

AFRICAN FOOD CRISIS – THE RELEVANCE OF ASIAN MODELS
REPORT ON VILLAGE DIAGNOSIS AND HOUSEHOLD SURVEY

By

A. Wayo Seini

and

V. K. Nyanteng

**INSTITUTE OF STATISTICAL, SOCIAL AND ECONOMIC RESEARCH
(ISSER)**

UNIVERSITY OF GHANA, LEGON

SEPTEMBER, 2003

CONTENTS

CHAPTER	PAGE
1.0 BACKGROUND TO THE STUDY	
1.1 Introduction.....	1
1.2 Research Questions.....	2
1.3 Research Approach.....	3
1.4 Household Survey.....	3
1.5 Choice of Study Areas.....	3
1.6 Recruitment and Training.....	4
1.7 Sampling and Field Survey.....	5
1.8 Organization of the Report.....	6
2.0 AGRICULTURE IN THE SURVEY DISTRICTS	
2.1 Introduction.....	7
2.2 Rainfall Pattern and Irrigation.....	7
2.3 Extension Services/Farmer Organizations.....	8
2.4 Crops and Varieties.....	9
2.5 Inputs/Agro-chemicals Availability.....	9
2.6 NGO Activities.....	10
2.7 Credit Situation.....	10
2.8 Land Tenure and Security.....	11
2.9 Constraints to Intensification.....	12
3.0 CHARACTERISTICS OF THE STUDY VILLAGES	
3.1 Introduction.....	14
3.2 Village Characteristics.....	14
3.2.1 Akatawia.....	14
3.2.2 Asitey.....	15
3.2.3 Apaa.....	15
3.2.4 Gyedi (Begoro).....	16
3.2.5 Gaani.....	16
3.2.6 Doba.....	17
3.2.7 Zanlerigu.....	17
3.2.8 Winkogo.....	18
3.2 Summary of Issues of Intensification at Village Level.....	18
3.3 Women's Participation.....	21

4.0 HOUSEHOLD SAMPLE CHARACTERISTICS

4.1 Introduction.....	22
4.2 Sample Size and Distribution.....	22
4.3 Household Size and Gender of Head.....	23
4.3 Gender of Household Head and Farm Manager.....	23
4.4 Age of Household Head and Farm Manager.....	24
4.6 Longevity of Farm Household.....	25
4.7 Formal Education of Farm Managers.....	25
4.8 Main Occupation.....	26

5.0 FOOD CROP ENTERPRISES AND LAND USE

5.1 Introduction.....	27
5.2 Food and Other Crop Enterprises.....	27
5.3 Cropping Combination.....	27
5.4 Quality of Farmland.....	28
5.5 Area of Crops Grown under Irrigation.....	28
5.6 Number of Crops.....	29
5.7 Other Use of Land.....	29
5.8 Farm Size.....	30
5.9 Area Cultivated by Crop.....	31

6.0 DYNAMICS OF FOOD CROP PRODUCTION, TECHNOLOGY AND INPUT

6.1 Introduction.....	32
6.2 Dynamics of Production.....	32
6.3 Utilization of Produce.....	33
6.4 Planting Materials	34
6.5 Application of Inorganic Fertilizers.....	35
6.6 Application of Pesticides.....	35
6.7 Method of Land Preparation.....	36
6.8 Cultural Practices.....	37
6.9 Irrigation Practices.....	38
6.10 Changes in Crop Yield Per Hectare.....	39

7.0 MARKETING CONDITIONS FOR INTENSIFICATION

7.1 Introduction.....	41
7.2 Sale of Food Crops and Prices.....	41
7.3 Main Market Outlet and Contract Farming	43
7.4 Dynamics of Marketing Conditions	45
7.5 Food Crop Marketing Constraints.....	47

8.0 OTHER FARM ENTERPRISES, LIVESTOCK, RESOURCES AND INSTITUTIONAL CONDITIONS

8.1 Introduction.....	50
8.2 Other Food Enterprises Cultivated and Sold	50
8.3 Input Use in Other Farm Enterprises.....	52
8.4 Livestock Rearing	52
8.5 Labour Resources	53
8.5 Land Resources	55

9.0 INCOMES, WEALTH ASSESSMENT AND EXPENDITURES

9.1 Introduction.....	58
9.2 Sources of Income	58
9.3 Household Assets	59
9.4 Means of Transport and Housing Standards	60
9.5 Household Expenditure.....	61
9.5.1 Cash Requirement for Inputs	61
9.5.2 Purchases of Food Crops	62

LIST OF TABLES

3.1 Rainfall Conditions.....	18
3.2 Soil Natural Fertility and Suitability for Cultivation	18
3.3 Nature of Farm Sites and Agricultural Potential.....	19
3.4 Services to the Communities.....	19
3.5 Land Acquisition by newly formed households	20
3.6 Major means of increasing farm size and title to land.....	20
3.7 Availability of Land for cultivation.....	21
4.1 Distribution of Sample By Region, District and Village.....	22
4.2 Distribution of Household Size in Akatawia Village.....	23
4.3 Gender of Head of Household and Farm Manager.....	24
4.4 Distribution of Age of Household Head and Farm Manager.....	24
4.5 Longevity of Farm Household.....	25
4.6 Number of Years of Formal Education of Farm Managers.....	25
4.7 Main Occupations of Household Head and Farm Manager	26
5.1 Farm Enterprise Base Year and Current Year.....	27
5.2 Cropping Combination.....	28
5.3 Farmland Quality Based on Crop Enterprise.....	28
5.4 Area of Crop Grown Under Irrigation.....	29
5.5 Number of Times Crop Grown under Irrigation in a Year.....	29
5.6 Other Uses of Land Besides Major Enterprise.....	30
5.7 Recent Change in Farm Size.....	30
5.8 Area Cultivated by Crop.....	31

6.1 Output of Selected Food Crops	32
6.2 Trends in Food Output, Comparing Seasons.....	33
6.3a Distribution of Produce by Utilization.....	33
6.3b Distribution of Produce by Utilization	34
6.4 Planting Material Used by Farmers: Base Year and Current Year...	34
6.5 Changes in Volume of Inorganic Fertilizers Application	
Comparing Current and Base Seasons.....	35
6.6 Application of Pesticides Comparing	
Current Year and Base Year.....	36
6.7 Equipment for Land Preparation.....	36
6.8 Cultural Practices Comparing Current and Base Year.....	37
6.9 Portion of the Farmland Cultivated with Irrigation by Crop.....	39
6.10 Trends in Crop Yield per Hectare Comparing	
Current and Base Year.....	39
6.11a Technology Change for Increased Crop Yield.....	40
6.11b Technology Change for Decreased Crop Yield.....	40
7.1 Sales of Food Crops Over Time	41
7.2 Mean Quantities of Food Crops Sold.....	42
7.3 Price Range for Food Crops in Recent Season.....	43
7.4 Outlet for Food Crops and Contract Farming	44
7.5 Changes in Sales and Prices	45
7.6 Changes in Market Outlet and Modern Input Prices	46
7.7 Constraining Factors for Food Crop Marketing	47
7.8 Problems of Production for Market	48
8.1 Other Food Crops Produced for the Market	50
8.2 Non-Food Cash Crops Grown and Profitability	51
8.3 Changes in Sales and Market Access	52
8.4 Input Use for Other Food and Cash Crops	52
8.5 Ownership of Livestock by Households.....	53
8.6 Household Labour Profile	54
8.7 Hired Labour for Farm Activities	54
8.8 Land Resource Use	55
8.9 Land Acquisition, Status and Control.....	56
8.10 Prospects for Expansion and Acquisition by Youth.....	57
9.1 Sources of Cash Income.....	58
9.2 Inventory of Household Assets	59
9.3 Transport and Housing Standards	60
9.4 Ranking of Households by their Wealth Assessment	61
9.5 Ranking of Expenditure on Inputs	61
9.6 Purchases of Food and Animal Products	62
9.7 Most Costly Household Expenditure Item	63
9.8 Extent of Borrowing and Savings	63

AFRICAN FOOD CRISIS – THE RELEVANCE OF ASIAN MODELS

REPORT ON VILLAGE DIAGNOSIS AND HOUSEHOLD SURVEY

CHAPTER ONE

BACKGROUND TO THE STUDY

1.9 Introduction

Africa can generally be described as a continent that is hungry in the midst of plenty. There is sufficient global food production to feed the entire population of the world. Yet tastes differ, eating habits differ and communities produce and feed on staples they are accustomed to. Even when food crops are similar to the staples that are produced, variety differences and genetic composition have often led to rejection by people who are extremely hungry. Sub-Saharan Africa in particular can hardly feed its people and the situation is exacerbated by rampant famine caused mainly by occasional droughts and the dislocation of communities through numerous civil wars, ethnic and religious conflicts.

Nevertheless, Africa can learn from societies that have advanced from similar situations into food self-sufficiency. A clear example is the “Green Revolution” that swept through Asia in the 1950s and 1960s. The Green Revolution, in this study, has been tentatively defined as a process of agricultural intensification, driven by new technologies developed by crop breeders. Added to this technocentric definition are some non-technical features that define the Green Revolution as a process of agricultural intensification aimed at increasing domestic self-sufficiency in food grains that is stimulated by state policies in the following areas: (i) protection of the domestic market against dumping and low-priced imports of food grains; (ii) price guarantees for food grains at the farm gate or subsidies of inputs to stimulate producers to adopt new technologies in order to increase the production of food grains; and (iii) extension of technology required for farmers to increase their production, including improved seeds, chemical fertilizer, pesticides, irrigation and other agricultural technology.

The question is if Africa can and ought to be learning from the intensification processes of the Green Revolution, what then is the state of intensification of food production on the continent, particularly Sub-Saharan Africa? The argument in this study is that models and theories involving only economic factors cannot be used to fully understand the Asian Green Revolution. For sub-Saharan Africa this in turn implies a criticism of the discourse on agricultural development, which has been dominant during the last two decades and which one-sidedly focuses on economic factors and sees only the destructive influence of the state while ignoring the potentials for state-driven development. Thus, institutional innovation is considered essential to the improvement and expansion of facilities that are necessary for the process of intensification. Issues such as cultural nationalism, ideology and geopolitics can serve as stimuli for the efforts to attain self-sufficiency in food grains. These and other issues are examined in an effort to study agricultural intensification in sub-Saharan Africa.

1.10 Research Questions

In the study of food crop intensification in sub-Saharan a number of research questions have been posed. These, among others, relate to the role of the state, agrarian policy reforms, market mediation, small farmer organizations, land tenure, technology, extension, gender and social inequality.

The nature of the state in sub-Saharan Africa in relation to developmental role and implementing agricultural policies in the interest of the majority of the rural population is a crucial question in this research. Besides, over 25 sub-Saharan countries adopted comprehensive Structural Adjustment Programmes (SAPs) in the 1980s and questions arise as to priorities assigned to the issue of self-sufficiency in food as against other developmental priorities. Also, geopolitical questions regarding the present international context of trade globalization in relation to national mobilization towards agricultural development need to be examined.

Market mediation is another crucial area affecting intensification. The extent to which private entrepreneurs have been allowed or encouraged to participate in the marketing of food crops, the identity of such entrepreneurs and the scale of their operations, the regions and sectors in which they operate need the attention in this study. Related to these are issues on private initiative in the processing and marketing of local produce, contract farming as a source of agricultural finance, price guarantees, input servicing, agricultural cooperatives and farmer organizations.

African agriculture is largely bimodal in its development approach. One major question that needs to be addressed is the perception that “big is beautiful” and the extent to which it remains a hindrance to small-farmer development. Related issues are whether new possibilities have been created – or obstacles removed – for peasant farmers to form their own independent and member based organizations to deal with agricultural or agriculture-related matters. The establishment of such organizations, their purposes and scope of activities are all issues that need to be investigated.

There is no doubt that land tenure is in a state of flux in many sub-Saharan African countries. There is therefore the need to understand the relation of tenure issues versus other issues (price stability, market access etc.) in local cases of intensification. Also, skewed land distribution or tenure insecurity is likely to constitute obstacles towards improved productivity. African women constitute a large proportion of food crop producers and the extent to which they and other marginalized groups are affected by tenure arrangements and their consequences for intensification need to be examined. The extent to which state policies improve tenure security for smallholders is another question to be looked at.

Policies on irrigation, transport infrastructure and research are all crucial to the process of agricultural intensification. The relation between suitable high yielding varieties and adoption, profitability, marketability and post-harvest activities of such varieties are all part of the research questions. Beside, the role of agricultural extension is equally

important in the intensification process. Of particular interest is whether the decentralized extension systems sufficiently address the needs of poor farmers, including women in such a way that broad adoption of new technologies and access to markets can be created for the bulk of the farming population.

1.11 Research Approach

No doubt the research questions are many and varied. One single research approach cannot provide all the answers. Multiple approaches were therefore adopted in order to provide the answers. One of the approaches was a macro study that provided answers to some of the research questions that required historical data and information. The other approach was to carry out a micro study by way of administering a structured questionnaire to households in a field survey. The field study also included informal data gathering of district level data from public officials of the district directorate of agriculture and other relevant ministries and departments as well as a questionnaire designed to collect village level data for the purpose of community or village diagnosis.

The idea of the village diagnosis was to assess by means of standardized questions and Rapid Rural Appraisal (RRA) methods what the situation in a sampled village was with regards to factors that constrain/enable agricultural intensification. Some of the information asked for was noted at the beginning of fieldwork when the project staff approached the village leaders. Other questions required careful observation and probing in focus group interviews and discussions with key informants. Uncoded questions were reported in the form of a text file labeled with the village name and village code number.

1.12 Household Survey

The household survey was based on the household questionnaires approved for implementation by all participating countries. In Ghana's case, all the four target crops, namely, cassava, maize, rice and sorghum are major staple food crops that are grown in various agro-ecological zones in the country. Cassava and maize are however consumed throughout the country, sorghum mainly in the northern savannah half of the country, while the consumption of rice has increased rapidly throughout the country, particularly in the urban areas.

1.13 Choice of Study Areas

The choice of the study regions (Upper East and Eastern) was based mainly on the relative contribution of the region to national production of the target crops while the choice of the study districts within regions was also based on the relative contributions of the districts to the production of the target crops in the region. The choice of communities to study was done in consultation with the district agricultural development officers and was based on not only the production of the target crops but also on the basis of the inclusion of the communities in an on-going agricultural enumeration exercise being carried out by the Ministry of Food and Agriculture.

Two regions were selected for the household survey and village diagnosis. The Eastern Region was selected for maize and cassava. The region played the pioneering role in the establishment of the cocoa industry in Ghana, a leading agricultural export crop in the early 20th century. The cocoa frontier has since shifted from this region into the Ashanti Region and later into the Brong Ahafo Region and now into the Western Region as the leading producer of cocoa in Ghana. With the decline in cocoa production, the Eastern Region has been transformed into one of the leading regions in maize and cassava production.

Within the Eastern Region, the Krobo Odumasi and Begoro districts were identified as the major producers of maize and cassava and were therefore selected for the study. The two districts have common features in terms of terrain that is quite hilly with flat bottom valleys in between. Two villages were then selected for each district, Akatawia and Asitey for the Krobo Odumasi district and Apaa and Gyedi (Begoro) for the Begoro district.

The Upper East Region was selected to cater for sorghum and rice production. Sorghum is the major staple food for this region while rice is cultivated mainly as cash crop. The Bolgatanga and Kasena-Nankani districts were selected for the study. In the Bolgatanga district, Zanlerigu and Winkogo were the communities selected while Gaane and Doba were selected for the Kasena-Nankani district. In selecting these communities the cultivation of rice was a major consideration. Whereas almost every farmer in the Upper East Region will normally grow sorghum as a staple food crop, the cultivation of rice is dependant on the availability of and access to suitable land for rice, as rice is grown mainly in valley bottoms.

1.14 Recruitment and Training

For the field survey in the Eastern Region, the researchers made use of the proximity of the region to the University, to recruit seasoned and experienced field enumerators from the Institute, other departments of the University and elsewhere. In all 10 enumerators were recruited and given training on the household questionnaire. All the field enumerators were fluent in the languages of the farmers in the region, mainly Krobo and Akan languages.

In the Upper East Region, the enumerators for the selected districts were recruited from the extension agents of the Ministry of Food and Agriculture. These agents were also experienced field enumerators. Since the languages spoken in the two districts were different, Kasin for Kasena-Nankani and Talensi for Bolgatanga, two different sets of 11 enumerators were recruited and trained for the field survey.

1.15 Sampling and Field Survey

With the exception of Gyedi (Begoro) all the communities studied were characterized by dispersed settlements with houses located on the household farmland. The approach was therefore to make a preliminary visit to the selected community and to solicit the assistance of the village chief to invite farmers in the village to a meeting with the research team on an appointment date. The village chief was apprised of the purpose of the survey before soliciting his assistance.

After explaining to the meeting about the purpose of the study, convenient sampling method was used in the sense that the farmers who were present and willing to be interviewed were selected and interviewed. In fact all farmers who turned up were willing to be interviewed and those who exceeded our target number were disappointed. This approach is described as convenient because it allows the researcher to meet the target sample size without compromising too much on the randomness of the sample. The risk here, however, is that households that are too far from the community meeting grounds may not bother to attend. To minimize this risk, the appointment days were fixed on days that the farmers normally do not go to farm and had the whole day to participate in the research. Since the research team had no prior knowledge of the total number of households in the selected villages, an average of 50 households per village was predetermined for the survey. The outcome was a variation of the percentage of households interviewed when the estimated number of households was later determined in the village diagnosis. Also, no conscious effort was made to predetermine a gender ratio in the interviews with the result that fewer female farmers than their male counterparts were interviewed.

The convenient sampling method was likely to result in a number of biases. In the first place it was likely to lead to an overrepresentation of farmers aged 50 years and above. This in actual fact was not the case as the age distribution reported in table 4.4 is surprisingly even with the exception of a curious dip in the 31 to 35 age group. This leaves three other sources of possible bias which are more difficult to check: (i) on a geographical scale, outlying farms may be underrepresented as earlier alluded to; (ii) on gender, women farmers are likely to be underrepresented; and, (iii) on ethnicity, minority groups may also be similarly underrepresented. These are minor sources of bias that cannot make the sample a non-random one.

In the survey itself, enumerators were transported from one village to another where they spread out to do the interviews in a manner that did not expose other farmers who were waiting to be interviewed to listen to the interviews that were going on. This prevented farmers from preconditioning themselves before they had their turn. In all, a total of 416 households were interviewed, made of 206 (49.5%) for the Eastern Region and 210 (50.5%) for the Upper East Region.

1.16 Organization of the Report

The report is presented in a hierarchical manner in order to reflect on the research approach. A report on the macro level survey that is based on national level data has been made separately. Chapter two discusses agriculture in the survey district and is based on information gathered from technical people in the district. The characteristics of the survey villages as revealed in the village diagnosis are discussed in chapter three.

Chapters four to nine then discuss various aspects of the household survey data. It is significant to note that throughout these chapters the sample for cassava and maize were drawn from the study villages in the Eastern Region while that of sorghum and rice were drawn from villages studied in the Upper East Region. Household sample characteristics are presented in chapter four while food crop enterprises and land use are discussed in chapter five. The dynamics of food crop production, technology and input use are discussed in chapter six, followed by a discussion of marketing conditions for intensification in chapter seven. Chapters eight and nine discuss other farm enterprises, and income and expenditure issues, respectively.

CHAPTER TWO

AGRICULTURE IN THE SURVEY DISTRICTS

2.10 Introduction

During the field survey, informal interviews were held with district agriculture development officers, staff as well as some Non-Governmental organizations and other relevant departments. The information and data gathered form the basis of this chapter. Specifically historical information was gathered on issues of agricultural intensification and constraints to intensification. Such issues included the use of agro-chemicals and pesticides, fertilizer use, use of improved seed varieties, NGOs operating with farmers in the districts and rainfall data as well as the status of irrigation in the survey districts.

2.11 Rainfall Pattern and Irrigation

For the Manya Krobo and Fanteakwa districts in the Eastern Region of Ghana the wet season is from April to early August and from September to October. The amount of annual rainfall, however, differs between the two districts. The mean of annual rainfall in the Manya Krobo district is between 900 and 1,150mm. There is the potential for irrigation in this district along the Volta Lake and yet very little irrigation is done. On the other hand the mean annual rainfall for the Fanteakwa district is between 1500 and 2000mm. There is a double maximum rainfall during the period of June and October each year in the two districts. Irrigation is not widespread in the Fanteakwa district. Indeed, the only known irrigation scheme is at a resettlement township (Dedeso) along the Volta Lake basin in the northern part of the district. Here irrigation is mainly for vegetable farming.

The two districts in the Upper East Region also have similar rainfall patters but differ slightly in the magnitude of rainfall. Both districts have a single maximum, peaking in August. Mean annual rainfall in the Kasena-Nankane district is about 990mm but varies between 800 and 1400mm. Rainfall distribution is poor as about 90% of rainfall is distributed between June and September. One of the large-scale irrigation schemes in Ghana is located in this district at Tono where up to 5,000 hectares can be irrigated. In addition, there are several small-scale dams that can irrigate between 20 and 30 hectares of land.

Mean annual rainfall in the Bolgatanga district is about 900mm with a range of between 900 and 1,200mm. Even though annual rainfall is slightly less than that of neighbouring Kasena-Nankane, the rainfall is similarly distributed between April and October in the two districts. Bolgatanga district also hosts another large-scale irrigation scheme at Vea which can irrigate up to 3,000 hectares of land. There are also a number of small-scale dams that irrigate between 20 and 30 hectares of land. Irrigation facilities in the two districts are used mainly for rice and vegetables, mainly tomatoes and onions.

2.12 Extension Services/Farmer Organizations

The Manya Krobo district has establishments for a staff of 40 but had a staff of 28 at the time of the survey. Out of the 28, 20 are extension agents the others being the District Development Officer and his assistants and three monitoring staff members. There are about 102,000 farmers in the district, giving a farmer/extension agent ratio of 5100/1. The extension strategy throughout the country is for every agent to organize farmers into small groups of 10 to 15 farmers each to receive extension messages. Each agent is expected to form 16 such groups. There were 224 such groups formed in the district. Two agents had formed less than the required 16 groups.

In the Fanteakwa district about 70% of the population are farmers. The district has a staff of 26 of which 18 are extension agents. Under NAEP groups are formed for extension. In 2001, 90 groups were formed for root/tuber improvement only and no groups were formed for general extension purposes.

The Kasena-Nankane district has a staff of 49 of which 40 are extension agents. The other staff included one gender officer. Out of a district population of about 150,000, exactly 113,212 (75.5%) are classified as farmers. This gives a farmer-extension agent ratio of 2830/1. However, only 35% to 40% of the farmers are covered by extension and this gives a farmer-extension agent ratio of 1132/1 on the upper percentage. The approach to extension is the same and follows the prescription of NAEP.

The Bolgatanga district has a staff of 45 of which 40 are extension agents. There are about 19000 farm families (households) giving a ratio of 475 farm families to an extension agent. The extension approach here is the same. Extension agents are expected to form a minimum of 16 and a maximum of 24 groups of farmers for extension purposes. A total of about 480 of such groups had been formed in the district. In addition, there are special commodity associations that come together to solve their common problems. These include the Rice Growers Association, The Seed Growers Association and the Tomato Growers Association.

In all the districts, the technology extended by the extension agents is quite limited. They include planting in rows, timeliness of weeding and the use of improved varieties of seed. The general impression is that farmers are now aware that their yields improved with the use of improved varieties or when they weed early and get more produce per hectare when they plant in rows with the correct spacing of crops. They are also aware that all farm operations like filling the gaps, weeding, fertilizer application, spraying and harvesting become easy when they plant in rows.

2.13 Crops and Varieties

Crops grown in the Manya Krobo district include maize and cassava that are cultivated almost throughout the district. Yam, cocoyam, beans, oil palm and rice are other crops that are cultivated in various parts of the district. Pepper is the major vegetable produced in the district. Most farmers in the district adopt improved varieties of crops. For maize, almost every farmer adopted the improved varieties of “abelehi”, “obrotia” and “komsa” that were introduced to them in the 1970s and 1980s. Farmers then switched to “obatampa”, an improved variety that was introduced in 1995. For cassava, various attempts have been made to introduce improved varieties such as “abasafitaa” and “afisiafi” that were not sustained due mainly to problems of planting materials. Thus farmers are now growing only the traditional varieties. About 15% of farmers also practice livestock farming in the district. Animals reared include sheep, goats, pigs, poultry and horses.

The Fanteakwa district also cultivates all the crops mentioned under Manya Krobo. In addition cocoa, coffee and banana are also grown as cash crops. Tomatoes and garden eggs are the vegetables that are widely cultivated. Most farmers (about 60%) use the improved variety of maize, “obatampa”. The local varieties of cassava are also cultivated in this district. Cassava and maize are normally intercropped. It is to be noted that about 20% of farmers in this district practice zero tillage, supplemented by weeding. This practice tends to protect the soil from erosion.

Kasena-Nankane and Bolgatanga, the two districts in the Upper East Region, are almost identical in the types of crops grown. For cereal staples, millet, sorghum, rice and maize are grown; for legumes, groundnuts, bambara-beans, cow pea and soybeans are grown; for vegetables, tomatoes, onions, pepper and okra are cultivated. In addition, sweet potatoes and Frafra potatoes are the tuber crops grown in various parts of the two districts. It is the local variety of “kundabua” that dominates in sorghum cultivation. An improved variety, “kapala”, that was introduced in 1997 is adopted by only about 10% of farmers. Guineas Ghana Limited patronizes the purchase and use of this variety in their brewery. The two districts also rear livestock in addition to crop farming. About 40% of farmers own cattle while 90% of them also rear goats and sheep.

2.14 Inputs/Agro-chemicals Availability

In the Manya Krobo and Fanteakwa districts, it is estimated that the use of organic manure, chemical fertilizer and other agro-chemicals are on a very limited scale. Farmers use less of these inputs because their prices are too high. Availability is not necessarily the problem as these inputs are largely available in the open market, the price is what everyone is complaining about. Nevertheless an estimated 53% of farmers in the Manya Krobo district use fertilizer mainly on maize. In addition, about 10% of maize farmers also use weedicides for the control of weeds. This is to be contrasted with the Fanteakwa district where about 50% maize farmers use fertilizer while about 25% of them use weedicides to control weeds.

In the two northern districts of Kasena-Nankane and Bolgatanga, projects play a major role in securing inputs for farmers. The Irrigation Company of the Upper Regions (ICOUR), for example, insists on the use of fertilizer and to some extent weedicides in the irrigation area. As such about 90% of rice farmers do apply fertilizers while another estimated 30% to 40% also use weedicides. Fertilizer and weedicides are however not used in sorghum cultivation.

In all cases, implements used in farming include simple tools like cutlasses, hoes and mattocks. Labour-saving inputs like tractors and other machines are completely lacking even though the hiring of tractors for the initial land preparation is practiced by some farmers. Animal traction is encouraged in the districts in the North but its use is limited due to poverty and the high costs involved.

2.15 NGO Activities

There is very little NGO activities in the agricultural sector of the Manya Krobo and Fanteakwa districts. ADRA, that is based in Koforidua, the regional capital, is the only NGO in these two districts and its activities are only in the area of agro-forestry. It organizes farmers for agro-forestry, using MOFA extension agents, while their own field workers do the monitoring.

The situation in the study districts of the Eastern Region is to be contrasted with the Kasena-Nankane and Bolgatanga districts in the Upper East Region where there is active NGO participation in agricultural activities.

The Adventist Development and Relief Agencies (ADRA) assists farmers with inputs, i.e., seeds (soyabean), fertilizer, and seedlings (free) for agro-forestry programme. ADRA picks produce, deducts input costs, and pays to the farmer what is left.

ACTIONAID, a British NGO, is more of a benevolent organization in its assistance to farmers and farming communities. It assists in the dissemination of improved technology. For examples, improved rabbits and improved cockerels are distributed to farmers free of charge. ACTIONAID also has a composting programme where it helps with compost tools.

TRAX, Technoserve and SESUNDI are relatively new in the region and they help mainly with farm credit schemes. SESUNDI works mainly with women's groups on gender issues and is now planning to go into family credit schemes.

2.16 Credit Situation

In the Manya Krobo and Fanteakwa districts, Rural Banks support farmers. Two Rural Banks are involved and they are based at Asewewa and Odumasi in the Manya Krobo district, and Begro (a branch of the Osino Rural Bank) in the Fanteakwa district. The rural banks handle mainly funds from the Smallholder Credit and Input Project (SCIMP),

an IFAD project that advances input credit to food crop farmers in the transitional zone of some regions in Ghana. The Ghana Commercial Bank (GCB) is the only commercial bank that is present in one of the districts (Manya Krobo) at Akuse.

The Kasena-Nankane and Bolgatanga districts are part of wider regional schemes that include credit components. The Land Consolidation and Smallholder Rehabilitation Project (LACOSREP) encourages farmer groups to open group accounts with the Agricultural Development Bank (ADB) or the Ghana Commercial Bank (GCB). A credit committee in each community, selected by the community, endorses groups for credit and are directly responsible for loan recovery. There are 30 communities involved in the whole of the Upper East region and loans have been disbursed to about 100 groups. The GCB has presence in both study districts while the ADB is present in only the capital of the region (Bolga) but serves all districts in the region, including the study districts. The Nara Rural Bank at Paga in the Kassena-Nakane district is an additional source of agricultural credit in that study district.

As mentioned earlier, the Adventist Development and Relief Agencies (ADRA) assists farmers with inputs, ie., seeds (soyabean), fertilizer, and seedlings (free) for agro-forestry programme. ADRA picks produce, deducts input costs, and pays to the farmer what is left. This is a form of credit in kind to the farmers that is also repaid in kind.

The Technoserve scheme includes credit to construct storage facilities, buy and sell in the lean season for profit. On the other hand TRAX is also initiating a credit scheme for women as is sponsored by Ministry of Women and Children.

2.17 Land Tenure and Security

Land acquisition, tenure arrangements and security are similar in the Manya Krobo and Fanteakwa districts. Acquisition is either through inheritance from family (individual ownership); renting or hiring from land owners; or mortgage. In both districts, agriculture is carried out by the indigenous people and the Krobo settlers who have established a large presence in many districts in the eastern region. For the indigenous people, land acquisition is mainly through family sources where family land can be allocated or inherited. For settlers and other category of people, such as government workers who would like to engage in farming, they have to go through a system of land acquisition that includes renting or hiring and mortgage (leasehold).

Land tenure arrangements in the two eastern study districts include: Owner occupancy where the farmer is the owner of the land on which he/she works and provides all the necessary inputs for production; Share Tenancy which includes “abunu” or the “abusa” share cropping system. Under this system the land owner leases the land to the farmer and the farm produce is shared either equally (abunu) or a third goes to the landlord while two-thirds goes to the tenant (abusa). In share tenancy, the tenant is responsible for all the farm operations, including costs. Renting or hiring is an arrangement between the tenant farmer and the landlord where a specified agreed amount is paid to the landlord, usually for a period of one year. The amount paid is a function of the size of the land, as well as

the degree of the relationship between the tenant farmer and the landlord. Under the arrangement of leasehold, the land is bought outright or it is a gift from a land owner, without any conditions attached. It is estimated that about 46% of farmers in the districts farm on family lands; about 30% are involved in share cropping; about 23% are involved in hiring (renting) and about 6% purchased their land outright.

Most farmers in the Manya Krobo district are “Huza¹” farmers most of whom settle on their farms. Other farmers practice mixed-cropping and land rotation with short fallow periods.

With respect to the Kasena-Nankane and Bolgatanga districts, communal ownership is the norm, indeed throughout the Northern parts of Ghana. Once land has been cultivated by a family, it is recognized as the property of the family which can then be inherited in future. Such family land can be rented or hired out, particularly for dry season farming in the two districts in the north. New land can be acquired from the village chief or the Tindana (traditional landlord). Virgin lands are hard to come by in the two districts but patches of such land can be found in the southern parts of the Bolgatanga district.

The extent to which land is available is generally reflected in the size of agricultural holdings and their fragmentation. Owing to the high population density, particularly in the study districts of Manya Krobo and the Upper East districts, there are large fragmentations and land is generally scarce. For example, many of the farmers in the Manya Krobo district (about 52%) have more than one plot, all small in size and scattered over the area often at considerable distance from one another. About 47% of farmers have farms that are less than one hectare while another 23% own between one and two hectares of land. Another 12% own between 3 and 7 hectares of land.

2.9 Constraints to Intensification

Farm labour is a major problem in all the study districts, particularly when needed in large quantities. Labour use and cost are usually by type of activity. Costs can vary between 10,000 and 15,000 cedis by day for a 12x12 fathoms (about 72 X 72 yards) plot. Other constraints to food crop intensification in the study districts were listed as follows:

- Low levels of agricultural productivity;
- Low level of technology application in agricultural production;
- Lack of storage facilities and the incidence of post harvest losses;
- Land tenure arrangements are not in the interest of tenant farmers- disregard for cost of production- kills incentive;
- Poor rural road infrastructure;
- Exploitation by traders;

¹ “Huza” farmers are Krobo ethnic farmers who migrated from land-scarce areas to buy land elsewhere as a group. The sharing of the land is done in strips to ensure that all the major characteristics of the land are included in each strip. For example if there is a river running through the purchased land, each strip of land will include a part of the river. Huza farmers characteristically build their houses, not in the form of a nucleated village, but at the same side of the strip.

Lack of credit facilities; and
Exploitation by moneylenders.

These general village level constraints may not necessarily apply to all enterprises of the farmer and may not also represent the true reflection of farmers' own field experiences.

CHAPTER THREE

CHARACTERISTICS OF THE STUDY VILLAGES

3.1 Introduction

The chapter is based on information gathered in the village diagnosis. The approach in the village diagnosis was to assemble the village chiefs, some of their elders and others who were knowledgeable enough about the conditions of the village for a dialogue with them. Knowledgeable people in the village included the assemblyman, the village head teacher, the extension agent in charge of the village etc. The approach was more or less a focus group discussion that involved the participation of people considered to be well informed about the village. A brief description of the major village characteristics is provided here. Some issues of intensification at the village level, from the analysis of the village diagnosis questionnaires, are also discussed.

3.2 Village Characteristics

For each study village the characteristics that are likely to impinge on the intensification of food crop production are described. These relate to the size of the community in terms of population, number of households and land area. The general land use and its composition are important indicators of the agricultural potential of the communities studied. Rainfall pattern and the status of irrigation, the cropping systems and accessibility to markets are among the characteristics that point to the direction of agricultural intensification in the communities.

3.2.1 Akatawia

Akatawia is in the Odumase-Krobo District of the Eastern Region. The 2000 population census estimates its population as 663. It has 90 households, 71 of which are male headed while the remaining 19 are female headed. The average household size was 7.4.

Akatawia covers an area of about 10 square miles with about 33 percent of the land under cultivation. The other major land uses are in the areas of housing (10%), and fallow/pastures (54.5%). Marginal lands constitute about 2 percent of the land area while only about 0.5 percent constitutes water bodies. None of the cultivated area is irrigated. Yet in the past three years, rainfall has been below average in 2001 and 1999 and has been average in 2000.

The village is well endowed with soils suitable for cultivation of many crops, particularly cassava and maize which every farmer grows in a mixed cropping system. The natural fertility of the soils around the village is not in doubt. The village is located in an area of mixed topography of steep slopes as well as flat and gentle sloping areas. The village in general has an average potential for agricultural intensification.

The village is located along a tarred (all-weather) road and is only about 7 km. from the nearest permanent crop outlet and 12.5 km. from the nearest town-based permanent market (Asesewa) that also has permanent telephone connection. Thus, the village on the whole has good market access in spite of the fact that there are no outgrower/contract farming schemes in the village.

4.2.2 Asitey

Asitey was the second village in the Odumasi-Krobo district that was selected for the survey. It has a population of 1,070 (200 census of population) and 110 households out of which only one was female headed. The average village household size was 9.7. The village covers an area of approximately 230 hectares out of which about 20 percent is under forest/virgin lands, about 4 percent is marginal land and another 2 percent is under water bodies. The remaining 74 percent is under cultivation and housing (about 1.5 percent).

No cultivated land is under any form of irrigation. Rainfall in the past three seasons has been above average in 2001, just average in 2000 and below average in 1999. The village in our estimation has an average potential for expanding agricultural production.

Asitey is regularly serviced by road transport, particularly on its market days (Wednesdays and Saturdays) as it is situated only 1 km. away from the nearest all-weather road. It is also only 3 km. away from the nearest permanent crop outlet and about 1.5 km. away from permanent telephone connection. On the whole the village appears to have average access to markets.

3.2.3 Apaa

Apaa is one of the two communities that were surveyed in the Begro district of the Eastern Region. The population of Apaa was 657 (2000 census of population). It has 113 households scattered in a land area of about 8 sq. kms. It has a lot of water bodies that cover about 10 percent of the land area. Land under cultivation is about 65 percent while about 10 percent is under forest/virgin land. Marginal lands are mainly in the hilly areas and account for about 3 percent of the land area while the remaining 12 percent will be under fallow and housing.

No cultivated land is under irrigation despite the numerous water bodies in the community. This is probably due to the fact that rainfall has been adequate to support agricultural activities. In fact, in the past three seasons, rainfall has always been above average. Most of the land is on flat terrain or gentle slopes and the community has a good potential for growth in agricultural production.

The village is not served by regular public transport and only taxis go there regularly and mini vans do so on hire to cart farm produce from the nearest all-weather road that is about 7 km. away (Begoro). While the nearest crop outlet and permanent market is also about 7 km. away, the nearest permanent or mobile telephone connection is about 47 km. away in Koforidua (the regional capital). In spite of its good potential for agricultural production, the village is marginal in terms of market access.

3.2.4 Gyedi (Begoro)

Gyedi, a suburb of Begoro has 123 households of which only 4 are female headed. The community had a population of 860 (2000 census of population). It has an estimated land area of about 240 hectares. About 40 percent of the land is under cultivation while 35 percent is under fallow/pasture. Also, about 18 percent is under housing while another 5 percent can be classified as marginal land and about 2 percent is estimated as water bodies. Only 2 hectares of the land is irrigated in the dry season for vegetable production that is managed by individual households.

Rainfall is quite erratic in this farming community. In the past three seasons, rainfall has been below average in 2001 and just average in both 2000 and 1999. The village is well endowed with soils suitable for cultivation and, on the whole, has a good potential for agricultural production.

Gyedi is well serviced by regular transport since it is a suburb of the district capital (Begoro). Strangely enough, the district capital does not serve as a permanent crop and market outlet for the community. Instead, Obuoho that is 7 km. away serve these purposes. The nearest permanent or mobile telephone connection is about 40 km. away in Koforidua (the regional capital). On the whole the community has good market access.

3.2.5 Gaani

Gaani in the Kasena-Nankani district of the Upper East Region had a population of 415 (2000 census of population). It has an estimated 93 households of which about 15 are female headed. Gaane has a land area of about 24 sq. km. of which about 75 percent is under cultivation while the remaining 25 percent is under fallow/pasture. None of the land under cultivation is irrigated. Rainfall in the past three seasons has been above average in 2000 and below average in 2001 and 1999. Most of the land is on flat terrain or gentle slopes and it has an average potential for agricultural growth.

The village is serviced by regular transport and it is located near an un-tarred but all-weather road. The distance of the village from the nearest permanent crop outlet and market is about 7 km. On the other hand, the distance to the nearest permanent electricity and telephone connection is about 2 km. Like the other villages, there were no

contract/outgrower schemes encountered. On the whole, however, the village has good market access.

3.3.6 Doba

Doba in the Kasena-Nankani district is a big farming community with a total population of 2,999 (2000 census of population). It has an estimated 415 households of which about 30 are female headed. The average household size is about 7.2 persons and population density of 20 people per sq. km. in the area.

The village covers a land area of 10 km. by 15 km. (150 sq. km.). About 93 percent of the total land is under cultivation while only 5 percent is under fallow/pasture. The remaining 2 percent is divided equally between water bodies and virgin land. Only about 0.5 percent of the land is irrigated in the dry season for the cultivation of vegetables by individual households. For the past three seasons, rainfall has been below average in 2001 and 1999 but above average in 2000. The village is averagely endowed in terms of suitable soils for cultivation. Most of the land is on flat terrain or on gentle slopes.

The village is situated along an international road linking Ghana with Burkina Faso and is regularly serviced by public transport. The village is about 5 km. away from a permanent crop outlet (Navrongo) and 25 km. away from a permanent market (Bolgatanga). It is also 5 km. away from permanent electricity and telephone connections. The village has good market access for agricultural produce.

3.3.7 Zanlerigu

Zanlerigu is in the Bolgatanga district of the Upper East Region. It has a population of 1,647 (2000 census of population), and an estimated 238 households of which about 25 are female headed. The average household size was 6.9 persons. It stretches about 4 km. x 10 km. (40 sq. km.) with population density of 41 persons per sq. km. in the area. About 90 percent of the land is under cultivation, 5 percent is marginal land and the remaining 5 percent is under other uses. No cultivated land is under irrigation. Rainfall has been above average in 2000, just average in 1999 and below average in the most recent season, 2001. Most of the land is mixed and made up of some steep slopes, gentle slopes and some flat terrain. The village has average potential for agricultural production.

The village is situated along an un-tarred road that is useable throughout the year. The nearest permanent crop outlet is 3km. away from the village while a permanent market is 15 km. away. The distance of the village from both permanent electricity and telephone connection is about 7 km. On the whole the village has average potential for increased agricultural production.

3.3.8 Winkogo

Winkogo is one of the large villages in the survey. It has a population of 3,798 (2000 census of population) and an estimated 485 households of which about 50 are female headed. The average household size is 7.8 persons. The area has a population density of about 152 persons per sq. km. The village covers an area of about 25 sq. km. of which about 59.5 percent is under cultivation, 30 percent is marginal land, 10 percent is under fallow/pasture while about 0.5 percent is under water bodies. None of the cultivated land is under irrigation. In the past three seasons, rainfall has been above average for 2001 and 1999 and just average in 2000. Most of the land is mixed and made up of steeply sloping hills and flat terrain. The agricultural potential of this village appears to be low given the mixed terrain and high population density.

The village is about 5 km. off an all weather road and is not regularly serviced by public transport. The distance to the nearest permanent crop outlet and market as well as telephone connection is about 14 km. (Bolgatanga). The village appears to be marginal in terms of market access.

3.4 Summary of Issues of Intensification at Village Level

The first major issue for agricultural development is the adequacy of water supply for agricultural activities, particularly for the growth of plants and animals. It is for this reason that rainfall is extremely important for food crop intensification. Table 3.1 confirms that for a majority of the villages in the sample, rainfall was below average in the most recent season, just average in the season before the most recent one and above average two seasons ago. This is an indication of fluctuations in rainfall conditions in the study villages, hence the need for supplementary irrigation in the communities.

Table 3.1 Rainfall Conditions (Valid Percentage of Communities)

Condition	Most Recent Season	Before Most Recent Season	Two Seasons Ago
Above Average	25.0	25.0	50.0
Average	12.5	62.5	25.0
Below Average	50.0	12.5	25.0

Source: Computed from Village Diagnosis Data

Table 3.2 Soil Natural Fertility and Suitability for Cultivation

Endowment	Valid Percentage
Well Endowed	25.0
Average	62.5
Less Endowed	12.5

Source: Computed from Village Diagnosis Data

On the issue of the general suitability of soils in terms of natural fertility, only 25% of the selected communities were well endowed while a majority (62.5%) was just averagely endowed as shown in table 3.2. Thus, with the application of modern technological inputs, most of the study villages are likely to be successful in food crop intensification.

Table 3.3 Nature of Farm Sites and Agricultural Potential

Farm Site/Agric. Potential	Valid Percentage
Farm Site:	
Most cultivated land on steep slopes	12.5
On Mixed topography	62.5
On Flat or gentle slope	25.0
Agric. Potential:	
Low agricultural potential	12.5
Average potential	62.5
Good potential	25.0

Source: Computed from Village Diagnosis Data

Related to the suitability of soils for cultivation the nature of the site for if soils are suitable and the site is unsuitable, then the potential for agriculture will be severely reduced. In table 3.3, a majority of cultivated lands in the selected villages are sited on mixed topography, that is neither on steep slopes nor on flat or gentle slopes. Thus given the fact that soils are averagely endowed and cultivated lands are also sited on mixed topography, there is little wonder that the agricultural potential of the selected villages is also average as indicated in 62.5% of cases in table 3.3.

A number of services to and within the villages (table 3.4) are also important pointers to the nature of agricultural development and food crop intensification in the study villages. Most of the villages (87.5%) are served by regular public transport, and indication that movement of people and agricultural products and services may not be a serious problem in most of the study villages. It is important to note from table 3.4 that contract farming or out-grower schemes are completely absent in the communities studied. It is an area worth examining by policy makers as it is an important source of incentive for agricultural development

Table 3.4 Services to the Communities (Valid Percentages)

Nature of Service	Yes	No
Regular public transport	87.5	12.5
Contract/Outgrower farming	0.0	100.0
Public food relief	37.5	62.5
Public price support/subsidies	0.0	100.0
Extension for food crops	25.0	75.0
Availability of modern farm inputs	50.0	50.0
Organization of small farmers	62.5	37.5

Source: Computed from Village Diagnosis Data

From the table 3.4 it can be noted that only 37.5% of the communities have at any time received some public food relief caused by local food shortages. Thus, for a majority of the villages (62.5%) one can assume that they are largely self-sufficient in staple food crop production. Conspicuously absent in the communities are public price support or input subsidies directed at food crops as indicated for 100% of the study villages (table 3.4). On the issue of extension services for the communities in the study, 75% of them do agree that they receive such services for food crops. Thus, if the extension messages are right they will go a long way to assist in food crop intensification. But then intensification goes with the use of modern inputs and table 3.4 indicates that only one-half of the communities agree that modern inputs are readily available in their villages at the right time and in the right quantities. Also, for small farmers to benefit from extension and other agricultural development processes, they ought to be well organized. Such organizations do exist in 62.5% of the communities.

Land issues are crucial to the intensification of food crop production. The acquisition of land by newly formed households, the means for increasing farm size and the availability of land for cultivation are all important in a dynamic process of agricultural development. In table 3.5, the allocation of family land and the hiring or renting of land to newly formed households are the best bets in the acquisition of land by such families as indicated by 37.5% of the villages for each of the two. The other communities either allocate land not previously cultivated or inherited land already under cultivation to newly formed households.

Table 3.5 Land Acquisition by newly formed households

Type of Acquisition	Valid Percentage
Allocated land not previously cultivated	12.5
Allocated family land	37.5
Inherit land already under cultivation	12.5
Hire/Borrow/Rent land	37.5

Source: Computed from Village Diagnosis Data

Table 3.6 Major means of increasing farm size and title to land

Means	Valid Percentage
Clearing virgin land	12.5
Cultivating communal pasture/grazing land	37.5
Renting/Borrowing/Hiring	50.0
Small-scale farmers with title to land	12.5

Source: Computed from Village Diagnosis Data

For established households, expansion of farm size sometimes becomes necessary as agriculture and farm business develops. In this case, one-half of the study villages indicated that the best means of expansion is through renting. In the case of 37.5% of the villages, available communal pasture or grazing land could be put into cultivation (table 3.6).

It is significant to note from table 3.6 that only 12.5% of the communities indicated that some small-scale farmers have title to land. Lack of title to land generally poses a threat to the intensification of food crop production, particularly as the gestation period for most crops is short and a farmer can easily be thrown out of the land after harvest. Under such conditions, there is no incentive to invest in land improvements.

Table 3.7 Availability of Land for cultivation

Availability	Valid Percentage
Fields permanently cultivated/land frontier exhausted	66.7
Land frontier still open but can close next	16.7
Land frontier open, no acute pressure	16.7

Source: Computed from Village Diagnosis Data

From the information provided it appears that land is generally not available for cultivation in the study villages. Indeed this is confirmed by 66.7% of the villages (table 3.7) that indicated that the land frontier is completely exhausted as all fields are permanently cultivated. No acute pressures on land was indicated by only 16.7% of villages in the study. Given the fact that most land holdings are small in size any attempt at expanding the size of farm holdings may require some land consolidation which might in turn lead to landlessness.

3.5 Women's Participation

In all the villages women's participation in agriculture was not in doubt. There are no problems with land tenure with respect to gender. Females have equal access to family land. The difference however is the nature of farm enterprises cultivated by males and females. Males are engaged in cassava and maize cultivation more than females while female farmers are found more in the cultivation of vegetables. This is hardly surprising since it is the duty of the male to provide the staple food for household consumption. Each is also responsible for the major decisions about their enterprises.

However, in some villages, for example Gaani in the Kasena-Nankane district, it was contended that most of the farm work in the village was done by women. There is no wonder therefore that the only farmer organization in that village is for women. They are organized into groups of between 10 and 20 and receive credit from IFAD and World Neighbours (an NGO). In Doba in the same district it was also contended that the women in this village generally do better than their male counterparts in farming even though there are no special interventions targeting women.

In Zanlerigu in the Bolgatanga district there were complains of discriminatory practices. The females in particular have access to credit since there are interventions targeting women. Indeed the men complained that NGOs working in the village are only interested in women. As such there are female farmer groups that get some help from NGOs.

CHAPTER FOUR

HOUSEHOLD SAMPLE CHARACTERISTICS

4.1 Introduction

In this section is discussed the sample size, villages, districts and regions where farmers were interviewed. Also discussed in this section are household size, gender of household head and also that of the farm managers, their age distribution, longevity of the farm households and the level of formal education of the farm managers.

4.5 Sample Size and Distribution

The number of farmers who were randomly selected and interviewed in the survey was 416. They were drawn from eight villages, two each in the Fanteakwa and Manya Krobo districts in the Eastern Region, and Kasena-Nankani and Bolgatanga districts in the Upper East Region. A total of 111 farmers were interviewed in the Fanteakwa district and 95 in the Manya Krobo district. In these two districts the major crops grown are maize and cassava. In the Upper East region where the major crops grown are rice and sorghum, 106 farmers were interviewed in the Kassana-Nankani district and 104 farmers in the Bolgatanga district (Table 4.1).

Table 4.1 Distribution of Sample By Region, District and Village

Region	District	Town/Village	Sample Size	Percentage of Total	
Eastern	Fanteakwa	Begoro-Gyedi	63	15.1	
		Apaah	48	11.5	
Upper East	Manya Krobo	Akatawia	45	10.8	
		Asitey Yukunor	50	12.0	
	Kassana-Nankani	Gaane	55	13.2	
		Doba	51	12.3	
	Bolgatanga	Zanlerigu	52	12.5	
		Winkogo	52	12.5	
All	2	4	8	416	100.0

Source: From the Survey

4.6 Household Size and Gender of Head

The Ghana Population and Housing Census conducted in 2000 gave the average household size in Ghana as 5.1 persons. In the Eastern Region and Upper East regions, the average household sizes were 4.6 persons and 7.2 persons, respectively. While the average household size in the Eastern Region was relatively small, below the national average by 0.5 percentage points, that of the Upper East region was quite large, exceeding the national average by 2.1 percentage points.

It is interesting to note that in the Akatawia village, the chief kept an up to date records of the 90 households there, including the number of persons, gender and age. This provided the opportunity to analyse the household size in this village (Table 4.2). The household size ranged widely from one to 55 people. Five or 5.6 percent of the households had single persons. In three of them, they were females and in the remaining two, they were males. In another 20 percent of the households, the size ranged from 2 to 4 people, below the average in the Eastern region. The households with 5 to 10 people formed the highest proportion of 36.7%. Cumulatively, 62.2% of the households had not more than 10 people and in the remaining 37.8% of the households, the size exceeded ten people. In 22.2% of the total households, the size ranged from 11 to 15 people and in 14.5% there were 16 to 29 people. The only household with more than 29 people had 55 people (Table 4.2).

Table 4.2 Distribution of Household Size in Akatawia Village

Size (No. of People)	Frequency	Percentage	Cumulative %
Less than 5	23	25.5	25.5
5-10	33	36.7	62.2
11-15	20	22.2	84.4
16-20	8	8.9	93.3
21-29	5	5.6	98.9
30 and more	1	1.1	100.0
Total Households	90	100.0	

Source: From the files of Chief of Akatawia

4.7 Gender of Household Head and Farm Manager

The household head and farm manager were in many instances wrap up in the same person. They were predominantly male, 85.6% of the household heads and 83.2% of the farm managers. The remaining 14.4% of the household heads and 16.8% of the farm managers were female (Table 4.3).

Table 4.3. Gender of Head of Household and Farm Manager

Gender	Household Head		Farm Manager	
	Freq	%	Freq.	%
Male	356	85.6	346	83.2
Female	60	14.4	70	16.8
Both	416	100.0	416	100.0

4.8 Age of Household Head and Farm Manager

The ages of the household heads as well as the farm managers were widely distributed, from 18 years to 95 years. Nearly one-fifth (18.8%) of the household heads were over 60 years. This is the age group of retired public sector employees in the country. On the other end of the scale, a little more than one-fifth (22.1%) of the household heads were not more than 30 years (Table 4.4). The household heads in the 31 to 40 years age group were also nearly one-fifth (19.6%). Those whose ages were over 40 years to 50 years were relatively more (24.2%), nearly one quarter of the sample. Finally, the household heads in the age group of 51 to 60 years were also about one-fifth (21.0%) of the sample.

The proportion of the farm managers who were over 60 years of age was relatively smaller (14.9%) than the household heads in this age group (18.8%). On the other hand, the farm managers whose ages were 30 years and below (26.1%) were relatively more than the household heads in this age group (Table 4.4). Generally however, the age distribution of the farm managers in terms of magnitude of proportions was quite similar to that of the household heads.

Table 4.4 Distribution of Age of Household Head and Farm Manager

Age Group (Years)	Head of Household			Farm Manager		
	Freq.	%	Cum. %	Freq.	%	Cum. %
Less than 25	23	5.6	5.6	24	5.8	5.8
26-30	45	10.9	16.5	60	14.5	20.3
31-35	34	8.2	24.7	40	9.6	29.9
36-40	47	11.4	36.1	48	11.6	41.5
41-45	45	10.9	47.0	48	11.6	53.1
46-50	55	13.3	60.3	51	12.3	65.4
51-55	48	11.6	71.5	47	11.3	76.7
56-60	39	9.4	81.3	35	8.4	85.1
Over 60	78	18.8	100.0	62	14.9	100.0
Total	414	100.0		415	100.0	

Source: From the survey

The lower percentage of farmers below 25 years in Table 4.4 could, perhaps, be taken as an indication of the age at which people can establish themselves as independent farmers. The higher number of farm managers in the 26 to 30 years age group could also be an indication of a gradual transfer of the farm and of land from the older to the younger generation.

4.6 Longevity of Farm Household

A few of the farm households (5.3%) were set up before 1960. Those which were set up in the 1960s were also not many (8.0%). Most of the farm households have been set up in the 1990s (39.4%), followed by those set up in the 1980 (25.4% and then the 1970s (19.1%). Cumulatively, nearly two-thirds of the farm households were set up in the last two decades (Table 4.5). The proportions by period of establishment of farm households indicate that old farm households are disappearing and being replaced by new ones.

Table 4.5 Longevity of Farm Household

Period Household Formed	Freq.	%	Cum %
Before 1950	2	0.5	0.5
1950-59	17	4.3	4.8
1960-69	32	8.0	12.8
1970-79	76	19.1	31.9
1980-89	101	25.4	57.3
1990-99	157	39.4	96.7
2000 and Beyond	13	3.3	100.0
Total	398	100.0	

Source: From the survey

4.9 Formal Education of Farm Managers

Most of the farm managers were not very well educated. Nearly two fifths of them had no formal education and were mostly illiterate who could not read and write in any language.

Table 4.6 Number of Years of Formal Education of Farm Managers

No of Years	Level of Education	Frequency	%
Nil	Nil	166	41.5
1 – 6	Primary	79	19.7
7 – 10	Middle / Junior Secondary	104	26.0
11 – 15	Senior Secondary/ Voc./Tech. Post-Secondary, etc.	44	11.0
Over 15	Tertiary- Polytech/ University	7	1.8
All		400	100.0

Source: From the survey

Those with the formal education levels classified as basic in the country (primary / middle / junior secondary) formed 45.7%. Those with educational levels beyond the basic, formed the remaining 12.8% of the sample (Table 4.6).

4.10 Main Occupation

An issue that borders on the proper management of the farm by households is the main occupations of the head of households and the farm manager. A household head who does no work is likely to be too old to work or does not want to interfere with the day to day management of the farm while a farm manager who does not work may be concentrating on the administrative and procurement activities of the farm, activities that are essential for the profitable management of the farm. In the survey, only 2.7% and 1.0% of household heads and farm managers did not work (table 4.7). It is hardly surprising that only a few of them did not work since most farmers in the survey districts and for that matter villages are small-scale farmers.

Table 4.7 Main Occupations of Household Head and Farm Manager (Valid % in Parenthesis)

Occupation	Household Head	Farm Manager
Does not work	11 (2.7)	4 (1.0)
Farming	386 (94.1)	395 (96.3)
Non farm work	13 (3.2)	11 (2.7)

Source: Computed from Survey Data

Being small-scale farmers where the available labour of everybody is important, the high proportion of household heads (94.1%) and farm managers (96.3%) in table 4.7 who are farmers is to be expected. For the few household heads (3.2%) and farm managers (2.7%) whose main occupations were outside farm work, it is just possible that these are professionals in the communities who also indulge in part-time farming. This is a normal practice with professionals such as teachers, extension agents and others who are posted to rural areas.

CHAPTER FIVE

FOOD CROP ENTERPRISES AND LAND USE

5.1 Introduction

In this section is highlighted the farm enterprises operated by the farmers interviewed, including farm size, quality of land and source of water for plant growth..

5.2 Food and Other Crop Enterprises

In 2001, the most recent year, the number of farmers who operated maize enterprises reduced as compared to the base year, while the farmers who operated other crop enterprises increased (Table 5.1). The farmers who operated the maize enterprises reduced by 1.5%. For cassava, the proportion of the farmers increased by 4.1%, rice by 5.3% and sorghum by 6.7%. For other food crops and vegetables, the proportion of the farmers increased by 3.9% in 2001 as compared with the base year. The proportion of the farmers increased the highest for non-food cash crops by 27.1%. The data indicate that a few farmers switched from maize enterprise to other crop enterprises or discontinued farming altogether between the base year and the current year (2001).

Table 5.1 Farm Enterprise Base Year and Current Year

Enterprise	Last Year (2001)		Base Year		Percentage change 2001/Base year
	Freq.	%	Freq.	%	
Maize*	203	98.5	206	100.0	-1.5
Cassava*	203	98.5	195	94.7	4.1
Sorghum**	208	99.0	195	92.9	6.7
Rice**	178	84.8	169	80.5	5.3
Other Food crops/Vegetables***	350	84.1	337	81.0	3.9
Non-Food Cash Crops***	61	14.7	48	11.5	27.1

Source: From the survey

- Percentage based on sample in Eastern Region
- ** Percentage based on sample in Upper East Region
- *** Percentage based on total sample

5.3 Cropping Combination

Many of the farmers practiced intercropping and those who cultivated crops in pure stand were relatively few (Table 5.2). However, for rice all the farmers indicated they cultivated in pure stand. For maize, only about one-fifth (21.3%) of the farmers cultivated

in pure stand. The proportion was relatively higher for sorghum (31.0%) and cassava (34.3%).

Table 5.2 Cropping Combination*

Base Crop	Pure Stand		Intercropped	
	Freq.	%	Freq.	%
Maize	43	21.3	159	78.7
Cassava	68	34.3	130	65.7
Sorghum	63	31.0	140	69.0
Rice	178	100.0	0	0.0

Source: From the survey

* Based on valid responses

5.4 Quality of Farmland

The majority of the maize and cassava farmers who were interviewed in the forest zone indicated that the quality of their farmlands (soils) was good; while the majority of the rice and sorghum farmers in the northern savanna zone ranked their farmlands as average quality. Less than 10% each of the farmers in the forest and savanna zones indicated that the quality of their farmlands (soils) was poor (Table 5.3). The assessment was made in comparison with the farmlands in their respective areas. It should be noted that assessment of the quality of land by farmers themselves is purely subjective and unscientific and is likely to lead to results that may seem unreliable.

Table 5.3 Farmland Quality Based on Crop Enterprise

Crop Enterprise	Good Quality		Average Quality		Poor Quality		Total	
	Freq	%	Freq.	%	Freq.	%	Freq.	%
Maize	93	46.2	89	44.3	19	9.5	201	100.0
Cassava	97	49.0	88	44.4	13	6.6	198	100.0
Sorghum	49	24.4	139	69.1	13	6.5	201	100.0
Rice	37	21.3	121	69.5	16	9.2	174	100.0
All	276	35.7	437	56.5	61	7.8	774	100.0

Source: From the survey

5.8 Area of Crops Grown under Irrigation

The use of irrigation to provide the needed moisture for plant growth was not an important feature in crop production in the districts surveyed. No farmer cultivated cassava under irrigation and for maize, only 3.5% of the farmers used it. In the more drier northern savanna zone, only 2% of the farmers who cultivated sorghum used irrigation to supplement rain water (Table 5.4%). The proportion was much higher for rice with 6.3% of the farmers indicating the use of irrigation.

For the cultivation of other crops, the general picture was not very different. Only a few farmers used irrigation but as a proportions, they were relatively higher (Table 5.4).

Table 5.4 Area of Crop Grown Under Irrigation

Crop	Farmers Using Irrigation	
	Freq	%
Maize	7	3.5
Cassava	0	0.0
Sorghum	4	2.0
Rice	26	6.3
Other Food Crops	5	45.4
Vegetables	4	36.4
Non-Food Crops	2	18.2

Source: From the survey

5.9 Number of Crops

Among the farmers who irrigated their farms, only about 43.2% used the facility to grow more than one crop in a year (Table 5.5). The majority of the farmers who used irrigation only produced one crop in a year. The facility was therefore used to supplement rain water in the main growing season.

Table 5.5 Number of Times Crop Grown under Irrigation in a Year

Crop	Freq.	%
Maize	6	85.7
Sorghum	2	50.0
Rice	8	32.0
All	16	

Source: From the survey

5.7. Other Use of Land

After cultivating the major crops, 96.5% of the maize farmers indicated that the land was used for other crops. This is a clear case of intercropping the maize crop with cassava and after harvesting the maize in three to four months, the cassava continues to grow on the land for several more months before it is ready to harvest. For sorghum land, 50% of the farmers used it to grow other crops and the remaining 50% use it for grazing (Table 5.6). For the rice land, a high proportion of the farmers (54.1%) reported that land has no specific use after harvesting the crop. The proportion of rice farmers who used their lands for growing other crops after harvesting the rice was 29% and the remaining 16.7% used it for grazing.

Table 5.6 Other Uses of Land Besides Major Enterprise

Enterprise Farmer	No Specific Use		For Other Crops		For Grazing		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Maize*	5	2.5	194	96.5	2	1.0	201	100.0
Sorghum	0	0.0	2	50.0	2	50.0	4	100.0
Rice	13	54.1	7	29.2	4	16.7	24	100.0

Source: From the survey

* Maize is invariably grown intercropped with cassava

5.8 Farm Size

The sizes of farm in the areas surveyed have undergone both positive and negative changes in recent years, while for many farmers, the farm sizes remained the same (Table 5.7). For maize and cassava that are cultivated mainly in the forest zone, more farmers (37.2%) reported decreases in farm size than those who reported increase (32.5%). Those who reported no change in the farm size averaged 27.1%.

The picture was not consistent for rice and sorghum grown mainly in the northern savanna zone. However, for both crops, over 50% each of the farmers reported that the farm size had not changed. For sorghum, 21% of the farmers reported an increase in the farm size while the remaining nearly 17% reported a decrease. The picture was the reverse for rice where the proportion of farmers who reported a decrease in the farm size was higher (17.3%) than those who reported an increase (16.0%) (Table 5.7). Though no significance test is done, the difference in these proportions is so small that it is not likely to be statistically significant.

Table 5.7 Recent Change in Farm Size

Crop Enterprise	Did Not Grow		No Change		Increased		Decreased		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Maize	5	2.7	50	26.9	62	33.3	69	37.1	186	100.0
Cassava	6	3.4	49	27.4	57	31.8	67	37.4	179	100.0
Sorghum	15	7.7	106	54.4	41	21.0	33	16.9	195	100.0
Rice	15	7.3	93	57.4	26	16.0	28	17.3	162	100.0
All	41	5.7	298	41.3	186	25.8	197	27.3	722	100.0

Source: From the survey

The farmers who reported that they did not grow the respective crops probably indicate that some farmers moved in and out of the crop enterprises periodically.

5.9 Area Cultivated by Crop

The farm sizes of the sampled farmers were predominantly small, hardly exceeding one ha. This is consistent with the general situation in the country. The mean farm size was marginally larger for maize and showed a considerable increase in the most recent season (2001) compared with the two previous seasons (Table 5.8). The mean size of cassava and rice farms were stable at 0.9 ha and 0.6 ha, respectively, in the three seasons. In the case of sorghum, the mean farm size increased in the previous season (2001) and decreased in the current season (2001).

Table 5.8 Area Cultivated by Crop (Ha)

Crop	Most Recent Season			Season before recent			Two Seasons Before		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
Maize (N=206)	0.0	16.0	1.8	0.0	10.0	1.1	0.0	19.0	1.1
Cassava (N=195)	0.1	8.8	0.9	0.0	8.0	0.9	0.0	8.4	0.9
Sorghum (N=202)	0.1	2.4	0.8	0.0	10.0	1.0	0.0	8.0	0.8
Rice (N=177)	0.1	3.2	0.6	0.0	8.0	0.6	0.0	9.0	0.6

Source: From the survey

The fact that production has generally gone up may be attributed largely to the opening up of the farming area in terms of the provision of road infrastructure. Good roads may have helped a lot in the marketing activities for the crops, thus serving as an incentive to increases in production.

CHAPTER SIX

DYNAMICS OF FOOD CROP PRODUCTION, TECHNOLOGY AND INPUT USE

6.11 Introduction

In this section is presented a discussion on the information gathered on dynamics of production, utilization of the produce, production inputs and crop yield per hectare, etc.

6.12 Dynamics of Production

The trends in the output of the selected food crops in the three seasons are shown in Table 6.1. Even though no noticeable change occurred in the minimum output of the selected crops, the maximum output increased over the period; steadily for maize and in a fluctuating fashion for the other crops. On average, the production of the crops increased steadily except for rice whose average output increased in a fluctuating manner.

Table 6.1 Output of Selected Food Crops (Kg)

Crop	Recent Season (2001)			Previous Season			Two Previous Season		
	Min.	Max.	Mean	Min.	Max.	Mean	Min.	Max.	Mean
Maize (N=176)	100	9,000	911	100	7,000	843	100	6,000	796
Cassava (N=196)	0	21,840	3,728	0	32,760	3,302	0	18,200	3,078
Sorghum (N=208)	27	4,469	409	0	4,251	367	0	4,360	360
Paddy Rice (N=177)	0	3,690	512	0	3,854	458	0	3,280	483

Source: From the survey

In Table 6.2 is the assessment of the farmers perception of production trends in the current season (2001) as compared to the base year (when they started producing the respective crops). A rather small proportions of the farmers perceived no significant change in the output of the respective crops produced. The proportion of farmers who perceived no significant change in their outputs was smallest for maize (4.8%), followed by cassava (6.8%). The proportions were relatively high for rice (22.5%) and sorghum (19.1%). A reverse trend is observed in the proportions of farmers who perceived a decrease in their outputs over the period. The proportion was highest for maize (51.6%), followed by cassava (46.1%), sorghum (30.9%) and rice 92.5% in that order.

Table 6.2 Trends in Food Output, Comparing Base Season and Most Recent Season

Crop	Did not Grow		No Change		Increased		Decreased		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Maize	0	0.0	6	4.8	55	43.6	65	51.6	126	100.0
Cassava	8	4.2	13	6.8	82	42.9	88	46.1	191	100.0
Sorghum	12	6.2	37	19.1	85	43.8	60	30.9	194	100.0
Paddy Rice	18	10.6	38	22.5	75	44.4	38	22.5	169	100.0

Source: From the survey

The proportions of farmers who experienced increased output of the respective crops over the period were not very different (Table 6.2). Again the perceived increases in crop output over the period underlines the fact that policies may have had positive effects in the production of these food crops. In particular, observed improvements in the quantity and quality of road infrastructure in the study areas may have contributed immensely in the disposal of food surpluses and hence serving as an incentive to increased production.

6.13 Utilization of Produce

Indications are that maize and cassava are currently produced mainly for the market than sorghum and rice. On average, 65% of the maize and 63.9% of the cassava produced were sold and compared with 34.7% of the sorghum and 35% of the rice that were sold (Tables 6.3a and 6.3b). It can be suggested that maize and cassava are produced primarily for market, and subsistent production dominates in the sorghum and rice enterprises. For sorghum and rice, 52.3% and 43.9%, respectively, of the output were consumed by the farm households as compared to 17.7% of maize and 22.2% of cassava.

Table 6.3a Distribution of Produce by Utilization (Kg)

Crop	Home Consumption			Labour Payment			Sale			Others		
	Min	Max	Mean	Min.	Max.	Mean	Min	Max	Mean	Min.	Max.	Mean
Maize (N=191)	0	1,000	160	0	1,300	115	0	8,500	588	0	500	41
Cassava (N=190)	0	3,640	846	0	4,095	383	0	18,200	2,432	0	3,640	143
Sorghum (N=192)	0	4,251	289	0	545	45	0	1,090	192	0	327	27
Rice (N=164)	0	902	227	0	1,230	63	0	2,050	181	0	738	46

Source: From the survey

Table 6.3b Distribution of Produce by Utilization (Mean Percentage)

Crop	Home Consumption	Payment for Labour	Sale	Others	Total
Maize	17.7	12.7	65.0	4.5	100.0
Cassava	22.2	10.1	63.9	3.8	100.0
Sorghum	52.3	8.1	34.7	4.9	100.0
Rice	43.9	12.2	35.0	8.9	100.0

Source: From the survey

In general, less than one-quarter each of the output of the selected crops were used for purposes other than selling and home consumption.

6.14 Planting Materials

In absolute terms, the number of farmers using improved planting materials currently as compared with the base year has increased for maize and cassava enterprises and decreased for sorghum and rice enterprises (Table 6.4). In spite of this, yields of both maize and cassava seem to be going down, suggesting that the complimentary inputs such as fertilizer and weedicides that are required for optimum yields may not be used in sufficient quantities.

Table 6.4 Planting Material Used by Farmers: Base Year and Current Year (2001)

Crop	Traditional		Improved		Hybrid		QPM		Total	
	Freq.	%	Freq.	%	Freq	%	Freq.	%	Freq.	%
Maize										
Current	4	20.0	122	61.0	54	27.0	0	0.0	180	100.0
Base Year	159	85.0	17	9.1	11	5.9	0	0.0	187	100.0
Cassava										
Current	161	79.3	42	20.7	0	0.0	0	0.0	203	100.0
Base Year	173	94.0	11	6.0	0	0.0	0	0.0	183	100.0
Sorghum										
Current	201	97.1	5	2.4	1	0.5	0	0.0	207	100.0
Base Year	182	96.8	2	1.1	4	2.1	0	0.0	188	100.0
Paddy Rice										
Current	116	67.4	56	32.6	0	0.0	0	0.0	172	100.0
Base year	114	73.5	41	26.5	0	0.0	0	0.0	155	100.0

Source: From the survey

The proportion of farmers who used improved and hybrid planting materials currently increased for maize, cassava and rice when compared with the base year. For maize, it increased from 15% in the base year to 80% currently (2001), a substantial increase of 65 percentage points. For cassava, the proportion of farmers who used improved planting materials were only 6% in the base year and increased to 20.7%, an increase of 14.7 percentage points. For rice, the proportion increased from 26.5% in the base year to 32.6% currently, an increase of 6.1 percentage points. Sorghum is the only crop for which the proportion of farmers who used improved/hybrid seed decreased from 3.2% in the base year to 2.9%, currently, a marginal decrease of 0.3 percentage points (Table 6.4).

6.15 Application of Inorganic Fertilizers

The information on the application of inorganic fertilizers are presented in Table 6.5. The information on cassava is strange as it does not conform to the fact that most farmers in the country do not use fertilizers directly in the production of the crop. It is therefore difficult to analyse the information as it is. The information on the other three crops are reasonable. The information show that a high proportion of farmers do not use inorganic fertilizers in producing any of the three crops, 82.2% in the case of sorghum, 77.2% of maize farmers and 64.1% of rice farmers. In general, fertilizer application is relatively more on rice cultivation than the other two crops. Among the maize farmers who apply fertilizers, nearly 60% indicated that the application has decreased and for rice and sorghum farmers the proportions were 45% and 25% respectively. The proportion of the farmers who have increased the application of fertilizers was 34% for sorghum, 26% for maize and 25% for rice. For 41% of the farmers cultivating sorghum and used fertilizers, there has been no significant change in the application. The proportions of farmers growing rice and maize indicated no change were 30% and 15%, respectively. Generally, however many farmers decreased the application of inorganic fertilizers than those who increased or sustained the application.

Table 6.5: Changes in Volume of Inorganic Fertilizers Application Comparing Current and Base Seasons

Crop	No Application		No Change		More Then		Less Then	
	Freq.	%	Freq	%	Freq.	%	Freq.	%
Maize (N= 149)	115	77.2	5	3.4	9	6.0	20	3.4
Cassava (N= 167)	52	31.1	58	34.7	11	6.6	46	27.5
Sorghum (N= 180)	148	82.2	13	7.2	11	6.1	8	4.4
Paddy Rice (N=156)	100	64.1	17	10.9	14	9.0	25	16.0

Source: From the survey

6.16 Application of Pesticides

The application of pesticides in the production of the selected crops is much lower than the application of inorganic fertilizers even though the proportion of farmers have

increased when the current period is compared to the base year, except in the production of cassava where the proportion decreased (Table 6.6). The use of pesticides is not an important input in the production food crops in the country.

Table 6.6 Application of Pesticides Comparing Current Year and Base Year

Crop	Current Season		Base Season	
	Freq.	%	Freq.	%
Maize (N=190)	28	14.7	11	6.3
Cassava N(= 196)	9	4.6	19	10.4
Sorghum (N= 200)	5	2.5	1	0.5
Rice (N=175)	18	10.3	8	5.1

Source: From the survey

6.17 Method of Land Preparation

A very high proportion (approximately 99%) of the farmers growing maize and cassava used the traditional hoes and cutlasses for land preparation. In the case of sorghum, the proportion of farmers who used animal drawn implements increased as compared to those

Table 6.7 Equipment for Land Preparation

Crop	Hoe/Cutlass		Animal Drawn		Tractor		Other		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Maize										
Current	198	99.0	0	0.0	2	1.0	0	0.0	200	100.0
Base year	182	98.9	0	0.0	2	1.1	0	0.0	184	100.0
Cassava										
Current	173	98.9	0	0.0	2	1.1	0	0.0	175	100.0
Base year	177	98.9	0	0.0	2	1.1	0	0.0	179	100.0
Sorghum										
Current	76	36.8	118	57.0	9	4.3	4	1.9	207	100.0
Base Year	97	50.8	87	45.5	3	1.6	4	2.1	191	100.0
Rice										
Current	64	36.7	48	27.6	61	35.1	1	0.6	174	100.0
Base Year	78	50.0	40	25.6	38	24.4	0	0.0	156	100.0

Source: from the survey

who used the traditional implements of hoes and cutlasses (Table 6.7). The use of tractor and the accompanying implements in land preparation was relatively more important in rice cultivation. The proportion of farmers who used this method increased from 24.4% in the base year to 35.1% in the current period. The use of animal drawn implements and tractors for land preparation is concentrated in the northern savanna zone where sorghum and rice are mainly grown in the country.

6.18 Cultural Practices

The cultural practices tend to relate to the agro-ecological zones. In the forest zone where maize and cassava are mainly grown, the major cultural practices include fallowing, intercropping and crop rotation. The proportion of farmers who used these cultural practices increased in the current period as compared to the base year. For maize, the farmers who practiced shifting cultivation increased from 80.2% in the base year to 81.5% in the current period, and for cassava, the proportion of the farmers increased from 76.2% to 80.1% (Table 6.8).

Table 6.8 Cultural Practices Comparing Current and Base Year

Crop	Crop Rotation		Intercrop with legumes		Fallowing		Animal Manure		Conservation tillage, Etc.		Green Manure/compost etc		Soil/Water Conservation	
	Freq	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Maize														
Current	57	28.5	45	22.6	163	81.5	6	3.0	18	9.1	23	11.6	19	9.6
BaseYear	54	28.7	47	25.3	150	80.2	2	1.1	21	11.4	26	14.1	18	9.8
Cassava														
Current	52	25.7	45	22.3	161	80.1	11	5.5	23	11.4	27	13.4	16	8.0
BaseYear	42	25.5	38	20.7	134	76.2	7	3.8	18	9.8	24	13.0	17	9.2
Sorghum														
Current	59	28.4	158	76.0	24	11.5	165	79.7	79	38.0	76	36.5	95	45.7
BaseYear	55	28.8	152	79.6	18	9.4	153	80.1	77	40.3	74	38.7	84	44.0
Rice														
Current	22	12.4	16	9.0	9	2.0	42	23.6	55	30.9	26	14.6	86	48.3
Baseyear	17	10.7	14	8.8	5	3.1	34	21.4	48	30.2	22	13.8	64	40.3

Source: From the survey

The proportion of maize and cassava farmers who practiced crop rotation were stable when the base year and the current period are compared, around 29% and 26%, respectively. Nevertheless, the differences between the current situation and the reference year are not statistically significant. For the other cultural practices, the proportion of farmers who used them is relatively small for both crops. In rice cultivation, the proportion of farmers increased only for the cultural practice of fallowing and the use of animal manure. For the cultivation of cassava, the proportion of farmers decreased only for the use of soil and water conservation practice.

In the production of sorghum, the major cultural practices were intercropping and the use of animal manure. The proportion of farmers who used these cultural practices declined marginally when the base year and the current period are compared (Table 6.8). The other relatively important cultural practices in the cultivation of sorghum are soil and water conservation, the use of green manure / compost, etc and conservation tillage. The proportion of farmers practicing soil / water conservation increased by 1.7 percentage points when the base year and the current year are compared. For the use of green manure / compost, etc and conservation tillage, the proportion of farmers decreased howbeit small when the base year and the current period are compared.

A higher proportion of the rice farmers (over 40%) used the soil and water conservation methods than any other cultural practice. The proportion of the rice farmers who used this cultural practice increased from 40.3% in the base year to 48.3% in the recent period (Table 6.8). The proportion of farmers who used green manure/compost, etc., conservation tillage and animal manure also increased in the recent period as compared with the base year. In rice cultivation only the land following had the proportion of farmers decreased.

6.19 Irrigation Practices

The use of irrigation to grow crops in the areas surveyed was virtually absent (Table 6.9). No farmer reported the use of irrigation in the cultivation of cassava and rice. For maize, about 95% of the farmers did not use irrigation in the base year and the proportion reduced to nearly 89% in the current period. For sorghum, the proportion of farmers that did not use irrigation increased from 92% in the base year to 99% in the current period. The fact that some small proportions of farmers (11% for maize and 1% for sorghum) use irrigation at all may be a tendency towards intensification.

Table 6.9 Portion of the Farmland Cultivated with Irrigation by Crop

Crop	Nil		One-Quarter		Two Quarters		Three Quarters		All	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Maize										
Current	177	88.5	12	6.0	4	2.0	2	1.0	5	2.5
Base Year	178	94.7	4	2.1	3	1.6	1	0.5	2	1.1
Sorghum										
Current	201	99.0	0	0.0	1	0.5	1	0.5	0	0.0
Base Year	173	92.0	8	4.3	3	1.6	1	0.5	3	1.6

Source: From the survey

6.20 Changes in Crop Yield Per Hectare

The majority of the farmers indicated increase in the crop yield per hectare (Table 6.10). For maize and cassava, nearly 95% each of the respective farmers indicated increase in crop yield and the remaining 5% indicated a decrease when the base year and the current period are compared. For sorghum and rice the proportion of farmers who indicated increased yields were 87% and 86%, respectively. The remaining 13% and 14% of the sorghum and rice farmers, respectively, indicated a decline (Table 6.10).

Table 6.10 Trends in Crop Yield per Hectare Comparing Current and Base Year

Crop	Decreased		Increased	
	Freq.	%	Freq.	%
Maize	10	5.3	177	94.7
Cassava	9	4.9	175	95.1
Sorghum	24	12.9	162	87.1
Millet	22	14.2	133	85.8

Source: From the survey

In Tables 6.11a and 6.11b are shown the factors perceived by farmers as responsible for the increased and decreased crop yields. For all the crops, the use of inorganic fertilizers and the practice of conservation tillage were important factors in the increased crop yields. In addition, access to improved inputs was important factor for the increased yield in maize and cassava; and for sorghum and rice, mechanization was relatively important (Table 6.11a).

For the factors accounting for the decreased yields, declining soil fertility was the most important for all the crops. In addition, bad weather was also blamed for the decreased sorghum yield, and for rice, the other relatively important factor for the low yield was poor seed (Table 6.11b)

Table 6.11a Technology Change for Increased Crop Yield

Crop	Access to Improved Inputs		Inorganic Fertilizer		Mechanization		Irrigation		Conservation Farming		Others	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Maize	21	21.9	21	21.9	5	5.2	0	0.0	18	18.8	31	32.3
Cassava	16	16.0	15	15.0	8	1.9	0	0.0	24	24.0	37	37.0
Sorghum	2	3.1	8	12.5	11	17.2	0	0.0	38	59.4	5	7.8
Rice	10	16.9	18	30.5	8	13.6	4	6.8	18	30.5	1	1.7

Source: From the survey

Table 6.11b Technology Change for Decreased Crop Yield

Crop	Poor Seed		Declining Soil Fertility		Increased Pests		Poor / Untimely Land Prep		Inadequate Water		Untimely Planting		Bad Weather Condition		Others	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Maize	3	3.6	60	71.4	0	0.0	1	1.2	0	0.0	1	1.2	4	4.8	15	17.9
Cassava	1	1.3	59	73.8	1	1.3	1	1.3	0	0.0	1	1.3	3	3.8	11	13.8
Sorghum	9	8.7	70	67.3	2	1.9	2	1.9	0	0.0	2	1.9	16	15.4	2	1.9
Rice	10	12.7	60	75.9	0	0.0	0	0.0	8	10.1	0	0.0	0	0.0	0	0.0

Source: From the survey

CHAPTER SEVEN

MARKETING CONDITIONS FOR INTENSIFICATION

7.1 Introduction

Agricultural intensification depends very much on producing for the market. Thus, market mediated development is essential for food crop intensification. This chapter therefore examines issues that relate to the marketing conditions for intensification at the micro level. The extent to which food crop farmers sell their crops, the quantities sold, the prices received, the market outlets and factors that constrain both food crop marketing and production for the market are among the issues that assist in establishing the marketing conditions for food crop intensification of households in the study.

7.2 Sale of Food Crops and Prices

The target crops in this study are mainly staple food crops in the areas where they are produced. Thus, the sale of food crops that are primarily produced for household consumption is an important indicator of the willingness of households to produce these staples for the market. The sale of the food crops over time is a measure of the sustainability of this willingness to produce for the market. Table 7.1 therefore presents not only the sale of food crops in the most recent season of the survey but also in the two seasons prior to that season as well as in the historical base year in which households were formed.

Table 7.1 Sales of Food Crops Over Time (Number of Household)*

Food Crop	Most Recent Harvest	Year Before Most Recent Harvest	Two Seasons Ago	In Base Year (Formation of HH)
Maize	192 (95.0)	184 (81.5)	180 (89.6)	173 (86.5)
Cassava	189 (93.1)	178 (87.7)	173 (86.5)	168 (83.6)
Sorghum	57 (28.1)	42 (20.0)	30 (16.5)	37 (19.4)
Rice	100 (57.1)	74 (43.3)	80 (47.1)	65 (37.6)

Source: Computed from Survey Data

* Valid percent of households in sample in parenthesis

It is interesting to note from table 7.1 that maize attracts the highest proportion (95%) of valid households that sold food crops in the most recent harvest. It is followed by cassava with 93.1% of valid households. Both food crops were the target staples for the Eastern Region districts of Krobo Odumase and Fateakwa. On the other hand fewer households sold the target staples of sorghum and rice in the two districts of the Upper East Region. Whereas over 57% of valid households sold rice, only 28,1% of them sold sorghum. The proportions of households selling a particular food crop is perhaps a measure of the degree of willingness to sell or the ability of households to generate surpluses over and above household requirements. Thus, in the case of sorghum, the main staple food crop in the study districts in the North of Ghana, it is more likely to be a case of lack of surplus

generation rather than willingness to sell, given that these districts are probably less endowed with good soils and rainfall conditions than their southern counterparts.

Table 7.1 reveals a clear dynamism in the evolution of market mediation among households in the sample. In all cases more households sold the food crops in the most recent season than in the previous one. In the same vein, more households are selling the staple food commodities now than in the base year when the households were formed. However, apart from cassava where a continuous positive trend in the increases in the valid proportion of households that have been selling since the base year to the most recent harvest, the other three commodities have been experiencing fluctuations in the proportion of household that sold them. This perhaps has to do with the physical properties of the commodities concerned. Whereas cassava is hardy and is generally regarded as a famine crop that can withstand harsh climatic conditions, the other crops are highly susceptible to climatic variations, making them more risky to produce than cassava. Thus, the fluctuations in the proportion of households that sell maize, sorghum and rice may just be a reflection of fluctuations in weather and other extraneous conditions that are characteristic of Ghana's agriculture.

Table 7.2 Mean Quantities of Food Crops Sold (Kg.)

Food Crop	Most Recent Harvest	Year Before Most Recent Harvest	Two Seasons Ago	Number of Cases (N)
Maize	749	711	628	162
Cassava Tubers	3067	2914	2537	157
Sorghum	310	252	223	23
Paddy Rice	398	361	379	63

Source: Computed from Survey Data

Whereas the willingness of households to sell is important, the quantity that is actually sold is the true measure of supply of the commodities to the market. The dynamics of the quantity of sales is also clear in table 7.2. With the exception of rice, the average quantity sold of the other commodities has been increasing monotonously from two seasons ago to the most recent harvest. Less paddy rice was sold in the year before the most recent season than in both two seasons ago and in the most recent season. It is hard to assign reasons but it might have been caused by any or a combination several factors including among others poor yield, low rainfall particularly in the critical period of seed formation, or just unwillingness to sell since fewer households sold paddy rice in that season than in the other relevant seasons (see table 7.1).

A related matter to the sale of food crops is the market price. Households will be less willing to offer food commodities for sale if prices are low. Table 7.3 gives the price range for the food crops in United States dollar equivalents. The range of prices is for both the minimum and the maximum that are received by food crop farmers as well as their means. The prices also offer us a measure of the value that is attached to the cultivation of the staple food crops.

Table 7.3 Price Range for Food Crops in Recent Season (US\$/100kg.)

Range	Maize	Cassava	Sorghum	Paddy Rice
Lowest:				
Mean	13.0	5.0	15.0	14.0
Minimum	4.0	1.0	4.0	9.0
Maximum	30.0	42.0	28.0	32.0
Number of Cases	179	179	37	37
Highest:				
Mean	22.0	9.0	19.0	17.0
Minimum	1.0	1.0	4.0	9.0
Maximum	41.0	69.0	30.0	35.0
Number of Cases (N)	179	179	37	37

Source: Computed from Survey Data

In the lowest range of prices quoted by households, the mean price is highest for sorghum (\$15/kg.) while the lowest average price is for cassava. The mean lowest prices for paddy rice and maize are not significantly different from that of sorghum. In the highest range of prices, maize has the highest mean of \$22/kg. followed by sorghum (\$19/kg.) and paddy rice (\$17/kg.). Again, cassava has the lowest mean price of \$9/kg. in the highest range of prices. It appears therefore that cassava is a low value food crop compared to the staple cereal food crops. Even though there are wide variations in the range of prices for all the food crops, those of cassava are outstanding, varying between \$1/kg. to \$42/kg. in the lowest range of prices and between \$1/kg. and \$69/kg. in the highest range of prices.

7.3 Main Market Outlet and Contract Farming

The market outlet and the proximity of the village to the outlet are likely to influence market transactions. Proximity in particular can encourage market releases of food crops. A distance of up to five kilometers should be close enough to attract food crop sales to the outlet. Under this assumption, about 79% of valid households indicated that the nearest market outlet was within five kilometers of the village, while that of cassava was almost 81% of the valid households. On the other hand only about 33% and 23% of valid households indicated that the nearest market outlet for sorghum and rice were within five kilometers of the village, respectively. The dichotomy is clear. Whereas the most households in the southern districts appear to have market outlets close to their communities, most households in the northern districts of the study do not have the same proximate outlets for their food crops. It is, perhaps, also a reflection of the general development of the two areas in terms of infrastructure as it is a well known fact that the northern parts of Ghana are generally less developed than the southern part of the country.

Table 7.4 Outlet for Food Crops and Contract Farming (Valid % in Parenthesis)

Crop	Farmer Cooperative	Private Trader	State Company	Own Piecemeal	Contract Farming
Maize	16 (8.4)	157 (82.2)	0.0	18 (9.4)	21 (11.1)
Cassava	10 (5.5)	154 (85.1)	0.0	17 (9.4)	13 (7.0)
Sorghum	0.0	28 (50.0)	0.0	28 (50.0)	3 (5.3)
Rice	0.0	51 (52.0)	4.0 (4.1)	43 (43.9)	2 (2.0)

Source: Computed from Survey Data

Table 7.4 shows the nature of marketing outlets used by households to dispose of their food crops. Clearly the private trader is the principal outlet for a majority of households and for all food crops. For cassava and maize in particular, the proportions of valid households that are served by private traders are quite high, 85.1% for cassava and 82.2% for maize. Aside from the private trader, piecemeal disposal of food crops in the other significant market outlet for the households. It is particularly significant for producers of sorghum as 50% of valid households do their own piecemeal marketing. Piecemeal marketing is particularly suitable for households that market small surpluses. There is therefore little wonder that it is a major outlet for the marketing of sorghum since most households sell only small surpluses, on the average, as observed earlier (section 7.2).

It is significant to note that farmer cooperatives are not significant market outlets for the households in the sample. Whereas only 8.4% and 5.5% of maize and sorghum farmers marketed their crops through cooperatives, none of the households involved in sorghum and rice farming did. It is equally important to note that with the exception of rice where only 4.1% of households indicated state company as the main market outlet for their produce, no other food crop is served by a state company. Perhaps this is an indication of successful disengagement of the state in the participation in agricultural production and marketing activities under the structural adjustment policy reforms. The participation of the state in rice marketing is as a result of the continued existence of the Irrigation Company of the Upper Regions (ICOUR), which is still involved in the production and marketing activities of farmers who operate in the irrigation areas.

It is worth noting, in the last column of table 7.4, that even though it was observed at the district level that contract farming was nonexistent, a few households indicated that they actually are involved in contract farming. The proportion of households involved in contract farming are 11.1% for maize, 7.0% for cassava, 5.3% for sorghum and 2.0% for rice. The kind of contract farming is some form of informal arrangements normally made with traders. In most cases, such arrangements could be describes as sponsored farming rather than contract farming. Although the trader normally will contribute towards the financial requirements during the farming seasons, the trader ends up with the exclusive rights to sell the farm produce, often at a great disadvantage to the farmer. In fact such informal arrangements often lead to the exploitation of the farmer.

7.4 Dynamics of Marketing Conditions

The dynamics of the market conditions of food crops are with respect to the changing conditions of sale, prices, market outlets and modern input prices in relation to the time households were formed and the situation in the most recent harvest season. With regard to sales the relevant issue is whether more or less are being sold now or there has been no significant change in the sales of food crops. As indicated in table 7.5, significant proportions of valid households indicated that more maize (58.6%) and cassava (61.9%) are being sold now than in the base year when households were formed. In the case of sorghum, less than the mean number of valid households (45.7%) believe that more of the crop is being sold now while for rice, the number of valid households with the same belief is just above the mean (51.6%).

In spite of the general observation that more food commodities are being sold now, quite sizeable proportions also believe that less of the food crops are now being sold. The proportions are 37.9% for maize, 30.4% for cassava and 34.3% for sorghum. It is only for rice that a very small proportion of valid households (2.2%) are of the opinion that less is being sold now. Even in the case of rice the feeling of a high proportion of households is that there has not been any significant change in the sale of rice between the two periods.

Table 7.5 Changes in Sales and Prices (Valid % in Parenthesis)

Crop	Sales			Prices		
	No significant	More sold now	Less sold now	No significant	Worse Now	Better Now
Maize	6 (3.6)	99 (58.6)	64 (37.9)	7 (4.0)	112 (64.7)	54 (31.2)
Cassava	13 (7.7)	104 (61.9)	51 (30.4)	5 (3.0)	124 (74.3)	38 (22.8)
Sorghum	7 (20.0)	16 (45.7)	12 (34.3)	13 (39.4)	0.0	20 (60.6)
Rice	21 (33.9)	32 (51.6)	9 (2.2)	9 (15.0)	20 (33.3)	31 (51.7)

Source: Computed from Survey Data

The dynamics of market prices seem to be the reverse of those for sales, for maize and cassava. As can be observed in table 7.5, most of the valid households in maize (64.7%) and cassava (74.3%) are of the opinion that prices are generally worse now than in the base year. In the case of maize, the abolition of the minimum guaranteed price for the commodity in the early 1990s as part of structural adjustment policy reforms could have influenced their responses. Nevertheless, 31.2% and 22.8% of valid households felt that maize and cassava prices were better now than in the base year. Worse prices imply lower prices than before and it is to be expected that when more is sold prices will come down. The observation of more sales now for maize and cassava and worse prices now for these commodities is therefore consistent with theory.

The lower half of table 7.5 tells a different story. Prices are significantly better now for the valid households in sorghum (60.6%) and rice (51.7%) production than in the base year. That being so, there must exist a price incentive to which rice and sorghum farmers should be encouraged to respond to by ensuring that the complementary inputs required

are made available to the farmers. Whereas none of the sorghum farmers felt that the price of sorghum was worse now, 39.4% felt that there was no significant change in the price of sorghum between the two periods. On the whole, therefore, sorghum farmers appear to be generally satisfied with the changing pattern of prices for the commodity. On the other hand about 33% of rice farmers were of the opinion that prices were worse now while another 15% felt that there was no significant change in prices between the two periods. Price dynamics for the rice commodity seems therefore to be emitting mixed feelings on the part of the farmers in spite of the fact that more than 50% of them are of the opinion that prices are generally higher now than in the formative years of the households.

Table 7.6 Changes in Market Outlet and Modern Input Prices (Valid % in Parenthesis)

Crop	Market Outlet		Modern Input Prices			
	Same	Better Now	Worse Now	No Significant Change	Prices Gone Up	Prices Gone Down
Maize	52 (30.1)	104 (60.1)	17 (9.8)	8 (60.0)	118 (88.7)	7 (5.3)
Cassava	40 (24.1)	107 (64.5)	19 (11.4)	3 (2.4)	114 (92.7)	6 (4.9)
Sorghum	5 (14.3)	29 (82.9)	1 (2.9)	3 (8.8)	29 (85.3)	2 (5.9)
Rice	17 (27.0)	41 (65.1)	5 (7.9)	4 (6.7)	54 (90.0)	2 (3.3)

Source: Computed from Survey Data

Changes in market outlet are shown in the first three columns of table 7.6. Improvements in market outlets are necessary as agricultural development takes place. Any lack of positive dynamics is likely to serve as a disincentive to the growth and expansion of food crop production. It is in this light that the general assertion that market outlets for all the food crops are better now than in the base year can be treated as a positive change in favour of food crop intensification in Ghana. Indeed, high proportions of valid households, that is, 60.1% for maize, 64.5% for cassava, 82.9% for sorghum and 65.1% for rice indicated that market outlets are better now. As the table 7.6 shows, even most of those households that did not agree with this assertion felt that market conditions at least remained the same if they did not change for better. The table also shows that relatively fewer households were of the opinion that market conditions were worse now than in the base year.

The information in the last three columns of table 7.6 leaves us in no doubt that prices of modern inputs have changed for the worse between the base year and the most recent harvest season. For maize, 88.7% of valid households shared this opinion, while 92.7%, 85.3% and 90% cassava, sorghum and rice farmers, respectively, were of the same opinion that prices of modern inputs have gone up over the years. So overwhelming is the

verdict on the dynamics of modern inputs that the other categories on the issue in table 7.6 are not worth discussing.

7.5 Food Crop Marketing Constraints

Food crop marketing constraints are of two types, namely, those factors that constrain food crop marketing and those factors that constrain households from producing surpluses for the market. Factors that constrain food crop marketing include low and fluctuating prices, high transport costs, untimely payment of farmers for their produce, unreliable market outlets, high input prices, unavailability of inputs and lack of credit. The assessment of households on the effects of these factors on the marketing of the food crops is presented in table 7.7.

Table 7.7 Constraining Factors for Food Crop Marketing (Valid % in Parenthesis)

Constraint	Maize	Cassava	Sorghum	Rice
Low/Fluctuating Prices	70 (34.5)	77 (38.3)	12 (5.8)	15 (8.5)
High Transport Costs	0.0	3 (1.5)	8 (3.9)	4 (2.3)
Untimely Payment	15 (7.4)	3 (1.5)	2 (1.0)	0.0
Unreliable Outlet	2 (1.0)	4 (2.0)	1 (0.5)	0.0
High Input Prices	20 (9.9)	11 (5.5)	49 (23.8)	46 (26.0)
Unavailability of Inputs	7 (3.4)	14 (7.0)	8 (3.9)	7 (4.0)
Lack of Credit	85 (41.9)	86 (42.8)	93 (45.1)	82 (46.3)
No Constraints	4 (2.0)	3 (1.5)	33 (16.0)	23 (13.0)

Source: Computed from Survey Data

Without exception, table 7.7 shows that lack of credit is the single most important factor constraining the marketing of the food crops in the study, as indicated by over 40% of valid percentage of households in each of the crops. Whereas low and fluctuating prices are also relatively important factors constraining the marketing of maize and cassava as indicated by 34.5% and 38.3% of valid households for the two crops respectively, high input prices is also the second most important factor constraining the marketing of sorghum and rice as indicated by 23.8% and 26.0% of valid households for the two crops, respectively. To the farmers, the other constraining factors, though important are not as pressing as those with the relatively higher proportions in table 7.7.

Factors constraining households from producing food crops for the market include shortage of household labour, expensive open market farm labour, chronic illness in the family, lack of land to grow crops or insecure land tenure, lack of knowledge about yield improving farming techniques, lack of capital to buy inputs and lack of capital to hire draught animals or tractors for ploughing and other land preparation activities. An assessment of the importance of these factors by households in the cultivation of the target crops is presented in table 7.8.

Table 7.8 Problems of Production for Market (Valid % in Parenthesis)

Constraint	Maize	Cassava	Sorghum	Rice
Household Labour	32 (15.7)	22 (10.8)	7 (3.4)	7 (3.9)
Expensive Farm Labour	60 (29.4)	50 (24.6)	20 (9.7)	15 (8.4)
Chronic Illness	10 (4.9)	14 (6.9)	8 (3.9)	6 (3.4)
Land Shortage	8 (3.9)	13 (6.4)	9 (4.4)	0.0
Lack of Knowledge	5 (2.5)	2 (1.0)	6 (2.9)	5 (2.8)
Capital for Inputs	48 (23.5)	57 (28.1)	90 (43.7)	82 (46.1)
Capital for Land Prep.	39 (19.1)	45 (22.2)	52 (25.2)	49 (27.5)
No Constraints	2 (1.0)	0.0	14 (6.8)	14 (7.9)

Source: Computed from Survey Data

In table 7.8, it is clear that expensive farm labour is an most important factor constraining the production of maize and cassava for the market as indicated by 29.4% and 24.6 of the valid households for the two crops, respectively. Another important factor that constraints the production of these two crops is lack of capital to purchase inputs as indicated by 23.5% and 28.1% of the valid households for maize and cassava, respectively. Lack of capital for land preparation and household labour shortage also feature quite prominently as constraints in the cultivation of maize and cassava for the market.

Capital issues dominate constraints to the production of sorghum and rice for the market. This is hardly surprising as the region of the survey (Upper East) is recognized as one of the poorest regions in Ghana. Thus, lack of capital to buy inputs and for land preparation together constitute 68.9% and 73.6% of the valid households that indicated these as major constraints in the cultivation of sorghum and rice, respectively. Expensive farm labour comes next in order of important constraints in the production of sorghum and rice for the market.

There is less variation in terms of the most important factors constraining the production of the individual crops for the market. For maize, which differs from the other target crops in this respect, expensive farm labour is the most constraining factor as indicated by 29,4% of the valid households. For the other three crops, lack of capital to buy inputs is the most important constraint to their production for the market, even though the relative importance varies among these crops. For cassava, 21.8% of the valid households make this the most important constraint as compared to 43.7% and 46.15 for sorghum and rice, respectively. Even with maize, lack of capital to purchase inputs comes a respectable second (23.5%) as the most important constraint to production for the market. It appears therefore that any policy to encourage the intensification of the production of these crops for the market will have to deliberately target the capital needs of the food crop farmers.

The relative importance of the two sets of constraints, namely, market related factors and household factors on marketing conditions for the food crops differ between the food crops but also sharply divided between the crops grown in the south and those grown in the north. For the households in the southern sector, market related factors are the most important for maize and cassava as indicated by 57.7% and 59.4% of the valid percentage

of household involved in the cultivation of these crops. For the households in the north, household factors are the most important as indicated by 68.1% and 58.1% of valid households for sorghum and maize, respectively. It is perhaps an indication that production of sorghum and maize is largely for household consumption purposes rather than for the market. For the intensification of the production of these crops in the survey areas in the north, policy will first of all have to address these household constraining factors.

CHAPTER EIGHT

OTHER FARM ENTERPRISES, LIVESTOCK, RESOURCES AND INSTITUTIONAL CONDITIONS

8.1 Introduction

Apart from the target crops in this study, it is a known fact that the small-scale farmers often indulge in other activities that complement or supplement the production of the major staple food crops. Thus, other minor farm enterprises and livestock of the farmer are likely to influence any intensification efforts on the main staple food crops since they are bound to compete for the farmer's resources. Besides, resources and institutional conditions will have their effects on the total farm activities of the household. These issues are addressed in this chapter as they have a bearing on intensification.

8.2 Other Food Enterprises Cultivated and Sold

Households in the study also cultivate a variety of food crop enterprises and vegetables in addition to the major staples that are the focus of this study. As presented in table 8.1, the most important additional enterprises are vegetables as indicated by 68.1% of the valid household. Indeed as revealed in the discussion on agriculture at the survey district level, different types of vegetables form a major part of the farming systems in all the survey districts. Groundnuts and beans are important leguminous farm enterprises in the cropping system of farmers in most parts of Ghana as they tend to fix nitrogen in the soil and improve on its fertility. Besides, these crops are also important cash crops for most farmers who cultivate them. It is hardly surprising therefore that 59.3% and 51.8% of the valid households cultivated groundnuts and beans, respectively. Apart from sorghum, millet is the most important cereal staple crop in the Upper East Region and every farmer cultivates the early maturing millet that is crucial to household consumption needs following the lean season. The 46.7% of the valid households that cultivate millet are therefore all from the survey districts in the north of Ghana.

Table 8.1 Other Food Crops Produced for the Market (Valid % in Parenthesis)

Other Crops/Vegetables	Number Growing	Number Selling	Most Profitable Crop
Bananas	52 (13.0)	32 (7.9)	16 (18.9)
Beans	214 (51.8)	89 (21.7)	45 (12.5)
Peas	8 (2.0)	5 (1.2)	4 (1.1)
Irish Potatoes	1 (0.2)	1 (0.2)	0 (0.0)
Sweet Potatoes	113 (27.6)	50 (12.2)	5 (1.4)
Millet	193 (46.7)	49 (11.9)	4 (1.1)
Groundnuts	245 (59.3)	153 (37.1)	66 (18.4)
Vegetables	280 (68.1)	182 (44.3)	118 (32.9)
Other	99 (28.6)	86 (23.8)	33 (9.2)

Source: Computed from Survey Data

Table 8.1 also shows that groundnuts and vegetables are the crops that are mostly sold as indicated by 44.3% and 37.1% of the valid households for vegetables and groundnuts, respectively. The two crops are also indicated to be most profitable as indicated by 32.9% and 18.4% of the valid households for vegetables and groundnuts, respectively. Beans, sweet potatoes, millet and bananas are other enterprises that are also sold by smaller proportions of the households in the sample, that is, 21.7% for beans, 12.2% for sweet potatoes, 11.9% for millet and 7.9% for bananas. Of these other minor crops that are sold only banana and beans appear to be most profitable as indicated by 18.9% and 12.5% of the valid households for the two crops, respectively. It appears therefore that vegetables and groundnuts are the enterprises that are likely to compete with the major staple food crops in this study for household resources, purely on the grounds of their profitability as indicated by the households in the survey.

Table 8.2 Non-Food Cash Crops Grown and Profitability (Valid % in Parenthesis)

Cash Crop	Number Growing	Most Profitable Cash Crop
Cotton	7 (10.8)	2 (0.5)
Sugar Cane	7 (10.8)	2 (0.5)
Cashew nuts	3 (4.7)	1 (0.3)
Cocoa	16 (24.9)	6 (1.5)
Tobacco	23 (35.4)	21 (5.1)
Coffee	7 (10.8)	1 (0.3)
Pyrethrum	4 (5.2)	0 (0.0)

Source: Computed from Survey Data

Apart from other food crops and vegetables, households in the sample also grow a number of non-food cash crops and these are presented in table 8.2. In this case, however, the relative proportions of households growing these crops are rather low. Apart from cocoa and tobacco that are grown by 24.9% and 35.4% of the sample of households, respectively, the proportion of households growing the other non-food cash crops is around 10% and below. They include cotton, sugar cane and coffee that are each grown by 10.8% of households; and pyrethrum and cashew nuts that are grown by 5.2% and 4.7%, respectively, of the sample. Of all these non-food crops, however, tobacco seems to be regarded by 5.1% of the sample as most profitable. Thus, on the whole non-food cash crops do not appear to be competitive with the major food crop staples in this study on the basis of profitability. Non-food cash crops are therefore not likely to affect efforts at intensification of these food staples.

For the most profitable other food crops, vegetables, most households felt that both sales and market access had improved between the base year and the most recent harvest season. In the case of changes in sales, 65.4% of households were of the opinion that there were more sales now than in the base year, while 21.6% responded that sales are now less and 13% feel that sales have not significantly changed. On changes in market access, 73.6% of valid households felt that access for vegetables are better now than in

the base year when households were formed. Only 10.3% of households felt that market access is now worse and 16.1% of them did not observe any changes in the intervening period (table 8.3). The improvements in market conditions in the intervening period, coupled with its profitability underlines vegetables as serious competitor for farm resources and policy towards intensification of major food crops will have to address the issue of integrating vegetable production into farm plans.

Table 8.3 Changes in Sales and Market Access (Valid % in Parenthesis)

Direction of Change	Change in Sales	Change in Market Access
No Change	35 (13.0)	44 (16.1)
Better Now (More Sales)	176 (65.4)	201 (73.6)
Worse Now (Less Sales)	58 (21.6)	28 (10.3)

Source: Computed from Survey Data

8.3 Input Use in Other Farm Enterprises

Input use in other farm enterprises is another source of competition for the farmers' resources viz-a-viz the intensification of staple food crop production. What is used for vegetable production will not be available for staple food crop production. Thus, the use of chemical fertilizers, animal manure, green manure and pesticides on other farm enterprises deprives the farmers their use on the staple food crops.

Table 8.4 Input Use for Other Food and Cash Crops (Valid % in Parenthesis)

Input	Use in other Food Crops	Use in Cash Crops
Chemical Fertilizers	111 (98.2)	5 (7.5)
Animal Manure	127 (34.8)	3 (4.3)
Green Manure	23 (6.3)	4 (5.8)
Pesticides	89 (24.6)	10 (14.3)

Source: Computed from Survey Data

It is significant to note in table 8.4 that 98.2% of valid households used chemical fertilizers on vegetables, while 34.8%, 6.3% and 24.6% used animal manure, green manure and pesticides on these other crops. These farmers may all have used these inputs on vegetables as they constitute the most profitable other crops. Indeed, the discussions on district and village level issues tend to support this assertion. At these levels it was revealed that most farmers use these inputs on vegetables.

8.4 Livestock Rearing

Livestock are an important part of the farming systems in Ghana. Farmers normally keep livestock according to their means. Poor households will normally start with the smaller livestock and move up to bigger ones as they advance in wealth. Table 8.5 gives statistics of livestock reared by households in the survey.

Table 8.5 Ownership of Livestock by Households

Type/Number	Total	Mean	Minimum	Maximum	No. of Cases (N)
Cows	441	5	1	50	83
Oxen	90	2	1	5	39
Goats/Sheep	2117	8	1	70	274
Donkeys	74	2	1	6	32
Pigs	5352	17	1	120	307
Poultry	494	7	1	50	68

Source: Computed from Survey Data

The most widely kept animal is the pig. A total of 307 households in the sample kept a total of 5352 pigs, giving an average of 17 per household. Averages sometimes mask the reality. The reality is that some households do keep large populations of pigs and table 8.5 actually shows that the maximum was 120 by one household. Goats and sheep rank second in the scale of livestock reared by the households as 274 of them kept over 2000 of the animals with a mean of 8 goats/sheep per household. Cattle ownership is often regarded as the preserve of the wealthy in the farming community and that explains why only 83 households reared 441 cows with an average of 5 per household. Strangely enough, few households (68) in the sample owned poultry, the smallest livestock. In any case modern poultry farming requires high capital investment that may be beyond the capabilities of rural households.

The survey confirmed that livestock farming is largely free range with no fodder cultivated for the animals. With the exception of pigs that are sometimes confined and fed most animals (including pigs) roam free range. Cows in particular have, from time immemorial been grazing free range on communal lands and formal grading and cross breeding are unknown.

8.5 Labour Resources

Labour has at all levels of the study been identified a potential bottleneck to the intensification of food crop production. Family labour is very important in small farmer agriculture. It is for this reason that household labour profile assumes much importance. Besides, peak season farming activities often overwhelm family labour availability and extra labour will have to be hired. These and other issues on the labour resource are discussed in this section.

Membership of households totaled 3387 of which 51.3% were male and 48.7% female as shown in table 8.6. Exactly 51% of the household membership was made up of working adults. It is significant to note from table 8.6 that the proportion of members aged 15 years and below is relatively high (42.2%). The mean of that group of households indicate that at least every household has 3 young dependant members and in some cases the young dependants can be as many as 10. Added to these young dependants are those

aged 61 years and above who are relatively too old to work. This increases the dependent membership of households to 49% of the total population of members.

Table 8.6 Household Labour Profile (Valid % in Parenthesis)

Profile	Total	Mean	Maximum	Number of Cases
Members	3387 (100.0)	8	22	410
Males	1737 (51.3)	4	11	410
Females	1650 (48.7)	4	12	410
Working Adults	1729 (51.0)	4	18	410
Aged 15 & Below	1430 (42.2)	3	10	410
Aged 61 & Above	228 (6.8)	1	9	220
In Big Business	230 (13.3)	1	1	230
In Micro Business	393 (22.7)	1	9	410
Outside Farm	420 (24.3)	1	9	410
On farm	686 (39.7)	2	8	410

Source: Computed from Survey Data

The structure of the nature of work done by the working adults in table 8.6 is quite revealing. While 13.3% of the working adults engage in big business, 22.7% are in micro business and another 24.3% do other jobs outside the farm. This leaves a balance of 39.7% of working adults on the farm. The mean number of adult workers is only two with a maximum of 8 adult workers.

The average number of adult farm workers per households therefore explains why labour is such a constraint in food crop production in the communities surveyed. It also, perhaps explains the widespread use of minors in less demanding farm activities as trainees in most rural farming communities. Above all, it compels farmers to resort to the hiring of labour to complete some farming activities. Indeed, table 8.7 reveals that almost 70% of households in the sample regularly hire labour.

Table 8.7 Hired Labour for Farm Activities (Valid % in Parenthesis)

Labour/Activity	Number of Households
Regular Hiring	289 (69.8)
Land Preparation	187 (64.7)
Watching Crops	8 (2.8)
Planting	138 (47.9)
Tending Livestock	25 (8.8)
Weeding	258 (89.6)
Transporting Crops	49 (17.2)
Fertilizing	29 (10.1)
Harvesting	125 (43.7)

Source: Computed from Survey Data

Households in the survey hire labour for different farm activities as shown in table 8.7. The farm activity that attracts the hiring of labour by most households is weeding as indicated by almost 90% of the households. This is followed by land preparation, planting and harvesting that attracted the hiring of labour by about 65%, 48% and 44% of households, respectively. These are all major farming activities that need to be done in a timely manner if food crop production is to be successful. Other farm activities that demand the hiring of labour by relatively smaller proportion of households included transporting crops (17.2%), fertilizer application (10.1%), tending livestock (8.8%) and watching crops (2.8%) of households in the sample.

8.5 Land Resources

Land is such a crucial factor in agricultural production, and particularly in food crop intensification, that in a study of this nature one keeps on coming back to it. Issues pertaining to land under cultivation, the proportion that is irrigated, the initial acquisition of the land, its current status, control and prospects for expansion of cultivable land and acquisition by the youth are all pertinent to the prospects for food crop intensification.

Table 8.8 Land Resource Use (Hectares)

Land Use	Total	Mean	Minimum	Maximum	No. of Cases (N)
Cultivation	991.1	2.4	0.3	23.0	414
Non Food Crops	47.7	0.9	0.1	8.0	54
For Expansion	692.3	1.7	0.1	25.0	410
Irrigated (All)	37.1	0.1	0.1	4.8	399
Irrigated (Cash)	2.1	0.0	0.0	1.0	46

Source: Computed from Survey Data

Table 8.8 summarizes land resource use by the household in the sample. In the most recent season, households in the sample cultivated a total of about 991 hectares of land. The total area cultivated per household varied between 0.3 of a hectare to 23.0 hectares with a mean of 2.4 hectares. This confirms the earlier observation that households in the sample were mainly small-scale farmers with small land holdings. Households in the sample also cultivated a total of 47.7 hectares of non-food cash crops, with holdings varying between 0.1 of a hectare to 8.0 hectares and a mean of 0.9 of a hectare. As noted earlier, non-food cash crops do not feature prominently in the farm plans of the households studied.

Households in the study also revealed that a total of 692.3 hectares of land could be available for the expansion of their farms. For individual households this availability of extra land varied between 0.1 of a hectare to 25.0 hectares with a mean of 1.7 hectares. The distribution is skewed towards the minimum, thus making the mean relatively high. In other words, a few large farms influenced the mean. On the whole extra land for individual households therefore appears to be scarce and prospects for the future expansion of farms is thus limited.

Table 8.8 also confirms that very little irrigation is done in the study area. Only 37.1 hectares were irrigated in the most recent season, representing only 3.7 of the total land cultivated. For cash crops, only 2.1 hectares were irrigated, representing 4.4% of cultivated land under cash crops. Thus, irrigation that is so crucial to agricultural development, particularly in a situation where rainfall is unreliable and erratic, has not yet caught on in the communities surveyed.

Table 8.9 Land Acquisition, Status and Control (Valid % in Parenthesis)

Land Attribute	Number of Cases
Land Acquisition:	
Allocated Virgin Land	35 (8.7)
Allocated Family Land	105 (26.1)
Inherited Land Under Cultivation	192 (47.6)
Purchased Land	5 (1.2)
Borrowed or Rented Land	66 (16.4)
Status of Land:	
Individually Owned	298 (72.5)
Use Rights by Community	38 (9.2)
Rented/Borrowed	75 (18.2)
Land Control:	
Full Control	325 (78.7)
Need Permission	88 (21.3)

Source: Computed from Survey Data

As shown in table 8.9, most households in the sample (47.6%) initially acquired land through inheritance in the base year when their households were formed. Another 26.1% were allocated family land. Thus family land was the major source of acquisition for about 74% of the households in their formative years. Rented land (16.4%) and those allocated virgin land (8.7%) accounted for the remaining households.

On the status of land now cultivated by households in the sample, about 73% are individually owned, 18.2% are rented and 9.2% are under use rights by the community. It is significant to note from table 8.9 that about 79% of household indicated that they have full control over the land they now cultivate while 21.3% of them will need to consult or seek permission from someone else in order to carry out major changes in the use of the land they now cultivate. Thus, for a majority of farmers, major policy changes can be implemented on the farm without any hindrance from elsewhere.

Sometimes, farmers have the means to expand their farm size and they have to take appropriate measures to do that. Such measures include the clearing of virgin land, turning virgin land into cultivation, bringing fallow land into permanent cultivation, renting or borrowing land and outright purchasing of land. For most households in the sample (40%) clearing of virgin land is the best prospect for the expansion of cultivated land. This option is followed by the deployment of fallow land (29.4%) and then renting or borrowing land (22.1%) that considered by the households to be important. Deploying

grazing land (7.4%) and buying land (1.2%) offer minor prospects to farmers in the sample table 8.10).

Table 8.10 Prospects for Expansion and Acquisition by Youth (Valid % in Parenthesis)

Method	Number of Cases
Expansion of Farm Size:	
Clearing Virgin Land	163 (40.0)
Deploying Grazing Land	30 (7.4)
Deploying Fallow Land	120 (29.4)
Renting or Borrowing	90 (22.1)
Buying Land	5 (1.2)
Acquisition by Youth:	
Allocated Virgin Family Land	31 (7.7)
Inherit Cultivated Family Land	136 (33.5)
Allocated Fallow Family Land	135 (33.3)
Rent or Borrow	99 (24.4)
Purchase Land	4 (1.0)

Source: Computed from Survey Data

Children growing up sometimes would like to have their own farms. In table 8.10 it is clear that such youth have family sources as their best bet for acquiring land. From the table 8.10, such family sources include allocation of family land now under fallow (33.3%) and inheritance of family land already under cultivation (33.5%). A minor family source of land in virgin family land which some households (7.7%) could allocate to the youth. Otherwise the youth will have to rent the land (24.4%) or purchase the land (1.0%).

Institutional conditions such as advise from extension staff, local farmer organizations and agricultural credit institutions are not well developed among the households studied. Only about 47% of the households said they regularly received advise from extension staff in the most recent season. This proportion appears to be high by African standards but reflects on the reforms in agricultural extension under SAP in Ghana and the involvement of NGOs, as discussed in the macro study. The rest either never (27.9%) or rarely (25.2%) received extension advice in that season. Only 36.7% of farmers in the sample belonged to farmer organizations, mainly farmer groups for extension purposes. Agricultural credit is almost non-existent as only 14% of the households indicated that they received some form of agricultural credit in the most recent season.

CHAPTER NINE

INCOMES, WEALTH ASSESSMENT AND EXPENDITURES

9.1 Introduction

Household incomes and wealth are important in determining the level of living of households. In farming communities, they also determine the extent to which the households can meet their expenditure requirements of inputs for their farms. In this chapter, the sources of income, household assets, cash requirements for inputs, purchases of food crops for consumption and the savings and borrowing habits are discussed in an attempt to illustrate the relative wealth of households in the study.

9.2 Sources of Income

Households have different sources of cash income and table 9.1 shows the proportion of households in the sample that derived their income from these sources and also the relative importance of these income sources to the households in terms of which of them generate the highest income for the households. Clearly, the largest proportion of households (76.0%) generated income from the sale of other food crops in the course of the past year. This is hardly surprising since most farmers effectively regard crops such as groundnuts and beans as cash crops.

Table 9.1 Sources of Cash Income (Valid % in Parenthesis)

Income Source	Number of Valid Cases	
	Cash Source	Highest Generator
Sale of Food Staples	302 (73.30)	172 (41.8)
Sale of Other Food Crops	313 (76.0)	97 (23.6)
Sale of Non-Food Cash Crops	60 (14.6)	15 (3.6)
Sale of Animals/Animal Products	251 (60.9)	65 (15.8)
Non-Farm Salaried Employment	38 (9.2)	9 (2.2)
Micro-Business	140 (34.1)	33 (8.0)
Remittances	72 (18.0)	17 (4.1)
Pensions	7 (1.7)	2 (0.5)
Rent, Interests	6 (1.5)	1 (0.2)
Large-Scale Business	1 (0.2)	0 (0.0)
Most Important Farm Source of Cash:		
Sale of Food Staples	193 (49.5)	
Sale of Other Food Crops	99 (25.4)	
Sale of Non-Food Cash Crops	16 (4.1)	
Sale of Animal/Animal Products	82 (21.0)	

Source: Computed from Survey Data

The sale of the major staple food crop itself ranks second as a source of income as indicated by 73.3% of the households. This augurs well for staple food crop intensification since most households are willing to offer these crops for sale.

It is often stated that livestock are the main source of income in difficult times. The fact that livestock sale was indicated by about 61% of the households as a source of income is therefore hardly surprising. Micro business was also indicated by over 34% of the households as a major source of income. This corroborates the observation that almost every household had a micro businessman among the adult working population. Other minor sources of household income included remittances, non-food cash crops and non-farm salaried employment as indicated by 18.0%, 14.4% and 9.2% of the households, respectively.

In spite of the fact that more households sold other food crops than the staple food crops, the latter was the highest generator of cash income as indicated by 41.8% of households as against 23.6% for the former. The sale of animals and animal products as well as micro business also generated the highest income for a significant proportion of households (15.8% and 8.0%, respectively).

The lower part of the table 9.1 shows that at the end of the day, most households (49.5%) regard the sale of staple food crops as the most important farm source of cash income. Other food crops (25.4%) and sale of animal and animal products (21.0%) follow next as the most important farm sources of cash income. Non-food cash crops do not rank high in importance of farm sources of income as it was supported by only 4.1% of the sample.

9.3 Household Assets

The ownership of assets by households go a long way in indicating the wealth of the household. In table 9.2, the commonest asset of most households in the ownership of a torchlight as indicated by over 79% of the household. This is hardly surprising as the village diagnosis revealed that most villages did not have electricity and torchlight is very

Table 9.2 Inventory of Household Assets (Valid % in Parenthesis)

Assets	Number Owning
Wired Electricity/Power	65 (15.7)
M obile/Stationary Phone	2 (0.5)
Diesel Powered Generator	3 (0.7)
Water Pipe to House	20 (4.9)
TV-Set	38 (9.2)
Radio	308 (74.2)
Tape Recorder	179 (43.3)
Bicycle	198 (47.7)
Sewing Machine	127 (30.6)
Kerosene Stove	45 (10.9)
Battery Torch	328 (79.2)

Source: Computed from Survey Data

convenient under such conditions. The fact that 74.2% of household also own radios is an indication of the demand for information by households in the sample even though they are in a rural setting. In this vein, it is significant to note that 43.3% of households also own tape recorders.

Other assets that are owned by a significant proportion of households in the sample are bicycles (47.7%), sewing machines (30.6%), and kerosene stove (10.9%). Very few households own the high value assets that may impact positively on their standard of living. For examples, only 15.7% and 4.9% of households in the sample had electricity and piped borne water in their homes.

9.4 Means of Transport and Housing Standards

The major means of transport of households and the physical characteristics of their houses are important indicators of the standard of their living. As table 9.3 shows, a majority of households (54.5%) have no means of transport and they naturally have to foot it to carry out their daily activities. Nevertheless, 37.5% of households in the sample do own bicycles as their main means of transport. In fact for farmers who own many farm plots that are scattered around the village, bicycles are very useful in helping them to visit the farms and carry out their farming activities. For the entire sample of households, only 8 (1.9%) and 24 (5.5%) had motor bikes and motor cars.

Table 9.3 Transport and Housing Standards (Valid % in Parenthesis)

Transport/Housing	Number of Valid Cases
Means of Transport:	
Foot	225 (54.5)
Bicycle	156 (37.5)
Motor Bike	8 (1.9)
Car	24 (5.8)
Housing:	
Mud House With Thatched Roof	159 (38.3)
Mud House With Iron Roof	193 (46.5)
Block/Brick House	63 (15.2)

Source: Computed from Survey Data

The lowest housing standard is the mud house with thatched roof, owned by 38.3% of households in the sample as shown in table 9.3. Mud house with iron roof is just a slight improvement in housing standards for the 46.5% of the households who own them. The ultimate housing standard is the block or brick house owned by only 15,2% of the sample.

Table 9.4 Ranking of Households by their Wealth Assessment (Valid % in Parenthesis)

Rank of Household	Number of Valid Cases
Very poor	158 (41.6)
Below Average	164 (43.2)
Average	55 (14.5)
Above Average	3 (0.8)

Source: Computed from Survey Data

In terms of housing and means of transport many households in the sample, therefore, appear to have low standards of living. There is little wonder that taking all the capital assets and appearances of houses into consideration 41.6% of the households are ranked as very poor while another 43.2% are ranked below average and only 14.5% are ranked just average. To underline the poor state of households, only 0.8% of them are ranked above average in table 9.4.

9.5 Household Expenditure

The other side of the coin in assessing the standard of living of households is expenditure. For rural farmers, the cash requirements for inputs, the purchase of food crops and animal products for consumption and the most costly household expenditure items are all important expenditure issues that affect the well-being of households. Also, when household incomes and expenditures are considered together it is important to find out whether households in the sample are largely net borrowers or savers.

9.5.1 Cash Requirement for Inputs

Rural farmers require cash for expenditure items such as seeds, chemical fertilizer, pesticides, machinery, hired labour, land improvements, transportation and land rentals. While attempts were not made to estimate the magnitude of the value of the cash requirements of these inputs, qualitative ranking of their importance to households in the sample was made.

Table 9.5 Ranking of Expenditure on Inputs (Valid % in Parenthesis)

Input	No Cash Outlay	Low/Little Cost	Moderate Cost	Most Significant
Seed	178 (43.6)	89 (21.8)	74 (18.1)	67 (16.4)
Chemical Fertilizer	144 (35.0)	36 (8.8)	44 (10.7)	187 (45.5)
Pesticide	208 (49.5)	29 (7.0)	43 (10.5)	134 (32.2)
Hired Labour	74 (18.0)	31 (7.6)	125 (30.5)	180 (43.9)
Land Rental	229 (57.3)	37 (9.3)	56 (14.0)	78 (19.5)
Machinery	189 (46.8)	36 (8.9)	46 (11.4)	133 (32.9)
Transport	194 (48.3)	54 (13.4)	81 (20.1)	73 (18.2)
Land Improvement	280 (70.4)	10 (2.5)	34 (8.5)	74 (18.6)

Source: Computed from Survey Data

In table 9.5, households see chemical fertilizer and hired labour as the inputs with the most significant cash outlays as indicated by 45.5% and 43.9% of them for the two inputs, respectively. Machinery and implements for land preparation (32.9% of households) and pesticides (32.2% of households) come next as inputs with the most significant cash outlays. All the remaining inputs seem to have almost the same low ranking (16.4% and 19.5% of households) as having most significant cash outlay.

Apart from hired labour which is regarded by 30.5% of households as being of moderate costs, all the other inputs are lowly perceived as moderate or low cost inputs. Thus if one considers moderate and most significant costs together, hired labour is perceived to be on the high side, in terms of costs, by about 74% of the sample of households. It is pertinent to note from table 9.5 that seeds, pesticides, rented land, machinery/implements for land preparation and land improvement measures are generally regarded by high proportion of farmers as having no cash outlay. This is hardly surprising as most farmers use seeds selected from their own farms and also simple implements like hoe and cutlass for land preparation.

9.5.2 Purchases of Food Crops

Although most small-scale farmers produce staple food crops primarily for household consumption, some of them do buy other food crops for consumption. In some cases, they even buy back what they may have sold at the harvest period to satisfy some pressing cash needs. Table 9.6 gives the information on the proportion of households that purchased food and animal products in the year to the survey time.

Table 9.6 Purchases of Food and Animal Products (Valid % in Parenthesis)

Item Purchased	Number of Cases
Food Crops:	
Maize	179 (43.2)
Cassava	48 (11.6)
Sorghum	107 (25.9)
Rice	280 (67.6)
Bananas	105 (25.5)
Beans	229 (55.3)
Peas	30 (7.4)
Irish Potatoes	6 (1.5)
Sweet Potatoes	122 (29.6)
Millet	145 (35.1)
Groundnuts	268 (64.7)
Vegetables	251 (60.9)
Animal Products:	
Meat	307 (74.0)
Fish	392 (94.5)
Milk	217 (52.7)

Source: Computed from Survey Data

Table 9.6 shows that most households in the sample (67.6%) bought rice, underlining the importance of rice in the consumption pattern of Ghanaians, even in the rural setting. In addition 43.2% and 35.1% of them also bought maize and millet, the other important cereal crops consumed by the households in the sample. The fact that only 25.9% of households in the sample bought sorghum seems to confirm it as a cereal that is produced largely for subsistence. In the same vein cassava was bought by only 11.6% of households in the sample, also indicating a high level of self-subsistence of households in this staple root crop.

For legumes, table 9.6 shows that 64.7% and 55.3% of the households surveyed bought groundnuts and beans, respectively. Thus in addition to being considered mainly as food cash crops, groundnuts and beans appear to be consumed significantly at the household level too. Vegetables were bought by 60.9% of households in the sample indicating a high degree of consumption of vegetables among them.

With regard to animal product, fish is undoubtedly the most consumed item as indicated by over 95% of the sample. This confirms most findings that fish is the most important source of animal protein in rural Ghana. While 74.0% of households purchased meat, 52.7% of them did by milk. Thus meat and milk consumption are relatively high among the households surveyed, thus giving a general picture of high consumption of animal products in the communities surveyed.

Table 9.7 Most Costly Household Expenditure Item (Valid % in Parenthesis)

Expenditure Item	Number of Cases
Farm Inputs	101 (24.4)
Food Items	142 (34.3)
School Fees	76 (18.4)
Medicals	78 (18.8)
Housing Costs	11 (2.7)
Transport	5 (1.2)
Other	1 (0.2)

Source: Computed from Survey Data

Of the categories of expenditure, households in the sample consider food items as the most costly group of expenditure item as indicated by 34.3% of them in table 9.7. This is strange and difficult to explain as the households surveyed were basically farmers who cultivated food crops primarily for subsistence.

Table 9.8 Extent of Borrowing and Savings (Valid % in Parenthesis)

Borrowing/Savings	Number of Cases
Borrowing	167 (40.0)
Savings	201 (48.6)

Source: Computed from Survey Data

Perhaps it is the purchase of crops and other items they do not produce themselves such as rice, fish, meat and vegetables that influenced their responses. Some households in the sample (24,4%) also regard farm inputs as most expensive. Others, 18.8% and 18.4%, respectively, regard medicals and school fees as the most costly household expenditure item.

As a result of high cost of household expenditure items, some households in the sample borrowed money to cover their expenditures. As presented in table 9.8, 40% of the households borrowed money to cover their expenditures. Nevertheless, some households indicated that they are normally able to save some money every year for their future needs. About 49% of the sample of households indicated that they saved regularly for their future needs. It is a habit that policy-makers must encourage to grow in the rural communities in order to mobilize capital for investment.