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THE EFFECTIVENESS OF FARMER FIELD SCHOOL (FFS) IN ATTAINING HOUSEHOLD FOOD SECURITY IN SIERRA LEONE

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ABSTRACT
Farmers Field School method of learning, technology development, and dissemination is based on adult learning principles such as experimental FFS introduced into Sub-Saharan Africa in the Mid 1990s. This paper reports investigation on the effectiveness of FFS in attaining household food security in Sierra Leone. The study was conducted in two Chiefdoms – Magbema Chiefdom in Kambia District, and Nongowa in Kenema in Sierra Leone. The research adopted descriptive, cross-sectional survey research design and combined both quantitative and qualitative data collection methods. Purposive simple random sampling technique was used to select 255(15.4%) research participants from 1,698 FFS members in the two districts. The findings of the study revealed more young farmers (54.5%) existed in Nongowa than in Magbema (32.6%). The farmers in Magbema were married (45.5%). And they cultivated medium size farms, while those in Nongowa earned lower annual farm income (< Le.1, 000,000). FFS involved farmers in raising awareness for adopting improved farming techniques (49.0%) and added food value chain process (48.6%). To some extent, FFS has made food affordable (77.4%), encouraged food hygiene (57.3%), promoted food processing (77.6%), food storage (92.2%), but has failed to reduce malnutrition (82.3%) in this settlements. There were low levels of household milk (91.8%), and meat (78.4%) security, while eggs were unavailable (100.0%) in households. The research concluded that lows level of farmers' involvement in the FFS programmes was unimaginable. Worst still, household food security was unachieved- most protein sources were unavailable. No thorough effort seemed also to have been made to measure environmental impact of FFS programmes. Therefore, hands-on education was needed to improve farmer expertise in the FFS management. The FFS process should build self-confidence (particularly for women), encourage group control of the process, and build group and management skills.

KEY WORDS: Effectiveness, Household, Food Security, Attainment, Farmer Field School

INTRODUCTION

Various agricultural extension approaches have been adopted especially in developing countries as vehicles for increasing agricultural productivity and income and in bridging the gap between new technological knowledge and farmers' own local practices (Spurling, 1992). Some of these are the general/conventional agricultural extension approach; commodity specialized/crop specific extension approach; Integrated rural development project approach; participatory/ farmer's organizational approach; programmes especially for women approach and the Training and Visit (T & V System). All of these show clear manifestations of the importance of extension. Extension is historically considered as an act of transferring technologies to farmers, and there is now increasing recognition for participation of farmers in the innovation process and facilitation of experimentation among communities. However, the recognition that process of agricultural improvements is not necessarily found in the technologies introduced, but in the social process of active farmer managed innovation and the dissemination of ideas has led to the introduction of participatory approaches thereby emphasizing the role of knowledge and learning within agricultural extension. Some of the participatory and demand-driven approaches used in supporting smallholder farmers have become mainstreamed during the past decades; but the rhetoric of participation is often being misused, and framed narrowly as a methodology to improve project performance, rather than a process of fostering critical consciousness and decision-making for collective action. The existing approaches in agricultural extension, though purporting to be participatory, are largely based on methods of transfer of technology which do not fit the resource-poor farmer but are mainly grounded in the context of farmers in the South (Scoones and Thompson, 1994; Leeuwis, 2004). The farming context for rural small holders is also changing rapidly; farming is increasingly being done on marginal, fragile lands with changing environments; meaning that many farmers can no longer rely on their local knowledge the way they have in the past (Percy,2005). Further, there has been increasing demand from consumers

for better value change activities beyond production such as processing methods to improve quality of produce. Market access has also become competitive. Producer organizations and farmer groups are thus important assets for providing a 'voice' for the poor, both by placing pressures on extension providers and by providing and facilitating services, such as collective input supply and marketing, for their members and other producers (Christoplos, Farrington, 2002; Leeuwis, 2004). With collective strength and a better approach to agricultural extension, the farmer is able to increase production, meet quality standards demanded by commodity chains and negotiate better prices from hawkers and wholesale traders. Networks of farmer groups are increasingly forming the organizational basis for collective marketing. This shift from focus on the individual level to the collective level in agricultural development requires us to rethink what farmer education is all about, and what the emphasis should be when it comes to providing small-holder farmers with support and assistance for increased productivity. Traditional forms of support to rural farmers, mainly addressing crop and livestock production through conventional extension services, do not seem to respond adequately to farmers' needs for greater productivity. Transition in small scale farming requires farmers to be innovative and able to adjust to changing demands from commodity chains and therefore new skills and capacities are needed by farmers to be more productive. To achieve rural development, new approaches for training and human resource development are needed that make better use of knowledge among farmers (Christopolos, 2003). From having considered extension as mainly an act of transferring technologies to farmers, there is now increasing recognition for participation of farmers in the innovation process and facilitation of experimentation among communities. This entails a change in focus from *what* farmers learn to *how* they learn and calls for a new paradigm in extension, as first expressed by Freire (1973): a stronger focus on education that is *liberating* in nature rather than *domesticating to improve on productivity*. Knowledge and information are seen as powerful tools in the process of change. Demand-driven advisory services, with greater participation among farmers are generally seen as the way forward to improve effectiveness of extension. However, demand-driven extension systems require that farmers are empowered to develop their capacity to articulate their demands and exert pressure on the system to deliver what they want (Rivera and Alex 2005). Only farmers that are capable of critically analyzing their situation can articulate informed demand, link farmer groups to services providers, can secure better service provision, social accountability and more efficient use of resources for greater productivity (DANIDA, 2004). Hence building of farmers' management and problem solving capacity require joint learning through practical field work. This in essence requires a shift from previous perceptions where farmers were seen mainly as 'adopters' or 'rejecters' of technologies but as providers of knowledge and improved practices (Chamber, 1994). In Sierra Leone the Ministry of Agriculture Forestry and Food Security with assistance from FAO introduced the Farmer Field Schools (FFFS) extension mythology in 2003. Curriculum development and training of trainers were preliminary activities undertaken to start the process. The identification of main opportunities for farming system improvement and related food security strategies were part of the process for commencement of the programme.

The FFS itself by definition is a Platform and a 'School without walls' for improving decision making capacity of farming communities and stimulating local innovation for sustainable agriculture in different commodity enterprises-crops, livestock, fishery *etc*. that will be of comparative advantage. FFS is now the current extension approach in Sierra Leone under the five year National Programme called Smallholder Commercialization Programme (SCP) hived out from the 20 year National Sustainable Agricultural Development Programme (NSADP) conducted by the Ministry of Agriculture Forestry and Food Security (MAFFS). Therefore, FFS is the main entering point of most Sierra Leonean farming groups which, graduates Farmer Base Organizations (FBOs). These are continuously supervised by Frontline Extension Workers (FEWs). Two to four FBOs converge, based on close proximity to form an Agricultural Business Center (ABC). Such FBCs must have a commodity with comparative advantage, with food value addition, processing and marketing as their main activities (MAFFS, 2012). In the year 2010, there were 390 FBOs with 150 ABCs established country-wide. In 2011 and 2012 the number increased to 400 FBOs and 125 community-driven ABCs (PEMDSU, 2010). According to Bangura (2012), the establishment of ABCs in Sierra Leone led to the continuous identification and training of several FFS towards the five year National target of 2,750 FFS/FBOs. He further stated that presently 650 established ABCs are being transformed into limited liability companies with District Networks that linked them with Financial Service Associations (FSAs) or Institutions recommended by International Funds for Agricultural Development (IFAD). These Institutions help rural poor farmers' access to financial assistance easily. Considering the standard of living and the household food security status of Sierra Leoneans, the question one needs to ask is whether FFS has made any impact on the lives of Sierra Leoneans' household food security status. Are Sierra Leonean farmers actually enjoying the facilities FFS has provided for in other countries like Indonesia? To answer these questions, a research like this is needed to investigate the effectiveness of the activities of Farmer Field Schools in Sierra Leone. The thrust of this study therefore is to assess the effectiveness of FFS in attaining household food security in Sierra Leone. It is hoped that the findings of this study will be useful to the government, donor agencies, financial institutions in planning, their strategies for promoting food security and alleviating poverty among farmers and the entire populace of not only Sierra Leone, but globally. The purpose of this study was to explore the effectiveness of Farmers field schools in attaining household food security in Magbema and Nongowa Chiefdoms in Kambia and Kenema Districts

respectively in Sierra Leone. Four objectives guided the study: 1) Examine the socioeconomic characteristics of farmers in Magbema and Nongowa chiefdom in Kambia and Kenema districts respectively; 2) Determine how and to what extent Farmer Field School has attained household food security in the study area;3) Determine the level of involvement/participation of farmers in the Farmer Field School household food security programmes; and 4) Assess the levels of household food security attained by Farmers Field School, in each of the study Chiefdoms.

METHODOLGY

Study Area

The research was conducted in Magbema Chiefdom in Kambia District in the north and Nongowa Chiefdom in the Eastern Region of Sierra Leone. These two chiefdoms were chosen because they are far apart and can give a representative picture of the FFS contribution to household food security in the country. Both Chiefdoms are characterized by undulating topography, deep and broad valleys and large tracts of red soil, harboring predominantly rainfed agriculture, and their agriculture is largely subsistence-oriented and is practiced by small and marginal farmers.

i). Magbema Chiefdom

Magbema Chiefdom is located in Kambia in the northern Region of Sierra Leone. It is allocated $9^0 10'$N 120^0N$45'$W and it is 115 miles of Freetown. It occupies a total area of 3,108 km^2 (1,200 sq mi) with a population estimated at 313,765. Kambia District is divided into 7 Chiefdoms - Bramaia, Gbinleh- Dixing, Magbema, Mambolo, Masungbola, Samu and Tonko-Limba. It has a large agricultural zone with extensive swamp areas found in each of the chiefdoms, but more in the south-west, dominated by mangrove and large river estuaries. The rest of the vegetation consists of a mix between forest to the south and grassland or savannah to the north east. With annual rainfall above 2,500mm, the district has an impressive potential for upland, inland valley swamp and mangrove swamp farming (SSL, 2004). In addition to farming, fishing along the many river estuaries and streams is practiced by a large proportion of the population of the district. Fishing is an important source of income for the district, as traders come from other areas on both sides of the border to the fishing Islands and enclaves. This sector more than any other, demonstrates the division of labour between men and women in the community. Magbema Chiefdom, the actual study chiefdom is centrally located in the district. It is bounded to the north-east by Bramala, east by Masungbola, south-west by Mambolo, west by Samu and to the North-west by Gbingle-Dixing Chiefdoms. The population is mainly farmers, practicing off-season activities such as gardening, hunting and as migrant labour. The major food crops grown by the people are, rice (the staple food), cassava, millet, sweet potatoes and sorghum, while groundnuts and maize constitute the major cash crops. Kambia District has 31 FFS groups with a total membership of 821 persons. Magbema chiefdom has 31 FFSs consisting of 136 members (MAFFS, 2012).

2. Nongowa Chiefdom

Kenema District is a district in Eastern Province of Sierra Leone. It is located $7^0 50'$N$11^0 10'$ W and it lies 200 miles east of Freetown and 42 miles to Bo. The district is the most populous district in the Eastern province with a population 545,327. Kenema District has an area of 6,053 km^2 (2,337 sq mi) and comprises sixteen chiefdoms - Dama, Dodo, Gaura, Gorama, Kandu Leppiama, Koya, Langurama, Lower Bambara, MendeTunkiaNiawa, Nomo, Nongowa, Wando Malegohun, Simbaru, and Small Bo. Kenema District has 30 FFS with membership population of 877 (MAFFS, 2012). The main economic activities of the populace of the district is farming, farming, mining, and trading. The actual field work occurred in Nongowa chiefdom. Nongowa chiefdom is where the study was actually conducted in Kenema District. Nongowa Chiefdom is bounded to the South and south-east by Dama chiefdom, to the South –west by Koya Chiefdom, to the West by Small Bo chiefdom, to the West west-north by Kandu Lekpeama Chiefdom, to the North by Lower Bambara Chiefdom, and to the North –east by Malegohun Chiefdom. Nongowa chiefdom has 4 FFSs with atotal membership of 125 persons.

Research Design

The study adopted descriptive, cross-sectional survey research design and combined both quantitative and qualitative data collection methods.

Sampling Size and Sampling Procedure

The study employed purposive, multistage and systematic random sampling techniques. The two regions –North and Eastern regions were purposively selected because of their locations, cultural diversities and their active involvement in Farmers Field School programmes. The second stage in the multistage sampling involved simple random selection of the two districts. In the third stage the FFSs were randomly selected. In this case all the existing FFS in the two chiefdoms were purposively chosen. The fourth stage involved the selection of research participants. The updated list of 1,698 FFS Members was used as a sampling frame and 15.4 % (Kambia =8.0%, Kenema = 7.4%) of the members were selected for interviews, creating a sample of 246 members, using systematic random sampling. Six FFS members, however, could not be found during group visit attempts or did not respond, leaving a sample total of 255 Farmer Field School members.

Research Instrument

The instrument consisting of semi-structured questionnaire was used for collecting quantitative data and was administered to 255study participants through face-to-face personal interviews. The questionnaire consisted of four sections based on the purpose and objectives of the study. The first section sought information on the socioeconomic and demographic characteristics of the research participants

(Farmer Field School members). The second section elicited information on the level of involvement of participants in FFS food security programmes, while the third section gathered information on how, and to what extent Farmer Field School activities/programmes for attaining household food security. The forth section gathered data on the level of household food security through Farmer Field School. As a result, the questionnaire consisted of several categories of questions. The responses for the second section had three – point scale options of highly involved(HI) = 1, moderately involved(MI) = 2, Not involved(NI) = 1, while thirdsection had four –point scale options of Very great extent =4, great extent =3, some extent = 2 No extent=1. The variables for level of household food security were measured on five – point scale with the following: 1) low (L) = 5; 2) medium (M) = 4; 3) Highly accessible (HA) = 3; 4) Affordable (A) =2; 5) Not Available. The individual responses for these variables were combined to establish the overall effectiveness of Farmers Field School in promoting food security.

The validation of the instrument was done by 10 experts from Agriculture and Food security, Extension, Economics, and other related disciplines. The experts' suggestions led to a modification of some items in the questionnaire. The instrument was subjected to pre-test in Yoni chiefdom in Tonkolili District, Northern Sierra Leone which was not part of the study area. The pilot testing was carried out on one farmer Field School group (comprising of 30 members) at two different occasions with an interval of two (2) weeks. The scores received were subjected to Cronbach's High coefficient reliability test. A reliability coefficient of 0.78 which was considered high enough to achieve the objectives of this study was obtained.

Data Collection

The data for this study was collected between 1st and 30th October 2013. Both primary and secondary data were collected. The secondary data were information from the literature, official documents, library materials, internet, and textbooks. Primary data was solicited through administration of questionnaire, direct observation, focus group discussions, and key informant interviews. Before conducting fieldwork, the FFS in each district received ethics approval from the University Research Ethics Committee of Research Ethics and the Registrar's Office at Njala University. The ethical Conduct for Research assured voluntary participation, prior informed consent, and safeguarded privacy and confidentiality of the research participants in the field. The ethics statements were prepared with the contact details of the Principal Investigators and were read in front of the research participants before starting the data collection through household survey, group discussions and qualitative interviews. A small number of participants chose to provide their written consent, while others provided a verbal consent. A copy of the prior informant consent statement was also provided to each of the research participants for their records. The fieldwork was supported by local research assistants in each of the chiefdom. The research assistants assisted in organizing the focus groups and individual interviews, as well as in translating sessions and answering questions during participant observation. A Farmer Field School membership list for both Magbema and Nongowa chiefdoms was made available by the District Agricultural Extension Officer in the two districts- Kambia and Kenema and was updated with the help of key informants.

Analysis

The qualitative data were analyzed through qualitative content analysis, while the quantitative data utilized Excel and Statistical Package for Social Sciences (SPSS) IBM Statistics version 20 to complete descriptive statistics. The researchers benefitted from another independent baseline study conducted by the PEMDSU (Planning, Evaluation, Monitoring and Statistics Division) and SLHS (2007) in the same area, which involved surveying entire chiefdom households on the availability and consumption of food; nutrition and health statuses using anthropometric measures; landholding, agriculture production and constraints; and local market chains and livelihood patterns. The understanding gained from this baseline study (PEMDSU, 2010) helped in interpreting some of the quantitative trends and qualitative insights reported in this study.

RESULTS AND DISCUSSIONS

1. Socioeconomic and demography characteristics of Farmer Field School member-Farmers

Table 1 presents the socioeconomic and demographic characteristics of farmers who are members of the Farmer Field School in Magbema and Nongowa Chiefdoms in Sierra Leone. The table revealed that 43.1% of the farmers are between the ages 15 and 35 years, while 30.2% of them fell within 36-50 years.

For these**,** Nongowa (54.5% and 31.8%) was higher than Magbema (32.6% and 26.5%). Nineteen point six percentage of the farmers attained Primary and Technical Vocational educations, and Teachers training (16.9%). A high Quranic education (25.3%) was more peculiar to farmers in Magbema Chiefdom than in Nongowa Chiefdom.Nearly half of the farmers (47.1%) were married, with a larger proportion from Magbema Chiefdom (45.5%). Majority of the farmers (66.7%) acquire land for farming through inheritance, for which there were more farmers in Magbema (72.0%) than in Nongowa Chiefdom (61.7%). The table further showed that 55.3% of the farmers cultivate marginal farmlands. The number for this is higher in Nongowa (60.2%) than Magbema (50.8%). Still, the results revealed that 42.4% of the farmers have small family sizes with Nongowa (71.5%) was better-off than Magbema (15.2%). Most of the farmers (42.4%), 38.4%) earn below Le. 1,000,000 and between Le.1000, 000 and 2000,000 per annual. This is earning is more peculiar to Nongowa (52.5%).

TABLE 1: Socioeconomic Characteristics of Farmers

Variables/Categories	Kambia (N=132)	Kenema (N=123)	Total (N=255)
Age			
Young (15 -35 years)	43(32.6%)	67(54.5%)	110(43.1%)
Middle (36 – 50 Years)	35(26.5%)	42(31.8%)	77(30.2%)
Ageing (51- 65 years)	49(37.1%)	12(7.8%)	61(23.9%)
Old (Above 65 years)	5(3.8%)	2(1.6%)	7(2.7%)
Educational Level			
Primary	40(32.4)	10(8.1%)	50(19.6%)
Secondary	10(7.6%)	17(13.8%)	27(10.6%)
Technical Vocation	15(11.4%)	35(28.5%)	50(19.6%)
Teachers Training College	11(8.3%)	32(26.0%)	43(16.9%)
University	1(0.8%)	27(21.9%)	28(11.0%)
Quranic Education	55(41.7%)	2 (1.6%)	57(25.3%)
Marital Status			
Single	15(11.4%)	55(44.7%)	60(23.5%)
Married	60(45.5%)	25(20.3%)	120(47.1%)
Divorced	47(35.6%)	10(8.1%)	40(15.7%)
Widow/widower	10(7.6%)	33(26.85)	35(13.7%)
Land Acquisition			
Gift	5(3.8%)	10(8.1%)	15(5.9%)
Inheritance	95(72.0%)	75(61.0%)	170(66.7%)
Lease	22(16.7%)	16(13.0%)	38(14.9%)
Purchase	10(7.6%)	22(17.9%)	22(8.6%)
Farm Size			
<1ha (marginal)	67(50.8%)	74(60.2%)	141(55.3%)
1- 2 ha (Small)	32(24.2%)	31(25.2%)	63(24.7%)
2.1 – 5ha (Semi- Medium)	18(13.6%)	10(8.1%)	28(11.0%)
6-10 ha (Medium)	15(11.4%)	8(6.5%)	23(9.0%)
Family Size			
0-5 members (Small)	20(15.2%)	88(71.5%)	108(42.4%)
6-10 members (medium)	42(31.8%)	25(20.3%)	77(30.2%)
11-20 members (large)	70(53.0%)	10(8.1%)	80(31.4%)
Annual Farm Income			
< Le 1,0000,000 (Small)	47(35.6%)	65(52.8%)	112(43.9%)
1,000,000–2,000,0000 (medium)	60(45.5%)	38(30.8%)	98(38.4%)
> 2,000,000 (Large)	25(18.9%)	20(16.3%)	45(17.6%)

TABLE 2: The Level of Farmers' Involvement in FFS Programmes for Household Food Security

FFS Activities/Programmes	Level of Involvement		
	HI=3	MI=2	NI= 1
Creating awareness among farmers for improved farming	125(49.0%)	85(33.3%)	45(17.6%)
Provision of improved varieties planting materials	22(7.8%)	68(26.7%)	165(64.7%)
Training farmers on crop protection techniques	145(56.9%)	91(35.7%)	54(12.2%)
Training farmers on food preservation techniques	123(48.2%)	100(39.2%)	32(12.5%)
Training on and supplying food processing equipment	15(5.9%)	20(7.8%)	220(86.2%)
Constructing drying floors and stores	5(2.2%)	6(2.3%)	244(95.7%)
Training farmers on basic farm record keeping	-(-)	-(-)	255(100.0%)
Organizing farmers training them on village savings	- (-)	-(-)	255(100.0%)
Connecting farmers with reputable financial institutions	- (-)	-(-)	255(100.0%)
Organizing farmers for networking	54(21.2%)	65(25.5%)	149(58.4%)
Training farmers on household food hygiene	56 (22.0%)	74(29.0%)	125(49.0%)
Training farmers on added value food chain processes	124(48.6%)	87(34.1%)	44(17.3%)

HI= Highly Involved, **MI**= Moderately Involve, **NI**= Not Involved

2. Level of Farmers' Involvement in FFS Programme for promoting Household Food Security

Table 2 depicts the level of farmers' involvement in the Farmer Field School programmes in promoting household

food security in Magbema and Nongowa Chiefdoms. It reveals that slightly over half of the farmers were highly involved in crop protection (56.9%), awareness creating among farmers for adopting improved farming technology (49.0%), added value chain process (48.6%), and food preservation (48.2%) techniques. The table further showed that all farmers (100.0%) were not involved in basic farm record keeping, village savings and connecting with reputable financial institutions, constructing dry floors and stores(95.7%), supplying processing equipment (86.2%), provision of improved varieties of planting materials(64.7%), and networking (58.4%).

3. The Extent to which FFS programmes have attained household food security within study area

Table 3 below shows the extent to which Farmer Field School programmes have promoted households food security in Magbema and Nongowa Chiefdoms. The table revealed that FFS has to a very extent provided food storage facilities (92.2%), promoted food processing (77.6%), created awareness on food hygiene (57.6%). To a great extent the farmers stated that FFS has made marketing of food products easier and increased food preservation within households (40.0%). It also to some extent it increased household food affordability (77.4%), and caused farmers to have access to financial assistance (78.4%). However, it to, no extent reduced malnutrition (82.3%) or caused household food availability throughout the year (65.9%).

TABLE 3: Extent of effects of Farmers Field School Programmes on Household Food Security

Ways FFS promoted household food security	Extent of effect on household food security			
	VGE	GE	SE	NE
Caused Food to be Available through the year	-(-)	- (-)	87(34.1%)	168(65.9%)
Increased household food Affordability	-(-)	- (-)	198(77.4%)	57(22.4%)
Caused to access financial assistance	-(-)	- (-)	200(78.4%)	55(21.6%)
Provided food storage facilities	235(92.2%)	20(7.8%)	- (-)	- (-)
Promoted food processing	198(77.6%)	38(14.9%)	19(7.5%)	- (-)
Made marketing of food produces easier	35(13.7%)	145(56.9)	45(17.6%)	20(7.8%)
Caused households to diversify food they eat	54(21.2%)	43(19.1%)	56(23.0%)	102(40.0%)
Increased food preservation within households	89(34.9%	102(40.0%)	56 (23.0%)	8(3.1%)
Reduced malnutrition among household	- (-)	-(-)	45(17.6%)	210(82.3%)
Created awareness about food hygiene	146(57.3%)	100(39.2%)	9 (3.5%)	- (-)
Have increase households farm incomes	20 (7.8%)	45(17.6%)	135(52.9%)	65(25.5%)

VGE= Very Great Extent, **GE**= Great Extent, **SE**= Some Extent, **NE**= No Extent

TABLE 4: The level of household food security promoted through Farmer Field School Programmes

	Level of household food security attained				
Food Security	Low (L) =1	Medium	H. Accessible	Affordable	N. Available
Rice	23(9.0%)	78(30.6%)	98(38.4%)	56(23.0%)	-(-)
Cassava	- (-)	- (-)	156(61.2%)	99(38.8%)	-(-)
Potato	- (-)	98(38.4%)	78(30.6%)	176(69.0%)	-(-)
Yams	157(61.6%)	45(17.6%)	23(9.0%)	30(11.8%)	-(-)
Fruits	- (-)	99(38.8%)	67(26.3%)	109(42.7%)	-(-)
Legumes, e.g. beans	- (-)	34(13.3%)	105(43.2%)	116(45.5%)	-(-)
Vegetables	- (-)	- (-)	146(57.3%)	109(45.5%)	-(-)
Onion	110(43.1%)	-(-)	-(-)	100(39.2%)	45(17.6%)
Meat	200(78.4%)	-(-)	-(-)	-(-)	55(21.6%)
Milk	234(91.8%)	-(-)	-(-)	-(-)	21(8.2%)
Fish	199(78.0%)	-(-)	-(-)	-(-)	56(23.0%)
Egg	- (-)	-(-)	-(-)	-(-)	255(100.0%)
Oil	- (-)	45(17.6%)	143(56.1%)	37(14.5%)	-(-)
Other(Specify)	- (-)	- (-)	- (-)	-	-(-)
- Food for Breakfast	- (-)	- (-)	53(20.8%)	100(39.2%)	103(40.4%)
-Food for Lunch	35(13.7%)	25(9.8%)	15(5.9%)	17(6.7%)	
- Food for Dinner	135(52.9%)	-	-	65(25.5%)	

H. Accessible = highly accessible, **N**. Available =Not Available

4. Level of Various Household Food Security promoted through Farmer Field School Programmes

Table 4 below presents the level of various household food security promoted through Farmer Field School programmes in Magbema and Nongowa Chiefdoms. The table indicated that low levels of household milk (91.8%), meat (78.4%), yam (61.6%) securities, and food for dinner (52.9%). It further stated that oil (65.1%), vegetables (57.3%), cassava (61.2%), and rice (38.4%) were highly accessible, while potato (69.0%), legumes (45.5%0, and food for breakfast (39.2%) were affordable. All the farmers (100.0%) stated that eggs were not available.

DISCUSSION

According to the findings, farmers in Magbema and Nongowa chiefdoms differ in certain characteristics but

share common experiences in their participation in Farmer Field School activities, the extent to which these activities impacted household food security, and the level of food security attained through Farmer Field School activities.

1. Socioeconomic and characteristics of FFS farmers in Magbema and Nongowa Chiefdoms

The study revealed that farmers in the Farmer field Schools were youth, especially in Nongowa chiefdom. Most of the farmers attained some form of education though to a lower level in Magbema Chiefdom where most of the people acquired Quranic education. More of the farmers in Magbema were married and had large family sizes. This result ascribed to the findings of Moriba *et al*. (2011) that most farmers in Tikonko Chiefdom in Bo District have lower levels of education and most are married. It further showed that the farmers mainly acquire farming land mainly through inheritance and cultivate marginal land area earning them very low income especially in Nongowa Chiefdom. This result confirms Sesay (2007) findings that most rural farming is on marginal and subsistence basis.

2. Level of farmers' involvement in Farmer Field School household food security programmes

The study revealed that very few farmers were involved in crop protection trainings, raising awareness about adoption of improved farming techniques, added food value chain processes, and food preservation. This result is in agreement with Ngegba (2008) that rural people are not considered in most community development activities in Africa, especially in Sierra Leone. The author further stated that sustainable food security cannot be obtained except the beneficiaries fully participate in the implementation processes. All the farmers were not involved in basic record training, village savings, construction of drying floors, nor connected to financially institutions. This confirms Sesay (2007) who found that farmers in the northern region of Sierra Leone lack basic farming skills facilities for equipping them for commercial farming or attaining sustainable household food security.

3. The Extent of Farmers Field School household food security attainment

The study revealed that Farmer Field School programmes caused household food security to a great extent through provision of storage facilities, food processing, awareness of food hygiene, and to some extent made food available, affordable, and accessible within households within the study area. These findings subscribe to PEMDSU (Planning, Evaluation, Monitoring and Statistics Division) (2010) that there is enough food available within communities in rural setting in Sierra Leone. However, it was not able to reduce malnutrition. Ngegba (2008) found that in Bumpeh Ngao and Valunia Chiefdoms in Bo District southern Sierra Leone that there was hunger even at the peak time of rice harvesting as farmers had no access to fish, meat and most essential sources of protein.FAO (2001) also found that food availability alone would not produce food security at household level. FAO indicated that hidden hunger existed in mist of abundant food as food consumed without the other essential components of a balanced diet. It is not more of the food eaten but the nutrition contained in the food that drives away hunger. According to FAO (2015) hunger has forced generations into a cycle of poverty, and for children today the long-term impact will impair their ability to stay in school and seek employment. In fact, FAO (1996) defined food based on four dimensions: the availability of sufficient quantities of food of appropriate quality; access by individuals to adequate resources for acquiring appropriate foods for a nutritious diet; utilization of food through adequate diet, clean water, sanitation and healthcare to reach a state of nutritional well-being where all physiological needs are met; and the ability of populations, households and individuals to have access to adequate food at all times.

4. Level of food household security promoted through Farmer Field School Programmes

The study showed that there was low level of meat, milk, yams and food for dinner. The implication of this is that the people eat unbalanced diet. The study furthermore revealed that rice and cassava were highly available and affordable. According to Gillespie, and Haddad (2001) household is said to be food secured "if it can reliably gain access to food in sufficient quantity and quality for all household members to enjoy a healthy and active life. It is possible, however, for individuals in food-secure households to have deficient or unbalanced diets. Thus, malnutrition occurs when an individual's diet does not provide adequate calories and protein for growth and maintenance, or if they are unable to fully utilize the food they eat due to illness (Gillespie, and Haddad (2001). Malnutrition is a direct consequence of food insecurity; however, even if a person consumes enough calories, this does not guarantee adequate intake of essential micronutrients– vitamins, minerals and trace elements. Nutrition security, a relatively newer concept is said to be achieved when secure access to food is coupled with a sanitary environment, adequate health services and knowledgeable care to ensure a healthy and active life for all household members (FOA, 2012)

CONCLUSION & RECOMMENDATIONS

From the discussion, it was concluded that the low level of farmers involvement in the programmes was unimaginable, resulting to food insecurity within the study area. As a result, despite the efforts made, Farmer Field School made effort, FFS could not achieve household food security in most homes in the study area- protein sources were unavailable, unaffordable and inaccessible. No thorough effort has been made to measure environmental impact of FFS programmes. It was therefore, recommended that FFS make extra effort to actively involve all its members in all aspects of the food security programmes. This could be done through skill training in proper food management practices. This technical knowledge will guide group's learning and action process. Most FFS programmes exist within a larger programme, run by government officers mainly from Ministry of Agriculture. It is essential to have a good programme leader who can support the training of facilitators, get materials organized

for the field, solve problems in participatory ways and nurture field staff facilitators. The FFS process should build self-confidence (particularly for women), encourages group control of the process, and builds group and management skills.

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