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Ghana Agriculture Production Survey (GAPS)

Report on data quality and findings on key indicators 2011/2012 minor season survey

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PREFACE

The importance of data for evidenced-based decision making cannot be over-emphasized. Data has become even more important in Ghana as the country deepens its decentralization. Governing bodies at district and regional levels require reliable data to make their plans meaningful. The Ghana Agriculture Production Survey (GAPS) undertaken by the Statistics, Research and Information Directorate (SRID) of the Ministry of Food and Agriculture is designed to provide data on community amenities, characteristics of farm families, utilization of land, use of inputs, outputs of major agricultural commodities, post-farm activities, household incomes, health of farm families, and health of farm animals on an annual basis. The survey has been piloted during the past three years with funding from the United States Agency for International Development (USAID). The Ghana Strategy Support Program (GSSP) of the International Food Policy Research Institute (IFPRI) has provided oversight in the planning and implementation of the survey as part of its capacity strengthening activities. This report based on the 2012/13 minor season survey demonstrates the enormous capacity of the data to offer insights relevant for planning agricultural development activities.

From an initial pilot in twenty districts (two from each region) in the first two rounds, the third round was scaled up to cover 60 districts. There are plans to cover the whole country of 216 districts in a stepwise manner. . Monitoring and evaluation of the three pilot surveys reveal weaknesses in the collection, recording and transmission of data. These weaknesses have been outlined in this report. The report also makes suggestions about how future surveys can be improved. It is hoped that lessons learned from the previous surveys will be used to improve the design and implementation of future surveys.

Conducting surveys during both seasons annually and releasing the data in a timely manner requires considerable organizational capacity. It is likely to take SRID several more seasons to acquire the capacity required to effectively meet the objectives of this survey. Strengthening its capacity by providing the needed human and financial resources and improving the organizational processes is critical to improving the data system.

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1. INTRODUCTION

1.1 Background

The Statistics, Research, and Information Directorate (SRID) of the Ministry of Food and Agriculture (MoFA) in carrying out data collection and surveys to inform policy formulation and implementation over the years has been using a Multi-Round Annual Crop and Livestock Survey (MRACLS) system. MRACLS data provides information on agricultural production by giving estimates of field areas and yields of important crops. This effort however excludes provision of detailed information on holders, farm practices, inputs used and agricultural infrastructure. There has, therefore been a quest for bridging the gap between agricultural data needs, and availability and quality of the data.

The Ghana Agricultural Production Survey (GAPS) was consequently introduced to improve methodologies for data collection, and enhance quality of agriculture statistics generation and accessibility. Thus GAPS updated sampling design, expanded scope of the questions beyond those of MRACLS, addition of geographical referencing, and added a new data management system in a form of a pilot. The main goal of the pilot was to meet the information needs of the government, donors, and agricultural policy planners, at district and national levels as well as the needs of researchers interested in Ghana's agriculture more appropriately. This initiative is very important for provision of timely information for policy formulation and policy implementation for agriculture planning and development purposes. The reason is that the survey is envisaged to provide reliable and regular data on agriculture production in Ghana which do not rely heavily on long recall periods of the farmers. It also mandates multiple visits to the farmer (at least 7 times) to avoid loss of critical information related to various agricultural seasons in the year. Moreover, the questionnaires are focused specifically on agriculture.

However, in order to scale up GAPS, to cover the whole country after two years of piloting the survey, there is the need to discuss how useful the data generated by the pilot survey had been and whether the data is reliable and of good quality. It is also appropriate to find out how relevant the survey data is to agricultural policy and development planning at the district and national levels and what are the current problems and challenges associated with the data being collected. This is necessitated by the need to address a number of data quality issues associated with the post-fieldwork activities of the survey before any reliable generalization can be done.

The main goal of this report is to assess the usefulness of the survey and its relevance to district and national agricultural policy and development planning. The report therefore attempted to find out the main information that can be generated from the survey data, noting any limitations on the quality and reliability of the data the pilot survey may have. The report in addition, attempts to determine the relevance of the pilot survey data to agricultural policy planning and the problems to consider so as to improve future surveys. The report consequently is organized into 3 sessions, namely: introduction which includes sampling design for GAPS and overview of GAPS data quality; report on key indicators for the 2011/2012 minor season; and conclusions and some recommendations.

1.2 Ghana agricultural production survey (GAPS) sampling design

Consistent with surveys of this nature, a three stage multi-sampling design was used for the pilot minor season survey. The survey also used clustering and stratification approach for the design. The first stage involved a random selection of two districts for each region of Ghana. The metropolitan districts, such as Accra and municipal districts were excluded. The second stage involved a random selection of 40 enumeration areas (EAs) for each selected district and at the third stage 10 farm holders from every selected EA were targeted for selection. Nonetheless, as a result of the work load and human resource issues, the sample size was reduced to 5 holders per EA. Further, as a result of challenges including wrong use of

data entry program by some districts the analysis for this report consists only of 18 instead of 20 districts. This explains why though the data from the minor season of the second round of the GAPS pilot covered 20 districts in Ghana the analysis contained in the report covers 18 of the districts. The 2 districts missing from the data set are Lawra and North Tongu.

The survey has sampling weights to account for the differential probability of inclusion of districts into the sample for the season. There is a limited extent to which results at the household and holder levels can be generalized beyond the sample characteristics. This is because the sampling weights do not account for the unequal probability of inclusion for household and farm holders.

1.3 Overview of 2011/2012 minor season data quality

First, survey documents including background papers, questionnaires and related reports were studied followed by an examination of the structure of datasets (in excel and text format) stored at various stages of data processing. Some of the original completed questionnaires were physically compared to soft copies of datasets. The data entry program used for the survey was also studied. The datasets were reviewed and primary analyses were carried out to generate tables based on suggestions from IFPRI.

There were large degree of correspondence and consistencies between procedures in written form and facts obtained from observations made through visits to offices and interactions with key members of the survey team. However, some differences were sometimes observed for the same datasets captured or exported in different formats.

There were issues on labeling of a number of variables which led to misleading results. These were errors, which came about because of data collection, data entry and data management problems. Some of these issues could be cleaned up through a recall of original completed questionnaires but others remain lessons that can only be resolved in future surveys. Examples of these include inconsistencies of codes for farm holders, households, fields, and crops which were identified and resolved for some sections of the datasets.

Some of the key identifiers needed to be re-entered through this review process. It was also observed that some codes and some variables did not match properly during data export from the data entry program used at the district level. In order to resolve these problems, some codes for fields and farms were re-entered before some of the analysis in section 2 could be done.

2. FINDINGS ON KEY INDICATORS FOR THE 2011/2012 AGRICULTURE MINOR SEASON

2.1 Introduction

A number of policy planning issues can be addressed using the 2011/2012 agriculture minor season survey data. These include the following: farm household characteristics, level of education of farm household members, agricultural and non-agricultural work in the minor season, livestock and poultry ownership, usage of animal droppings (waste) and revenue from livestock and poultry. Others include animal health issues, feeding of animals, tree crop production, farms and fields, land utilization and irrigation, farm practices and inputs, other income generating activities, types of both production and non-production shocks and information on the health of household members.

2.2 Farm household characteristics

The GAPS survey defines a household as one person or a group of persons, living together in the same house or compound, sharing the same house-keeping arrangements and is catered for as a unit. The person or group of persons forming a household normally pool together their in-kind and cash incomes and obtain their essential living requirements by drawing from a common pool or common stock of resources acquired through their joint efforts. The second round minor season pilot survey data show that holders from 2,845 households were interviewed using the different sets of questionnaires from the 18 districts. In all, 2,845 out of a target of 3,600 farm households were reached during the survey with highest participation from the Mfantsiman district (6.6 percent) and the least from the Prestea Huni Valley (1.7 percent). Apart from the Prestea Huni Valley district, other districts virtually met more than half of the target number of households needed (Table 1).

In this report, the districts namely Prestea Huni Valley, Bia, Mfantsiman, Assin North, Ga West, Ga East, Keta, West Akim, Atiwa, Amansie East, Sekyere Afram Plains, Dorma East and Techiman are considered to be in southern zone of

Ghana. Whilst Yendi, Gushiegu, Kasena Nankenan East, Bawku Municipal, Sissala East were considered to be the northern zone of Ghana. Considering the aggregation of the districts, 2,362 households were covered from southern zone and 483 household's falls within the northern zone (Table 2). The six districts from the north accounted for 17 percent of the households and the 12 from the south 83 percent.

Table 1—Number of households interviewed, by district

District	Number of households	Percent of total	Percent of expected respondents interviewed
Prestea-Huni Valley	48	1.69	24.0
Bia	179	6.29	89.5
Mfantsiman	187	6.57	93.5
Assin North	183	6.43	91.5
Ga West	150	5.27	75.0
Ga East	173	6.08	86.5
Keta	167	5.87	83.5
West Akim	131	4.60	65.5
Atiwa	167	5.87	83.5
Amansie West	165	5.80	82.5
Sekyere Afram Plains	172	6.05	86.0
Dormaa East	169	5.94	84.5
Techiman	178	6.26	89.0
Yendi	162	5.69	81.0
Gushiegu	178	6.26	89.0
Kasena N. East	178	6.26	89.0
Bawku M.	149	5.24	74.5
Sissala East	109	3.83	54.5
Total	**2,845**	**100**	**79.0**

Source: GAPS 2012, minor season data

Table 2—Number of households interviewed, by zone

Zone	Frequency	Percent
South	2,362	83.0
North	483	17.0

Source: GAPS 2012, minor season da

2.3 Level of education of female household heads

The survey data from the given districts suggest that the proportion of households whose heads are females from the southern sector is 30.23 percent whilst those of the north is 8.86 percent. These are indicated in Table 3. This therefore suggests a vast difference in the role of females and their empowerment from the two geographical locations in the country. The level of education attained by the household heads in the corresponding locations in the country similarly revealed the same pattern. The percentage of heads that finished primary education or beyond is about 49 percent in the south and about 11 percent in the north, and about 43 percent in both zones.

Table 3—Percent of female household heads and heads of households with education beyond primary, by zone

	South	North	All
Percent of female headed households	30.23	8.86	26.6
Percent of all heads of households with education beyond Primary	49.11	11.14	42.67

Source: GAPS 2012, minor season data

2.4 Agricultural and non-agricultural work in the minor season

The survey has information on the main occupation of the heads of households. Since the sampling design targets farmers the majority of heads of households are engaged mainly in farming, providing farm hands or labour, fishing and agro-processing. About 87 percent of them in the south are mainly into agriculture and almost all heads of households in the north are primarily in agriculture (Table 4).

Table 4—Proportion of households in agricultural and non-agricultural work, by zone

Main occupation	South	North	All
Farmer	85.38	92.4	87.29
Farm hand	0.48	0.39	0.46
Fishing	0.97	-	0.7
Agro processing	0.48	-	0.35
Non-agricultural work	12.69	7.22	11.19

Source: GAPS 2012, minor season data

Participation in non-farm activities in the minor season is very important for most agricultural households and the timing of the survey makes it possible to obtain more precise information on their activities.

2.5 Ownership of livestock and poultry

Crop farmers sometimes keep livestock at home to supplement income from the crops they grow or sometimes keeping livestock may even be the main activity. About 52 percent of households in the zones keep some form of livestock (Table 5). It is observed that whilst about 73 percent of the households in the north keep some form of livestock, about 48 percent of those in the south do.

The survey results depict that livestock and poultry birds are owned by holders in both north and south. It can be observed from Table 6 that local chicken is the most common form of animal kept by households in the districts with about 26 percent of all households keeping them. Djallonke sheep are also very common in the north (16.3 percent), followed by the Sahelian goat (about 5.8 percent). Less than five per cent of households in the districts keep the West African dwarf goat (about 4.6 percent in the south and about 3.1 percent in the north). Guinea fowls are kept predominantly in the north (about 9.5 percent of households).

Table 5—Percent of households that keep animals, by zone

Zone	Percent
South	47.91
North	73.31
Total	**52.21**

Source: GAPS 2012, minor season data

Ownership of cattle among the households is the same in terms of *Sanga getrudis* breeds (0.04 percent) for northern and southern regions. The cattle breeds of Zebu and the N'dama are owned only by the households of the northern regions. About six percent of northern households also own West Africa short-horn cattle compared to about one percent of households from the south.

Table 6—Proportion of households that own different types of animals, by zone

Types	Percent of households		
	All Districts	South	North
Poultry birds			
Crossed breed chicken	0.79	0.34	2.99
Exotic chicken	0.21	0.25	0.00
Guinea fowl	1.92	0.36	9.53
Duck	1.84	2.09	0.64
Local chicken	26.11	27.21	20.71
Turkey	0.00	0.00	0.00
Pigeon	0.00	0.00	0.00
Small ruminants			
Djallonke_sheep	5.21	2.94	16.30
Sahelian_sheep	2.35	2.68	0.70
Sahelian_goat	4.89	4.70	5.79
West African dwarf goat	4.33	4.58	3.12
Pigs			
Exotic pig	0.20	0.24	0.00
Local Pig	0.39	0.21	1.32
Cattle & large ruminants			
Sanga	0.04	0.04	0.04
Zebu	0.04	0.00	0.21
N'dama	0.06	0.00	0.37
Ghana West Africa short-horn	2.00	1.04	6.71
Donkey	1.46	0.79	4.71
Mule	0.17	0.21	0.00
Other animals			
Grass cutter	0.06	0.08	0.00
Rabbit	0.04	0.05	0.00
Others	0.10	0.09	0.17

Source: GAPS 2012, minor season data

We now discuss the average number of a particular livestock type in the two zones. For local chicken, the average number kept by households in the two zones is almost the same at about 20 live birds. For exotic chicken the number is 183 birds because only few households reported keeping them and those households are keeping them on commercial basis.

The average number of turkeys owned by those who owned (14) for the south is above the mean (13) for all the districts whilst that of the north (7) is below the overall mean. The average number of all small ruminants owned by households ranges between 6 and 11. For the southern zone the mean numbers fall between 8 and 11 compared to the 6 – 11 range for the northern households. The number of small ruminants (sheep and goats), are therefore fairly distributed over the south and north.

Table 7—Average number of animals owned by households who have animals, by district and zone

Type of Animals	Mean number of animals owned by household		
	All Districts	South	North
Poultry birds			
Cross breed chicken	17	14	19
Exotic chicken	183	183	0
Duck	14	15	8
Guinea fowl	17	18	16
Local chicken	21	21	19
Turkey	13	14	7
Pigeon	20	20	0
Small ruminants			
Djallonke sheep	9	9	9
Sahelian goat	8	8	6
West African dwarf goat	10	9	11
Sahelian sheep	10	11	9
Pigs			
Exotic pig	36	36	0
Local Pig	11	12	10
Cattle and large ruminants			
Ghana W/A short-horns	10	12	10
N'dama	6	0	6
Sanga	6	6	5
Zebu	15	9[1]	15
Donkey	5	8	3
Mule	42	42	0
Other animals			
Grass cutter	13	13	0
Rabbit	7	6	8[2]
Others	8	7	8

Source: GAPS 2012, minor season data

The highest average number of cattle breeds owned is the zebu, nearly 15 per household who actually owned them in the north and an average of nine for the south. N'dama cattle are owned by those from the northern regions only and on the average six of them are owned per household. However, there seem to be no significant difference between the average number of *Sanga getrudis* and the West African Short-horn breeds of cattle reared by all households.

2.6 Usage of animal droppings (waste)

Three major uses of the droppings of animals owned are considered in this analysis. They include use of the dropping for the owners' fields, for compost and those who sell them (Table 8).

Cross breed chicken, guinea fowl, duck and exotic chicken droppings are predominantly used on the owners' fields and a small percent are sold to other farmers. For the exotic chickens' droppings, 62 percent of those who keep those birds use them on their fields and 19 percent of holders sell them. Local chickens' droppings are used for all the three purposes with owners' usage very pronounced than the other options. The droppings of ducks and turkey are used only for owners' fields.

The droppings of all the small ruminants kept by the respondents also have all the three uses. The percentage of respondents who use small ruminants' droppings on their own fields lies between 17 and 30 percent of owners depending on the type of animal. About 2 to 7 percent of them used sheep and goats droppings as composts while 2 to 5 percent sell them to other users.

[1] Zebu cattle recoded zero percent for the south in Table 6 but average value of 9 is record for in Table 7. This may be due to data entry /collection error or the number of owners was very few accounting for the nearly zero percent in Table 6.

[2] Table 6 reported no household ownerships of the rabbit for the northern sector but Table 7 reports on the average number of rabbit owned by the northern households which is very absurd. These are indication of gross inconsistency in the data, which need to be strictly checked in the future.

N'dama, Sanga and Zebu cattles' droppings are mostly used on farmers' own fields and to a lesser extent also for compost preparation. Ghana W/A short-horns and donkey droppings were used on owners' farms, as compost and also for sale. Nonetheless more than 20 percent of farmers use them on their own farms.

Table 8—Use of animal droppings (waste)

Types of animals owned	% used droppings in own field	% using droppings as compost	% sold droppings
Poultry birds			
Cross breed chicken	56.04	-	3.83
Guinea fowl	39.94	-	2.64
Duck	22.38	-	-
Exotic chicken	61.60	-	19.1
Local chicken	23.97	3.23	3.29
Turkey	30.51	-	-
Small ruminants			
Djallonke sheep	29.58	5.34	3.79
Sahelian goat	16.64	6.98	4.63
Sahelian sheep	19.95	3.29	3.13
West African dwarf goat	29.30	2.26	2.02
Pigs			
Exotic pig	20.10	-	1.61
Local Pig	26.95	-	1.65
Cattle and large ruminants			
N' dama cattle	92.97	6.63	-
Sanga cattle	35.62	4.90	-
Zebu cattle	74.42	6.29	-
Ghana W/A short-horns	20.98	5.19	8.52
Donkey	25.70	5.84	2.92
Other animals			
Grass cutter	9.88	-	-
Rabbit	45.86	-	-
Others	83.66	-	-
Total	**26.28**	**3.24**	**3.13**

Source: GAPS 2012, minor season data

2.7 Revenue from livestock and poultry

The survey has information on average total revenue obtained from various types of animals kept by households. Among the poultry birds, the exotic and cross breed chickens yielded the highest average annual revenues with the amounts of 848.24 and 329.93 Ghana Cedis respectively. These figures are relatively high because of the predominantly commercial nature of those birds. Local chicken and Guinea fowls recorded the lowest annual average revenues of 18.33 and 18.85 Ghana Cedis respectively for poultry birds owned.

Table 9—Annual revenues from sales of livestock, by type of animal

Types of animal own	Average total revenue (GH¢)
Poultry birds	
Cross breed chicken	329.93
Local chicken	18.33
Guinea fowl	18.85
Duck	31.15
Exotic chicken	848.24
Turkey	107.72
Small ruminant	
Sahelian sheep	77.66
West African dwarf goat	51.57
Djallonke sheep	50.25
Sahelian goat	42.69
Pigs	
Exotic pig	179.36
Local Pig	70.30
Cattle & other large ruminants	
Sanga cattle	574.22
Zebu cattle	131.33
Ghana W/A short horns cattle	67.43
Donkey	46.76
Other animals	
Grass cutter	67.87
Others	6.77

Source: GAPS 2012, minor season data

The Sahelian sheep produced the highest average annual revenue of 77.66 Ghana Cedis among the small ruminants but the Sahelian goat produced the lowest average revenue of 42.69 Ghana Cedis. Moreover, the West African dwarf goat and Djallonke sheep produced average revenues that are quite close (51.57 and 50.25 Ghana Cedis respectively) and there might not be any significant difference between them. Exotic pig owners comparatively obtained higher average revenues than those keeping the local breeds of pigs of more than 100 percent. In terms of cattle owners Sanga yielded the highest average revenue of 574.22 Ghana Cedis compared with Zebu and West Africa short-horns which recorded 132.33 and 67.43 Ghana Cedis respectively.

2.8 Animal health issues

2.8.1 Types of animals and percent reported sick

The data also covers sicknesses reported for various types of livestock. The proportion of a particular livestock that was reported sick in the past three months preceding the survey is presented in Table 10. For poultry birds, about 12 percent of cross breed chicken were reported sick and about nine percent of exotic ones were reported sick. As expected, the proportion of local birds reported sick is relatively small (5.17 percent), with a further lower proportion for guinea fowls. Similarly, whilst about eight percent of exotic pigs were reported ill, only 1.5 percent of the local pigs were reported ill.

Table 10—Percentage of animals reported sick, by type of animal

Types of Animals own	Percentage reported sick
Poultry birds	
Cross breed chicken	12.19
Duck	3.45
Local chicken	5.17
Guinea fowl	1.38
Exotic chicken	8.81
Turkey	0.44
Small ruminants	
Sahelian sheep	6.93
West African dwarf goat	5.48
Djallonke sheep	4.12
Sahelian goat	4.36
Pigs	
Exotic pig	8.19
Local Pig	1.50
Cattle & other large ruminants	
Sanga cattle	0.25
Zebu cattle	6.41
Donkey	5.72
Ghana W/A short horns	1.42
Mule[3]	16.67
Other animals	
Others	1.35

Source: GAPS 2012, minor season data

The survey indicated that sicknesses affected all breeds of goats and sheep (small ruminants). Between four and seven percent of those small ruminants were reported ill. Nearly six percent of Zebu cattle and donkeys were reported sick in the given period but for Sanga and the Ghana W/A short-horns cattle, less than two percent of them were reported sick. However, 17 percent of mules reported having some sicknesses.

2.8.2 Main animals' sicknesses

There are varieties of diseases that affect animals households keep in the study area (Table 11). Some of the households know the particular types of diseases but there is a significant number that is not known by them. The major sickness reported were Newcastle disease (NCD)-36 percent, Peste des Petits Ruminants (PPR)-about 25 percent and those unknown to the holders-13.6 percent.

[3] Mules was reported in Keta District and it is owned by very few holders

Table 11—Types of animal sicknesses reported

Main sickness of the animals	Number of holders	Percent
Parasites / Worms	30	3.75
Tetanus	5	0.65
Anthrax	2	0.20
Pneumonia	12	1.49
Contagious Bovine Pleura-pneumonia (CBPP)	23	2.89
Tuberculosis	2	0.23
Blackleg	1	0.08
Newcastle disease (NCD)	290	36.30
Fowl pox	27	3.35
Mareks disease	6	0.72
Gumboro	4	0.45
Coccidiosis	21	2.66
Avian flu	2	0.19
Peste des Petits Ruminants (PPR)	199	24.89
Foot rot	2	0.27
Foot and Mouth	5	0.59
Mange	34	4.21
Bloat	4	0.46
Poison	2	0.27
Ingestion of Polythene Bags	2	0.23
Accident	4	0.51
Other	15	1.86
Unknown	109	13.64

Source: GAPS 2012, minor season data

Between the ranges of 3 to 4 percent of those in animal husbandry also reported that their animals suffered from Mange, Coccidiosis, fowl pox, worms/parasites and Contagious Bovine Pleura-pneumonia (CBPP). Less than 2 percent of the holders with animals mentioned sickness like tuberculosis, Gumboro, pneumonia, tetanus, inter alia.

The main types of diseases that affect specific types of livestock are also reported by the survey (Table 12). For example, Newcastle is the main disease that affect cross breed chicken (41 percent), followed by Pneumonia with about 12 percent. For local chicken, Newcastle accounts for about 73 percent of their illnesses and even higher for guinea fowl (93 percent). Parasites/Worms are the main illnesses of pigs (40 percent for exotic and 55 percent for local pigs). Small ruminants are mostly affected by PPR, about 60 percent in cases for West African dwarf goats and 65 percent for sahelian goats. It is also obvious that CBPP affects cattle more than any other disease.

The respondents, who reported treating sicknesses due to parasite/worm infections, pneumonia, CBPP, fowl pox, Mange and Coccidiosis fell within the range of 2 – 4 percent of total treatments. The percentage of the rest of the treatments mentioned was below 2. The least of the sickness treated indicating 0.13 percent include Anthrax, Brucellosis, Avian flu, bird pecking and foot rot. Local chicken and cross breed chicken were found to be affected most, given different treatments against 16 and eight diseases respectively among all poultry birds. Turkeys and ducks have the least number of treatment of 1, thus they are least affected birds by sicknesses.

The small ruminants were observed to be the most widely affected and treated animals having a range of 6 to 12 different treatments and diseases (Table 12). The West Africa dwarf goats and Sahelian sheep are most affected with treatment against 12 and 10 ailments correspondingly and the Sahelian goats were given the least treatments of 6. Local pig was noted to be given 5 different treatments as compared to 3 for exotic pigs. Considering cattle, the West African short-horns received the highest of treatments of 5 relative to the allocation for Donkeys, and Zebu. Sanga and the N'dama cattle got the least treatment against one disease

Table 12—Treatment of sicknesses, by type of disease and type of livestock (per cent of holders)

Type of disease	Poultry birds						Pigs		Small ruminants				Cattle & Donkey					Total
	Cross breed chicken	Duck	Local chicken	Exotic chicken	Guinea fowl	Turkey	Exotic pig	Local Pig	Sahelian sheep	W/ A dwarf	Sahelian goat	Djallonke sheep	Sanga cattle	Donkey	Zebu cattle	W/A short horns	N' dama cattle	
Parasites / Worms	5.88	-	0.88	-	-	-	40	55	4	3.55	7.69	8.51	-	14.29	-	-	-	4.39
Tetanus	-	-	0.59	-	-	-	-	-	2	-	-	-	-	-	-	-	-	0.38
Anthrax	-	-	-	-	-	-	-	-	-	0.59	-	-	-	-	-	-	-	0.13
Pneumonia	11.76	-	-	-	-	-	-	5	4	7.10	5.77	19.15	-	-	-	14.29	-	3.88
CBPP		-	-	-	-	-	-	-	-	-	-	-	100	71.43	60	57.14	100	3.51
Tuberculosis	-	-	-	-	-	-	-	-	-	0.59	-	-	-	-	20	-	-	0.25
Brucellosis	-	-	0.29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.13
Newcastle	41.18	60	72.86	33.33	93.10	-	-	-	2	-	-	-	-	-	-		-	37.5
Fowl pox	5.88	-	5.60	16.67	3.45	100	-		-	-	-	-	-	-	-	-	-	3.51
Mareks disease	-	-	1.18	-	3.45	-	-	-	-	-	-	-	-	-	-	-	-	0.63
Gumboro	-	-	1.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.63
Coccidiosis	-	-	4.72	16.67	-	-	-	-	-	-	-	2.13	-	-	-	-	-	2.26
Avian flu	-	-	0.29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.13
Bird Pecking	-	-	0.29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.13
(PPR)	-	-		-	-	-	-	-	54	59.10	65.38	57.45	-		-	-	-	24.2
Foot rot	-	-	0.29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.13
Foot and Mouth	-	-	-	-	-	-	-	-	2	1.78	-	-	-	-	20	14.29	-	0.88
Mange	-	-	-	-	-	-	-	-	8	13.60	9.62	-	-	-	-	7.14	-	4.14
Bloat	-	-	-	-	-	-	-	-	2	1.78	-	-	-	-	-	-	-	0.50
Poison	-	-	0.29	-	-	-	-	-	-	-	-	2.13	-	-	-	-	-	0.25
Ingestion of Poly Bags	-	-	-	-	-	-	-	-	-	0.59	-	2.13	-	-	-	-	-	0.25
Accident	5.88	-	-	-	-	-	-	-	-	1.78	-	-	-	-	-	-	-	0.50
Other	-	-	0.29	-	-	-	-	-	2	1.78	1.92	6.38	-	7.14	-	-	-	1.25
Unknown	5.88	40	9.73	33.33	-	-	40	5	20	7.69	9.62	2.13	-	-	-	-	-	10.30

Source: GAPS 2012, minor season data

2.8.3 Vaccinations and medications for animals

The data also contain what was done to treat the animals against the diseases (either through vaccination or application of medications). Tables 13a to 13c present specific vaccines and selected livestock types that received those vaccines or medications. About 40 percent of djallonke sheep were vaccinated against PPR whilst about 36 percent of Sahelian sheep were vaccinated against PPR. A relatively lower percentage of goats were vaccinated against the disease (Table 13a).

Table 13A—Application of PPR vaccinations and medication, by type of animal (per cent of holders)

Type of animal Vaccination	Neither applied	Vaccination	Medication	Both
Djallonke sheep	50.68	40.34	3.62	5.37
Sahelian sheep	61.87	36.06	1.05	1.01
Sahelian goat	68.18	27.52	3.17	1.12
West African dwarf goat	65.71	26.7	3.1	4.5

Source: GAPS 2012, minor season data

Contagious Bovine Pleuro Pneumonia (CBPP) vaccination for cattle was given mostly to Zebu cattle (68 percent) as compared to about 30 percent for Sanga cattle, about 13 percent for WA short-horns and 12 percent for N'dama cattle (Table 13b). Black leg vaccinations were applied mostly to Sahelian sheep (14.55 percent) and Zebu cattle (13.56 percent, Table 13c).

Table 13B—Application of CBPP vaccinations and medication, by type of animal (per cent of holders)

Type of animal own	Neither applied	Vaccination	Medication	Both
Sanga cattle	70.33	29.67	-	-
N'dama cattle	79.70	12.18	4.06	4.06
Ghana W/A short-horns cattle	84.22	13.47	-	2.31
Zebu cattle	27.98	68.17	3.85	-
Donkey	95.08	3.94	0.97	-
Mule	100	-	-	-

Source: GAPS 2012, minor season data

Table 13C—Application of black leg vaccinations and medication, by type of animal (per cent of holders)

Types of animals own	Applies Neither	Vaccination	Medication	Both
Small ruminants				
West African dwarf goat	98.15	1.55	0.30	-
Sahelian goat	91.57	7.91	-	0.52
Sahelian sheep	85.45	14.55	-	-
Djallonke sheep	95.33	3.93	0.74	-
Cattle and related species				
N'dama cattle	100	-	-	
Mule	100	-	-	-
Sanga cattle	100	-	-	-
Donkey	96.82	3.18	-	-
Ghana W/A short-horns	92.33	7.18	0.49	-
Zebu cattle	86.44	13.56	-	-

Source: GAPS 2012, minor season data

2.9 Feeding of animals

The survey also tried to find out from animal husbandry holders their modes of feeding the animals they keep and the results are presented in Table 14. For each type of livestock, the distributions of the sources of feeds that were used are also

presented[4]. Cross breed chicken were noted to graze on public land (70 percent), feed on grass (62 percent), feed on dried crop residues (41 percent) and also depend on grains and left over food 26 and 20 percent respectively. About 85 percent of ducks were offered left-over food and 30 percent were fed with grains. Local chicken likewise depend mainly on grains and household left-over food as their source of feed (65 and 62 percent respectively) Exotic chickens on the other hand were fed with grains (62 percent), compound feed (41 percent) and in some cases household left-over food.

For small ruminants, sheep and goats, 51 to 68 percent were fed on public grazing lands and 12 to 29 percent on owners' land. Both exotic and local pigs were provided with leftover food for their up keep and these involved 93 and 69 percent for exotic and local pigs respectively.

Most cattle and donkeys were fed by grazing on public and own fields in addition to grass cut for them. About 77 percent of the donkeys were also fed on household left-overs.

[4] The sums add to more than 100 because a particular livestock can feed on multiple sources.

Table 14—Feeding of animals

Animal types	Graze on public land	Graze on own land	Grass	Grain	Pellet	Vine	shrubs	silage	Compound feed	Browse	Fresh crop residue	Dried crop residue	Household left overs	Other feeds
Poultry birds														
Cross breed chicken	69.72	-		26.48	-	3.84	1.72	-	4.28	0.45	14.20	40.69	20.10	17.52
Duck	8.80	3.58		29.72	-	-	-	1.39	19.19	2.63	15.93	20.60	84.57	14.45
Local chicken	25.94	13.63		65.22	3.64	0.32	0.12	0.33	11.64	2.09	8.68	10.09	61.77	27.79
Exotic chicken	19.84	-		61.74	-	-	-	-	40.50	19.84	15.02	16.80	25.38	43.29
Pigeon	100.0	100.0		100.0	-	-	-	-	-	100.0	100.0	100.0	100.0	-
Turkey	42.16	30.51		85.53	-	1.70	1.70	1.70	24.38	1.70	14.42	12.72	45.13	29.02
Guinea fowl	32.25	8.22		70.06	7.67	0.5	-	-	9.73	2.02	3.78	3.78	53.52	35.21
Small ruminants														
Djallonke sheep	53.47	29.42	60.73	16.27	3.05	7.24	7.89	2.48	12.58	24.02	33.86	41.45	48.74	13.40
Sahelian goat	67.77	12.15	37.82	9.42	-	1.10	18.44	7.58	6.01	18.84	29.70	28.79	68.88	26.07
Sahelian sheep	51.05	18.94	58.96	22.01	2.41	4.98	13.46	6.69	15.40	15.08	34.00	32.43	54.82	23.45
West African dwarf goat	58.42	19.66	58.69	16.26	2.86	3.83	14.15	3.87	10.74	20.14	39.28	36.74	53.54	13.00
Pigs														
Exotic pig	-	11.16	30.44	3.34	-	-	-	-	22.18	36.22	66.73	44.06	93.45	-
Local Pig	26.42	9.47	11.81	35.20	3.50	2.28	0.25	0.25	4.92	12.57	27.39	11.05	68.63	39.86
Cattle & Other large ruminants														
Sanga cattle	78.11	-	69.28	24.76	-	15.1	17.72	-	-	-	42.48	47.39	42.48	24.76
Zebu cattle	83.73	40.51	64.92	21.04	1.84	11.8	-	3.85	15.40	15.40	18.50	51.25	58.94	15.51
Ghana W/A short-horns	59.76	18.94	38.02	6.57	1.69	6.11	5.74	2.93	24.06	10.63	14.36	24.13	31.36	4.01
Donkey	81.51	28.63	70.12	28.05	-	5.33	8.57	3.89	9.21	3.85	39.38	40.57	77.14	30.37
Mule	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-
N'dama cattle	80.10	72.68	30.98	-	-	8.12	-	4.06	20.30	-	-	43.56	51.68	8.12
Other animals														
Grass cutter	-	-	100.0	41.13	-	-	-	-	-	3.21	61.01	16.67	39.12	6.54
Rabbit	-	-	57.92	25.89	-	3.77	3.77	-	25.89	70.34	32.03	32.03	28.25	42.08
Others	50.70	35.49	13.31	-	-	-	-	2.54	17.75	-	10.14	43.10	45.49	12.53

Source: GAPS 2012, minor season data

2.9.1 Production and purchase of feed

To get a clue of the extent of expenditure on livestock, for specific feeding sources, the proportion of holders who produced the feed themselves are compared with those who bought them from neighbors or the local market. The feed types that have the highest percentage of holders buying them are grains (5.5 percent of holders) and compound feed (about 3 percent of holders). For the rest of the feed types, they were largely produced at home or gotten free (Table 15). About 65 percent of holders produced dried crop residues, 50 percent own grains, and 33 percent fresh crop residues.

Table 15—Feed production and purchases

Type of Feed	Per cent of holders	
	Produced	Purchased
Grass	15.64	1.51
Grain	49.66	5.52
Pellets	2.39	0.26
Vine	7.37	0.78
Shrub	4.34	1.08
Silage	1.25	0.2
Compound Feed	13.75	3.09
Browse/leaves	11.91	0.63
Crop Residue/fresh	33.00	1.62
Crop Residue/dried	65.63	1.02
Household left overs	21.66	0.86
Total	**20.72**	**1.52**

Source: GAPS 2012, minor season data

2.10 Tree crop production

Households' activities on tree production practices in the minor season were covered by the survey. Districts that have a relatively more households planting tree crops were Bia, Assin North, West Akim and Atiwa (Table 16). Also, tree crops that were planted by a relative greater percentage of households in the sample are local cocoa_, hybrid cocoa_and oil_palm.

Households cultivating cocoa hybrid are found in seven out of the 18 districts. The proportion of households growing hybrid cocoa are concentrated in the Dormaa East district, constituting 69 percent of the households as compared to 24 percent in the West Akim and 17 percent in the Prestea-Huni Valley districts. Meanwhile local cocoa was identified with 11 of the district under consideration. The proportion of households producing local cocoa was 93 percent in Bia, 87 percent in Assin North, 84 percent in Atiwa, 82 in the Amansie East, and 50 percent in Prestea-Huni Valley.

Sheanut trees are cultivated in the five northern districts, namely, Yendi, Gushiegu, Kasena Nankena East, Bawku and Sissala East with the largest proportion of households, 49 percent, found in the Sissala East district.

Mango trees are owned by households in 11 of the districts including all the five northern districts. The Kasena Nankena East district had about 35 percent of households cultivating mangoes, and it was 32 percent in Keta in the coastal zone.

The average number of specific trees owned by holders is presented in Table 17. The average number of shearnut trees in the northern districts was 27 trees. The south did not have sheanut trees. Trees such as cocoa and rubber have the highest average number because there are some large-scale for commercial farmers.

Table 16—Percent of households in tree crops production, by district and type of crop

District	Type of tree crops													
	Avocado	Cocoa hybrid	Cola	Coconut	Mango	Oranges	Oil palm	Other	Pawpaw	Rubber	Shear nut	Lime	Cocoa local	Cashew
Prestea-Huni Valley	-	16.67	-	-	-	-	22.92	-	-	-	-	-	50.00	-
Bia	8.38	-	-	7.82	1.12	11.73	9.50	-	-	-	-	-	93.30	-
Mfantsiman	-	-	-	3.74	1.07	5.88	17.65	-	-	-	-	3.21	1.07	1.60
Assin North	-	0.55	-	-	-	4.37	26.78	-	-	1.09	-	-	86.89	-
GA West	4.67	0.67	-	4.00	10.00	6.67	13.33	-	4.00	-	-	0.67	3.33	-
GA East	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Keta	-	-	-	39.52	31.74	4.19	15.57	1.20	1.20	-	-	-	-	1.20
West Akim	-	24.43	0.76	-	-	12.21	38.17	-	-	-	-	-	32.82	-
Atiwa	-	3.59	0.60	1.20	-	4.19	10.18	-	-	-	-	-	84.43	-
Amansie West	-	6.67	-	-	-	1.82	4.85	-	-	-	-	-	82.42	-
Sekyere Afram Plains	4.07	-	-	1.16	5.23	2.33	6.40	-	1.74	-	-	-	10.47	-
Dormaa East	-	69.23	-	0.59	-	1.78	15.98	-	-	-	-	-	4.73	1.78
Techiman	-	-	-	-	0.56	5.06	1.12	-	-	-	-	-	16.85	19.66
Yendi	-	-	-	-	1.23	-	-	-	-	-	8.64	-	-	1.23
Gushiegu	-	-	-	-	0.56	-	-	-	-	-	10.11	-	-	-
Kasena N. East	-	-	-	-	34.83	1.12	-	-	2.25	-	17.98	-	-	0.56
Bawku M.	-	-	-	-	3.36	-	-	-	-	-	0.67	-	-	-
Sissala East	-	-	-	-	4.59	-	-	-	-	-	48.62	-	-	4.59

Source: GAPS 2012, minor season data

Table 17—Average number of trees owned by households

Type of tree crop	Zone		
	All	South	North
Avocado	3	3	-
Cocoa hybrid	2,128	2,128	-
Cola	1,514	1,514	-
Coconut	18	18	-
Cocoa local	2,418	2,418	-
Cashew	188	197	54
Lime	534	534	-
Mango	6	5	6
Orange	189	191	3
Oil palm	581	581	-
Other	4	4	-
Pawpaw	6	5	12
Rubber	2,725	2,725	-
Shear nut	27	-	27

Source: GAPS 2012, minor season data

The average age of the trees is another important feature for tree crops. Table 18 shows the proportion of fields with trees not more than ten years in the field. For example, only about 14 percent of fields with sheanut trees have their ages not more than ten years, implying that sheanut trees are mostly old trees.

Table 18—Percent of fields with trees that are under 10 years of age

Type of tree crop	Zone		
	All	South	North
Avocado	59.75	59.75	-
Cocoa hybrid	72.76	72.76	-
Cola	63.24	63.24	-
Coconut	49.95	49.95	-
Cocoa local	51.09	51.09	-
Cashew	71.24	71.42	69.06
Lime	73.00	73.00	-
Mango	41.79	43.51	39.30
Oranges	62.82	62.65	75.00
Oil palm	63.58	63.58	-
Other	30.00	30.00	-
Pawpaw	72.11	66.63	87.50
Rubber	75.00	75.00	-
Sheanut	14.48	-	14.48

Source: GAPS 2012, minor season data

The proportion of households planting new tree crops by district during the last 12 months preceding the survey shows interesting differences (Table 19). The survey shows that there were no households producing new tree crops in Bawku, Ga East and Yendi. The greatest proportion of households involved in new trees production is Prestea-Huni Valley (33 percent), Atiwa (32 percent), Assin North (31 percent), Dormaa East (30 percent) and West Akim (28 percent).

Table 19—Percent of households that plant new trees, by district

District	Percent of households
Prestea-Huni Valley	33.33
Bia	8.94
Mfantsiman	6.95
Assin North	30.60
Ga West	1.33
Ga East	-
Keta	4.19
West Akim	28.24
Atiwa	31.74
Amansie West	18.18
Sekyere Afram Plains	2.91
Dormaa East	30.18
Techiman	7.30
Yendi	-
Gushiegu	2.81
Kasena N. East	2.25
Bawku M.	-
Sissala East	3.67

Source: GAPS 2012, minor season data

2.11 Farms and Fields

We now discus some details of farms and fields in the survey. Table 20 shows the proportion of holders who have specific number of farms-either 1, 2 3, 4 or 8. In general the majority of holders have only 1 farm across all the 18 districts, ranging between 70 to 100 percent of the holders, depending on the district. There were 6 out of the 16 districts where farmers kept only one farm where there could be more than one field on the farm.

Table 20—Number of farms per holder, by district

District	Number of farms				
	1	2	3	4	8
Prestea-Huni Valley	100	-	-	-	-
Bia	95.58	3.31	1.10	-	-
Mfantsiman	98.50	1.50	-	-	-
Assin North	98.96	0.52	0.52	-	-
Ga West	83.21	13.87	1.46	1.46	-
Ga East	100	-	-	-	-
Keta	94.29	4.29	1.43	-	-
West Akim	72.41	17.24	6.90	2.59	0.86
Atiwa	70.32	27.74	0.65	1.29	-
Amansie West	96.81	3.19	-	-	-
Sekyere Afram Plains	97.70	1.15	1.15	-	-
Dormaa East	100	-	-	-	-
Techiman	94.30	5.70	-	-	-
Yendi	100	-	-	-	-
Kasena N. East	100	-	-	-	-
Bawku M.	100	-	-	-	-
All districts	**93.44**	**5.36**	**0.81**	**0.33**	**0.05**

Source: GAPS 2012, minor season data

Only seven districts reported holders with 3 farms or more and this mostly occurred in the West Akim district with seven percent and the least at Atiwa and Assin North with nearly one percent of the holders. Nonetheless, in general, 93 percent of holders had 1 farm, five percent had 2 farms and less than one percent of the holders had 3, 4, and 8 farms respectively.

2.11.1 Field measurements

Some of the fields in the survey were measured. Table 21 shows the number of fields measured during the minor season. There were no fields measured in the Kasena Nankena, Bawku and Yendi districts mainly because of the dry climatic conditions observed during the minor season and the fact that large number of the households do not engage in dry season gardening. Ga West records the highest number of fields measured to be 200 fields. About 33 percent of the total number of fields were measured and there was no indication in the data as to why some of the fields were not measured.

Table 21—Percent of minor season's fields measured, by district

District code	Number of fields	Number measured	Proportion measured
Prestea-Huni Valley	142	78	54.9
Bia	304	32	10.5
Mfantsiman	138	14	10.1
Assin North	267	16	6.0
GA West	225	209	92.9
GA East	170	90	52.9
Keta	251	38	15.1
West Akim	219	147	67.1
Atiwa	253	55	21.7
Amansie West	103	73	70.9
Sekyere Afram Plains	101	42	41.6
Dormaa East	412	24	5.8
Techiman	241	216	89.6
Yendi	1	-	-
Kasena N. East	305	-	-
Bawku M.	24	-	-
All districts	**3,156**	**1,034**	**32.8**

Source: GAPS 2012, minor season data

2.11.2 Sources of water for the irrigated fields

The survey also contains sources of water for irrigation for each district. Some fields have no form of irrigation whiles others have 1 or more sources. On average about 86 percent of all fields have no form of irrigation and only about 11 percent of them have one source of water for irrigation (Table 22). The distribution by districts differs significantly.

The sources of water used for irrigation were identified to be river, stream, well, dam and pond. Other water sources include flooded areas. Proportions of the total land area measured that have access to some of the sources of irrigation is presented in Table 23.. It is obvious that for fields that have access to water for irrigation, the most prominent source is river. For the Ga East district, about 37 percent of the fields have access to a river for irrigation.

Table 22—Number of sources for irrigated water that are used on fields, by district

	Number of sources of irrigation used			
District	**None**	**1 Source**	**2 Sources**	**3 Sources**
Prestea-Huni Valley	90.14	8.45	1.41	-
Bia	92.43	7.57	-	-
Mfantsiman	96.38	3.62	-	-
Assin North	97.75	2.25	-	-
GA West	82.22	16.89	0.89	-
GA East	75.88	23.53	0.59	-
Keta	21.91	55.78	21.51	0.80
West Akim	93.61	6.39	0.00	-
Atiwa	81.42	7.91	7.91	2.77
Amansie West	83.50	16.50	-	-
Sekyere Af Plains	85.15	14.85	-	-
Dormaa East	99.03	0.97	-	-
Techiman	90.46	9.54	-	-
Yendi	100.00	-	-	-
Kasena N. East	91.80	7.21	0.98	-
Bawku M.	100.00	-	-	-
All districts	**86.47**	**10.67**	**2.52**	**0.33**

Source: GAPS 2012, minor season data

Table 23—Source of water for irrigation, by district (per cent of measured fields)

District	River	Well	Dam/pond	temporary shadow well	flooded area	other
Prestea-Huni Valley	-	-	-	-	-	-
Mfantsiman	-	-	-	-	7.69	-
Assin North	13.33	-	-	-	-	6.67
GA West	7.50	-	0.50	-	7.50	2.50
GA East	37.50	1.14	1.14	-	-	5.68
Keta	11.11	-	-	-	-	11.11
West Akim	2.33	-	-	-	-	8.53
Atiwa	25.93	-	-	-	9.26	35.19
Amansie West	-	-	1.37	6.85	-	-
Sekyere Af Plains	-	-	-	-	-	29.03
Dormaa East	4.17	-	-	-	-	-
Techiman	9.35	-	-	-	-	0.93

Source: GAPS 2012, minor season data

Eight out of 12 districts recorded use river as their source of irrigation (Table 23). The use of dam/ pond for irrigation was only reported in Ga East for about one percent of the fields. Amansie West was the only district where holders reported the use of temporary shallowwell for irrigation; for about seven percent of the fields.

It is also interesting to consider for each crop, the various sources of irrigation used by all districts (Table 24). The distribution is constructed for the first crop reported on the field. Crops that have very diverse sources of irrigation sources are maize, plantain, and tomatoes. But for a crop like rice, the only reported irrigation source is dam/pond (24 percent of the fields).

Table 24—Source of water for irrigation, by type of crop (percent of measured fields)

Crops	River	Well	Dam/pond	Temporary shadow well	Flooded area	Urban waste water	other
Cereals and legumes							
Maize	3.87	1.82	0.41	0.72	1.47	-	6.02
Ground nuts	-	-	-	-	-	-	23.25
Rice	-	-	24.98	-	-	-	-
Roots, tubers and plantains							
Cassava	4.39	4.87	-	1.40	0.63	-	9.78
Plantain	3.22	0.90	0.45	6.65	0.07	-	4.14
Yam	-	-	-	-	8.23	-	3.64
Tree crops							
Cocoa - Local	7.26	1.93	0.62	0.35	0.44	-	1.83
Oranges	10.49	0.65	-	-	-	-	2.47
Industrial crops							
Sugar Cane	14.25	4.40	-	-	89.61	-	66.58
Fruits and vegetables							
Pineapples	21.84	-	-	-	-	-	-
Cabbage	75.33	-	2.20	-	-	-	-
Garden eggs	54.61	-	-	-	12.12	-	-
Okro	20.09	54.66	-	-	3.88	-	12.98
Pepper (Sweet)	16.47	28.20	-	-	3.13	-	24.44
Tomato	34.17	23.45	3.77	11.21	6.50	-	24.64
Spices							
Onions	-	2.68	1.03	-	-	-	-
Shallots	-	87.50	-	-	-	-	18.75
Other Crops	-	-	-	-	-	-	-
Other	-	17.18	-	-	-	-	24.32
Total	**5.58**	**4.17**	**0.53**	**1.00**	**1.76**	**-**	**6.14**

Source: GAPS 2012, minor season data

2.12 Land utilization and irrigation

Even though the survey instrument requested for at most three crops per field, some of the fields (those on fallow) obviously had no crops reported. Table 25 gives the distribution of the number of crops reported for fields by district. On average about 22 percent of the fields had no crop and were left fallow during the minor season. On about 30 and 37 percent of the fields, 1 and 2 crops respectively were reported.

Table 25—Distribution of the number of crops reported on the same field, by district

District	Number of crops per field			
	0	1	2	3
Prestea-Huni Valley	11.97	72.54	12.68	2.82
Bia	3.62	4.93	76.32	15.13
Mfantsiman	83.33	7.97	7.97	0.72
Assin North	0.75	1.12	68.91	29.21
GA West	3.56	70.22	24.89	1.33
GA East	32.94	28.24	37.65	1.18
Keta	23.11	21.51	53.78	1.59
West Akim	17.81	34.7	36.99	10.5
Atiwa	-	67.19	21.34	11.46
Amansie West	18.45	67.96	9.71	3.88
Sekyere Af Plains	32.67	41.58	22.77	2.97
Dormaa East	12.14	3.16	50.49	34.22
Techiman	29.05	36.51	29.46	4.98
Yendi	-	100	-	-
Kasena N. East	70.16	19.34	10.49	-
Bawku M.	8.33	75	16.67	-
Total	**21.99**	**29.44**	**37.48**	**11.09**

Source: GAPS 2012, minor season data

To give an idea of which crops are given more land area, Table 26 presents area measurements in hectares and the percentages given to specific crops. Based on the estimates, maize is planted on 61 percent of the land area measured in the survey. This is followed by cassava with 13 percent and local cocoa with about 10 percent of the measured land area. These are rough estimates as they are based on the first crop reported on a particular field. The distribution also differs by district as shown in Table 27, but maize is still very prominent in each of the districts where measurements of fields were undertaken.

Table 26—Area cultivated and percentage given to specific crops for selected districts[5]

Crop	Hectares	Percent of total
Cereals and legumes		
Rice	14.19	3.84
Ground nuts	0.55	0.15
Maize	226.19	61.22
Roots, tubers and plantain		
Cassava	48.06	13.01
Plantain	3.25	0.88
Sweet potato	0.55	0.15
Yam	7.42	2.01
Tree crops		
Cocoa - Local	39.20	10.61
Oranges	9.42	2.55
Industrial crops		
Sugar Cane	1.82	0.49
Fruits and vegetables		
Pineapples	1.37	0.37
Watermelon	0.45	0.12
Cabbage	1.18	0.32
Carrots	0.05	0.01
Garden eggs	0.87	0.24
Okro	6.75	1.83
Pepper (Sweet)	5.08	1.38
Tomato	2.64	0.71
Spices		
Onions	0.30	0.08
Shallots	0.04	0.01
Other Crops	0.08	0.02
Total	**369.48**	**100**

Source: GAPS 2012, minor season data

[5] Estimated for districts with more than 10% area measurement available, and also for the first crop reported for a field

Table 27—Distribution of land area to specific crops in selected districts

Crop	Ga West	Ga East	West Akim	Amansie West	Techiman	Sekyere
Cereals						
Rice						31.71
Maize	81.94	47.73	35.52	97.04	71.30	60.24
Roots, tubers and plantain						
Cassava	10.37	14.94	21.57	1.43	15.72	3.23
Sweet potato		2.83				
Yam						0.19
Plantain	1.35	0.76	0.38	-	1.52	0.55
Tree crops						
Cocoa - Local			23.46	1.53	4.14	2.20
Oranges			18.57			
Industrial crops						
Sugar Cane	0.77					
Fruits and Vegetables						
Watermelon		2.30				
Pineapples	2.89					
Okro	1.65	18.78			2.50	
Pepper (Sweet)	0.94					
Tomato	-	1.63			1.81	1.49
Cabbage		2.83			0.69	
Garden eggs		1.33				
Pepper (Sweet)		6.65	0.50		2.32	0.39
Other Crops	0.09	0.21				

Source: GAPS 2012, minor season data

2.13 Farm practices and inputs

Table 28 illustrates the proportion of fields using various weed and pest control practices by district. Considering all districts as a unit, 35.40 and 15 percent of the field were observed to have hand weeding and selective pesticides as weed control practices respectively. In line with pest control activities, for all fields, nearly 19 percent of them were the result of farmer initiative whilst 12 percent were attributed to government campaigns.

In all the districts weed control was mainly done by hand weeding with Bia, Keta and Assin North recording the highest percent of the fields, 83.5, 68.8 and 60.7 percent respectively. The Sekyere Afram Plains district had the highest proportion of fields using selected herbicides accounting for 37 percent of the measured fields, followed by Techiman with 24.5 percent, and Atiwa 22.5 percent. According to the results, pest control in all the districts was done mainly from farmers' own initiative than government campaigns.

Table 28—Percent of field using a particular field practice, by district

District	Weed control		Pest control	
	Hand weeding	Selective herbicide	Farmer initiative	government campaigns
Prestea-Huni Valley	21.83	22.54	22.54	21.13
Bia	83.55	4.93	52.63	44.08
Mfantsiman	14.49	5.07	6.52	-
Assin North	60.67	14.23	37.83	20.60
GA West	29.33	13.33	6.67	-
GA East	51.18	5.88	24.12	-
Keta	68.53	8.37	31.08	0.80
West Akim	50.68	12.33	18.26	13.24
Atiwa	16.21	22.53	6.72	11.07
Amansie West	11.65	11.65	2.91	-
Sekyere Afram Plains	49.50	33.66	8.91	0.99
Dormaa East	3.16	4.37	3.88	-
Techiman	59.34	24.48	11.62	0.41
Yendi	-	-	-	-
Kasena N. East	6.56	3.28	9.84	1.31
Bawku M.	8.33	8.33	8.33	8.33
All districts	**35.40**	**15.10**	**18.65**	**11.61**

Source: GAPS 2012, minor season data, SRID

Table 29 presents the proportion of measured fields using various weed and pest control practices by crops. Considering all crops cultivated as a unit, 41.5 and 17.7 percent of the crop fields were observed to have hand weeding and selective pesticides as weed control practices correspondingly. With respect to pest control, for all fields nearly 22 percent of the cropped fields were done as a result of farmer initiative and14 percent resulted from government campaigns.

Cereals and legumes fields were noted to have hand weeding mostly for weed control except for rice fields where 58.34 percent used selective herbicide. There was no indication of pest control in groundnut fields but 19 percent of the rice fields experience pest control initiated by the farmers themselves. Nearly seven percent of maize fields also practice pest control initiated by the farmers and five percent due to government campaigns.

Farmers engaged in production of vegetables use hand weeding to control weeds, 70 – 99 percent of their fields and on 1 – 33 percent of them, use selective herbicides. Pest control on vegetable fields is mainly due to farmers' own initiatives. Only 2.16 percent of okro fields experience pest control resulting from government campaigns.

Table 29—Percent of fields using a particular field practice by crop

	Weed control		Pest control	
Crop	**Hand weeding**	**Selective herbicide**	**Farmer initiative**	**government campaigns**
Cereals and legumes				
Rice	53.87	58.34	19.98	-
Ground nuts	46.50	-	-	-
Maize	23.93	15.26	6.71	4.94
Roots, tubers and plantains				
Cassava	67.15	25.48	22.44	18.22
Plantain	36.27	9.08	4.94	1.18
Yam	41.93	34.18	22.30	22.30
Tree crops				
Cocoa – Local	58.39	18.92	50.36	39.39
Oranges	63.33	34.14	30.25	17.67
Industrial crops				
Sugar Cane	94.55	0.00	1.58	-
Pineapples	21.84	21.84	14.56	-
Vegetables				
Cabbage	69.62	32.57	100.00	-
Garden eggs	90.98	1.17	58.32	-
Okro	82.97	29.40	78.30	2.16
Pepper (Sweet)	94.08	20.80	84.27	-
Tomato	99.42	6.50	62.51	-
Spices				
Onions	8.02	2.68	6.09	4.15
Shallots	96.88	3.13	96.88	3.13
Other Crops	26.68	40.83	24.12	-
Other	49.95	22.95	32.73	19.16
All crops	**41.47**	**17.65**	**21.96**	**13.68**

Source: GAPS 2012, minor season data

The fields of roots/tubers/plantains experienced highest pest control emanating from government campaigns with cassava (18 percent), plantain (1.18 percent) and yam (22.3 percent). Farmers in spices production used hand weeding to control weeds on eight percent of their onion fields and on 97 percent of their shallot fields, they use selected herbicides. Pest control on spices fields is mainly due to farmers' own initiatives. Less than five percent of spices fields experience pest control ensuing from government campaigns.

The survey identified manure, inorganic and diverse forms of organic fertilizers as sources of soil nutrients. It also provided information on the usage of seed and other planting materials used by the farmers. These pieces of information are summarized in Table 30. The table shows that manure was not used by any of the fields in the West Akim, Atiwa, Amansie West, Dormaa East and the Bawku districts. Manure was used mostly by holders from Keta (34 percent), Prestea-Huni Valley (13 percent), Ga East (9 percent), Sekyere Afram Plains (5 percent) and Kasena Nankena (3 percent). The rest of the districts where manure was used recorded less than two percent.

Table 30—Percent of fields using a particular source soil of nutrients and seeds by district

District	Sources of soil nutrients			Seeds/planting material		
	Manure use	Other organic	inorganic	certified seed	Other improved planting materials	Row planting
Prestea-Huni Valley	12.68	11.97	15.49	12.68	18.31	13.38
Bia	0.33	5.92	34.54	0.99	4.28	0.99
Mfantsiman	0.72		2.17	2.17	1.45	11.59
Assin North	0.75		7.49	16.10	4.12	13.11
Ga West	0.89	2.22	4.89	16.00	8.00	24.00
Ga East	8.82		26.47	40.00	11.18	50.00
Keta	33.86	11.16	34.26	33.47	17.53	41.43
West Akim		0.46	3.20	4.11	5.02	6.85
Atiwa			1.19	14.62	11.46	7.51
Amansie West			2.91	7.77	0.97	0.97
Sekyere Afram Plains	4.95		18.81	12.87	8.91	34.65
Dormaa East				5.83		1.70
Techiman	1.24	1.66	22.41	34.44	6.64	31.12
Kasena N. East	3.28		10.49	8.20	2.95	3.93
Bawku M.					4.17	8.33
All districts	**5.37**	**3.64**	**12.29**	**12.94**	**8.36**	**13.28**

Source: GAPS 2012, minor season data

The usage of other forms of organic manure was mainly found in fields of Prestea-Huni Valley, Bia and Keta districts. The percentages of holders/households using other forms of organic manure on their fields from these districts were 12, 6 and 11 respectively.

Table 30 also indicates that inorganic nutrients, certified seeds, other improved planting materials and row planting are practiced by farmers on their fields in all the survey districts. The highest usage of the inorganic nutrients is identified with Bia, Keta, Ga East, Techiman, Sekyere Afram Plains, Prestea-Huni Valley districts with 35, 34, 26, 22, 18, 15 and 10 percent respectively. The rest of the districts using inorganic inputs as nutrients were less than 10 percent of holders' fields.

The Ga East district had the highest proportion of fields using certified seeds accounting for 40 percent of the measured fields, followed by Techiman district with 34 percent and Keta district 33 percent. The rest of the districts had less than 20 percent of the fields seeded with certified seeds.

According to the result, other improved planting materials were used on the fields of all the 18 districts, however, they were predominantly used on 18 percent of the fields found in Prestea-Huni Valley and Keta districts. Nearly 11 percent of the fields in the Atiwa and Ga East districts also adopted the use of improved planting materials by holders whilst the rest of the districts had less than 10 percent of their fields with other improved planting materials aside certified seeds.

Row planting was also noted to be a common practice across districts. Between 20 to 50 percent of the fields where row planting was used included Ga West, Techiman, Sekyere Afram Plains, Keta and Ga East districts. Considering the percentage range of fields of 10 to 20 with row planting as a practice, Mfantsiman, Prestea-Huni Valley and Assin North districts were identified. The remaining 7 districts had fields with less than 10 percent row planting.

Considering all districts as a unit, 5, 4 and 12 percent of fields were observed to have manure, other organic and inorganic fertilizers as soil sources of nutrients respectively.. With respect to seed/planting materials, for all districts nearly 13 percent of the cropped fields were planted with certified seeds in rows, whilst eight percent had other improved planting materials.

The survey identified manure, inorganic and other forms of organic nutrients were applied to various crops. Table 31 shows the proportion of measured fields using these sources of nutrients and seeds/planting materials including mode of planting. Considering all crops cultivated as a unit, 6.5, 4.5 and 14.7 percent of the crop fields were observed to have treatments of manure, other organic and inorganic nutrients respectively. With respect to seeds and seed/planting materials, for all crops nearly 15, 10 and 16 percent of the cropped fields respectively were treated with certified seeds, other improved planting materials and row planting.

Table 31—Percent of fields with particular source of nutrients, seeds and planting methods, by crop

	Source of nutrients			Seeds/planting		
Crop	**Manure use**	**Other organic**	**inorganic**	**certified seed**	**Improved planting materials**	**Row planting**
Cereals and legumes						
Maize	1.93	1.80	9.45	17.61	3.49	12.92
Ground nuts	-	-	-	23.25	23.25	-
Rice	-	-	55.26	27.20	19.98	43.35
Roots, tubers and plantains						
Cassava	8.66	5.00	5.72	6.24	32.50	19.40
Plantain	1.48	0.59	4.61	2.69	10.04	5.56
Yam	-	-	-	-	3.64	3.64
Tree crops						
Cocoa – Local	8.49	8.42	21.13	13.40	11.92	13.71
Oranges	9.00	8.02	23.95	22.63	24.33	25.74
Industrial crops						
Sugar Cane	-	-	-	-	10.39	89.11
Fruits and vegetables						
Pineapples	-	-	21.84	-	-	21.84
Cabbage	6.59	-	95.60	100.00	-	51.54
Garden eggs	-	-	32.90	2.35	12.59	70.44
Okro	50.81	25.95	59.50	63.25	18.58	66.36
Pepper (Sweet)	39.25	26.29	66.12	41.08	16.39	67.70
Tomato	32.79	-	93.16	43.52	13.61	56.57
Spices						
Onions	3.71	3.87	3.71	3.71	1.03	3.71
Shallots	90.63	25.00	87.50	6.25	34.38	6.25
Other Crops	-	-	-	9.43	8.12	25.43
Other	17.18	-	22.95	17.88	6.43	36.52
All crops	**6.50**	**4.50**	**14.66**	**15.47**	**10.31**	**16.25**

Source: GAPS 2012, minor season data

Among cereals and legumes only maize fields had manure and other inorganic nutrients applications. However, about 55 percent of rice fields had inorganic nutrient application compared to nine percent for maize fields. A larger proportion of rice fields had row planting (43 percent) compared to maize (13 percent). Groundnut was planted in rows in all of its fields. However, it has the highest percentage of fields with certified seeds and improved planting materials of 23 percent. Rice fields also have higher percentage of certified seeds (27 percent) and improved planting materials (20 percent) compared to of maize 18 and three percent respectively.

For roots/tubers and plantains, cassava fields have maximum sources of soil nutrients and planting materials followed by plantains. There was no source nutrients application and certified seeds for yams and they have least planted field with improved planting materials.

Tree crops of cocoa and orange have virtually similar percentage of fields with all the 3 sources of soil nutrients. Nonetheless in terms of seeds/planting materials and row planting, orange fields were 100 percent better than cocoa. Supplementary soil nutrients were not applied to sugarcane but 10 percent of its fields were planted with improved planting materials and 89 percent of the field also experienced row planting (Table 31).

Vegetables fields used inorganic sources for soil nutrients with cabbage fields recording the highest with nearly 96 percent and garden eggs fields being the least with 34 percent. More than 50 percent of the vegetable fields were planted in rows, with the highest percentage for garden eggs (70 percent) and lowest for cabbage (52 percent). Apart from okro and sweet pepper none of the vegetables has other organic sources. However, they all have manure for soil nutrients except for garden eggs fields. Cabbage fields indicated lowest percent of fields (7 percent) and okra highest (51 percent) of fields using manure. It was also observed that shallot fields used more manure, inorganic and other organic sources for nutrients in their soils compared to that of onion fields.

2.14 Other income activities

The 2012 minor season, GAPS survey provided information on other income generating activities undertaken by the holders/households apart from farming. It was observed that most of the farmers were in self-employment (a range of 71 to 83 percent) rather than wage employment (16 to 29 percent) (Table 32). Thus in overall analysis of work 23 percent got extra income from waged-employment and 77 percent from self-employment.

In relation to wage employment about 16 percent of the holders/households were engaged in farm labour and about 29 percent were in handicraft business. With respect to holders in self-employment the maximum of 83 percent are in farm labour and a minimum of 71 percent were in handicraft.

Table 32—Other income generating activities, by status of employment

Engagement/Work	Wage employment	Self-employment
Trading	26.79	73.21
Farm labourer	16.08	83.92
Hunting/fishing	26.92	73.08
Mining	27.00	73.00
Construction	22.34	77.66
Handicrafts	29.33	70.67
Other	27.52	72.48
All work	**23.23**	**76.77**

Source: GAPS 2012, minor season data

Comparing income sources based on the average annual income per job and per holder, it was realized that wage employment gives a higher income (GHS 1,550.16 per annum) on average. Average income from self-employed jobs gave GHS 1,031.11 per annum. Mining seems to yield the highest average annual income of GHS 1,395.32.

Table 33—Average annual income, per job and status of work (Ghana Cedis)

Engagement/Work	Wage Employed	Self employed	Total average
Trading	1,739.89	1,164.19	1,318.80
Farm labourer	1,208.58	845.99	903.72
Hunting/fishing	1,366.57	952.43	1,063.93
Mining	1,487.44	1,361.35	1,395.32
Construction	1,800.07	996.11	1,175.68
Handicrafts	1,504.69	1,325.22	1,377.86
Other	1,608.48	666.33	967.44
All work	**1,550.16**	**1,031.11**	**1,151.80**

Source: GAPS 2012, minor season data

The survey also reports statistics on the months of the year that are associated with different types of jobs. Table 34 shows information for each type of job, and the months in which it is mostly associated with. The results indicate high percentages because each job can be engaged in more than one month. Household members may be engaged in other income generating activities throughout the year. However, most of them were engaged in providing farm hands as labourers (84 to 66 percent) and trading (72 to 84 percent).

Table 34—Types of work, month and proportion of households

	Trading	Farm labourer	Hunting/fishing	Mining	Construction	Handicrafts	Other
January	82.33	82.68	78.12	60.02	52.66	35.80	31.70
February	81.48	83.86	78.01	60.32	53.25	35.80	31.55
March	76.75	82.29	76.76	62.97	56.87	36.54	37.07
April	71.34	77.61	73.44	59.29	54.70	34.16	37.07
May	66.26	74.51	67.91	55.66	53.10	33.56	36.06
June	65.56	72.33	63.87	53.48	49.66	34.42	34.03
July	66.74	74.07	66.22	53.53	50.42	34.66	34.03
August	68.64	77.16	68.10	54.00	53.46	32.23	36.52
September	70.26	78.14	65.26	54.37	53.75	33.06	37.77
October	77.26	81.92	69.92	55.22	57.75	32.27	38.55
November	83.57	83.38	74.92	54.07	52.28	36.68	34.05
December	84.47	84.37	77.48	55.25	56.49	35.21	34.20

Source: GAPS 2012, minor season data

Table 35—Percent of households with members doing other work and average number of jobs, by district

District code	Percent	Average number of jobs
Prestea Huni Valley	6.25	1
Bia	34.64	2
Mfantsiman	47.06	1
Assin North	65.03	1
Ga West	34.00	2
Ga East	79.77	2
Keta	76.65	2
West Akim	36.64	2
Atiwa	73.05	2
Amansie West	27.88	1
Sekyere Afram Plains	48.26	2
Dormaa East	50.89	1
Techiman	75.84	1
Yendi	89.51	1
Gushiegu	31.46	2
Kasena N. East	56.18	2
Bawku M.	48.99	1
Sissala East	22.02	1
All districts	**48.57**	**2**

Source: GAPS 2012, minor season data

In general, the trend of engagement in these activities decreases progressively from the beginning of the year and rises again during the last two months of the year. This might be attributed to involvement of household members in their own farming activities which is at its peak during May –August and so they lessen their engagement in other income generating activities and work on their farms.

Broadly, 49 percent of households had a member engaged in other works for income apart from farming. On average, households had about two jobs (Table 35). With respect to individual districts, households from 9 out of the 18 districts (50 percent) had on average two jobs. Techiman, Yendi, Keta and Ga East districts had more than 70 percent of households engaged in other income generating activities.

2.15 Types of Shocks

The survey collected data on the various types of shocks that affected the farmers in their work. In total 2.54 percent of the holders reported some shocks in the last 12 months (Table 36). However, more holders in the north (3.09%) as compared to the south (1.69%) reported being affected by shocks in the past 12 months in the production of their crops.

Table 36—Percentage of holders affected by shock on crops, by type of shock and zone

Type of shock	South	North	All
Lower temperature	0.49	0.25	0.44
High temperature	4.97	0.25	3.87
Strong winds	3.78	1.41	3.22
Storm	1.51	0.5	1.27
Flooding /water logging	2.23	1.94	2.16
Drought	8.47	14.1	9.80
Fire	0.46	0.29	0.42
Weed damage	3.25	1.82	2.91
Plant disease	7.56	2.46	6.35
Insect/pest infestation	7.13	0.49	5.55
Livestock eating/ trampling crop	0.64	2.34	1.05
Birds /other animals	0.85	0.67	0.81
Illness of household member/worker	3.08	0.16	2.39
Death of household member/worker	0.77	0.23	0.64
Theft of crops /livestock/equipment/cash	0.45	0.13	0.37
Other	4.43	-	3.36
Total	**3.09**	**1.69**	**2.77**

Source: GAPS 2012, minor season data

It was observed that drought was the main event which affected the production of crops in the past 12 months. In total, 9.8 percent of the holders reported to be affected by drought. Comparing the north to the south, 14.1 percent of the total holders in the north were affected by drought as compared to 8.47 percent in the south. Plant disease follows as the second most prominent event which affected crop production in the past 12 months. About 6.3 percent of the holders reported to be affected by plant disease.

About 60.4 percent of holders reported they lost up to 25 percent of their produce due to various shocks they experienced (Table 37). More holders in the south (61.1 percent) reported losing up to 25 percent of their farm produce due to shocks as compared with the north (56.41 percent).

Table 37—Percent of produce lost by holders due to shock (crops), by zone

How much did you lose	North	South	Total
Up to 25%	56.41	61.1	60.45
Between 26% and 50 %	27.00	23.24	23.76
Between 51% and 75%	13.91	3.77	5.17
More than 75%	2.68	11.89	10.62

Source: GAPS 2012, minor season data

Table 38—Percentage of holders affected by shocks on animals

Types of Shock	South	North	All
Lower temperature	-	0.13	0.03
High temperature	0.91	-	0.70
Strong winds	0.05	0.13	0.07
Flooding /water logging	0.05	0.33	0.12
Drought	1.07	0.41	0.91
Fire	0.05	0.13	0.07
Weed damage	0.07	-	0.05
Plant disease	-	0.08	0.02
Insect/pest infestation	0.2	-	0.15
Illness of household member/ worker	0.68	-	0.52
Death of household member/ worker	0.17	0.25	0.19
Theft of crops /livestock/ equipment/ cash	0.51	0.13	0.41
Other	0.14	-	0.10
Total	**0.24**	**0.1**	**0.21**

Source: GAPS 2012, minor season data

For the holders who kept livestock and poultry, 0.21 percent reported different events which caused shocks to their livestock production in the past 12 months (Table 38). More holders in the south (0.24 percent) lost livestock as compared to the north (0.1 percent). Droughts, theft and illness of the household member/worker were the main sources of the shocks to the livestock.

About 78.6 percent of local chickens were reported to have been lost during the past 12 months (Table 39). This proportion was followed by losses in West African Dwarf Goats (WAD) (31.8 percent reporting loss). The pattern for the losses in the north was not very different from those in the south.

Table 39—Percentage of animals lost due to shock

Animal	South	North	Total average
Poultry birds			
Guinea fowl	-	7.03	0.70
Duck	1.13	-	1.02
Local chicken	85.67	14.06	78.57
Exotic chicken	0.25	-	0.22
Cross/Hybrid chicken	5.06	-	4.56
Pigs			
Local pig	-	14.06	1.39
Exotic pig	1.28	-	1.15
Small ruminants			
Sahelian Sheep	-	4.30	0.43
Djallonke Sheep	3.37	42.18	7.22
Sahelian Goat	0.83	0	0.75
West African Dwarf Goat (WAD)	33.54	15.64	31.77
Cattle			
Ghana West African shorthorn (WASH)	-	14.06	1.39
Other cattle	1.01	-	0.91
Other animals			
Grass cutter	0.12	-	0.11
Other animal	1.01	-	0.91

Source: GAPS 2012, minor season data

2.16 The health of household members and the effect of illness on their productive activities

The minor season survey also collected data on the health status of the farmers and members of their households. Table 40 provides information on the proportion of household members who could not perform one or more of the following activities due to illness;

- Stand from sitting in a chair
- Rise from sitting on the floor
- Weed on a field or farm
- Walk up to 5 km
- Carry a heavy load (like a bucket loaded with cassava) for up to 30 steps.

About 28 percent of household members in both the north and south could not perform at least one of these functions because of illness. Also, some household members (about 14 percent) missed full working days because of illness. More households in the south (about 14.89 percent) experienced this phenomenon than in the north ((10.6 percent).

Table 40—Percent of household members reporting illness and the effects of illness on productive activities in the last two weeks

District	% HH members who could not perform at least one listed activity due to illness in last two weeks	% of HH who missed full day's work in the last two weeks
South	27.86	14.89
North	27.41	10.60
Total	**27.77**	**14.01**

Source: GAPS 2012, minor season data

Table 41—Symptoms of illnesses reported by holders[6] (percent of holders)

Symptom	South	North	Total
Diarrhea	1.43	7.34	2.58
Nausea	1.63	8.19	2.91
Vomiting	3.48	8.97	4.55
Poor appetite	7.13	20.87	9.81
Intense headache	12.06	12.64	12.17
Fever	28.92	21.91	27.55
Cough (with and without bloody spit)	3.97	6.02	4.37
Sore throat	2.37	3.15	2.52
Sneezing	2.17	4.65	2.65
Generalized aches and pains	24.02	13.48	21.97
Fatigue (decreased energy/weakness)	16.44	6.64	14.53
Shortness of breath	1.88	0.97	1.70
Chest pain	8.38	6.32	7.98
Joint swelling	5.83	6.95	6.05
Skin ulcers, sores or lesions	0.46	0.00	0.37
Eye infection (discharge, swollen eyelids)	0.99	1.72	1.13
Ear infection	0.29	0.60	0.35
Injury suffered while doing farm work	1.50	0.63	1.33
Injury suffered while doing non-farm work	0.70	0.60	0.68
Injury suffered while doing domestic work	0.33	0.12	0.29
Abdominal pain or waist pain	15.47	3.34	13.11
Other	9.21	6.81	8.75
None	42.88	49.67	44.21

Source: GAPS 2012, minor season data

Even though the majority of household members did not experience any illnesses during the period under consideration, about 28 percent of household members reported fever during the last two weeks (Table 41). Cases of other

[6] Percent of cases for multiple responses, total a bit different than average of the two.

specific symptoms or illnesses were also reported. Close to 22 percent reported experiencing aches and pains during the two weeks preceding the survey and close to 17 percent also complained about general fatigue.

3. CONCLUSION AND RECOMMENDATIONS

This report presents an analysis of the 2011/2012 minor season survey data collected during the pilot stage of the Ghana Agriculture Production Survey (GAPS). The main objective of the exercise is to draw lessons from the elaborate processes GAPS used for the survey and use them to inform the preparation for scaling up of the project. The other goal is to assess the usefulness of survey data, even at the pilot stage, and report the key findings that can be used for agricultural policy and development planning processes at the various levels of governance for the sector.

A number of processes involved in data quality assessment were used, including an active engagement with major stakeholders related to the implementation of GAPS. These include SRID of MoFA, and key staff of GAPS at IFPRI office in Accra. The main observation made through this process is that the newly introduced GAPSis a good exercise in principle and it needs to be encouraged. This is because the survey is designed in a manner to provide reliable and regular data on agriculture production in Ghana which do not rely heavily on long recall periods for farmers. It also mandates multiple visits to farmers, which help to avoid loss of critical information related to various agricultural seasons in the year. Like other surveys, successful implementation of GAPS depends on how well data is captured in the field and then processed for analysis.

However, there were a number of observations that point to the need to implement key remedial measures so as to minimize post interview processing errors. More circumspection is needed at the level of data collection, entry and export. The reason is to reduce data entry and extraction errors which necessitate elaborate data cleaning for data users. There is a need to make changes in the format of the questionnaire to help with easy identification of basic information that is required to link appropriately all parts of data for respondents. Close attention needs to be given to correct entry of the key identifiers for all the sections of the questionnaires. This will aid users of the data to easily combine information from various data files of the survey during analysis.

There is also the need to revise the design of data entry program. For example, a simple and an easy to use design and layout could help minimize common mistakes. All new versions of the data entry program should be pre-tested as much as possible before rolling them out to the field. This will enhance validating of consistency checks and ensuring that they are working properly.

Refresher training of DASOs in computer literacy, basic statistics and data management will also be useful to help them resolve some of the avoidable errors observed at that level of the process.

There is a need to assess the processes used to capture data at the district levels and review the protocols used for data cleaning and office editing. This is because too many issues on data transfers between programs and at different levels of the survey were identified. It is therefore anticipated that cautious revision of the processes will facilitate the required flexibility with the use of the data in all circumstances.

The current survey does not have clear information on the major statistical decisions including reasons why weights were generated only at the district levels and not at EA, household and holder levels. Future surveys should be very clear about the major statistical decisions employed in the implementation of the survey research design. This recommendation is very essential in helping users of the data to assess the validity, quality and reliability of the data. The ultimate result of this is to enhance the usefulness of the information the survey provides among all users and stakeholders.