DESCRIPTIVE REPORT ON CROPPING SYSTEMS IN UPPER WEST REGION, GHANA

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SANREM CRSP

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1.0 INTRODUCTION

1.1 Problem

In Sub-Saharan Africa, agriculture constitutes the backbone of most of the economies. Therefore investing in agriculture will likely contribute significantly to poverty reduction, providing food security and growing economies. Most populations in Africa live in rural areas that are dependent on crop and livestock production.Most agricultural production in the West African sub-region is low-inputwhich may not able to meet the required food demands of the households. Production is becoming more difficult due to land degradation from soil erosion, nutrient loss and low soil fertility combined with variable rainfall, high temperatures and low water holding capacities.

The challenges one faces in trying to increase improving ecosystem services, improve yields and increase farm level profitability in West African countries largely revolve around the environmental and economic constraints. Improving ecosystem services with a focus on maintaining soil quantity, quality and moisture in West Africa will require the adoption of conservation agricultural practices (CAPS) such as legumes to fix nitrogen, a focus on reduced tillage and practices that maintain as much residue in the system as possible and integrated nutrient, water and pest management practices.

The goal of this project is to contribute to poverty alleviation and improve food security by improving economic returns, system productivity and sustainability of agricultural production systems, creating market opportunities and livelihoods of small holder farming households dependent on rain fed agriculture through the evaluation, development and dissemination of conservation agricultural production practices that improve soil quality, water use efficiency, crop productivity, ecosystem services and efficient use of farm inputs and labor.

1.2 Overview of the study area

The baseline study was carried out in the Upper West Regionlocated in the northwestern part of Ghana. The region has a total of nine administrative districts with a total population of 576,583, representing about 3% of the national population (GSS, 2005). Geographically, it covers an approximate area of 18,478 square kilometers, representing 12.7% of the total land area of Ghana. It is bordered to the south by the Northern Region, east by the Upper East region and north and north west by the Republic of Burkina Faso.(www.ghanadistricts .com, Aug. 2010)

Various economic activities take place in the region. The major occupation is agriculture which employs about 72% of the populace, Commerce employs about 5.2%, professionals while technical and related work employs about 4% (GSS, 2005). Three districts from the region were selected for the project implementation.

The Lawra district which has a population of about 5,763 inhabitants (GSS, 2005) and lies in the northwestern part of the region, occupies about 1,051 sq. kilometers. Agriculture employs about 77.6% of the populace. The major crops produced in the district include maize, millet, sorghum cowpea, peanuts and bambaranuts. Four communities in the district are involved in the study:Brutu, Puffien, Bu and Nabugaun.Wa west district is the second district located in the south western part of the region. It occupies a geographic area of approximately, 5,899 sq.

kilometers. Also the predominant economic activity in the area is agriculture. Four communities involved in the study from the district include; Seiyiri, Nyoli, Ga and Kokoyiri.

The Wa municipal district has a population of about 224,066 inhabitants representing about 38.9% of the region's population. It is located in the central part of the region. Agriculture also predominates among the economic activities of the people in the district (GSS 2000). Major crops cultivated in the area include; maize, sorghum, rice, yam, cowpea, soy beans, peanut and other legumes. The four communities involved in the study from the district are; Busa, Busa-Tangzu, Biihee and Dodiyiri.

SANREM project activities are to be implemented with partners such as WaPolytechnic, Langmaal Centre for Rural Development(LACRD) (Lawra district), Upper West Agro-industries (Wa municipal) and Lassia-tuolo Agricultural Project (LAP) (Wa West district). These partners are involved in development projects in the three districts especially in the selected communities. They have a long relationship with farmers in these communities whose activities are based on farmer based organizations and with poor soils.

1.3 Sampling strategy

The population of interest for the study included all households in the Upper West region of Ghana. The unit of study is the household which we define for this study as a group of individuals who share common resources and eat from a common cooking "pot".

A total of 210 households were randomly sampled from a purposive sample of 12 communities in three districts of the Upper West region. The communities were selected because of the existence of farmer based organizations (FBOs) communities and their working relationship with the local NGOs. Out of the 12 communities, 7 were classified as the intervention (with) communities and 5 were as the non-intervention (without) communities. This segregation is to enable comparison in the future. The "with" community is also broken into two subgroups to include non-participant households labeled as "within". *Table 1* below shows sampled communities and the number of households by category.

Table 1: Districts, communities and households surveyed

Name of district	*Name of community*	**Category of households**			*TOTAL*
		With	*Within*	*Without*	
	Seiyiri	*13*	*10*	*0*	*23*
	Nyoli	*12*	*12*	*0*	*24*
Wa West	***Ga***	*0*	*0*	*12*	*12*
	Kokoyiri	*0*	*0*	*12*	*12*
Total		***25***	***22***	***24***	***71***
	Busa	*10*	*10*	*0*	*20*
	Busa-tangzu	*11*	*10*	*0*	*21*
Wa Municipal	***Biihee***	*0*	*0*	*10*	*10*
	Dodiyiri	*0*	*0*	*10*	*10*
Total		***21***	***20***	***20***	***61***
	Brutu	*9*	*8*	*0*	*17*
	Puffien	*8*	*9*	*0*	*17*
Lawra	***Bu***	*8*	*8*	*0*	*16*
	Nabugaun	*0*	*0*	*19*	*19*
Total		***25***	***25***	***19***	***69***

N = 201. Source: Author, 2010.

Data was collected from the household head and his wife using structured questionnaires in a face-to-face interview. Questions covered household demographics including age, household size, education and gender of household members. Household assets were inventoried to include both agriculture and non-agriculture assets and materials used in constructing house, crops and livestock inventories. An agricultural system module surveyed crop production and agricultural land use, biochemical input uses, and labor requirements. We also administered questions on market particaption (both inputs and outputs), groups and organizational affiliation and contacts, food security and conservation knowledge questions. The questionnaire was pre-tested at Goyiri in the Wa West district.

2.0 SURVEY FINDINGS

Table 2 below presents the summary of the number of questionnaires completed during the survey from May 1st to May 12th, 2010. A total of 358 completed questionnaires were obtained

Table 2: Districts, communities and number of questionnaires administered

District	Name of community	Category of community						Total
		With		Within		Without		
		Male	Female	Male	Female	Male	Female	
	Seiyiri	13	3	10	2	0	0	28
Wa West	Nyoli	12	13	12	12	0	0	49
	Ga	0	0	0	0	12	12	24
	Kokoyiri	0	0	0	0	12	10	22
Total		**25**	**16**	**22**	**14**	**24**	**22**	**123**
	Busa	10	10	10	10	0	0	40
Wa	Busa-Tangzu	11	5	10	10	0	0	36
municipal	Biihee	0	0	0	0	10	10	20
	Dodiyiri	0	0	0	0	10	10	20
Total		**21**	**15**	**20**	**20**	**20**	**20**	**116**
	Brutu	9	8	8	7	0	0	32
Lawra	Puffien	8	8	9	5	0	0	30
	Bu	8	7	8	11	0	0	34
	Nabugaun	0	0	0	0	19	4	23
Total		**25**	**23**	**25**	**23**	**19**	**4**	**119**
	Total	**71**	**54**	**67**	**57**	**63**	**46**	**358**

Source: Results of field survey, May, 2010

fromhousehold heads and their wives intwelve (12) communities and in three districts. The reductions in the female questionnaires were due to our inability to track some of the wives of the head of the household who were either at funerals or at the markets. Follow ups were made to reduce the number of missing observations.

2.1 DEMOGRAPHIC INFORMATION

Table 3 below presents the summary of the demographic structure of the households sampled. The structure as seen above is disaggregated by the household category but very little can be

seen in terms of differences between the households. The indication is that, the households are evenly composed of both adults (> 15 years) and children (< 15 years) with an average each of four (4) individuals per household in all categories.

Household structure on average is made up 7 - 9 individuals per household which is reflective of the National household size of 5 individuals (with + or – a standard deviation of five) (GSS, 2005). On average, the age of the household head ranges between 42 to 46 years compared to their wives whose average age ranges between 30 to 35 years. The results also showed that migration of household members were not common during the rainy season but about 10% of household member migrate down south when agricultural activities decline. The observations indicate that most of the household heads (97%) were involved in crop production. Livestock rearing is considered as an occupation by very few households (2%).

Table 3: Household demographic structure by the three segments of the survey

Category of Household	*Variable*	*Mean*	*Median*	*Standard deviation*	*Minimum*	*Maximum*
	HH size	*7.0*	*7.0*	*3.0*	*1.0*	*20.0*
	Age (HHH)	*42.0*	*44.0*	*13.0*	*20.0*	*80.0*
With	***Age (WHH)***	*30.0*	*30.0*	*15.0*	*0.0*	*62.0*
	# of Adults (> 15 yrs)	*4.0*	*3.0*	*2.0*	*1.0*	*16.0*
(N = 71)	***# of Chn. (< 15yrs)***	*4.0*	*3.0*	*2.0*	*0.0*	*10.0*
	HH size	*8.0*	*7.0*	*3.0*	*1.0*	*15.0*
Within	***Age (HHH)***	*43.0*	*44.0*	*12.0*	*25.0*	*73.0*
	Age (WHH)	*30.0*	*30.0*	*16.0*	*0.0*	*70.0*
(N = 67)	***# of Adults (> 15 yrs)***	*4.0*	*3.0*	*2.0*	*1.0*	*10.0*
	# of Chn. (< 15yrs)	*4.0*	*4.0*	*3.0*	*0.0*	*9.0*
	HH size	*9.0*	*9.0*	*4.0*	*3.0*	*17.0*
	Age (HHH)	*46.0*	*45.0*	*14.0*	*19.0*	*80.0*
Without	***Age (WHH)***	*35.0*	*36.0*	*11.0*	*0.0*	*70.0*
	# of Adults (> 15 yrs)	*4.0*	*4.0*	*2.0*	*2.0*	*10.0*
(N = 63)	***# of Chn. (< 15yrs)***	*5.0*	*4.0*	*3.0*	*0.0*	*11.0*
	HH size	*8.0*	*8.0*	*4.0*	*1.0*	*20.0*
All	***Age (HHH)***	*44.0*	*44.0*	*13.0*	*19.0*	*80.0*
Categories	***Age (WHH)***	*32.0*	*32.0*	*14.0*	*0.0*	*70.0*
	# of Adults (> 15 yrs)	*4.0*	*4.0*	*2.0*	*1.0*	*16.0*
(N = 201)	***# of Chn. (< 15yrs)***	*4.0*	*4.0*	*2.0*	*0.0*	*11.0*

Source: Results of field survey, May, 2010

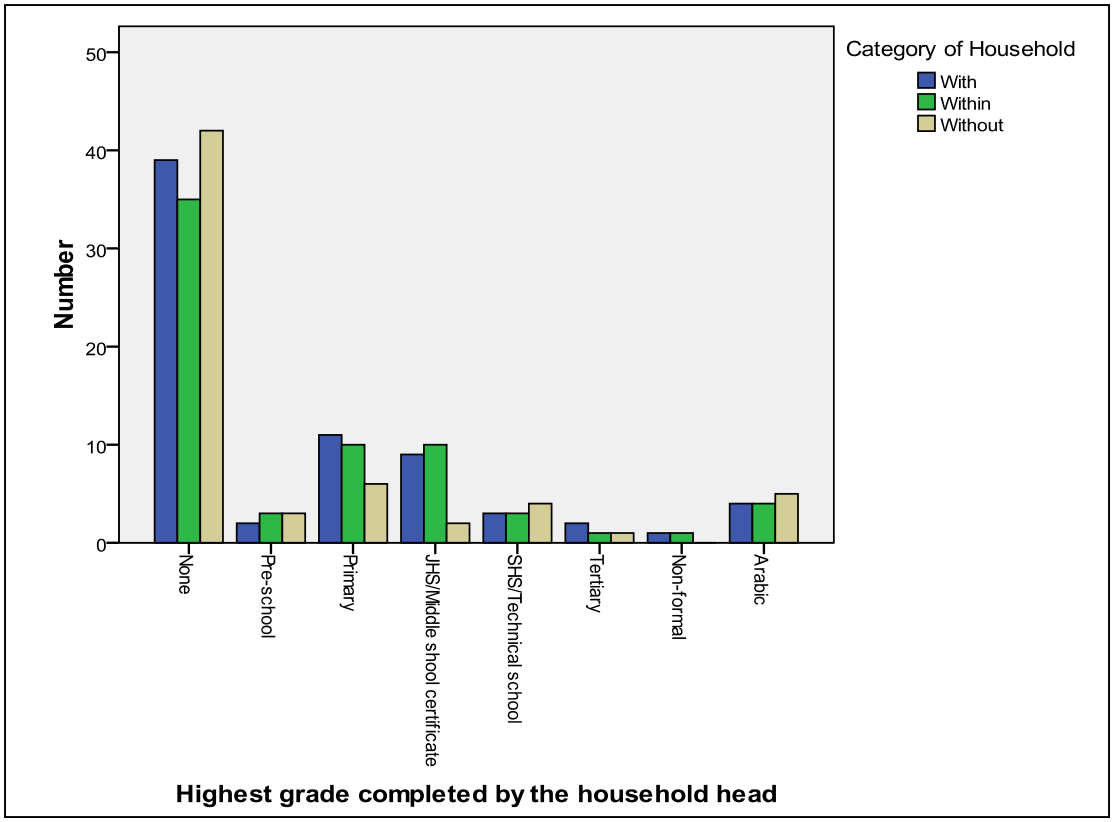

Figure 1: Highest grade completed by household head

Figure 1 above present results of the highest grade completed by the household. In all three categories of household interviewed, majority of the household heads (about 58%) had no education. A few of the household heads, averaging 13% had completed primary education and about 10% had completed junior high/middle school. Very few household heads had senior high or technical education.

2.2 HOUSEHOLD WEALTH INDICATORS

Household wealth indicators include; household assets, household structure and amenities and crops in storage.

2.2.1 Household assets

Household assets are categorized into three; Agricultural assets, Non-agricultural assets and Livestock inventory. The assets were valued at their current sale prices and presented as in *Table 3* below. The average of a total household wealth ranged between *GH¢1,224* and *GH¢ 1,729* per household (US$871 to US$1231)[1]. Even though very few households consider livestock rearing as an occupation, the results indicate household wealth is highly concentrated in livestock inventory (68%) whiles non-agricultural assets commands about 20% of the household wealth. Agricultural assets only command about 12% of the household wealth.

[1] Valued at and exchange rate of $USD1 to *GH¢*1.40477 on % May 2010.

Table 4: Value of House assets (GH¢)

Category of community	Type of asset	Mean	Median	Minimum	Maximum	Standard deviation	N
With	Agric. Asset	156.38	15.00	0.00	2174.00	501.98	71
	Non-agric. Asset	259.28	96.00	0.00	2739.00	447.35	71
	Livestock	1006.20	1069.00	0.00	1937.00	294.47	71
Within	Agric. Asset	88.10	15.00	1.00	2174.00	371.01	67
	Non-agric. Asset	198.61	80.00	6.00	1280.00	315.73	67
	Livestock	936.81	1051.50	48.00	1906.00	384.92	67
Without	Agric. Asset	266.52	12.00	3.50	2174.00	629.85	63
	Non-agric. Asset	437.72	234.00	14.00	2314.00	516.60	63
	Livestock	1025.30	1056.00	0.00	1969.00	406.09	63
All categories	Agric. Asset	168.14	14.00	0.00	2174.00	511.71	201
	Non-agric. Asset	294.99	100.00	0.00	2739.00	441.97	201
	Livestock	989.06	1056.00	0.00	1969.00	363.04	201

Source: Results of field survey, May, 2010

2.2.2 Household amenities

As part of the wealth indicators, the construction method of the home and amenities were surveyed. Generally the average number of room per household was 5, with a minimum of two rooms per household and a maximum of eight rooms per household. The houses were largely constructed with earth or mud with cement floors and zinc roof. A few of the houses had their exterior walls painted, had latrines in the houses and were also connected to the national electricity grade. *Table 5* below presents the inexhaustible summary of the household structure and amenities.

Table 5: Household structure

Amenities		With (N=71)	Within (N=67)	Without (N=63)	All categories (N=201)
Roof of Primary Residence					
Zinc		31.34%	26.87%	24.88%	83.08%
Grass/Leaves/banboo		1.49%	2.49%	0.99%	4.97%
Wooden/earth		2.49%	3.98%	5.47%	11.94%
Floor of Primary Residence					
Earth		12.94%	12.94%	10.45%	36.32%
Brick		1.49%	1.49%	0.99%	3.98%
Board/Wooden		0.00%	0.49%	0.00%	0.49%
Cement/tile		19.90%	18.41%	19.40%	57.71%
Other		0.99%	0.00%	0.49%	1.49%
Walls of Primary Residence					
Earth/mud		18.41%	17.41%	11.94%	47.76%
Earthern/Brick		6.48%	7.46%	8.94%	22.39%
Cement brick		9.95%	8.46%	9.95%	28.36%
Other		0.49%	0.00%	0.99%	1.49%
Painted exterior walls?	**Yes**	6.96%	8.46%	4.98%	20.40%
	No	28.36%	24.88%	26.37%	79.60%
Latrines	**Yes**	13.43%	10.95%	10.95%	35.32%
	No	21.90%	20.40%	20.40%	64.70%
Electrified?	**Yes**	11.94%	11.94%	7.49%	31.34%
	No	23.40%	21.40%	23.90%	68.70%

2.2.3 Crops in storage

The observations from the survey indicated that almost all crops grown in these areas were held in storage.It was observed that the most held crops in the area were maize, with an average of 40% and millet, with an average of 10% and the rest include Groundnuts (peanut), sorghum, bambara groundnuts etc. Several reasons were advance for holding these crops in storage. They serve as food and cash security measure in the coming season (especially during the lean season). Figure 2 below shows crops held in storage.

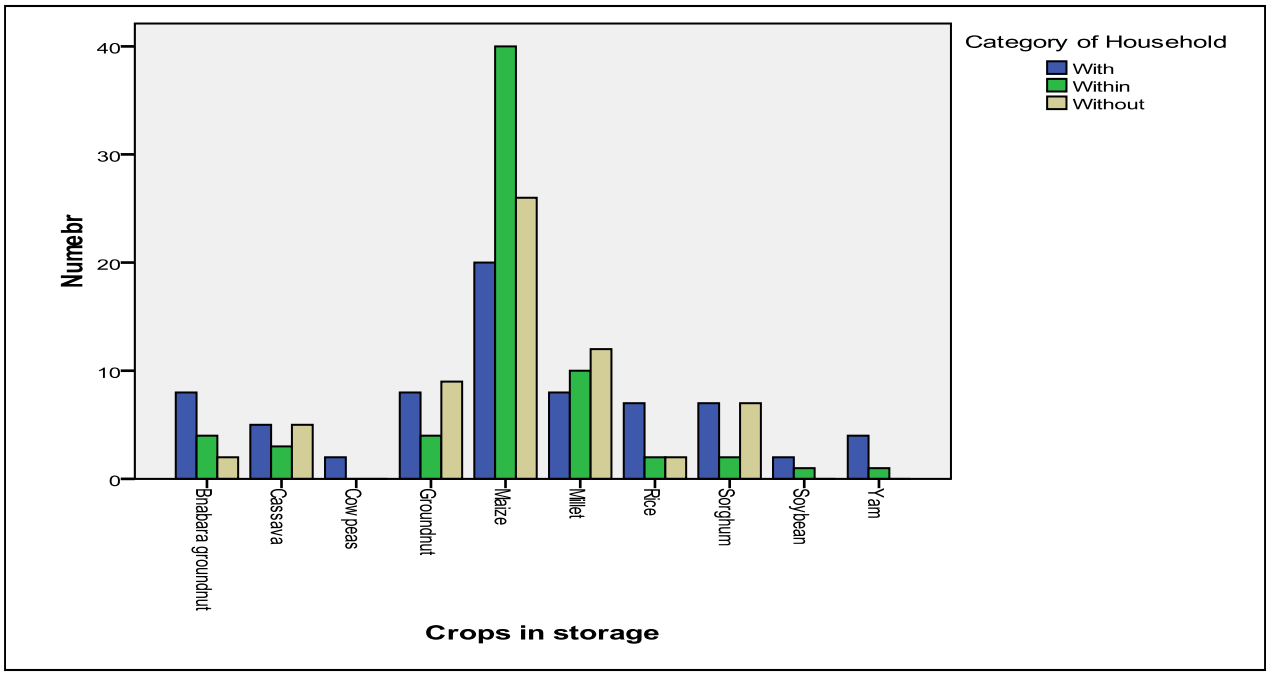

Figure 2: Crops held in storage during the 2009 cropping season

2.3 AGRICULTURAL PRODUCTION

2.3.1 Cropping system

Most households (42%) in all categories practiced the sole or mono-cropping method with peanuts, maize, millet, rice, sorghum, soybeans and yam. On category basis, sole cropping by households in the ("with") category accounts to about 23%, whiles 27% and 16% of households with the "within" and "without" categories practice sole cropping respectively.Few households (31%) practiced mixed cropping but those that did associated cereals and legumes, e.g. millet and peanut. The observations indicate that about 24% of households in all categories practice a split plot cropping system.

2.3.2Household plots and size

Cropping systems in the region are diverse as indicated earlier. These cropping systems are practiced on more than one plot per household. Observations from the survey indicate that, on average, households in all categories operate on three (3) parcels of land with a total average of 10 acres per household. It was also observed that tenure on most the land were direct ownership (87%) by the household heads probably through inheritance or outright purchase. About 97% of

the plots cultivated depend on rain fed without irrigation. Averagely it takes a bit more than 60 minutes (1 hour) to travel from the household to the plots. *Table 6* below presents the summary of household plots, acres and time of travel.

Table 6: Household plots

Category	Statistic	Variables		
		No. plots owned	No. of acres	Time to walk to plots(min)
	Mean	2.61	10.01	76.08
	Median	3.00	8.00	62.00
With	Std.	1.42	9.03	64.81
	Min.	0.00	0.00	0.00
N = 71	Max	10.00	50.00	303.00
	Mean	2.54	7.96	85.34
	Median	2.00	7.00	60.00
Within	Std.	1.16	5.87	103.69
	Min.	1.00	1.00	1.00
N = 67	Max	6.00	30.00	686.00
	Mean	2.92	10.59	66.60
	Median	3.00	7.00	45.00
Without	Std.	1.46	7.64	74.69
	Min.	1.00	1.00	3.00
N = 63	Max	6.00	41.00	450
	Mean	2.68	9.52	76.20
	Median	3.00	7.00	55.00
All categories	Std.	1.36	7.70	82.49
	Min.	0.00	0.00	0.00
N = 201	Max	10.00	50.00	686.00

Source: Results of field survey, May, 2010

2.3.3 Input use

Biochemical input use in crop production for all categories of household were very limited. As summarized in Table 7 below, values of all inputs; seed, fertilizer and other introduced chemicals (herbicides and insecticides) were calculated using 2009 cropping season market prices. There were varying limited use of other inputs among the categories of households. The observation indicate an average low of GH¢ 0.80 per household for the "within" category whiles the "with" category had an average valueas high asGH¢13.40

Fertilizer application in all three categories was also limited. The observations indicate that about 28% of the households use purchased fertilizers. This could have been due to the substitution of manure for purchased fertilizer but the survey indicates that manure use was very limited (only 5% of households). Hence limited use of fertilizer might be attributed to a cash liquidity constraint to purchase or limited market access to fertilizer. The value of fertilizer was also calculated and presented as in *Table 7 below* using the 2009 market prices with the government subsidy.

Table 7: Value of purchased inputs

Category	Statistic	Variables(GH¢)		
		Value of Seed	Value of fertilizer	Value of other introduced inputs
	Mean	204.28	90.78	13.40
	Median	25.50	15.00	0.00
With	Std.	655.20	206.87	45.94
	Min.	0.00	0.00	0.00
N = 71	Max	5044.00	1300.00	350.00
	Mean	187.01	46.02	0.80
	Median	48.00	6.00	0.00
Within	Std.	742.78	75.21	3.60
	Min.	0.00	0.00	0.00
N = 67	Max	6046.00	425.00	27.00
	Mean	210.04	111.06	11.33
	Median	39.00	6.00	0.00
Without	Std.	605.76	358.01	50.30
	Min.	0.00	0.00	0.00
N = 63	Max	3996.00	2800.00	283.00
	Mean	200.33	82.22	8.55
All	Median	39.00	6.00	0.00
categories	Std.	667.96	239.40	39.50
	Min.	0.00	0.00	0.00
N = 201	Max	6046.00	2800.00	350.00

Source: Results of field survey, May, 2010

Seed requirement for the household depended largely on retained seed which were valued using the market prices as mentioned above. *Figure 3* below shows the sources of the household's seed requirement. The observation showed that most farmers do depend solely on their retained seedand very few farmers obtain seeds from certified seed sellers and researchers.

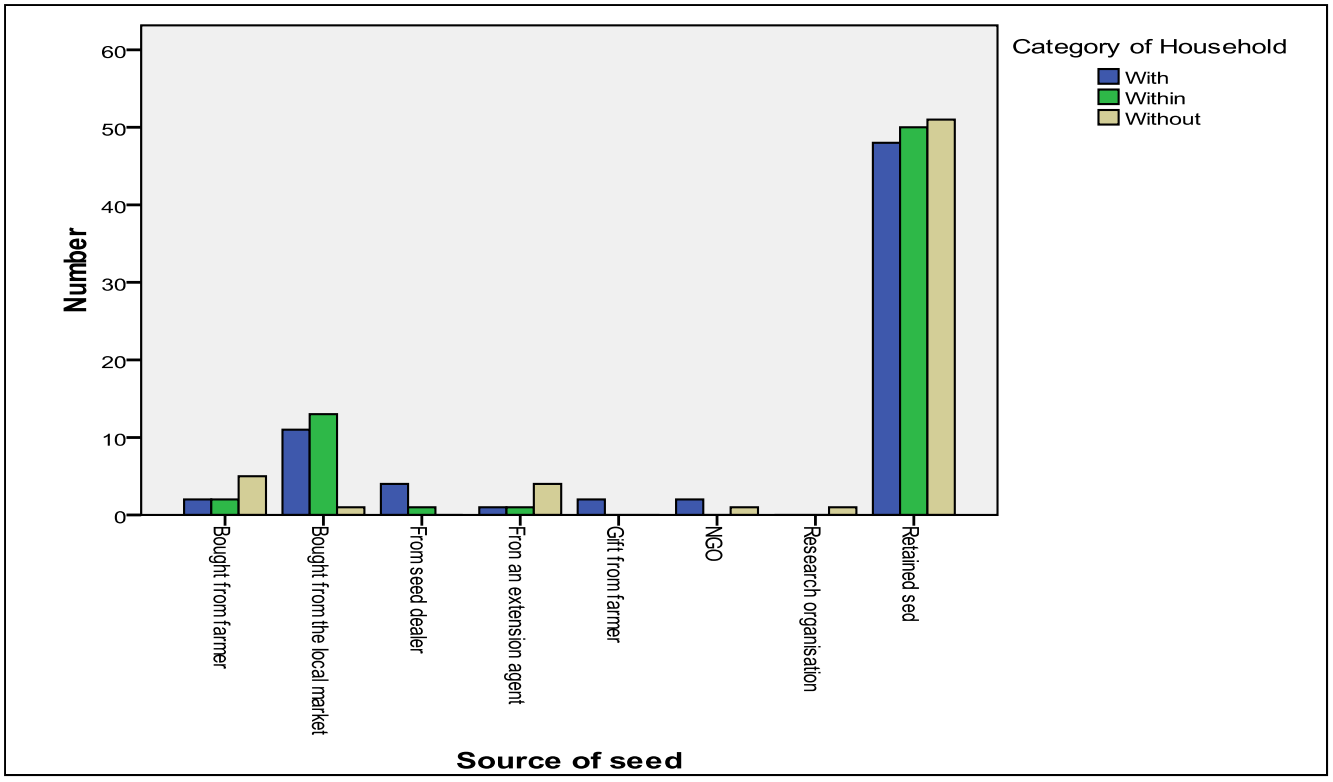

Figure 3: Seed source for household plots

2.3.4 Labor requirements

Observations on labor use were based on the total number of plots owned by the household. The labor use data was categorized into three types; exchange labor, hired labor, and family labor (Male, Female and children < 15 years). Estimated cost of hired and exchange labor were from the heads of the household.

The results on labor use are as summarized in *Table 8* below this is based on the total plots held by households and the cost is based on the labor days used. It indicates that, labor requirements per household were predominantly family dependent. It also indicates, that hired labor cost per day on average were high (aboutGH¢ 9.00/day) compared to the overall labor wage of GH¢3.00 per day in Upper West region. The average labour days were estimated to be 15 days in all categories.

Table 8: Labor use

Category	Statistic	Variable						
		Exchange Labor days	Exchange labor cost(GH¢)	Hired labor days	Hired labor cost(GH¢)	Male family labor days	Female family labor days	Child (< 15) Labor days
	Mean	18.47	112.90	16.03	225.42	55.72	30.50	17.85
	Median	10.00	48.00	10.00	95.00	30.00	18.00	0.00
With	Std.	22.79	168.54	22.00	345.95	75.64	40.54	43.30
	Min.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N = 71	Max	132.00	628.00	104.00	1945.00	469.00	239.00	236.00
	Mean	13.30	110.06	13.54	174.61	54.30	45.21	11.96
	Median	10.00	50.00	6.00	90.00	28.00	19.00	0.00
Within	Std.	15.10	137.15	18.49	236.20	66.05	59.52	33.43
	Min.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N = 67	Max	65.00	605.00	96.00	1229.00	240.00	239.00	210.00
	Mean	12.43	144.18	14.68	136.16	59.35	33.41	18.92
	Median	6.00	53.40	8.00	110.00	35.00	21.00	1.00
Without	Std.	16.90	199.64	21.06	171.28	64.83	53.65	44.61
	Min.	0.00	0.00	0.00	0.00	1.00	0.00	0.00
N = 63	Max	93.00	830.00	137.00	960.00	244.00	360.00	226.00
	Mean	14.85	121.76	14.78	180.00	56.37	36.31	16.22
All	Median	9.00	50.00	8.00	95.00	34.00	19.00	0.00
categories	Std.	18.78	169.52	20.51	265.97	68.92	51.75	40.63
	Min.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N = 201	Max	132.00	830.00	137.00	1945.00	469.00	360.00	236.00

Source: Results of field survey, May, 2010

2.4 CROP PRODUCTION AND MARKET ACTIVITY

2.4.1 Crops produced

Figure 4.1 below presents the graph of non-exhaustive list of Crops produced by the surveyed farmers. The observation was that, in all categories of the household, maize was the dominant crop produced by households with peanuts, millet and rice following. The other crops produced include, Sorghum, Soy beans, Bambara groundnuts, yam and cowpea. The observation from the crops produced supports the observations on the crops in the storage as in *Figure 2* above.

From the graph in *Figure 4.1 below*, it can be observed that there is a significant variation in the type of crop produced by household category, legumes; peanuts, cowpea, soy beans and bambara nuts are predominantly produced by the intervention ("with") households while cereals such as maize and rice are produced predominantly by "within" households and millet produced more by the "without" households.

Figure 4.2 below presents pie chart with the average acres used by households in producing crops. The observation show that, on average, 45% of the total land use by household was allocated for Maize cultivation, 13% for Soy beans, 12% for rice, 10% for groundnuts with Sorghum and Millet accounting for only 3% and 9% respectively.

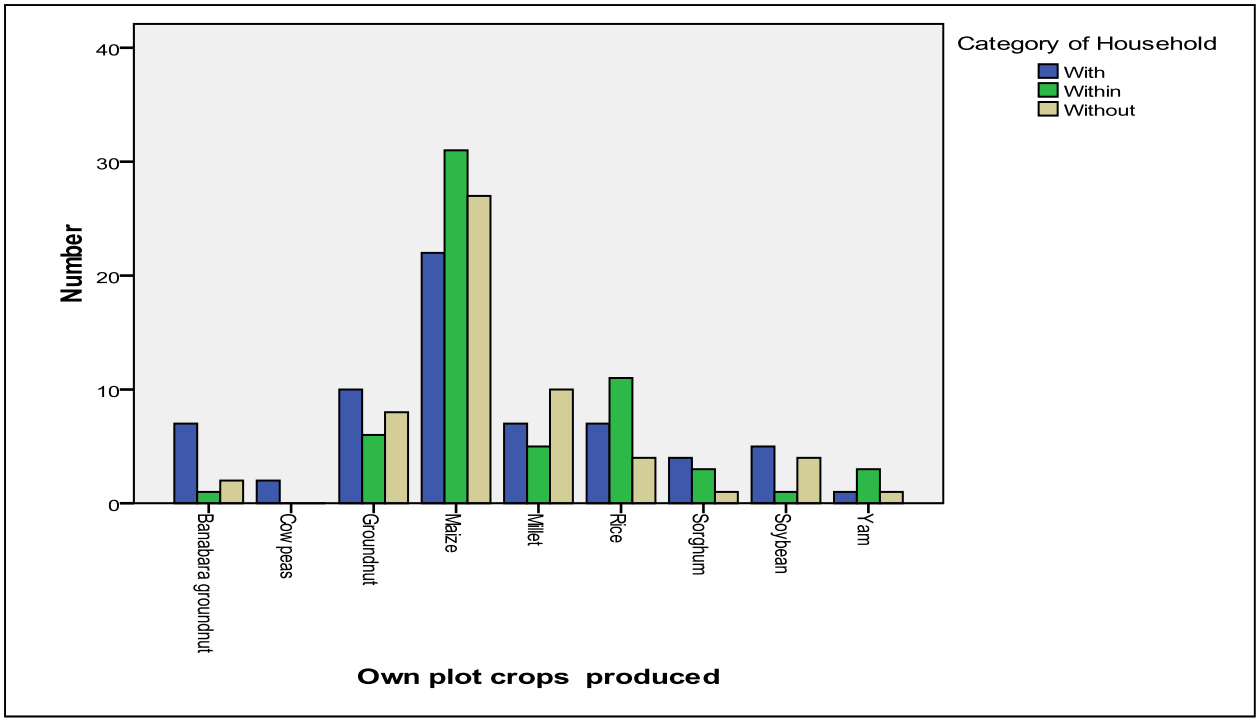

Figure 4.1: Frequency of crops produced

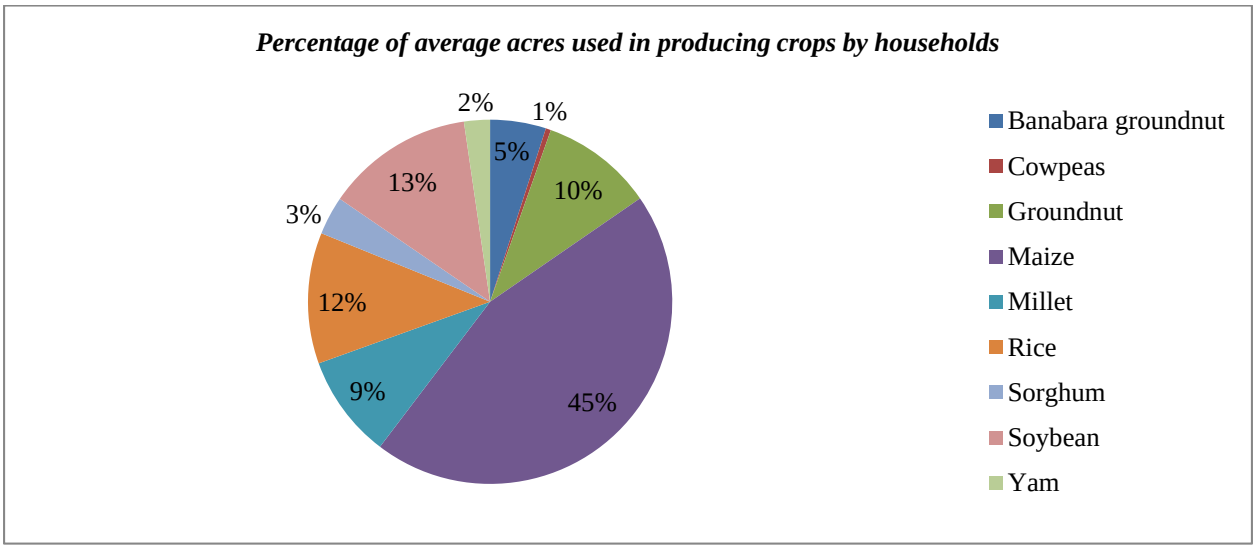

Figure 4.2: Distribution of crops per total land use by households

2.4.2 Value of crops sold

The major crops produced as discussed above have various uses. Some of the products are marketed and others are mainly for household consumption. The survey indicated that about only 14% of the households interviewed did not sell their farm produce. *Table 9* below present results on the majority (86%) who sold part or all of their farm products. The observations indicated that, an average of 24% of the all crops produced is sold out in all the household categories.

Leguminous crops such as soy beans, peanuts and cowpea are predominantly marketed crops and numerous farms indicated that they sold 100% of what they produced.

The mean value of all crops sold averaged about GH¢2,800 per household but this statistic is highly skewed by a few large observations. The median value was significantly lower at 448GH¢. Several reasons were advanced for selling farm produce. Among them include; to buy agricultural inputs (23%), education of their children (19.4%), to buy food (15.4%) and medical care (5.5%). The rest scored about 1% each and they are; buy clothes, payback loan, funerals and to build a house.

Table 9: Percentage and Value of sold produce from own plots

Variable &Statistic	*Category*			
	With (N = 71)	*Within (N = 67)*	*Without (N = 63)*	*All categories (N = 201)*
% of Primary product sold				
Mean	*26.0*	*21.0*	*25.0*	*24.0*
Median	*0.0*	*0.0*	*0.0*	*0.0*
Std.	*34.0*	*29.0*	*34.0*	*32.0*
Minimum	*0.0*	*0.0*	*0.0*	*0.0*
Maximum	*100.0*	*100.0*	*100.0*	*100.0*
Value of produce sold(GH¢)				
Mean	*4033.57*	*2649.20*	*1512.52*	*2781.93*
Median	*402.00*	*448.00*	*670.00*	*448.00*
Std.	*10441.41*	*4958.20*	*3424.85*	*7139.78*
Minimum	*0.00*	*0.00*	*0.00*	*0.00*
Maximum	*57702.00*	*21920.00*	*25120.00*	*57702.40*

Source: Results of field survey, May, 2010

2.4.3 Market activity

Assessments of households' involvement in market participations with major crops cultivated were conducted. The observations were that the majority of the households (77.1%) were involved in the sale of their produce. Very few households (3.5%) were involved in purchases whilegifts (out) and relief (in) had 2% each of households being involved. The rest were, barter/exchange (in) and barter/exchange (out) had 1% and 0.5% of households involved in respectively. Overall, households are net sellers of agricultural products.

The dominantlocation of transactions were at the local/village market (45.3%), town market (25.9%), own farm (9.0%), or own house (about 4.5%). Main transactors with the farmers wereinclude small traders (62.2% of all transactions), large traders (6.0%), NGOs (5.0%), itinerant trader (1.5%) and government (0.5%). Majority of the households (60.7%) had no reason for taking part in the transaction but that it was just an opportunity. Few households (15.4%) transacted because they knew somebody and very few were involved in some form of a contract with the transactor (ie. product guaranteed by transactor (1.5%) and transactor providing credit (5.5%).

2.5 ORGANIZATIONAL CONTACTS AND PARTICIPATION IN GROUPS

The observation indicate that, approximately 61.2% of household heads belong to a club or a farmer organization and about 55.2% report receiving some form of information on agricultural production from NGOs and governmental institutions. In all categories, monthly meeting by group members was predominant and meetings were attended regularly by about 41.3%. Only about 11.4% of the sampled household heads occupy leadership positions in their various clubs and farmers' based organisations.

The observation on the male heads did not differ much from the women in the household. It was observed that, 63.7% of the women sampled belong to women or mixed-gneder group with 28.6% receiving information on agricultural production. Among the women, weekly meeting were predominant with 83% being officers of their group.

2.6 CONSERVATION KNOWLEDGE DECISION

A conservation practice knowledge assessment, consisting of twelve questions, was administered to the households. The questions focused on knowledge and usage of crop residues, animal manure, tillage, water infiltration, rotations and the usage of cover crops. This was designed to test respondents' knowledge on some conservation practices. Table 10 summarizes these results.

Statements on some conservation practices were made and respondents were to answer whether the statement made were true or false. Observations on conservation knowledge decision index indicate that, both male and female household members sampled in all categories show high knowledge of some conservation issues. Overall, it appears that most farmers understood basic agronomic practices and the intended benefits of conservation practices. Exceptions to this observation include the ability to plant directly without ploughing (zero or no-tillage), where the conservation knowledge scored 40% for male and 39% for female respondents sampled in all categories, the rest of the conservation practices scored above 70%. Farmers also largely believed that manure was a s "strong" as purchased fertilizer.

3.0 Summary conclusions

Generally, there was an even distribution of both adults and children in a household with an average age of household head being 44 years in all categories while that of their wives was estimated as 33years. Majority of the household heads and their wives had no education and their primary occupation was crop production. Household wealth was largely concentrated on Livestock inventory.

Cropping systems were found to be mostly sole cropping with cereals, legumes or root and tubers. However, few mixed cropping and split plot cropping systems were also practiced by some households. Households in all categories cultivate on more one piece of land which is direct ownership and takes a little above sixty minutes to walk to the plot. Inputs of all kinds except labor use in all categories are very low. Households use of certified seed was very limited and major crops produced in the area include; maize, millet, peanuts, sorghum, bambara nuts, soy beans, yams, rice and cowpea.

Household heads and their wives participate in clubs and groups to receive information on agricultural production. Knowledge on conservation practices in all categories was very high for households. However, knowledge on no-tillage (zero-tillage) varied.

Table 10: Conservation knowledge decision index

Conservation knowledge	Male				Female			
	With (N=71)	Within (N=67)	Without (N=63)	Total (N=201)	With (N=54)	Within (N=57)	Without (N=46)	Total (N=157)
Crops residue are sources of organic matter to soil								
True	97.2	100	98.4	98.5	96.3	93.0	91.3	93.6
False	2.8	0.0	1.6	1.5	3.7	7.0	8.7	6.4
Organic matter improves soil water holding capacity								
True	94.3	95.5	91.9	93.0	90.7	87.7	93.5	90.4
False	5.7	4.5	8.1	7.0	9.3	12.3	6.5	9.6
Manure is as strong as purchased fertilizer								
True	78.9	85.1	77.8	80.6	86.8	77.2	73.9	79.0
False	21.1	14.9	22.2	19.4	13.2	22.8	26.1	21.0
Manure improves soil water holding capacity								
True	91.5	94.0	83.6	91.5	87.0	89.5	82.6	86.6
False	8.5	6.0	16.4	8.5	13	10.5	17.4	13.4
One can plant directly without ploughing								
True	40.8	34.3	44.4	39.8	38.9	38.6	39.1	38.8
False	59.2	65.7	55.6	60.2	61.1	61.4	60.9	61.2
Tilling the soil assist in water infiltration								
True	85.9	74.6	77.8	79.6	72.2	80.7	67.4	73.9
False	14.1	25.4	22.2	20.4	27.8	19.3	32.6	26.1
Seed bed increases water holding capacity of soil								
True	81.7	91.0	74.6	82.6	79.6	80.7	76.1	78.9
False	18.3	9.0	25.4	17.4	20.4	19.3	23.9	21.1
Seed bed improves aeration in the soil								
True	95.8	97.0	90.5	94.5	76.6	82.5	86.9	
False	4.2	3.0	9.5	5.5	23.4	17.5	13.1	82.8 17.2
Rotating cereals and legumes improves soil fertility								
True	97.2	98.5	98.4	98.0	88.9	82.5	84.8	85.3
False	2.8	1.5	1.6	2.0	11.1	17.5	15.2	14.7
Rotation prevents some plant disease								
True	90.1	97.0	90.5	95.0	87.0	84.2	84.8	85.3
False	9.9	3.0	9.5	5.0	13.0	15.8	15.2	14.7
Cover crops prevents soil erosion								
True	88.7	92.5	90.5	90.5	85.2	84.2	91.3	86.6
False	11.3	7.5	9.5	9.5	14.8	15.8	8.7	13.4
Cover crops increase microbial action in the soil								
True	84.5	91.0	87.3	87.6	77.8	82.5	84.8	81.5
False	15.5	9.0	12.7	12.4	22.2	17.5	15.2	18.5

Source: Results of field survey, May, 2010

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APPENDIX A: List of Enumerators

Supervisors

1. YahayaIddrisu (Research Scientist)
2. Ibrahim Hashim (Technical assistant)

Enumerators

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3. Soliku Prosper
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5. Nyuzagbil B. Francis
6. Suleman Abdul-Raheem
7. YakubuAmina
8. Mohammed S. Rasheeda
9. YakubuMahayadeen
10. Mohammed Zulkanaini
11. Mumuni M. Sankoro
12. Osman Lutufia
13. Mohammed Eddi
14. LuqmanKhalida
15. Bayou Martha
16. Yakubu Monica

APPENDIX B: Sample distribution of crops by acres cultivated