Table 16. This exercise assisted participants to develop their own mental images and understanding of the notion of 'participative learning.'

The use of familiar linguistic frameworks like myths and proverbs stimulated participants to identify themselves with the learning process. The focus was on enabling participants to appreciate the importance of their local knowledge and the need to develop a co-operative relationship that would foster participative learning (sharing and learning from interpretation given to individual experiences). At the end of our discussions, participants came to understand that the learning at the workshop would be done collectively by participants. They also understood that the knowledge to be generated would come from reflecting on their own experiences and that the knowledge generated would be used to plan actions to improve their future actions.
<table>
<thead>
<tr>
<th>Proverb</th>
<th>Meaning and Relevance to Participative Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Nunya adidoe asi metu ne o.</em></td>
<td>‘Knowledge is as big as the baobab (<em>adasonia digitata</em>), so one hand cannot grasp it’. This underpins the need for different people to define what knowledge should be, in order to grasp the holistic view of the phenomena under study: Further, to know the <em>baobab</em>, one must know the various parts and how they relate to one another. This suggests the need to learn with each other in order to improve our understanding of our relationships with each other and our environment. the notion of systemic development.</td>
</tr>
<tr>
<td><em>Nutefe kpokpo nye munya.</em></td>
<td>‘Experience is knowledge’. This implies that we should value our experiences or derive our knowledge from our experiences instead of depending on external sources for the ‘best’ knowledge: the notion of experiential learning.</td>
</tr>
<tr>
<td><em>Wome noa gbe de donomu o.</em></td>
<td>‘No one except the sick, must take the medicine to achieve the healing he or she desires’. The owners of the problem are the sick and they must be involved in those actions that are being put in place to ‘cure’ them. This is suggestive of the importance of the problem owners participating and collaborating in the development process. The notion of ‘people-centred’ development. In organisational terms it means the development process cannot be detached from the knowledge and creative capacities of problem owners.</td>
</tr>
</tbody>
</table>

The concept of critical reflection was also introduced as an act of conscious questioning of the contextual relevance of knowledge and actions. This was
implemented by encouraging participants to consciously critique their beliefs about their own knowledge and actions. The workshop supported participants in this by asking discriminating question that enabled them to learn to perceive their own situation, problems and practices differently. They were also encouraged to critique their interpersonal relationships, roles and organisational norms.

In terms of organisational learning this means that participants need to see themselves as responsible for the problems or issues of concern to them, while at the same time questioning existing political framework of which they are part, as a way of changing the relationships that contribute to their problematic situations. It can therefore be conceptualised as an effort at encouraging stakeholders to develop what Senge (1994 et al) has described as the capacity to think and interact differently as a necessary condition to act differently.

The discussion on the concept and logic as discussed above provided the basis for understanding the overall strategy of:

- valuing personal experiences
- recalling and interpreting these experiences to create new insights and meanings
- envisioning new strategies and plans that are consistent with the our new insights and meanings.

6.3.2 Methods and Techniques
The methods and techniques adopted in the workshop included presentation of discussion papers, brainstorming and discussions at small group meetings and at plenary sessions. The various groups also made a field trip to some villages to interact with farmers in their homes and fields.

6.3.2.1 Presentations on Various Organisations
Presentations were made by representatives of various organisations. These presentations reviewed the objectives, activities, targets, success stories and failures of the organisations represented. (See Appendix 7 for summaries of these
presentations). These presentations were used (a) to initiate and stimulate the exchange of ideas; and (b) to critique the activities and performances of these organisations.

6.3.2.2 Small Group Work

Participants were divided into four groups in order to facilitate participation and collaboration in discussion and decision making. It was deemed easier for people to formulate and articulate their questions as well as share their understanding and viewpoints in smaller groups. De Venney-Tierman, Goldband, Rackham and Reilly (1994), have argued that in a small group, people get to know each other well enough to build trust and confidence easily with the result that they are able to articulate their views, explore their thoughts, feelings and ideas more readily. It also provided the opportunity for collecting a broader range of ideas than if we had remained in one group. Participants were allowed to use the language they were familiar with (Eweh or English), as the exclusivity of language would have had an alienating effect on the group. To prevent defensiveness, participants were discouraged from passing judgement on specific viewpoints or from dwelling on what they thought was ‘logically wrong’ about views expressed by other people. No contribution was regarded as the best or worse, but only different.

By focusing on people talking about their everyday experiences, participants used each other in the group for support in confronting issues that their social and/or official positions may not allow them to discuss or agree with openly. For example, through the asking of discriminating questions, participants were able to confront and discuss politically sensitive issues such as the adverse effect of the government’s structural adjustment policy on farmers and the contextual irrelevance of some of the technologies recommended to farmers by the researcher.

6.3.2.3 Plenary Sessions

Two plenary sessions were held during the workshop. These plenary sessions were used by the groups to present their learning outcomes from the small learning group sessions. Group members supported each other at the plenary sessions to articulate
(a) how they learned; (b) what they learnt; and (c) why they believed what they learnt to be 'true'. Views expressed by each group were critiqued, re-articulated and discussed for further appreciation. All views were accepted as the intellectual property of the whole group and no one person or group of people could claim ownership or responsibility for what was learnt or presented.

The plenary sessions were used to challenge the participants to critique group presentations to enable participants have a more holistic understanding of issues being discussed at the workshop. The final plenary session was also used to evaluate the workshop on the bases of stated objectives, organisation and usefulness of knowledge generated. Most participants also used this opportunity to reflect on their own learning experiences during the workshop.

6.3.2.4 Brainstorming

This technique was used, in the small group sessions, to help participants develop a rich picture of issues, problems and possible interventions. The discussions that followed these brainstorming sessions were used to look for and explain the meanings attached to various experiences by participants. It also enabled participants to learn to appreciate the differences and similarities as well as linkages and patterns of themes and ideas held by various people on the issue of agriculture and its development.

6.3.2.5 Field Visits

A field visit was organised at the request of a group of participants who felt that there was a need to consult the opinion of some farmers outside the workshop session to corroborate views expressed within the workshop. This field visit took us to the homes and farms of four farm families in two villages (Godenu and Ve Koloem) located within a radius of about 25 km of the workshop centre. During the field work, participants listened to and held discussions with farmers with regard to their views of their problems and their 'coping mechanisms'. Information collected from the field visit was discussed and used as input to plan interventions.
6.3.2.6 Facilitation of the Workshop

I was involved in all the activities as a participant/facilitator at this workshop. During the small group discussions sessions I acted as a member of the groups while at the same time observing and listening to the various transactions that were taking place during the sessions. I also facilitated the plenary sessions. Some of the discussions were tape recorded, however, assisted by the recorders of the various small discussion groups, I was the main instrument of data collection.

The major challenge at this workshop was to create and foster a co-operative atmosphere in which collaborative efforts were valued and used for learning. It involved motivating participants to critically consider the issues, without taking the role of defender of the groups they represented, while at the same time sharing their views and insights without fear of intimidation. It was a way of letting participants embrace reflection on their own experiences as an important aspect of personal and organisational development. The workshop provided me with an opportunity to introduce ‘Participative Learning’ to participants and to learn from the various transactions that took place at the workshop.

6.4 Reflection on Outcomes of Workshop Activities

The main outcomes of this workshop included: (a) the creation of a ‘learning space’ for participants to engage in a collective reflection; (b) better understanding of the problematic situation; and (c) the creation of new strategies for the improvement of farming and other agricultural development work.

6.4.1 Making Space for the Inquiry

One of the major outcomes of the workshop was that it was able to provide space within an inquiry could take place. This was done by establishing a framework of enabling structures that encouraged open and unrestricted discussion in the group. This included:

- facilitating a process in which participants developed mutual trust in each other and came to appreciate that everyone has something very useful to contribute
• ensuring that individuals had the opportunity to express their views
• making sure that all participants have the language to express their views and to receive feedback.

There is a ‘universally-held doubt’ about the abilities of farmers to have coherent discussions with professional agriculturists (Horton, 1991). This is based on the assumption that the agriculturist or the ‘learned’ in society has access to knowledge that is not available to ‘illiterate farmers’ (Rhoades, 1984). Similarly, because of the differences in levels of training, even the agriculturists sometimes fall victim to what Garret (1994:120) calls all-those-technical-questions-you-always-wanted-to-ask-but-could-not-as-you-risk-looking-stupid’. Further, participants were also drawn from different organisations with differing agenda and ways of looking at agriculture and its development. There was therefore the need for participants to develop a mutual trust, respect and equality for each other and all the views that would be expressed.

Using my experience from the village level learning, I drew participants’ attention to the fact that no one person knows everything about farming or agricultural development work. We discussed this issue using some local proverbs and myths. Table 17 contains one of the myths that was told at the session to convey the fact that each and everyone at the workshop has some knowledge to share. The theme of this myth was that knowledge about farming and agricultural development work was scattered among all participants present at the workshop. The idea conveyed by this myth is similar to the views of Scoones and Thompson (1994) that knowledge can be conceived as fragmented among stakeholders, and it is through networking that information is communicated and legitimised. This implies that no one can claim to be the sole custodian of knowledge. This understanding therefore challenged the commonly-held notion that it is the educated elite that holds all relevant knowledge. It suggested that the workshop should look for knowledge from among all the participants and not only from a few ‘knowledgeable’ people.

The understanding conveyed through the use of these myths and proverbs was that everyone has vital information and knowledge to share and must participate freely in the learning process. This was a way of reducing both ‘superiority’ and ‘inferiority’ complexities among participants or the creation of psychological space for all
participants to be actively involved in the social discourse. In this way participants were empowered to share their experiences and ideas. Participants also appreciated the need to make conscious efforts against the tendency to dominate the learning process, and to respect views expressed by fellow participants irrespective of social status, profession or age.

Table 17. *Ananse* and the Gourd of Knowledge

In the days of old, *Ananse* (the spider) was the wisest of all creatures on earth. However, *Ananse* was not happy that some other creatures also had some knowledge. He therefore decided to deprive other animals of their knowledge. What he did was to collect all knowledge into a big gourd. He intended to place this ‘gourd of knowledge’ on top of the tallest tree out of reach of everyone on earth. Unfortunately for *Ananse*, when he was climbing the tree, the gourd fell to the ground and broke into pieces scattering all the knowledge it contained among all animals on earth. In that way all animals came to have their own share of knowledge.

Source: An *Eweh* myth as told by Kofi Korda, (1995; pers. comm.)

In order to ensure active participation in the learning process, the large group was divided into four smaller groups that comprised members from the different organisations. Not only did this help participants to develop mutual trust and respect, it also ‘compelled’ all stakeholders to take active part in the group discussions. For example a farmer in one of the groups said,

*'If the groups were large I would have kept quiet. I am not used to speaking in public. But as it turned out, I was one of the three farmers in my group. So I had no choice but to support my other friends in talking about our experiences as farmers. (Elisabeth Akpini; pers. comm. 1995)*
The seating arrangements also made no one superior to the other. There was no ‘high table’, all participants were seated in a semi-circle to talk with each other for about five continuous days. The languages used included English and the local Eweh language. This was to make sure that everyone fully understood the learning process in which they were involved. The discussions held were mainly on everyday experiences of participants. An informal learning environment was therefore created which enabled everyone’s experience and wisdom to be tapped in defining the situation and initiating ways of changing it for the better.

6.4.2 Use of Local Skills, Knowledge and Institutions

Fisher (1990) argues that the features of an appropriate developmental response requires the utilisation of local skills, knowledge and institutions. Participants in the workshop were drawn from organisations that are directly involved in taking day-to-day management decisions regarding farming and agricultural development work. The knowledge was not generated by a detached ‘outside’ observer, but emerged from stakeholders' critiques of, and reflection on their own knowledge and experiences. The results therefore convey their own convictions about their practices and lives as farmers and development workers. Active participation of concerned institutions in such a collaborative learning process ensured that stakeholders construct social realities that are of relevance to them.

The workshop also discovered and used myths, proverbs and stories as ‘meaning making’ tools. These ‘linguistic icons’, which are part of the participant’s everyday life, were used to demystify, and give meaning to the philosophy and methodology of participative learning. Their use enabled participants to understand the notions of ‘constructivism, participation, and experiential learning without having to grapple with unfamiliar terms and ‘languages’. They were used to facilitate the development of a mental framework from which participants perceived and enacted ‘participative learning’. Russell (1991) has observed that the language of metaphor and myths belong to our psychological realms and act as a bridge between what is observed and what is imagined.
The value of myths and stories in 'meaning-making' was also identified by Michael Kaye (1996:55):

'Myths tells us about life in human systems....Every myth serves to magnify our vision...what we learn from myths convey the 'truth'.....In our daily lives, stories are vehicles for life long learning as well as managing our communication processes.'

The flux of myths, proverbs, stories with real life experiences helped participants to link the theoretical foundation to the learning process, and the learning process to their working lives. For example when the workshop was being evaluated a participant shared a story to express her view of how agricultural development work should be organised (Table 23). This story can be conceptualised as both an input into and an output of the learning process. The final sentence of the story, '......we development workers should stop laying urban eggs for rural hens to hatch...' can be conceptualised as a shift in the way of seeing and thinking on the part of the participants as a result of learning done at the workshop. Further, the clapping, smiles and 'head nodding' that followed the story were interpreted as manifestations of what the other participants learnt from that story.

6.4.3 Better Understanding through Experiential Learning

The workshop enabled participants to reflect and discuss their views about their individual organisations, problems and the role they are playing in it. During the small group discussions, individuals were encouraged, by reflection of alternative views and critique of their own views, to develop a richer picture of their own situations and problems. In experiential learning terms it was a time when participants diverged to develop a holistic view of the problem and its context (Kolb, 1984). The various views expressed were further reflected on collectively at the plenary session in order to generate a better understanding of the similarities and differences among the views expressed by various participants. It was also time when participants were encouraged by the group to recognise linkages between the various issues and concerns and to develop patterns that then helped them to redefine
the themes of the problems. In addition to selecting items worth pursuing as a means of overcoming observed problems under present of organisational norms. The participants critiqued the TOT model as being practised in the study area. New strategies were also suggested to support a learning process approach to agricultural development instead of the present top-down and product approach. In terms of learning organisation, the workshop was an opportunity for participants to explicitly identify themselves with the problems that affect their performances and to reflect on desirable changes to organisational norms (Senge et al., 1994).

6.4.3.1 Farmers' Problems and Perceptions

Workshop participants explored farmer's problems and perceptions about agricultural development in the study area. The main insights generated on this issue were quite similar to those recognised at the village level (Chapters 4 and 5). However, the presentation from the Project Officer of the Agricultural Development Bank (ADB), Hohoe led to a lot of discussion on the role and effectiveness of the present commercial banks in providing institutional credit to small holder farmers. In his presentation, the chairman of GNAFF criticised the banks for not providing loans to farmers. Discussions that followed showed that the inability of farmers to access loans is related to the small or 'non-economic' size of their farms, low production levels and low repayment rates. The relationship between the high interest rate being charged by the banks, farmers' low productivity, and low agricultural commodity prices were also identified as contributing to the low farm income and the inability of farmers to repay bank loans on schedule.

6.4.3.2 The Development Agencies

One of the main problems identified regarding the performance of development agencies was the lack of good working relationship among the various organisations involved in the field of agricultural development. As shown in Table 18, each ministry and/or department was found to be following their own agenda. There was the acknowledgement that the commitment of MOFA and MIST is limited to departmental targets. Development programs are department-centred and are viewed as activities through which to legitimise departmental or professional status.
Table 18  Agricultural Development Tasks and Responsibilities

<table>
<thead>
<tr>
<th>Development Task</th>
<th>Group Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Generation of Technology</td>
<td>CSIR of Ministry of Science/Technology:</td>
</tr>
<tr>
<td>2. Adapting of Technology to Farmers needs.</td>
<td>Adaptive Research Departments (Crop Services, Animal Production, and Fisheries) of MOFA</td>
</tr>
<tr>
<td>3. Training of Front-line Staff</td>
<td>Subject Matter Specialists drawn from the Adaptive Research Departments of MOFA.</td>
</tr>
<tr>
<td>4. Training of Farmers in the use of Technology</td>
<td>FLS of the Department of Agricultural Extension Services of MOFA.</td>
</tr>
<tr>
<td>5. Adoption of Technology</td>
<td>Farmers</td>
</tr>
</tbody>
</table>

This appears to have contributed led to a lack of synergy among the various departments and the ineffectiveness of the whole development process. The lack of synergy and responsibility beyond departmental targets or ‘departmental-centredness’ of the development agencies is best illustrated by the case of the 1994 ‘abortive adaptive trials’ (Table 19). By using these cases, participants were encouraged to identify themselves with the problems of their individual departments. Participants came to identify the need for closer co-operation among various development agencies as a means of helping farmers improve their production practices.

A result of farmers becoming alienated from the technology development process is that their knowledge, capabilities, values and resource endowment become ignored. This is directly reflected in the farmers inability to adopt the technologies that are being transferred to them in the study area. The participants identified that most of the technologies being transferred to farmers at the time of this research were unable to meet the day-to-day needs of various farmers. Table 20 shows a story of how farmers rejected a researcher-developed high yielding sorghum variety because it was unable to meet their special needs.
Table 19. The Case of the ‘Abortive’ Adaptive Trial of 1994

In 1994, the Crop Research Institute (CRI) of CSIR designed farmer-managed on-farm trials, on maize and cassava, to be tested on farmers’ fields in the Volta Region. The implementation of this trials was to be done by Crop Services Department (CSD) of MOFA. CSD saw itself as implementing the trials for CRI and requested logistic support from CRI. CRI expected CSD to lay the trials as part of their adaptive research work. CRI therefore provided no resources for the trials and CSD too could not lay the trials for ‘want’ of logistics. The questions that need to be answered from this experience are, who are the victims of this departmental furor? And who are responsible?

Source: D.K. Tetteh, Regional Adaptive Research Officer for Volta Region (pers. comm.)

It was inferred from the case presented in Table 20 that while the agriculturists were describing ‘better variety’ in terms of grain yield, the farmers saw ‘better’ in terms of more grains, better beer brewing ability and higher fuel wood production. Further, because of the deterioration in terms of trade, farmers become economically ‘worse off’ when they adopt these researcher-recommended technologies. It is therefore practically rational for them to reject these technologies than to adopt them. Farmers could be said to be subscribing to ‘practical reason’ (Habermas, 1984) or defining rationality as it applies to their everyday lives (Ulrich, 1993). On the other hand, scientists are rooted in propositional knowledge about the biological and economical efficiency of farming. The lesson here is that the problem of non-adoption of technology will remain so long as the researchers continue to determine the values that must be enshrined in these technologies. FSR&D programs being undertaken by the researchers in CSIR is meant to elicit farmer participation but farmers need to be encouraged to be fully involved in all the phases of these activities.
Table 20. The Story of the Rejected ‘High Yielding’ Sorghum

In 1990, the Ministry of Agriculture introduced a new sorghum variety, *Flaminida* to farmers in the Northern Zone of Volta Region, Ghana. This sorghum variety yields twice as much as the local variety in grains. Some farmers planted this variety in the first year of its introduction after which no other farmer planted the variety again. Why? The farmers use the sorghum for food (grains), *pito* (local beer) and fuel (stalks). Although this variety is high yielding, it was rejected because it produces poor quality *pito* and cannot provide fuel because its stalk is very short.

Source: Elvis Degbor, Regional Agriculture Extension Officer, Volta Region

Participants therefore became conscious of the fact that by having faith in only ‘rationality’ and ‘certainty’ of scientific knowledge, the development agencies have created a barrier against the values that are at the heart of farmers’ decision making processes. This understanding enabled the participants at the workshop to focus on the wider interpretation of beliefs, assumptions, problems, options and choices by tracing the relationships through which transactions are mediated. Participants also became critically aware that the ‘landscape’ in the agricultural sector is continuously changing e.g. rainfall pattern, vegetation and government policies have changed over the years. The logical fallacy of the assumption that once a technology is introduced to farmers, the problem is ended, was appreciated.

Another thing that participants became conscious of was the adaptive problem solving abilities of farmers. One lesson that we learnt, through the interaction with farmers at the workshop and the field, was that the farmers know their needs and problems. They were also found to be able to develop, through trial and error, different ways of coping with their perceived problems. The case of spraying a mixture of common salt and sulphate of ammonia on rice fields as presented in Table
21 is an example of such coping mechanisms. The farmers in this example were trying to cope with the socio-economic problems of labour and high prices of inputs on the market. The spraying of this concoction saves labour and reduces the amount of money the farmers have to spend on the purchase of chemicals. Some of these farmers coping mechanisms may not be perfect but what they did show is that farmers are capable of learning. This therefore challenges the dominant belief that it is only the researchers who are capable of knowledge generation. This brings to the fore the need to provide opportunities for farmers (a) to articulate and clarify their problems; and (b) to be challenged and supported to improve upon their adaptive problem solving abilities.

Table 21 A Mixture of Ammonium Sulphate and Table Salt$^{31}$ as 'Fertiliser and Herbicide'

Farmers were advised to apply herbicide and fertiliser concurrently to their rice plots. But farmers experimented with a mixture of common salt and nitrogen fertiliser and found out that this mixture serves the dual purpose of herbicide and fertiliser. The farmers used only 60 per cent of recommended nitrogen fertiliser per unit area in the process. This practice therefore helped farmers to save time and reduced cost of maintaining their farms. However, the agriculturists are advising farmers against this practice because it is unscientific, 'unproven', and ecologically hazardous. The researchers have not investigate the scientific basis of this practice and the farmers are yet to stop the practice.


$^{31}$ The impact of this practice is to be investigated by the Crop Services Department of MOFA in collaboration with the farmers.
6.4.4 New Metaphors from Critical Reflection

By consciously working towards developing shared understandings about agricultural production and its problems, participants became critically aware of the limitations of using TOT as a model for agricultural development in the study area. They became conscious of the fact that various factors like the negative terms of trade being experienced by farmers, increase in interest rate, removal of subsidy on farm inputs, break in kinship welfare system, decreasing farm sizes, changes in rainfall pattern have emerged as complex contextual issues that technologies alone cannot ‘fix’ or solve. The reliance on technologies, to solve these complex issues that farmers are faced with each farming day is therefore akin to putting a light adhesive dressing on a malignant tumour.

There was also that general agreement among participants that the reliance on technocentrism alone has led the development process into a state of ‘suspended animation’. So many resources have been committed by development agencies into the generation and transfer of technologies that are never adopted by farmers. The approach too, has failed to motivate farmers to improve upon their adaptive problem solving abilities. Farmers are led to believe that government agents have the political mandate and ability to provide the solutions for their problems. This has become an illusion. In other words, the reductionist, linear, ‘blue print’ and prescriptive approach based on positivist epistemology has failed to adequately explain and solve farmers’ problems. The realisation of the inadequacy of the present practical reason approach of farmers and technicism of the development agents provided the impetus for the workshop to consider alternative strategies for development.

During the course of the workshop, participants were encouraged to critically re-examine, without being defensive of themselves and their organisations, the way they think and go about farming and organising agricultural development in the study area. In learning organisation terms, the workshop used the concept of critical reflection to facilitate learning to learn how the organisation of agricultural development could be re-conceptualised and improved. Participants could therefore
be said to have supported each other in reflecting on their experiences within existing frameworks and attitudes from a meta level. In this process, participants came to (a) question their own processes and beliefs about their knowledge; and (b) critique their own actions in order to create new metaphors that could better describe their organisational behaviour. This also can be conceptualised as a process of learning to learn how to create mental images of new organisational relationships that could help stakeholders to better manage the problems of food and agricultural production. By sharing and shaping the mental images constructed by various small groups, participants were able to learn collectively to re-conceptualise their own situation, design new strategies and set new priorities: the notion of organisational learning (Argyris and Schon, 1978; Bawden and Zuber-Skerrit, 1991).

The various insights gained through this process led participants to see that the main problem that militates against smallholder agriculture in the study area is not technological. The problem was narrowed down to the way agricultural development work is organised and implemented in Ghana. The existing organisation was found to be problematic because:

- it works to simplify all issues and problems to the domain of technology instead of looking at them in holistic and systemic terms
- it results in development workers being alienated from farmers' problems
- it absolves development workers from being responsible for the consequences of the technologies they recommend to farmers
- it ignores local knowledge and capacities instead of supporting and enhancing the creativity of farmers
- it discourages farmers from improving their adaptive learning capacity and from being more responsible for their own development.

Participants became conscious of the fact that their lives as farmers and development workers are nothing more than the relationship they have with each other and with their environment. For example it was realised that the farmers' food production system is nested in the socio-cultural system of the villages, which is also related to,
and influenced by the political economy of the country. Everything is therefore related to everything (Cobb, 1984).

The issue of production came to be seen as sets of interrelationships that are capable of being interpreted differently by different people according to the facts and values they hold in time and space (White, 1989). There is therefore the need for these different representations to be redefined and re-examined on a continuous basis to link them in a meaningful way to generate knowledge that is relevant to the needs of stakeholders. This implies that the perceived interrelationships must be subjected to interpretative reasoning and critical reflection to create further metaphors to capture the realities of the circumstances of the time. This brought into focus the need for a working framework that could encourage stakeholders to continuously define and make sense of these relationships to support effective decision making.

This insight came with the understanding that farmer’s practices do not have meaning in themselves, but acquire meaning only in relation to the context in which they are applied. Critical reflection on these issues brought us to the knowledge that we are part of the problem we experience and the problems, as we came to understand them, result from our interpersonal relationships and our relationship with our environment (Senge, 1992). For example the development agents came to the consciousness that the problem of low adoption rate was created by their own act of ignoring the context of application. The inability of the TOT model to solve farmers’ problems was therefore understood as being closely associated with the fundamental mismatch between farmers and development agents with regard to what White (1989) has described as statements of facts and values of problems and solutions.

The development of the consciousness of the unity between problems and owners is an important ingredient in creating a learning organisation. Senge (1992:141) asserted that;
‘At the heart of a learning organisation is a shift of mind from seeing ourselves as separate from the world to connected to the world, from seeing problems as caused by someone or something “out there” to seeing how our own actions create the problems we experience’. (Senge 1992: 141).

| Table 22 ‘Let’s Stop Laying Urban Eggs for Rural Hens to Hatch’ |

I would like to convey my understanding of this workshop by telling a story. The Ministry of Agriculture in country X decided to ‘improve poultry production’ by the ‘most cost effective method’: to supply eggs of improved stock for the local hens to hatch. Using the parent stocks of the desired breed, eggs were produced by some large scaled poultry farmers in the capital city. The eggs were then distributed to selected farmers but majority of the eggs got rotten in the farmers’ care, some ended up in cooking pots, and only few eggs were hatched. The failure of the program was blamed on ‘farmer-conservatism’. But using the experiences of this workshop, I would argue that, the program failed because the plans were not informed by the farmers’ context. For example the officials were ignorant of the egg laying cycle of the local birds. They therefore ended sending the ‘right eggs’ to the farmers at the ‘wrong time’. What I have learnt from this workshop is that, we development workers should “stop laying urban eggs for local hens” to hatch.

Source: Ms. A. Gaglezu. WIAD, MOFA, Jasikan (pers. comm.)

Participants appeared to have seen the need to make a shift from seeing agricultural development as the adoption of specific practices, to that of an integrated and interactive process in which all stakeholder must actively participate. This is consistent with the view of Thompson (1991) that all stakeholders are custodians of myths that capture some essence of experience and wisdom, so all of them must have
something to contribute. This implies that farmers and development agencies should take responsibility and recognition for their actions and emergent consequences. The recognition for the need to change the metaphor for development from ‘top down’ to that of forging ‘co-operative relationship’ among stakeholders is evident from the story told by Madam Gagblezu, an SMS (WIAD) during the evaluation phase of the workshop (Table 22).

6.4.5 Creating New Strategies for Development

Having re-conceptualised our beliefs about previous knowledge and actions in light of new social theories created at the workshop, the stage was set for the development of a strategy to help us link our theory to action. The common understanding among participants was that the problem of food and agricultural production should be conceptualised as a multi-faceted interacting process of planning, acting and reflection: the notion of action research. At the heart of this process is the need for all interested parties to take an active part in the establishment and maintenance of a practical discourse through which ‘what is’ and ‘what ought to be done’ could be settled. This idea was conveyed by Mr. Sekou, a former Volta Regional Agriculture Extension Officer and a research student of the University of Ghana.

‘My experience from this workshop has taught me that if we the agriculturists had spent more time talking with farmers and ourselves about farmers’ problems and how they go about their farm work a lot of useful knowledge would have been generated and a lot of action would have taken place.’ (Thomas Sekou; 1995, pers. comm.)

There was therefore an emergent consciousness among participants of the need for the establishment an on-going discussion among various agencies and farmers to critique their own experiences as an input into learning how to improve their performances. This is akin to what Bawden (1995) describes as critical conversation among development agencies and farmers and among individual stakeholders. Participants came to see the importance of conceptualising, organising and implementing efforts at agricultural development as a network of recursive
conversation among ‘self critical communities of people participating and collaborating’ with each other to shape their own collective understanding of their experiences, to recreate knowledge (Carr and Kemmis, 1986). The emphasis of such a ‘conversation’ is not on proving the superiority or inferiority of any experience, interpretation, knowledge or action. The focus is on critically questioning what ‘ought to be done’, ‘how it should be done’ and ‘why the belief that it should so be done’ (Bawden, 1995).

In general terms, this means replacing the linear model of development with an integrated co-operative system to support a network of action research groups to facilitate critical conversation within and among organisations. In that context, the decision of what ought to be done is subsumed in, and determined by, a practical discourse in which interested members of the community are engaged. In such a discourse, problems can be solved by seeing to it that things are done better within established norms (single loop learning or purposive-rational mode) or issues can be resolved by establishment of new rules, norms and priorities (double loop learning) (Argyris and Schon, 1978).

Participants also suggested some specific changes to the structure and process of knowledge generation and use. These suggestions included the following:

- Farmers knowledge and practices must be valued, analysed and improved through participative learning
- Technologies developed by researchers should be regarded as useful knowledge but not as the superior knowledge that farmers must adopt by all means. Farmers should be encouraged to modify these technologies where necessary
- FLS learn with farmers to facilitate farmers decision-making process instead of only transferring ready-made technologies
- Farmers should be encouraged to share useful information with each other instead of always looking to FLS or other development agents for direction
- FLS training to be based on field experiences and concerns instead of the present lecture-based approach. It might be desirable to invite farmers to share their experiences with FLS and SMS at such training sessions
• TRM meeting between researchers and extension workers should review farmer experimentation and contextual implications of technologies being developed
• Conscious efforts should be made by all stakeholders to hold open discussions on issues that are of concern to them.

These changes were thought necessary to support collective analysis of problems and solutions by interested parties. These suggestions were however regarded as heuristic guides that could be adapted to support collaborative learning among stakeholders.

This development is consistent with the concept of organisational learning for organisational action developed by Argyris and Schon (1978). They have argued that organisational learning involves:

‘...restructuring of organisational norms, and very likely a restructuring of strategies and assumptions associated with those norms....’ (Argyris and Schon, 1978:134).

This suggests that the style of interaction between farmers and development agents must shift from one of prescribing blueprints or formulating pre-packaged prescriptions to embracing a collegiate and collaborative learning between farmers and development agents. It also means being more responsive to the needs and values of farmers and the sharing of decision making and control with farmers (Mattock and Steele, 1994; Pretty, 1995).

6.4.6 Public Critique of Workshop Outcomes

The validation and public criticism of the workshop process and outcomes was done by publishing and circulating a workshop report to solicit comments and critique from a cross section of workshop participants and resource persons from the University of Western Sydney, Hawkesbury.
6.5 Conclusion

The workshop was an opportunity for stakeholders to experientially learn about their own organisations and activities. As participants described, interpreted, questioned their own knowledge, ideas, assumptions and actions, they came to discover new meanings and metaphors to describe their own activities and how such activities could be better organised. This confirms Kaye’s assertion that:

‘Learning by experiencing’ is more powerful than learning by passively receiving information from the experts because without experiencing or being part of the knowledge generation process, people find it difficult to apply ‘words of wisdom’ to their lives and interpersonal worlds’ (Kaye, 1996:33).

The critique of the TOT model at the workshop was not supposed to discredit the value of technologies being generated and transferred to farmers. It was meant to stimulate awareness of the strengths and weaknesses of this approach. The recognition of weaknesses in the model helped open the door for participants to value and explore other ways of knowing and of improving the organisation of food and agricultural production. The workshop was therefore seen as having helped participants to change the way they see and think about agriculture and its development. This assertion was made based on the observations that:

- development agents moved from having a detached view about farmers issues to linking those problems directly to their own activities
- stakeholders came to appreciate the need to have a systemic view of farmers problems
- there was also the realisation that ‘what ought to be done’ must be based on problems and opportunities as perceived through practical discourse among stakeholders or interested parties
- workshop participants came to identify interactive communication and negotiation as a better development approach than the ‘blue print’ prescriptive method that was being adopted.
I have also come to learn that developing competency in ‘experiential learning’ and ‘critical conversation’ is a life long process. The expectation of this workshop was therefore not to make expert ‘participative learning practitioners’ of participants or have the present system changed immediately with a single workshop input. However, what this input did was to bring stakeholders to the awareness of the possibilities, potentials and the challenges of the approach.
CHAPTER SEVEN

EVALUATION AND TRUSTWORTHINESS OF THE STUDY

7.1 Introduction

This chapter embodies the reflections of participants on the lessons they learnt during the research process. The focus here is on reflecting on what happened, why participants thought those things happened and what these observations meant to them in terms of their work and lives as farmers and development practitioners. It also includes my own reflections on my role as a researcher and the facilitator of the learning process. Finally, the chapter also looks at the attributes of the research that represented the validity claims of the knowledge generated from the study.

7.2 Evaluation of the Research

This phase of the research was a follow-up to the participative learning done at the village and district levels. It was carried out one year after the stakeholders were introduced to the concept and logic of participative learning via the village level learning and the district workshop (Chapters 5 and 6). It was therefore a process of reflective learning about the learning process initiated in the previous learning inputs. The exercise was not meant for the purpose of verifying or making judgment on the outcomes of the initial inputs. Neither was it used to determine the amount of farm produce harvested, amount of money mobilised or the number of village meetings held as a result of the research input. It was rather a process of finding out and making sense of the experiences stakeholders had had with the ‘participative learning’ in which they were engaged.

The evaluation was seen as an interactive process in which stakeholders reflected on (a) activities carried out by different groups of people; (b) lessons learnt from
participating in those activities; and (c) what could be done to further improve participative learning in the study area. The evaluation was further conceptualised as an input into reinforcing the learning culture established with the initial inputs. The evaluation exercise was therefore regarded as another ‘action research loop’ in which stakeholders learnt to improve upon the participative learning process.

7.2.1 Approach Adopted in the Evaluation.

The evaluation exercise carried out in this study was informed by the concept of fourth generation evaluation (Guba and Lincoln 1989) or participatory evaluation (Nayaran, 1993; Williams, 1995). There has been a gradual shift in the notion of evaluation, from the ‘conventional approach’ of measurement, description and judgment by an ‘external expert,’ to a concept of participatory evaluation in which the researcher and stakeholders participate in the creation of knowledge about the program under review (Guba and Lincoln, 1990; Wardsworth, 1991; Narayan, 1993; Williams 1995). This is because as Narayan (1995) has pointed out, if the evaluation is researcher-focused, information collected and conclusions arrived at may be of no use to stakeholders. The reason being that, the output of the process may not reflect the concerns, views and expectations of the end users of the knowledge generated (Guba and Lincoln, 1989).

Participatory evaluation recognises the central position of stakeholders as users of the results of the evaluation and advocates for their effective participation in the process (Guba and Lincoln, 1989; Wardsworth, 1991; Narayan, 1993; William, 1995). The evaluation process therefore took the form of a social discourse in which stakeholders were encouraged to construct and reflect on the experiences they had had with participative learning that they were introduced to in the previous research inputs. It also acted as an opportunity for stakeholders to further learn to improve how they should learn to continuously adjust to the challenges they face as farmers and development workers. This is congruent with Vickers’ (1983) concept of measuring the effectiveness of social action. Vickers was of the view that the thoughts of stakeholders determine the measurement criteria of the effectiveness of actions taken. It is therefore necessary that research participants partake of the evaluation of the
learning process as a means of learning to conceptualise new ways of improving their own knowing and actions. Evaluation in this context becomes an act of learning between stakeholders and the researcher as an input into improving understanding of (a) participative learning; (b) the context of the study; and (c) issues and the practices of farming and agricultural development work.

In the context of this present study, I considered that instead of acting as a detached outside evaluator, with predetermined standards that should be met by the research outcome, it would be more appropriate for me to engage stakeholders in a process of ‘reflective learning’ about the participative learning done at the village and district levels.

7.2.2 The Evaluation Process

The evaluation was carried out at three levels as follows:

- **Village Level**: Two group discussion sessions were held with village level co-researchers at Liati Soba and Fodome Ahor to generate knowledge about lessons learnt in the implementation of participative learning at the village level. The group evaluation process was supplemented with informal discussions with other farmers who were not in the ‘learning teams.’

- **District level agricultural workers**: Group discussions were held with FLS and their supervisors to reflect on the appropriateness and challenges of using participative learning in their agricultural development work in the Hohoe district.

- **Trainers and Supervisors at District and Regional levels**: Informal discussions were held with individuals and groups of supervisors and subject matter specialists to inquire into the views and learning experiences of supervisors and trainers in MOFA.

The method adopted for each category of stakeholders was similar. The process involved encouraging participants to reflect on the process of learning done the previous year, actions taken by stakeholders, concerns and problems associated with the use of the approach. The knowledge generated was then used to suggest further actions that could be taken to improve the approach and/or stakeholder activities.
7.3 Outcomes and Implications

The following sub-sections on outcomes focus on the main themes that emerged from the reflective learning done by various stakeholder-groups as part of the evaluation exercise. These are supported by direct quotes from a cross-section of stakeholders.

7.3.1 Village Level Perception of Participative Learning

As indicated below, the village level perception of participative learning was improvement of interpersonal relationship, improvement of participants' understanding of their problems, increased collaboration between farmers and other stakeholders, and informed action taken as a result of new knowledge generated.

7.3.1.1 Improvement in Interpersonal Relationships at the Village Level

Many stakeholders observed participative learning has helped improve the communication among farmers and between farmers and the FLS in the study villages. Some farmers have indicated that they have become more disposed to discussing their personal experiments with the FLS as a result of this research input. This observation was interpreted as being related to the fact that the value of farmers' knowledge and experiences have been acknowledged. Similarly the FLS in the two villages are now at ease to hold discussions and learn with farmers because they are not under any obligation to get the best technology for, or adopted by, farmers. This improved relationship has been interpreted as having emerged from the re-ordering of the 'giver-receiver' and 'expert-novice' relationship between the FLS and farmers. The FLS of Fodome Ahor, Mr. Ahiaudu, observed that the initiation of the research has led to the development of a different but better relationship between him and the farmers. He describes a new relationship in which the focus of his activities has shifted from 'giving the best technology to farmers' to learning with farmers to build their problem solving and decision making abilities.

'This study has been a very significant experience for me because it has helped me and the farmers to confront the various contextual issues that I normally face in trying to 'sell' our technologies to the farmers. For example the
government’s policy of privatization and removal of subsidies on farm inputs has made the work of extension officers difficult because farmers are unable to adopt the recommended technologies. The participative learning approach has however offered me the opportunity to enter into a new relationship with the farmers. A relationship that does not put me, the extension officer, at the giving end and the farmers at the receiving end. It is a relieve to know that we can now learn together as partners in finding solutions to farmer problems’. (Ahiaudu, 1996; pers. comm.)

The inquiry has therefore helped farmers and village level development workers to develop what Attwater (1996) has described as the critical consciousness that farmers should function not only as receivers of knowledge but as creators of knowledge and decision makers who must be encouraged to become more responsible for their own development. This constitutes empowerment because as Arnstein (1969) has observed, encouraging stakeholders to participate in sharing information, setting their own goal, planning and acting to achieve set goals is a process of making people become responsible for their own development.

It also appeared that the sharing of experiences, ideas, perspectives and further insights gained have also led to changes in social relationships and behaviour of stakeholders. The following conversation between Ms. Irene Afenyo and Mr. Srabi of Liaty Soba during the evaluation session could be seen as stakeholders’ self reflection on (a) the learning process; and (b) the changes that occurred to them as a result of the research input.

Ms. Irene Afenyo: ‘I am now wondering why we were not able to do all these simple things like changing our cropping pattern, planting cover crops and networking for resource mobilisation, until now.’

Mr. Srabi: ‘I attribute this to the way the discussions were organized. The cog that drove the wheel was the recognition and understanding of our own lives. In the other meetings we just listen to the agriculture messages from the
extension staff. We therefore thought the best thing to do was what we were told by the FLS. What is unique in this one is that we decided what to do based on our understanding of our environment. You see most of the interventions that we are putting into action now were our own suggestions'.

The working partnership built between different stakeholders through the process of participative learning gave a greater responsibility for problem identification and planning to farmers. It was also a process of supporting farmers to develop self esteem and to become more responsible for their own development. There was also that emergent understanding that the FLS cannot develop farmers. They can only facilitate the process through which farmers can create their own understanding and actions necessary for improving their lives. The inquiry therefore helped farmers and FLS develop the mental framework and conviction that learning about their everyday experiences is an effective way to develop agricultural production in the study villages.

7.3.1.2 Understanding Relationships between Problems and the Context

Some of the farmers observed that participative learning helped them to understand their problems in relation to their context. For example they became critically aware that their low production is not due to lack of money alone but to the relationship between rainfall, government policy and relative prices of inputs and farm products. This point was highlighted by Mr. Leve of Liati Soba when he said:

‘Now I understand my problems in relation to rainfall, land degradation, government policy, and myself. Our people say “if you understand why you are sick you could think of what to do to heal yourself”. Now we understand why our production and our standard of living is falling and that is very significant to me.’ (Leve, 1996; pers. comm.)

It was also appreciated that situations in which farmers live and work are always changing. For example, changes in the (a) ecology (disappearance of the forest and the emergence of gregarious weeds, decreased soil fertility, changes in the rainfall
pattern); (b) the social system (weaknesses in the bonds of the kinship system); and (c) the political economy (changes in government policies in response to global trends) all imply that knowledge and understanding of what should be done to improve agricultural production cannot be static. This recognition therefore brought to the fore the need for stakeholders to continually hold critical discussions among themselves, with regard to the relationship between their activities and the context in which this activities are being carried out, as a way of learning about these changes and what can be done to cope with the challenges posed by these changes.

7.3.1.3 Actions taken by Farmers to Improve Farm Practices

The participative learning process at the village and district levels stimulated farmers in the study-villages to adopt certain practices as a way of improving their farm practices. The main actions taken by some stakeholders included:

- **Changing the farming calendar:** There was a general agreement among stakeholders for the need to change the farming calendar to coincide with the changing trends in the rainfall pattern. It was also agreed that the rainfall pattern needs to be continually studied as a way of informing the timing of farm operations.

- **Self-help groups:** A group of 15 farmers at Liati Soba formed a self-help group. This group contributes 500 Cedis every week towards the funding of their farms. Indications are that more such groups would be formed as a way of supporting agricultural production. Similarly, small groups of farmers in the two villages have been trying to rekindle the sharing labour among themselves as a way of solving their labour problems.

- **Actions to improve farm practices:** Some farmers in Liati Soba also planted cover crops in 1995 and 1996 to help improve the fertility of their soils. The cover crop used was velvet beans (*mucuna*). The farmers observed that *mucuna* produces a lot of leaves and that it has the potential for improving the soil especially when supplemented with some inorganic fertiliser. Yet some farmers criticised the use of velvet beans (*mucuna*) as a cover crop because it harbours snakes. This led to the suggestion of sun hemp (*crotalaria*) as an alternative cover crop. Sun hemp was reported to have been used by vegetable farmers in Kpando.
district of Volta Region, Ghana to improve soil fertility and for use as a nematicide
(Mr. Sam Dzebu, 1996 pers. comm.)

It was also suggested that farmers should make conscious efforts at adopting practices like inter-cropping with legumes and leaving fast growing trees on farms to improve the quality of the 'fallow crops'. The Department of Agricultural Extension Services and the Crop Services Department are also committed to collaborating with farmers in learning from and reviewing the suggested interventions. The challenge was therefore for the agriculturists to support farmers to search for, reexamine and adapt practices that meet the needs of their situations. This is also consistent with the monitoring and Feedback role of the Crop Services Department.

7.3.1.4 Collaboration between Farmers and Other Stakeholders
The village level learning gave farmers the opportunity to locate themselves in the broader economic and socio-political context in which they do their farming. Issues such as the measurement of farm produce by traders, the removal of subsidies, increase in interest rates by banks and the effect of devaluation of the Cedi have been understood as affecting the cost of inputs and the revenue of farmers. In reaction to this consciousness, the local executives of the Ghana National Association of Farmers and Fishermen (GNAFF) made an attempt at negotiating the measurement and the prices of their farm produce with the traders. However, at the time of this evaluation little had been achieved so far in this respect. Farmers observed that, despite their meeting with the local traders, the influence of conditions of other market centres prevented traders from giving farmers fair returns for their produce. They therefore suggested a tri-partite meeting between farmers' groups, traders and government officials to further discuss these issues of appropriate measurement and equity price for farmers. This is an act of political awareness brought about by questioning the status quo (Friere, 1972). The inquiry has therefore raised the consciousness of stakeholders about the relationship between the micro-level and the macro level of the economy. It has also encouraged them to look for and explore new ways of engaging socio-political and economic issues that affect their production and livelihood.
7.3.2 Impact on District Level Agricultural Workers

At the time of the evaluation, I had two group discussion sessions with FLS, the DEO, DDEO and DCSO at the offices of MOFA, Hohoe. As indicated in this section, the discussions focused on their learning experiences, concerns and suggestions with regard to the use of the participative learning process.

7.3.2.1 Improvement in Working Relations and Strategies

Some of the district officers observed that they previously viewed agricultural extension as being similar to Christian missionary work. Consequently, with the framework of the 'superiority of recommended practices' over the farmers' practices they go about trying to convert farmers into 'modern farmers' by the 'gospel according to improved technology'. However participation in the research process had enabled them to question and change their view on the use of 'scientific knowledge' as the only way to help solve farmer's solve their production problems. This change in attitude is expressed in the words of Mr. Jones Attah, the FLS for Likpe sub-district;

'The participation in this research has helped me to change my outlook as an extension worker. It has exposed me to a new way of interacting with my farmers: that of being in partnership with farmers, supervisors and trainers. It has also removed the stress of always trying to force farmers to adopt technologies in order to achieve departmental targets'. I no longer need to convert farmers to the ways of technology' (Attah, 1996; pers. comm.).

Similarly, Ms. Feli, the only female FLS in the Hohoe district, also learnt that 'participative learning' is capable of helping them (FLS and farmers) to generate new knowledge that are more relevant than the technology being transferred farmers;

'Formerly we worked at conveying superior technology to farmers without reflecting on what these technologies might mean to the farmers. But now I appreciate the need to use my service to improve farmers' understanding of the various choices open to them. Learning with farmers exposes new ideas that enabled farmers to improve their own practices' (Feli, 1996; pers. comm.).
The sharing of field experiences at monthly training had also enabled FLS to appreciate and critique their interactions with farmers and knowledge they gained from such interactions. The relationship of FLS with farmers has therefore changed from teaching technical knowledge ‘as given’ by researchers to that of creative building of knowledge and skills of farming in collaboration with farmers. The discussions at the evaluation sessions reinforced the idea that interaction between FLS and farmers should not merely be for handing out knowledge that should be used in the ‘real world’ of farmers but it should be the real world in which the farmers and FLS critically analyse real life problems, opportunities, take actions to solve them and make conscious efforts to learn from the process.

7.3.2.2 Recognition of the Contextual Relevance of Farmer-practices

In the transfer of technology model that is being implemented in the study villages, researchers and extension workers rarely value farmer’s knowledge. Researchers are cast in the role of creating and managing the knowledge generation process whilst farmers are encouraged by extension workers to follow mechanical rote behaviours.

<table>
<thead>
<tr>
<th>Table 23</th>
<th>Farmer’s Practices are ‘Contextually Relevance’</th>
</tr>
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<tbody>
<tr>
<td>I visited a farmer at Liati Dafonu last year during the farming season. I observed that the farmer had planted his crops along the slope against our recommendation that crops should be planted across the slope to reduce erosion. Instead of insisting on the recommended practice, I asked the farmer to explain the reasons behind his practice. The farmer looked at me and said: ‘My son you have asked well. The local winds here blow along the slope, so if we plant across the slope, the wind would blow our crops to the ground. So the best way to avoid crop loss to winds on our fields here is to plant the crops in lines along the slope’. That was how I learnt my first lesson on the relationship between lodging and wind direction. In addition other such experiences, I have become convinced that farmers practices are contextually relevant.</td>
<td></td>
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</table>

(Mr. Prince Kwao, 1996; pers. comm.)
that are dictated by researchers. However, by consciously learning with farmers as colleagues, the FLS and their supervisors have come to appreciate the contextual relevance of farmers’ knowledge and actions.

<table>
<thead>
<tr>
<th>Technology Recommended</th>
<th>Modification Made</th>
<th>Reasons for Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant improved variety of maize.</td>
<td>Plant a mixture of local and improved varieties.</td>
<td>To obtain high yield of maize of desired food value.</td>
</tr>
<tr>
<td>Bury urea at application.</td>
<td>Topdress urea after light rain or heavy dew.</td>
<td>Presence of water helps dissolve the urea and save labour.</td>
</tr>
<tr>
<td>Bury urea at application</td>
<td>Coat urea with wood ash and top dress.</td>
<td>Prevent sublimation of urea and saves labour.</td>
</tr>
<tr>
<td>Apply one bag (50Kg) of NPK by four weeks after planting maize and top dress with one bag nitrogen fertiliser after the 6th week.</td>
<td>Apply a mixture of NPK and nitrogen fertiliser in the ratio of 50:50 to maize 5-6 weeks after planting.</td>
<td>To reduce cost of fertilising the farm.</td>
</tr>
<tr>
<td>Apply 1. 5 litres of herbicides per acre of rice field, then fertilise with one bag of compound fertiliser and one bag of nitrogen fertiliser</td>
<td>Spray a solution of table salt and sulphate of ammonia to the rice field. 0. 5 bags (25 Kg) sulphate of ammonia and 0. 55 Kg common salt in about 60 litres of water.</td>
<td>Achieve the dual purpose of controlling weed and providing nutrients to the rice. Saves cost of fertilisers, agro-chemicals and labour.</td>
</tr>
</tbody>
</table>
The main lesson learnt by FLS was that farmers adopt practices that are consistent with their values and environment. Mr. Kwao, the FLS for Liati sub-district, recollected his learning experience with a hill-side farmer at Liati Dafoonu (Table 23). FLS also took note of, and learnt from the various modifications made to recommended practices by farmers (Table 24).

The discussions held on these field observations enabled (a) all participants to recognise that farmers’ actions are value laden; and (b) enabled the agriculturists to appreciate the importance of the relationship between contextual issues and the farmers’ decision making process. The main idea to emerge, from the view point of the agriculturists, was that agricultural development agents should learn with farmers in order to discover practices that are contextually relevant to farmers.

7.3.2.3 The Future of Participative Learning in the District

Although there was a general appreciation of the potentials of participative learning, a few of the FLS found it difficult to adopt this approach in their dealings with farmers. One FLS was of the opinion that spending time with the farmers, listening to their stories, fears, disappointments, experiences and struggles, appeared to be waste of time. He reckoned that MOFA has the mandate to develop agriculture and must be seen as teaching farmers how to adopt the recommended practices. Yet another conceded that he found it hard to tell farmers that he has no answers to their problems. These observations showed how difficult it was for some participants to make the transformation from the teaching role to the learning and facilitation role.

These observations generated discussion among participants with regard to the reasons why some FLS were able to learn with farmers whilst some found it difficult to do. Various points were made by both FLS and supervisors to highlight the benefits and challenges of the approach. What came from these discussions was the ‘invalidation’ of the often held view that scientific knowledge is superior to that of farmers. Further, the agriculturists became critically aware that if farmers’ problem situations were to be improved then the farmers values, knowledge and realities must be placed first: the notion of people-centred development (Korten, 1981, Chambers
There was that agreement that an appropriate and legitimate way to let farmers know what to do and to empower them to take informed actions was to facilitate the development of their creative learning abilities. This was alluded to by Ms. Florence Yeyie, the DEO/DAC of Hohoe district when she said:

'The commitment to learning from each other and from farmers is an important way of improving our jobs and ourselves as agriculturists. I have come to appreciate that as a supervisor I should allow myself to be part of my coworkers' (FLS and Farmers) working lives. That is to allow my professional life to be touched, enriched and even shaped by their lives. In the same way the FLS should become part of the farmer's life in order that our efforts can be rewarded. Without that we would be cast into the role of purveying technologies that farmers would never adopt.' (Yeyie, 1996; pers. comm.)

There was a general agreement among participants, at the end of the evaluation process, that the lessons learnt from adopting the approach for one year justified the need for FLS to consciously work towards effective involvement of farmers in their own development. Feedback on the concerns, feelings of success and challenges of the evaluation exercise was therefore seen as reinforcement for the need for the adoption of the learning approach in the development process.

7.3.3 The Learning Experiences of Trainers and Supervisors

At the start of this research there had been some 'scepticism' about the appropriateness of this approach in the Ghanaian context. Some of the agriculturists were of the opinion that the approach might work against the present ways of doing things in the MOFA. They saw the service as a process of adapting and conveying the latest technology to farmers under a 'one-chain-of-command' arrangement. They were not sure if (a) FLS 'would get it right' when allowed to learn 'their own things' with farmers; (b) if the service would not be seen as supporting 'unscientific farming'; and (c) it might not be seen as bringing the name of the Ministry into disrepute if farmers and FLS are allowed to 'do their own thing' outside the present strict guide lines set by the ministry.
The power structure in the agricultural set-up is based on a ‘knowledge gradient’ between stakeholders. Normally the SMS and supervisors are better ‘educated’ than the FLS, so it is assumed that knowledge must flow from the supervisors to the FLS and from the FLS to the farmers who are regarded as being last on the ‘knowledge gradient’. The FLS are the carriers of knowledge to farmers who are expected to adopt the ‘already made’ technology for their own good. Making FLS and farmers partners in the development process would therefore mean losing control of the knowledge delivery process. The initial scepticism could therefore be interpreted as the reaction to the possibility of losing control of the development process.

This situation was challenged and improved by encouraging the agriculturists, during informal discussions and at the district workshop, to critically reflect on the present approach and to question their own activities as development agents. Some of the questions that they had to reflect on included:

- Is our present approach the best we can offer ourselves and our clients?
- Do we have to teach our FLS new technologies even if they are not of any use to the farmer?
- Should farmers experiences ‘play second fiddle’ to research station knowledge being taught by SMS?
- Since farmers work in complex and dynamic situations can simple universal technologies suit all farmers?
- Are we sure that our technologies can solve all the farmer’s problems?

The reflection on these during the learning process led to some fundamental changes in the way the supervisors and trainers see how they should go about doing their jobs. This shift was reflected in a change in the organisation of FLS training session. Formerly, the SMS lectures to FLS on the recommended practices and the FLS are supposed to convey the same to farmers. However, with the inputs of this research, SMS and the supervisors have devised ways of incorporating field learning experiences into their training sessions.

This was revealed by Mr. Francis Nuotaba, the Training Officer, DAES, Volta Region when he said:
"Although technologies are still being discussed at training sessions, time is now set aside, at monthly training sessions, for the discussion of field problems and experiences. FLS are now able to share what they learnt from farmers with their peers and trainers. Through this process, individual farmer experiences and practices are becoming public knowledge and other farmers now have the opportunity to participate in those useful practices that were hitherto personal to only few of them. It was also agreed that technologies were not to be 'handed down' to farmers as the absolute truth but be used as points of discussion to help farmers in taking decision with regard to their practices.' (Nuotaba, 1996; Pers. Comm.)

It evident from the assertion of the Training Officer that the use of participative learning does not prevent extension officers from 'transferring' their technologies to farmers. What the approach added to the development process is the idea of developing a learning culture within which information, on both context and content of practices, can be analyzed and mutually understood by all stakeholders. In this way, the T and V system of extension being adopted in the Hohoe district became subsumed by the participative learning approach. The former slogan of 'Train, Visit and Deliver Technology' has been changed to 'Train, Visit and Construct Knowledge'.

The usefulness of this approach was supported by the realization by trainers and supervisors, that farmers do not have adoption of technology as their target. It was appreciated that development agents have no power to force farmers to adopt the recommended practices on an 'as is' basis. Further, the series of modification made to researcher-recommended-technologies brought into the fore the futility of advising farmers to adopt value-free technologies. This view was echoed by Mr. Piety Ahiable, an SMS (crops), when he said:

'Field experiences reported by FLS at training sessions showed that most farmers were not adopting our technologies "as given". They were rather
found to be modifying them or creating new practices out of them. If the farmers cannot adopt these technologies as we "preach", then there is no justification for using the resources to "push these technologies". It is therefore appropriate under these circumstances to encourage the FLS to learn with the farmers to use all information received (irrespective of the source) to support farmers in taking decisions that they found relevant'. (Ahiable, 1996; pers. comm.)

This suggests that the focus on development needs to be shifted from 'enabling the development institutions' (i.e. spending resources on research and extension to develop technologies) to enabling farmers to learn to become responsible for their own development: the notion of the learning process approach to development (Korten, 1981).

The need for agriculturists to facilitate and support farmers in the process of making informed choices through creative interaction has emerged as an important means of improving food and agricultural production. However, the officers observed that since this approach requires (a) a new set of social relationships; and (b) a new political orientation for its effective implementation. This view was expressed by Mr. Elvis Degbor, the Regional Agricultural Extension Officer for Volta Region, when he said:

'This approach means that we should make learning our goal instead of technology development and delivery. However, it needs to be supported by government policy. We need a policy aimed at encouraging and supporting the creation and maintenance of learning partnerships between farmers and the agriculturists. The implementation of such policies could encourage us to articulate views and to support practices that might not be scientifically proven but which is judged, through the learning process, to be relevant to particular situations.' (Degbor, 1996; pers. comm.)
Presently, the staff of MOFA are mandated to transfer technologies to farmers. There have been periodic field inspections by officers from the national headquarters to ascertain if that is being done. It follows that if a different approach is to be adopted then it must be sanctioned from National Headquarters in Accra. The main challenge to this approach being implemented was therefore seen as the need for policies that could support the establishment and maintenance of institutional frameworks for collaborative learning and action among all stakeholders.

With this as my context, I also held discussions with the National Director for DAES and the Deputy Minister for Food and Agriculture (Volta Region) on the implications of the results of this inquiry. It was inferred from these discussions that the agricultural administrators and politicians were critically aware of the limitations of the technological approach to agricultural development in Ghana. They were therefore keen to initiate policies that would ensure effective farmer-participation in future agricultural development efforts. I have been informed by the DEO of Hohoe that the first National Seminar on farmer participation in agricultural development (sponsored by MOFA) was held in Accra, Ghana, in September 1996. There is therefore the hope that the Hohoe initiative will not die for want of political support.

7.3.4 Summary of Suggested Interventions
During the evaluation exercise the various stakeholders suggested interventions that they believed could be carried out to further improve their learning and their activities. These suggested interventions are enumerated below.

- Farmers to be encouraged to consciously (a) explore the potential and weaknesses of their practices; and (b) make possible changes to improve their practices.
- Farmers and FLS to be encouraged to continue to learn about changes in the ecology and to make all their findings public knowledge.
- Farmers should be invited to training sessions to share their experiences with agriculturists.
- GNAff should continue to negotiate with government agencies and traders on the question of better terms of trade for farmers.
• FLS to make conscious efforts at (a) learning with farmers and peers; and (b) making all ‘good’ farmer-practices, irrespective of the source, public knowledge.
• FLS to be recognised and rewarded for learning with farmers.
• The need for political will and support for the approach should be acknowledged.

7.4 Researcher’s Self-Evaluation

The questions I had wished to address at the time of this evaluation were:
• To what extent has the research objective been achieved at the end of the second research cycle?
• What happened in the course of the learning process? What are the reasons for what happened?
• What are the implications of what was observed to have happened?

By the end of this research input, however, no specific answers were found for these questions. However, this study helped me to get more insights into (a) the farmer’s ways of knowing and practices; (b) agricultural development work; and (c) the theory and practice of ‘participative learning’. Further, the opportunity to learn with farmers, NGOs and other agriculturists has enabled me to change my perception about smallholder farmers and agricultural development work. I went to the Hohoe district with an understanding of the small farmers based on my training as an agriculturist and experiences of training FLS and supervising the transfer of technologies to farmers. I returned with quite a different view based on the learning experience I had with other stakeholders. Just as garlic adds an entirely new flavour to cooking, the learning I did with the other stakeholders in Hohoe and other parts of Ghana, gave me an entirely new perspective on the life of the farmers and the whole development process. I came to experience and appreciate the force of learning through the coming together, questioning and accommodation of the various cultures of knowing and acting. In the process, my own ideas of ‘good’ farm practices and agricultural development in rural communities of Ghana were challenged and reshaped by the learning process. Before I left for the field, the words that I associated with the small farmers included, ‘small farmers’, ‘non-adopters of
technology', 'conservative' and 'people who needed' to be taught. But the words that I now use are (a) 'creators of knowledge'; (b) 'dictionary on complex life problems'; and (d) 'innovators'. Above all, I have learnt that learning from individual experiences by stakeholders within a social system is a powerful means of changing society for the 'better'. What counts as 'better' is defined by stakeholders through the learning process.

Every participant in this study appeared to have been affected in different ways, not only because of the different perspectives that were brought to bear on the issues and problems identified, but also because of the different but relevant meanings they took from those experiences. We had the opportunity to re-experience our experiences of farming and agricultural development work in a new way and to discover something about our actions, our cultures, our beliefs and our own lives. What was learnt, shared and internalized appeared to be far more than can ever be read or captured on the pages of a book.

I have come to appreciate that the most important ingredient needed for improving food and agricultural production in the study area is not 'technological evangelism' but the 'creation of the understanding' necessary for effective decision making. This consciousness came with a call, by some of the participants, to make learning a goal for development agencies in place of technology development and delivery. This realization is important because, as Kippendorff (1993) points out, no one can knowingly act against his or her own understanding. Mutual understanding among actors as to what constitutes the problem and what interventions are required then becomes the central focus of the development effort. There is surely a place for 'technology', but when the goal is to enhance local capacity and sustainability, forging of understanding through creative interaction between stakeholders and their environment becomes more appropriate.

The results of the study have also brought to the fore the need for development workers, to be conscious of the limitations of the 'paternal' relationships and the 'quick fix' technological approach on which so much effort has been expended in the study area. I
have come to understand agricultural development as improvement in the capacity of stakeholders to learn about, and manage the uncertainties and contradictions associated with a complex social system like the small holder farming system: the notion of development as a cognitive process (Bawden, 1995). The research has provided me the opportunity to shift my way of thinking from seeing development as the product (number of meetings, number of technologies and bags of maize) to that of development a the process of ‘learning into being’ a farmer or a development worker.

7. 4. 1 The Facilitation Process

In the positivist tradition, the researcher is in control of the search for knowledge as he or she researches on the subjects. This sort of research is focused on the generation of objective knowledge from a sample of the population. This implies isolating oneself from the real life issues of the people on whom the study is being done. Consequently the research could gloss over the everyday discourses and meanings that the people attach to their activities and lives. This research project, however, avoided the isolation of the other stakeholders by adopting a participative learning approach grounded in action research, experiential learning and critical learning systems. This therefore encouraged stakeholders to explore their own experiences through a reflective and interactive process of sharing insight to make sense of what it meant to be farmers and development workers in the study area.

During the learning process I had to co-operate with the other stakeholders, respecting their views and asking discriminating questions to open up the issues of farming and agricultural development work to unrestricted but constructive criticism. Through this process, I came to learn that different people have different experiences on the same issue and even put different values on the same experiences. This was what gave rise to a multiple perspective of realities of issues about which Elden (1981) has written:

'... because different people have different ideas, perceptions and experiences leads to multiple perspective, and multiple perspective means that knowledge generated cannot be value free.' (Elden, 1981:256)
Participative learning can therefore be seen as denying 'unambiguous and value free knowledge' in favour of 'value-laden contextually and relevant knowledge'. The facilitation of such a process can therefore be conceptualised as encouraging stakeholders to collaboratively create new metaphors to describe their own activities and beliefs. Consequently, there appears to be no logical room for 'absolute control' of the process by the researcher. While I was in control of my experiences and interpretations, I was 'controlled' by the research process. This is a paradox of being in control and being controlled at the same time. Facilitation, as I experienced it, can therefore be described as process of maintaining a tension between being in control and being controlled by the learning process.

As a supervisor in Volta Regional office of DAES, MOFA, I have had the experience of being in 'charge of change', and I work with predetermined frameworks within the general orders (GO) of MOFA. But in this participative learning project, I have had to develop a new framework in collaboration with the other stakeholders to learn within that framework. In the process, I had to learn how to change my role from 'expert' to that of a 'facilitator'. In the role of a facilitator, I had to accept that I have been disenfranchised of the notion of 'knowing all' because the learning process and the outcome were quite unpredictable. By listening and acknowledging the value of other people's experiences and interpretations, I became part of what was being learnt and had to go where the 'spirit of the learning' directed.

The learning done through this process was also associated with the development of personal understanding and ownership of the outcomes of the learning that we did (Kemmis and McTaggart, 1988). The perspective transformation and attitudinal changes that were associated with the learning process have convinced me that agricultural development can be more effective if shared with the beneficiaries of the development process (Narayan, 1993; Attwater, 1996). This is because perspective transformations by the individual is at the heart of desired changes in any 'change' in human activity systems (Mezirow, 1983). The implication here is that development workers need to desist from the notion of 'going to change farmers'. They must be change agents who are ready to change with the system they are changing.
7.4.2 Limitations of the Study

My reflections has led me to realise that the results from this research could possibly be limited by (a) the small group of people used in the study; (b) the short time duration; (c) the biases that I and other research participants brought to bear on the research process. This study explored the use of ‘participative learning’ in the improvement of the farming lives of two communities in Ghana between 1995 and 1996. Although this study can provide useful reference material for agricultural development work, the usefulness of specific results appears to be limited to the space and time of the study and may not be ‘generalisable’ for all Ghanaian communities.

It is understood that I, as a ‘researching facilitator’, must have influenced the course of the research. My position as a senior officer in the Ministry of Food and Agriculture might have influenced the way the farmers, FLS and other agriculturists learnt at the village level and district workshops. Furthermore, what is written here is my construction of what happened or what I might have seen. While I was committed to being faithful to the group view, it is entirely possible that other participants might have seen or documented things differently from those captured here.

The research was also limited by the number of people who participated in the learning sessions. There was a maximum of 20 people from each village and about 52 participants to the district workshop. It is therefore possible that there are many other experiences that have not been explored by this study because of the small number of people who participated in the research process. This study was also limited by time. It was difficult to learn about everything within the time constraints of this study. There is a possibility that there are several issues and experiences that have not been explored because of time limitations.

Although it was assumed that all the data collected and used in this study are reliable and were validated by the use of data from different sources, I am conscious of the fact that the results are limited by the recollection and interpretation process. The results are therefore limited by the ‘truth’ or otherwise of the narration and
interpretation given by the research-participants. However, these limitations, do not invalidate the results of the study, they rather reflect the justification of the research paradigm used in this study and the challenges that I faced in using ‘participative learning’ to intervene in farming and agricultural development work in Ghana.

7.5 The Trustworthiness of the Inquiry

The focus of the methodology used in this study was to establish a social discourse to encourage farmers, researchers, extension workers and other groups involved in agricultural development to construct their own realities about what needs to be done to improve agricultural production in the study area. This was, therefore, a process of presenting and critiquing the multiple, holistic, competing and often conflicting realities of research participants (Lincoln, 1990). The group discussion sessions used in this inquiry also led to the creation of individual realities that were informed and shaped by ‘realities’ held by other participants. This implies that ‘reality’, as constructed by the individual stakeholders, cannot be regarded as the ‘truth out there’, but can be conceptualised as a variety of ‘subjective truths’ (Marshall, 1981) or has become what Krippendorf (1991:13) has described as a ‘jointly woven fabric that does arise in every participant’s own construction’. Although personal reflection and group critique employed in the research enabled stakeholders to justify the grounds of their knowledge claims, I cannot say that this inquiry did offer the ‘absolute truth’. Rather it led to the creation of inter-subjective realities about issues and problems that were relevant to stakeholders.

The subjective or the value-laden nature of the inquiry however, brings in its wake the question of what strategies were adopted in the course of the inquiry to ensure the quality and credibility of the research process and outcomes. In this section I draw upon the works of Reason (1981), Tandon (1981), Guba and Lincoln (1989) and Smith (1990) as discussed in Section 3.8, to answer the questions: ‘What makes the descriptions, interpretations and the claims made in this thesis “valid” or “trustworthy”? The various strategies adopted to ensure and to justify the
trustworthiness of the process and outcomes of this study is described in sections 7. 5. 1 to 7. 5. 6 below.

7. 5. 1 Extended Contact with Participants

Chambers (1993) and Reason (1981) used the term ‘rural tourism’ and ‘rural journalism’ respectively to describe situations in which the research interaction is so short that rural realities can barely be illuminated. In this present research, I engaged participants in reflective learning about their experiences, practices and lives for a period of about one and a half years (February 1995 to June 1996). Within this period, stakeholders participated in (a) setting the research agenda; learning about their own situation and practices; (c) putting some of the research findings into action; and (d) evaluating the initial research inputs to generate knowledge to inform future actions.

I also participated actively in the activities of the Ministry of Food and Agriculture during this research engagement. I attended research-extension workshops, FLS training sessions, bi-monthly Technical Review Meetings and visited farmers’ fields. These points of interaction provided opportunities for me to observe, appreciate, reflect and question the construction of reality by stakeholders. It also helped me to put across emerging themes and questions for reaction by a cross-section of stakeholders. Reactions from these engagements were very useful in ‘assessing’ and refining the ‘truthfulness’ of the information collected.

Henderson (1991) has mentioned that participants can mislead the researcher, especially when they are not sure of what the research results were meant for. However, by engaging the stakeholders (especially farmers) for a long time, they came to view the researcher as one of them, and could not hide their feelings and perceptions from me. Further, the long engagement with the stakeholders also enabled me to go through the research cycle (description, interpretation, construction of future direction) with individual and group members several times.
7.5.2 Multiple Sources of Information

Different methods were adopted to collect data in the field e.g., semi-structured interviews, key informant interviews, village meetings and workshops. Information generated through these methods informed each other. Through these methods, a large number of people with different backgrounds (extension workers, farmers, administrators, researchers, NGOs, financial institutions) were brought into the orbit of the research. The information network established between the various groups of people ensured that the data was generated and interpreted from different perspectives. The feeding back of the various perspectives into the learning process was seen as helping the research participants to (a) have a more holistic understanding of their own situations; and to validate their own interpretations.

7.5.3 Participant Checking

I also allowed participants to review the transcribed version of data collected. For example, during the semi-structured interviews, the data were transcribed at the end of each day's interview. The transcribed responses were later checked with some of the participants to ascertain the degree to which they reflected their perceptions. Similarly, I read proceedings of the village learning sessions to participants as 'last minutes' in the following learning session for their comments, concurrence or dissent. The district level workshop report was also circulated among a cross-section of participants for their feedback. These 'participant-checking' exercises helped me to cross-check on information. It also assisted in finding out whether participants' views were being fairly represented in the write up. In most cases the respondents agreed to my analysis while in some cases participants also identified a range of alternative views. In this way I was able to maintain a flux between data discovery and interpretation to reflect the views expressed by the research participants.

7.5.4 Cross-examination of Participants

During the village learning and the workshops, stakeholders were requested to 'reflect aloud' reasons for their interpretations. They were requested to elaborate on their descriptions and interpretations as a way of challenging them to identify themselves with their beliefs, experiences, knowledge and actions. In that process
some participants were able to confirm their realities while some changed their ideas and reconstructed new realities consistent with their new understanding. The data generated therefore arose from the tension between participant’s inner convictions and the external criticism by peers (Reason, 1981; Torbert, 1981). Reason (1981) has argued that data generated from an inquisitive social atmosphere, as described above, is liable to be of high quality because it has become vetted by the social system within which it was generated.

7.5.5 Making Participants Co-researchers.

During the inquiry, I shared the process of data discovery and interpretation with participants. Participants had the opportunity to criticise their own knowledge and actions through the process of describing and reflecting on their experiences. The sharing and criticism of various interpretations by the group led to the construction of ‘social realities’, that were consistent with the contextual values of stakeholders. This was referred to by Habermas (1984) as a process of judging the rationality of our knowledge and by Bawden (1995) as trying to critique the learning process and beliefs that inform the knowledge generated. The content and context of the research were therefore integrated and became validated by the active participation of all interested parties. The data generated was therefore validated by the co-researcher-role of the subjects of the inquiry. In other words the active participation of stakeholders in the research process was seen as conferring legitimacy on the knowledge generated (Wyman 1985).

7.5.6 Impact of the Research on Stakeholders

This research was not designed to find the ‘truth’ about farming or agricultural development work. It was rather about exposing stakeholders to their own, as well as other people’s experiences as a way of generating ‘new knowledge’ that can inform their own practices. The process therefore allowed social theories and concepts held by stakeholders to be progressively extended and refined leading to clarity of themes and interpretations (Guba, 1990). It also led to self-understanding in relation to the understanding of other stakeholders: the notion of ‘second order understanding’ (Krippendorf, 1993). The validity of this study therefore encompasses the enhanced
understanding stakeholders have of themselves and their environment and the very
disposition of using knowledge generated to inform their practices.

The learning process initiated in the smallholder farming system is ongoing, however,
the outcomes of the evaluation done with stakeholders have shown that, the research
has provided an opportunity for stakeholders to critically reflect on their practices and
lives. This has enabled them to design some activities, based on the understanding
obtained through this learning process, which can help them improve upon their
practices and their lives. For example, farmers became critically conscious of the
need to change their farming calendar in response to changes in the climate and
MOFA staff embraced learning with farmers as an integral part of their practice.

Torbert (1981) has pointed out the need to consider, not only the ‘rightness’ of
interpretation but, also its usefulness and illumination. The modest improvement in
(a) understanding; (b) the usefulness of knowledge generated; and (c) the social
changes that occurred with this research input are therefore three interrelated
characteristics that were also conceptualised as validating the knowledge that
emerged from this study.

7.6 Conclusion
The evaluation exercise forms an integral part of my research work and was carried
out to further learn about the participative learning initiated in concert with farmers;
NGOs and MOFA staff in the Hohoe district of Ghana. It was an opportunity to share
the views and concerns of other people. It was a process of accessing the creative
potentials and knowledge of stakeholders as a way of building their capacity to direct
their own development. It also enabled me to draw on stakeholders’ understanding
and critique of participative learning as done in the Hohoe district of Ghana.

The evaluation exercise suggested that the participative learning enabled stakeholders
discover their own creativity and capacity for self improvement. The limitations of
the use of ‘technology’ as a tool for development was identified and facilitation of
learning and decision making has been appreciated as an appropriate way into
development. There has also been that realisation, among stakeholders, of the need to reorient the existing ‘paternal relationship’ between farmers and agriculturists to that of ‘creating and supporting critical conversation networks and learning partnerships between stakeholders’ as a necessary condition for improving agricultural production in the study area.

In the course of the study, stakeholders were given the opportunity and encouragement to tell their own stories, to interpret their experiences, and to recreate their realities in a non-threatening but socially inquisitive environment. Participants were supported and challenged by the learning groups to generate knowledge that was judged by the research participants as being contextually valid. I also adopted several strategies to ensure the trustworthiness of data generated. I also made conscious efforts to give fair representation to the viewpoints of participating stakeholders.

It should, however, be noted that the knowledge documented in this thesis was created through the interaction between the research and the researched. The shared biases of stakeholders has therefore become part and parcel of the process and outcomes of this inquiry. I acknowledge these biases as healthy because the paradigm adopted implied that the subjective values of research participants become part of the data. There is, therefore, no ‘universal truth’ or ‘certainty’ about the knowledge generated in this study. However, what is true about this research, is that all the views shared by various actors were respected and taken as authentic, because, as Judi Marshall (1981) says, ‘each has its own integrity and own validity’.
CHAPTER 8

GENERAL DISCUSSION

8.1 Introduction

In this chapter I reflect on the research process, its outcomes and the implications for agricultural development in Ghana. The thesis explored in this study was that 'participative learning' is an appropriate means of informing farming and agricultural development work in Ghana. The research was grounded in constructivism and the critical system paradigm. This can also be referred to as radical constructivism (Bird, 1990) which encompasses the notions that:

- reality is not 'out there' to be discovered, but a series of subjective truths held by beholders (Marshall, 1981; Guba and Lincoln, 1989)
- reality is greatly influenced by the context. So there is the need to critically reflect on various interpretations as a way of seeking emancipation from cultural, political and historical forces that predispose individuals to particular worldviews or interpretations (Jackson, 1982; Shor and Friere, 1987).

Methodologically, the research was based on the three interrelated concepts of action research, experiential learning and critical learning systems. The first is the concept of mutual inquiry by stakeholders and the reflection on actions that arise from the inquiry (Lewin, 1951; Kemmis and McTaggart, 1988; Dick, 1993). The second is the concept of searching for meaning for adaptive action (Kolb, 1984), and the third is the concept of critical reflection on the process and context of the inquiry and actions (Freire, 1972; Carr and Kemmis, 1986; Bawden, 1995). I have adopted the political stance of critical theory in action research and experiential learning as a way of (a) facilitating communicative relationship among stakeholders (Habermas, 1984; Jackson, 1982; Turnbull, 1993; Williams, 1995); (b) enabling them to question the contextual validity of their knowledge (Marshall, 1981); and (c) of enabling
stakeholders to question and reflect on how they know what they do and how they organise their knowing and actions (Argyris and Schon, 1978; Senge, 1992, Bawden, 1995).

Participative learning was therefore used in this study as the methodological framework within which farmers and agricultural development workers created and personalised knowledge about their practices and situations, while using their own experiences as the main input. This research then became an opportunity for stakeholders to communicate with each other on their viewpoints and through such exchange learn to appreciate issues, problems and opportunities of farming and agricultural development from the multiple perspectives of other stakeholders. In addition to helping participants to better understand their situations and practices, the learning process also helped reinforce participants’ sense of ownership of problems and interventions explored during the learning process. The results of this study can therefore be seen as being consistent with the position presented by Bawden (1989:16) on outcomes of an action research project viz.:

- improving the practice of the researcher
- improving the understanding of the practice by the practitioner
- improving the situation in which the practice is practiced
- improving the understanding of the situation in which the practice is practiced
- subjecting the interpretations or understandings to social critique thus adding to social knowledge.

The results of this research also highlighted the limitations of using the TOT model of development in the improvement of food and agricultural production in the study area. Participative reflection on these limitations and the further insights generated by the use of participative learning persuaded me and most of the research-participants, that the development of sustainable food and agricultural production in the study area and indeed farming and agricultural development work, should be re-conceptualised and implemented as a process of critical reflective learning by stakeholders.
The thesis developed out of these learning process was that participative learning informed by the concepts of action research, experiential learning and critical learning systems, can provide the conceptual and methodological basis for stakeholders to create contextually relevant knowledge to inform their decision making and actions. This assertion is congruent with contemporary views on agriculture and rural development that the active engagement of problem owners in the critical analysis of their own situation is an ethically defensible way of knowing and an effective means of empowering stakeholders to implement what they have been learning about their own situation (Korten, 1980; Russell, 1991; Chambers, 1993; Fisher, 1993; Turnbull, 1993; Messerschmidt 1995; Williams, 1995; Attwater, 1996; Hobley and Wollengberg, 1996).

8.2 Reflections on Methodology

The methodology used in this study has its foundations in radical constructivism interpreted in terms of action research and experiential learning and reflecting a critical learning systems paradigm. The paradigm was implemented as a participative learning process in which farmers and development workers described, analysed and reflected on their own ideas and experiences, planned and undertook actions to improve their own situations. This is consistent with the ideas of action research which emphasises the involvement of stakeholders in (a) exploring or learning about their current situation; (b) proposing possible changes; (c) implementing those proposals; and (d) learning from the process to generate knowledge to inform future actions (Lewin, 1951; Kemmis and McTaggart, 1988). In this case, issues, concerns, problems, opportunities and interventions discussed were conceptualised as social constructs held by stakeholders as they made sense of how to live in relation to the meaning they come to attach to their own environment. This position reflects the belief that these issues, problems and interventions do not exist independently of the stakeholders and cannot be known or appreciated except in the process and outcome of their construction and 'reconstruction' by the stakeholders (Torbett, 1981; Guba and Lincoln, 1989; Marshall, 1990).
Participative learning, as being used in this study, can be construed as an overall strategy to set up a phenomenological and a hermeneutic interchange of ideas about knowledge and actions in which the constructions of individuals were exposed to critique and reactions in socially inquisitive atmospheres to generate further constructions that were themselves subjected to further critique and enrichment. The methodology involved participants in continuous dialectics of iteration, analysis, critique of their own situation from which a construct, of what is to be known and done, emerged. It was seen as a process of establishing and refining a creative learning culture through group meetings, village meetings and a district workshop to encourage stakeholders (a) to develop an appreciation for a learning approach to development; (b) to generate greater self-awareness of their own situation; and (c) to create knowledge about more effective actions to be taken to improve the food production situation. This process therefore cast the farmers and development workers who participated in this study in the role of co-researchers and 'co-legitimisers' of knowledge generated.

Consequently, the methods adopted in the inquiry were sets of activities that went into establishing a network of conversations through which farmers, researchers and extension workers were encouraged and supported to consciously verbalize, reflect on, interpret and clarify their own understanding of the experiences they had in relation to their context. This process is congruent with Smith’s (1990) view that the reality of meaning, intentions and purposes is found in human interpretations. The sets of activities carried out during this research was therefore seen as an appropriate way to legitimise that interpretation as it afforded stakeholders the opportunity to partake of the knowledge generation process.

This approach is therefore different from the ‘positivist’ research that (a) privileges the duality between observer and observed (Guba and Lincoln, 1990); and (b) embraces the philosophical position that the observer can stay dispassionately outside the universe of the observed who is therefore able to generate an objective knowledge that can then be 'transferred passively' to the observed for adoption (Pretty and Chambers, 1993; Pretty, 1995). The notion here is that the 'expert observer' knows
that which is real as that which can be verified. In that case, the focus is on the 'objective truth' while the subjective dimension of everyday life is taken for granted. The present inquiry was not interventionist, and was not set up to discover the truth about the nature and operation of farming and agricultural development work in Hohoe district. It was meant to encourage stakeholders to critique their own experiences, knowledge and assumptions in order to engage their worlds in better ways and thereby be able to improve their own situation. In this context, what constitutes 'better' and 'improvement' is subject to public discourse set up as participative learning by interested stakeholders.

In terms of development, the approach adopted in this research project is consistent with Bawden's (1995) idea of cognitive and systemic development that involves stakeholders creating a network of critical conversations in which a community or organisation learns about itself as a learning system co-evolving with the world about it. It was therefore not possible to arrive at 'blue prints' about the issues, problems and solutions. The inquiry rather suggested sets of ideas and viewpoints that can be described as 'multiple and inter-subjective truths' (Marshall, 1981; Krippendorf, 1993) or 'heuristic metaphors' (Ulrich, 1993) that can be reflected on further to guide stakeholders to better understand their own situations in order to take informed actions to improve their practices as farmers and development workers.

8.2.1 Characteristics of the Methodology

The methodology as implemented here was seen to be consistent with the tenets of action research, as it was an inquiry in which stakeholders worked collaboratively toward improving their own situation and practices through self-reflective learning. It was also conceptualised as a process of using critical learning systems to improve communal or organisational behaviour as stakeholders were involved in using their own experiences to theorise about how present organisational norms could be changed to make agricultural development activities more effective in improving the agricultural production situation.
The methodology adopted be seen as an overall strategy at supporting a process of participatory social construction through which social relationships were identified and improved by means of the social discourse established as part of this research. It also emphasised the use of both statements of facts and the propositions of values to define social realities (White, 1989). The methodology was therefore regarded as ethically defensible as it dealt with what Turnbull (1993:15) refers to as 'ideals of engendering social action rather than an attempt at social manipulation.'

8.2.1.1 Social Construction through Reflection and Critique

Farming and agricultural development work can be regarded as human activity systems representing systems of ideas, institutions and functions that are related to and nested within each other. The methodology can therefore be seen as dealing with the social context of the research by subjecting stakeholders to continuous and collective reflection on the experiences they had with their 'conceptualised social system.' The emergent learning that occurred through that process led to the creation of new social constructs or knowledge that were used to inform actions of farmers and agriculturists in the study area. This makes the participative learning what can be seen as a 'flux between experience and action.' This is also consistent with Freire's (1974) notion of 'praxis' where individuals learn to live up to their own ideals of 'correctness'.

8.2.1.2 Systemic Inquiry

The learning process adopted in this study enabled stakeholders to co-inquire to explore relevant relationships within the context of their lives and work as farmers and development workers. They also re-conceptualised how such relationships could be established or maintained to improve their practices and their lives. For example research participants were able to establish a relationship between farm yield, marketing strategies and income. Participants also used the opportunity to develop personal meaning of present power relationships in the organisation of agricultural development, and the relationship between the micro socio-economic conditions and the macro-economic structure of the country. The lesson here is that all issues, concerns and problems of food and agricultural production are constantly influencing
each other and must be conceptualised as interrelated elements in the totality of an integrated system (Ison, 1994). Further, the exploration of these relationships also encouraged stakeholders to redefine theories with regard to relationships that ought to be established and improved in order to make farming and agricultural development work more effective.

Kolb (1984) identified observation, conceptualisation, planning and action as processes involved in a ‘cycle’ of adult learning. However, Bawden (1995) argues that each of these processes is better conceptualised as learning sub-systems that are in a constant flux with each other. The systemicity in this study therefore relates to the improved ability of stakeholders to be critically conscious of the implications of, and relationships between what they do (observations, thoughts, plans, and actions), how they about doing what they do (process), and their beliefs about what they do and how they do it (context). As Bawden (1995) presents it, the purpose of systemic inquiry is to help people learn how to view, and to act in, their worlds from the perspective of themselves as a coherent learning system, or linked system. In other words, ‘they come to learn how to deal with the complexity of the “external world” through learning about their “own internal world”’ (Bawden, 1995:31).

8.2.1.3 Problem Solving and Action Orientation
In this study, the focus was on real life issues and problems of farming and agricultural development in the study area. It was a collaborative development effort of generating knowledge and action through finding out and taking action about knowledge and action. This resonates well with the development goal of encouraging stakeholders to seek experiences that are related to their present problems and goals, interpreting them and forming concepts to inform their future actions (Korten, 1980; Kolb, 1984).

8.2.1.4 'Values' as much as 'Facts'
There appears to exist a strong relationship between farmer’s realities and the values they hold about their situation and practices. For example, the practice of growing local varieties of maize instead of researcher-introduced high yielding varieties was
found to be related to the food values of local varieties. Similarly the adoption of mixed cropping by farmers is related, among others, to its value in delivering multiple products and helping farmers hedge against total crop failure. Farmer's practices were therefore predicated not only on 'facts' regarding yield and economic returns, as used by researchers as measures of 'good practice', but also on their personal subjective values.

The argument here is that farmer's 'realities' are not simply the objective scientific facts established by the scientists but also the subjective values they attach to them. This assertion reflects the inseparable relationship between subjectivity and objectivity in the act of knowing and decision making in human activity systems (Reason 1981; Vickers, 1983; Harmon, 1984). Development efforts have relied upon a two-factor-capital and labour- neoclassical economic models (Drucker, 1992). However, failures have occurred when these models are applied to agrarian societies where complex and dynamic social and ecological forces dictate different ways of knowing and acting that are dissimilar to the logical frameworks of these objectivist models (Rhoades and Booth, 1982; Kanwar et al, 1992; Chambers, 1997). This is because these rationalistic economic models 'lack foundation in human values' (Berry, 1984; Hill, 1986, Drucker, 1992). Vickers' (1983) identified 'human values' as being central to development. He posited that all efforts at development should start from re-orienting the value that stakeholders place on their relationship with each other and their environment. Berry (1984) also talks of the inappropriateness of 'sweeping all human values under the scientific carpet' when it comes to food production.

'Food is a cultural product; it cannot be produced by technology alone. Those agriculturists who think of problems of food production solely in terms of technological innovation are oversimplifying both the practicalities of production and the network of meanings and values necessary to define, nurture and preserve the practical motivations for its development.' (Berry, 1984:221)
The contention here is that it is appropriate to intervene in farming and agricultural development work in the study area with a methodology that places emphasis on the statements of both facts and values held by stakeholders.

In the context of this study, considerable emphasis was placed on the discovery and criticism of what stakeholders view as the defining qualities of their context and practices. This had to do with encouraging stakeholders to critically clarify their contextual values as a way of developing understanding of how these values affect their practices and lives. Through this way, stakeholder’s knowledge and actions were examined for their meanings in relation to the beliefs they held about them. The relationship between theories and practices of farm and agricultural production were therefore established and improved through the ‘definition and redefinition’ of values held by stakeholders. Group critique also helped reveal contradictions on value positions, and enabled stakeholders to reconstruct their future actions as critical thinking enhanced decision making on new value positions.

8.2.1.5 Participative Learning and the Question of Ethics

Conventional positivist research is based on the notion that proven facts based on objective observation and analyses are the key to improving human life (Jamieson, 1985). The focus of such a research is on the neutrality of the researcher in order to discover objective knowledge for which a value-free environment is assumed (Guba and Lincoln, 1989). The main task of the researcher then is to control the research environment and concentrate on measuring the effects of variables that are of interest to him or her, to generate knowledge that is supposed to approximate universal reality (Brockett, 1988; Pearce, 1993).

However, as noted by several post-positivist social researchers and practitioners such as Berger and Luckmann (1966), Brundage and Mackearcher (1980), Kemmis and McTaggart (1988), Guba and Lincoln (1989), Reason (1994), Pretty (1995) and Chambers, 1997), this detached researcher-centred approach to social research and development raises ethical questions that include:

- Whose reality is being explored?
- Can the researcher really assume a neutral position?
- Can social knowledge be ‘acontextual’ and value-free?
- Who takes responsibility for the consequences of the research?

The constructivist paradigm questions the notion of one objective reality. It holds the view that ‘truth’ is a relationship between the phenomena under study and the researcher who is also influenced by the environment (Beger and Luckmann, 1966; Guba and Lincoln, 1990). Further, this paradigm posits that personal beliefs, disciplinary orientations, language, and experiences influence how problems are conceptualized, analysed and understood (Hardiman, 1990; Hall, 1994). Knowledge about a human activity system, such as farming and agricultural development work in the study area, can be considered as being subjective and value-laden.

The research methodology adopted was therefore a way of creating an opportunity for all values to be expressed, critiqued and used in social construction of knowledge about farming and its development. This is consistent with Guba and Lincoln’s (1990) idea that social research cannot be done in a value-free environment and neither would the result be applied in a value-free context. This implies that stakeholders realities are rooted in values embedded in their context. The active involvement of the stakeholders in the research process was therefore to explore the inevitable interaction between the research findings with the context from which they are drawn, and to which they are applied.

The methodology can also be conceived as being ethically defensible because the knowledge generated was not discovered by the researcher through what Henderson (1991:79) describes as ‘controlling and confounding variables that are of interest to the researcher’. It rather emerged from the shared values and experiences interpreted and validated by those involved in the process of agriculture and food production in the study area. The inclusion of all stakeholders as co-researchers in the learning process therefore enabled the results to be validated by addressing the question of contextual relevance and utility of results. By sharing insights and ‘agreeing and disagreeing’ on the interpretation and meanings of (a) different experiences; (b)
beliefs and; (c) perceptions, stakeholders were able to construct metaphors, they felt comfortable with at the time, to describe their own realities of food and agricultural production. The methodology adopted therefore included the commitment to answer the questions of responsibility for the research process and outcomes as well as improving the coherence between what is espoused and what is experienced.

8.2.2 My Role as a ‘Researching Facilitator’

I came to see my roles in the research process as the initiator of the idea, learning facilitator, a catalyst, a resource person and student of participative learning. These roles were executed by (a) having consultation with stakeholders; (b) providing background information on participative learning; and (c) creating ‘space’ to enable stakeholders to learn to improve their own situations. I organised group discussions and other learning activities as discussed in Chapters five, six and seven to encourage stakeholders to learn about their own experiences and to reflect on their own learning. Although I assumed the responsibility for managing the learning process, I also encouraged stakeholders to assume personal responsibilities for their own learning, frustrations and achievements of the learning in which they were engaged.

This approach reflected a reorientation of the roles and responsibilities of the researcher and the researched from the positivist’s sense of doing research. In this participative learning project, I had to share the research process and responsibility with farmers and development workers who became co-researchers in this learning project. The stakeholders were therefore part of the research process and were equally responsible for the inevitable socio-political consequences associated with this inquiry. My role can be seen as that of creating a situation in which stakeholders could learn themselves into self-awareness of their problems and actions to undertake to improve their own situations. The change in the situation and practices of stakeholders therefore came from the personal transformation that occurred to them by virtue of being actively engaged in the learning process.
8.3 Transfer of Technology in Agriculture: A Development Model in Crisis

During the research engagement, stakeholders critiqued the TOT model being adopted in agriculture development in Ghana. They reflected on the worldviews, problems and dilemmas they faced in the implementation of the TOT model. Philosophically, the TOT model is consistent with the tenets of positivism. Positivism embraces the use of objective knowledge generated by measuring and explaining the world as distinct measurable ‘bits’ by detached scientists (Guba 1990; Pretty, 1995). In that case, agricultural production is conceptualised as a mechanism; orderly, understandable and knowable and hence predictable, manageable and ultimately perfectible (Sriskandarajah et al, 1991). The view on theory and practice is that researchers should try to provide objective knowledge free from all human distortions that should be applied by farmers to improve this mechanism to solve the problem of low productivity. Agricultural development is therefore conceptualised in a reductionist and deterministic way in which farmers must conform to a set of natural laws as observed and handed down by researchers.

In Ghana, efforts at agricultural development are focused on advising farmers to adopt scientifically proven practices that are believed to provide the answers to problems that farmers face as they go about producing agricultural products. It is acknowledged that some useful technologies were developed and transferred to farmers. The main technologies extended to farmers include high yielding varieties of major staple crops (cassava, grains and legumes), application of fertilisers and other agro-chemicals and post harvest management practices. However, the adoption of most of these technologies were found to be low. This situation is attributed to the fact that in dealing with farmer’s problems, the development agents separate the natural system from the social system, ignore the relationship between the two and insist on the use of technologies generated from observing the natural system (soil, crops, weeds, animals, pests) as the only way to develop food and agricultural production. However, as observed in the study area, farmer’s knowledge about their practices is tied up with their experiences on the field. They learn or generate knowledge through creative adjustment to unpredictable field conditions rather than experimenting with a priori theories and set plans. Farmer’s experimentation and
technology generation can, therefore, be viewed as a process of interactive learning with their environment and iterative learning with changing times and conditions (Millar, 1993).

Farmer’s practices can also be conceptualised as emerging from their ‘reflections in action’ about their practice in relation to the context of application (local conditions of the times). However, in the application of the TOT in the study area, the importance of the complex nexus of social transactions, contextual issues and values as well as the creative problem solving abilities of farmers are sacrificed for ‘scientific and economic values’. Henderson (1991:25) reminds us that:

'It is virtually impossible to imagine any human behaviour that is not heavily mediated by the context in which it occurs'.

Kuhn (1970) has also rejected the notion of neutral observation language and argued that scientific change cannot take place independent of the social context. Similarly, Habermas (1971) has posited that detached objective knowledge may offer explanatory theories but on its own alone cannot guide action.

The discussions held with stakeholders during this inquiry illustrated that transactions involved in agricultural production in the study area are mediated by the context (the relationship between the ecology, social organisation and the political economy of the country). It was therefore understood by research participants that agricultural practices in the study area cannot be understood and properly dealt with if viewed in isolation from the wider context in which the practices are taking place. It was also appreciated that the interpretation and the importance given to these relationships vary with individuals in time and space. This means that there can be no one ‘absolute or static and agreed on reality’ that can sufficiently describe all interpretations given to these relationships. Rather there are numerous different perspectives that are equally valid in terms of those in which they are viewed.
It was also observed that in the implementation of TOT, development agents appear to adopt a posture of forcing all other beliefs and values to become subservient to the 'superior' values created via technologies developed by researchers. However, the notions of (a) the 'infallibility' of scientific knowledge; and (b) 'the absolute confidence in scientific technology to solve all farmers problem' can be misleading. As Coulson (1958:66) has asserted:

'What in an intellect is a proof is not so to another and the certainty proposition does properly consist in the certitude of the mind that contemplates it'.

It was observed during this study that a 'good farming practice' was defined differently by different stakeholders depending on their profession (farmer, agriculturist), resource endowment, needs, preferences and goals. Consequently, by having faith in only scientific knowledge, TOT has created a barrier against the beliefs and values and local knowledge of farmers. This has consequences for agricultural development because as posited by Vickers (1983) and White (1989), reality in any 'human activity system' is subject to, and a product of value judgment. In that sense, scientific facts become meaningless, except in the value framework within which they are interpreted and used. This implies that the realities of farming in the study may not be known apart from the views expressed and meanings attached to it by stakeholders.

It was also observed that TOT does not subscribe to experiential learning by stakeholders. Farmers are not explicitly encouraged to learn from their experiences to improve their practices and situation. Rather, a paternal relationship is established and maintained by development agencies in which farmers must depend on development agencies for production knowledge. It was however realised in the current research (see Chapters 5, 6 and 7) that the 'researcher-recommended' practices are unable to address the diverse and subjective interests of farmers as evident from the various modifications made to them by farmers. However, technocentrism remains the worldview that informs agricultural development in the study area. This appears to be related to the belief that the technologies develop the
experts are sufficient to help farmers solve their production problems (Himmelstrand, 1994; Chambers, 1997). But Coulson (1958:78) has argued that:

'The notion of the complete sufficiency of any item of knowledge is the fundamental error of dogmatism. . . . It is most dangerous to speak of the truth once and for all delivered in whatever kind that truth might be'.

Further, driven by the utilitarian beliefs that individuals' actions are driven primarily by self interest and profits, TOT assumes that farmers take production decisions essentially for economic reasons. On the contrary, 'social investment' within existing social networks were found to be relatively important in the socio-economic and political organisations in the study villages. For example, the use of productive resources is negotiated by reference to one's ancestry and through a series of inter-personal family negotiations. These kinship-based social networks promote patronage and sustainability of relationships in the communities against economic motives (Hyden, 1986; Olomola, 1995). The value of goods and services are therefore not always expressed in monetary terms as farmers make social investment as well as economic investments. This observation is consistent with the view of Forbes (1988) that issues concerning social roles were often of equal or greater importance to farmers than high production. It could therefore be argued that by targeting only the economic dimensions of the farmers life, the TOT model has closed its doors on other important value systems within which food and agricultural production transactions are made in the study area and in the process became caught in the 'crisis of value and meaning'. As a consequence, farmers cannot reconcile their values with the meanings attached to researcher-recommended practices (Berry, 1984).

Another dilemma associated with the implementation of TOT in the study area is the apparent contradiction between government agricultural policy intentions and the effect these policies are having on farmer’s lives. The government’s neo-liberal economic policy has the intention of promoting efficiency, rational self interest and individual development that could improve overall agricultural production (Assuming-Brempong, 1994). The ‘market’ is supposed to distribute agricultural
goods and services in a ‘rational’ manner. However, this contradicts the ‘social management strategies’ being adopted by farmers for resource allocation and distribution of goods and services at the village (micro) level. Further, as discussed in Chapter 6, in the case of the sale of farm produce, the ‘real values’ of these commodities are distorted by the social behaviour associated with the transactions in the market place. In this situation the reaction to ‘market forces’ becomes an ineffective means of explaining the production and consumption behaviour of farmers. The removal of subsidies, and the declining terms of trade associated with the devaluation of the currency, and farmers inability to get equity prices for their produce at the local markets, means that farmers cannot afford to buy inputs to adopt technologies that are being developed and transferred. The mismatch between local level management strategies and macro level expectations and directives, makes the national economic policy unable to support the TOT model.

In summary, it can be posited that scientific knowledge as applied in TOT in the study area has lost its credibility and effectiveness when (a) scientists have assumed that scientific knowledge could be applied without adjusting to the local context; (b) researchers and development agencies fail to recognise that farmers are important custodians of knowledge in farming and the local environment; (c) the model sacrificed the creative ability of farmers and development agents; and (d) the model failed to respond to farmer’s needs and the socio-economic implications of these technologies.

This thesis does not argue against scientific research or propose that farmer’s practices are ‘better’ than the researcher-recommended practices. It is known that the agricultural development agencies have help create the awareness among farmers with respect to increasing farm production through scientific management practices. Humado et al (1990) and Marfo et al (1994) have indicated that small holder farmers have embraced technologies like planting in lines and in some cases the planting of improved varieties of maize, cassava and cowpeas. However, adoption of most of these technologies that involve the application of external inputs (fertilisers and agro-chemicals) are very low. According to Drinan, TOT model is in crisis because of the
mistaken belief by the scientists and extension personnel that techno-science could fix everything.

Scientific experimentation to evaluate new farm practices is very useful but the argument here is about phenomenon of ‘scientific dogma’, in which development agencies are always ‘positive’ or through which they pretend that scientific interpretations provide all the answers to farmer’s questions and problems, is detrimental to farming and its development. This assertion can be justified against the observation that a lot of ‘simple everyday practices’ being adopted by some farmers, could have been made public knowledge for all farmers to adopt if the emphasis had not been on researcher-recommended practices. Consequently, the model that was supposed to make farmers efficient in food and agricultural production has become ineffective in the facilitation of the development process. My position is that an organisational norm should be developed in which the development and use of technology become part of a collaborative learning process in which the experiences of all stakeholders are valued and used in creating critical knowledge to inform agricultural development: the notion of participative learning.

8.4 Participative Learning as a Development Process

It is evident from the preceding sections that the TOT model has failed to provide the answers to farmers problems because it:

- subscribes to the myth of ‘value-free’ science and ignores the beliefs and the values that inform farmer’s decision making process in their day-to-day activities,
- ignores the importance of local knowledge and adaptive problem solving abilities of farmers
- assumes a simplistic and mechanistic view of farmer’s problems
- looks for the ‘absolute truth’ amidst the ‘rubbles of uncertainty’
- sacrifices responsiveness and creativity for scientific accuracy and departmental targets.
This realisation of the ineffectiveness of TOT in the context of this study is central to the call for, and the appreciation of, the need for alternative strategies that could enable stakeholders to express and improve their values and practices with regard to food and agricultural production in the study area. The argument here is that efforts at developing agricultural production should move away from answering the question; ‘How can we get farmers to adopt researcher designed technologies?’ to ‘How can we encourage stakeholders to participate in learning about ways of managing the complex and dynamic problems they face in food and agricultural production’. The criticism is therefore against the goal-seeking linear approach of TOT as an adequate model for developing agricultural production in the study area.

This assertion is made against the background that when applied in the small holder farming system in the Hohoe district, participative learning by stakeholders enabled them to:

- learn and develop a deeper appreciation of the concept and logic of participative learning as an approach to agricultural development
- generate knowledge to improve their understanding of the situation in which they practice farming and agricultural development work
- be empowered, by being active participants, to take actions to improve their own practices
- improve the situation in which farming and agricultural development is done
- identify the need to change the present technological approach to the organisation of agricultural development to the learning approach in which interested stakeholders become partners in learning and development.

8.4.1 Understanding of the Concept and Practice of Participative Learning

Through this study, participants have been able to learn to develop a better understanding of the concept and practice of participative learning. The logic and concept of participative learning were introduced to research participants at the various social interactions (village meetings, workshops and informal discussion sessions) that came to form part of this study. The meaning and relevance of participative learning were made more relevant to participants through the use of
local proverbs, myths and stories. The understanding of the idea, the logic and process by stakeholders was further broadened and reinforced through their active engagement in the practice of participative learning (describing, analysing and critically reflecting on their own experiences to plan future actions).

The relevance of this approach to agriculture development in the study area was also legitimised during the evaluation phase of the study when research-participants endorsed the establishment and maintenance of social networks for ongoing discourse and development. This shift in development framework among participants was seen as emerging from their recognition and appreciation of the benefits of mutual learning as a means of better understanding and informed action. The ease and enthusiasm with which participants grasped the meaning, relevance and application of participative learning at the time of this study, suggested that the approach could easily be adapted and used for agricultural development in Ghana.

8.4.2 Breaking Down Communication Barriers

The main objective of this study was to establish a social discourse within the context of the smallholder farmers. In order to achieve this, it was necessary to establish mutual trust and good working relationship between farmers and development workers. The development and expression of issues that are of relevance to farmers, in the language that they could understand, was seen as being central to this ideal. In TOT, researchers’ expert-language is used to describe and judge farmer’s realities. As Awa (1996) presents it, such language cannot be said to express the values farmers attach to their social reality. For example, as observed in this study, while farmers talked about a variety of sorghum that could give them multiple products (food grains, grains for beer and fuel wood), the development agents were busy developing a variety that could increase income through higher grain yield.

It was noted that getting close to each other and sharing experiences, insights, beliefs, expectations, aspirations, hopes, fears, and stories of successes and failures, were very rewarding in bridging communication barriers among stakeholders. A farmer from Liat Soba, echoed this when he said, 'Mi'ele egbe deka dom azo (See Section 5.7.1).
This means that we are now speaking the ‘same language’ or ‘we are now on the same wavelength’. Being on the *same wavelength* in the research process led to the building of mutual trust and confidence that is necessary for sharing and analysing personal attitudes, ideas and beliefs: the notion of communicative competence (Habermas, 1984).

The validity claim raised in communicative action is about bridging the gap between what Habermas calls the three ‘worlds’ to which speakers relate: the objective world of physical things, the subjective world of inner experience and the social world of roles and norms (Outhwaite, 1994). It follows, after Habermas (1971; 1984), that the rationality of what is said, known or done, by farmers and development workers, as defined by the existence of ‘good reasons or grounds’ must take the relationships between these three ‘worlds’ of stakeholders into consideration before an effective action can take place. This also reflects Bawden’s (1995) position that critical conversation between learning people, as they share their mental images of their everyday worlds of events in a bid to find some mutual understanding for ‘some consensus about actions to be taken’ to improve their own situation, denotes that communicative action. In this respect, the participative learning done in this study can be seen to have helped in bridging the gap between what Argyris and Schon, (1978) called espoused theory and theory in action Kemmis and Carr (1986) and Flood and Jackson (1991) argue that interpretive inquiry alone cannot provide a sufficient framework within which social reality can be understood and improved. They argue for the need for ‘critical reflection’ in the discourse as being necessary for achieving Habermas’ communicative action. This is about having stakeholders emancipated from historically and culturally constraining relationships in order to find ‘good reasons’ for what they can do to improve their own situations (Mingers, 1980). Krippendorf (1993:10) labelled such a process the ‘creation of language of language for development’.

The group discussions, field work and reflective learning carried out during the study, encouraged self expression’ and the creating of a ‘language of meaning’ (Shor and Friere, 1987) and explored the interrelationship between Habermas’ (1971) ‘three
knowledge-constitutive-interests’ by which stakeholders came to understand their own realities. Through the various attempts to understand and make themselves understood, the stakeholders came to discover within their own knowledge, better metaphors to express their realities that are necessary for the creation of personal knowledge to direct meaningful action (Freire, 1974). I see this as a process of creating a ‘development language’ that transcends both the indigenous and scientific languages previously used by farmers and development workers respectively to bring individual experiences and knowledge to what Habermas (1984) has labelled as the practical task of emancipation.

8.4.3 Understanding Our Situation and Practices Better

The approach adopted in this study enabled participants to share their life experiences with each other in a relaxed and collegial fashion. In the process, they came to discover a little bit more about what it means to be farmers and development workers in the Hohoe district of the Volta Region of Ghana. By critically reflecting on the various perspectives of social reality that they hold, participants were challenged and encouraged to re-perceive their former perceptions about their knowledge and practices. This led them to doubt some of the opinions they held about realities and replaced them with more critical knowledge (Freire, 1972). This is consistent with Graman’s (1988) notion of engaging learners in ‘problematising’ reality - that is, learners identify problems and come to recognise and understand the significance of those problems in relation to their own lives and the lives of other stakeholders.

In this study, some of the assumptions questioned or realities problematised included: (a) the paternal relationship between farmers and development agents; (b) the universality of scientific knowledge; (c) the superiority of recommended practices; and (d) the ‘conservatism’ of the farmers. In the process, the development agents came to acknowledge that farmers not only have insights that are worth knowing about, but they also have the right to be heard. That is to say that local people who are supposed to benefit from development efforts have rights to self-determination and self-development (Fisher, 1990; Chambers, 1997). This is similar to Freire’s (1974), view of offering stakeholders the opportunity and support to name their
world, in order to change it. The awareness was therefore for development agencies to encourage farmers to co-participate in the generation of the knowledge to inform their own practices.

The interpretive reasoning, social criticism, and communicative power associated with the process was seen to have enabled most of the participants to transform their views about issues and problems of food and agricultural production in the study area. For example, farmers no longer see lack of money for their farm work as the inability of the government to give them money but rather the inability to manage their resources in relation to their own environment. Similarly, the agriculturists now see the low adoption rate of technology as being related to the way they have alienated farmers from the development process and not due to ‘farmer-conservatism’. The lesson here is that by questioning their own reasoning in light of other dimensions of social reality to which they were exposed, participants were jolted from their false assumptions, social prejudices and self-perpetuating errors of interpretation, to rethink their views on knowledge and actions. This is seen as being consistent with the emancipatory role of action research (Kemmis and McTaggart, 1988; Whyte et al, 1991). Radical constructivism, with its corollary of the invitation to collaborative action research and critical learning systems can therefore be conceptualised as giving or returning the responsibility and freedom to stakeholders to learn and to act- the notion of self-development.

Further, participants became more conscious of the fact that the issues, problems and concerns discussed were related to each other. For example, participants became critically aware that the phenomenon of low agriculture production observed in the study villages was related to the ecology, social networks at the village level and the political economy of the country. This has reflected the systemic nature of human activity systems within which everything is related to everything else and nothing can be said to have an independent existence from the other (Cobb, 1984; Checkland, 1985; Mollah, 1993). It was also acknowledged that the definition of these relationships is not simple, linear nor static as visualised under TOT. The understanding of issues and problems of food and agricultural production in terms of
complex and dynamic relationships, helped participants to create their own mental images of the relationships they might have wanted to establish and maintain to further the course of agricultural production in the study area. For example, the farmers came to recognise the close relationships between marketing of their wares and their income level, while the development agents came to appreciate the importance of maintaining good interpersonal relationships with farmers and their peers as an appropriate way of supporting farmers to adopt contextually relevant practices.

8.4.4 Has the Approach Triggered Change for the Better?

It is my opinion, based on my own observation and interpretations and reinforced by the views of participants that, this study has led to improvement in: (a) interpersonal relationship between stakeholders; (b) the practices of stakeholders; and (c) the general situation in which food and agricultural production is carried out in the study area. It also enabled the stakeholders to obtain an informed critique of their knowledge and practices as a basis of social knowledge on food and agriculture production in the study area.

8.4.4.1 Interpersonal Relationships and Empowerment of Stakeholders

This study was directed at establishing a learning culture in which local communities and development workers are given the voice and responsibility for development efforts that affect their lives. It is my observation that the learning process helped unite participants together in a shared ‘cognition’ of the importance of ascribing to a flexible structure in which every stakeholder becomes a ‘functional partner’ in the development process. Russell (1991) has also undertaken a similar learning research project with pastoralists north of the city of Broken Hill, in New South Wales in Australia. The focus of this project was on establishing a social discourse among pastoralists to empower them, through the learning process, to identify their own enthusiasm for taking action. This is congruent to the ‘partnership model’ of development described by Mattock and Steele (1994:56) in which farmers are given considerable decision making control’. The participative learning approach adopted represents a change in organisational relationship akin to the concept of
learning organisation (Argyris and Schon, 1978; Senge, 1992; Garrat, 1994), in which development agents and farmers come to share the learning about, and taking responsibility for actions they take as a result of the learning process, for the development of agriculture in the study area.

Involving stakeholders in taking responsibility for learning and deciding what could be done in concert with each other constitutes an act of empowerment (Arendt, 1970). Through problem posing and critical examination of assumptions and beliefs surrounding farming and agricultural development work, dilemmas and contradictions were exposed as were new insights and challenges. Lamport (1985) has argued that exposure to the dilemmas and contradictions that arise through social learning processes, involve learners and practitioners in a desire to bring about change, and the will to make it happen. In this case, power to decide ‘what to know’ and ‘what ought to be done’ is not wielded by any one individual but is reproduced in the discursive network created through participative learning.

According to Habermas (1971), knowledge based on action and reflection deals with individual self-knowledge and self-reflection to release the subject from dependence on hypostatised powers. This is associated with (a) the enhanced ability of farmers to influence technical and social processes that are related to food and agricultural production in the study area; and (b) the agriculturists enhanced ability to form a common will through mutual persuasion and deliberation with farmers. The sharing of ‘power to learn and to take personal responsibility’ is vital to improvement in the ability of all stakeholders to act to improve their own situations. This is congruent with Foucault’s (1980) ‘win-win’ concept of empowerment in which empowerment is an interactive process that generates more power, leading to improvement in stakeholders ability to manage and live better.

8.4.4.2 Improvement in Practices of Stakeholders
In Chapters 6 and 7, I gave some insights into participant’s reflections on the impact their involvement in this study had on their practices. The most important impact of this study has been the flow of information that enabled stakeholders to better understand both the object and process of their practices. For example, farmers
shared ideas about how they could improve yields on their fields whilst the agriculturists took decisions on how to make their work more meaningful to their clients. These social developments reflected the changes in the way stakeholders came to think about their own situation and practices. It was observed that the views of farmers who participated in this study with regard to the relationship between (a) ecology and yield; (b) between marketing and income of farmers; and (c) between farmers and development agents changed. This is consistent with Bawden’s (1995) view of cognitive approaches to change as being more effective than the deterministic and product approaches used in the TOT model. This is because as noted by Korten (1981), Ackoff (1974) and Whyte (1991), such knowledge is given legitimacy and contextual relevance by inputs from the stakeholders who are the end users of the knowledge generated.

8.4.4.3 Improvement in the Situation

The study was able to generate contextually valid knowledge as well as increase capacity of stakeholders to pursue actions for which they developed enthusiasm through the learning process. However, the ‘physical’ achievements of this research in terms of improving the capital base, labour and even yield of agricultural commodities can best be described as modest. The change in the situation lay in the individual’s ability to see and do their farming and agricultural development work differently.

Challenged by the learning process to construct, test and restructure knowledge with regard to their vocations, participants were able to form or develop mental frameworks that enabled them to take some new but deliberate actions, to improve their practices to solve their own problems. The improvement in the capacity of stakeholders to take informed decisions and actions appear to be consistent with de Zeeuw’s (1992) concept of improvement in ‘collective competence’ or improved understanding and decision-making through learning. I therefore see the improvement in the situation as a relationship between enhanced knowledge generated, improved understanding gained, improvement in decision-making ability and actions taken by participants (Fig. 6).
Figure 6  Relationship between Knowledge, Understanding, Decision-Making and Action.

Improvements in the situation were also conceptualised in terms of change in how stakeholders came to view and act in terms of their organisational and interpersonal relationships. This as seen in terms of enabling research participants(a) to critique and recognise the potentials and limitations of the TOT model being adopted; (b) to pose new questions to uncover the constraining power relations and norms within the present organisation; and (c) speculated about possible changes to existing norms and procedures that needed to be implemented to support a flexible co-operative learning organisation. It is acknowledged that MOFA and MIST have been trying to involve farmers in the generation of technologies. However, this attempts are limited by the fact that farmers are only required to give information in order to enable the agriculturists select the 'perfect technology' for adoption by all farmers. Biggs (1985) have argued that there are no collegiate relation between farmers and development agents under the FSR&D programs. The technologies generated are therefore not subjected to contextual criticism by the farmers.

The learning approach being argued by this thesis is for farmers, extension workers and researchers to join together to plan, implement and review agricultural activities on a continuous basis in order to support sustainable improvement in food and agricultural production. This call came with the understanding that farming and its
problems are social constructs and as such are open to different interpretations by
different stakeholders (Pretty, 1995). This implies that ‘what the problems are’ and
‘what ought to be done’ and ‘how they could be done’ to improve the situation should
be open to sharing of insights and perspectives by interested stakeholders. This
echoes Thompsons’ (1991) view that since every stakeholder’s myth captures some
essence of experience and wisdom, all stakeholders must have something to offer to
the development process.

It was observed through the learning process that stakeholders were able to make a
shift from seeing development in agricultural production as adopting certain
recommended practices ‘as given’ to creating a situation in which interested
stakeholders can learn from each other, construct their own understanding of their
problems and plan actions for desired improvement. This observation reflects
Maturana’s (1988:29) view that a change in the way people think gives rise to ‘the
possibility of different attitudes and actions’.

8.4.5 Potential for Sustainability

Another reason why I see participative learning as a legitimate and appropriate
approach to agricultural development in the study area is its potential for supporting
development on a sustainable basis. The World Commission on Environment and
Development (1987:43) defined sustainable development as:

‘development that meets the needs of the present generation without
compromising the ability of the future generations to meet their needs.

In the context of this study, this would imply that stakeholders should maintain
agriculture production to support the livelihood of the communities while maintaining
a healthy environment and life support-system for future generations. The United
Nations Commission on Environment and Development (1987) also sees sustainable
development as that which does not destroy or undermine the ecological, economic or
social basis on which continued development depend. It is recognised that in order to
achieve this end new concepts and knowledge must be developed to meet the
changing trends in the environment (ecology, economic, social) within which people live and work (Milbrath, 1989).

Agriculture has been interpreted as a complex and dynamic human activity. This implies that the values and meanings attached to this activity must reflect both this complexity and the changing trends in the environment. In this context, stakeholders cannot afford to cling to ‘certainty’ of ideas as the only way into development. Sustainable development of food and agricultural production in the study area would require that stakeholders become actively engaged in the search for new meanings and metaphors to describe their own situations and activities as a means of managing the inherent uncertainty and complexity.

As farmers and agricultural development workers are prepared to continually observe and listen, question and reflect on their own experiences they become more capable of responding appropriately to meet the challenges of the complex and dynamic situations in which they live and work (Milbrath, 1989). This implies that farmers and agriculturists have to learn their way into developing agricultural practices in order to meet the challenges of the complex and the ever changing phases of agriculture in which they are engaged. Kolb (1984) has asserted that in a rapidly changing world, ‘... the ability to learn seems an important, if not the most important skill’ (Kolb, 1984:31).

This inquiry has demonstrated that by encouraging stakeholders to constantly reflect on their own experiences they could maintain the ‘flux between knowledge and action’ needed for triggering change on a continuous basis. The argument here is that through (a) collaborative problem-posing; (b) theorising about their own activities; and (c) critically reflecting on knowledge and practice, knowledge and actions are continuously constructed in the light of new learning and knowing to direct future actions.

Further, as the stakeholders examine the validity of the myths they hold about their worlds, through the posing of new and challenging questions, they are able to explore
new ideas never thought of before and to develop new 'language of possibilities'. This might suggest, from the perspective of this study, that in order to know how to produce food and other agricultural products without jeopardising future capabilities, stakeholders must 'learn to learn' how to construct their realities on a continuous basis. This is consistent with Freire's (1972) view that knowing is a dynamic act and no knowledge is capable of ever being completed. This notion supports the need for stakeholders to continuously look for new metaphors to interpret their actions as farmers and development workers.

8.5 Challenges to be Faced in Adopting this Approach

Although participative learning has the potential to help improve food and agricultural production in the study area, it also brings in its wake some challenges that need to be confronted to make it operational. During the learning process in the study area, it was observed that stakeholders' personal meanings, self-concepts and values became vulnerable. The act of questioning individual behaviour and understanding became intimidating to some participants who were forced by the circumstances to defend their beliefs about their knowledge and actions. Further, the power relations associated with existing TOT hierarchical structures also came under threat as attempts were made to create a flexible co-operative inquiry system. For example, the development workers, at some points, felt their power and competencies were being called into question, while the position of farmers as 'wards of state' or people who needed to be helped by the government was also called into doubt. The development and maintenance of appropriate personal attitudes and institutional frameworks to support creative learning therefore appear to be the two interrelated challenges faced by practitioners of participative learning in the study area.

8.5.1 Personal Attitudes

One of the main challenges likely to be faced in adopting participative learning is what Busch (1996) has described as the development and maintenance of that disposition for sceptical criticism of all dogma of science and values. Specifically, this has to do with:
• how 'comfortable' the development agents would be with the criticism of their ideas and especially the technologies upon which their very jobs depend
• how proactive farmers would be in shedding their cloaks as 'wards of state' or to give up the 'receivership' status in the development process and accept the mantle of co-researchers and co-developers of their own situation.

At present, the development agents see themselves as experts who must bring development to farmers. A dependency relationship is therefore established and reinforced through the TOT model. The philosophical dichotomies of 'expert-novice' and 'sender-receiver' enshrined in the dominant model is manifested in farmer's dispositions to look to, and rely on, 'external help' to solve their problems. However, this study has demonstrated that without effective farmer-participation, development efforts will suffer from 'contextual irrelevance'. This implies that farmers need to (a) take a more active role in learning about their environment and practices; and (b) take responsibility for the outcomes of the learning process. But as Korten (1981) has pointed out, this would occur only if the development agents learn to share the development process with the farmers. The challenge here is for the stakeholders to embark on a life-long learning and to persevere to learn as partners even when it becomes frustrating. This appears to be important because it is through such discourse that knowledge and actions can be legitimised to be of relevance to the productive interest of farmers.

8.5.2 Institutional Support

The adoption participative learning as a development approach would depend, among other things, on the concurrence and commitment of the government agencies (MOFA and the MIST) who have the political mandate for agricultural development. It is understood that these institutions work within a policy framework of increasing farmer and the national income through increased production that is to be brought about by adoption of 'improved technologies' by farmers. The organizational structure and behaviour of these organisations are therefore geared towards the generation and transfer of knowledge to farmers. Difficulties may arise if individual agents would wish to undertake participative learning within the existing development framework.
Pretty (1995) has observed that government financed development agencies, like MOFA and MIST, which are established on product oriented and positivist frameworks, may find it difficult to support participative learning. In his opinion the associated power structure with its excessive centralisation and inflexible management may not support (a) collaborative learning; (b) personal initiatives; and (c) sharing of the responsibilities of the development process by all stakeholders as required under participative learning.

The present ‘single line of command’ approach in the civil service in Ghana means that agriculturists respond to orders from the ‘top’ and follow departmental routines. However, participative learning requires a responsive, self-defining, self-reflective, self-critical and innovative organisation, whose members are capable taking personal initiatives, embracing error and taking responsibility for their own actions (Senge, 1992; Chambers 1997). Participative learning also requires what Pretty (1995:251) has referred to as ‘creative interaction’ among stakeholders. This implies that the various splinter development agencies involved in agricultural development in Ghana should establish and maintain structural frameworks that can support social discourse within their establishment and with other related institutions. This suggests that the MOFA and MIST should remove the ‘restrictive bureaucracies and centralised hierarchical authority’ that forces staff to ‘look inward and upward to seniors rather than looking outward towards other stakeholders’ (Pretty, 1995:164). The call here is for the creation of a different development culture of inclusiveness of ideas, the creation of an issue-based system for knowledge generation, and collective responsibility for knowledge generation and action across departmental boundaries. I know this would be profoundly difficult in the present power structure where development workers are mandated to develop and transfer technologies.

During this study the issue of power in relation to participative learning was raised by the Regional Agricultural Extension Officer for the Volta Region in the course of this study when he identified the need for a 'new political directive' to give the field officers a new mandate for learning instead of transferring technologies (Section 7.3.3). This implies that although the usefulness of the approach is acknowledged by
the research participants the issue of power in relation to society as recognised by workers like Habermas (1984) need to be addressed to make this approach operational in the context of this study. The point here is that without the reorientation in the present power structure, with regard to roles and responsibilities of agricultural workers, it would be very difficult, if not impossible, to adopt this approach in Ghana. The government is however aware of the usefulness of participatory approaches to development. For example, MOFA has organised a National workshop on participatory approaches to agricultural development in 1996. It is therefore the expectation that the issue of power in relation to participatory approaches in agricultural development would be reflected upon and addressed by the policy makers in order to the necessary political legitimacy to this development approach.

The challenge therefore is for the political will and action to develop a learning organisation in which agricultural research and extension is conceptualised as a learning process, managed by a ‘new agriculturist’ capable of facilitating agricultural development as a learning process.

8.5.3 The Need for a ‘New Agriculturist’

The case argued in this thesis is for the adoption of ‘participative learning’ as an approach to agricultural development in the study area. However, its practitioners require new competencies including: (a) looking at the whole and identifying the relationship between all parts (issues, problems and interventions); and (b) the ability to look for differences and the unexpected instead of honouring familiarity and the status quo. It also requires them to develop the disposition to facilitate the construction of reality in concert with others as a requirement for empowerment (Arendt, 1970; Reason, 1994). The implementation of participative learning therefore depends, among other things, on a ‘new generation of agriculturists’ who must see their contribution to agricultural development as facilitating learning by, and with farmers, rather than as purveyors of expert knowledge to farmers. There must be that disposition and commitment to facilitate and participate in the development of cognitive maps in concert with other stakeholders for the purpose of informing food and agricultural production.
These 'new agriculturists' must see themselves as conveners of group discussions and facilitators of farmer's own analytical and decision-making processes (Korten, 1980; Chambers, 1997). They also need to make conscious efforts to relate to their peers, subordinates and other stakeholders as co-partners in development (Whyte, 1991; Maclure and Bassey, 1991; Turnbull, 1993; Williams, 1995). These 'new agriculturists' could serve to generate or gather information from research stations and other sources. However the technologies or information should not be handed down as the 'absolute truth' but would have to be used to support the farmer's decision making process. Such agriculturists need to have participative worldviews that would enable them to share power with peers and other stakeholders, be open to new ideas and to be ready to learn from and with other stakeholders as equals (Reason, 1994; Chambers, 1997). In other words they must participate in, and facilitate power-engendered communication among stakeholders to define 'what is, what might be or what ought to be done' in the name of agricultural development.

Politically, this suggests that development agencies must provide not only the 'institutional environment' for creative interaction among all stakeholders but also the 'cultural resources' to educate and train agriculturists to enable them to (a) develop a participative worldview; and (b) have the disposition to solicit and use the expressive values of all stakeholders in the improvement of agricultural production. Participative learning, which embraces collaborative learning and action involving agricultural professionals and other stakeholders, requires agricultural practitioners who are critically self reflective of their own knowledge and actions even as they learn with farmers to have a shared understanding of issues, problems and actions being taken. I acknowledge that the agriculturists still need technical skills, but their role as facilitators in the participative learning process would require them to be learners and good communicators more than technical experts. The new agriculturists, therefore, need to be trained in various situations that would challenge them to learn 'how to learn' to manage the complex and systemic nature of farming in Ghana. This calls for a new scholarship of which Bawden (1998:3) refers to as 'scholarship of self-engagement- of critical reflection' on knowledge actions to enable the agriculturists to
become capable of their new role of participative learners and facilitators of the development process. This does not mean the rejection of the present training process but the call is for encouraging students to develop the disposition to critique and contextualise what they learn and know so that in the real world of farming they would have the ability to learn with farmers to seek practices that are contextually relevant. There are indications that this reforms are being attached to agricultural development programs in Ghana. For example, MOFA has been collaborating with the University of Cape Coast and the Winrock International under an SG 2000 educational program to train some staff of MOFA in this direction.
CHAPTER NINE

CONCLUDING REMARKS

9.1 Introduction
In this final Chapter I highlight the thesis developed in this study by summarizing the theoretical frameworks, their application and outcomes. I also discuss the implications and challenges of the outcomes of the study to agricultural development in Ghana.

9.2 Theoretical Frameworks and their Application
The thesis developed through this study is that participative learning based on constructivist and critical systems paradigm is appropriate for improving the knowledge, decision making and actions of farmers and agricultural development workers in the Hohoe District of Ghana. The theoretical and methodological traditions applied in the study include hermeneutics, action research, experiential learning and critical learning systems. These interrelated traditions subscribe to the view that, there can be no ‘objective truth’ about human activity systems, but rather ‘multiple and inter-subjective truths’ held by different stakeholders as they try to attach meaning and values to their relationship with each other and their environments. The argument, therefore, is for the interpretation of relevant experiences by stakeholders to form the basis of knowledge to inform what can be done to improve the social system. This process could also be made more relevant by encouraging stakeholders to critique their own presuppositions and the process of knowledge generation and use in order to (a) correct contextual distortions and errors of judgment, (b) to legitimise knowledge generated; and (c) to empower stakeholders to put knowledge transformed into action.

In the context of this study the multiple perspectives held by the various stakeholders were conceptualised as valid expressions of an ‘indivisible whole of reality’ held by stakeholders about farming and agricultural development work in the Hohoe district.
The implication here is that the 'truth' about agriculture, its generation and application, may not be divorced from the views held by individual stakeholders. Participative learning was therefore used as an overall strategy to engage stakeholders in learning about how to create and improve their own creation of the 'truth about agriculture production and its development' as a way of knowing about and acting to improve agriculture production in the study area.

The participative learning approach was implemented by providing a learning situation in which stakeholders engaged in social discourse and critical reflection about their beliefs, perceptions, intentions and actions as a means of creating knowledge and deciding how to use this knowledge to improve their practices. The focus was not on upholding any doctrine, knowledge or actions but on helping stakeholders to construct personal meanings within the body of experiences and knowledge held by stakeholders with regard to farming and agricultural development work. The learning therefore focused on modifying, transforming and reintegrating of experiences of stakeholders into valid knowledge to inform their own actions.

The tenor of this thesis is that development would come about by engaging different stakeholders in social discourse about their beliefs, perceptions, intentions and expectations of problems and opportunities and interventions. This is based on the premise that human behaviour is predicated on ways of thinking. Consequently an appropriate way to change the behaviour of stakeholders for the better is to encourage them to improve the way they think about their roles, relationships and actions. Viewing 'reality' from a variety of perspectives also helped the stakeholders to perceive their world differently and create new perspectives of activities to be undertaken to improve the situation. The ethical viewpoint taken by this research was therefore to empower stakeholders to learn to act in concert with each other to take control of and responsibility for their own development.

9.3 Participative Learning and Agricultural Development

Issues and problems associated with food and agricultural production in the study area were found to be complex, interrelated and dynamic. Further, the way stakeholders
view or interpret these relationships vary with the different ‘windows’ that individuals have on reality. In this context problems cannot be solved with knowledge generated independent of the views held by stakeholders. The present TOT approach develop and transfer values, designed by researchers, which do not conform to the concepts and values of farmers. TOT ignores the values that farmers attach to, and languages that farmers use to describe their realities. I acknowledge the important role ‘scientifically generated’ technology can play in agricultural development. However, it is my view that technology developed by a researcher is only a form of abstraction from the greater body of knowledge held by stakeholders about agricultural production but not the only arbiter of ‘truth.’ This research has demonstrated that, there are other experiences and knowledge held by other stakeholders that are equally valid and which can make positive contribution to the development of food and agricultural production in the study area. It is therefore an unethical and an ineffective use of resources for development agencies to exclude other sources of knowledge and experiences from the development process for the sake of ‘objective scientific abstractions of reality.’

The observed complexity and dynamism of the act of food and agricultural production and the varied views held by the various stakeholders about the nature and practice of agricultural production therefore justify the use of a methodology that encouraged stakeholders to:

- explore and understand the interrelationship of problems and opportunities associated with food and agricultural production in the area
- use all body of abstractions of realities held by all stakeholders to develop knowledge that is contextually valid
- use knowledge generated to inform action to improve the situation, and to learn from such action to direct future actions.

9.4 Outcomes

This study explored the various perceptions of stakeholders with regard to the complex environment within which agricultural production is done in the Hohoe district of Ghana. One of the outcomes of this exploration was the understanding
gained, by research participants, that there exists a strong relationship between the environmental factors, farm productivity and farm incomes. It was appreciated that changes in the environment have consequences for farmer's practice. For example, changes in the social system, ecology and the economic-policy were found to have effect on how farmers do their farming and what they gain from it. This means that technologies must be designed or applied with regard to the complex and dynamic environment in which farming is done. The TOT model was therefore critiqued for alienating the context of technology application in general, and the farmers for whom the technologies were being generated in particular, from the development process. The redesigning (modification) of researcher-recommended practices by farmers in the study area was seen as an indication of the need for the contextual relevance of technologies.

This study also provided an opportunity for research participants to explore how contextually relevant practices can be designed and used to improve agricultural production. It was observed from the study that effective participation of stakeholders in critical social discourse led to the generation of knowledge that was judged to have served the needs of stakeholders. As stakeholders learn through their problems, they considered not only what they could do to solve these problems, but also how the problems and interventions affect and, are affected by environmental factors. Understanding of the situation through critical reflection on experiences in a group situation was found to have led to the emergence of new ideas and possibilities which (a) were judged by participants as contextually valid; and (b) can be applied by stakeholders to improve their own situations. The validity and legitimisation of agricultural practices is therefore done by stakeholders through their participation in the social discourse.

Another outcome of this study was the appreciation that changes in the attitude and behaviour of stakeholders are closely linked to the understanding they have of their environment and their own practices. In other words there is a relationship between what stakeholders (a) think and know; and (b) what they do and/or can do. The assertion here is that the change in attitude and behaviour comes from changes in the
way stakeholders think of their own situations: the notion of development as a cognitive process. For example; stakeholders participated effectively in the learning process when they understood the underlying assumptions of 'participative learning' in terms of their myths and their day-to-day social processes. Similarly; the establishment of the social discourse is seen as enabling stakeholders to (a) critique their experiences and beliefs, and (b) extend the limits of their thinking to explore and use possibilities that they have not thought of before. This suggests that a change in the practices of stakeholders is indicative of both cognitive and social change. The general conclusion drawn for the study, therefore, is that (a) conscious learning about the process and outcomes of our development efforts; and (b) self-criticism of the development process have the potential of helping stakeholders to better manage the complexity and dynamism of relationships within which food and agricultural transactions are mediated in the study area.

9.4.1 Implications of Outcomes to Agricultural Development in Ghana

The results of this study suggest that issues and problems associated with food and agricultural production, are interrelated and influence each other and cannot be dealt with by the use of researcher-developed technologies only. The study has demonstrated the effectiveness of encouraging stakeholders to seek mutual understanding of issues and problems as well as 'grounds' for actions that need to be taken in the name of development. This supports the thesis proposed in this document, that participative learning is an appropriate way of improving farming and agricultural development work.

The implication here is that all agricultural development efforts need to be conceptualised and implemented as a learning process in which all stakeholders are explicitly encouraged to participate in learning about their own experiences to generate knowledge to inform their actions, while being critical of the process and outcome of their own learning. This is consistent with the understanding that knowledge is not 'the stagnant pool of thought immortalised in the words of any individual or group of people as visualised under TOT, but rather a body of 'inter-subjective realities' held by all stakeholders. Conscious efforts at sharing and
learning from the knowledge and experiences of all stakeholders is, therefore, seen as an appropriate and indeed a legitimate way of taking informed action to improve agriculture production.

The findings also suggest that research and extension organisations should make learning with farmers their goal instead of the generation and transfer of perfect knowledge to farmers. This is seen as necessary because the complexity and dynamism of the environment in which food and agricultural production takes place calls for creative learning by stakeholders to help them learn to change their ideas and practices to meet the challenges of the changing times. Participative learning therefore becomes a development framework and process within which learning, communication and implementation of relevant ideas about food and agriculture can be facilitated.

9.5 Challenges

In this thesis I highlighted the potentials of Participative Learning as interpreted from my study. I am however aware that its implementation by the agricultural agents in Ghana would not be easy because it would entail changes to the organisation and the process of agricultural development. This research does not have the goal of changing the present agricultural development efforts. The present structure, organisation and operation of agricultural development work has the potential for militating against (a) the flexible and creative interaction; and (b) an atmosphere of mutual transaction required for its adoption. Further, farmers also appear to have accepted their position as ‘wards of state’ and tend to look to the government, through the development agencies, for knowledge and inputs for their farming ventures. The challenge to the future of this approach in Ghana is therefore seen as the political will and social commitment to change the institutional framework and social processes from the present ‘giver-receiver’ policy and practices into those which are conducive to the establishment and maintenance of social discourse among stakeholders.
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APPENDIX 2

THE ECONOMIC SETTING OF GHANA

A2.1 Introduction
Ghana lies approximately between latitude 4° 45' and 11° 11' North and longitude 1° 11' and 3° 15' West and covers an area of 238,538 square kilometres (92,000 square miles) which is divided into 10 administrative regions viz. Upper-East, Upper-West, Northern, Brong-Ahafo, Ashanti, Volta, Eastern, Greater-Accra, Central and Western Regions. A large part of the country is drained by the river Volta, which has its sources in the Bobo Dialoso highlands of Burkina Fasso and empties into the gulf of Guinea in Ghana. The river is dammed at Akosombo and Kpong to generate hydropower. This resulted in the creation of the Volta lake that covers an area of about 9100 sq. km.

Ghana has a relatively high temperature throughout the year. The mean monthly temperature stands at about 24.5°C. The country has two main climatic seasons: the rainy and dry seasons with the rainfall generally decreasing from Axim in the South-Western corner (200cm per annum) to Bawku in the North-Eastern corner (100cm per annum). The south eastern part also has low rainfall similar to the experiences in the northern sector of the country. The heavy rains in the south-west supports the production of luxuriant vegetation in the southern forest zone and the lighter rains, as one moves inland, yields less dense vegetation until finally resulting into a much sparser northern Savanna and brush. The latter vegetation also exists in the Accra plains, on account of its comparatively meagre rainfall.

A2.2 The Economy at a Glance
Ghana at the time of independence (1957) was one of the richest countries in sub-Saharan Africa. It had a per capita income of 70 British pounds as compared to Nigeria (29 pounds), Egypt (56 pounds), and Ivory Coast (25 pounds) (Huq 1989). The annual GDP growth of 6 per cent in 1960 declined to 2.8 per cent by 1970,
became stagnant by 1980 and nose-dived to -5.2 per cent by 1983 before been restructure through an economic recovery program (ERP) or an economic structural adjustment program (SAP) supported by the World Bank (Huq, 1989) in 1990 when a growth rate of around 5 per cent was achieved. During the 1970s and early 80s, the currency was significantly overvalued, agricultural producer prices were low and Government controls and participation in the economy, excessive. Agriculture, representing the bulk of GDP, was virtually neglected, resulting in a steady decline in the production of food. Cocoa, the leading export crop, was subject to high net taxation and poor producer incentives, leading to a dramatic and steady decline in both production and export.

Starting in 1983, the government introduced a series of policy reforms under a World-Bank supported Economic Recovery Program (ERP). The key reforms under the ERP included: devaluation of the Cedi (Table 25), liberation of internal and external trade, and reduction of subsidies and price controls. In Agriculture, the farm gate prices of cocoa, coffee and shear nuts were increased, marketing of inputs, notably fertiliser and agro-chemical were also privatised.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cedis to 1US$</td>
<td>20.33</td>
<td>36.00</td>
<td>54.4</td>
<td>89.2</td>
<td>190.0</td>
<td>315.0</td>
<td>345</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cedis to 1US$</td>
<td>370.0</td>
<td>398.0</td>
<td>610.0</td>
<td>750</td>
<td>900.0</td>
<td>1100</td>
</tr>
</tbody>
</table>

Source: Ministry of Trade, Accra.

A2.3 Agriculture Production

Agriculture is by far the largest sector of the Ghanaian economy, contributing about 55 per cent of her GDP and providing livelihoods for over 70 per cent of the population. Agriculture is an important source of public revenue and has an
important impact on both public and private savings. Food prices account for a significant component of household expenditure. Hence, agriculture also has substantial influence on real wages and is a key determinant of overall macro-economic performance.

Most of the farmers have small holdings and produce crops using traditional methods or low resource technology. It is estimated that about 31 per cent of the farm holdings are less than one hectare, 55 per cent are less than 1.6 hectares and 82 per cent are less than 4.0 hectares per farmer (MOFA, 1992). This signifies the importance of smallholders for family, regional and national food security and for achieving sustained growth in agricultural production.

Common factors in Ghanaian agriculture are the use of bush fallow to restore soil fertility, mixed cropping to minimise risks and, in the north of the country, the widespread integration of livestock into farming systems. There is little use of purchased inputs and land preparation is manual in most areas, though ox-traction is important in the North. Mechanisation is used only by a few large enterprises, and irrigated agriculture is poorly developed. While tree crops like cocoa and oil palms are grown as sole crops, food crops are mainly inter-crop mixtures of maize, plantain, cocoyams, cassava and legumes.

Rainfall is the main determinant of what crop is cultivated in various parts of the country. The southern wetlands (rain forest, deciduous forest and forest/grassland transition) supports tree crops, major grains, starchy staples and many vegetables, whilst the drier Savanna areas (coastal and northern zones) support the growth of cereals (maize, millet, sorghum, rice), root crops (yam and cassava), legumes (cowpeas and peanuts), tobacco and cotton. The varied ecological zones of Ghana support a variety of animals, cattle, sheep, goats, pigs and poultry. The country produces about one-third of its meat requirements with the remaining being imported. Fishing is done in the sea, the lagoons, the Volta lake and other fresh water bodies.
Most agricultural marketing in Ghana is conducted by small-scale operators. The principal agents are women who bring the farm output and food products to rural markets. Rural food markets however, lack basic infrastructure such as paved floors, cover protection, water supply, refuse collection, storage, etc. Poor market conditions increase produce spoilage, transport and marketing costs, and they adversely affect prices. Poor market access roads and marketing information diminish market integration and increase marketing costs. Further, lack of suitable storage for the various tiers of the marketing chain (on-farm, local and regional wholesale markets) is a crucial impediment to efficient marketing. It (a) creates strong seasonal price fluctuations; (b) discourages commercial production; (c) increases post-harvest losses and wastage; (d) and generates multiple small transactions inflating handling, transport and marketing costs.

Women are responsible for most food processing, using simple methods to make locally-consumed products. Small-scale food processing includes that of palm kernel seeds and shea nuts into oil and butter; cassava into gari, starch, dough, pellets; maize into maize meal and fermented dough; and fish into smoked and dried products. The traditional processing sector is severely undercapitalised, resulting in low labour productivity and poor product quality.

A2.4 ERP and the Performance of the Agricultural Sector

Agriculture was severely hampered by the adverse economic conditions of the 1970s and the early 1980s. The per capita food production index declined from an estimated 100 in 1974 to about 62 in 1983. The government’s long term objectives for the agricultural sector of food security, higher employment and incomes in rural areas, balanced regional growth and a greater contribution of the agricultural sector to GDP, foreign exchange earnings and government revenue was therefore not being achieved under such situations. To achieve these objectives, the government embarked upon a medium-term Agricultural Development Programme (MTADP) under the ERP. This includes deregulating the financial market, liberalising agricultural trade and removing subsidies on agricultural inputs as a means of
improving the incentive framework for farmers and encouraging private sector participation in agricultural development (PPMED\textsuperscript{32}, MOFA 1992:1).

Further, two agricultural development projects, the National Agricultural Extension (NAEP) and National Agricultural Research Projects (NARP) are being implemented as part of the MTADP as a means of (a) strengthening the management of agricultural services, particularly extension and research and (b) to establish a framework for more rational allocation of public resources to agricultural development.

Table 26  The Sectoral Growth Rate (%) of the Ghanaian Economy (1984-1994)

<table>
<thead>
<tr>
<th>Year</th>
<th>Agriculture</th>
<th>Services</th>
<th>Industry</th>
<th>Overall growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>9.7</td>
<td>6.6</td>
<td>9.1</td>
<td>8.6</td>
</tr>
<tr>
<td>1985</td>
<td>0.6</td>
<td>7.5</td>
<td>17.6</td>
<td>5.1</td>
</tr>
<tr>
<td>1986</td>
<td>3.3</td>
<td>6.5</td>
<td>7.6</td>
<td>5.2</td>
</tr>
<tr>
<td>1987</td>
<td>0.0</td>
<td>9.4</td>
<td>11.5</td>
<td>4.8</td>
</tr>
<tr>
<td>1988</td>
<td>3.6</td>
<td>7.8</td>
<td>7.3</td>
<td>5.6</td>
</tr>
<tr>
<td>1989</td>
<td>4.2</td>
<td>5.8</td>
<td>4.1</td>
<td>5.1</td>
</tr>
<tr>
<td>1990</td>
<td>-2.0</td>
<td>8.8</td>
<td>5.4</td>
<td>3.3</td>
</tr>
<tr>
<td>1991</td>
<td>4.7</td>
<td>6.3</td>
<td>3.7</td>
<td>5.3</td>
</tr>
<tr>
<td>1992</td>
<td>-0.6</td>
<td>7.7</td>
<td>5.8</td>
<td>3.9</td>
</tr>
<tr>
<td>1993</td>
<td>2.5</td>
<td>7.2</td>
<td>4.3</td>
<td>5.0</td>
</tr>
<tr>
<td>1994</td>
<td>1.0</td>
<td>6.6</td>
<td>2.8</td>
<td>3.8</td>
</tr>
</tbody>
</table>

Source: ISSER, University of Ghana, Legon (1995)

This strategy is predicated on the assumption that Ghanaian farmers will respond to suitable incentives to increase production of both cash and food crops. The emphasis of these projects are on the development and transfer of appropriate technologies to the farmers while encouraging farmers to take advantage of market forces for the distribution of agricultural goods and services.

Following the introduction of the ERP (1983-1988), there was some improvement in agricultural performance. Agricultural output as measured by sectoral GDP grew in real terms for five successive years from 1983, and in 1988 achieved its highest level since 1974. However, as shown in Table 26, the growth in agricultural production has also lagged significantly behind that of the economy as a whole and the share of agriculture in total GDP has fallen from 55 per cent in 1982 to 47 per cent in 1989. Further, the percentage contribution of agriculture to the GDP further fell from 43.5 per cent by 1990 and to about 39.1 by 1994 (Table 27).

Table 27  Percentage Contribution to Ghanaian GDP by Sector (1990-1994)

<table>
<thead>
<tr>
<th>Year</th>
<th>Agriculture</th>
<th>Services</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>43.5</td>
<td>42.4</td>
<td>14.1</td>
</tr>
<tr>
<td>1991</td>
<td>43.3</td>
<td>42.8</td>
<td>13.9</td>
</tr>
<tr>
<td>1992</td>
<td>41.4</td>
<td>44.4</td>
<td>14.2</td>
</tr>
<tr>
<td>1993</td>
<td>40.2</td>
<td>45.2</td>
<td>14.6</td>
</tr>
<tr>
<td>1994</td>
<td>39.1</td>
<td>45.9</td>
<td>15.6</td>
</tr>
</tbody>
</table>

Source: ISSER (1995)

The production level in the post ERP period between 1990-1994 (Table 28), shows that the agrarian crisis in which Ghana found itself has not abated as envisaged by the proponents of the Structural Adjustment Program (SAP). On the contrary agricultural production is very unstable as shown on Tables 27 and 29. For example it was noted by ISSER (1995) that between 1993-1994 there was about 8 per cent decline in the production of starchy staples whilst the grain recorded a 3 per cent decline. This instability and reductions in the major food crops led to the negative growth experienced in 1990 and 1992 and the infinitesimal growth of 2.5 per cent and 1 per cent in 1993 and 1994 respectively (Table 26). Shortfall in agricultural production had to be balanced by importation of food. Table 29 shows the value of grains imported into the country through the major ports of Tema and Takoradi between 1992 to 1994.
Table 28 Estimated National Output (Metric Tonnes) of Major Food Crops in Ghana for the Period 1990 to 1994

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Starchy Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cassava</td>
<td>2,717</td>
<td>5,701</td>
<td>5,662</td>
<td>5,973</td>
<td>6,025</td>
</tr>
<tr>
<td>Yam</td>
<td>877</td>
<td>2,632</td>
<td>2,331</td>
<td>2,720</td>
<td>1,700</td>
</tr>
<tr>
<td>Cocoyam</td>
<td>815</td>
<td>1,297</td>
<td>1,202</td>
<td>1,236</td>
<td>1,248</td>
</tr>
<tr>
<td>Plantain</td>
<td>799</td>
<td>1,178</td>
<td>1,080</td>
<td>1,322</td>
<td>1,475</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>5,208</td>
<td>10,808</td>
<td>10,275</td>
<td>11,251</td>
<td>10,348</td>
</tr>
<tr>
<td>Cereals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maize</td>
<td>553</td>
<td>932</td>
<td>731</td>
<td>961</td>
<td>940</td>
</tr>
<tr>
<td>Sorghum</td>
<td>136</td>
<td>259</td>
<td>281</td>
<td>328</td>
<td>324</td>
</tr>
<tr>
<td>Millet</td>
<td>75</td>
<td>113</td>
<td>138</td>
<td>198</td>
<td>168</td>
</tr>
<tr>
<td>Rice</td>
<td>49</td>
<td>123</td>
<td>132</td>
<td>157</td>
<td>162</td>
</tr>
<tr>
<td>Sub Total</td>
<td>813</td>
<td>1,427</td>
<td>1,282</td>
<td>1,644</td>
<td>1,594</td>
</tr>
</tbody>
</table>


Table 29 Grain Imports into Ghana- 1992 to 1994 (Million US$)

<table>
<thead>
<tr>
<th>Year</th>
<th>Maize</th>
<th>Rice</th>
<th>Wheat</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>3.11</td>
<td>57.56</td>
<td>17.54</td>
<td>78.21</td>
</tr>
<tr>
<td>1993</td>
<td>0.58</td>
<td>33.00</td>
<td>27.03</td>
<td>60.61</td>
</tr>
<tr>
<td>1994</td>
<td>0.32</td>
<td>56.71</td>
<td>34.60</td>
<td>91.63</td>
</tr>
<tr>
<td>Total</td>
<td>4.01</td>
<td>147.27</td>
<td>79.17</td>
<td>230.45</td>
</tr>
</tbody>
</table>


A2.5 Effect of ERP on Agricultural Research and Extension

The direct effect of the devaluation of the Cedi and removal of subsidies was an increase in the nominal prices of imported agricultural inputs (Table 30). On the other hand there has been an infinitesimal change in the price of agricultural produce like maize that farmers sell on the local market. (See Tables 30, 31 and 33)
Table 30  Price of Fertilisers (Cedis per 50 Kg.) and Subsidies (1979-1994)

<table>
<thead>
<tr>
<th>Year</th>
<th>NPK (20-0-20)</th>
<th>Sulphate of Ammonia</th>
<th>Subsidy (per cent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979</td>
<td>10</td>
<td>8</td>
<td>80</td>
</tr>
<tr>
<td>1980</td>
<td>15</td>
<td>12</td>
<td>65</td>
</tr>
<tr>
<td>1981</td>
<td>30</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>1982</td>
<td>30</td>
<td>25</td>
<td>40</td>
</tr>
<tr>
<td>1983</td>
<td>58</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>1984</td>
<td>440</td>
<td>295</td>
<td>45</td>
</tr>
<tr>
<td>1985</td>
<td>440</td>
<td>295</td>
<td>45</td>
</tr>
<tr>
<td>1986</td>
<td>780</td>
<td>490</td>
<td>56</td>
</tr>
<tr>
<td>1987</td>
<td>1380</td>
<td>1270</td>
<td>36</td>
</tr>
<tr>
<td>1988</td>
<td>2300</td>
<td>1600</td>
<td>42</td>
</tr>
<tr>
<td>1989</td>
<td>3350</td>
<td>2100</td>
<td>30</td>
</tr>
<tr>
<td>1990</td>
<td>4200</td>
<td>3500</td>
<td>0</td>
</tr>
<tr>
<td>1991</td>
<td>5000</td>
<td>3500</td>
<td>0</td>
</tr>
<tr>
<td>1992</td>
<td>6250</td>
<td>6400</td>
<td>0</td>
</tr>
<tr>
<td>1993</td>
<td>11800</td>
<td>6,400</td>
<td>0</td>
</tr>
<tr>
<td>1994</td>
<td>22,000</td>
<td>18,800</td>
<td>0</td>
</tr>
</tbody>
</table>


A situation was seen to have arisen where the real value of farm produce is declining while the price of imported farm inputs are on the increase. While there have been cases of improvement in terms of trade for cocoa and coffee farmers (Assenso-Okyere, 1994; Assuming-Brempong, 1994), the change in agricultural terms of trade for majority of farmers who depend on food crops appears to be on the decline under the ERP regime. This situation does not only lead to the erosion of benefits from adopting input intensive technologies as shown by declining benefits from applying these inputs (Table 33), but it also has the possibility of lowering the income and standard of living of farmers majority of whom are dependent on food crops as the only source of household food and income (Stewart, 1995).
Table 31  Monthly Maize Price (000 Cedis/ Bag\textsuperscript{33}) for Hohoe (1985-1994)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>1.20</td>
<td>3.71</td>
<td>3.34</td>
<td>4.94</td>
<td>5.00</td>
<td>5.54</td>
<td>6.70</td>
<td>5.72</td>
<td>7.20</td>
<td>7.75</td>
</tr>
<tr>
<td>Feb.</td>
<td>1.40</td>
<td>3.76</td>
<td>3.99</td>
<td>5.90</td>
<td>4.95</td>
<td>5.90</td>
<td>7.75</td>
<td>8.30</td>
<td>5.00</td>
<td>7.50</td>
</tr>
<tr>
<td>Mar.</td>
<td>1.13</td>
<td>3.88</td>
<td>5.16</td>
<td>7.31</td>
<td>4.97</td>
<td>7.42</td>
<td>10.0</td>
<td>10.4</td>
<td>8.00</td>
<td>9.10</td>
</tr>
<tr>
<td>April</td>
<td>2.22</td>
<td>4.86</td>
<td>6.30</td>
<td>9.03</td>
<td>4.99</td>
<td>8.00</td>
<td>10.1</td>
<td>10.0</td>
<td>10.6</td>
<td>11.1</td>
</tr>
<tr>
<td>May</td>
<td>2.20</td>
<td>5.59</td>
<td>6.72</td>
<td>9.03</td>
<td>4.50</td>
<td>9.70</td>
<td>10.2</td>
<td>11.7</td>
<td>12.5</td>
<td>14.9</td>
</tr>
<tr>
<td>June</td>
<td>2.25</td>
<td>5.67</td>
<td>8.40</td>
<td>10.4</td>
<td>4.99</td>
<td>11.4</td>
<td>9.22</td>
<td>12.0</td>
<td>12.5</td>
<td>16.0</td>
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<tr>
<td>July</td>
<td>22.1</td>
<td>42.2</td>
<td>8.08</td>
<td>6.80</td>
<td>4.87</td>
<td>15.6</td>
<td>9.18</td>
<td>10.4</td>
<td>11.6</td>
<td>16.7</td>
</tr>
<tr>
<td>Aug.</td>
<td>1.85</td>
<td>3.65</td>
<td>4.42</td>
<td>5.70</td>
<td>4.62</td>
<td>7.10</td>
<td>7.88</td>
<td>8.25</td>
<td>9.53</td>
<td>13.4</td>
</tr>
<tr>
<td>Sept.</td>
<td>1.74</td>
<td>1.84</td>
<td>3.85</td>
<td>3.50</td>
<td>3.20</td>
<td>4.88</td>
<td>4.00</td>
<td>6.00</td>
<td>6.49</td>
<td>10.3</td>
</tr>
<tr>
<td>Oct.</td>
<td>1.90</td>
<td>2.41</td>
<td>4.94</td>
<td>3.77</td>
<td>4.20</td>
<td>5.67</td>
<td>4.99</td>
<td>6.09</td>
<td>6.70</td>
<td>11.8</td>
</tr>
<tr>
<td>Nov.</td>
<td>3.30</td>
<td>2.48</td>
<td>5.38</td>
<td>3.76</td>
<td>5.4</td>
<td>8.00</td>
<td>6.19</td>
<td>7.79</td>
<td>8.00</td>
<td>15.6</td>
</tr>
<tr>
<td>Dec.</td>
<td>3.30</td>
<td>2.41</td>
<td>4.75</td>
<td>5.16</td>
<td>5.40</td>
<td>8.00</td>
<td>6.03</td>
<td>8.58</td>
<td>8.90</td>
<td>1500</td>
</tr>
</tbody>
</table>

Source: PPMED, MOFA, Ho.

Table 32  The Trend in Prices\textsuperscript{34} of Fertilisers and Maize( USS) for 1990 to 1994

<table>
<thead>
<tr>
<th>Year</th>
<th>Price of NPK</th>
<th>Price of Maize</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hohoe Market</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lowest</td>
<td>Highest</td>
</tr>
<tr>
<td>1990</td>
<td>11.35</td>
<td>13.20</td>
</tr>
<tr>
<td>1991</td>
<td>12.50</td>
<td>10.05</td>
</tr>
<tr>
<td>1992</td>
<td>12.30</td>
<td>9.80</td>
</tr>
<tr>
<td>1993</td>
<td>15.70</td>
<td>8.65</td>
</tr>
<tr>
<td>1994</td>
<td>24.40</td>
<td>11.50</td>
</tr>
</tbody>
</table>

Source: Computed from data obtained from MOFA (1995).

\textsuperscript{33} This is taken as 100kg by agriculturists, but in the market, this can be anything between 18 and 20 ‘olonkas’ depending on the method of measurement.

\textsuperscript{34} The nominal value divided by the US $: Cedi exchange rates shown in Table 25.
Table 33  Cost/Benefit Analysis for Adopting Maize Technology (1990 & 1994)

<table>
<thead>
<tr>
<th></th>
<th>1990</th>
<th>1994</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Yield</td>
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<tr>
<td>Estimated Grain Yield</td>
<td>648</td>
<td>1,093</td>
</tr>
<tr>
<td><strong>Incremental Variable Cost (C)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertilizer</td>
<td>8,470</td>
<td>29,805</td>
</tr>
<tr>
<td>Seed Maize</td>
<td>1,500</td>
<td>9,000</td>
</tr>
<tr>
<td>Additional Labor</td>
<td>1,000</td>
<td>6,000</td>
</tr>
<tr>
<td>-Fertilizer Application</td>
<td>500</td>
<td>3,000</td>
</tr>
<tr>
<td>(2 Mandays)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Harvesting (Extra 1 Manday)</td>
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<td></td>
</tr>
<tr>
<td>Total Incremental cost</td>
<td>-</td>
<td>11,470</td>
</tr>
<tr>
<td></td>
<td></td>
<td>47805</td>
</tr>
<tr>
<td>Gross Value of Produce @ 50,000 Cedis per ton</td>
<td>32,400</td>
<td>54,650 @11874=</td>
</tr>
<tr>
<td></td>
<td></td>
<td>76,943.35</td>
</tr>
<tr>
<td></td>
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<td>129,782.8</td>
</tr>
<tr>
<td>Marginal Return</td>
<td>43,180</td>
<td>36,455</td>
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<tr>
<td>Marginal Return to additional Investment</td>
<td>376</td>
<td>-76</td>
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</tbody>
</table>
APPENDIX 3

AGRICULTURAL RESEARCH AND EXTENSION IN GHANA\textsuperscript{35}

A3.1 Agricultural Extension

The extension activities were initiated in Ghana by church missionaries and foreign owned companies involved in the production of export crops such as coffee and cocoa. After independence, Ghana tried various approaches to extension under the cooperative movement and several donor assisted projects. The United Ghana Farmers' Cooperative Council (UGFCC) provided extension services in the 1960 which was supplemented at the time by the government initiated USAID assisted 'Focus and Concentrate ' project. In both approaches, extension agents gave advice and supplied inputs. Between 1970s and late 1980s, the various departments of the Ministry of Agriculture were involved in their own extension work.

Recent donor assisted agricultural development projects which had substantial agricultural extension components include among others;

- GTZ assisted Ghanaian-German Agricultural Development Project (ongoing since 1970)
- IFAD assisted Small Holder Rehabilitation and Development Program (ongoing since 1988).

In most of these projects, the emphasis was on reaching farmers with relevant technical messages. For example under URADEP and VORADEP, the main component was on strengthening the extension service through the introduction of the Training and Visit (T&V) system of Extension. Lessons learnt from these extension interventions suggested that farmers became more aware of the benefits of the technologies being transferred to them. However, they were unable to adopt the same as they did not have the needed resources to purchase inputs.

A3.1.1 Present Agricultural Extension Strategy

In 1987, MOFA established the Department of Agricultural Extension Service (DAES) to bring all splinter public service extension services (except for cocoa) under one umbrella. MOFA’s extension strategy became a unified system (using T&V as an approach), whereby all extension messages are channelled through a single agent or the front line staff (FLS) under the administration of DAES. Headed by a Director who is assisted by two Deputy Directors (Training and Field Services) DAES is tasked to transfer technologies from relevant aspects of agriculture to farmers and to advice agricultural research and other agricultural services institutions about farmer needs and constraints. They also collaborate with the subject matter departments of MOFA for adaptive trials and training of staff.

This extension initiative is currently being supported by a World Bank supported program; the National Agricultural Extension Project (NAEP) which was initiated in 1992 under the government’s Medium Term Agricultural Development Project. It was envisaged that the project would help a) improve the efficiency in the management and delivery of extension services, (b) improve the relevance of technologies available to farmers and (c) to strengthen the technical departments of MOFA.

Presently FLS are trained once a month by SMSs drawn from the subject matter or technical departments of MOFA. They are to visit groups of contact farmers on a

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36 The Cocoa Marketing Board (COCOBOD) provides a range of services to cocoa farmers. These include the provision of planting materials, pest control and marketing. Generally, the Cocoa Services Department of COCOBOD provides extension services to cocoa farmers.
fortnightly basis. Each contact farmer group has a minimum 10 farmers and each FLS interacts with about 16-24 of such groups in a particular farming season. Messages are transferred to farmers by way of teaching and on-farm demonstrations or extension test plots (ETPs) which are meant to persuade farmers to adopt recommended practices on portions of their farms, so that they serve as demonstrations to other farmers while at the same time providing opportunity for further verification for the recommendation. The main constraint of this strategy is the low adoption rate of technologies by farmers (Marfo, et al 1994).

A3.2 Agricultural Research and Technology Development

A3.2.1 Agricultural Research Set-up

Most of the research done in Ghana is carried out by CSIR of the Ministry of Science and Technology (MIST) which was formed in 1968 to promote and co-ordinate research efforts of the different ministries and departments. Agricultural research is carried out by seven semi-autonomous institutes with specialisation in crops, soils, animals, oil palm, aquatic biology, and food. Cocoa\textsuperscript{37} research is however carried out by the Cocoa Research Institute under the management of the Ghana COCOBOD. The Technical Departments of the MOFA, crops, livestock and fisheries also undertake some adaptive trials with or without the collaboration of the research institutes of CSIR.

A3.2.2 Current Research Status

A3.2.2.1 Crops

Most of the efforts at agricultural research are directed at crop development. Among the food crops, the current concentration of research is on maize, sorghum, cowpea and soybean. The non-cereal staples of such as cassava, yam, cocoyam, yam and plantain received minor attention. Research carried out include refining existing

\textsuperscript{37} Because of the importance of cocoa to the economy of Ghana, issues involved in Cocoa production and its development is carried out, ministerially, by a department of cocoa affairs that is attached to the office of the President of Ghana.
technologies, generate new technologies, adapt new technologies developed from international research centres to Ghanaian conditions.

The main technologies generated and transferred through the technology delivery system (research and extension) mainly include improved crop varieties and recommended agronomic practices for cereals, legumes, cassava, oil palm and plantains.

A3.2.2.2 Soils
The research on soils carried out by the Soil Research Institute include soil mapping and classification and restoration of soil fertility. It is however recognised that past research in soil and water conservation in agriculture has been inadequate (World Bank, 1992). This is being addressed under the National Agriculture Research Project.

A3.2.2.3 Livestock and Fisheries
The livestock research being carried out by the Animal Research Institute (ARI) and Animal Production (APD) and Veterinary Services Departments (VSD) of MOFA emphasise disease control and pasture development. The ARI, APD and VSD are now collaborating, under a World Bank Livestock development project, to develop improve breeds of animals for distribution to farmers. Attempts are also being made to evaluate a number of fodder crops and leguminous species to improve the nutritional level of natural rangelands.

Fisheries research being carried out by Institute of Aquatic Biology and the fisheries Department of MOFA, on oceanography, movement of fish species over the year, studies of the fishing practices of fishermen in the Volta lake, development of fast growing fish species and the development of fingerlings for fish farmers.
A3.2.2.4 Market Research
Research into the agricultural marketing system including price of farm inputs and produce, availability of food and farm inputs on the market and farm surveys are carried out by the Policy Planning Monitoring and Evaluation Department of MOFA.

A3.2.3 The National Research Project
A National Agricultural Research Project (NARP) is being implemented as part of the MTADP, with objective of strengthening the national research capabilities, and to improve research-extension-farmer linkage. NARP involve primary and adaptive research activities by the CSIR agricultural research institutes and six Regional Research Stations (RRS) which are managed by the Crop Services Department (CSD) of MOFA. These centres are to be involved in adaptive trial of findings from the research institutes and to undertake researcher-managed trails on farmers fields.

A3.2.4 Research-Extension-Farmer Linkages
The main operative steps of this linkage is

- technical review meetings which is attended by research, technical or SMS departments of MOFA and DAES. At these meetings SMS are introduced to new technologies from research, specific technologies are evaluated based on field experiences, farmers problems are discussed and solutions sought for them.

- various stages of technology development and delivery in which researchers, SMSs, extension staff and farmers take part. This include adaptive trials on the regional research stations, on farm trials carried out by SMSs and extension staff in collaboration with farmers and small plots demonstrations carried out on specific technologies by farmers and FLS.

Coordination of research and extension activities at the regional level by the Research-Extension Liaison Committee (RELC). The committee which is made up of researchers, Managers of regional research centres, SMSs, Regional Training Officer of DAES, Regional Agricultural extension officer and representatives of GNAFF functions to review and assess the performances of the various organisations involved in technology development and delivery in the region.
APPENDIX 4

RAINFALL IN HOHOE DISTRICT

The established rainfall in Hohoe district is bi-modal. As shown in Table 34, the rain is heaviest between May and July every year. December to March are normally the dry months of the year.

Table 34  The 5-Yearly Average Rainfall Figures (mm) for Hohoe (1976-1994)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>4.5</td>
<td>1.2</td>
<td>19.7</td>
<td>1.2</td>
</tr>
<tr>
<td>February</td>
<td>27.2</td>
<td>25.5</td>
<td>76.6</td>
<td>27.4</td>
</tr>
<tr>
<td>March</td>
<td>126.7</td>
<td>121</td>
<td>78.7</td>
<td>95.9</td>
</tr>
<tr>
<td>April</td>
<td>139.2</td>
<td>135.5</td>
<td>84.52</td>
<td>138.7</td>
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<tr>
<td>May</td>
<td>198.0</td>
<td>170.5</td>
<td>147.9</td>
<td>154.5</td>
</tr>
<tr>
<td>June</td>
<td>233.1</td>
<td>180.4</td>
<td>137.34</td>
<td>102.6</td>
</tr>
<tr>
<td>July</td>
<td>196.6</td>
<td>127.2</td>
<td>200.9</td>
<td>208.4</td>
</tr>
<tr>
<td>August</td>
<td>72.9</td>
<td>139.6</td>
<td>184.96</td>
<td>151.3</td>
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<tr>
<td>September</td>
<td>123.9</td>
<td>215</td>
<td>245.8</td>
<td>167.5</td>
</tr>
<tr>
<td>October</td>
<td>244.7</td>
<td>119.4</td>
<td>208.0</td>
<td>232.7</td>
</tr>
<tr>
<td>November</td>
<td>95.2</td>
<td>81</td>
<td>59.7</td>
<td>76.1</td>
</tr>
<tr>
<td>December</td>
<td>45.5</td>
<td>19.6</td>
<td>33.5</td>
<td>26.1</td>
</tr>
</tbody>
</table>

Source: Meteorological Department, Ho.
APPENDIX 5

SAMPLE OF INTERVIEW GUIDES\textsuperscript{38} USED DURING THE EXPLORATORY STUDY

1. Name and Gender of respondent.
2. Age and educational attainment of respondent.
3. ‘Citizenship status’ of respondent and effect of this status on her or his farming activities and general livelihood in the village.
4. Relationships with other members of the community and the role these relationships play in the lives of farmers.
5. Relationships among household members and the significance of these relationships in terms of household and farm management practices.
6. Occupations (main and secondary) of household members. Note importance of these occupations in terms of food provision and income generation.
7. Major sources of food and income for the household. Note times of food surplus and food scarcity. Discuss food storage and how farmers deal with food shortages.
8. Land resource endowment, availability and use.
9. Various tenancy arrangement under which farmers hold and use land. Note farmers perceptions about the suitability these land tenancy arrangements.
10. Approximate area of land cultivated by individuals and households. Note factors that affect farmers decision with regard to size of farm.
11. Types of crops planted by acreage. Note crop management practices and the importance of these crops to farmers.
12. Yields of crops by farmers. Note whether yields meet farmers’ expectations and where total production is sufficient to meet farmers’ basic needs.
13. Discuss farming calendars and note why farmers follow such routines.

\textsuperscript{38}One interview guide was used for each respondent or each responding household. However, these questions were not asked in a sequence and the farmers were not obliged to answer all the questions. The trend of questioning was therefore dependent on the emerging stories being narrated by each respondent.
14 Methods by which farmers evaluate soil fertility on their fields.
15 Methods adopted to maintain or improve soil fertility on farms. Comments on why those methods are adopted and effectiveness of methods being adopted.
16 Sources and availability of labour farming in the communities.
17 Comment on the sources of agricultural finance with regard to availability, sufficiency and reliability.
18 Comments on the trend and suitability of the weather for farming.
19 Types and numbers of farm animals kept by household. Husbandary practices adopted and the importance of the animals to the household.
20 Sources of agricultural technology. Comments on why those sources are important or not important.
21 Find out about the working relationship between agricultural extension workers and the farmers.
22 Adoption of technologies. Note why some technologies are being or are not being adopted.
23 Problems being faced by farmers. In what ways are these problems affecting farmers? How has farmers being coping with these problems?
24 What can be done to solve these problems (compare the views of farmers and development workers).
25 Note any other issues that are of concern or important to the respondent
26 Thank respondents for their time and knowledge.
APPENDIX 6

THE VILLAGE LEVEL ‘LEARNING TEAMS’

Tables 35 & 36 shows the learning teams from Liati Soba and Fodome. The DEO, DDEO and District Crops Officer also attended some of the learning sessions.

Table 35  Members of the ‘Learning Team’ for Liati Soba

<table>
<thead>
<tr>
<th>Name</th>
<th>Gender</th>
<th>Age</th>
<th>Marital Status</th>
<th>Education</th>
</tr>
</thead>
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<tr>
<td>Prince Kwawu</td>
<td>M</td>
<td>34</td>
<td>M</td>
<td>Cert. in Agric.</td>
</tr>
<tr>
<td>Tornyesinu Jonas</td>
<td>M</td>
<td>43</td>
<td>Married</td>
<td>NFE\textsuperscript{40}</td>
</tr>
<tr>
<td>Miheso Vivian</td>
<td>F</td>
<td>42</td>
<td>Married</td>
<td>NFE</td>
</tr>
<tr>
<td>Agbesi Ben</td>
<td>M</td>
<td>48</td>
<td>Married</td>
<td>NFE</td>
</tr>
<tr>
<td>Amelele Winfred</td>
<td>M</td>
<td>50</td>
<td>Single</td>
<td>NFE</td>
</tr>
<tr>
<td>Abua Elisbeth</td>
<td>F</td>
<td>56</td>
<td>Single</td>
<td>NFE</td>
</tr>
<tr>
<td>Dakey Florence</td>
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<td>Married</td>
<td>Primary</td>
</tr>
<tr>
<td>Leve Humphery</td>
<td>M</td>
<td>56</td>
<td>Married</td>
<td>NFE</td>
</tr>
<tr>
<td>Afenyo P. K.</td>
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<td>Senoo G. K.</td>
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<tr>
<td>Adesu Cecilia</td>
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<td>Woname Mary</td>
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<td>Do Akosoa</td>
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<td>Maman Samutu</td>
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<td>Irene Afenyo</td>
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<td>Kporxa Kwaku</td>
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<td>Kenyeku Braima</td>
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<td>Miheso David</td>
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<td>Kalayi John</td>
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\textsuperscript{39}FLS for Liati Sub-district
\textsuperscript{40}NFE means no formal education.
<table>
<thead>
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<tr>
<td><strong>Table 36</strong> Members of the ‘Learning Teams’ for Fodome Ahor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Gender</td>
<td>Age</td>
<td>Marital Status</td>
<td>Education</td>
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<tr>
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<td>--------</td>
<td>-----</td>
<td>----------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>David Ahiadu</td>
<td>M</td>
<td>41</td>
<td>M</td>
<td>Cert. in Agric</td>
</tr>
<tr>
<td>Togbe Akorli 111</td>
<td>M</td>
<td>61</td>
<td>Married</td>
<td>Secondary</td>
</tr>
<tr>
<td>Fedilis Gbogbo</td>
<td>M</td>
<td>36</td>
<td>Married</td>
<td>Primary</td>
</tr>
<tr>
<td>Abala Awusi</td>
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<td>Married</td>
<td>Primary</td>
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<tr>
<td>Nteh Cosmos</td>
<td>M</td>
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<td>Primary</td>
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<td>Akpatsa Jonas</td>
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<td>Married</td>
<td>Primary</td>
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<tr>
<td>Dogbe Christine</td>
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<tr>
<td>Nutsudza Cleophas</td>
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<td>Klu Vincent</td>
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<td>Theresa Daketsey</td>
<td>F</td>
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<td>Married</td>
<td>Primary</td>
</tr>
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<td>Agbeteli E.</td>
<td>M</td>
<td>56</td>
<td>Married</td>
<td>NFE</td>
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<td>Anipayede Anna</td>
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<td>NFE</td>
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<td>Francis Adoboe</td>
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<td>Leopold Afedo</td>
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<td>NFE</td>
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<td>Valentia Gbogbo</td>
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<tr>
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<tr>
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<td>Togbe Makralo</td>
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</table>

41 FLS for Fodome Ahor
APPENDIX 7

DISTRICT WORKSHOP: SUMMARY OF PAPERS PRESENTATIONS AND LIST OF PARTICIPANTS

The summary of papers presented at the district workshop are presented below in addition to the names of workshop participants.

A7.1 Agricultural Extension in the Volta Region: Mr. E. Degbor

The Volta Region implemented a World Bank assisted integrated Rural Development Project; Volta Region Agricultural Development Project (VORADEP from 1981-1988). The project adopted the T&V extension system where field extension officers (FEO) were trained fortnightly and mandated to visit and deliver specific technological packages to pre-selected contact farmers fortnightly. Farm inputs were also sold to farmers at subsidised rates by the project. Presently agricultural extension is being done under a World Bank assisted project, National Agricultural Extension Project (NAEP), which is implementing a unified agricultural extension system. The extension agents or the Front Line Staff (FLS) are trained monthly by the SMS to enable them to competently train ‘contact-farmer’ groups every fortnight. The FLS also lay farmer-funded small plot demonstrations (SPDs) for farmer-relevant issues.

Extension under these projects, firstly VORADEP and now NAEP, has demonstrated that our ‘recommended practices’ can help the farmers produce more than when they use their own practices. We are, however, aware of farmers’ inability to adopt most these practices. The rejection of the high yielding sorghum variety, *flamida*, in the northern zone of the region is an example of the many cases of the phenomena of ‘low adoption rate’ of technologies by farmers. It is my hope that this workshop could work to identify strategies that would help us solve this problem.

---

42 Regional Agriculture Extension Officer for Volta Region.
Questions (Q)

Q. How do you think you can modify your activities to improve the adoption rate?
A. We need to work more closely with farmers in order to decide on practices that meet their real needs.

A 7. 2 The Adaptive Research role of the Crop Services Department: by Nana Oware-Owusu

Basic agricultural research in Ghana is carried out by the Council for Scientific and Industrial Research (CSIR) of the MIST. Crop Services Department (CSD), like any other Subject Matter Department (APD and Fisheries) repeats these technologies under farmers conditions (adaptive research). The close collaboration between CSD and the Extension Department in laying these trials ensures that proven technologies are made available to farmers for adoption. SMS from CSD also train FLS on these technologies. The SMS attend Bi-monthly Technical Review (BMTR) meetings with researchers and extension workers to share ideas on research results and farmers problems.

This technology development process is however faced with some problems including the following:

- conflict in allocation of resources. For example in 1994 we could not define which institution was responsible for the provision of logistic support for on-farm trials.
- the subjects of research are geared towards international audience instead of farmers' problems.
- linkages between departments involved in the technology delivery process are weak. eg. we have only one inter-departmental planning session and 4 BMTR for the whole year.

It is therefore difficult to make a meaningful impact on the farmers production process with a system which lacks synergy in terms of process and content of

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43 Regional Crop Services Officer for Volta Region.
44 BMTR. Bi-monthly Technical Review meetings. These are held between researchers from CSRI, adaptive research from MOFA and Extension Department from MOFA to review farmers problems and recommended practices.
activities. I think there is a need for a more effective inter-institution communication to enable farmers benefit from the investment being made by the government.

Comments (C).

C: We are aware of the technologies. What we need as farmers is credit and farm inputs at low prices.

C: I wish to differ on that point. We in WVI have demonstrated that with guidance and effective discussion technical messages can be made useful by farmers. The usefulness of counselling and good advice in social development has been demonstrated in the Bible. I wish to refer to Proverbs Chapter 15 verse 22 where it is written that ‘without counsel purposes are disappointed’. ....and to Proverbs Chapter 16 verse 16 where it is written ‘how better is it to get wisdom than gold....get understanding rather than silver. I think that is why we are here to share experiences to find more effective ways of solving our problems instead of the persistent demand for inputs and credit that the present political economy cannot deliver.

A 7.3 The Role of ADB in Agricultural Financing in the Hohoe District.-

Mr. K. Andoh 45

ADB gives two types of loans to farmers; sector and group loans. Sector loans are given to medium and large scale farmers (individuals, partners or companies) for which collateral is required. The group credit scheme, is directed at smallholder farmers for which the executives of the group (group of 10 ) act as guarantors for the loans. Loans granted by ADB to farmers for the past five years are as indicated in Table 37 below.

45 The Project Officer, ADB, Hohoe.
Table 37  Loans Granted by ADB to Farmers at Hohoe (1990-1995)

<table>
<thead>
<tr>
<th>Enterprise</th>
<th>Sector Loans (number of farmers served)</th>
<th>Group Scheme (number of groups financed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop Production</td>
<td>78</td>
<td>24</td>
</tr>
<tr>
<td>Processing &amp; Marketing</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Fishing</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Poultry</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>118</td>
<td>55</td>
</tr>
</tbody>
</table>

ADB is also involved in the operation of special loan schemes instituted by external donors e.g. the Sasakawa Global 2000 and the IFAD/MOFA Smallholder Credit, Input Supply and Marketing Project (SCIMP). In 1995 disbursement was made to 63 farmer groups under these schemes.

The main problem for financing agriculture is the high number of people who could not repay moneys granted them because of low yield, weather failure or the attitude of people towards the repayment of ‘government moneys’.

**Questions and Comments.**

**Q:** Don’t you think the high interest rate contributes to non-repayment of the loans?

**A:** Yes. But this rate is fixed by Bank of Ghana and ADB can do nothing about it.

**C:** The Bank was able to grant loans to only 55 groups of smallholder for the last five years. I think the government should review the banking policies to satisfy the needs of the smallholder farmers.
A 7.4 Farmers: Some of Our Problems and Expectations by Togbe Kutter III\textsuperscript{46}.

We farmers have been trying to do our best under difficult conditions. Presently we are finding it difficult to adopt technologies transferred to us by FLS because of the high cost of farm inputs. We do not have money to buy the inputs, and the market prices for our products are very low. It is the wish of farmers that the government could implement policies that would make farming more rewarding.

I want to use this opportunity to tell the ADB officials that farmers are usually unable to repay loans because of weather failure, and high interest rates. No farmer wants to be in debt. Another problem with these bank loans is that they are given out when the farming season is gone. The bank should try to give us the money, and they should do that on time to enable us put it to productive use.

I wish to say that there are only a few farmers here today to benefit from this workshop. I hope this will not be the first and the last. We must keep on talking together to encourage each other as a way of developing our activities. On behalf of GNAFF executives and all farmers in the Hohoe I thank the organisers of this unique workshop.

Comments:

C: I would like to suggest that farmers need to diversify into vegetables and livestock in order to achieve food security and better earnings from the farm.

C. Though I agree that farmers should be encouraged, I also the necessity of farmers to do away with their ‘dependency syndrome’: the belief that somebody must help them out by all means. I think that improvement in farming would come when farmers are encouraged to take responsibility for their own learning and actions.

\textsuperscript{46} Chairman, Ghana National Association of Farmers and Fishermen, for Volta Region.
A 7.5 Community Participation in Development: The World Vision International’s (WVI) Experience in the Volta Region of Ghana, by Mr. G. Kumahlor

Presently WVI is working with 35 communities in nine districts in the Volta Region. We promote agriculture production by assisting farmers with credit, farm input, and by organising and facilitating training workshops for farmers. Our programs are process-oriented and people-empowerment centred. We mobilise, educate, train and facilitate the process through which beneficiaries come to understand and work towards improving their own situations.

One lesson we have learnt is that every community knows who they are, and what their needs and problems are. So to effectively involve farmers we have to treat them as equals and listen to them as they learn about their own lives and problems. The emphasis of our programs are on ownership and self-management of initiatives by the beneficiaries.

Questions.
Q. How can these projects be sustained?
A. We are working closely with the communities, district assemblies and various government agencies who would continue to motivate the beneficiaries. But main thing is the motivation and commitment of the beneficiaries themselves.

A 7.6 Farmer Participation in Agricultural Research: The LGB Project Experience by Ms. P. Magrath

Our objective is to help farmers to control losses from the Larger Grain Borer (LGB) and other insects. We are using farmers’ and traders’ knowledge as an input into knowing ‘what is the problem and where the problem is’. Farmers are also participating in the testing of possible technologies against the pest.

---

47 Project Officer, WVI, Volta Region.
48 Socio-Economist, British Overseas Development Administration Larger Grain Borer Project, Ho.
Initially we talked to farmers about (a) the pest, (b) the extent of damage done to stored food, (c) the effect of the pest on their lives as farmers, and (d) the methods they use or could use to combat the pests. We followed up by laying trials at Kpeve agricultural Research Station to investigate the various characteristics of the pest and effectiveness of interventions. We also involved farmers and traders in the assessment of damage and in the valuing of damaged grains to enable us assess the damage cause to farmers’ food supply and income. Summary of the participatory methods being used by this project to tap farmers knowledge are stated in the Table 38. The lesson we learnt from our interactions with farmers and traders is that local knowledge is vital in identifying problems and solutions in agricultural development projects.

Table 38  Summary of Participatory Methods used by the ODA/LGB Project

<table>
<thead>
<tr>
<th>Participatory Methods Used</th>
<th>Question to Be Answered</th>
<th>Results to be achieved or Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid Survey</td>
<td>Where is the Larger grain borer?</td>
<td>Map of the infested areas</td>
</tr>
<tr>
<td>Loss Study</td>
<td>What is the extent of Damage?</td>
<td>Behaviour of the Pest. Rate of loss and total loss</td>
</tr>
<tr>
<td>Focus group</td>
<td>What do the presence of LGB in the Ban mean to the farmer?</td>
<td>Farmers’ interpretation of the situation and anticipated interventions</td>
</tr>
<tr>
<td>Trader Panels</td>
<td>What is consumer reaction to LGB infested maize?</td>
<td>Pricing of LGB infested products. Loss of income.</td>
</tr>
<tr>
<td>Community Meetings</td>
<td>What has been found out from the farmers?</td>
<td>Share results with farmers.</td>
</tr>
</tbody>
</table>

Questions and Comments.

Q. Have you developed any technology against the Larger Grain Borers?
A. We are still working on it. However we have released a biological predator, TN, which feeds on the larvae of the LGB.
C. I hope the LGB project is certain that this biological predator would not become an agricultural pest in this country.

A 7.7 Introducing ‘Participative Learning’ as an Approach to Agricultural Development by A. Amezah

Our present efforts at developing the smallholder farming system treat farmer’s problems as basically technological. Consequently, most of these technologies are based mainly on economic rationalism and ignore the many social-economic, ecological and political issues and values that are part of farmer’s lives. In my opinion farmers are not adopting these recommended practices because the conditions under which the technologies are developed are often different from the context of application. Based on my learning experience with farmers in Liati Soba and Fodome Ahor, and recent development literature, I would like to suggest that a more appropriate way to identify farmers problems and generate better interventions is to involve all stake holder (especially farmers) in problem definition and deciding on what should be done in the name of improvement.

I have found out that farmers’ knowledge about their environment and their own capabilities and deficiencies are very critical in the development process. It must be acknowledged, supported and complemented. We development workers should rethink the notion of the ‘infallibility of scientific knowledge’ and also learn with and from farmers through the holding of collegiate discussions with them. In essence the whole concept of development (research and extension) should be reconstructed as a learning process about the process and outcome of our actions as farmers and development workers: the notion of critical conversation between stakeholders (Bawden, 1995). In that context extension workers become facilitators of learning but not purveyors of technologies. Farmers also become partners in the learning process and should take responsibility for the generation and utilisation of knowledge to improve their own practices.
There is no recipe for participative learning but it involves encouraging people to critically reflect on, and reconstruct their beliefs and knowledge in order to take informed actions. In this process all co-participate in knowledge generation and utilisation. This idea is supported by some Eweh proverbs like Nunya adidoe asimetune o, and Eta deka medea adamu o. This workshop is therefore about learning about why and how we should learn in order to improve our practices as farmers and development workers. You are all welcome to partake of the learning.

Comments and Questions:
Q: From your presentation there are two key terms that came to mind; facilitation (catalyse the process) and extension (teaching). When does facilitation ends and when does extension start.
A: The purpose of extension is to bring about change for the better. Facilitation is about motivating people to learn how to define and recreate their own realities (problems and intervention). In the process people come to change their thoughts, attitudes and actions. This process also has the possibility of empowering farmers to take action to improve their own situations. So by facilitating the learning between stakeholders, development workers can achieve the goals of 'extension'.

Q. Is participatory Approach (PA) by force or optional?
A. An analogy to that question is; Should teaching or advising farmers be an option or done by force? I would not say that PA is either optional or force. I see it rather as a concerted attempt at identifying better ways to do our jobs as farmers and development workers.
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<thead>
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<th>Name</th>
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<th>Place</th>
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<td>Adzaku, C.H.Y.</td>
<td>MOFA, Extension</td>
<td>Hohoe District</td>
<td>FLS</td>
</tr>
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<td>Ahiadu, D. K.*</td>
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<td>FLS</td>
</tr>
<tr>
<td>Akoto, T. K.</td>
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<td>Hohoe District</td>
<td>FLS</td>
</tr>
<tr>
<td>Tsigbey, B.K.</td>
<td>MOFA, Extension</td>
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</tr>
<tr>
<td>Feyi, Millicent</td>
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</tr>
<tr>
<td>Akpini, Elisabeth</td>
<td>Farmer</td>
<td>Hohoe District</td>
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<td>Farmer</td>
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</tr>
<tr>
<td>Quarshie, Regina</td>
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<td>Hohoe District</td>
<td></td>
</tr>
<tr>
<td>Nuley Hellen</td>
<td>Farmer</td>
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<td></td>
</tr>
<tr>
<td>Sekou, E.T.</td>
<td>MOFA, Extension</td>
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<td>Student.</td>
</tr>
<tr>
<td>Dzebu, S.Y.</td>
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<td>SMS (crops)</td>
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<tr>
<td>Tetteh, I.K.</td>
<td>ODA/LGB Project</td>
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<td>Datsa, W. K.</td>
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<td>Asinyo F.K.</td>
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<td>Togbe Kutor III</td>
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*Involved in village level learning at Liati Soba and Fodome Ahor*
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<td>Florence Yeyie</td>
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<td>Akatsi David</td>
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<td>Andoh, E.</td>
<td>Agric, Dev.Bank</td>
<td>Hohoe District</td>
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<td>Oduro Ameayaw</td>
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<td>Kadjebi</td>
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<td>Amezah, A.</td>
<td>MOFA, UWS, H</td>
<td>Ho, Richmond</td>
<td></td>
<td>Facilitator</td>
</tr>
</tbody>
</table>
# APPENDIX 8

## LIST OF KEY INFORMANTS

<table>
<thead>
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<th>Name</th>
<th>Organisation</th>
<th>Position</th>
<th>Location</th>
</tr>
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<tbody>
<tr>
<td>Mr. S. Korang-Amoako</td>
<td>DAES, MOFA</td>
<td>Director</td>
<td>Accra</td>
</tr>
<tr>
<td>Mr. F. K. Donko</td>
<td>DAES, MOFA</td>
<td>Deputy Director</td>
<td>Accra</td>
</tr>
<tr>
<td>Mr. J. Wumnaya</td>
<td>DAES, MOFA</td>
<td>Deputy Director</td>
<td>Accra</td>
</tr>
<tr>
<td>Mr. P. Titiku</td>
<td>CSD, MOFA</td>
<td>Asst. Director</td>
<td>Accra</td>
</tr>
<tr>
<td>Mr. D. Nutsukpo</td>
<td>CSD, MOFA</td>
<td>Agric Officer</td>
<td>Accra</td>
</tr>
<tr>
<td>Mr. Atsu-Ahedor</td>
<td>MOFA</td>
<td>Deputy Minister for Agriculture (Crops)</td>
<td>Accra</td>
</tr>
<tr>
<td>Mr. K. Alormele</td>
<td>MOFA</td>
<td>Deputy Minister for Agriculture (V/R)</td>
<td></td>
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<tr>
<td>Mr. H. Boye-Doh</td>
<td>TMD, MOFA</td>
<td>Asst. Director</td>
<td>Accra</td>
</tr>
<tr>
<td>Mr. E. A. Addison</td>
<td>CRI, CSIR</td>
<td>Director</td>
<td>Kumasi</td>
</tr>
<tr>
<td>Ms. G. Broffery-Anku</td>
<td>CRI, CSIR</td>
<td>Research Officer</td>
<td>Kumasi</td>
</tr>
<tr>
<td>Mr. K. Osei-Yeboah</td>
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<td>Research Officer</td>
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<td>Mr. A. Opoku-Apau</td>
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<td>Socio-Economist</td>
<td>Kumasi</td>
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<tr>
<td>Mr. K. Bonsi</td>
<td>CRI, CSIR</td>
<td>Principal Tech. Off.</td>
<td>Kpeve</td>
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<td>Mr. S. Noamesi</td>
<td>FRI, CSIR</td>
<td>Scientific Officer</td>
<td>Accra</td>
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<tr>
<td>Mr. F.K. Tetteh</td>
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<td>Ms. V. Quayson</td>
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<td>Ms. B. Frempong-Asante</td>
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<td>Nana Oware-Owusu</td>
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<td>Mr. S.Y. Dzebu</td>
<td>CSD, MOFA</td>
<td>SMS (Crops)</td>
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<tr>
<td>Mr. P.N.K. Ahiable</td>
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</table>
Mr. J.T. Wayem  
CSD, MOFA  
District Crops Officer  
Ho

Mr. J.H. Ankah  
AHP, MOFA  
SMS (Livestock)  
Ho

Mr. Kuegbi  
AHP, MOFA  
SMS (Livestock)  
Jasikan

Mr. K. Kartey  
PPMED, MOFA  
Regional Officer  
Ho

Ms. J. Dogbe  
WIAD, MOFA  
Regional Officer  
Ho

Ms. Agnes Gagblezu  
WIAD, MOFA  
SMS  
Jasikan

Mr. D.K. Tetteh  
CSD, MOFA  
Regional Adaptive Research Officer.  
Ho

Mr. F. Nuotaba  
DAES, MOFA  
Regional Training Officer  
Ho

Mr. Y. Della-Braunes  
SG2000/ MOFA  
Co-ordinator  
Ho

Mr. E. Degbor  
DAES, MOFA  
Regional Extension Officer  
Ho

Mr. K. Tummy  
DAES, MOFA  
DDAEO  
HO

Ms. P. Magrath  
ODA/LGB  
Socio-Economist  
Ho

Ms. Julia Compton  
ODA/LGB  
Project Co-ordinator  
Ho

Ms. F. Yeyie  
MOFA  
DAC/DAEO  
Hohoe

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DAES, MOFA  
DDAEO  
Hohoe

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District Officer  
Hohoe

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Ms. A. Agbeko  
Farmer  
Liati Soba
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A PARTICIPATIVE LEARNING APPROACH TO AGRICULTURAL DEVELOPMENT: A GHANAIAN CASE

Agbenyega Amezah

A Thesis Presented in Fulfillment of the Requirement for the Degree of Doctor of Philosophy

School of Agriculture and Rural Development
University of Western Sydney, Hawkesbury

January 1998
PLEASE NOTE

The greatest amount of care has been taken while scanning this thesis,

and the best possible result has been obtained.
DECLARATION

I hereby declare that except where the contributions of others are acknowledged, this thesis is my original work. I further certify that the material contained in this document, and the research from which it is derived has not been submitted for a degree at any other university or institution.

January 1998

Agbenyega Amezah
ABSTRACT

This dissertation is the documentation of a participative learning done with farmers and agriculturists with the purpose of facilitating improvement in farming and agricultural development work in the Hohoe district of Ghana.

This study was done in a context in which (a) agricultural production is carried out by small scale farmers who depend on social networking at the village level, for the distribution and management of agricultural resources, and on local knowledge for productive purposes; (b) government efforts at agricultural development is implemented through the activities of its agricultural development agencies- Ministry of Food and Agriculture (MOFA) and the Ministry of Science and Technology (MIST). These activities involve the creation of technologies which are transferred to farmers for adoption; and (c) the political-economy is guided by a neo-liberal economic policy being implemented under the guidance of the World Bank, as a Structural Adjustment Program (SAP). The requirements of this program which include the devaluation of the local currency, liberalisation of the market and removal of subsidies on agricultural inputs is adversely effecting the farmer’s terms of trade.

The concerns in the context of this study were those of low adoption rates of technologies being transferred by extension workers, inability of farmers to buy farm inputs at prevailing market prices, low agricultural production, inability of the farmers to get equity prices for their farm produce, and low income of farmers.

The initial rationale for this study was to explore MOFA’s concern about the low adoption rate of technologies by farmers in order to generate knowledge that could be used by MOFA in directing its efforts aimed at improving adoption rates among farmers. This would have meant giving an ontological existence to the phenomenon of ‘low adoption rate’ and generating an objective knowledge about it for implementation by MOFA. However, this view changed as I engaged in learning about the nature of knowledge, ways of acquiring knowledge and relationships between the ‘researcher’ and the ‘researched’ in social inquiry. I became impressed by the perspective of food and other agricultural production as a complex and
dynamic human activity system. What constituted the system and its relationships, its problems and what ought to be done to improve the practices of stakeholders, as well as the performance of the whole system, is subject to different interpretations by the various stakeholders. This came with the recognition that meaning-making by stakeholders could only be understood holistically within their own situational context. I became critically aware that we cannot detach our actions from what we believe we know about our world or our relationship with it. It is therefore philosophically and ethically defensible to engage all stakeholders in constructing their realities of ‘what the system is’ and ‘what ought to be done’ in the name of its improvement. The perspective of the research therefore changed from studying the stakeholders and their practices as an outside ‘expert’, to that of establishing a social discourse with the stakeholders through which they could learn to understand their own world as a basis for improving it: changing it for a mutually agreed ‘better’.

Participative learning, based on the logic and concepts of action research, experiential learning and critical systems learning, was used as a methodological framework within which stakeholders were encouraged to engage in developing their own meanings about, and understanding of their own problems, opportunities and practices, to generate knowledge to enable them take informed actions to improve their own situations. This was implemented through an initial exploratory survey, village level collaborative learning, a district workshop on ‘participative learning’ and an evaluation phase in which stakeholders reflected on the process and outcomes of their own learning.

Through this methodology, stakeholders were able to use their experiences and enhanced cognitive skills to discover and create new meanings and knowledge that were different from that which they previously held, and to plan and take actions to improve their own practices and situations. The social reflective interactions involved in the participative learning process became the basis of insight offered, understanding gained, knowledge generated and empowerment for stakeholders to put the knowledge generated into action. Participative learning therefore offered a way
of ‘being’ and knowing in which the model of reality constructed by stakeholders provided the model for their actions in the social system.

Stakeholders were also encouraged by the learning process, to critique the assumptions and implementation processes of the positivist transfer of technology (TOT) model of agricultural development being adopted in Ghana. The position from the social critique, is that the concept of a single knowledge system of TOT is unattainable and unrewarding, and that all stakeholders should be given the opportunity to contribute to defining issues and problems of interest to them as well as legitimising what must be done in improving their own practices and lives be they farmers or development agents. This was the central idea that supported and emerged from the participative learning I did with farmers, researchers, extensionists and the staff of some non-governmental organisations with the intent of improving farming and agricultural development work in the Hohoe district of Ghana.

The conclusion drawn from this inquiry is that participative learning is a legitimate and an effective way of facilitating the development of food and other agricultural production in the study area. This conclusion suggests that agricultural research and extension in Ghana be conceptualised and implemented as a learning process. Farmers become ‘co-learners’ instead of ‘receivers of knowledge’ and researchers and extension workers become ‘facilitators’ of the learning process instead of ‘creators and transferers’ of expert knowledge. The challenge is therefore for individuals and organizations involved in the development of agricultural production in the study area to establish suitable processes and relationships to support participative learning.
ACKNOWLEDGMENT

I would like to thank members of my supervisory Panel of Dr. N. Sriskandarajah (Principal Supervisor), Prof. R. Bawden, Associate Prof. R. Packam and Dr. A. Andrews for their valuable guidance, encouragement and support during the various stages of this study. provided. I am particularly indebted to Prof. Bawden for his consistent encouragement and critical comments that helped shape my ideas in the development of this thesis.

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May all thanks, however, be unto God with whom all things are possible.
GLOSSARY

ADB  Agricultural Development Bank
APD  Animal Production Department
BMTR Bi-Monthly Technical Review Meeting
BODA British Overseas Development Administration
CIDA Canadian International Development Agency
CRI  Crop Research Institute
CSD  Crop Services Department of MOFA
CSIR Council for Scientific and Industrial Research
CYMMIT *Centro Internacional de Mejoramiento de Maiz y Trigo
(The International Maize and Wheat Improvement Centre)
COCOBOD Cocoa Board
DAC  District Agricultural Co-ordinator
DAEO District Agricultural Extension Officer
DAES Department of Agriculture Extension Services of MOFA
DCSO District Crop Services Officer
DDAEO Deputy District Agriculture Extension Officer
Dufia*1 The chief of the town or village
Dzidudu* The government
ERP Economic Recovery Program
FEO  Field Extension Officer
FLS  Front Line Staff (Field Extension Officers of MOFA)
Fome* The extended family
Fufu* Pounded yam or cassava mixed with plantain or cocoyam
FSR&D Farming System Research and Development
gari* Roasted cassava flour
GDP  Gross Domestic Product
GGDB Ghana Grains Development Board
GNAFF Ghana National Association of Farmers and Fishermen
GTZ  German Agency for Technical Co-operation

1* Denotes an Eweh terminology.
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<tr>
<td>IFAD</td>
<td>International Fund for Agricultural Development</td>
</tr>
<tr>
<td>IITA</td>
<td>International Institute of Tropical Agriculture</td>
</tr>
<tr>
<td>ISSER</td>
<td>Institute of Social Science and Economic Research</td>
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<tr>
<td>Mamaga*</td>
<td>Title for the Queen or a great grandmother</td>
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<tr>
<td>MOFA</td>
<td>Ministry of Food and Agriculture</td>
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<td>MIST</td>
<td>Ministry of Industries Science and Technology</td>
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<tr>
<td>MTADP</td>
<td>Medium Term Agricultural Development Program</td>
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<td>MOFA</td>
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<td>NAEP</td>
<td>National Agricultural Extension Project</td>
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<tr>
<td>NARP</td>
<td>National Agricultural Research Project</td>
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<tr>
<td>NFE</td>
<td>No Formal Education</td>
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<tr>
<td>NGOs</td>
<td>Non-Governmental Organisations</td>
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<tr>
<td>PA</td>
<td>Participatory Approaches</td>
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<tr>
<td>Pers. comm.</td>
<td>Personal Communication</td>
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<tr>
<td>PPMED</td>
<td>Policy Planning Monitoring and Evaluation Department</td>
</tr>
<tr>
<td>RELC</td>
<td>Research-Extension Liaison Committee</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
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<tr>
<td>Sa*</td>
<td>A network of extended families who trace their descent to a grand forefather</td>
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<tr>
<td>SAP</td>
<td>Structural Adjustment Program</td>
</tr>
<tr>
<td>SCIMP</td>
<td>Smallholder Credit, Input Supply and Marketing Project</td>
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<tr>
<td>SG-2000</td>
<td>Sassakawa Global 2000</td>
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<tr>
<td>SMS</td>
<td>Subject Matter Specialist</td>
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<td>SPDs</td>
<td>Small Plot Demonstrations</td>
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<tr>
<td>Sub-district</td>
<td>The operational area of an FLS in the district</td>
</tr>
<tr>
<td>SRI</td>
<td>Soil Research Institute</td>
</tr>
<tr>
<td>TN</td>
<td><em>Teretriosoma nigrescens</em></td>
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<td>Torgbe*</td>
<td>Title for an elderly male or a person placed in a position of authority in the clan or the village</td>
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<tr>
<td>Torgbega*</td>
<td>A 'mystical' forefather to which members of the clan are patrilinearly linked</td>
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<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>TOT</td>
<td>Transfer of Technology</td>
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<tr>
<td><em>Tsiam</em></td>
<td>The Linguist or the speaker of the traditional council</td>
</tr>
<tr>
<td>T&amp;V</td>
<td>Training and Visit System of Agriculture</td>
</tr>
<tr>
<td>UGFCC</td>
<td>The United Ghana Farmers’ Co-operative Council</td>
</tr>
<tr>
<td>URADEP</td>
<td>Upper Region Agricultural Development Project</td>
</tr>
<tr>
<td>UNDP</td>
<td>United Nations Development Program</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
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<tr>
<td>VORADEP</td>
<td>Volta Region Agricultural Development Project</td>
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<tr>
<td>V/R</td>
<td>Volta Region</td>
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<tr>
<td>WIAD</td>
<td>Women in Agricultural Development</td>
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<tr>
<td>WVI</td>
<td>World Vision International</td>
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