ENTERPRISE DEVELOPMENT SERVICES LTD
15 Mudge Farm, Off Sir Samuel Lewis Road
Freetown ~ Sierra Leone
www.eds-sl.com

ISSUES IN FOOD SECURITY AND CASH CROP PRODUCTION IN SIERRA LEONE

By

Dunstan Spencer
Senior Partner, EDS

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TABLE OF CONTENTS

ABBREVIATIONS

Acronym	Description
ABC	Agricultural Business Center
ADB	African Development Bank
ATS	Agricultural Tracking Survey
AU	African Union
BSL	Bank of Sierra Leone
CAADP	Comprehensive African Agricultural Development Program
CBO	Community Based Organisation
CI	Confidence Interval
CIF	Charged Insurance and Freight
CILSS	Comité permanent Inter-états de lutte contre la sécheresse au Sahel
CNFA	Citizens Network for Foreign Affairs
CORAF	Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles
CPI	Consumer Price Index
CSO	Central Statistics Office
DFID	Department for International Development
DTIS	Diagnostic Trade Integration Study
ECOWAS	Economic Community of West African States
EDS	Enterprise Development Services Ltd
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FARA	Forum for Agricultural Research in Africa
FBO	Farmer Based Organization
FCS	Food Consumption Score
GDP	Gross Domestic Product
GHI	Global Hunger Index
GOSL	Government of Sierra Leone
GPS	Global Positioning System
Ha	Hectare
HDDS	Household Dietary Diversity Score
IADP	Integrated Agricultural Development Project
IBRD	International Bank for reconstruction and Development (World Bank)
IDAS	Integrated Development of the Agricultural Sector
IDB	Islamic Development Bank
IFAD	International Fund for Agricultural Development
IITA	International Institute for Tropical Agriculture
IRPRI	International Food Policy Research Institute
JICA	Japanese International Cooperation Agency
Kg	Kilogram
MAFFS	Ministry of Agriculture, Forestry and Food Security
MANR	Ministry of Agriculture and Natural Resources
MFMR	Ministry of Fisheries and Marine Resources
MSU	Michigan State University
MT	Metric Ton
NEPAD	New Partnership for African Development
NGO	Non Gevernmental Organization
NRA	National Revenue Authority
NSADP	National Sustainable Agricultural Development Program

Acronym	Description
NUC	Njala University College
PAGE	Promoting Agriculture, Governance and the Environment
PEMSD	Program Evaluation, Monitoring and Statistics Division
RVCD	Rice Value Chain Development Project
SCP	Small holder Commercialization Program
SIPAG	Système d'Information sur les Produits Agricoles en Guinée
SL	Sierra Leone
SLARI	Sierra Leone Agricultural Research Institute
SLPMB	Sierra Leone Produce Marketing Board
SNAP	SNAP Sustainable Nutrition and Agricultural Promotion
SSL	Statistics Sierra Leone
UN	United Nations Organization
UNDP	United Nations Development Program
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
USG	United States Government
VAM	Vulnerability Assessment and Mapping
WFP	World Food Program
WHO	World Health Organization
WVSL	World Vision Sierra Leone

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Enterprise Development Services Ltd, Freetown, Sierra Leone

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I. INTRODUCTION

This paper seeks to identify issues which are adversely affecting the production and availability of food and export crops in Sierra Leone, whether policy or market failures or other shortcomings. It provides recommendations for addressing these or outlines a program of further work that needs to be undertaken.

Section II describes the previous and current agricultural policies and programs including current programs that support small holder producers as well as medium and large scale farmers, drawing lessons from past failures and successes for future programs.

Section III examines the achievements of the programs in terms of national food security, trends in food crop production and prices as well as achievements in terms of cash crop production and export.

Section IV of the paper contains a critic of current programs and policies, covering the question of the functioning of output markets, the attention paid to issues of input supplies, the emphasis on large tractor mechanization and the effect of government interventions on expansion of demand for local versus imported food products. It also reviews the land tenure system as a constraint to agricultural development and discusses the poor quality of agricultural production statistics in the country.

II. POLICIES AND PROGRAMMES FOR INCREASING FOOD SECURITY

2.1 Previous agricultural development policies and programs

The Sierra Leone Agricultural Sector Review (MAFFS/MFMR, 2004) outlined the history of major agricultural development programs in the country. It is instructive to review them so that mistakes of the past can be avoided and new approaches and best practices adopted.

Colonial governments especially in the early stages pursued a relatively non interventionist policy in agricultural development. Apart from support to agricultural research and limited training, farmers were left to rely on their own ingenuity. Later on there were government sponsored projects some of which failed because of poor staffing, poor management, inadequate funding and lack of knowledge of local socio economic conditions. Notable examples for rice were the irrigation and

drainage schemes in the Scarcies, rice seed multiplication and distribution, mechanization and rice milling and marketing schemes.

There was a shift in agricultural policy in the immediate post independence period to direct intervention in agricultural production by the State. The Rice Cooperation which was established in 1961 imported tractors and equipment. It established its own rice farms and provided mechanical cultivation services to farmers. These schemes were poorly planned (often with no feasibility studies), located in unsuitable areas and poorly staffed. By 1967, the Rice Cooperation could not raise operating capital to pay farmers cash for produce purchased from them and resorted to IOUs. Government was forced to close down the Rice Corporation in 1978 and the Mechanical Cultivation Service reverted to the Ministry of Agriculture.

Rice pricing, policy during Rice Corporation period was unfavorable to farmers. The Corporation offered prices that were below world market prices. Its rice mills were idle for significant periods and the Rice Corporation concentrated its efforts on the more profitable importation of rice, which was a disincentive to local production. When the Rice Cooperation was closed in 1978 the mandate for operation of rice policy fell to the Sierra Leone Produce Marketing Board (SLPMB). Over the next 10 years the SLPMB also operated a policy that was very unfavorable to domestic rice producers (Spencer, et al, 1997). Its monopoly was removed in 1986 and the private sector assumed responsibility for the marketing of both locally produced and imported rice.

The government's Cooperative Department Credit Schemes which had been designed in the 1950s to give low cost institutional credit to cooperative societies to finance their marketing and other activities collapsed in the immediate post independence period. The policy was that loans guaranteed by government were provided by commercial banks to the Registrar of Cooperatives who then lent to their members or invested in projects such as purchase of tractors, rice mills and construction of stores. The schemes achieved some success in the 1950s and early 1960s, but reflecting other aspects of life in Sierra Leone, politics intruded into the scheme. Unqualified staff were recruited, bad loans were given out, produce misappropriated in the field and what was delivered to the Rice Corporation was not paid for. Because of the defaults in payments, banks refused to give out more loans, and requested government to repay outstanding loans.

During the late 1960s and 1970s government's policy gave emphasis to the support for small scale agriculture. Integrated Development of the Agricultural Sector (IDAS) projects commenced in 1967 to be followed by the Integrated Agricultural Development Projects (IADPs) in 1972. The main components of these projects were: (1) provision of intensive extension services (2) supply of improved planting materials (3) supply of low interest development and seasonal credit to farmers (4) provision of infrastructure such as feeder roads, drying floors and wells and (5) utilization of qualified staff, usually expatriate management staff on contract. Although some of the inputs were said not to have reached the intended beneficiaries, the IADPs had a positive effect on agricultural output and rural income during the life of the projects but the effects were not sustainable and quickly faded when subsidies were removed at the end of the projects.

During the 1980s the Ministry of Agriculture and natural Resources launched a *Green Revolution Program* to boost agricultural production. It was characterized by wide publicity and the acquisition of vehicles. It failed because of inadequate extension services, planning, monitoring and evaluation.

The clear lesson from all the past failures is that government interventions in agricultural production and marketing is very problematic, Government must therefore restrict its interventions to broad policy formulation and stimulation and support to private sector engagement in production and marketing. All government programs require sound planning, allocation of appropriate roles to various stakeholders, good management of appropriate institutions and resources and exit strategies from time bound projects are crucial for development of the agricultural sector including the rice sub sector.

2.2 On-going Agricultural Development Programs and policies

A) Support to Small holders

Sierra Leone's agricultural development activities are now driven by its' Comprehensive African Agriculture Development Program (CAADEP) Compact - the Small Holder Commercialization Program (SCP) which is the culmination of an extensive national process, involving consultation with stakeholders, development partners and experts, as well as in-depth analysis of the agriculture sector in Sierra Leone. The *Agenda for Change*, Sierra Leone's second Poverty Reduction Strategy Paper, was published in 2008 and set out a five-year national plan for the country's development. Agriculture was clearly identified as one of four strategic priorities, and a critical factor in meeting Millennium Development Goal 1 - reducing poverty and food insecurity. MAFFS subsequently developed a National Sustainable Agriculture Development Plan (NSADP), a broad sector-wide framework for putting the objectives of the *Agenda for Change* into action. The NSADP also served as Sierra Leone's contribution to the CAADP Compact under the African Union's New Partnership for Africa's Development (AU/NEPAD) activities.

The overall goal of the SCP is to reduce rural poverty and household food insecurity on a sustainable basis, and to strengthen the national economy. The specific objectives of the SCP are to:

- promote commercialization of smallholder agriculture through increasing productivity, intensification, value addition, post-harvest infrastructure, and marketing with emphasis on commodity chain development and institutional strengthening to build self-reliance of farmer-based organizations (FBO);
- develop appropriate small scale irrigation infrastructure in order to boost rice production, a main staple in the country, leading to increased food security, market surplus particularly for lowland smallholders, and the creation of wealth and employment notably for youth.
- improve access to markets through the rehabilitation and effective maintenance of priority feeder roads, generating smallholder commercialization;
- broaden smallholders' access to rural financial services tailored to the specific needs of clients expected to be individuals and groups, in particular FBOs/ABCs;
- promote national growth and development with equity by reducing households' vulnerability to shocks and disaster and increasing food security and nutrition of vulnerable households through providing a package of social protection safety nets with focus on children, promoting human capital potential and employment, improving livelihoods and contributing to creation of productive assets; and
- to ensure effective strategic and well-coordinated operational planning and implementation of SCP, with efficient coordination of resources and implementing partners, and adequate monitoring and evaluation of progress and impacts.

B) Support to medium and large-scale producers

Improving the climate for private sector investments: Sierra Leone has recorded impressive improvements in the investment climate that benefit both foreign investors and domestic companies. Sierra Leone is one of Africa's most active reformers of laws and business regulation. "Doing Business 2010" which is published by the World Bank Group, identifies Sierra Leone as having made reforms in four key areas important to investment and exports: Starting a Business, Dealing with construction permits, Registering Property, and trading across borders.

In May 2009, the Parliament passed two very important laws - the Companies and Bankruptcy acts. The new Companies bill updates the original, which was passed in 1960, and brings Sierra Leone in line with international standards. Provisions of the new law include:

- Mandates disclosure of personal conflicts of interest by company directors and officers

- Requires shareholder approval of large related-party transactions to reduce possible misuse of company assets
- Provides shareholders with rights to hold the directors liable for damages to resulting in a related-party transaction
- Offers the possibility of rescission of the transaction, in the case of a related-party transaction that is harmful to the company
- Grants shareholders access to all relevant documents.

Other key laws include:

- Investment Promotion Agency Act: The Sierra Leone Investment and Export Promotion Agency, established by an act of parliament in 2007, became operational in May 2008 as the country's official agency to assist and inform investors and exporters about investment and export opportunities.
- Investment Code: A new Investment Code went into effect in 2005, which was designed to provide more protection for companies investing in Sierra Leone and to promote production and value-added activities. The government encourages joint ventures, and full foreign ownership is allowed. In addition, there is no discriminatory economic or industrial strategy against foreign investors, and no limit is imposed on foreign ownership or control.
- Business Registration Act: In 2007, Parliament passed a new Business Registration Act that trims company registration procedures to four steps. There are no restrictions on the amount of equity a foreign firm may own in a local business. In addition, there are no requirements that nationals own shares, that the share of foreign equity fall over time, or that technology be transferred under certain terms. There also are no "offset" requirements.

Subsidization of Mechanical Cultivation: GOSL is currently subsidizing mechanical cultivation and post harvest activities through the equipment hire purchase scheme currently operated by the First International Bank (SL) Limited. Through an Indian Government loan, MAFFS acquired a set of agricultural equipment which it has used to set up the hire purchase scheme. FIB was given the following equipment for the scheme in mid 2010:

- 265 new Indian tractors
- 100 used tractors
- Rice threshers
- 25 Trailers
- 26 Alvan Blanch 500-800 Kg/hr rice mills with accessories, stores etc
- 2 Indian 1000 kg/hr rice mills with accessories, briquetting machines, etc

All the equipment are offered to clients at a subsidized rate (40% of the cost to MAFFS), the burrowers make a down payment of 20% of the subsidized cost, with equal yearly payment (over 15 years for the rice mills and 7 years for the tractors and equipment), plus 4% interest, half of which is the fee to FIB. Information available to the author is that FIB and MAFFS are having difficulties getting burrowers to meet their contracted repayment schedules.

C) Donor Support programs

Over the last decade, donor activity in support of agriculture has been making a transition from post-conflict and emergency relief to longer-term development. After the war, donors and NGOs were primarily focused on resettlement and rehabilitation of farming land and rural communities, using project-based approaches. More recently donors shifted to more programmatic designs, and refocused activities towards capacity-building, enhancing productivity through mechanization and input supply, and building rural infrastructure including feeder roads.

Development partners have been responsive in supporting the development of MAFFS policies and implementation. A number of projects are ongoing or in the pipeline, geared towards enabling farmers and stakeholders along commodity chains to realize their aspirations and potential (See Annex 1). The largest financers in the sector are the European Union (EU), World Bank (WB), African Development Bank (ADB), World Food Program (WFP), the International Fund for Agricultural Development (IFAD), and Islamic Development Bank (IDB). They are joined by other partners including the Japanese International Cooperation Agency (JICA), Irish Aid and the Italian Cooperation, Governments of China, Germany and Nigeria, as well as a range of NGOs including Action Contre le Faim, ACDI/VOCA, Africare, BRAC, Care, Concern, COOPI, Catholic Relief Services, Christian Aid, Heifer International, OFID, Oxfam, World Vision as well as UN agencies, including FAO, ILO, UNDP, UNICEF, UNEP, WHO and WFP. A number of sub-regional organizations are also providing support on food security issues and CAADP process. They include the Mano River Union, ECOWAS, and Comite Permanent Inter Etat de Lute Contre la Secheresse (CILSS). Research is supported by CORAF, FARA, IITA and the Africa Rice Centre. There are many smaller organizations doing localized work as well. This institutional landscape is in itself a management issue for MAFFS but provide financial and technical support where national capacity is weak.

Development-supported interventions in agriculture have made an impact, but problems persist related to alignment, poor coordination and inadequate investment. Each individual project adheres to different standards and reporting processes, addressing different parts of the commodity value-chain and geographic areas without sufficient synergies. Furthermore, by establishing separate Project Implementation Units, many of these projects have not been able to successfully build capacity within the Ministry of Agriculture. In the Agenda for Change and the NSADP, the Government recognizes the need to strengthen coordination in the Ministry in order to coordinate and organize donor activities more effectively and optimize results. The SCP is designed to address these difficulties by aligning donor projects under a single policy framework with a common goal and harmonized strategies, coordinated by a central coordinating mechanism staffed and led by the Ministry.

III. ACIEVEMENTS OF DEVELOPMENT PROGRAMS

3.1. TRENDS IN FOOD SECURITY AND PRODUCTION

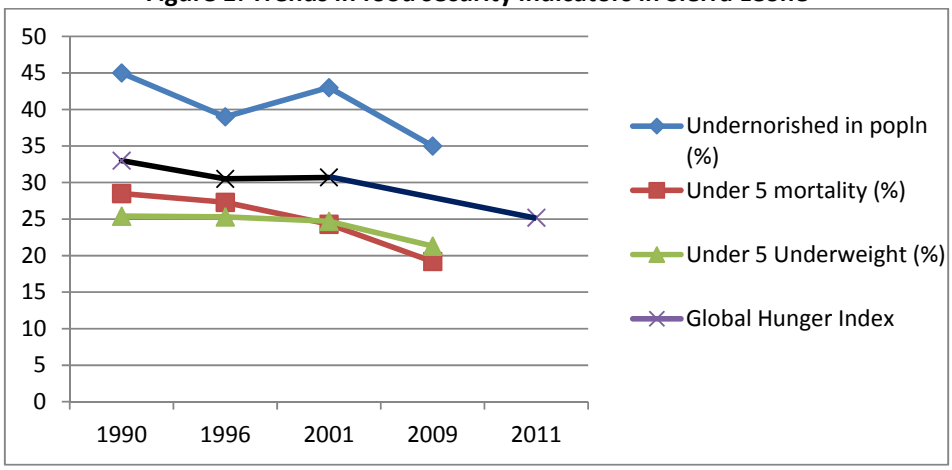
According to the 1996 World Food Summit, food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life. There is no single, direct measure of food security. The food security status of any household or individual is determined by the interaction of a broad range of social, economic, cultural and environmental factors. However there are three key dimensions to food security: aggregate food availability at local/regional/national levels, household food access, and individual food utilization (WFP 2010).

Agriculture forestry and fishing are the mainstays of the Sierra Leone economy, accounting for about 46% of real GDP during the last five years. Rice is the staple food crop of the country and alone accounted for about 15% of real GDP (SSL 2010). Rice is cultivated by 87% of Sierra Leonean farmers (ATS 2011).

A) Trends in Overall National Food Security

According to the IFPRI Global Hunger Index (IFPRI 2011), food security at the national level has increased steadily in Sierra Leone over the last two decades, although the losses during the civil war years slowed the process (Figure 1). Sierra Leone has moved from the "extremely alarming" category (GHI > 29.9) to the "alarming" category (GHI 20.0 – 29.9). However, Sierra Leone still ranks last out of 15 countries in West Africa and 36th out of 43 African countries in terms of hunger faced by the population.

Figure 1: Trends in food security indicators in Sierra Leone



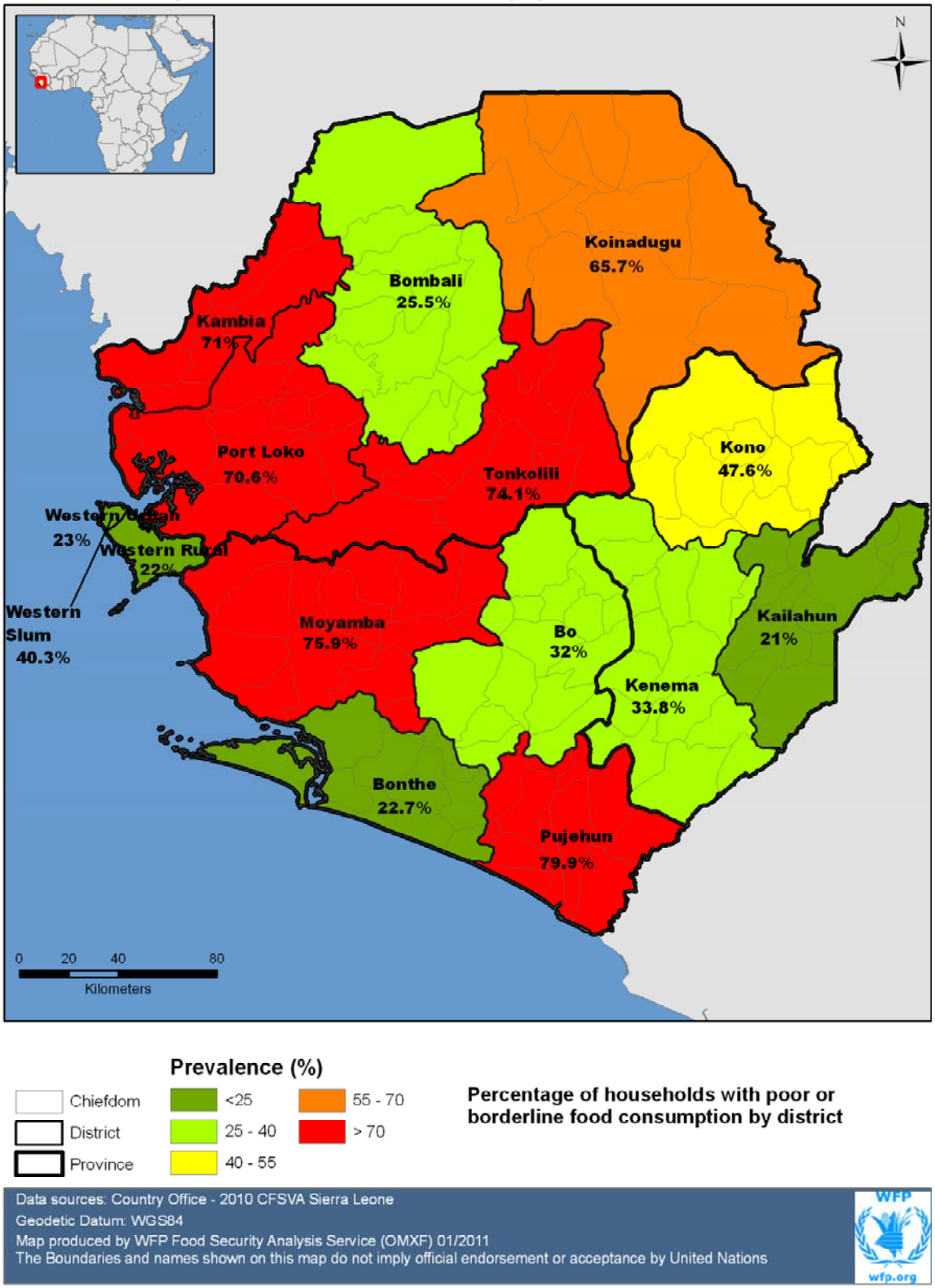
Source: IFPRI et al, 2011

B) Spatial Distribution of Food Insecurity

Food consumption is a reflection of food availability and food access at the household level. It is frequently used as a proxy indicator of the current food security situation. The Food Consumption Score (FCS) is a composite score based on dietary diversity, frequency of consumption of different food groups, and relative nutritional importance of various food groups consumed by a household. A higher FCS therefore is related to a higher dietary diversity, frequency and nutritional value of a household's diet.

The latest data from the WFP vulnerability ranking shows the spatial distribution of food insecurity in the country (Figure 2). At national level about 2.5 million people are food insecure in Sierra Leone representing 45% of the country's population. Among them about 374,000 people (6.5%) are severely food insecure (Table 1). Food insecurity is highest in Pujehun District and lowest in the heavily forested Kailahun District with its diverse food sources and Bonthe District where year round availability of fish probably helps in food security of the population. The highest number and percentage of food insecure people are in the Northern Province.

Figure 2: Prevalence of Food Insecurity by District in Sierra Leone



Source: WFP 2011

Table 1: Prevalence of food insecurity in Sierra Leone in 2010

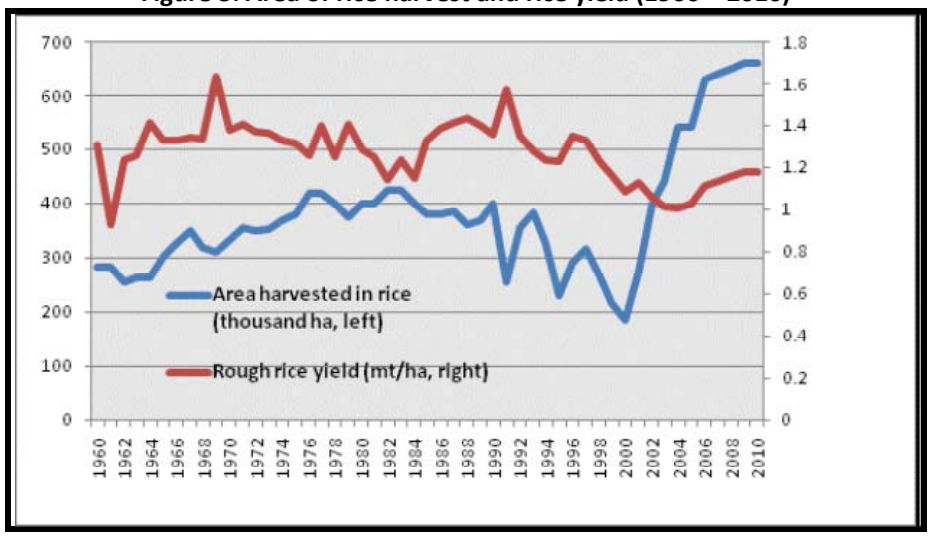
Admin sub-division	Total Population	Number Food Insecure			Percent Households Food Insecure		
		Severely food insecure	Moderately food insecure	Total food insecure	Severely food insecure	Moderately food insecure	Total food insecure
Bombali	518,909	10,897	121,425	132,322	2.10%	23.40%	25.50%
Port Loko	503,500	25,175	330,296	355,471	5.00%	65.60%	70.60%
Tonkolili	392,997	88,424	202,786	291,211	22.50%	51.60%	74.10%
Koinadugu	303,289	40,641	158,620	199,261	13.40%	52.30%	65.70%
Kambia	308,929	13,284	206,056	219,340	4.30%	66.70%	71.00%
Northern Province	2,027,624	178,421	1,019,183	1,197,605	8.80%	50.26%	59.06%
Kenema	592,466	11,257	188,997	200,254	1.90%	31.90%	33.80%
Kono	214,956	16,982	85,338	102,319	7.90%	39.70%	47.60%
Kailahun	421,287	15,588	72,883	88,470	3.70%	17.30%	21.00%
Eastern Province	1,228,709	43,827	347,218	391,043	3.57%	28.26%	31.83%
Bo	596,469	5,368	185,502	190,870	0.90%	31.10%	32.00%
Bonthe	152,059	1,673	32,845	34,517	1.10%	21.60%	22.70%
Moyamba	248,378	44,460	144,059	188,519	17.90%	58.00%	75.90%
Pujehun	306,700	20,856	224,198	245,053	6.80%	73.10%	79.90%
Southern Province	1,303,606	72,357	586,604	658,959	5.55%	45.00%	50.55%
Western Area Rural	241,438	3,139	49,978	53,116	1.30%	20.70%	22.00%
Western Area Urban	885,473	55,785	147,874	203,659	6.30%	16.70%	23.00%
Western Area Slum	59,905	3,594	20,547	24,142	6.00%	34.30%	40.30%
National	**5,746,755**	**373,539**	**2,212,501**	**2,586,040**	**6.50%**	**38.50%**	**45.00%**

Source: WFP, 2011

C) Trends in Food Crop Production and Self-sufficiency

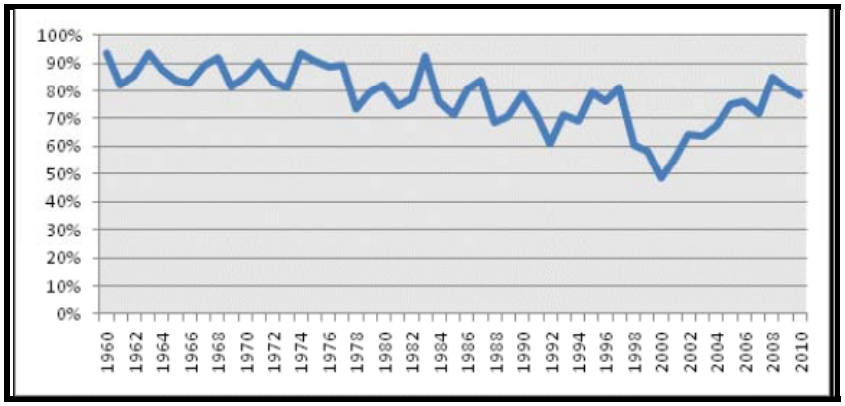
Domestic food production is an important determinant of food security. With the importance of agriculture to the economy, it is essential to have accurate statistics on the sector for accuracy of management of the economy, particularly of the staple food crop rice. However, as discussed in Annex 2, the data on trends in food crop production are very questionable. Published figures by the MAFFS, USDA, FAO etc show beautiful trends – for example see Figures 3 and 4 from the recent VAM Report (WFP 2011) which use United States Department of Agriculture (USDA) data. The Figures show that crop yields have not increased over the last two decades, so that the production increases are due to massive expansion in area cultivated particularly during the last decade after the end of the civil war. The rate of food self-sufficiency declined from a high of about 95% at Independence in 1961 to a low of 50% during the civil war years in the 1990s. Although there has been some recovery during the last decade self-sufficiency has not yet recovered to the levels in the early 1960s.

Figure 3: Area of rice harvest and rice yield (1960 – 2010)



Source WFP, 2011, Graph 1

Figure 4: Self-sufficiency ratio, grains (1960-2010)



Source: WFP 2011, Graph 2

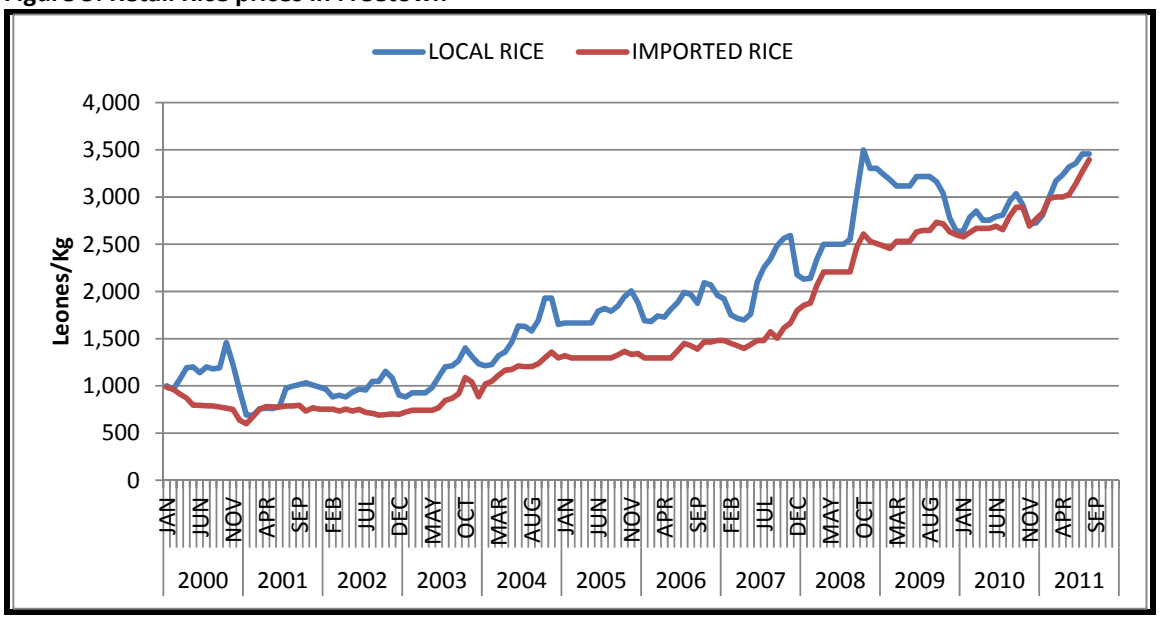
D) Trends in Food Prices

The movements of food crop prices in the country give an indication of the degree to which the level of domestic production (supplemented by imports) meet consumer demand. Monthly data on rice prices are collected by Statistics Sierra Leone for computation of the Consumer Price Index. Figure 5 shows that the retail price of local rice in Freetown, i.e. rice produced in Sierra Leone, has constantly been above that for imported rice except for a few months. However, the gap has narrowed significantly in the last two years implying that domestic production has increased faster than increases in demand. Furthermore, unlike the situation in the past when local rice prices were higher

than imported rice prices even in major rice producing areas such as the Scarcies (Kambia) and the Bolilands (Makeni) (Spencer, 1997), domestic rice prices are now lower than that for imported rice in the urban areas of the hinterland of Sierra Leone (Figure 6), particularly in Kenema, indicating that transportation costs of imported rice to provincial towns is now enough to remove the slight competitive advantage that imported rice may still have in Freetown.

There are indications that the price of locally produced rice is determined by the price of imported rice in addition of course to the level of production in the country. In addition to the international price for imported rice domestic transportation cost play a part in determining imported rice prices in the different urban areas of the country. An examination of the relative roles of the above factors in rice price determination is beyond the scope of this paper.[1]

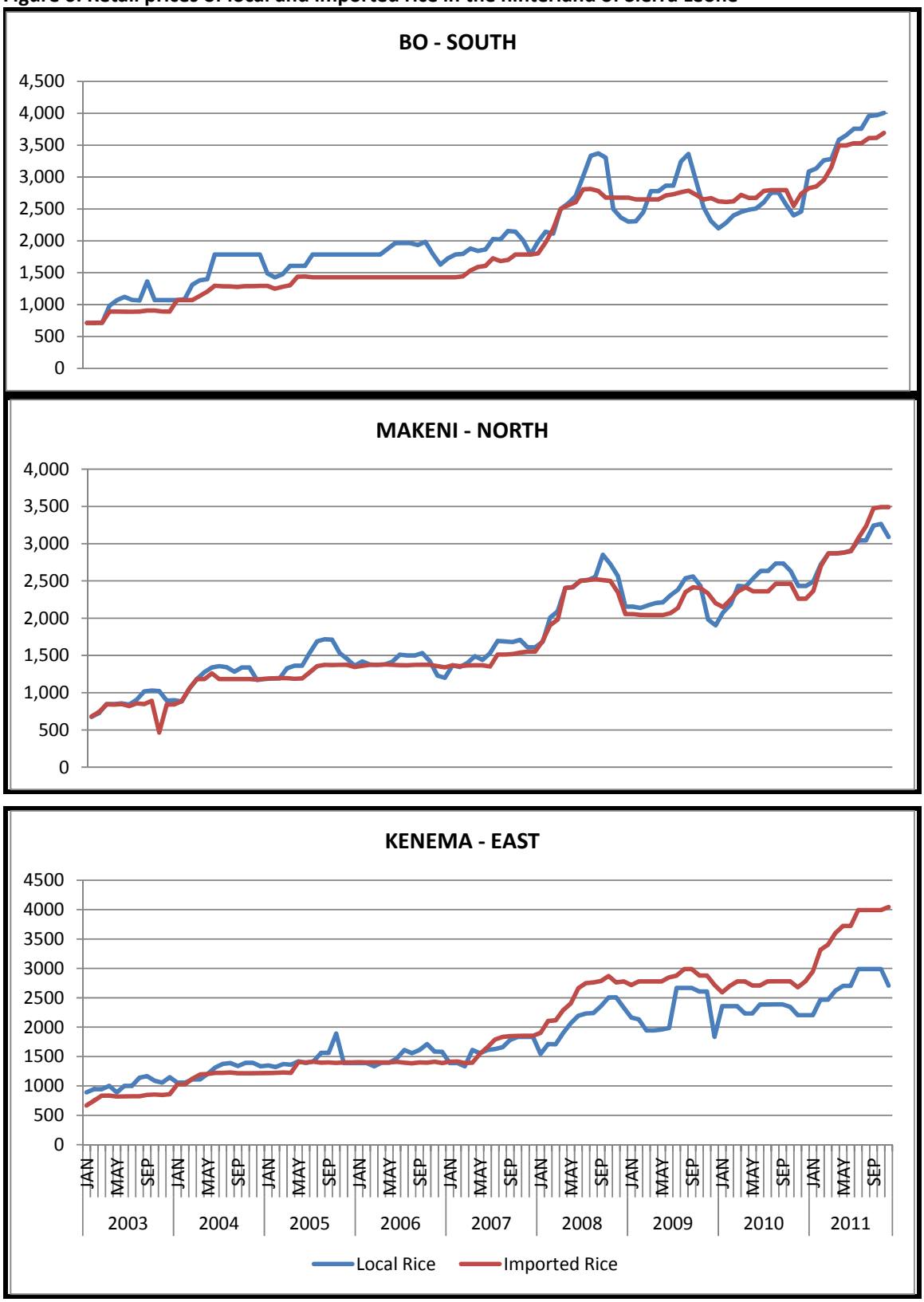
Figure 5: Retail Rice prices in Freetown



Source: Statistics Sierra Leone, Consumer Price Index, Average prices series

[1] Hopefully the study of rice processing, marketing and distribution in Sierra Leone for which there was a recent call for expression of interests by the World Bank financed Rural and Private Sector Development Project will examine the relationships.

Figure 6: Retail prices of local and imported rice in the hinterland of Sierra Leone



Source: Statistics Sierra Leone, Consumer Price Index, Average prices series

3.2. TRENDS IN AGRICULTURAL EXPORTS

A) Trends in Cash Crop Production

The Ministry of Agriculture, Forestry and Food Security (MAFFS) is the only institution that publishes statistics on production of cash crops in the country. According to the Figures in Table 2 area and yields of the principal cash crops (Cocoa, Coffee and Oil Palm) have increased significantly since the end of the civil war in 2002. However the published figures are highly suspect since there are no annual production survey for these crops in the country, and there is no justification provided for the projections, e.g. for 2010. And they are at variance with the only recent objective study of cost of tree crop production in Sierra Leone (Spencer, 2009) which revealed that that cocoa farms averaged between 2.7 ha in Kenema and 3.3 ha in Kono, and yields averaged 0.18 – 0.32 mt/ha in 2009. Yields on coffee farms average 0.11 mt/ha in Kailahun and 0.24 mt/ha in Kenema with farm size averages of 2.4 ha in Kailahun and 2.9 ha in Kenema. The study also revealed that District farm size averages for small holder oil palm plantations ranged between 1.8 ha in Kailahun and 3.0 ha in Kenema and average palm oil yields ranged from 26 gal/ha in Kenema to 54 gals/ha in Kailahun.

Table 2: Trends in Cash crop production in Sierra Leone

Year	Cacao			Coffee			Oil Palm		
	Area (Ha)	Yield (Mt/Ha)	Production (Mt)	Area (Ha)	Yield (Mt/Ha)	Production (Mt)	Area (Ha)	Yield (Mt/Ha)	Production (Mt)
2001	30,333	0.36	10,920	14,037	1.78	24,986	218,750	4.50	984,375
2002	35,135	0.37	13,000	16,854	1.77	29,832	293,750	4.50	1,321,87
2003	42,105	0.38	16,000	21,910	1.77	38,781	306,250	4.50	1,378,12
2004	49,762	0.42	20,900	28,843	1.78	51,341	312,500	4.50	1,406,25
2005	57,226	0.42	24,035	35,208	1.79	63,022	328,125	4.50	1,476,56
2006	73,576	0.42	30,902	42,725	1.80	76,905	344,531	4.50	1,550,39
2007	84,578	0.42	35,523	49,134	1.80	88,441	361,758	4.50	1,627,91
2008	97,265	0.42	40,851	56,505	1.80	101,709	416,022	4.50	1,872,09
2009	106,992	0.87	93,083	62,156	1.88	116,852	457,624	6.40	2,928,79
2010	117,691	0.91	107,099	68,372	1.97	134,693	503,368	6.72	3,382,63

Source: MAFFS, PEMSD

Note: 2010 figures are projections projected at 10% increase for area and 5% increase for yield

From Spencer's analysis it is clear that small holder tree crop farming is very profitable under current pricing regimes. Apart from palm oil production in Kenema where average net returns to family labor were negative because of low yields from relatively large plantations (over 12 ha), net returns to family labor were substantially greater than the going wage rates, ranging from around 50% to almost 400% higher than the hired labor wage rate.

However yields are low and there is much scope for increasing them using improved planting materials and cultural practices. Development agencies should concentrate on helping farmers to invest in the new technologies. The supply of improved planting materials is critical in this regard and the clonal gardens of the Sierra Leone Agricultural Research Institute should be rehabilitated and expanded to provide a domestic source of supply.

B) Trends in Exports of Cash Crops

Import and export data are collected at the ports of Sierra Leone by the National Revenue Authority (formerly the Customs and Excise Deportment) in order to collect import and export duties[2]. Since such revenue has traditionally formed the bulk of GOSL revenue, much attention has been given to the system for collecting the revenue and the underlying data. However, there is no correlation between export quantities in Table 3 and production quantities in Table 2 for these crops for which there is virtually no domestic consumption indicating that either or both of the figures are wrong!

Table 3: Trends in Exports of Cash Crops in Sierra Leone

	Coffee		Cocoa	
Year	**mt**	**000 US$**	**mt**	**000 US$**
2001	75	22.9	641	265.9
2002	947	272.1	1,178	1,218.9
2003	113	40.1	2,733	2,572.8
2004	118	52.8	6,187	5,259.4
2005	1,039	735.5	7,169	5,524.9
2006	693	1,093.4	2,502	11,570.8
2007	717	1,854.7	7,384	11,368.1
2008	1,958	1,487.5	17,893	14,981.9
2009	2,695	13,123.5	24,514	20,544.6
2010 (Prov)	349	1,698.2	31,557	26,456.6

Source: MAFFS, Bull 2. Data from Customs and Excise Department (NRA) and the International Finance Department of BSL

Furthermore, as Spencer (2009) points out, the estimated quantities of cocoa and coffee exported to Europe as reported locally by the Bank of Sierra Leone and internationally in UN Statistics are significantly different. Although there is likely to be some double counting of export quantities as reported in import figures by Sierra Leone's external trade partners, the substantial difference in export price between the FOB price reported in Bank of Sierra Leone statistics and the CIF prices reported in the UN trade statistics (over 100% difference) cannot be explained by double counting of export volumes. The inevitable conclusion is that there is significant under reporting of export volumes and particularly of export prices in the local statistics. There is an incentive for exporters to under report both volumes and prices as this reduces their profit tax payable to the Government. The extreme reluctance of exporters to disclose the export price to EDS investigators while they were very willing to reveal their costs of operations, lends credence to this view.

Using the CIF Europe prices reported in the UN Statistics Spencer (2009) estimated that the exporter's margins (including the margins by the Buying Agents) are about 86% of the farm gate price for coffee and 107% for cocoa. Negative margins obtained when Bank of Sierra Leone FOB export prices were used confirmed that the reported prices are unrealistically low – they were even lower than the farm gate prices reported by farmers in the farm survey!

The study therefore showed that profit margins by exporters of cocoa and coffee are high, even for the poor quality of produce supplied to the international market. There is therefore scope for

[2] Currently there are no export duties on agricultural products and a 10% duty on the CIF value of imported rice

increased payments to farmers, particularly for payment of a premium for high quality produce, as is now being done by Cooperatives such as those recently set up by the Rural and Private Sector Development Project (Sherrif, 2010)

IV. A CRITIC OF CURRENT AGRICULTURAL PROGRAMS AND POLICIES

A) Functioning of output markets

There are questions as to how well the private sector output markets are functioning. In a study at the end of the last decade, Spencer (1997) reported that the rice marketing system is quite traditional involving assemblers, itinerant merchants, custom millers, wholesale distributors, and retailers. However, the trade is liberalized and very competitive at all stages, although practices such as credit during the growing season tied to sales at harvest at low prices may restrict the freedom of farmers to take full advantage of the competitive nature of the market.

Spatial price differences for domestic rice as well as imported rice were not that significant. For example, a cup of parboiled rice sold for Le 150 in Kassiri and Le180 to Le190 in Koidu town (Table 4). Parboiled rice was sold at Le180 per cup in Freetown. It was very difficult to get wholesale prices for domestic rice, as the common practice was to sell even whole bags by cup. However, the cups used by wholesalers contain 5 - 10 % more rice than cups used by retailers.

Table 4: Wholesale and Retail Prices of Domestic Rice in Different Areas of Sierra Leone, June, 1996.

Area	Wholesale Price (240 Cups "Banga" Bag)	Retail Price Per Cup
Freetown	40,000	200
Kono	40,000	180
Makeni	34,000	150
Kambia	32,000	150
Kassiri	32,000	150
Dahagbe (Guinea)	40,000	

Source: Spencer, 1997

However the WFP report (2011) claims that domestic markets are only partially integrated in Sierra Leone because of several factors that include the inter-annual variability in production, low volume of commercial surpluses and poor infrastructure. The situation needs to be examined to see whether the output marketing system has deteriorated compared to the situation at the time of the study by Spencer (1997), and market failures are now significant. Hopefully that will be done in the upcoming study (see footnote 1).

B) Input Supply and Use

There has been inadequate attention to issues of input (fertilizer) supply and use. As shown Figure 2 and Annex 2, crop yields particularly of the staple food crop rice are very low in Sierra Leone. A major contributing factor is the very low level of fertilizer use and very low dosages applied by farmers who use fertilizers. A recent survey (Spencer et al.2009) revealed that although a new development over the last decade is that almost a third of mangrove farmers now use fertilizers and about a quarter use pesticides, mainly to control crabs, application rates of fertilizers are very low, mainly under 100 Kg/ha of 15-15-15 NPK. Fertilizers are obtained from the informal market, with supplies obtained from traders who import the fertilizers and pesticides from Guinea, and provide them on loan to the farmers to be repaid at harvest in the form of supplies of paddy to the traders at agreed prices that are usually below the open market price for paddy at harvest time.

Another survey among farmers in the CARE Rice Value Chain Development (RVCD) Project in Northern Sierra Leone (Spencer, 2010) showed that although the vast majority of farmers have had access to and use improved rice varieties only a few use fertilizers (Figures 8 and 9). This implies that despite the fact that improved varieties perform best with fertilizers farmers have selected such varieties and grow them without fertilizers. Farmers have also adopted other improved crop varieties with over 50% of the sample growing improved cassava and oil palm varieties.

Figure 7: Access & Use of Improved Varieties

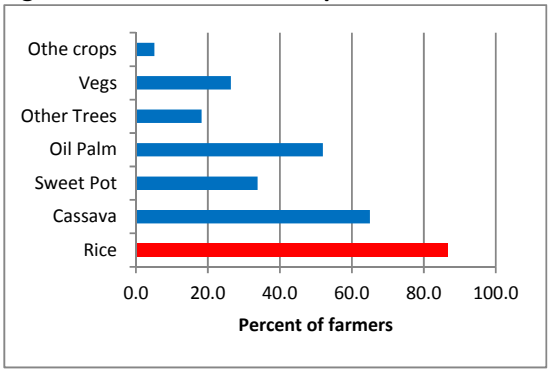
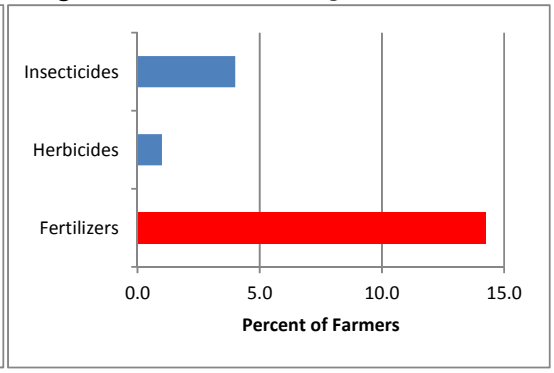


Figure 8: Access & Use of Agro Chemicals



Source: Spencer, 2010

Farmers report that they do not use fertilizers even though most are very aware of the benefits in terms of increased yields, because the fertilizers are not easily accessible at the time required i.e. at the start of the planting season, and they are very expensive.

The GOSL has made attempts over the years to import and distribute fertilizers to farmers usually at subsidized rates but the programs have not been sustainable and have had little or no effect on long term use by farmers. The GOSL fertilizer programs have been characterized by high costs and inefficient distribution systems.

On the other hand the private sector has not moved into the input distribution market in a significant way. MAFFS under the SCP has commissioned the Citizens Network for Foreign Affairs inc (CNFA) to mount a Pilot Agrodealer Strengthening Program that is expected to begin developing a private network of agrodealers by establishing a one-stop-shop solution where small holder farmers can access improved inputs (seeds, fertilizer, crop protection products), services (advice, machinery, micro-insurance, credit), and output marketing (processing, crop aggregation, packaging). At least 40 agrodealers will be trained and certified in Bo, Kenema and Bombali Districts with at least 10 of them working in collaboration with the GOSL's Agricultural Business Centers (ABCs), providing access to improved inputs to at least 10,000 farmers. This is a very welcome initiative which needs to be expanded with local private sector participation.

Use of input subsidies: As Dorward (2009) points out a subsidy can only generate a positive net economic return to a country if there is some market failure, as appears to be the case with the input supply system in Sierra Leone, which means that the downward shift in the supply curve is greater than the cost of subsidizing production, including the costs of subsidy administration. This may occur where farmers' perceived private cost of inputs is higher than the true social or economic cost, and/or the farmers' perceptions of private benefits from increased input use are lower than the actual social or economic benefits. Such situations can arise where (a) farmers' private costs of working capital for input purchase are greater than the social cost of capital, (b) farmers' lack of

knowledge about the benefits of inputs means that their expectation of the production benefits from input use are less than the benefits that they will gain, (c) there are learning costs with input use such that initial farmer returns are low but these will increase with experience, and (d) farmers' risk assessment and aversion in investing working capital in input purchase and use is higher than society's risk assessment and aversion. These divergences between farmers' and society's perceptions should decline as farmers gain experience with input use, with increasing knowledge of the benefits and risks of input use, increasing knowledge of how to use inputs, and consequent increasing efficiency in their use.

Morris et al. (2007) describe 10 features of smart subsidies: 'promoting fertilizer as part of a wider strategy', 'favoring market based solutions' in input supply, 'promoting competition' in input supply, 'paying attention to demand', 'insisting on economic efficiency', 'empowering farmers', 'involving an exit strategy', 'pursuing regional integration', 'ensuring sustainability', and 'promoting pro-poor economic growth.' They recognize that 'in exceptional circumstances, poverty reduction or food security objectives may even be given precedence over efficiency and sustainability goals'. Instruments proposed for implementing smart subsidies include demonstration packs, vouchers, matching grants and loan guarantees. For all of these the details of instrument design and implementation are critical to their success.

As Elbehri and Sarris (2009) point out input subsidies are often not enough by themselves. To be effective, they require large complementary investments in output market development policies and institutional support. If successful, input subsidies could help develop a functioning input market and improved supply systems, build farmers know-how, and induce dynamic and spillover effects on rural economies and other agricultural activities beside the targeted commodities.

A note of caution in considering the use of smart input subsidies in Sierra Leone is required considering that a review of several fertilizer subsidy programs in Africa by Dorward (2009) shows that often these input subsidy programs tend to over emphasize setting specific production targets without due consideration to consumer interests or to wider pro-poor economic growth. As a result, input subsidies programs as currently implemented in many African countries are rarely implemented with necessary complementary investments in input market infrastructures and other market instruments (such as institutional support to farmers organizations) needed to ensure effective implementation of such programs in the long run.

In the face of these institutional and endemic implementation difficulties in developing countries, the question is whether input subsidy is the best way to encourage higher input use in Sierra Leone. Are there alternatives to input subsidies or if justified, how can input subsidies be made part of broader strategies encompassing other critical market failure remedies that can also result in more optimal use of inputs in agricultural production?

A channel to enhanced input use is better access to credit. Credit access is considered a prerequisite to input use in most farming situations. One alternative to direct input subsidy is to provide subsidized credit to farmers to finance input purchases. This form of support would overcome one of the most endemic causes of underutilization of inputs among small farmers. In fact, in many cases past state interventions on stimulating input use involved subsidized credit. Such an approach has the advantage of avoiding the input-overuse possibility from subsidy and would also allow optimal decisions by farmers on the mix of inputs to use.

However, this approach too has limitations. Even with subsidized and accessible credit, the price of unsubsidized inputs may still too high relative to product prices, and hence remain out of reach for small farmers who would need it the most. Also, misuse of agricultural credit programs in the past led to financial losses, and credits were often applied regressively (loans to well-connected and wealthy borrowers). In fact the demise of the farm credit programs in many developing countries allowing farmers to purchase inputs, is one of the justification for opting for significant subsidies to

inputs as the only option that will significantly incite small poor farmers to access and use inputs such as fertilizer.

Recommendation: There is an urgent need to study the possibility of improving the level of use of fertilizers by rice and other food crop farmers in Sierra Leone. This could be by a combination of expansion of the private sector input distribution network (Agrodealers) and the use of "smart subsidies" as necessary.

C) Mechanization

There is an over emphasis on large tractor mechanization in Sierra Leone and there is a need to rethink mechanization policy. In the past mechanical cultivation service was provided to farmers by the Ministry of Agriculture. Inaugurated in 1951, GOSL intended the mechanical cultivation scheme to encourage the extension of rice production. Acreage mechanically cultivated fluctuated over the years reaching a peak of about 54,000 acres in 1975/76. Because it was concentrated in the Riverain grasslands and Bolilands, areas with unutilized land and low population density, the scheme had no adverse effect on aggregate employment. In fact there is evidence that mechanical cultivation encouraged rural to rural migration in the 1960s and 1970s (Njoku 1971 and Whittaker 1971), increased farm sizes resulting in higher rice output per family (Spencer and Byerlee 1977). Unfortunately, there is also some evidence that the impact of this technology has an adverse effect on the sexual division of labor within the family. The workload of women apparently increases as they are called on to weed and harvest larger acreages while that of men fall (Spencer and Byer1ee 1977). At the national level the scheme had a negative return. The management of the scheme was very inefficient and costs were high. It was estimated that it cost GOSL up to Le 60,000 to plough an acre while farmers were charged Le 10 (Whittaker 1971)! Very little attempt was also made to get farmers using mechanical cultivation to adopt yield increasing practices. Happily, GOSL is no longer providing mechanical cultivation services to farmers.

As pointed out earlier the current means of GOSL support to large and medium scale food production enterprises is the subsidization of mechanical cultivation and post harvest activities through provision of subsidized equipment hire purchase scheme currently operated through the First International Bank (SL) Limited.

There is a lot of empirical evidence showing that agricultural mechanization is important for achievement of food self-sufficiency in the developing world, e.g. Hossain, 2009 shows that food production in Bangladesh increased from 11.0 million tons in 1971 to about 30 million tons in 2007 due to irrigation development and partial mechanization of other agricultural operations. Studies in West Africa have clearly shown that to increase agricultural productivity in a sustainable way, the best option is to increase production per unit of land as well as cropping intensity. For this, faster development of agricultural mechanization as well as variety development is needed. In addition, the task of increasing food security would be made much easier if post harvest losses could be significantly decreased. This is again an area where improved mechanical technologies, including improved storage and handling systems are required

However many studies have also pointed to the conclusion that the degradation of soil resources is a major risk of motorized tillage particularly in forest zones in which most of Sierra Leone's agricultural area falls. In methods currently practiced, motorization damages the natural resources to the extent that there are irreversible environmental effects and, eventually, a negative impact on food production, food security and food self-sufficiency, (Gert van der Meijden, 1998).

Recommendation: There is need to provide scientific arguments either in support of the decisions successive governments in Sierra Leone have made for the promotion of pre and post harvest agricultural mechanization technologies considering use of all associated technologies such as

improved crop varieties, increased fertilizer use, improved credit schemes, etc., or provide enough empirical evidence to reconsider the position on this, while providing recommendations for more appropriate sustainable mechanization approaches or more efficient ways of achieving food security objectives.

Such as study should focus on the following areas:

i. The short term and long term effects of mechanization on the predominant ecologies in Sierra Leone;
ii. Associated technologies and interventions that could be combined with mechanization
iii. How successes of mechanization achieved in other countries can be replicated with appropriate modifications;
iv. The effect of mechanization on labor, specifically if on balance, the loss of income from displaced workers would compensate for the income made from the creation of a cadre of highly skilled labor, as the value chains of rice and root & tubers are enhanced;
v. The effect on household income, given that women are the greater contributors and that mechanization could disadvantage them, if the new highly skilled labor force does not include them;
vi. The types of subsidies associated with farm mechanization, and how these could be redesigned to be more effective.

D) Expanding demand for local products

Government interventions need to be positive in expanding demand for local products rather than imported products. Informal export of rice from the Scarcies area to Guinea has been going on for decades. Spencer (1997) reported that field visits to the border areas of Guinea (Pamlap and Dahagbe) showed that the flow of domestically produced rice from the Samu and Mambolo areas into Guinea was brisk business. The major reasons were:

- Dual trade - business people sell rice in Guinea and buy mainly imported goods (cigarettes, clothing, Maggi cubes, etc.) for sale in Sierra Leone.
- Relative ease and reduced risks of transportation to the Guinea markets compared to the traditional markets in Sierra Leone.
- Traditional family ties with Guinea.

He reported that the unrecorded export trade provided evidence that Sierra Leone was exploiting a comparative advantage in rice supply to parts of Guinea.

WFP (2011) provides the most recent analysis of regional trade. It shows that Sierra Leone continues to benefit from a buoyant regional trade, which offers an outlet for rice, gari (cassava flour) and palm oil. It is reported that statistics gathered by the Guinean Système d'Information sur les Produits Agricoles en Guinée (SIPAG) in late 2009, as the harvest was being brought to the market, indicated that Guinea was importing at least 360 tons of local rice from Sierra Leone monthly. These rice quantities are assembled and dispatched through the Barmoi international market in Sierra Leone.

The WFP study also shows that substantial volumes of palm oil are traded in the West African region and Sierra Leone has been benefitting from this trade. Eastern Sierra Leone (Kailahun and Koindu) exports significant quantities of the oil to neighboring Guinea through the market in Guéckédou (Guinea). The quantities sent from eastern Sierra Leone to Guinea are difficult to ascertain, given the multiple crossing points between both counties. The palm oil producing areas of Western Sierra Leone (Kambia) export surpluses to Conakry, through the market in Barmoi, in quantities estimated at some 30mt per month. Since 2007, and notwithstanding a dip in late 2008, palm oil prices have

been buoyant on the international and regional markets. These high prices for palm oil have supported producer incomes and have allowed palm oil producing groups to weather the shock of high food prices in 2008. Guinean traders commonly offer advances to producers in order to secure much desired palm oil supplies. These advances, normally provided during the lean season, provide an important cushion for small scale palm oil producers against food insecurity.

Furthermore, Sierra Leone has a burgeoning *gari* industry that has been supplying neighboring countries with cassava products made in Sierra Leone marketed to urban consumers in Conakry and Monrovia. The DTIS study (World Bank 2006) estimated that annual exports of gari from Sierra Leone to Guinea were about 10,000 mt. The WFP study estimates that monthly gari exports to Guinea through Barmoi are thought to exceed 400 tons at times of peak seasonal availability.

Instead of taking steps to encourage regional trade to allow Sierra Leone to exploit its comparative advantage and derive benefits from export trade expansion,[3] GOSL has periodically tried to put restrictions on the exportation of agricultural commodities, particularly rice and palm oil, especially when food prices are high particularly due to outside forces.

It is clear that this measure has had very little if any, and only temporary effects on food prices. By contrast such measures have tended to undermine the long term effects of prices in stimulating production and development of regional trade. Furthermore, they are contrary to the ECOWAS treaty which provides for the free movement of people and goods across the borders of member countries. For example quoting a Newspaper report by Gibao Brima in the Exclusivepress.net (Friday, 24 June 2011):

> "Government's ban on export of local produce reduces revenue and increases smuggling at Kambia. Following Government ban on local produce such as rice, and palm oil to neighboring countries such as Guinea and Liberia, Guinean government has in turn banned seven locally produced foodstuffs namely groundnut oil, onions, carrots, cabbages, tomatoes and lettuce, which petty traders from Sierra Leone mainly trade in. This has created headache for not only the traders but also for the National Revenue Authority in collecting revenue for the nation. Talking to this medium at the Balamuya Customs in Kambia it was confirmed that revenue collection has dropped to two-thirds whilst the petty traders opined that despite the fact that Government's ban on exportation of the staple food may be a positive drive in a bid to avoid scarcity in the markets it has, on the other hand, created more harm than good, since smuggling has now intensified in Kambia. This, he said, is as a result of the fact that government presence is not felt in all fifty six crossing points in and around Kambia District and has contributed to a great loss in revenue generation. As far as the traders are concerned, most of these items banned by our Guinean counterparts have affected them a lot. They also stressed that most of the women are trading in micro finance basis and are supposed to give returns on weekly bases but now that there is a standoff from their partners in neighboring Guinea, they ask - how are we going to fend for our children and at the same time payback our micro credit? They are therefore calling on the government to levy taxes on all local produce going out of Sierra Leone. By doing so, they said the government will not lose revenue and they will in return have their business going on smoothly and can pay their dues to the National Revenue Authority".

[3] As stated in the DTIS report (World Bank 2006) increased trade can have direct impacts on the poor by affecting their levels of income and employment, and the prices they face as both consumers and producers. Trade can also affect poverty indirectly by stimulating economic growth and its linkage effects and dynamic processes, and through the impact on government revenues and expenditures that affect the poor.

It is indeed surprising that the simple alternative even suggested by even journalist has not been adopted by GOSL!

Recommendation: GOSL needs to resist the temptation to periodically "ban" exports of food crops from Sierra Leone.

Government supported institutions such as hospitals, schools, prisons, the military, the police etc., are provisioned almost exclusively with imported rice. Spencer (1997) recommended that in order to encourage further development in the market for domestic rice, there is need to encourage merchants handling imported rice to switch to domestic rice. This would involve investment not only in the milling industry but in the organization of assembly and distribution of domestic rice. A start could be made by encouraging a switch of the sources of supply for rice allocated to institutions such as the military, police etc. from imported rice to domestic rice. WFP's Purchase for Peace program provides an example of what can be done.

Recommendation: GOSL should take steps to expand the internal demand for *local rice* as opposed *to imported rice*. As already recommended by Spencer (1997), GOSL should restrict supplies for its institutions to domestically produced rice. All normal quality specifications should apply. In order to stimulate new entry into the resulting domestic rice trade, tenders should be in small lots, e.g. 500 metric tons.

D) The land tenure system

The land tenure system is not a major constraint for agricultural investment although it is a factor often cited as constraining Sierra Leone's ability to fully exploit its comparative advantage, particularly for expansion of large scale commercial rice farming. The Sierra Leone Agricultural Sector Review document (MAFFS/GOSL 2004) concludes that for the small scale subsistence agriculture prevalent in the country now, the existing land tenure system is adequate. A recent analysis by SLIEPA (2010) has produced guidelines for large scale leasing of land for agricultural purposes which meets the needs of all potential investors and is fully compliant with local laws and international best practice.

The MAFFS/GOSL (2004) study, however, identified the following points that need to be highlighted (particularly with regards to larger scale farming):

a) The first is the inability of the banks and other financial institutions to provide farm credit based on the current system of land holding. The issue has been that the financial institutions do not consider the existing system as providing the needed security on which farm credit could be advanced. The individual's usufructory estate does not provide the needed security. This is because the individual cannot mortgage the land on which he works without the consent of the family head and even where he can obtain the consent, the financial institution cannot sell the land to a purchaser who is not a member of the family should the farmer default in payment. To expect someone within the family to purchase the land in such circumstances is to show a lack of understanding of the social system operating in the traditional societies of Sierra Leone. To solve this problem, it has been suggested that community interests be registered to enable the communities' access farm credit.

b) For large scale commercial farming, there already exist some arrangements under which farmers and companies could acquire leases on land and there is evidence that many farmers particularly expatriates have taken advantage of this (see SLIEPA 2010). What needs to be done is to use the arrangements to fashion out new legislation, which take modern demands into consideration, and

generally streamlines the system to ensure that all parties know the full extent of their commitments under a leasehold arrangement.

c) It does not appear that the tenure system has sufficient safeguards for accommodating the interests of cattle owners in the community. The result is a constant conflict among crop farmers and those who rear cattle. It is important that a continuing dialogue among the people is instituted until a solution could be found

E) Quality of Agricultural Production Statistics

The trends described in Section 3 above seem logical and give the impression of validity. However, a close examination of the underlying data shows that they are highly questionable because with the exception of trade data (imports, exports and prices), the quality of agricultural statistics in the country is very poor. The situation still not far removed from the colonial period when economic planning situation was described by Stoppler (1966) as "Planning without Facts." Although it is evident as discussed below that the situation improved in the 1970s and 1980s, it was still described in by Spencer (1997) as follows:

> "Agricultural production statistics are very unreliable in Sierra Leone. Annual production figures are often *guestimates*, based on the benchmarks established by the Agricultural Statistical Surveys conducted in 1970/71 and 1984/85, and the Land Resources Surveys in 1978/79. Although the Planning Evaluation and Monitoring Division of the Ministry of Agriculture and Natural Resources was charged with the responsibility of producing the necessary statistics in the early 1980s, no consistent annual production figures were produced, even before the onset of the rebel war in 1992."

The situation has not much improved. In fact it has got to be more confusing! To illustrate the point, rice production statistics published by MAFFS are presented in Table 5. Those published by FAO are shown in Table 6 and are similar to the national statistics, although the great increase in rice area and yield between 2005 and 2006 and the equally great drop the following year cannot be explained. The general similarity between the national statistics and FAO data is not surprising as FAO usually bases its data on national statistics suitably adjusted for consistency.

The MAFFS and FAO data imply that Sierra Leone should now be self sufficient in the production of its staple crop – in 2006 using FAO data, and in 2010 using MAFFS data! However, Table 7 shows that imports of rice have been around 100,000mt or more between 2006 and 2010. Why has the country been importing so much if it is self sufficient?[4] Clearly, the production statistics are meaningless! Annex 2 describes the discrepancies and examines the reasons for the poor state of the Statistics. The conclusion is that with the available it is not possible to establish a baseline for the level of agricultural production, especially of the staple food crop rice, with much confidence.

Recommendation: Sierra Leone needs to conduct an independent agricultural production survey as a follow up to the ATS in which crop areas are measured and yields are estimated using the yield plot techniques as was done in the Agricultural Surveys conducted by the then Central Statistics' Office in 1966/67 and 1970/71. Better estimates of informal and formal food crop exports are also needed.

[4] As shown earlier the level of informal regional trade (the so called smuggling trade) cannot be used to explain the discrepancy. Also as shown in Figure 4, the country is far from being self-sufficient according to USDA data.

Table 5: Sierra Leone, National Rice Production and Self-Sufficiency for Period 2001 - 2010.

Year	Area (Ha)	Yield (Mt/Ha)	Production (Mt)	Milled Equivalent (Mt)[1]	Population[2]	National Requirement (Mt Milled)[3]	Self-Sufficiency (%)
2001	258,850	1.20	310,620	186,372	4,725,033	491,403	37.93
2002	343,142	1.23	422,065	253,239	4,814,808	500,740	50.57
2003	356,506	1.25	445,633	267,380	4,906,290	510,254	52.40
2004	426,772	1.27	542,000	325,200	4,999,509	519,949	62.54
2005	427,907	1.29	552,000	331,200	5,094,500	529,828	62.51
2006	422,556	1.33	562,000	337,200	5,216,890	542,557	62.15
2007	432,356	1.36	588,004	352,802	5,343,200	555,693	63.49
2008	475,592	1.43	680,097	408,058	5,473,530	569,247	71.68
2009	499,111	1.78	888,417	533,050	5,607,930	583,225	91.40
2010[4]	549,022	1.87	1,026,671	616,003	5,746,800	597,667	103.07

Source: MAFFS 2011

Notes:

[1] Milled recovery = 60%

[2] Population growth rate at 1.9% using 2004 population as baseline

[3] Per caput consumption = 104 kg per person per annum

[4] 2010 Figures are projections projected at 10% increase for area and 5% increase for yield

Table 6: Sierra Leone – National Paddy Rice Production

Year	Area (Ha)	Yield (mt/ha)	Production (mt)
2000	183,214	1.09	199,134
2001	300,000	1.00	300,000
2002	420,000	1.00	422,066
2003	440,000	1.01	445,633
2004	540,000	1.00	542,000
2005	650,000	1.14	738,000
2006	742,000	1.43	1,062,320
2007	432,356	1.36	588,004
2008	475,592	1.43	680,097
2009	523,151	1.50	784,737

Source: FAO Stats

Table 7: Sierra Leone, Rice Imports for 2001 - 2010

Year	Volume (mt)	Value US$ 000	Cost US$/mt	Mid Exch Rate Le/US$**
2001	132,183.1	23,784.2	179.9	1,985
2002	146,422.4	23,222.4	158.6	2,099
2003	156,701.9	25,672.5	163.8	2,345
2004	124,039.0	26,682.3	215.1	2,701
2005	96,445.0	22,662.4	235.0	2,889
2006	97,884.4	23,576.8	240.9	2,961
2007	99,679.0	24,008.6	240.9	2,984
2008	157,942.5	59,229.8	375.0	2,981
2009	143,814.4	55,469.9	385.7	3,385
2010*	103,171.0	64,088.4	621.2	3,978

Source: MAFFS, 2011, Table 27 from Customs and Excise Department; * BSL 2011a; ** BSL, 2011b

V. SUMMARY AND CONCLUSIONS

This paper has attempted to identify some of the issues which are adversely affecting the production and availability of food and export crops in Sierra Leone. Colonial and Post Independence agricultural policies and programs have been described, including current programs that support small holder producers as well as medium and large scale farmers and lessons drawn from past failures and successes for future programs.

Colonial governments especially in the early stages pursued a relatively non interventionist policy in agricultural development. There was a shift in agricultural policy in the immediate post independence period to direct intervention in agricultural production by the State. Sierra Leone's agricultural development activities are now driven by its' Comprehensive Africa Agriculture Development Program (CAADEP) Compact - the Small Holder Commercialization Program (SCP). Support to medium and large-scale producers is manifested in the improvement of the climate for private sector investments and subsidization of mechanical cultivation.

Donor Support programs over the last decade have been making a transition from post-conflict and emergency relief to longer-term development. After the war, donors and NGOs were primarily focused on resettlement and rehabilitation of farming land and rural communities, using project-based approaches. More recently donors have shifted to more programmatic designs, and refocused activities towards capacity-building, enhancing productivity through mechanization and input supply, and building rural infrastructure including feeder roads.

The achievements of the agricultural development programs and policies are reflected in the trends in overall national food security which has increased steadily in Sierra Leone over the last two decades, although the losses during the civil war years slowed the process. Sierra Leone has moved from the IFPRI "extremely alarming" category (Global Hunger Index > 29.9) to the "alarming" category (GHI 20.0 – 29.9). However, Sierra Leone still ranks last out of 15 countries in West Africa and 36th out of 43 African countries in terms of hunger faced by the population.

At national level about 2.5 million people are food insecure in Sierra Leone representing 45% of the country's population. Among them about 374,000 people (6.5%) are severely food insecure. Food insecurity is highest in Pujehun District and lowest in the heavily forested Kailahun District with its diverse food sources and Bonthe District where year round availability of fish probably helps in food security of the population. The highest number and percentage of food insecure people are in the Northern Province.

With regards to the trends in food crop production and self-sufficiency, published figures e.g. by United States Department of Agriculture (USDA) data show that crop yields have not increased over the last two decades, so that the production increases are due to massive expansion in area cultivated particularly during the last decade after the end of the civil war. The rate of food self-sufficiency declined from a high of about 95% at Independence in 1961 to a low of 50% during the civil war years in the 1990s. Although there has been some recovery during the last decade self-sufficiency has not yet recovered to the levels in the early 1960s.

Food crop prices in the country give an indication of the degree to which the level of domestic production (supplemented by imports) meet consumer demand. Over the past decades the retail price of local rice in Freetown, i.e. rice produced in Sierra Leone, has constantly been above that for imported rice except for a few months. However, the gap has narrowed significantly in the last two years implying that domestic production has increased faster than increases in demand. Furthermore, unlike the situation in the past when local rice prices were higher than imported rice prices even in major rice producing regions, domestic rice prices are now lower than those for imported rice in the urban areas of the hinterland of Sierra, indicating that transportation costs of imported rice to provincial towns is now enough to remove the slight competitive advantage that imported rice may still have in Freetown.

With regards to the trends in cash crop production, figures published by MAFFS show that the area and yields of the principal cash crops (Cocoa, Coffee and Oil Palm) have increased significantly since the end of the civil war in 2002. However the published figures are highly suspect since there are no annual production surveys for these crops in the country, and there is no justification provided for the projections. And they are at variance with the only recent objective study of cost of tree crop production in Sierra Leone, which revealed that export crop yields are much lower than the MAFFS figures.

The paper provides a critic of current agricultural programs and policies, and concludes that:

A) There are questions as to how well the private sector output markets are functioning. Reports in the 1990s showed that the markets were functioning well. But the situation needs to be examined to see whether the current output marketing system has deteriorated compared to the situation reported for the 1990s, and market failures are now significant. Hopefully that will be done in the upcoming rice processing and marketing study to be conducted under the auspices of the Rural and Private Sector Development Project.

B) There has been inadequate attention to issues of input (fertilizer) supply and use: Crop yields particularly of the staple food crop rice are very low in Sierra Leone. A major contributing factor is the very low level of fertilizer use and very low dosages applied by farmers who use fertilizers. There is an urgent need to study the possibility of improving the level of use of fertilizers by rice and other food crop farmers in Sierra Leone. This could be by a combination of expansion of the private sector input distribution network (Agrodealers) and the use of "smart subsidies" as necessary.

C) There is an over emphasis on large tractor mechanization, and there is a need to rethink mechanization policy in Sierra Leone. There is a need to provide scientific arguments either in support of the decisions successive governments in Sierra Leone have made for the promotion of pre and post harvest agricultural mechanization technologies considering use

of all associated technologies such as improved crop varieties, increased fertilizer use, improved credit schemes, etc., or provide enough empirical evidence to reconsider the position on this, while providing recommendations for more appropriate sustainable mechanization approaches or more efficient ways of achieving food security objectives.

D) Government interventions need to be positive in expanding demand for local products rather than imported products. Informal export of rice from the Scarcies area to Guinea has been going on for decades. A recent study by the WFP shows that substantial volumes of palm oil are traded in the West African region and Sierra Leone has been benefitting from this trade. Furthermore, Sierra Leone has a burgeoning gari industry that has been supplying neighboring countries with cassava products made in Sierra Leone marketed to urban consumers in Conakry and Monrovia. Instead of taking steps to encourage regional trade to allow Sierra Leone to exploit its comparative advantage and derive benefits from export trade expansion, GOSL has periodically tried to put restrictions on the exportation of agricultural commodities. The attempts have had very little if any, and only temporary effects on food prices. By contrast such measures have tended to undermine the long term effects of prices in stimulating production and development of regional trade. Furthermore, they are contrary to the ECOWAS treaty which provides for the free movement of people and goods across the borders of member countries. GOSL needs to resist the temptation to periodically "ban" exports of food crops from Sierra Leone.

E) GOSL should take steps to expand the internal demand for local rice as opposed to imported rice. GOSL should restrict supplies for its institutions to domestically produced rice. All normal quality specifications should apply. In order to stimulate new entry into the resulting domestic rice trade, tenders should be in small lots, e.g. 500 metric tons.

F) The land tenure system is not a major constraint for agricultural investment although ii is a factor that is often cited as constraining Sierra Leone's ability to fully exploit its comparative advantage. The Sierra Leone Agricultural Sector Review document (MAFFS/GOSL 2004) concludes that for the small scale subsistence agriculture prevalent in the country now, the existing land tenure system is adequate. A recent analysis by SLIEPA (2010) has produced guidelines for large scale leasing of land for agricultural purposes which meets the needs of all potential investors and is fully compliant with local laws and international best practice.

G) The quality of agricultural production statistics in Sierra Leone is poor. The trends described in the paper seem logical and give the impression of validity. However, a close examination of the underlying data shows that they are highly questionable. One is left to conclude that with the available data it is not possible to establish a baseline for the level of agricultural production, especially of the staple food crop rice, with much confidence. The most recent data on food crop production produced by the Agricultural Tracking Survey (ATS) is the most credible existing data on crop production because it triangulates reasonable with other survey data. However, because of the method used to estimate household farm size and yields, it is likely that the ATS data are an under-estimate of national crop production and yields. Sierra Leone needs to conduct an independent agricultural production survey as a follow up to the ATS in which crop areas are measured and yields are estimated using the yield plot techniques as was done in the Agricultural Surveys conducted by the then Central Statistics' Office in 1966/67 and 1970/71. Better estimates of informal and formal food crop exports are also needed.

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ANNEX 1: ONGOING DONOR SUPPORTED PROJECTS IN THE AGRICULTURAL SECTOR

(Source: SCP Investment Plan, Annex 3, 31.05.10

PROJECT TITLE	FINANCE SOURCE	TIME FRAME	FUNDS REMAINING (USD)	LOCATION	SUMMARY OF ACTIVITIES
Rural Private Sector Development Program (RPSDP)	World Bank	2008 – 2012	23,592,960	Nationwide	The objective of the project is to help improve efficiencies along the value chain of agricultural commodities yielding higher benefits to the producers. The outcome of the project will be measured by farm level value addition and quality premiums in agricultural export crops. Activities include: Rehabilitation of feeder roads; capacity-building of the supply chain through use of surveys and training; construction of rural infrastructure (drying floors, processing sheds and stores); rehabilitation of local council market centers; export promotion; training and support to FBOs;
NERICA Project	ADB	2005 - 2010	2,400,817	Kambia, Moyamba, Port Loko, Western Area	The NERICA Dissemination Project aims to promote food security through the wide dissemination of NERICA rice, with an objective to test, multiply and extend this rice variety. includes activities centred on four components: Technology Transfer (varietal improvement, complementary technology generation, palatability tests and brreder and foundation seeds production); Production Support (supporting extension service, building feeder roads, drying floors, grain stores and marketing sheds); Capacity-building (providing technical assistance, office equipment and mobility); and Project Coordination (comprising Coordinator, M&E specialist, accountant and support staff).

PROJECT TITLE	FINANCE SOURCE	TIME FRAME	FUNDS REMAINING (USD)	LOCATION	SUMMARY OF ACTIVITIES
Agricultural Sector Rehabilitation Project (ASREP)	ADB	2006 - 2010	14,487,074	Kambia, Moyamba, Port Loko, Pujehun, Kenema	The objective of the project is to increase agricultural production and improve farmers' income. There are three components: (1) Agricultural Production (rehabilitation of IVS, rehabilitation of tree crops plantations, and production of seeds and planting material); (2) Capacity Building (Rehabilitation and reconstruction of MAFFS Field offices and facilities, strengthening the extension service, rehabilitation of rural infrastructure including feeder roads and marketplaces); (3) Project Management.
Rehabilitation and Community Poverty Reduction Project (RCPRP)	IFAD	2006 - 2010	7,150,376	Kailuhan, Kono	The objective of the project is to support short-term recovery of rural communities and farming systems, while laying the basis for long-term rehabilitation and participatory development. There are four components: (1) Support to household recapitalisation and farming activities development (procurement and distribution of seed rice, fertiliser, tools, planting materials, livestock, establishing Farmer Field Schools); (2) Support to community-based institutions and participatory development (Training members of District Councils, M+E, storage); (3) Rehabilitation of rural infrastructure (feeder road construction, IVS and ferries); (4) Project management.
Rural Finances and Community Improvement Project (RFCIP)	IFAD	2007 - 2011	8,300,280	Kailuhan, Kono, Koinadugu	The goal of the project is to reduce rural poverty and increase household food security through the provision of access to rural finance facilities in the Program areas. There are three specific objectives: (1) establish 15 additional Financial Services Associations (FSAs) and support 11 ongoing FSAs to provide savings/loan facilities to poor rural clients; (2) Establish 3 existing Community Banks in Kailuhan and Kono and four additional banks in Kono, Kenema and Kailuhan, to provide savings/loan facilities to small and medium clients and FSAs; (3) Establish a Technical Assistant Agency.

PROJECT TITLE	FINANCE SOURCE	TIME FRAME	FUNDS REMAINING (USD)	LOCATION	SUMMARY OF ACTIVITIES
Capacity Building for Oil Palm Production, Processing and Marketing	IDB	2005 - 2009	828,518	Bonthe	Activities under this project include: South-south cooperation (expert visits); under-brushing of plantation; ring-weeding; procurement of fertiliser; land preparation; boreholes and capacity-building.
Diversified Food Crop Production Project (DFPP)	IDB	2007 - 2011	9,715,977	Bo, Bombali, Tonkolili	The project is a livelihood improvement and commercially oriented package for diversified food production. There are the following components: (1) Rural Infrastructure (rehabilitating 1000 ha of IVS, 350ha in Bombali, 350ha in Bo and 300 ha in Tonkolili; rehabilitating 9 district stores, constructing 10 rural markets, 30 Community stores and 90 drying floors; constructiopn of 70km of feeder roads); (2) Extension Services and Institutional Strengthening (Training extension agents and farmers; supporting agricultural research centres, registering farmer associations); (3) Input Tools and Equipments & small animals (supplying tools, fertiliser, compost, threshers, power tillers, work oxen, planting materials; training programs; breeding stocks); (4) Support to PIU; (5) Technical assistance; (6) Familiarisation visit; (7) Consultancy services; (8) Audit.
National Agricultural Response Program (NARP)	IDB	2009 - 2010	700,000	Tonkolili	This project has been aligned behind the EU Food Facility.
Seed Enterprise Enhancement and Development (SEED)	FAO/GTZ	2009 – 2011	2,200,000	Nationwide	This project has been aligned behind the EU Food Facility.

PROJECT TITLE	FINANCE SOURCE	TIME FRAME	FUNDS REMAINING (USD)	LOCATION	SUMMARY OF ACTIVITIES
EU Food Facility (EUFF)	EU/FAO	2008 - 2010	8,753,589	Nationwide	The purpose of the project is to enhance food security of beneficiary families through enhanced access to extension services. There are three activity areas: (1) Establish and operationalise Agricultural Business Centres (site selection, procurement and delivery of inputs, construction, technical management training); (2) Strengthening capacity and resources of MAFFS (establishing procedures and standards, procuring equipment, training District-level staff); (3) Effective and decentralised institutional governance framework (mapping, technical advice and training); (4) PEMSD Monitoring and Evaluation Unit (procedures and standards, training).
National Agricultural Response Program (NARP)	Irish Aid/ FAO	2008 - 2010	461,681	Bo, Bonthe	This project has been aligned behind the Smallholder Commercialisation Program.
Food Security for Commercialisation of Agriculture (FSCA)	Italian Trust/FAO		2,187,093	Koinadugu, Kono	The goal of the FSCA is to reduce rural poverty on a sustainable basis, with an objective to increase agricultural productivity, marketed output and incomes of beneficiary FBOs on a sustainable basis. There are three components: (1) Support to FBOs (establishing 600 new groups, training for farmer facilitators); (2) Support to Value Addition and Marketing (equipment and infrastructure for post-harvest processing and marketing, training); (3) Project Coordination, M+E and Regional Cooperation. The FSC has been aligned behind the EU Food Facility.
EUFF Safety Nets	EU/WFP			Nationwide	
Agriculture for Development (A4D)	EU	2010-2015	25,000,000	Nationwide	The purpose is to improve the incomes and food entitlements of rural families in selected Districts by improving the quantity and quality of cash crop production, reducing transaction costs and maximising the efficiency and effectiveness of the value chain, with special emphasis to

PROJECT TITLE	FINANCE SOURCE	TIME FRAME	FUNDS REMAINING (USD)	LOCATION	SUMMARY OF ACTIVITIES
					selected crops (eg. cocoa, coffee, cashew). The majority of effort will focus on tackling the large-scale rehabilitation, resestablishment and extension of cash crop areas. Other principal activities include: (1) consolidating fermenting and drying areas, central buying and selling locations; (2) Reviewing existing legislation, enabling it to meet the needs of today's marketplace; (3) Establishing an independent private commodity board, replacing the SLPMB; (4) Introducing Quality Assurance System; (5) Helping address the problems of Producers, Agents, Buyers' Agents, Buyers, Exporters, Traders; (6) Supporting strengthening governmental bodies, partic decentralised ones; (7) Identifying and collecting germ plasm, test and validate for commercial crops; (8) Undertaking training at all levels.
West African Agricultural Productivity Program (WAAPP) Phase II	World Bank	2010-2015	23,812,400	Nationwide	The World Bank has developed the WAPP as a lending instrument to support the implementation of ECOWAP, the agriculture program of ECOWAS. It is a ten year Program conducted in two phases. The second phase is being expanded to include Sierra Leone. The objective is to contribute to agricultural productivity increases in the participating country's top priority commodity sub-sectors that are aligned with regional priorities. The project includes the following components: (1) Enabling conditions for regional cooperation in technology generation and dissemination; (2) National Centers of specialisation; (3)Funding of demand-driven technology; (4) Project coordination, management, monitoring and evaluation.

PROJECT TITLE	FINANCE SOURCE	TIME FRAME	FUNDS REMAINING (USD)	LOCATION	SUMMARY OF ACTIVITIES
National Rice Development Strategy (NRDS)	JICA,	2010-2015		Kambia	The goal of the NRDS is to lay out a framework for significant increases in rice production in order to improve food security and economic development. The specific objectives are to: (1) ensure an increase in the sustainable productivity and production of rice; (2) promote appropriate post-harvest handling, processing and marketing of rice; (3) develop appropriate infrastructure for rice production and marketing; (4)improve the capacity of stakeholders and institutions involved in rice sector.
Rural Infrastructure Development Project (RIDP)	IDB	2008-2010	3,530,000	Bombali, Tonkolili, Kono, Kailuhan	Through the implementing partner of NaCSA, the $11.316 million RIDP is building 555.5 kilometres of feeder roads.
Social Action Support Project (SASP)	ADB	2005-2008	25,000,000	Nationwide	Through the implementing partner, NaCSA, the $25 million project is building 63.1 kilometres of feeder roads
Pro-poor Growth for Peace Consolidation Program (GPC)	KfW		11,000,000	Koinadugu, Kailuhan, Pujehun, Western Area	Through the implementing partner, NaCSA, the $13.5 million project is building 229.3 kilometres of feeder roads. The target group for the project is youth aged between 15 and 35.
EU Rural Roads Project	EU	2008-2010	10,000,000	Port Loko, Kambia, Kenema, Pujehun	Through the implementing partner, the National Authorising Office, the 11 million project is building 647.3 kilometres of feeder roads.
Infrastructure Development Project (IDP)	World Bank		12,400,000	Kono, Kailuhan, Koinadugu, Bonthe	Through the implementing partner, the Coordination and Monitoring Unit, the $12.4 million project is building 400 kilometres of feeder roads.

PROJECT TITLE	FINANCE SOURCE	TIME FRAME	FUNDS REMAINING (USD)	LOCATION	SUMMARY OF ACTIVITIES
Promoting Agriculture, Governance and the Environment (PAGE)	USAID	2008-2012		Kono, Kailuhan, Kenema, Koinadugu	PAGE is a $13.2 million USAID-financed project that builds on previous USG projects in the sectors of agriculture, democracy and governance, and natural resources management. A consortium of international NGOs is implementing the program (ACDI/VOCA, ARD, World Vision). The program will establish 375 new FFS and support the existing 600 FFS to become marketing associations. Activities include: training local government officials; building capacity of local partners; supporting FFS and marketing associations; improving the value-chain for cocoa and rice; increasing smallholder productivity by enhancing access to seed and technologies; improving soil and water management in the IVS; improving access to agricultural finance.
Food Security and Economic Development (FoSED)	EU	2009-2014		Bo, Pujehun, Kenema	This $3.1m project is delivered through NGO Welthungerhilfe. It has four components: Agricultural production (sustainable farming systems are developed and best agricultural practices are promoted); promote commercial agriculture through private sector participation (market opportunities for agricultural and forest products are promoted and rural households empowered to make use of them); Introducing a mechanism for sustainable management of natural resources; strengthening local institutions to promote economic development.
Women (LEAP) (Leadership, Empowerment, Accountability and Participation)	Oxfam	2009-2012	$43,279	Kailuhan, Koinadugu, Western Area	Funds are being raised to extend this pilot project, which finances agricultural production, processing, mmarketing and gender components. Outcomes include quality local products being enjoyed by local markets; women producers being recognised as successful entrepreneurs, transformation of gender roles and tackling discrimination and violence

PROJECT TITLE	FINANCE SOURCE	TIME FRAME	FUNDS REMAINING (USD)	LOCATION	SUMMARY OF ACTIVITIES
Livelihoods Project	CORD Aid	2009-2012		Kenema	This small project is being implemented by Action Aid and is focused on capacity-building and gender components. 600 women are trained in basic business management and engaged in livelihood and income-generating activities.

ANNEX II: THE POOR STATE OF AGRICULTURAL STATISTICS IN SIERRA LEONE

Collecting Agricultural Production Statistics

To try to understand why the agricultural production statistics in Sierra Leone are so unreliable, we examine the methods of data collection in the country.

In situations where farmers do not keep records such as in Sierra Leone, national agricultural sample surveys are used to provide point estimates of agricultural statistics establishing trends which can be used to estimate annual statistics often supplemented by surveys of principal produce. In such sample surveys, national production figures are calculated by multiplying average household or "Holder" crop area and yields by the weights derived by sampling proportions. All the agricultural sample surveys in Sierra Leone have used adequate sampling methods to derive representative samples and weighting factors. In the view of this author therefore, the problem with the accuracy of the statistics lies in the accuracy of the average figures estimated for crop area and yields.

In situations where farmers do not keep records, there are three methods for estimating household crop area and yields as follows:

1. Cadastral survey/measurement of crop area using Measuring Tape, Ranging Poles and Compasses or Global Positioning Systems (GPS) combined with measurement of yields using crop cuts from yield plots (Spencer 1972, PEMSD/MANRF 1987)
2. Cadastral survey of crop area as above, combined with farmer recall of total output from the measured area recorded in local units of measure which are converted to metric units using standard conversion factors
3. Farmer recall of crop area and output recorded in local or metric units

The level of accuracy of estimations decreases the more reliance is put on farmer recall given the fact that farmers do not keep written records which can be used as memory prompts i.e. from Method 1 to 3 above, especially with single visit interviews (Spencer1972). As stated by Spencer "It is well recognized that collection of non-registered input-output data, such as labor use in farm production using single visit techniques makes the data subject to bias, due to failures in respondents memory recall, etc. Generally, one expects output to be underestimated and inputs, especially labor, to be overestimated." Even for permanent crop area, where one would expect farmers recall to be accurate, the data in Table A2.1 from a recent survey in the East of Sierra Leone shows that although there was reasonable correlation between the objectively measured crop areas using GPS equipment and that reported by farmers, there was systematic underreporting of tree crop area by farmers.

The first two national agricultural statistical surveys in 1965/66 and 1970/71 were conducted by the Central Statistics Office. Thereafter the responsibility was taken over by the then Ministry of Agriculture and Natural Resources, now MAFFS.

Table A2.2 shows the methods used in the main agricultural sample surveys in Sierra Leone, and therefore the accuracy that can be ascribed to the results.

Table A2.1: Correlations between tree crop areas (Ha) measured by GPS equipment and that reported by farmers in Eastern Sierra Leone

Paired Samples Statistics						Paired Samples Correlations		Paired Samples Test	
		Mean (Ha)	N	Std. Dev	Std. Error Mean	Corr	Sig	t	Sig (2 tailed)
Pair 1	Cocoa Area – GPS measure	5.00	269	4.90	.30	.417	.000	2.90	.004
	Cocoa Area – Farmer estimate	4.03	269	5.25	.32				
Pair 2	Oil Palm Area – GPS measure	3.80	91	4.06	.43	.818	.000	3.07	.003
	Oil Palm Area – Farmer estimate	3.02	91	3.89	.41				
Pair 3	Coffee Area – GPS measure	4.76	185	6.03	.44	.752	.000	4.45	.000
	Coffee Area – Farmer Estimate	3.32	185	6.46	.47				

Source: EDS, Field data collected during PAGE baseline survey, October, 2009

Table A2.2: Agricultural Sample Surveys in Sierra Leone and Methods Used in estimation of Crop Area and Yields

Survey	Crop Year	Method
Agricultural Statistical Survey (CSO, 1967)	1965/66	1
Agricultural Statistical Survey (CSO, 1972)	1970/71	1
Rural Employment Research Study (NUC/MSU)	1974/75	1
Sample Census of Agriculture in Sierra Leone (PEMSD/MANRF, 1986)	1984/85	1
Groundnut, Rice and Maize (PEMSD/MANRF, 1987)	1986/87	1
VAM - Household Food Security Survey in Rural Areas (WFP 2010)	2006/07	3
Comprehensive Food Security and Vulnerability Analysis (WFP 2011)	2010	3
MAFFS/SLARI - Emergency Rice Initiative, Country report	2010	1
Agricultural Tracking Survey (J-PAL/IPA & MAFFS 2011)	2009	3
SNAP Baseline Study (EDS 2011)	2011	2

Tables A2.3 and A2.4 present comparative data from some of the agricultural surveys in Sierra Leone. They provide a confused picture:

1. The data from the early surveys (1970s and 1980s) published by the Central Statistics Office and MANR on farm household size and rice yield are different and not consistent even though they apparently used the same survey techniques (Method 1). The differences cast a doubt on the accuracy of the data, particularly that produced by MANR since it had to

reconcile two different figures on rice production produced by two of its own Divisions for the same crop season – the Agricultural Data Collection Unit and the Monitoring and Evaluation Unit!

2. Comparing paddy rice yield recorded by MANR/MAFFS using Method 1 in the early 1970s with those published for the last two years, would imply that average rice yields have increased by about 35%. As indicated earlier using these yield and production figures MAFFS has published information showing that Sierra Leone is virtually self sufficient in rice production – a situation that is clearly not correct as evidenced by the amount of rice still being imported into the country
3. Comparing paddy rice yields recorded in the 1970s and 1980s using Method 1 with those published for the last five years using Methods 2 & 3 imply that there has been a 65% decline in average upland rice yield and about a 75% decline in lowland rice yields. It is difficult to believe that yields have declined so much, even allowing for the fact that fallow periods have declined in uplands and hardly any fertilizer is used except in mangrove swamp rice production
4. Comparison between the three most recent surveys (VAM 2007, ATS 2009 and SNAP 2010) that used similar methods (Method 2 & 3) show reasonably consistent household farm size and rice yield figures, especially for the uplands). The correlation between the different sources may lead one to regard the figures as a baseline for the current level of production and yields of staple food crops. However, it is well known that the methods used tend to lead to an underestimate of household crop area and yields.
5. The figures referred to in bullet 4 above are about 30% of the yield apparently obtained by MAFFS/SLARI in 2009 using Method 1. This difference is vastly greater than anything that is expected because of the difference in the methods of data collection. Since there is no corroborative source for the MAFFS/SLARI data it is difficult to accept them as a baseline figure in preference to those from the ATS etc, despite the fact the method apparently used[5] is generally regarded as most suitable to the farming systems of the country.

Table A 2.3: Area and Yields of Upland rice from Agricultural Surveys in Sierra Leone

	CSO 1970/71		MAFFS 1984/85		WFP VAM 2006/07		ATS (2009)		SNAP Baseline (2010)	
District	**Ha/HH**	**mt/ha**	**Ha/HH**	**mt/ha**	**Ha/HH**	**mt/ha**	**Ha/HH**	**mt/ha**	**Ha/HH**	**mt/ha**
Bo	1.54	1.43	1.12		1.41	0.59	1.30	0.49		
Bonthe	1.12	1.14	0.59		1.23	0.64	1.34	0.23		
Moyamba	1.47	1.28	0.96		1.18	0.80	1.46	0.35		
Pujehun	1.21	1.26	0.70		1.25	0.79	1.21	0.35		
South	1.43	1.33								
Kailahun	1.03	1.31	1.36		1.10	0.80	1.30	0.59	1.25	0.5
Kenema	1.22	1.58	1.09		1.09	0.74	1.26	0.41		
Kono	1.06	1.43	1.10		1.07	0.70	1.34	0.57		
East	1.13	1.46								
Bombali	1.52	1.16	0.64		0.87	0.57	1.34	0.49	0.92	0.3

[5] This author has not been able to verify the accuracy and correctness of the data collection method, since information on the methodology is not available, unlike the case in the surveys conducted in the 1970s and 1980s where the data collection methodology is explicitly presented in the reports

	CSO 1970/71		MAFFS 1984/85		WFP VAM 2006/07		ATS (2009)		SNAP Baseline (2010)	
District	Ha/HH	mt/ha	Ha/HH	mt/ha	Ha/HH	mt/ha	Ha/HH	mt/ha	Ha/HH	mt/ha
Bo	1.54	1.43		1.12	1.41	0.59	1.30	0.49		
Kambia	1.81	1.56		0.99	0.99	0.58	1.46	0.45		
Koinadugu	1.46	1.48		1.26	1.53	0.64	1.26	0.61	1.33	0.7
Port Loko	1.51	1.53		0.88	1.22	0.59	1.21	0.33		
Tonkolili	2.03	0.67		0.80	1.17	0.50	1.01	0.51	1.32	0.45
North	1.65	1.19								
WA	0.66	1.53		0.59	0.86	0.29	1.05			
All									1.22	0.5
Sierra Leone	1.41	1.31		0.97	1.15	0.63	0.85	0.46		

Table A2.4: Area and Yields of <u>Lowland Rice</u> from Agricultural Surveys in Sierra Leone

	CSO 1970/71		MAFFS 1984/85		WFP VAM 2006/07		ATS (2009)		SNAP Baseline (2010)	
	Swamp Rice		Lowland Rice		Lowland Rice		Lowland Rice		Lowland Rice	
District	Ha/HH	mt/ha	Ha/HH	mt/ha	Ha/HH	mt/ha	Ha/HH	mt/ha	Ha/HH	mt/ha
Bo	0.59	1.36		2.91	0.58	1.20	0.57	0.79		
Bonthe	0.53	1.28		2.05	1.00	1.37	0.69	0.30		
Moyamba	0.64	1.68		3.30	0.83	1.40	1.30	0.38		
Pujehun	0.26	1.26		2.72	0.64	1.14	0.61	0.47		
South	0.52	1.46								
Kailahun	0.55	1.56		3.36	0.72	1.30	0.93	0.52	0.79	0.63
Kenema	0.69	1.48		3.38	0.70	1.22	0.69	0.49		
Kono	0.94	1.95		3.17	0.82	1.35	1.13	0.50		
East	0.69	1.61								
Bombali	0.43	1.38		1.87	1.70	1.00	1.13	0.44	0.65	0.51
Kambia	0.57	1.24		3.49	1.17	1.65	1.30	0.49		
Koinadugu	0.91	1.61		3.06	1.15	1.21	1.17	0.66	1.1	0.69
Port Loko	1.05	1.58		2.89	1.11	0.95	0.61	0.40		
Tonkolili	0.46	1.26		2.43	1.23	1.01	0.77	0.54	0.81	0.61
North	1.02	1.43								
WA	0.65	1.58			0.96	0.97	1.54			
All									0.83	0.61
Sierra Leone	0.79	1.48		2.96	0.97	1.23	1.01	0.50		

Conclusion – an accurate baseline or trends cannot be established using existing data

It is generally accepted that agricultural statistics data in the country is worse than those for other sectors of the economy because crop production in the country is by small scale producers with highly dispersed production and with no record keeping. However, there are well known methods for collecting accurate statistics in such situations.

Data collection has not been properly done by the responsible Ministry – MAFFS ever since it took over in the responsibility from the Central Statistics Office (now Statistics Sierra Leone) in the 1980s. In its first survey after it took over in the 1984/85 season it had to reconcile two different figures on rice production produced by two of its own divisions – the Agricultural Data Collection Unit and the Monitoring and Evaluation Unit!

Unfortunately one is left to conclude that with the available data it is not possible to establish a baseline for the level of agricultural production, especially of the staple food crop rice, with much confidence.

However:

- The rice import data can be accepted with a fair degree of confidence
- The wholesale and retail price data for rice and other food prices published by Statistics Sierra Leone can also be accepted with a high degree of confidence
- The export data on cash crops (coffee and cocoa) collected by the Customs and Excise Department of the National Revenue Authority is questionable as they do not correlate with data available from independent international trade sources
- The most recent data on food crop production produced by the Agricultural Tracking Survey (ATS) is the most credible existing data on crop production because it triangulates reasonable with other survey data. However, because of the method used to estimate household farm size and yields, it is likely that the ATS data are an under-estimate of national crop production and yields.