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## 1. INTRODUCTION

1.1 Post-harvest loss reduction activities have a major economic impact and should increasingly become a major focus in development strategies: carefully selected interventions leading to reductions in PHL are likely to be much more cost-effective than investments in additional production. Increasing production implies using scarce and costly resources through intensive farming practices and expansion of cultivated areas. The marginal environmental cost of qualitative and quantitative saving through improved post-harvest techniques is generally much lower than trying to reach the same value through additional production. PHL reduction aims at maintaining or optimising the value of already existing (produced) products through improved and cost-effective conservation and value-addition strategies.

1.2 Furthermore, post-harvest activities generate on- and off-farm employment opportunities in rural areas, reduce rural exodus, enhance rural income, contribute to value-addition and increased competitiveness. Post-harvest activities generally belong to a more formal sector and should, directly (tax on revenues) and indirectly (VAT) participate in increasing public revenues. In addition, post-harvest activities, including transformation and marketing, are to a large extent assumed by women thereby leading to increased female empowerment.

1.3 The post-harvest chain involves a series of interconnected activities from the time of crop harvest, live animal sales at farm gate, milk at immediate post-milking stage, or fish capture, to the delivery of the food to the consumer. The nature of the activities varies considerably according to the type of food and there are major differences among plant products (e.g. grains, roots and tubers, fruit and vegetables and pulses), livestock products (meat, dairy, hides and skins) and fish. As a product moves along the chain, losses may occur from a number of causes. These losses fall into three main categories: (i) quantitative or physical losses which cause a loss in weight of the product; (ii) loss of quality which changes the appearance, taste, texture or nutritional value of the product; and (iii) loss of opportunity for value addition to the product.

1.4 This report assesses the situation in Sierra Leone regarding post-harvest losses (PHL). It identifies constraints and intervention priorities in the main commodity chains. The report analyses Government strategies and interest in investing in PHL reduction, and explores possibilities for collaborative action in this area by FAO, ADB and other partners. The annexes provide additional information on the country, the targeted commodities, as well as on-going and planned projects relevant to PHL reduction in the country.

1.5 The report was prepared following a joint FAO-ADB rapid needs assessment mission carried out from August 29 to September 4, 2009<sup>1</sup>. The objectives of the mission were to: (i) assist the country in assessing its needs regarding Post-Harvest Loss (PHL) reduction and also its interest to invest in PHL reduction interventions; and (ii) identify priority areas of interventions for PHL reduction in the country.

1.6 In Freetown the mission met with directors and staff of the following divisions of the Ministry of Agriculture, Forestry and Food Security (MAFFS): Crops; Animal Production; and Planning Evaluation Monitoring and Statistics Division (PEMSD). In addition, meetings were

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<sup>1</sup> Mission members were: Divine Njie, Agro-industries Officer, Rural Infrastructure and Agro-industries Division of FAO; Vincent Glaesener, Economist, Investment Centre Division of FAO; and Ulrich Boysen, Principal Agro-industry Specialist, Agriculture & Agro-Industry Department of ADB.

held with: the Director of Fisheries in the Ministry of Fisheries and Marine Resources (MFMR); the Director General of the Sierra Leone Agricultural Research Institute (SLARI); staff of the Department of Agricultural Engineering of Njala University; and staff of projects funded by FAO, ADB, European Union, USAID, the FAO Representative and various NGOs. The mission identified priority areas of interventions for PHL reduction, taking into account national strategies, ongoing/planned public and private projects, and stakeholders' needs and initiatives. Following discussions with government authorities and development partners, the main commodities on which to focus the current initiative were identified. They include rice, cassava, cocoa, oil palm, fish, fruits and vegetables. Government authorities expressed important interest in investing in PHL reduction interventions as a means to ensure food security, increase rural incomes and foster economic development of the country.

1.7 The report will be used for the preparation of ADB's Continental Programme Framework Paper on PHL Reduction in Africa. PHL reduction is one of three pillars identified by the ADB within its African Food Crisis Response (AFCR) which was articulated in June 2008. It is also envisaged that the report will be found useful by the Government of Sierra Leone in assessing the country's situation with regards to PHL reduction as well as related value addition and marketing activities.

## 2. COUNTRY OVERVIEW

2.1 Sierra Leone is located in West Africa, bordered by the Atlantic Ocean, Guinea and Liberia. The land area is 71 740 km<sup>2</sup>. About 74 percent of the total land area is suitable for cultivation. The climate is a monsoon type humid tropical with two distinct seasons – a rainy season from May to October and a dry season from November to April. The average annual rainfall is about 3 000 mm while average monthly temperature ranges from 23 to 29°C. Relative humidity is high throughout the year, especially in the coastal areas. During the rainy season the average is 95-100 percent. The dry season is characterised by the strong dust-laden Harmattan wind during which relative humidity may drop suddenly to as low as 20 percent.

2.2 Sierra Leone's population is estimated at 5.7 million. In 2002, the country emerged from an 11-year civil war which had devastating social and economic consequences. Tens of thousands of people were killed, wounded, mutilated or abducted while over two million people were displaced. Most of the country's social, economic and physical infrastructure was destroyed or severely damaged, including local social and productive infrastructure, such as markets, stores, rice mills and community service buildings. The country is gradually moving from a rehabilitation stage and entering a development phase, although the effects of the conflict still remain. For example, rural infrastructure is still dilapidated or absent, social and community organizations are weak, and the rural economy has yet to rebound fully.

2.3 The main sector of the economy is agriculture (46 percent of GDP) while mining represents around 25 percent of GDP. Services, mainly governmental, represent only 29 percent of GDP. Sierra Leone's agricultural sector is largely rain fed and crop and livestock production are mostly operating at subsistence level with farm-size generally ranging from 0.5 to 2.0 ha. The agricultural sector provides livelihood to nearly 75 percent of the country's population. The main food crops are rice, cassava, sweet potato, groundnut and maize. Rice dominates the sector. Tree crops such as coffee, cocoa, oil palm and to a lesser degree cola, cashew, and rubber are also grown and have a high economic importance. General country data, social and agricultural statistics are presented in

Annex 1, while Annex 2 presents the various agro-climatic zones and the crop/commodity mapping

### 3. CHOICE OF MAIN COMMODITIES TO STUDY

3.1 The choice of commodities considered in this report is based on two main considerations: (i) their economic importance and (ii) the potential for reducing post-harvest losses. The main commodities considered for analysis are:

- rice
- cassava
- cocoa
- oil palm
- vegetables
- fish

3.2 **Rice** is the main staple crop for the urban and rural population. It is grown by almost the totality of the small-scale farm families in all five agro-ecologies of the country. In terms of contribution of rice in the total calorie intake, the country is ranked highest in Sub-Saharan Africa. On the basis of an average consumption ratio of 104 kg/person, the country is expected to reach its full self-sufficiency around 2011. The perspectives of the country are therefore to rapidly become a net rice exporter. Rice is predominately available in the harvest and the immediate post-harvest seasons from October through January. It is during this period that its consumer price is the lowest and also when it is most available on subsistence farms for consumption. The price rises in the late post-harvest season and during normal planting growing times due, among other factors, to a lack of effective storage as well as insufficient transport facilities and market information. Rice is also important because of the huge expenditure on its import and also its value in trade as there is demand in neighbouring countries. Post-harvest losses in the rice value chain is high and could easily be reduced.

3.3 **Cassava** has become the second food crop in terms of importance and its area has increased five-fold since 1991. Due to its low husbandry requirements, convenient processing and storage characteristics, it served as a food-buffer crop during the conflict years. It is grown throughout the country in uplands and inland valley swamps. Cassava is available throughout the year. There is strong demand in both urban and rural populations within the country, as well as among Sierra Leone's border neighbours. Cassava has a synergy with rice due to the traditional harvest seasons. It is mostly consumed instead of rice during the dry and early growing seasons for rice. Another factor that plays in the synergy between rice and cassava is that cassava leaves are consumed as the major ingredient in a sauce made for rice and cassava. This has implications for the varieties of cassava that are grown since it is a crop used for its leaves as well as for the tuber products.

3.4 **Cocoa** is the most important export crop. Sierra Leone's cocoa has a premium for its special flavours, if the quality issues (mould and foreign matter content) can be managed. Currently, all of the Sierra Leone cocoa is exported and sold on the "commodity" cocoa market due to its lack of quality. This represents a major post-harvest loss. There is an interesting opportunity for Sierra Leone in the specialty cocoa market which is about 10 percent of the total international market and has prices that are in the neighbourhood of 20 percent higher than those in the commodity market.

3.5 **Oil Palm** is one of the tree crops that have a major economic importance in Sierra Leone. It is grown throughout the country. Palm oil is the most significant vegetable oil used in the country. It is the sole edible oil used in the typical Sierra Leonean household daily diet. As it did in the war and immediate post-war economy, palm oil continues to have a key role in terms of

non-monetary trade in the rural areas and often acting as the sole means for basic input (tools, seed) bartering. There is a high demand for palm oil both within Sierra Leone and in neighbouring countries. Even though transport costs are high – most of the oil processing locations are in remote areas in the South – production of palm oil is lucrative. According to discussions with traders, locally produced palm oil is preferred by customers due to its colour and flavour. Post-harvest losses occur throughout the chain, mainly at the processing and marketing stages.

3.6 **Vegetables:** Vegetables such as “krain krain” (*Corchorus olitorius*), “green” (*Amaranthus hybridus*), “bitterleaf” (*Veronica amygdalina*), cassava leaves, sweet potato leaves, okra, pepper, tomatoes, cucumbers, ginger and onion provide much needed proteins and vitamins in the diet of most Sierra Leoneans. They play a critical role in food security. A few other vegetables are produced as exotic crops mainly for the supermarkets and high income residents in the urban areas. They include: cucumber, cabbage, carrots, tomatoes, and shallot onions, sweet pepper. They provide an important income generation source for producers in rural and peri-urban areas. Vegetables are extremely exposed to very high post-harvest losses.

3.7 **Fish:** Although cattle and poultry are reared throughout the country, the most easily accessible and affordable source of protein for household food consumption is fish. Fish accounts for about 75 to 80% of total animal protein intake of the average Sierra Leonean and the national per capita consumption is 23.5 kg as compared to the global average of 15 kg. The fisheries sub sector contributes about 9% of GDP of the national economy and it is a significant foreign currency revenue earner to the government. The sector provides employment opportunities as it employs a large number of men in fishing and ancillary activities while a large number of women are gainfully engaged in fish processing and marketing. The sector suffers very high post-catch losses due to the difficulty of conservation and the absence of processing capacities.

3.8 Other agricultural produces play an important role in the national economy but have not been selected in this report for the following reasons:

- **Groundnut:** Groundnut is considered of high importance, as the level of cultivated area indicates (see table in

ANNEX 1). The post-harvest value addition and losses seem however limited: locally produced groundnuts are mainly roasted and grinded. Major risks are the development of aflatoxins due to improper drying. Effective oil extraction requires the use of adapted varieties, and the process is hardly competitive against the widely produced palm oil. Despite its economic importance, considering the more limited scope for post-harvest loss reduction compared to the other produces listed in this report, groundnut has not been selected for the detailed appraisal.

- **Livestock:** Livestock has suffered severe losses during the war: an estimated 2/3 up to 3/4 of the livestock had been killed by 2000, after which the stock started to recover. Today's estimated figures (MAFF/PEMSD, 2009) are 10% (cattle, sheep, goats) up to 100% (chicken, ducks, rabbits, pigs) above the situation of 1991, which was the highest stock level during the immediate pre-war time. Without disposing of any precise figures, post-harvest losses in livestock is likely to be limited: the chain is very short, and the meat rapidly consumed without any transformation. Despite bad sanitary conditions leading to high risks for the consumers, the scope for rapid value-addition through transformation is quite limited in the country: it is very risky due to the absence of cold chain, and there is no demand due to the very limited purchasing power of the population.
- **Cereals other than rice (maize, millet, sorghum)** have a limited transformation potential and face similar problems than rice. Their economic importance is overall more limited.
- **Cashew, ginger** may have some important economic and social value and potentials, but have been considered as of minor importance compared to the produces that were selected in this report. Most of the reasons leading to post-harvest losses for these crops are being addressed for rice or in more general and crosscutting terms (see table in Annex 6.1).
- **Coffee:** Coffee was not considered as it appears, amongst the cash crops, as the least important one.

## 4. PRESENTATION OF POST-HARVEST SITUATION

### A. COUNTRY-WIDE ISSUES AFFECTING POST-HARVEST SITUATION

4.1 The following paragraphs will present, by taking the different stages of the chain, the general cross-cutting issues. These are also summarised in Annex 6. Most, if not all them, largely or fully apply to the commodities that are presented in the next chapter. The more precise review of the different commodities will therefore not repeat the issues that are pointed out here but rather focus on the individual specificities.

#### Issues impacting various stages along the chain

##### Investment climate

4.2 Although the investment climate has improved over the past years, Sierra Leone still presents a poor investment climate. The five military coups that have taken place since its independence and recent civil war have given the country a poor reputation. Endemic corruption, weak administrative capacity, widespread mismanagement, a weak judicial system, limited freedom of speech, particularly for the press, and recent political violence (March 2009) produce an unfavourable investment climate. Sierra ranks last on Human Development Index. Life expectancy, GDP per capita and adult literacy are low. (Source: Biblio 4 & Biblio 5)

4.3 The infrastructure network (roads, port, railway) is in a poor state, thus making internal transport costly and hindering the supply of raw material as well as output marketing. Electricity supply is unreliable and associated with frequent shortages. Telecommunications connections are weak and expensive.

4.4 Access to foreign currency is very difficult. The banking sector is very reluctant to offer loans, as these are considered high risk. If available, interest rates are very high. Micro-finance is inaccessible to the population especially those in rural areas. Inflation is very high. The national currency is exposed to permanent depreciation and highly sensitive to external shocks, such as the suspension of donor disbursements.

4.5 In the present situation, foreign direct investment remains low and focused on the mining sector, with very little going to the more risky and less profitable agricultural or manufacturing sectors.

4.6 The potential for a rapid development of the economy is high if the appropriate conditions are put in place. Numerous reforms are being made, some of which will directly address the investment climate. An Investment Promotion Act was enacted and entered into force in 2004 to promote and attract both domestic and foreign investment. The recent start-up of the Bumbuna hydroelectric dam should also ease power problems.

4.7 On the positive side, Sierra Leone ranks 22 out of 46 countries in sub-Saharan Africa in the World Bank's Ease of Doing Business report covering the period June 2008 through May 2009. The country had a relatively high score in the indicators of "starting a business" and "protecting investors", while it had relatively average scores in the indicators of "getting credit" and "trading across borders". The indicators where the most improvement is required include: "registering property", "dealing with construction permits", "paying taxes", "employing workers" and "enforcing contracts".

## **Services related to PHL**

4.8 The research and extension system has not benefited agricultural producers in the rural areas. Historically, the government has spent relatively little resources in agricultural research. As for the country's extension system, the government has gradually become uninvolved. To compound the problem, the link between agricultural research and the extension services is very weak. In the past, the government was heavily involved in the provision of agricultural inputs to rural farmers via a state control extension system. This structure changed, however, with the gradual replacement of the government services by Non-Governmental Organizations in the post war years. Yet, the NGOs have been largely unable to do what the government had found itself only partly capable of doing as research and extension still remain largely informal activities that, at times, benefit only a handful of farmers.

4.9 Presently the national capacity to ensure food safety and quality though weak before the war, further deteriorated during the 10 year conflict. National support institutions were vandalized and destroyed and thus facilities such as the food analysis laboratory of the Sierra Leone standards Bureau are ill equipped and the human resource capacity weak. The ability to access domestic, regional and international markets are critical in attracting meaningful investment in food industries and the existing situation inadvertently affects investor confidence and interests. In addition, the danger of importing food not safe for human consumption is also high and poses a serious public health risk.

4.10 National capacity in the area of food science and technology is weak. A department of Food Science and Technology is yet to be established in the main Agricultural College (Njala University). Training programmes are in favour of agricultural production/ agronomic aspects, while post-harvest training is very limited especially in value added activities including crop processing. In addition there are no formal programmes for agri-business as well as no special training of mechanics/technicians to fabricate, maintain and repair agro-processing machinery.

4.11 Considering the limited involvement of the private sector, the State still intends to replace the private sector by intervening through the distribution and management of tractor services, the creation of agricultural banks, the direct involvement in the import and distribution of fertiliser, etc. Most of these services could be achieved much more efficiently and at a lower cost if the State was focusing its intervention on promoting a sound investment and business environment.

4.12 The high interference of the State in the cooperative businesses has largely impeded their efficiency. Besides the research and extension services, the other governmental services are also very weak, both in resources and technical capacities. The State has a very low implementation capacity of the State and donor-funded projects.

4.13 Due to the absence of national statistics and their timely diffusion through an appropriate information network (radio, boards, etc.), the various commodity chains are characterised by a very weak information flow and a major information imbalance between the various actors. This mainly affects the population of the farmers and reduces their capacity in marketing their produces at a reasonable price.

## **Rural finance**

4.14 Access to formal credit is very limited. Not many rural credit and financial institutions have emerged to replace previously subsidized credit from the government. Credit availability is biased to large importers and exporters and selected marketing associations and is

not readily available to small-scale resource-poor farmers and processors. High interest rates affect access and availability of credit, the traditional inflexibility of formal financial institutions (e.g. the collateral syndrome and complex administrative procedures) and the short-term nature of loans. Most traders using credit obtain it from relatives, friends and, to a lesser extent, money-lenders.

4.15 Despite the fact that 80 percent of the population live and work in the rural areas, formal financial institutions do not provide financial services within these areas. A general problem is the inability of many lower-income people to meet lenders' requirements for formal physical collateral. The closure of the rural banks, initially due to the poor management and later as a result of the war, left a vacuum of regulated access to rural finance. Despite Government's recent efforts to establish community banks throughout the country, the outreach of formal and semiformal rural finance institutions to rural areas remains limited.

4.16 Banking presence outside Freetown is thin. In addition to the physical absence of banking outlets, the small size of the financial system and the dysfunctional state of most non-bank financial intermediaries have combined to limit the range of financial products available and restrict access of households and enterprises to financial services.

4.17 Most banks are willing to lend only against certain fixed assets that serve as collateral or that provide sufficient guarantees. Typically, banks require collateral such as real estate that is easy to sell or liquidate in the event of default. On the other hand, the collateral that farmers, processors, and traders can offer, such as inventories, may be difficult to sell, especially where markets are located abroad or the commodities are not well graded. Even when borrowers are able to provide collateral, the banks may impose fixed repayment schedules that do not reflect cash-flows and cash-flow risks in agriculture.

4.18 Credit information is lacking. There is little sharing of credit histories. As a result, each lender has to establish its own credit appraisal. Credit information services could play a vital role in expanding credit and outreach of financial services particularly to the SMEs. Availability of formal mechanisms for information sharing, such as the credit bureaus, is an essential element for development of well functioning and sustainable credit markets.

4.19 A leasing sub-sector is non-existent. SMEs have little access to term lending for the purchase of equipment. Another very useful credit instrument for farmers, the warehouse receipt system (credit granted against stocks of cereals and other crop with good conservation capacities) is not applied, probably because both of the lack of warehouses and the lack of knowledge of this specific instrument by the MFIs.

### **Other general issues**

4.20 Land use and property rights: The absence of strong land use and property rights impedes private investments, both at farmer's level as well as for private businesses (manufacturing). Land is scarce as two-thirds of it is owned by provincial chiefs and their families, while more than 50 percent of the remaining land in Freetown and its surroundings is owned by the State and the Military. Land scarcity and issues of registration and titling impede use of land for collateral and negatively affect long-term investment.

4.21 Technical and entrepreneurial know-how: The technical and business-related (entrepreneurial) know-how is extremely limited along all the commodity chains. Associated to the lack of information and poor horizontal and vertical coordination, the chains suffer from inefficiency, high transaction costs and a general atmosphere of mistrust. While some actors of the chain may benefit from this situation, it negatively impacts on the prices paid by the consumers

and those paid to the farmers and on the competitiveness of the national production versus world products.

4.22 **Border protection measures:** The taxes, tariff and duty structure on imports and exports need to be improved in order to promote private investment in production and processing, reinforce the protection of the national products against the world market while still maintaining some external pressure to promote quality improvement.

4.23 **Varieties:** Appropriate choice of varieties plays an important role in PHL reduction throughout the chain: 1) maturation time influences time of harvesting and marketing; and 2) determines the resistance to deterioration during handling and storage, as well as processing qualities. The absence of effective research and extension activity in the country and the limited financial and physical access to seeds play an important role in the reduced use of improved varieties and the consequent high losses (in addition to the limited yields).

### **Production and harvest**

4.24 The absence of regulation on seeds, fertiliser and pesticides, the lack of norms, grades and the associated control and certification systems (related to inputs) reduces the incentives to use inputs, reduces their impacts, increases the cost of production and affects post-harvest losses<sup>2</sup>. The lack of finances and of physical offer in the countryside reinforce this constraint. When available, through traders, the inputs are linked to abusive credit conditions and are likely to be of low quality. In appropriate practices such as poor handling at harvest and harvesting of immature products leads to damage and rapid deterioration.

### **Drying methods and conditions**

4.25 Natural drying through open-air exposure of the product is the prevalent method used. Very few energy-driven (wood, electricity, petrol) dryers are used. Climatic conditions in Sierra Leone are highly unfavourable for natural drying. Most of the drying is carried out on bare soil. Some farmers use tarpaulin sheets provided by donor agencies for other purposes. Cemented drying floors constructed before the war have been destroyed or are in poor shape. Some dryers provided by donors have not been adopted because they do not fit the socio-cultural context of the beneficiaries. Poor drying techniques are used. The various stakeholders – farmers and traders – are not conversant with appropriate drying techniques. Market incentives to operate proper drying (for those products that enter the marketing chain) may be extremely reduced (see chapter on cocoa).

### **Handling and transport**

4.26 Domestic movement of goods and people is dominated by the road sub-sector with other sectors playing a less significant role. Sierra Leone has a very sparse road network (about 80 km/1 000 km<sup>2</sup>). There are 2 140 km of primary roads (of which 756 km are paved), about 1 900 km of mostly unpaved secondary roads and about 8 200 km of tertiary roads. The road network is severely deteriorated. Even the feeder roads that are repaired suffer rapid and extreme damage due to the heavy rains in the rainy season. Overall, 25 percent of the roads are classified as good, 31 percent as fair, and 44 percent as poor. There are a few passable roads in most rural areas. The above factors lead to extremely high transport costs, market segmentation, and rural impoverishment.

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<sup>2</sup> For example, the post-harvest conservation properties of onion are largely affected by the appropriate quantitative and timely use of fertiliser (and pesticides) during the growth stage.

4.27 The availability of trucks is scarce due to the limited and the degraded technical condition of the fleet. Handling practices while charging and discharging are poor. Products are transported with inappropriate packing, packaging and protection, leading to high losses due to rain, humidity, pressure and shocks. Delays during transportation due to the condition of roads hinders the transportation of fresh and perishable goods. Truck breakdowns or major problems on the road may lead to the complete loss of the stock.

4.28 The difficult access to markets is one of the major problems faced by farmers and micro and small entrepreneurs. The difficulty in transporting products in the country is exemplified by the situation of rice. Transaction costs are lower when transporting across the border to Guinea than when navigating the poor road infrastructure to sell in Freetown, whereas at the same time, the country imports rice that is mainly sold in Freetown.

4.29 Communities that are far removed from accessible roads are highly vulnerable due to increased seasonal gaps and lower prices for their products during the harvest season. There are significant seasonal movements in food marketing as prices in rural areas may be more than twice as high during the lean period than during the harvest period. These seasonal variations are accentuated by the high transportation costs due to deficient road infrastructure, by the reversal of flows from rural to urban areas, and by high opportunity costs of capital. Transport costs in most of these communities constitute over 30 percent of total operating costs and discourage inter and intra-regional trade.

4.30 For products that are exported (e.g. cocoa and fish), the administrative burden and operational inefficiencies at the harbour of Freetown result in delays and further losses.

### **Agro-processing**

4.31 There is a limited number of rural micro-enterprises in Sierra Leone. Most of them operate informally and face the following constraints: (i) limited local demand/market for their products and services; (ii) lack of diversification resulting in a high level of competition from imported products; (iii) use of simple traditional manual technologies resulting in low productivity (high post-harvest losses); (iv) low quality (unhygienic in the case of food products creating a threat to public health); (v) limited or no access to financial services, as well as an interest rate on credit of up to 20-30 percent; (vi) lack of even basic technical skills; (vii) absence of or poor basic infrastructure (electricity, water and access roads); and (viii) inadequate access to business and market information.

4.32 The agro-processing sector also faces the constraint of the very limited number of fabricators and maintenance services which are mainly in the Freetown area and are not available in rural areas. Providers of these services have poor resources, lack of marketing capacities and lack of information on improved technologies.

4.33 Sierra Leone also lacks qualified technical experts such as engineers and technologies to develop improved technologies and provide services such as maintenance and repair to the agro-processing sector.

4.34 Limited access to credit and other financial services, high costs and inconsistent supply of energy, inconsistent raw material and input supply, and the lack of resources and entrepreneurial know-how further hinder the development of the agro-processing sector. Other factors include the absence of public incentives for private investment promotion associated to the bad investment climate and the image of risky sector associated to agriculture (compared to other sectors like services and mining).

## Conservation and storage

4.35 Most warehouses in Sierra Leone were destroyed during the civil war. The use of storage facilities is not very common and traders store very small quantities. The limited propensity to store stems from cultural beliefs, the fear of losing products to traditional rulers, uncertainties regarding price changes, lack of purchasing power, lack of access to credit, lack of knowledge about storage technologies, limited access to storage, limited physical and financial access to pesticides and limited knowledge of the treatment practices.

4.36 There are no private businesses running voucher or bond storage systems, neither are there credit schemes based on a warehouse receipting system. Available storage capacity is low, including cold storage for fruits, vegetables, meat and fish. Some of the warehouses constructed by projects have not sufficiently taken the socio-cultural milieu of the beneficiaries into consideration (geographic location, gender factors).

4.37 Most warehouses and stores are inappropriately designed and poorly constructed while inappropriate packaging materials are used.

## Marketing

4.38 Market Infrastructure: As in most Sub-Saharan African countries, there are two main types of agricultural markets, viz. the daily community markets and periodic markets<sup>3</sup>. Most daily markets have large covered structures where agricultural commodities are sold. However, due to limited space, some agricultural produce are sold around the markets and in adjacent streets. Manufactured commodities are usually sold in makeshift sheds in different sections of the market. In the case of periodic markets (except daily markets which also serve as periodic markets), there are usually no well-constructed market shelters. Traders and farmers display their products on the ground or in makeshift booths. In most cases markets are makeshift facilities with very unhygienic conditions. They offer no storage for perishable products and provide no security for the produce of traders. Participants cover long distances to these markets by foot or by poor means of transport.

4.39 Market information: Existing marketing chains are poorly coordinated, while knowledge of market information and diversification opportunities is extremely limited. There is high information asymmetry, with middlemen and wholesalers having the most access to information on prices and quantities to the detriment of farmers.

4.40 Quality, grades and norms: the country does not have any operational grades and standards system or any system in place for quality certification. In the case of cocoa, there is a state-managed quality certification system, but it seems largely inefficient (see chapter on cocoa). This situation largely impedes quality improvement as it does not enable the introduction of a price premium based on clear and nationally recognised quality criteria. The problem is particularly acute in the case of export products such as cocoa and fish for which international standards exist but which the Sierra Leone producers are presently unable to meet (or unwilling to meet because of insufficient incentives). The weak coordination in the chain, the lack of information, the low purchasing power of the population that favours raw over value-added but also more expensive products, and the low capacity to meet international standards are further disincentives to investors to engage in the various chains.

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<sup>3</sup> Daily community markets are market halls built in cities and towns across the country that conduct business everyday, while the periodic markets are those that meet on a specific day or days in the week that fall on fixed days or follow some regular cycle.

## B. CONSTRAINTS/OPPORTUNITIES FOR MAIN COMMODITIES

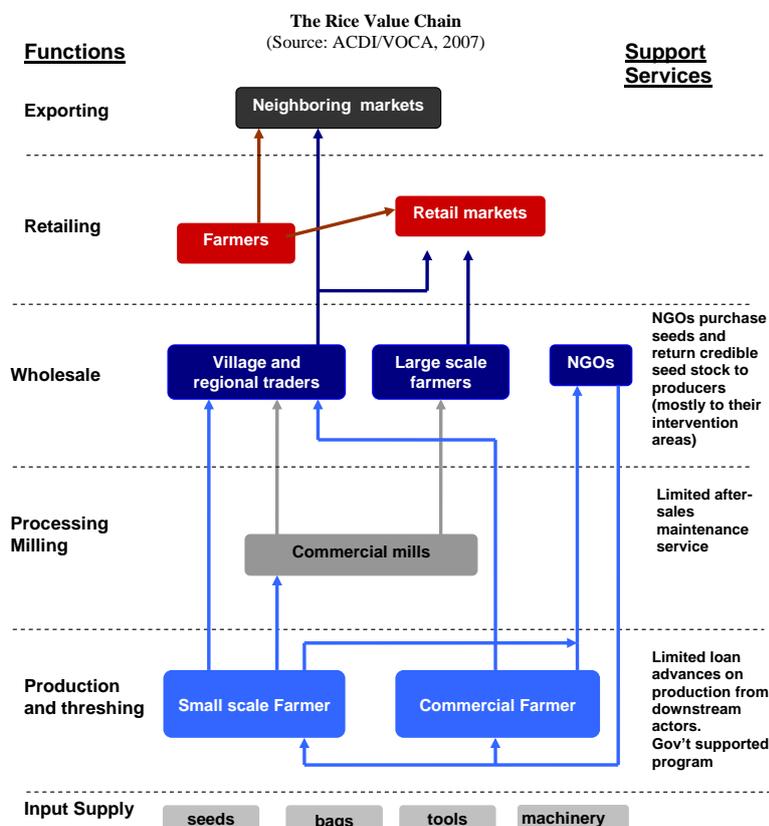
4.41 Annex 6 presents a detailed SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis and a list possible intervention areas. It covers the above cross-cutting as well as the following commodity-specific issues.

4.42 Note: The lack of quantitative data in the description of the selected commodity chains is a result of the absence of statistical data, both in official circles and in the various reports that were consulted by the mission.

### Rice

4.43 **Harvesting:** Over-drying in the field due to bad practices or lack of labour forces leads to high losses, prior to and during harvesting. In upland areas where rice is grown mainly in mixed cropping with other crops, harvesting is still done panicle by panicle using a small knife. In the wetlands with pure stands of rice, farmers use larger knives and some use sickles although this is a new technology. After harvest most farmers leave the rice in the field to dry. This is preferred to avoid drying after threshing especially in cases where there are no drying floors. It leads to losses through rodents, birds, termites and micro-biological attack. Some farmers however transport their harvested paddy bundles home immediately after harvest and place them in their barns with fire underneath to help drying. For these farmers field storage losses are minimal. The harvest is often delayed due to insufficient capacity to hire and organize work groups.

4.44 **Threshing:** Threshing and winnowing are invariably done by hand. Farmers are often the threshers as well. Losses from traditional threshing are high (estimated up to 6 percent).



4.45 **Drying:** Poor drying is a key factor responsible for poor storability and the high post-harvest losses. Only an estimated 18% of farmers have access to drying floors. Drying after threshing or parboiling is still by and large on mud floors or tarmac roads. Cement drying floors constructed before the war have been out of use for a long time as a result of the war, and most are in poor condition. Access to drying floors provided by various programmes is limited mostly due to socio-cultural reasons. For example, some drying floors are located far from some households making it difficult to secure and farmers would rather not publicly 'show-off' the quantity of rice they harvest. During drying losses are caused by rodents, birds, termites, animals

or simply because not all grain is collected at the end of the process. Poor drying leads to bad

conservation in the stores and to high losses at processing. Excessive drying of unparboiled rice leads to a high level of broken grains during milling, whereas insufficiently dried rice ends up as a paste through the rolls of milling machine.

4.46 **Storing:** Only an estimated 14 percent of all households have access to grain stores. Storage is ad hoc, occurring on the farms or homes (as threshed rice), at the mills and with wholesalers (as milled or threshed rice), and by some commercial storage firms that make money by waiting for the within year price to improve. Harvested rice is often stored in bags or baskets stacked in huts on damp floors without protection from insects, rodents and fungi. Unthreshed rice is stored in barns with thatched roofs that offer no protection against pests. Storage losses due to rodents could exceed 7 percent, depending on the type of storage. Community storage is a relatively new concept to farmers in Sierra Leone, and even though association members fully participated in the construction of the stores under the leadership of their respective chairperson, few are willing to store their food grains in the community stores and prefer to store in the household.. This reluctance may be due to social factors: not wanting to expose their grains to other members, not having confidence in the record keeping system, not enough jute bags for their produce and fear of government access to their products. The traditional storage structures used at village level are: barns, baskets and cribs, wooden boxes, other structures such as pots, jute bags and oil drums. Only small quantities of grain (200 to 250 kg) can be stored, and losses from insects and pests are high.

4.47 **Parboiling:** Parboiling reduces losses due to improper drying during the milling process. It however leads to deforestation of mangroves to provide wood for burning.

4.48 **Milling:** Where rice is stored on the farm, milling takes place in the homestead using hand pounding. Anecdotal evidence indicates that over 40% of the marketed milled rice is hand pounded. This is laborious and produces a product that, though appreciated for its taste, is not well suited to urban demand for a convenience staple food. Generally, the quality of local rice marketed is low due to the foreign matter content (e.g. small stones and weed seeds). It therefore competes unfavourably with imported rice which better meets specifications for cleanliness, colour, and rapid preparation. Traditional milling using mortar and pestle have a recovery of about 60 percent (the theoretical milling recovery rate of paddy is 70-80 percent by weight) and yield an end product containing 50 percent or more of broken grains.

4.49 Rice milling capacity is low. It is estimated at approximately 2-300,000 MT per year which is below the required national capacity to handle the national rice production capacity. Generally, millers lack technical and management capacity as well as the required equipment to ensure quality. Basic equipment such as de-stoner polisher, bagging, stitching and weighing scales that enhance the quality of rice are not available. Rice mills are sparsely distributed all over the country. It is currently estimated that there are about 300 rice hullers but this number is difficult to confirm. Only an estimated 4 percent of the households have access to rice mills. As compared to milling using mortar and pestle, mechanical hullers lead to better recovery rates of 64-68 percent and the proportion of broken gains drops to between 32 percent and 14 percent, which compares favourably with 25 percent broken rice most often imported into Sierra Leone. There are a variety of hulling machines in use throughout the country. They range from locally fabricated hullers to Chinese and Indian manufactured hullers and even the users of these machines have low opinions of the technology prevalent in country. This is attributed to the frequent breakdowns and lack of spares especially for the imported mills. Local fabricators face constraints such as poor resources, lack of nation-wide market information on their products, poor coordination and lack of proper linkages to Government and donor supported programmes. There is only one large (1 ton/hour) rice mill managed by the Chinese in Bo, Southern Province. Installed in 2004, it is equipped with

a pre-cleaner, destoner, polisher and grader but lacks a bagging and weighing unit. It has operated intermittently because of poor supply chain management.

4.50 **Overall post-harvest losses:** Data on the losses that occur in the rice chain are hard to find. The PFL project documents for Sierra Leone (Biblio 26) reported that about 25.8% of total production is lost during harvesting, threshing, drying and milling, with the percentages lost during these operations being 5.0%, 6.2%, 6.6% and 8%, respectively. The report further mentions that it was demonstrated during the PFL project in Sierra Leone that a 10% reduction in losses could be achieved through adoption of improved threshing, drying, and milling methods. It also mentions that although published information is not available on the actual percentage of loss in domestic stores, a figure of 10 percent is often mentioned.

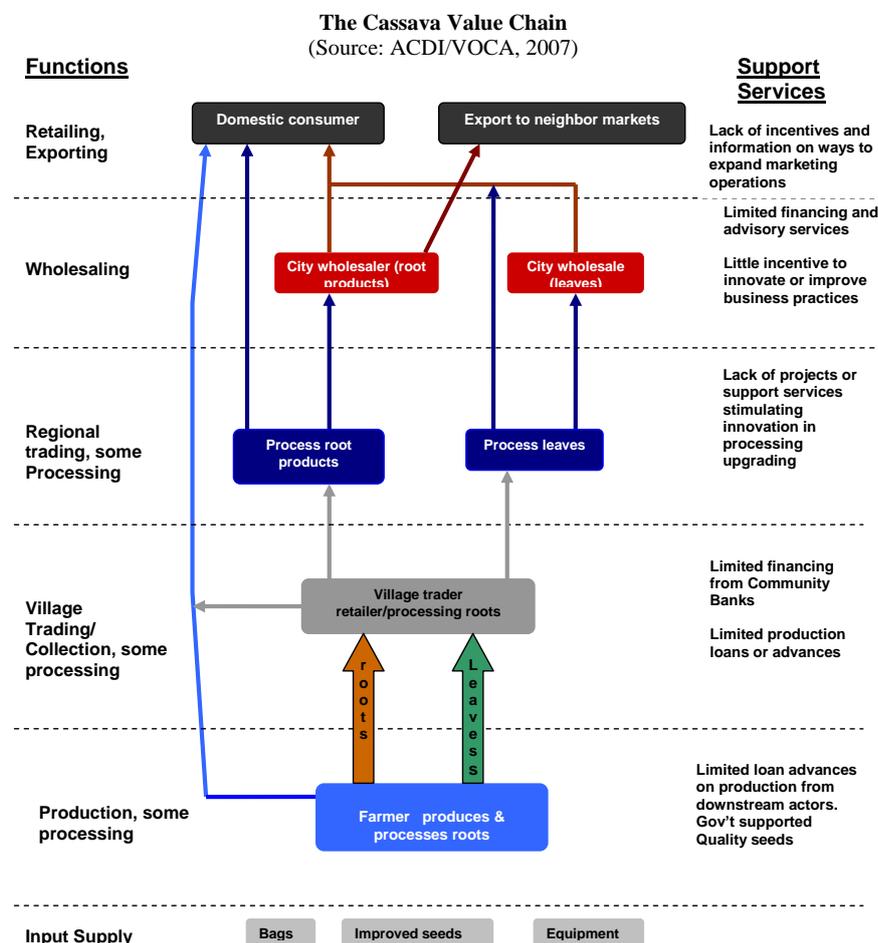
4.51 Despite the high levels of foreign matter, broken rice, mixed varieties and unattractive colour (parboiled and lack of polishing), local rice commands a price premium (15 to 20 percent), primarily for its taste.

4.52 The SWOT analysis presented in Table A6.1 presents a number of possible interventions to support and promote the rice commodity chain.

### Cassava

4.53 **Production related issues:** In general terms, the choice of varieties plays an important role in the conservation of cassava and its products. Sweet varieties are generally more sensitive than the bitter ones, but there may be additional important differences within those two major groups.

4.54 **Harvesting:** At the harvesting stage, poor methods lead to damage to skin and to a rapid deterioration and loss of value. Poor handling and transportation between the field and the processing spot provoke additional damage and losses through skin damage and roots breakage.



4.55 **Handling and Transportation:** Out of the soil, considering the lack of cold rooms and without applying – largely unknown – specific conservation methods, the conservation capacities of fresh cassava are quite limited, between one and three days. Farmers still do not have the know-how

in preserving fresh cassava sealed in plastics. Some farmers mention that plastics are difficult to get. Dried cassava has a storage capacity of several months (6 months according to Biblio 29). Cassava leaves are widely consumed as a fresh product. They need to be sold and consumed shortly after collection, which limits the transport possibilities, and require careful sorting and cleaning in order to avoid bitter taste.

4.56 **Processing:** Due to their bulkiness and weight, nearly all the cassava is being transformed within the immediate surroundings of the harvesting area, mainly by the farmers themselves. Cassava roots can be transformed in a large variety of products - tapioca, gari, flour, chips, alcohol, starch, fufu, lafun, attiéké ..., and in a further stage (secondary processing), bread, chinchin, bakery, medicines, industrial foods, glues, adhesives ... A key issue with value addition on cassava is the lack of processing equipment and know-how. The need by farmers for processing equipment having higher throughput and capable of producing better quality products is becoming more of an issue now than before, because of the development of a new product, gari flower, which has a definite demand by city dwellers.

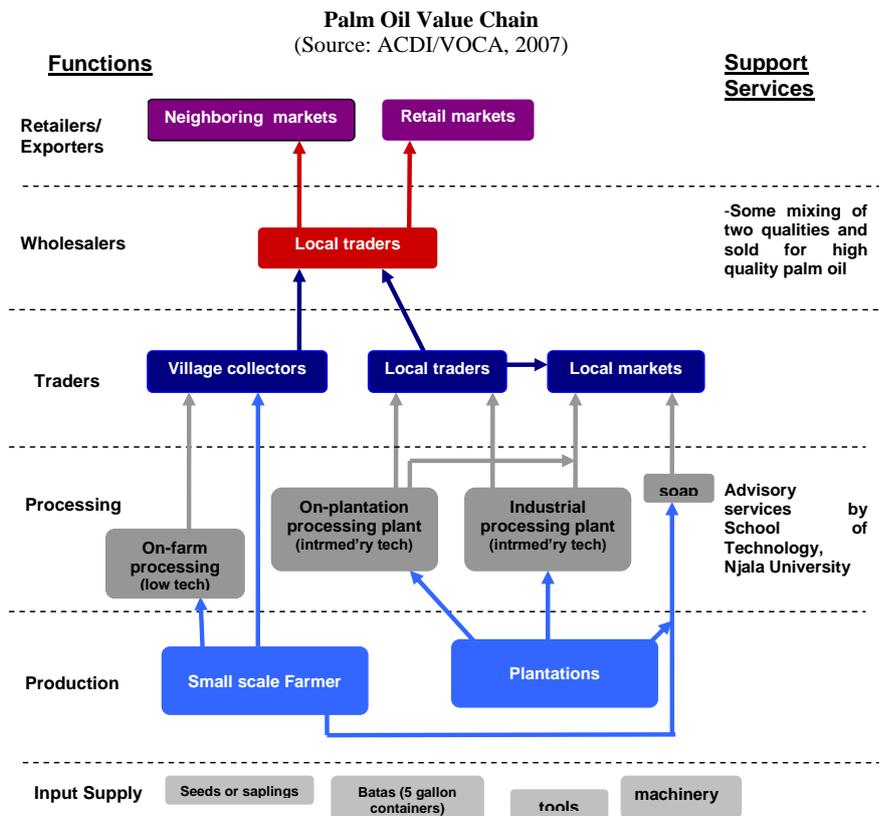
4.57 **Primary processing:** Farmers prefer using cassava graters with engines and are ready to pay for the service rather than use hand operated graters. Many cassava graters are in operation in the country, supplied to farmers by donors. Blacksmiths fabricate most or all of the graters locally, with the exception of the engine, which is imported. Other cassava processing equipment like screw press, frying pan and spoon are made locally. Cassava chips, flour and gari are (almost) exclusively sun-dried, despite the very high relative humidity, the lack of drying floors or surfaces (tarpaulin) and existing sun or energy-based drying techniques (Biblio 31).

4.58 Small cassava processing equipment (graters, pressing and dewatering units, and frying pans) is currently manufactured in a number of locations in the country. The only import dependent component is the engine for the mechanised graters. One medium-scale industrial-type processing plant funded by UNIDO was installed in Tonkolili chiefdom in 1989. It experienced acute supply problems from its establishment, has never achieved full capacity and is currently not in operation.

4.59 **Secondary processing:** Fufu and gari are the most popular cassava derived foods. Fufu production is by an old traditional process that has seen no improvement over countless generations and is still completely manual. Increasingly, gari production is being mechanized by the use of motorized graters. Small cassava graters are now locally manufactured and widely use in the gari production industry, a cottage industry that operates in most parts of the country, especially in the Bo, Moyamba and Bonthe Districts. Peeling of the tubers and roasting of the grated cassava is still done manually. Gratis Foundation, a Ghanaian appropriate technology foundation and Finnic Engineering Company, a Sierra Leonean company both produce motorized cassava graters currently in use in Sierra Leone but not peelers and roasters. The proposed Freetown Production Centre, which has been studied by UNIDO, envisaged bringing these two companies into collaboration in the production of food processing machines in Freetown, Sierra Leone. This project has been pending for over 3 years with the Ministry of Trade and Industry.

4.60 The SWOT analysis presented in Table A6.2 presents a number of possible interventions to support and promote the cassava commodity chain.

## Oil Palm



4.61 **General:** Palm oil is, with cocoa and coffee, one of the three major cash crops and represents an important source of foreign income for the country. Unfortunately, the chain is characterised by strong weaknesses. Most of the palm oil in Sierra Leone is produced from wild palm groves and abandoned government plantations and processed using the traditional methods. As for the cocoa sector, the palm oil chain is characterised by an important distrust among the actors of the chain.

### 4.62 Processing.

It is labour intensive and requires large quantities of water, which is scarce in April and May, the peak period of production in some years. Palm oil is mostly processed at the farm level and it is typically done by women. Extraction efficiency is 40-50 percent of the oil content. This processing is tedious and time-consuming.

4.63 **Marketing:** The major issue for the palm oil production is grading. There is no grading system for defining the different qualities of palm oil. The system will be difficult to administer due to the fact that the palm oil is sold at wholesale in 5 gallon cans called “batta” that are open and easy to mix with the contents of others.

4.64 Depending on the variety, there are two types of oil, the red and the white one. There is a premium on red oil for local consumption whereas the white one is preferred on the international market. The lack of norms and controls along the chain leads to frequent abuse: cheaper white oil, sometimes imported from Asia, is mixed to red oil and sold as the later one. Also in the soap industry, the final products present very different qualities. This lack of quality control along the chain limits the potential for export, thus reducing the marketing opportunities and price optimisation for all the actors of the chain.

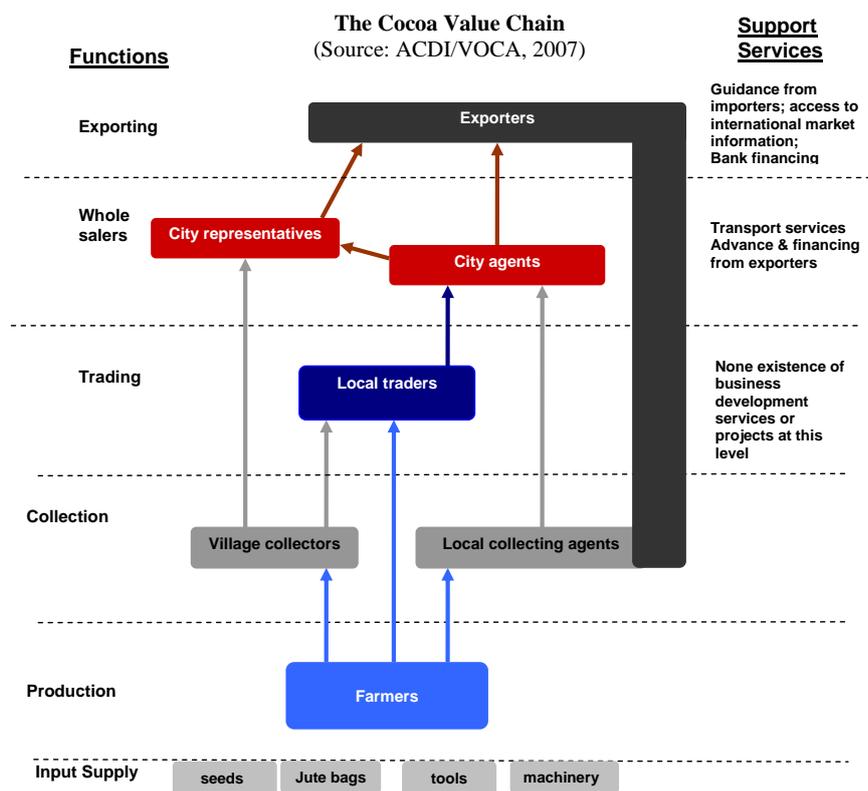
4.65 The SWOT analysis presented in Table A6.3 presents a number of possible interventions to support and promote the palm oil commodity chain.

## Cocoa

4.66 Cocoa is the most important agricultural export commodities. Sierra Leone has a past history of producing a high quality cocoa bean, high in fat content because of ideal growing conditions and a good control of production and post-harvest procedures. Today, it has one of the highest percentages of post-harvest loss and defect amongst cocoa exporting countries (estimated 20-25%). It is sold at 20% discount from international prices because of poor quality and an uncertain standardization, whereas prior to the war, it was granted a quality premium. As for palm oil, the chain is characterised by a very important mistrust.

4.67 **Production and harvest:** Production is concentrated in small farm holdings which are often isolated and lack connection or access to information and transport hubs. Farmers knowledgeable and experienced in cocoa production techniques have been replaced by a younger generation that lacks skill levels and patience to plant, grow and harvest cocoa. During the production and harvesting stages, there are high losses due to attacks of insects (ants) and various diseases (black pod, swollen shoots).

4.68 **Fermentation and drying:** Farmers have difficulties providing a thoroughly dried



bean to the buyer, in part because of high ambient humidity, but as well because of low prices and the need to raise cash (or repay advances) quickly at the beginning of the season. Cocoa bought from the farmer is paid essentially on weight (by kg rather than by bag), giving the producer an incentive to not dry or clean the bean completely. Unless there is a high premium on quality, and considering that harvest is falling at a time when the farmer needs cash, the producer accepts to sell the bean at a lower price and avoid the expense and time to ferment (7 day process)

and dry the bean properly. Drying is essentially solar and low tech (on drying floors or raised beds for better circulation) and takes days if the rains are frequent. Insufficient drying capacity results in high moisture contents and the occurrence of fungal diseases on the beans. Some exporters have seen the advantage of providing industrial-level dryers to their operation, which gives them better control over the shipped product. The process ensures a better grade and a higher importer price

4.69 **Storage:** The poor bagging of bean at the beginning of the supply chain (use of polyethylene bags instead of jute bags, which increase humidity content when stored and

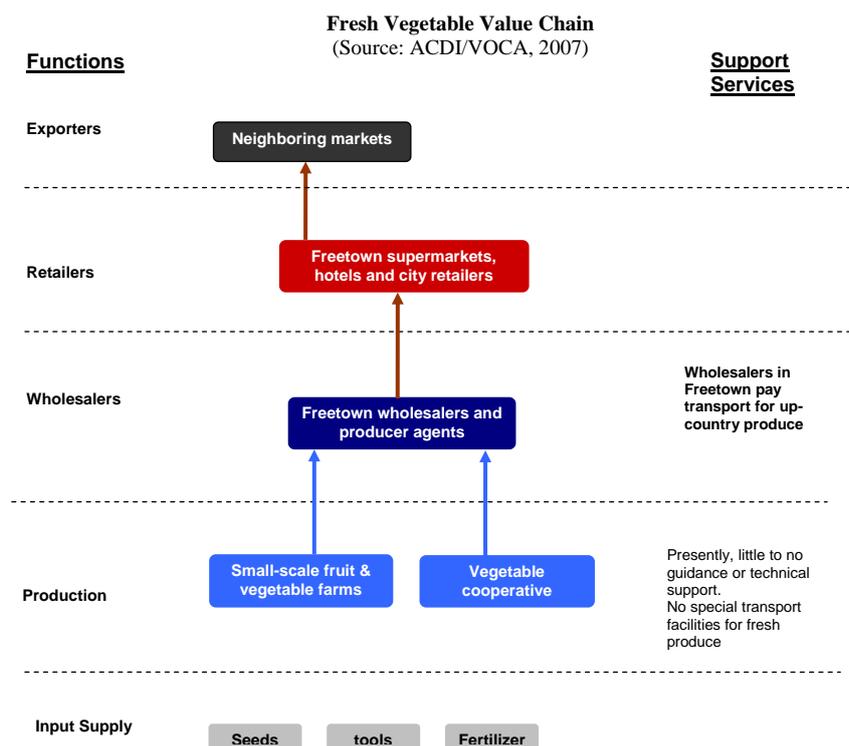
transported) and off-norm storage conditions at producer and trader levels (insufficient ventilation and protection) reinforces the qualitative and quantitative losses.

4.70 **Handling and transport:** The problems of road transport, the numerous transshipments and hauling practices add substantial costs to the final product. The collection arrangements are largely ineffective. Even at the level of the port, the handling costs are high and the conditions lead to further delays and damage through humidity. Even on the boat, the containers are not well adapted to the transport of cocoa. For an export product, these conditions reduce the long-term competitiveness of Sierra Leone. As the exporters have little influence on the world-market price they are being offered, including the discount for the lack of quality, all these costs eventually impact directly on the price paid to the farmers.

4.71 **Marketing:** It seems that, for the time being, the chains is so disorganised that the final exporters have little or no incentives in trying to set up a system of quality control and incentive along the chain. There is a considerable lack of information on prices, markets and quality requirements all along the chain. No grade quality standards are applied or explained to producers. The four-step quality compliance control and inspection system set up by the Government from farm to port appears largely inefficient and costly. The local price to farmers that is determined by the Ad hoc Commodity committee composed of members of the Exporter Association. As a partial consequence of this highly criticised system, farmers in Sierra Leone only get about 55% of the FOB price whereas the percentage is much higher in the neighbouring countries. 95% of the national production is bought by one international trader who, de facto, disposes of a nearly monopsony. This trader has however sent clear messages to the actors of the chain, imposing the introduction of a certificate for sustainable management and announcing the introduction of a discount-premium system to promote quality.

4.72 The SWOT analysis presented in Table A6.4 presents a number of possible interventions to support and promote the cocoa commodity chain.

### Vegetables



4.73 Post-harvest losses are particularly serious for perishable crops such as vegetables. Damage results from poor handling, poor transportation and poor storage facilities including lack of cold rooms.

4.74 **Production and harvesting:** One of the issues that impact on post-harvest losses is the use of inappropriate seeds varieties which cannot support the difficult harvest and post-harvest conditions. Poor handling and conditioning during harvest and immediately

after lead to a high degree of losses. For some species such as onion, inappropriate cultivation practices (lack of fertilisers) have an immediate impact on the conservation capacities of the bulbs.

4.75 **Storage and handling:** The limitation in cold storage is related to the bad and expensive electricity / energy supply as well as to the lack of availability of equipment and credit. Farmers who grow mainly vegetables but lack good storage system hurriedly sell the fresh products to traders. The high seasonality, reinforced by the lack of varieties that mature in the off-season, and the lack of appropriate conservation methods lead to a very high surplus in supply. The lack of transport network to the main consumption centres and the absence of processing reinforce the difficulty of marketing and the high surpluses and waste. Handling of vegetables in marketing centres is often unsatisfactory as the items are displayed in the open exposed to the elements. No standard measures or grades are used in selling fruits or vegetables. Price fixing is arbitrary and negotiations and settlement time-consuming.

4.76 **Processing:** Vegetables such as pepper, okra and onions are sun dried on mats spread on the ground or on the bare soil which results in contamination by stones and dirt. With the exception of this traditional low-tech drying procedure, there is no processing vegetables (into for example jam, soups, chutney, mashed paste, caning, etc.) in the country.

4.77 Fruits face very similar problems as raised for vegetables. The SWOT analysis presented in Table A6.5 presents a number of possible interventions to support and promote the fruits and vegetables commodity chains.

## Fish

4.78 The total coastline of Sierra Leone is 570 km long. In addition to that, Sierra Leone is endowed with important inland waters (rivers, lakes and flood plains). Sierra Leone water are considered having rich fishing grounds and very favourable conditions for shelter and nursery.

4.79 There is neither recent evaluation nor statistics available on the Sierra Leone fisheries sector. Regarding the inland fisheries, the data are gross estimates: the annual production is put at 20 000 mt, of which 5 000 mt from the lakes and 15 000 from the rivers. There are no data available on the number of fishers. Inland fishery activities are however of high social (fishing and post-harvest largely operated by women) and economic importance (cheap source of proteins) for the population. In many provincial villages, women are exclusively responsible for post-harvest activities and dominate in the scoop net fishing system, by which up to 60 percent of all fresh water fish is caught.

4.80 The total annual marine fish production has remained between 60 000 and 70 000 metric tons in the past decade, with exports constituting around 10%. The total estimated potential yields in marine resources (demersal, pelagic, shrimps, cephalopods and others) is estimated between 160 000 and 180 000 metric tons per annum. The bulk of the fish produced by the artisanal sector (marine fisheries) is consumed locally. Whilst only 22 percent of the fish harvested came from the artisanal sector in 1990, nowadays the artisanal sector lands 75 percent of all the fish harvested.

4.81 Fish exports from Sierra Leone are made up of fish products manufactured by industrial fishing trawlers operating offshore, through trans-shipment arrangements. These foreign-owned vessels fish in Sierra Leonean waters through joint venture arrangements with Sierra Leonean nationals. The absence of home-based industrial fishing vessels and land-based infrastructure and facilities to catch and process fish limits the country's ability to maximise

benefits from the resources. The production from the industrial fleet fell from about 75 000 mt in 1991 to between 13 000-21 000 mt per annum in recent years, mainly due to the reduction of the Soviet fleet. Currently, Sierra Leone is unable to (directly<sup>4</sup>) export fish products to the EU market due to the low quality standard of the production.

4.82 **Harvesting and handling:** Because of limited ice availability, shortage of handling, storage, hygienic facilities in landing sites and transportation facilities that would secure the cold chain, fresh fish marketing is not extensive in Sierra Leone. Rather, it is mainly confined within the landing sites and nearby centres. Any fresh fish on sale is usually put on the market with minimum or no ice, which exposes the fish, fishermen and fish mongers to high risks. They become compelled to reduce their selling prices to low and unprofitable levels just to avoid the risk of complete loss. Currently, Sierra Leone is unable to (directly<sup>5</sup>) export fish products to the EU market due to the low quality standard of the production. There is no efficient on-shore cold chain infrastructure for domestic and export marketing of fresh and frozen fish. National fish handling facilities do not currently meet international sanitary standards for export of sea products to Europe and other markets abroad. Most of the trawlers and canoes supplying the bulk of fish for the domestic market lack of chilling and freezing facilities on board. The roads and other infrastructure serving the fishing villages are poorly developed and maintained. The lack of adequate electricity supply for cold storage and processing of fish is a major set back to the development of the industry.

4.83 **Processing:** Due to lack of facilities for preserving and marketing fresh fish, and to consumer preferences, a large proportion of fish is traditionally processed. The main processing methods are sun drying and hot smoking which gives a strong taste to the final products which is well liked by the consumers. As much as 90 percent of the fish caught by the artisanal fisheries is preserved by smoking. Smoking is usually done on open beds over wood fire. Kilns are not in common usage. Smoked product quality is therefore not controlled. Microbial and insect attack, and fragmentation during storage and transport produce significant losses of processed fish. In addition smoking operations are hazardous to the processors and present fire risks. Forest resources, notably mangroves, are being severely depleted by the increasing use of wood for smoking. The use of salt (sodium chloride) in fish preservation has not been encouraging. According to the fishermen and processors, salt is very expensive, and as such smoking is preferred.

4.84 **Post-harvest losses:** There are few data on fish PHL. According to MacAlister Elliot and Partners Ltd (Biblio 13) the characteristics of post-harvest problems in the fish sector are similar throughout the West Africa region, with fishermen, processors and traders sharing resources common to many countries, using similar (often identical) processing techniques, and marketing products in other countries. They estimated the average post-harvest fish losses as high as 20 percent regionally, and even higher in specific places and seasons.

4.85 **Marketing system:** There are about 330 landing sites along the coast. Smoked fish, mainly from artisanal fishing, follows a complex but well developed marketing system. Itinerant traders move large quantities of smoked fish to the numerous periodic markets across the country.

4.86 Because of limited ice availability (3 plants with an ice production capacity of 11 tons a day), shortage of handling, storage, hygienic facilities in the landing sites and transportation facilities that would secure the cold chain, fresh fish marketing is not extensive in Sierra Leone.

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<sup>5</sup> Some of the landed fish seems to be processed in Freetown and shipped to Senegal to be sold on the EU market under Senegalese origin.

Rather, it is mainly confined within the landing sites and nearby centres. Any fresh fish on sale is usually put on the market with minimum or no ice, which exposes the fish, fishermen and fish mongers to high risks. They become compelled to reduce their selling prices to low and unprofitable levels just to avoid the risk of complete loss.

4.87 The SWOT analysis presented in Table A6.6 presents a number of possible interventions to support and promote the fish commodity chain.

## 5. POLICY AND INSTITUTIONAL FRAMEWORK

### A. POLICIES AND STRATEGIES RELATED TO POST-HARVEST

5.1 On the assumption of office for a second and final term, **President Kabbah** pledged in May 2002 that by the time his tenure of office ended in 2007 no Sierra Leonean would go to bed hungry. This ambitious objective, made against the background of the country having just gone through a bitter and devastating rebel war that completely destroyed the social, economic and political advancement, has guided Government actions in the agricultural sector till date.

5.2 The Sierra Leone **Poverty Reduction Strategy (SLPRS)** comprises the following three pillars: (1) Good Governance, Security and Peace Building; (2) Pro-poor Sustainable Growth for Food Security and Job Creation; and (3) Human Development. Agriculture, fisheries and allied sectors are supported under Pillar 2. As an input into the SLPRS, the GOSL, with assistance from IFAD, FAO, UNDP and WB as well as other donors, carried out a comprehensive **Agricultural Sector Review (ASR)** in 2003, which resulted in the Government's **Agricultural Development Strategy**. Some of the main areas for development identified by the strategy include the following:

- Improving rural/village infrastructure, with the aim to increase both quality and quantity of marketed produce and thereby increasing farmers' income. This would include community and farmer-driven investments in construction and rehabilitation of feeder roads, on-farm and village storage and processing facilities, market infrastructure, and irrigation infrastructure, as well as promotion of Intermediate Means of Transport (IMTs).
- Commercialisation of agriculture and export promotion, aimed at the development of a private-sector led agricultural marketing system.
- Efficient provision of agricultural services, in particular research, market information, extension and rural financial services.
- Human resource development.

5.3 The **Agenda for Change**, Sierra Leone's Second Poverty Reduction Strategy Paper, places top priority on energy, infrastructure and agriculture for national development efforts up to 2012. The Agenda calls on agriculture to be the engine for economic growth with a focus on production, processing and marketing of domestically consumed and export oriented crops, livestock, forestry and fisheries products. The Agenda recognizes that raising quantity and value-added productivity in agriculture and fisheries is critical to poverty reduction. Its objectives include: (i) Increasing agricultural productivity (intensification and diversification) through a variety of support measures along the entire agricultural value chain; and (ii) Promoting commercial agriculture through private sector participation, by creating an enabling environment that is attractive for the private sector to invest.

5.4 The **National Sustainable Agriculture Development Plan (NSADP)** provides the broad framework for putting the objectives of the Agenda for Change into action within the agricultural sector. Envisaged to cover the period 2010-2030 all donor programmes will be implemented within its scope. The NSADP serves as the CAADP Compact (Comprehensive Africa Agriculture Development Programme) under (NEPAD) activities. The four sub-

programmes include: Commercialization of key commodities; Agriculture Infrastructure development; Private Sector Promotion.; Sector Coordination and Management (Biblio 2).

5.5 A **National Rice Development Strategy (NRDS)** is being developed. The goal of the NRDS is to lay out a framework for significant increases in rice production in order to contribute to the improvement of food security and economic development in Sierra Leone. Its specific objectives are to: Ensure an increase in the sustainable productivity and production of rice in Sierra Leone; Promote appropriate post-harvest handling, processing and marketing of rice; Develop appropriate infrastructure for rice production and marketing; and Improve the capacity of stakeholders and institutions involved in rice sector (Biblio 37).

5.6 The incentives bill developed in 2004 under **the Investment Promotion Act** is yet to be enacted. This is important for the development of agro-processing activities because the tax incentives for agri-processing activities, requiring 60% of local input or value added to the product, could potentially be an important encouragement to manufacturing and agro-processing when coupled with the low import duties for capital goods for agri-business (now clarified at 5 percent).

5.7 The **Ministry of Agriculture (MAFFS)**'s **stated vision** is to make agriculture the engine of socio-economic growth and development in Sierra Leone. To do this the Ministry will focus on a two-pronged approach: on the one hand seeking to promote food security and poverty alleviation and on the other, private sector development and growth. MAFFS has elaborated a number of key interlinking objectives, including *inter alia*: enhancing increased agricultural productivity and production; promoting crop diversification; assisting small-farmers to be organized for market access; and promoting development of sector infrastructure such as roads, markets and post-harvest facilities. Private sector participation in agriculture will be promoted by creating an enabling environment that is attractive for the private sector to invest in agriculture, including access to financial services, physical infrastructure such as roads and community markets, and post-harvest storage facilities.

## **B. PUBLIC AND PRIVATE STAKEHOLDERS INVOLVED IN POST-HARVEST ACTIVITIES**

5.8 **The Ministry of Agriculture, Forestry and Food Security (MAFFS)** has five Divisions, i.e. Crops, Livestock, Forestry, Land and Water Development (LWDD), and Planning, Evaluation, Monitoring and Statistics, (PEMSD). MAFFS is highly centralised, with much power assigned to headquarters and little authority to the field. Visits to MAFFS field offices showed that very few subject matter specialists. Staff morale is low. MAFFS does not seem to have a comprehensive policy on staff development and training. In the recent times, the mandate of MAFFS has been expanded beyond food security to cover but not limited to private sector led agric commercialization to include small, medium and large scale production using sustainable agricultural diversification and intensification. However it has not been resourced to carry this out.

5.9 PEMSD carries the responsibility of taking stock of on-going activities in the sector and identifying gaps; analysis and integration of the on-going and planned activities in the sector by donor agencies and other development partners; preparing proposals to address the priority needs, and initiating action to mobilize resources to implement the proposals; set up mechanisms for co-ordination of the activities in the sector and monitoring their implementation, more particularly generation, management and dissemination of reliable data and information on various aspects of food and agriculture.

5.10 The MAFFS's current structures are based on the traditional organogram framework which is no longer viable to manage complex modern organisation like MAFFS.

5.11 **The Ministry of Fisheries & Marine resources (MFMR).** A close look at the organisational set-up, staffing and the assignment or distribution of staff shows that there is an extremely skewed distribution of manpower in favour of Freetown to the disadvantage of the provinces. Considering the mandate of the Ministry, it is currently understaffed, lacks adequate logistical support to effectively and efficiently execute its mandate. Consequently, it has established close collaboration with certain institutions with some work force capacity to assist implement its mandate. These institutions include:

5.12 **The National Association of Farmers of Sierra Leone (NAFSL)** was established in 1987 and has the responsibility to support development activities of farmers (including herdsmen and fishermen) who have limited opportunities to participate in mainstream economic, social and political decisions, which affect their lives. The association claims a membership of 1.5 million. It supports programmes which reduce poverty of farmers who lack the means to exist adequately through advocacy, lobbying and programme implementation. A careful look at NAFSL's mandate, structure, logistical and financial situations reveals that it does not have the necessary capacity at this point in time to perform an umbrella and coordinating function for its farmer associations. Furthermore, NAFSL lacks technical and economical expertise as far as know-how about cropping systems and sustainable agriculture is concerned.

5.13 Annex 9 presents a SWOT analysis of the public and private stakeholders.

### C. ONGOING AND PLANNED POST-HARVEST ACTIVITIES/PROJECTS

#### Ongoing and planned activities of public institutions

5.14 **Operation "Feed the Nation" (OFTN)** is supported by various development partners such as FAO, UNDP, WFP and IFAD/ADB and uses the farmer field school (FFS) approach. The ADB funded ASREP and the IFAD funded RCPRP have signed an MOU with OFTN on the provision of extension services. Started in 2005, OFTN has the following five components: (i) Capacity Building for Food Security; (ii) School Gardens; (iii) Communication and Networking; (iv) Improved Agricultural Technologies for Food Security; and (v) Programme Management. Through "Farmers' Field Schools" (FFSs), subsistence farmers are learning how to increase and diversify production, reduce wastage in storage, develop group savings schemes, create networks which strengthen their bargaining power in markets, and grow nutritious crops under irrigation in the dry season, among other things. GoSL is presently seeking donor support for the up-scaling of the programme, which is estimated to cost US\$17 million over five years.

#### Donor (technical & financial partners) activities (include timeframes)

5.15 **IFAD:** The current IFAD-funded interventions in Sierra Leone include the Rehabilitation and Community Based Poverty Reduction Project (RCPRP), which started in 2006, and the Rural Finance and Community Improvement Programme (RFCIP), which became effective in 2008. RCPRP supports: (i) rehabilitation of the productive capacities of smallholders; (ii) community development; and (iii) rural infrastructure rehabilitation and development. The RFCIP focuses on promoting Grassroots Financial Services Associations, supporting Community Banks and supporting a favourable environment for rural finance.

5.16 IFAD projects also include “Enhancing smallholder access to NERICA seed for alleviating rural poverty in Western and Central Africa”, implemented by the Africa Rice Centre (WARDA) with a grant from IFAD. The programme aims at increasing the production of locally produced, milled and marketable rice. It will develop packages of NERICA seed and grain production practices for farmers, strengthen national rice research, conduct participatory assessment of labour saving and post-harvest technologies for reduced losses and high grain quality, and undertake studies to improve policy and market arrangements for domestic rice production and trade.

5.17 **UNIDO:** The UNIDO Post-conflict SME Support Programme for Industrial Development and Poverty Alleviation which has established four growth centres in Pujehun, Bo, Binkolo and Kpandebu. New centres are planned in Kabala (Koinadugu District), Mambolo (Kambia District) and Rotifink (Moyamba District). The centres organise vocational training in small-scale agro-processing and will play a key role in RADEP to strengthen the capacity of entrepreneurs engaged in rice and cassava processing.

5.18 **World Bank:** The World Bank-funded Rural and Private Sector Development Project (RPSDP), which is implementing country-wide since 2008 over five years. It has the aim of (i) improving domestic marketing linkages; (ii) increasing agricultural exports; and (iii) increasing farm revenues through improved technologies and services. Key interventions under the RPSDP include value chain analyses, establishment of a market information system, and matching grant funds for productive assets and infrastructure.

5.19 **EC:** The EC-STABEX funded programme in support of improved production, processing and marketing of basic food commodities (rice) and export crops (cocoa/coffee). Potential links and complementarities exist in the areas of capacity building of farmers, farmers’ associations, processor/marketing groups/individuals, and MAFFS local extension staff, among others.

5.20 **FAO:** The FAO/Government of Italy-supported Food Security through Commercialization of Agriculture (FSCA) Project started in 2008. It is being implemented in Koinadugu and Kono Districts over a three-year period to support the establishment and strengthening of sustainable farmer-based organizations, and the strengthening of service provision for value addition development. Its 2 main components are: (1) Support to Farmer-Based Organizations (FBOs) which aims to: (a) establish new groups through support to existing and emerging “market clusters” at the village level; (b) strengthen various existing farmer networks and enable them to facilitate increased marketing of unprocessed and processed outputs of FBOs; and (c) improve the capacity of District Councils to plan, coordinate and monitor agricultural development and food security initiatives; and (2) Support to Value Addition and Marketing, which aims to: (a) strengthen capacity of FBOs in post-harvest handling, processing and marketing; (b) strengthen service provision to support value addition and value chain processes; (c) strengthen value chain coordination and linkages; and (d) create synergies with ongoing initiatives for agrifood processing and value chain development.

5.21 **CORAD:** The CORAD (Consortium for Rehabilitation and Development, including CARE, CRS, World Vision, among others) Livelihood Expansion and Asset Development (LEAD) Program, a 3-year programme funded by USAID and GoSL which started in 2007, supporting, among others, grassroots-level associations in production, processing and marketing as well as agricultural infrastructure (farm-to-market roads and community-managed infrastructure associated with producing, marketing, storing or processing of agricultural commodities). CORAD produced several value chain and commodity studies, as well as an analysis of input supply. A market information system has been operational since 2005.

5.22 **GTZ:** GTZ is implementing the Food Security and Reconciliation Project (FSR). The project focuses on food security, reconstruction and conflict mitigation and started in 2004 in selected chiefdoms of Kailahun and Kono Districts. Main interventions include: (i) community mobilization and organization; (ii) water, sanitation, health and nutrition; (iii) agricultural support services; and (iv) income generating activities and small-scale enterprises. GTZ is also involved in short term reintegration work, mainly skills training funded by UNHCR, KfW and DFID.

5.23 **ADB:** ADB's Agricultural Sector Rehabilitation Project (US\$15.4 million, for 2006-2010) has the the main objective to reduce poverty and improve food security of smallholder farmers in the districts of Kambia, Port Loko, Moyamba, Pujehun and Kenema. It has the following three main components: (i) Support to Agricultural Production; (ii) Capacity Building of the Ministry of Agriculture and Food Security, and of Rural Communities; and (iii) Project Management. As both the RCPRP and the ASREP have the same focus and similar components. The RFCIP would complement the RCPRP and ASREP, mainly by facilitating the access to financial services by the poor, and would make use of the same management structures.

5.24 **UNCDF:** The Microfinance Investment and Technical Assistance Facility (MITAF) project is jointly funded by the United Nations Capital Development Fund (UNCDF), the United Nations Development Programme (UNDP) and the Kreditanstalt für Wiederaufbau (KfW). Its goal is to increase sustainable access to financial services for poor and low-income people in general, and micro- and small businesses in particular.

5.25 **IsDB:** The Islamic Development Bank's Integrated Rural Development Project (IRDP). The integrated rural development project aims to raise agricultural productivity by rehabilitating inland valley swamps, constructing grain stores and drying floors, and constructing latrines and water well. The Bank is supporting a seed production programme at Chiefdom levels in 74 Chiefdoms. This programme will support the constructions of 74 drying floors and 74 community stores and the training of farmers in Post-harvest rice handling techniques. Similarly the programme will support the acquisition of Post-harvest equipment like rice threshers, cleaners, and tools like sickles.

### **Private sector activities**

5.26 The Agricultural Sector Review (Biblio 1) mentions some activities being carried out by NGOs:

- At Pujehun, Africare is supporting farmers with cassava graters for the production of gari.
- BAFCO, a local NGO based in Bo, has a large gari processing industry in Bo.

### **Other**

5.27 Ongoing and planned donor activities related to PHL reduction are presented in ANNEX 10.

## 6. GOVERNMENT INTEREST IN PHL REDUCTION

6.1 Agriculture is the largest economic sector in Sierra Leone, accounting for about 47 percent of Sierra Leone's GDP. When broadly-defined agribusiness (including fishing, livestock, processing and logistical support) is included the sector contribution to GDP rises to 55-60 percent. About two-thirds of the population derives its livelihood from agribusiness. Government holds agriculture top most in its priorities and is committed to addressing the challenges facing the sector to enhance food security and generate tradable agricultural products with a view to reducing poverty.

6.2 The recently signed new National Sustainable Agricultural Development Plan 2010 – 2030 (NSADP), a CAADP country compact, targets key sub-sectors such as land and water management, rural-urban infrastructure, commercialisation, trade and marketing, resources management and increased agricultural productivity.

6.3 Poor development of value chains, inadequate agro-processing, lack of logistical infrastructure and the resulting post-harvest losses, which are estimated to average 40 percent and higher for perishable fish, and crops including vegetables, fruits, cassava and sweet potato, are seen as a key challenges that have to be addressed under NSADP/CAADP.

6.4 Most of the policies documents make statements regarding reduction of PHLs, improving rural/village infrastructure, construction and rehabilitation of feeder roads, on-farm and village storage and processing facilities. These include: the Agricultural Development Strategy; the National Rice Development Strategy and the Ministry of Agriculture's vision statement.

6.5 From the Ministry of Agriculture's stated vision, priorities would include assisting small-farmers to be organized for market access; and promoting development of sector infrastructure such as roads, markets and postharvest facilities. Private sector participation in agriculture will be promoted by creating an enabling environment that is attractive for the private sector to invest in agriculture, including access to financial services, physical infrastructure such as roads and community markets, and postharvest storage facilities.

## 7. OPPORTUNITIES FOR ADB INTERVENTION

7.1 As already mentioned, post-harvest loss reduction activities have a major economic impact and should increasingly become a major focus in development strategies: carefully selected interventions leading to reductions in PHL are likely to be much more cost-effective than investments in additional production. Increasing production implies using scarce and costly resources through intensive farming practices and expansion of cultivated areas. The marginal environmental cost of qualitative and quantitative saving through improved post-harvest techniques is generally much lower than trying to reach the same value through additional production. PHL reduction aims at maintaining or optimising the value of already existing (produced) products through improved and cost-effective conservation and value-addition strategies.

7.2 Furthermore, post-harvest activities generate on- and off-farm employment opportunities in rural areas, reduce rural exodus, enhance rural income, contribute to value-addition and increased competitiveness. Post-harvest activities generally belong to a more formal sector and should, directly (tax on revenues) and indirectly (VAT) participate in increasing public revenues. In addition, post-harvest activities, including transformation and marketing, are to a large extent assumed by women thereby leading to increased female empowerment.

### A. ANALYSIS OF ONGOING ADB PROJECTS

7.3 The objective of the Bank Group's medium-term strategy for Sierra Leone is to support the Government in its effort to reduce poverty and reconstruct and rehabilitate the war devastated socio-economic infrastructures. The Bank has a portfolio of 10 on-going projects in Sierra Leone with a total approved amount of UA 85.78 million. The Bank Group's interventions are focused on the social sector (53% share of portfolio), rural development (29% share of portfolio) and infrastructure (15% share of portfolio).

7.4 In the agricultural sector the Bank currently implements 3 projects:

- The Artisanal Fisheries Development Project (AFDEP) (2002 to 2009) aims to increase artisanal fish production in a sustainable and environmentally friendly manner. The project has five components, namely: a) artisanal fisheries development; b) rational management of fisheries resources; c) institutional capacity building; d) credit services; and e) project management.
- The Agricultural Sector Rehabilitation Project (ASREP) with the main objective to reduce poverty and improve food security of smallholder farmers in the districts of Kambia, Port Loko, Moyamba, Pujehun and Kenema has the principal objective to restore agricultural production to prewar level through the rehabilitation of the agricultural sector.
- The New Rice for Africa Dissemination Project (NERICA) has the objective to increase rice production and import substitution. The project is focused on supporting small-scale rice producers improve production and their household incomes through the transfer of NERICA varieties and complementary technology from WARDA. The NERICA rice varieties have been introduced and tried in many West African countries including Benin, Cote d'Ivoire, Guinea, Ghana, Guinea Bissau and Togo, where they have shown high productivity, good consumer acceptability, and high quality grain.

7.5 Post-harvest issues mainly in the rice sector (ASREP and NERICA) have been addressed under the Bank's African Food Crises Response Mechanism in 2008. These measures were based on a reallocation of funds and included the purchase of rice mills, rice threshers, rice graders and rice destoners as well as the rehabilitation of feeder roads.

7.6 Activities related to post-harvest losses reduction : Measures to reduce post-harvest losses are carried out by the 3 agricultural ADB projects, however, have so far only a limited, exemplary effect. For further details see Annex 11 of this report.

7.7 Generally, projects in Sierra Leone experience long delays; especially between approval and launching, and during implementation which is lagging behind schedule in most of the projects. The average disbursement rate in the agricultural projects is relatively low with 29%. Among all on-going projects implementation of agricultural projects tend to take the longest with an average of 5.8 years (social sector with 5.4 years and infrastructure with 2.9 years).

7.8 Despite delays in the implementation, the Bank gives a positive rating to its interventions as they have contributed to an increased share of households with adequate foods consumption (from 56% to 73% between 2005 and 2009, particularly through increased production of paddy rice) and a growth of the Agriculture GDP (from 5.5% to 8% in 2009) reducing the poverty headcount level from 70% to 60%.

7.9 ADB and the World Bank are currently in the process of developing a Joint Country Assistance Strategy (JAS) setting out planned lending and non-lending support by the World Bank and African Development Bank to Sierra Leone over the period FY10-13 (July 2009-June 2012). The JAS will reflect the structure and priorities established by Government in the PRSP which establishes four strategic priorities covering Energy, Transport, Agriculture and Human Development.

7.10 ASREP and NERICA will stretch into the JAS implementation period - until 2012. The World Bank is in the process of restructuring its Rural Private Sector Development Project which will be implemented for the whole JAS period.

## **B. SCOPE FOR NEW PROJECTS**

7.11 High physical and qualitative losses caused by weak value chains, low processing and lack of infrastructure can be identified in all agricultural sub-sectors in Sierra Leone, without exception. Accordingly there is a broad need for investments to make agriculture a key driver of socio-economic development. Support from development partners is critical in this respect.

7.12 New investment projects should be based on the priorities set out in the National Sustainable Agriculture Development Plan (NSADP/CAADP), which provides a clear basis for concerted efforts by the Government and all development partners. According to the plan the government is seeking productivity gains mainly in the rice, cassava, oil palm, cocoa, fisheries and forestry value chains.

7.13 The NSADP will have four major sub-programs, namely:

- 1. Commodity Commercialization
  - Component 1: Small-holder Commercialization Scheme,
  - Component 2: Medium and Large Farm Producers Promotion Scheme

- 2. Agriculture Infrastructure
  - Component 1: Support to the Rehabilitation and Upgrading of Feeder Roads
  - Component 2: Support to the Development of Irrigable Swamps
  - Component 3: Rehabilitation and Modernization of existing storage and processing facilities and equipment
  - Component 4: Rehabilitation and construction of Research Centers, MAFFS Offices
- 3. Private Sector Promotion
- 4. Sector Coordination and Management.

7.14 Activities that will contribute directly and indirectly to reduced post-harvest losses are assigned primarily to the sub programs 1 and 2.

7.15 NSADP/CAADP Sub-program 1 (Commodity commercialization) aims at an increase of productivity through appropriate technologies and providing access to markets. Activities that could be supported by the Bank are:

- Development, demonstration and adoption of productivity enhancement technologies for small and medium scale producers.
- Farm management skills development for producers including large-scale farmers.
- Development of agribusiness along commodity chains aimed at improved value addition and linking farmers with input and output marketing.
- Reforming and training of farmer-based organizations in order to build their capacity to engage in commercial agriculture and link to the market economy.
- Development of market information systems and quality measures and standards.

7.16 NSADP/CAADP sub-program 2 (Agriculture infrastructure development) aims to develop appropriate infrastructure of public goods in nature to support agricultural development. Infrastructures of most immediate need are: roads, irrigation facilities, markets, processing, and packaging and storage facilities. Activities that could be supported by the Bank are:

- Improvement of basic rural infrastructure to increase output from the farms to marketing and processing outlets.
- Provision of community service infrastructure designed to eliminate bottlenecks from the cultivation process to marketing the produce. This should include construction of farm markets, daily retail markets and irrigation schemes.
- Provision of appropriate production infrastructure, within easy access of communities for post-harvest processing of produce on farm and village level. This should include drying floors to facilitate proper drying, mobile threshers as a means to solve both labour constraint and yield losses in comparison to manual threshing, improved parboiling technologies that use less firewood, improved rice hulling and milling machines as well as crop stores and packaging facilities.

7.17 Dissemination of technologies through farmer-based organizations could be an interesting approach to promote the development of sustainable private sector activities in agriculture.

7.18 An improved transport network is critical for growth in the agricultural sector. The existing network of roads, air and sea transport but maintenance has been neglected since the war. The existence of inadequate and poorly maintained rural and feeder roads connecting villages and farm areas to market centres and the lack of regular transport services poses serious challenges in the country. The rehabilitation of approximately 160 km of roads in the major provincial towns and 2,055 km of feeder roads as well as the construction of highways between the urban centres is a priority of Government in the medium term, particularly to develop agribusiness.

## 8. NEXT STEPS AND FOLLOW-UP ACTIONS

8.1 Reduction of Post-Harvest Losses (PHL) is a priority area of collaboration between the African Development Bank (ADB) and FAO. It is one of three pillars identified by the ADB within its African Food Crisis Response (AFCR) of June 2008. The current collaboration between ADB and FAO focuses on 2 pillars. Pillar I: Screening of ongoing ADB projects and sensitization of ADB staff in PHL and value chain development issues; and Pillar II: preparation of a Framework Paper for a Continental Programme on PHL for ADB, based on needs assessments carried out in about 16 African countries.

8.2 The present report will be transmitted to the Government for consideration and reaction. It is based on a rapid appraisal mission and addresses the issues in general terms, due to the lack of statistical data and limited mission time. It presents a general picture of the PHL situation in Sierra Leone that can serve as a basis for launching a national identification and appraisal process in order to develop a national PHL reduction strategy and action plan. Based on the decision to further address PHL reduction, if considered necessary, additional commodity-specific appraisal missions and studies may be launched. The national strategy should serve as a guideline for the Government and all development partners to ensure that the various projects address the PHL problem in an appropriate and coordinated manner, either through specific PHL projects or by including PHL reduction activities in wider projects.

8.3 The time is also opportune for incorporating PHL reduction interventions into national agricultural strategies, including the CAADP Compact- based national investment program.

8.4 ADB should contact the World Bank to start the process of joint planning for a country validation workshop as has been discussed previously with FAO in the context of World Bank's study on Post-Harvest Loss Reduction Technologies and Practices for Basic Grains in Sub-Saharan Africa.

8.5 ADB may liaise with the Government to assume leadership for the organization of the country workshops with technical assistance from FAO Country Office, ADB Field Office and the WB Country Office. The country validation workshop which should involve the various stakeholders of the commodity chains of importance to the particular country, and should result in development of specific and relevant action plans (i.e. further commodity specific studies and appraisals).

8.6 On the side of ADB, the report should provide information on opportunities to incorporate PHL reduction and related value addition and marketing activities in ongoing or planned Bank operations. Ongoing development projects, i.a. ADB projects may also be revised and adjusted in order to better account for PHL reduction issues. Annex 11 addresses, for each of the ongoing ADB projects, potential ways to do so. FAO could provide more specific technical assistance in undertaking this redesigning exercise.

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# **ANNEXES**



## ANNEX 1: GENERAL COUNTRY DATA & SOCIAL AND AGRICULTURAL STATISTICS

**Table A1.1. General Data and Social and Agricultural Statistics**

<b>General</b>	<p><u>Area</u>: Surface area (sq. km) (thousands) 71.7  <u>Population</u>: 2007 (WB) = 5.85M  <u>Pop. Growth rate</u>: 2007, WB=1.8%                      Urban Population: = 2005= 40.7% projected 2015 = 48.2%  <u>Altitude range</u>: 0 - 1948 m  <u>Temperature range</u>: 26-29°C  <u>Relative humidity</u>: high  <u>Precipitation (mean annual)</u>: 3000  <u>Precipitation Range</u>: 3 / 782 mm/month (Feb. / July)</p>
<b>Social</b>	<p><u>Life expectancy at birth</u>: 43 (WB, 2007)  <u>% of pop. under poverty line</u>: &lt; \$1/day = 57%; &lt;\$2/day = 74.5%  <u>Adult Illiteracy rate</u>: 65.2% (Male: ;Female: )  <u>UNDP Human development index</u>: 2005 Value -177/177</p>
<b>Market Access</b>	<p><u>Paved roads (km/km2 - status)</u>: 0,01  <u>Unpaved roads (km/km2 - status)</u>: 0,16  <u>Railways</u>: 84 km (From Pepel to Marampa)  <u>Landlines</u>: 24 000 (EIU, 2006)  <u>Mobiles</u>: 776 000 (EIU, 2007)</p>
<b>Agricultural statistics</b>	<p>Surface: (Biblio 11) Agricultural land: 60%                      Pastures: 18%                      Mangroves and inland swamps: 8%                      Forest: 4%                      Other: 10%</p> <p><u>Agricultural GDP as share of total GDP</u>: 46%</p> <p><u>Major crops</u> (in order of importance, in tons): Rice, cassava, vegetables, sweet potato, groundnut, sugar (see annex 2)  <u>PH Losses estimates</u> (in tonnes and equivalent \$USD): grossly estimated 40% in volume and quality, depending on product. No available figures.</p> <p><u>Major agricultural exports</u> (in order of importance, either MT or value):                      Cocoa: 9,5 million USD in 2008 with high variations (see Annex 5)</p> <p><u>Major agricultural imports</u> (in order of importance, either MT or value):                      Rice, 138.000 MT in 2008 (compared to a national production of 408.000 MT milled). No other data available.</p>

Note: the figures are to be considered as very indicative, due to the absence of clear production data and the high permissivity of the borders allowing high volumes of unregistered transactions (imports and exports).

**Table A1.2. Production Data by Cultivated Area**

<b>Produce</b>	<b>Area cultivated in 2008 (ha)*</b>
Rice	476.000
Oil palm	416.000
Cassava	312.000
Groundnut	87.000
Coffee	56.000
Sweet potato	34.000
Maize	28.000
Cocoa	** 2.500

(\* Source: MAFF/PEMSD, 2009)

(\*\* Source: Biblio 11)

## ANNEX 2: AGRO-CLIMATIC ZONES OF SIERRA LEONE

	AREA (KM <sup>2</sup> )	DOMINANT LANDFORM	ALTITUDE	AVERAGE TEMP. (°C)	RAINFALL (mm.)	AVERAGE LGP DAYS	DOMINANT VEGETATION
COASTAL PLAIN	11,016	Estuarine swamps, alluvial plains, beach ridges and coastal terraces.	< 150	27.9	3000	260 ± 10	Mangrove, swamp and grassland.
SAVANNAH WOODLAND	27,993	Drainage depressions, undulating plains, low plateau and hills.	150-300	28.2	2280	255 ± 10	Lophira Savannah, Savannah woodland, mixed tree Savannah upland grassland and forest re- growth.
RAIN FOREST/ SAVANNAH	20,712	Plateau with undulating high lying plains, rolling hills.	150-300	28.5	2730	270 – 300	Savannah woodland, montane grassland and forest re-growth.
RAIN FOREST	12,579	Plateau with undulating plains, rolling plains and hills.	300-600	28.6	2660	314 ± 9	Forest and forest re-growth.
HILLS /MOUNTAINS	14,723	Highly dissected hill ridges	> 600				Montane grassland. Upland Grassland

Source: UNDP/FAO, 1979

### ANNEX 3: CROP/COMMODITY MAPPING

Figure A3.1. Map of Sierra Leone showing the main crops (Source: Biblio 9)

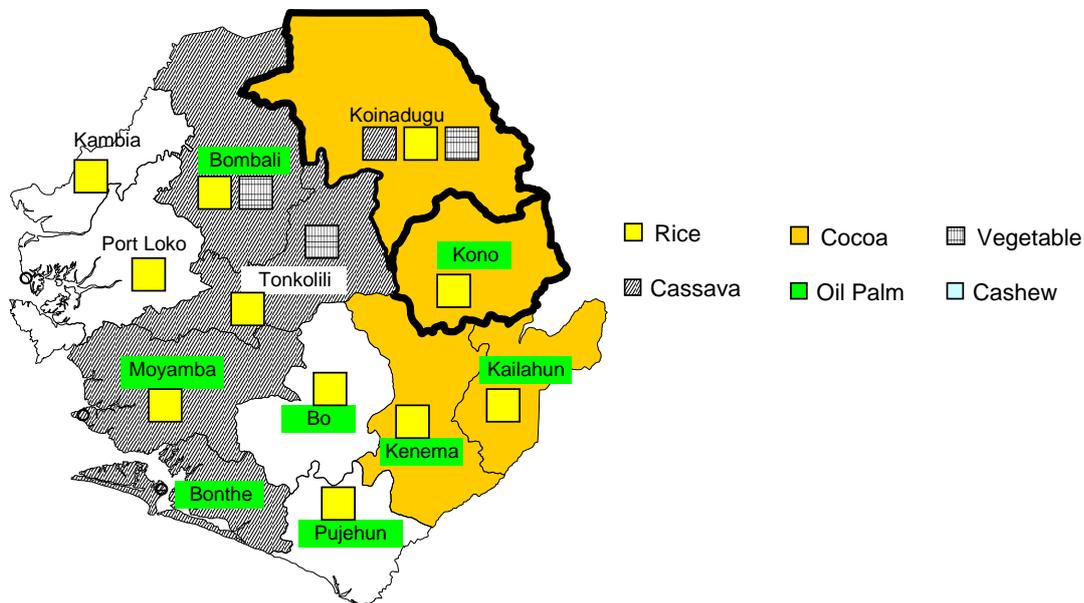


Table A3.1. Regional Distribution of the Main Crops (Source: Biblio 3)

Province	District	Crops				
		Rice	Cassava	Cocoa	Oil Palm	Vegetables
Southern	Bo					
	Bonthe		+		+	
	Moyamba	+	+		+	
	Pujehun	+			+	
Eastern	Kailahun	+		+	+	
	Kenema	+	+	+	+	
	Kono	+		+	+	
Northern	Bombali	+	+		+	+
	Kambia	+				
	Koinadugu	+	+	+		+
	Port Loko	+				
	Tonkolili	+	+			+
	Western Area - Rural	+				

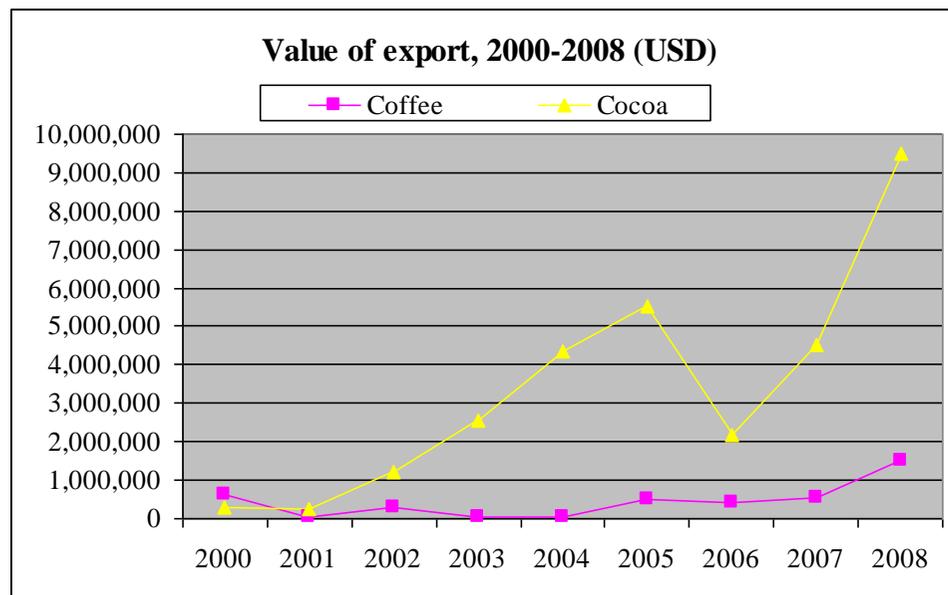
**ANNEX 4: PRODUCTION, IMPORT/EXPORT AND CONSUMPTION OF MAIN COMMODITIES**

Commodity	90 000	Imports		Exports		Consumption
	<i>MT</i>	<i>volume (MT)</i>	<i>value (USD Million)</i>	<i>volume (MT)</i>	<i>value (USD Million)</i>	<i>volume (MT)</i>
Cereals	3 500	no data	no data	no data	no data	
Pulses	60 000	no data	no data	no data	no data	
Oilseeds	no data	no data	no data	no data	no data	
Root & Tubers	no data	no data	no data	no data	no data	
Vegetables	250 000	no data	no data	no data	no data	
Fruits	65 000	no data	no data	no data	no data	
Animal products		no data	no data	no data	no data	
- Milk						
- Meat	no data					

(SOURCE: FAOSTAT. 2007)

Note : the figures are to be considered as very indicative, due to the absence of clear production data and the high permissivity of the borders allowing high volumes of unregistrered transactions (imports and exports).

**ANNEX 5: REGISTERED VALUE OF MAIN AGRICULTURAL EXPORT (COCOA AND COFFEE), 2000-2008**



Note: no data available for palm oil.

## ANNEX 6: COMMODITY/VALUE CHAIN DESCRIPTION, CONSTRAINTS/OPPORTUNITIES, AND PRIORITY ACTION MATRIXES

**Table A6.1 SWOT Analysis on Cross-cutting Issues**

WEAKNESSES	POSSIBLE INTERVENTIONS
<p style="text-align: center;"><b>General</b></p> <ul style="list-style-type: none"> <li>- Unfavourable <u>investment climate</u></li> <li>- <u>Investment in agriculture</u> considered as particularly risky.</li> <li>- State's tendency of trying to unsuccessfully replace the private sector.</li> <li>- Interference of the State in <u>cooperatives</u>.</li> <li>- <u>Lack of resources and limited technical capacities of public sector agencies</u>.</li> <li>- <u>Very weak extension and research services</u>.</li> <li>- Lack of up-to-date and complete <u>data</u>.</li> <li>- Low <u>implementation capacity</u> of agricultural projects.</li> <li>- Insecure <u>land property</u> and user rights.</li> <li>- <u>Poorly coordinated chains</u>.</li> <li>- Lack of access to <u>credit</u>.</li> <li>- Unfavourable <u>tariffs and duty</u> structure.</li> <li>- Lack of <u>entrepreneurial</u> competences at all stages of the chains.</li> <li>- <u>Lack of technical know-how</u> at all levels of the chains.</li> <li>- Weak <u>farmer organisations</u>.</li> </ul> <p style="text-align: center;"><b>Production and Harvest</b></p> <ul style="list-style-type: none"> <li>- Absence of regulations.</li> <li>- Lack of <u>grades and norms</u> as well as <u>control and certification</u> systems related to inputs.</li> <li>- Very limited physical access to <u>input</u> (fertiliser, improved</li> </ul>	<p style="text-align: center;"><b>General</b></p> <ul style="list-style-type: none"> <li>- Improve the <u>investment and business environment</u>.</li> <li>- Promote <u>private sector development</u>.</li> <li>- Support <u>heavy investments</u> in production and processing infrastructure.</li> <li>- Restrict <u>State's intervention</u> in tractor services, pesticides or fertilisers distribution, commodity boards, credit, etc. that can be better achieved by the private sector.</li> <li>- Introduce legislative changes regarding statutes of <u>cooperatives</u> and their independence from State authorities.</li> <li>- <u>Provide technical assistance to the public sector agencies</u>.</li> <li>- <u>Reinforce extension and research services</u>.</li> <li>- Reinforce the collection, treatment and spreading of <u>statistical information</u>.</li> <li>- Reinforce <u>project implementation capacities and framework</u>.</li> <li>- Reinforce <u>land property</u> and user rights.</li> <li>- Promote better horizontal and vertical <u>integration and collaboration / trust</u> amongst the chains (events, intermediation, round-tables and conferences, fairs, visits, ...)</li> <li>- Develop appropriate <u>microcredit</u> instruments (leasing and credit based on storage bonds / warehouse receipt system and vouchers) and sources of funds.</li> <li>- <u>Border measures</u>: adjust tariffs and duty structure to promote investment in agriculture.</li> <li>- Assist microentrepreneurs and farmers (through associations) with appropriate <u>training</u> (technical knowledge, bookkeeping, business plans, organisation).</li> </ul> <p style="text-align: center;"><b>Production and Harvest</b></p> <ul style="list-style-type: none"> <li>- Pass a <u>seed, fertiliser and pesticide regulation law</u>.</li> <li>- Introduce a <u>control and certification body</u> for fertilisers, pesticides, animal food, etc.</li> <li>- Further reduce <u>custom duties</u> on agricultural inputs (duty and tax free).</li> <li>- Ensure access to good quality <u>seeds</u> by appropriate selection through research and diffusion through stores</li> </ul>

WEAKNESSES	POSSIBLE INTERVENTIONS
<p>seeds, chemicals).</p> <ul style="list-style-type: none"> <li>- Limited use of improved <u>varieties</u> having long shelf life.</li> <li>- Lack of know-how on optimal harvesting moment or/and lack of labour forces to optimise quality (taste) and conservation properties.</li> <li>- <u>Lack of care while harvesting and handling</u> the produce.</li> </ul> <p style="text-align: center;"><b>Drying</b></p> <ul style="list-style-type: none"> <li>- Unfavourable <u>climatic conditions</u>.</li> <li>- <u>Lack of drying infrastructure</u>.</li> <li>- Limited <u>availability and access to improved techniques</u>.</li> <li>- Lack of <u>know-how</u> on best practices.</li> <li>- <u>Lack of market incentives</u>.</li> <li>- <u>Socio-cultural specificities not taken into account by projects</u>.</li> </ul> <p style="text-align: center;"><b>Handling &amp; Transport</b></p> <ul style="list-style-type: none"> <li>- <u>Poor feeder and main roads'</u> network.</li> <li>- Very bad <u>handling practices</u> by farmers and transporters.</li> <li>- Insufficient <u>transport offer</u> (trucks, rail, water ways) in terms of capacity / quantity and quality.</li> <li>- Administrative and technical inefficiencies of the <u>sea port</u> operations.</li> <li>- Use of inappropriate <u>packaging</u>.</li> </ul>	<p>and farmers' organisations.</p> <ul style="list-style-type: none"> <li>- Promote the installation of <u>input supply stores</u>.</li> <li>- Promote better <u>production and harvesting techniques (best practices)</u>.</li> </ul> <p style="text-align: center;"><b>Drying</b></p> <ul style="list-style-type: none"> <li>- Promote a wider access to improved <u>drying infrastructure</u>.</li> <li>- Provide <u>training and sensitisation</u> for appropriate drying.</li> <li>- Import or develop appropriate drying <u>techniques</u>.</li> <li>- Promote drying through appropriate <u>incentives</u> in the marketing system (quality-based premiums).</li> <li>- Operate <u>social appraisal</u> of the existing forces before deciding the location of drying floors.</li> </ul> <p style="text-align: center;"><b>Handling &amp; Transport</b></p> <ul style="list-style-type: none"> <li>- Improve <u>feeder roads network</u>.</li> <li>- Introduce measures to promote the development of a <u>transport fleet</u> (trucks, boats) (reduced import tariffs, access to credit, etc.).</li> <li>- Consider the rehabilitation of the <u>rail</u> system (feasibility study on cost-effectiveness).</li> <li>- Promote better <u>protection measures</u> while handling and transporting.</li> <li>- Make <u>information</u> on transport costs more transparent (network) and organise <u>combined transport</u> of goods (economies of scale) through an integrated information system.</li> <li>- Promote the production and use of adapted <u>packaging</u> for transport and marketing.</li> <li>- Provide <u>technical advice</u> to transporters in order to adapt their truck for a better protection of the product. Link farmers, traders and transporters to promote a mutual win-win situation through reduced transport losses (shared quality premium).</li> <li>- Improve <u>port handling and storage conditions and price</u> in order to reduce the duration of shipment and promote the export of perishable products.</li> </ul>

WEAKNESSES	POSSIBLE INTERVENTIONS
<p style="text-align: center;"><b>Processing</b></p> <ul style="list-style-type: none"> <li>- Equipment fabrication, maintenance and repair: very limited number, poor resources, lack of networking and marketing capacities, lack of information on technology.</li> <li>- Use of inappropriate processing equipment</li> <li>- Absence of trained and experienced <u>post-harvest specialists</u></li> <li>- Lack of <u>knowledge</u> on processing techniques and norms.</li> <li>- Lack of <u>finances</u>.</li> <li>- High <u>energy costs</u>, lack of - or inconsistent <u>electricity supply</u>.</li> <li>- Lack of <u>financial incentives to promote quality</u>.</li> <li>- <u>Inconsistent raw material and input supply</u>.</li> <li>- Risk of bad management of community machines.</li> </ul> <p style="text-align: center;"><b>Conservation and Storage</b></p> <ul style="list-style-type: none"> <li>- Use of inappropriate <u>varieties</u>.</li> <li>- Lack of (collective) <u>storage culture</u>.</li> <li>- Absence of private businesses running <u>voucher or bond storage schemes</u>.</li> <li>- <u>Limited means</u> (financial reserves/credit) to facilitate survival during lean periods.</li> <li>- <u>Limited storage capacity</u> for dry as well as cold storage.</li> <li>- <u>Poor location</u> of project-constructed warehouses and stores.</li> <li>- Project-constructed warehouses / storage systems do not take <u>socio-cultural aspects</u> into consideration.</li> <li>- <u>Inappropriately designed and poorly constructed storage</u></li> </ul>	<p style="text-align: center;"><b>Processing</b></p> <ul style="list-style-type: none"> <li>- Support <u>fabricators</u> in building up a marketing and maintenance network and upgrading their technology by having access to improved models.</li> <li>- Finance training to <u>post-harvest specialists</u>.</li> <li>- Develop (based on the practices in other African countries) <u>new products and processing techniques</u>.</li> <li>- Investigate and import already tested and <u>improved equipment</u> from the subregion.</li> <li>- <u>Demonstrate</u> prototype equipment.</li> <li>- Introduce <u>leasing schemes</u> and other credit instruments.</li> <li>- Use the cheap and largely available <u>labour</u> for manual processing (above all as long as energy costs remain high).</li> <li>- <u>Train technicians</u> (blacksmiths, mechanics, carpenters, etc.) in the <u>fabrication</u> of improved farm implements and processing equipment.</li> <li>- Promote the development of a well trained and widely available network of technicians for <u>repairs and maintenance</u>.</li> <li>- Train processors on norms and grades.</li> <li>- Provide the <u>appropriate market incentives</u> to promote quality.</li> <li>- Promote <u>contractual relationships</u> and collaboration networks between farmers and processors.</li> </ul> <p style="text-align: center;"><b>Conservation and Storage</b></p> <ul style="list-style-type: none"> <li>- Investigate for the use of improved <u>varieties</u> responding to better conservation and marketing potential.</li> <li>- Promote <u>cooperative storage</u> or private storage schemes provided as a private service to the farmers (bonds and vouchers). Includes support for construction (including leasing instruments) and management training.</li> <li>- Inform on best <u>practices</u> for storing (appropriate protection measures) and make protection material physically and financially accessible.</li> <li>- Use appropriate <u>packaging</u> and <u>protection</u> while transporting and storing.</li> <li>- Finance <u>training and education of post-harvest specialists</u>.</li> <li>- Operate careful <u>appraisal of social and security constraints</u> prior to installing stores and warehouses (location and structure).</li> <li>- Promote investment in <u>cooling rooms</u>, <u>refrigerated trucks</u> and <u>ice</u> production units.</li> </ul>

WEAKNESSES	POSSIBLE INTERVENTIONS
<p><u>infrastructure.</u></p> <ul style="list-style-type: none"> <li>- <u>Use of inappropriate storage techniques.</u></li> <li>- <u>Use of inappropriate packaging.</u></li> </ul> <p style="text-align: center;"><b>Marketing of raw and processed product</b></p> <ul style="list-style-type: none"> <li>- Lack of quality <u>grades and standards</u> as well as certification systems.</li> <li>- Lack of effective <u>regulatory control.</u></li> <li>- Lack of <u>incentives to promote quality.</u></li> <li>- <u>Lack of units and measures.</u></li> <li>- Insufficient and low quality <u>market places infrastructure.</u></li> <li>- Lack of market <u>information and organisation.</u> Higher margins captures by middlemen, reinforced by the inappropriate credit system provided by traders.</li> <li>- Limited market demand due to reduced <u>purchasing power</u></li> <li>- Lack of capacity to comply with national and <u>international norms and standards.</u></li> </ul>	<p style="text-align: center;"><b>Marketing of raw and processed product</b></p> <ul style="list-style-type: none"> <li>- Develop and introduce <u>standards and grades</u> in line with international references.</li> <li>- Introduce appropriate <u>independent control and certification</u> mechanisms (institutional framework and operational procedures) to control norms, grades and sanitary standards.</li> <li>- Develop a horizontal and vertical <u>integration</u> (linkages and contractual agreements) between the actors to reinforce the flow of upstream and downstream information, better respond to market requirements and ensure a balanced share of the margins.</li> <li>- Reinforce <u>sanitary control</u> system on food and processing and marketing conditions.</li> <li>- Institute <u>units and measures</u> to facilitate marketing transactions.</li> <li>- Promote <u>collective marketing.</u></li> <li>- Install <u>collection points</u> next collective warehouses and markets.</li> <li>- Investigate best <u>varieties</u> for conservation and marketing.</li> <li>- Make <u>market information</u> on prices (offer vs. demand) widely accessible through adapted technologies (SMS, telephone consultation, radio, etc.) (implies collecting the data, processing and disseminating).</li> <li>- Support appropriate <u>market infrastructure</u> protecting against dust and humidity (rain) and following hygienic standards (concrete floor and access to water for regular cleaning).</li> <li>- Train the various value chain actors in <u>marketing techniques and requirements.</u> Provide <u>financial and technical support</u> (<u>market studies</u>, marketing strategies, branding, packaging, labelling, distribution, participation in fairs, etc.).</li> <li>- <u>Adjust border protection measures</u> to facilitate the entrance of important inputs or better protect the local production while still keeping an incentive to improve its quality.</li> </ul>

**Table A6.2 SWOT Analysis on Rice Chain**

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS	POSSIBLE INTERVENTIONS
<p><b>General</b></p> <ul style="list-style-type: none"> <li>- Food security: major crop in SL, grown by a majority of farmers all over the territory. Self-sufficiency: 80%.</li> <li>- Consumption: Very high level of per capita consumption compared to other African countries (104 kg / person)</li> <li>- Parboiled rice is high demand.</li> </ul> <p><b>Production and Harvest</b></p> <p><b>Drying and threshing</b></p> <ul style="list-style-type: none"> <li>- Some drying techniques using fire.</li> <li>- Knowledge of the importance of using drying floors</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>- Economy: high rice imports (25% of national consumption).</li> </ul> <p><b>Production and Harvest</b></p> <ul style="list-style-type: none"> <li>- High cost of irrigation infrastructure and land preparation.</li> <li>- Overdrying in the field leading to high losses prior and during harvest</li> </ul> <p><b>Drying and threshing</b></p> <ul style="list-style-type: none"> <li>- Limited access to drying floors.</li> <li>- Poorly designed drying systems and bad techniques.</li> <li>- Inadequate threshing methods.</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>- Economy: projected population growth, rapid organisation and rising per capita income will lead to demand for more and better quality rice.</li> <li>- Credit: rice is rather easy to conserve, is well adapted to storage and to storage-based credit instruments.</li> </ul> <p><b>Production and Harvest</b></p> <ul style="list-style-type: none"> <li>- High availability of suitable land (inland valley swamps).</li> <li>- High scope to increase current low yields.</li> <li>- Suitable agro/climatic conditions to support double cropping.</li> </ul> <p><b>Drying and threshing</b></p>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>- Economy: competition from imported rice.</li> <li>- Environment: degradation resulting from deforestation of mangroves to 1. provide wood fuel for parboiling and 2. clear land for swamp rice cultivation.</li> </ul> <p><b>Production and Harvest</b></p> <p><b>Drying and threshing</b></p>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>- Economy: study competitiveness and design protection measures.</li> <li>- Credit: Rice storage well adapted to develop leasing and credit based on storage bonds / warehouse receipting system and vouchers.</li> </ul> <p><b>Production and Harvest</b></p> <ul style="list-style-type: none"> <li>- Promote good practices such as choice of suitable varieties, timely harvesting, etc.</li> <li>- Support heavy investments in production infrastructure.</li> </ul> <p><b>Drying and threshing</b></p> <ul style="list-style-type: none"> <li>- Promote improved drying techniques (cemented floors, tarpaulin ...).</li> <li>- Promote foot pedal threshers.</li> </ul>

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS	POSSIBLE INTERVENTIONS
<p><b>Storage</b></p> <p><b>Processing</b></p> <ul style="list-style-type: none"> <li>- Availability of dealers for milling machines in Freetown.</li> </ul>	<p><b>Storage</b></p> <ul style="list-style-type: none"> <li>- Inadequate traditional storage systems.</li> <li>- Project financed stores not used due to a lack of consideration of local social context.</li> <li>- Inappropriate packaging.</li> </ul> <p><b>Processing</b></p> <ul style="list-style-type: none"> <li>- Manual threshing and dehusking lead to high losses.</li> <li>- Low yields and high level of breakage during milling.</li> <li>- Poor quality finished product (high level of foreign matter and lack of polishing).</li> <li>- Inappropriate drying (insufficient or excessive) leads to high losses.</li> <li>- Poor access to operational mills.</li> <li>- Lack of spares and maintenance capacities.</li> <li>- Limited access to and high price of energy (electricity and fuel).</li> <li>- High wood-consuming parboiling techniques (with high environmental costs on mangrove).</li> </ul>	<p><b>Storage</b></p> <ul style="list-style-type: none"> <li>- Stores and their content (stocks) used as a collateral for credit.</li> </ul> <p><b>Processing</b></p> <ul style="list-style-type: none"> <li>- Opportunities to use residues and waste (straw, bran and husk).</li> <li>- Opportunities for product differentiation through secondary processing (flour, starch, etc.)</li> </ul>	<p><b>Storage</b></p> <ul style="list-style-type: none"> <li>- Poor management of community stores.</li> <li>- Social constraints limiting the use of community stores.</li> </ul> <p><b>Processing</b></p> <ul style="list-style-type: none"> <li>- High level of deforestation to provide fuel for parboiling.</li> </ul>	<p><b>Storage</b></p> <ul style="list-style-type: none"> <li>- Improve access to modern private or community stores after careful appraisal of social constraints.</li> <li>- Provide training on good management practices.</li> <li>- Develop a system of bonded storage and warehouse receipts (also serving as a guarantee for credits).</li> </ul> <p><b>Processing</b></p> <ul style="list-style-type: none"> <li>- Improve access to better technology.</li> <li>- Training in processing.</li> <li>- Use of better techniques.</li> <li>- Promote innovative and differentiated products as well as the use of by-products.</li> </ul>

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS	POSSIBLE INTERVENTIONS
<p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- Local rice considered to have better taste and to be more nutritious. Price premium of 15-20%.</li> <li>- Local rice competes well against imported rice.</li> <li>- Serves as a suitable medium for in-kind transaction (credit, trade).</li> </ul>	<p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- Low quality of local rice (foreign matter, highly broken, unattractive colour, varietal impurity).</li> <li>- Limited protection of local rice due to custom duties that allow cheap imports (15% and no sale-tax) (but favours food security).</li> <li>- Absence of grades and standards</li> <li>- Absence of regulatory control measures.</li> </ul>	<p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- Local rice benefits premium due to better taste.</li> <li>- Expected high increase in demand due to gradual shift from cassava to rice as incomes increase.</li> </ul>	<p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- Improved infrastructure may increase the pressure from imported rice in remote areas.</li> </ul>	<p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- Gradually adjust border protection to favour and protect local production while giving the appropriate incentive for quality improvement and ensuring food security</li> <li>- Introduce grades and standards and associated regulatory control measures.</li> <li>- Improve access to credit through specific financial instruments (credit based on storage bonds / warehouse receipting system and vouchers).</li> <li>- Analyse limits of competitiveness of local vs. world market rice.</li> </ul>

**Table A6.3 SWOT Analysis on Cassava Chain**

<b>STRENGTHS</b>	<b>WEAKNESSES</b>	<b>OPPORTUNITIES</b>	<b>THREATS</b>	<b>POSSIBLE INTERVENTIONS</b>
<p><b>General</b></p> <ul style="list-style-type: none"> <li>- Nutrition: very important (tuber and leaves). Strong interplay with rice.</li> <li>- Food security &amp; economy: very important.</li> </ul> <p><b>Production and Harvest</b></p> <p><b>Handling &amp; Transport</b></p> <p><b>Processing</b></p> <ul style="list-style-type: none"> <li>- Locally produced handheld graters (for the roots) and grinders (leaves) sufficient for home consumption.</li> <li>- Inexpensive processing techniques at family</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>- Nutrition: poor in nutritional elements.</li> </ul> <p><b>Production and Harvest</b></p> <ul style="list-style-type: none"> <li>- Sensitive to dangerous <u>diseases</u>.</li> <li>- High <u>damage to skin</u> at harvest leads to rapid deterioration and loss of value.</li> </ul> <p><b>Handling &amp; Transport</b></p> <ul style="list-style-type: none"> <li>- High damage to <u>skin</u> if transported raw, leading to high losses.</li> <li>- Injury to roots (breakage) due to rough handling.</li> <li>- <u>Very expensive transport</u> when fresh, above all under SL transport conditions.</li> </ul> <p><b>Processing</b></p> <ul style="list-style-type: none"> <li>- Lack of <u>semi-industrial and industrial processing equipment</u>. Only artisanal processing.</li> <li>- <u>Lack of knowledge</u> on the various processing possibilities and techniques.</li> <li>- Requires careful <u>sorting and cleaning of leaves</u> to avoid bitter taste.</li> </ul>	<p><b>General</b></p> <p><b>Production and Harvest</b></p> <ul style="list-style-type: none"> <li>- Availability of improved and diseases resistant varieties with much higher yields.</li> </ul> <p><b>Handling &amp; Transport</b></p> <p><b>Processing</b></p> <ul style="list-style-type: none"> <li>- Possibilities to combine the grater with a mill (linkage to an independent engine).</li> <li>- Labour intensive, providing employment</li> </ul>	<p><b>General</b></p> <p><b>Production and Harvest</b></p> <ul style="list-style-type: none"> <li>- Spreading diseases in eastern and central Africa</li> </ul> <p><b>Handling &amp; Transport</b></p> <p><b>Processing</b></p> <ul style="list-style-type: none"> <li>- New varieties presenting new untested properties for processing.</li> <li>- High processing costs and limited outcomes for industrial</li> </ul>	<p><b>General</b></p> <p><b>Production and Harvest</b></p> <ul style="list-style-type: none"> <li>- Improve the <u>harvesting conditions</u> to reduce harm to the skin and immediate post-harvest losses.</li> <li>- Ensure availability of <u>resistant varieties</u> in case of a disease outbreak.</li> </ul> <p><b>Handling &amp; Transport</b></p> <ul style="list-style-type: none"> <li>- Consider resistance to damage and chocks in choice of varieties.</li> <li>- <u>Improve handling and transportation conditions</u>.</li> <li>- Construct <u>feeder roads</u> and improve general network.</li> </ul> <p><b>Processing</b></p> <ul style="list-style-type: none"> <li>- Select <u>varieties</u> based on attributes desired: e.g. high dry matter to increase the conversion rate into gari, or high leaf / starch production varieties, etc.</li> <li>- Locate processing sites near <u>production areas</u> due to high transport cost of tubers.</li> </ul>

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS	POSSIBLE INTERVENTIONS
<p>level (largely manually operated).</p> <ul style="list-style-type: none"> <li>- Motorised graters accessible throughout the country.</li> <li>- Gari production can be operated throughout the country, whereas leaf-based enterprise needs to be close to urban centre.</li> </ul> <p><b>Drying</b></p> <p><b>Storage</b></p> <ul style="list-style-type: none"> <li>- Bitter varieties have good conservation capacities in the soil.</li> </ul> <p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- Marketing of raw cassava, processed products and leaves.</li> </ul>	<p><b>Drying</b></p> <ul style="list-style-type: none"> <li>- Difficult to dry, leading to high losses.</li> <li>- Risk of <u>aflatoxins</u> if not properly dried.</li> </ul> <p><b>Storage</b></p> <ul style="list-style-type: none"> <li>- Poor <u>storage</u> facilities.</li> <li>- Lack of <u>cold rooms</u>, limited access to electricity and regular electricity cuts.</li> <li>- Lack of <u>conservation techniques</u> (available in neighbour countries) and protection against high humidity.</li> <li>- Little access to <u>plastic</u> for sealing.</li> </ul> <p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- No <u>information</u> on trade (prices and markets).</li> <li>- Absence of <u>grades and standards</u>.</li> <li>- <u>Fresh cassava hardly marketed</u> as too</li> </ul>	<p>opportunities.</p> <ul style="list-style-type: none"> <li>- Many processing opportunities.</li> <li>- Many possibilities for diversified products (already tested in other countries): e.g. flour mixed with wheat flour for bakeries.</li> </ul> <p><b>Drying</b></p> <p><b>Storage</b></p> <p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- <u>Widely consumed</u>.</li> <li>- Existing <u>world market</u> for some of the products.</li> </ul>	<p>processing</p> <p><b>Drying</b></p> <p><b>Storage</b></p> <p><b>Marketing</b></p>	<ul style="list-style-type: none"> <li>- Development, evaluation and promotion of appropriate <u>processing techniques</u>.</li> <li>- Facilitate access to equipment in relation to microcredit products.</li> <li>- Develop and promote new products: e.g. starch, bread, glues, adhesives, etc.</li> </ul> <p><b>Drying</b></p> <ul style="list-style-type: none"> <li>- Improvement of <u>drying techniques</u> and <u>conditions</u> (training and access to new technology).</li> <li>- Install <u>laboratory</u> controls on toxins.</li> </ul> <p><b>Storage</b></p> <ul style="list-style-type: none"> <li>- Development and promotion of improved <u>conservation techniques</u>.</li> <li>- <u>Information</u> on risks of bad drying and regular control of toxin levels.</li> <li>- Multiplication of <u>storage</u> facilities.</li> </ul> <p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- Improved <u>marketing</u> techniques (promotion of new products, new markets ...).</li> <li>- Promote <u>credit</u> based storage bonds / warehouse receipting system and</li> </ul>

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS	POSSIBLE INTERVENTIONS
	heavy and voluminous for transport and available in every household in the production area.	<ul style="list-style-type: none"> <li>- The preparation of gari requires much less wood than cooking cereals.</li> <li>- Opportunities for <u>introducing new products</u> (presently limited to gari and flour).</li> </ul>		vouchers. <ul style="list-style-type: none"> <li>- Develop an <u>information</u> system on prices and markets.</li> <li>- Develop <u>branding, packaging and labelling</u>.</li> </ul>

**Table A6.3 SWOT Analysis on Oil Palm**

<b>STRENGTHS</b>	<b>WEAKNESSES</b>	<b>OPPORTUNITIES</b>	<b>THREATS</b>	<b>POSSIBLE INTERVENTIONS</b>
<p><b>General</b></p> <ul style="list-style-type: none"> <li>- Economy: important source of foreign currency.</li> </ul> <p><b>Production and Harvest</b></p>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>- Environment: processing wastes cause environmental damage.</li> <li>- High distrust among the actors of the chain.</li> </ul> <p><b>Production and Harvest</b></p> <ul style="list-style-type: none"> <li>- 5-6 years before productive age.</li> <li>- Largely unorganised: mainly produced from wild palm groves and abandoned plantations.</li> </ul> <p><b>Processing</b></p> <ul style="list-style-type: none"> <li>- Oil can be further integrated in various products (e.g. soap). Cake is used as animal feed.</li> </ul>	<p><b>General</b></p> <p><b>Production and Harvest</b></p> <p><b>Processing</b></p>	<p><b>General</b></p> <p><b>Production &amp; Harvest</b></p> <p><b>Processing</b></p>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>- Environment: tighter protection measures.</li> <li>- Organise events to reinforce collaboration and trust building in the chain (fairs, round tables, discussions, collaborations, ...)</li> </ul> <p><b>Production and Harvest</b></p> <ul style="list-style-type: none"> <li>- Distribute or sale former state plantations' land to smallholders.</li> <li>- Assist in rehabilitation of plantations through collective solidarity system.</li> <li>- Adopt the right varieties depending if targeting the export (clear oil) or national/regional market (red oil).</li> </ul> <p><b>Processing</b></p> <ul style="list-style-type: none"> <li>- Support for the acquisition of improved processing equipment (mills), inter alia, by supporting the microcredit sector to introduce leasing</li> <li>- Support for the diversification of 1<sup>st</sup> and 2<sup>nd</sup> level products</li> </ul>

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS	POSSIBLE INTERVENTIONS
<p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- Highly profitable product.</li> </ul>	<p><b>Storage &amp; Marketing</b></p> <ul style="list-style-type: none"> <li>- No grading, standards, regulations and associated independent control and certification body, which reduces the incentive for producing higher quality oil.</li> <li>- Poor organisation of producers and processors.</li> <li>- High volumes informally exported to neighbours.</li> <li>- No apparent market for press cake, which reduces the profitability of the chain.</li> </ul>	<p><b>Storage &amp; Marketing</b></p> <ul style="list-style-type: none"> <li>- Seasonal price fluctuation offering the possibility of storing and selling at higher prices.</li> <li>- As biofuel, possible adjustment of the price to the prices of petrol (for consumers).</li> <li>- Market for cakes will develop with the recovery of the livestock sector.</li> </ul>	<p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- As biofuel, risk of adjustment of the price to the prices of petrol (for the consumers).</li> <li>- Important competition from the world market (Asia).</li> </ul>	<p><b>Storage &amp; Marketing</b></p> <ul style="list-style-type: none"> <li>- Introduce of a grading system and parallel market chain for oils of different grades.</li> <li>- Introduce an independent control and certification body (international specialised agency).</li> <li>- Introduce a sealed packaging system in order to avoid cheating after certification.</li> <li>- Promote storage (support construction and training) through community and private storage based on voucher / bond schemes.</li> </ul>

**Table A6.4 SWOT Analysis on Cocoa**

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS	POSSIBLE INTERVENTIONS
<p><b>General</b></p> <ul style="list-style-type: none"> <li>- Economy: very important source of foreign currency.</li> <li>- Social: one of the most important cash crops in the country</li> <li>- Credit: imperfect, but existing, credit system organised by exporters.</li> <li>- Chain: well integrated production – marketing system. Largely controlled by traders.</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>- Economy: lack of value addition due to bad quality of final exported product.</li> <li>- One of the highest percentages of PHL and defect amongst cocoa exporting countries (20-25%). 20% discount on international prices. whereas.</li> <li>- High level of mistrust within the chain.</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>- High improvement margins along the chain could benefit all the actors and the economy</li> <li>- Before the war, SL cocoa got a premium as high quality product.</li> </ul>	<p><b>General</b></p>	<p><b>General</b></p>
<p><b>Production &amp; Harvest</b></p>	<p><b>Production and Harvest</b></p> <ul style="list-style-type: none"> <li>- Very atomised and unorganised production hampering the quality improvements of the produce.</li> <li>- Low yields, poor practices. Low skilled younger farmers replacing experienced.</li> <li>- Losses through black pod and swollen shoots diseases and through insects (ants) at production and harvest.</li> </ul>	<p><b>Production &amp; Harvest</b></p>	<p><b>Production &amp; Harvest</b></p>	<p><b>Production and Harvest</b></p> <ul style="list-style-type: none"> <li>- Introduce high-yielding hybrids.</li> <li>- Disseminate best practices.</li> </ul>
<p><b>Fermentation &amp; drying</b></p> <ul style="list-style-type: none"> <li>- Some traders operate semi-industrial drying.</li> </ul>	<p><b>Fermentation &amp; drying</b></p> <ul style="list-style-type: none"> <li>- Poor weather conditions (air humidity and rain) and technology considering the high requirements (8% moisture content).</li> <li>- Insufficient incentive to operate proper drying and fermentation. The factors are amongst other.</li> </ul>	<p><b>Fermentation &amp; drying</b></p> <ul style="list-style-type: none"> <li>- High incentive (premium) if properly dried.</li> </ul>	<p><b>Fermentation &amp; drying</b></p>	<p><b>Fermentation &amp; drying</b></p> <ul style="list-style-type: none"> <li>- Increase knowledge of fermentation and drying.</li> <li>- Introduce norms and promote a premium system for rewarding best practices.</li> </ul>

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS	POSSIBLE INTERVENTIONS
<p><b>Storage</b></p> <ul style="list-style-type: none"> <li>- Adequate number of facilities.</li> </ul> <p><b>Handling &amp; Transport</b></p> <ul style="list-style-type: none"> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Mainly solar and low-tech drying.</li> <li>- Credit constraints and urgent need of cash.</li> <li>- The rush of the collectors for buying the cocoa just after harvest in order to secure their source and the repayment of the credit granted to the farmer.</li> <li>- Paid on the weight (rather than volume) which discourages proper drying and cleaning.</li> <li>- Lack of drying floors.</li> <li>- Presently, apparently little marginal benefit for the exporters in controlling the quality throughout the chain compared to selling low-grade quality (situation reinforced by the length of the chain).</li> <li>- Thus, lack of concern along the chain (absence of premium and discount system).</li> </ul> <p><b>Storage</b></p> <ul style="list-style-type: none"> <li>- Off-norm storage at producer and trader's levels.</li> </ul> <p><b>Handling &amp; Transport</b></p> <ul style="list-style-type: none"> <li>- Lack of drying floors and price paid on weight (no quality check) leads to high dirt content.</li> <li>- High level of damage during hauling and transport in trucks and in ship containers.</li> <li>- Remoteness of farms and bad road system leads to high transport costs.</li> <li>- Ineffective collection and transport arrangement.</li> <li>- High port handling costs for exporters.</li> <li>- Using polyethylene bags instead of jute. Reinforces the problem of humidity.</li> <li>- Important number of transport and transshipment steps between the farmer and the exporter, adding substantial transaction and transport costs and reducing the margins granted to the farmers.</li> </ul>	<p><b>Storage</b></p> <p><b>Handling &amp; Transport</b></p>	<p><b>Storage</b></p> <p><b>Handling &amp; Transport</b></p> <ul style="list-style-type: none"> <li>- Poor port handling conditions may even worsen as export increases.</li> </ul>	<ul style="list-style-type: none"> <li>- Introduce and promote improved fermentation techniques.</li> <li>- Improve access to drying technology (through microcredit).</li> </ul> <p><b>Storage</b></p> <ul style="list-style-type: none"> <li>- Improve storage capacities (stores, warehouses), conditions and access.</li> </ul> <p><b>Handling &amp; Transport</b></p> <ul style="list-style-type: none"> <li>- Improve feeder roads network.</li> <li>- Improve port handling conditions.</li> <li>- Improve transportation conditions (training, using appropriate protection).</li> <li>- Promote the use of jute bags.</li> <li>- Identify appropriate techniques to ship through containers.</li> </ul>

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS	POSSIBLE INTERVENTIONS
<p><b>Processing</b></p> <ul style="list-style-type: none"> <li>- Traders have installed industrial – level dryers in order to reduce the risks and PHL.</li> </ul> <p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- Most important agricultural export commodity.</li> <li>- Advantageous export duty (2.5% of FOB) compared to neighbour countries.</li> <li>- Important rise in export over the recent years (18.000 MT in 2008).</li> </ul>	<p><b>Processing</b></p> <ul style="list-style-type: none"> <li>- Limited processing in country: fermenting, drying, sorting.</li> </ul> <p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- Includes high mould, impurities and humidity content. Sold as 15% mould. Automatic 20% discount in value.</li> <li>- Little collaboration between farmers, except for sharing drying floors (but not for marketing and transport).</li> <li>- No information on prices and markets at farmers’ level.</li> <li>- No grading and norms system applied (even if international standards exist).</li> <li>- No adoption of the international standards for organic cocoa despite significant opportunities.</li> <li>- Unsatisfactory and costly four-step quality compliance control and inspection system by the government from farm to port.</li> <li>- Lack of competition amongst international buyers (virtual monopsony), largely due to quality of SL cocoa.</li> <li>- Price to farmers commonly agreed amongst traders (export association) through the largely criticized Commodity Committee. Low remuneration of farmers (+55% of FOB).</li> <li>- In the value chain, exporters getting the highest margin but also assuming the highest risks.</li> </ul>	<p><b>Processing</b></p> <p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- High potential in producing high quality and speciality beans, high value in fat.</li> <li>- One of the best opportunities to raise farmer’s income.</li> <li>- Successful experiences of traders enlarging their scope of activity and integrating the collection by trucks and the drying (vertical integration).</li> <li>- International client decided to introduce premium / discount system + requirement of sustainable management certification.</li> </ul>	<p><b>Processing</b></p> <p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- Due to the bad reputation, need to raise the quality of the (nearly) entire output (critical mass) of SL to raise reputation and avoid discount.</li> <li>- Government opposing the independency of the certification system.</li> <li>- Major international client decided to introduce a premium / discount system and the requirement for certification on sustainable management.</li> <li>- Highly variable price of cocoa and very competitive market, very sensitive to world economic conjuncture.</li> </ul>	<p><b>Processing</b></p> <p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- Promote a credit system that would break the dependency of farmers towards loan agents (who are also the traders).</li> <li>- Promote collective marketing.</li> <li>- Provide TA with international clients to sensitise farmers and intermediary actors.</li> <li>- Introduce and promote grades and standards based on international references (above all for the export market).</li> <li>- Introduce a system of premium linked to the grading and standardisation.</li> <li>- Introduce an independent and professional control, inspection and certification system (using specialised international companies or agencies).</li> <li>- Democratise the Commodity Committee or replace by a private sector association.</li> <li>- Consider developing niche-markets like certified fair-trade or organic cocoa.</li> </ul>

**Table A6.5 SWOT Analysis on Vegetables (and fruits)**

<b>STRENGTHS</b>	<b>WEAKNESSES</b>	<b>OPPORTUNITIES</b>	<b>THREATS</b>	<b>POSSIBLE INTERVENTIONS</b>
<p><b>General</b></p> <ul style="list-style-type: none"> <li>- Nutrition: very important for essential elements.</li> <li>- Social: Vegetables are mainly grown by women.</li> </ul> <p><b>Production and Harvest</b></p> <ul style="list-style-type: none"> <li>- Important commodities for farmers.</li> <li>- Well adapted in combination with rice extensive production.</li> </ul> <p><b>Storage</b></p>	<p><b>General</b></p> <p><b>Production and Harvest</b></p> <ul style="list-style-type: none"> <li>- Very difficult access to seeds and seedlings.</li> <li>- No guarantee on quality of seeds.</li> <li>- Difficult physical and financial access to phytosanitary products.</li> <li>- Lack of technical knowledge.</li> <li>- Choice of varieties not adapted to difficult handling, moisture and transportation conditions prevailing in the country.</li> <li>- Highly perishable, thus not adapted to storage credit.</li> <li>- Highly seasonal and low conservation leading to picks of high surpluses and waste (PHL) followed by high scarcity.</li> <li>- Bad harvesting practices (see handling) leading to high damage and value losses.</li> </ul> <p><b>Storage</b></p> <ul style="list-style-type: none"> <li>- Absence of adapted cooling rooms. Very limited and expensive access to electricity.</li> <li>- High humidity gradient and perishability of fresh fruits lead to high losses.</li> </ul>	<p><b>General</b></p> <p><b>Production and Harvest</b></p> <ul style="list-style-type: none"> <li>- High value products facilitating access to input.</li> <li>- Well adapted in association with rice production (dry season).</li> </ul> <p><b>Storage</b></p>	<p><b>General</b></p> <p><b>Production and Harvest</b></p> <p><b>Storage</b></p>	<p><b>General</b></p> <p><b>Production and Harvest</b></p> <ul style="list-style-type: none"> <li>- Promotion of input stores.</li> <li>- Improvement of production techniques.</li> <li>- Improvement of harvesting techniques.</li> <li>- Choice of more resistant varieties.</li> </ul> <p><b>Storage</b></p> <ul style="list-style-type: none"> <li>- Promote financial, organisational and technical conditions for improving access to cold rooms.</li> </ul>

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS	POSSIBLE INTERVENTIONS
<p><b>Handling &amp; Transport</b></p> <p><b>Processing</b></p> <p><b>Marketing</b></p>	<p><b>Handling &amp; Transport</b></p> <ul style="list-style-type: none"> <li>- Poor handling practices and lack of adapted packaging material provoking high levels of losses during handling and transport.</li> <li>- Very poor transportation conditions due to truck condition and bad road network. High losses.</li> <li>- Insufficient and high cost transport means.</li> <li>- Inefficient logistic at port compared to the extremely tight deadlines for expedition and arrival to the final customer.</li> </ul> <p><b>Processing</b></p> <ul style="list-style-type: none"> <li>- Very limited processing due to lack of knowledge, equipment and demand for processed goods.</li> <li>- Absence of quality control (staff &amp; laboratory).</li> <li>- Basic drying technique (mats) (onion, pepper, okra) leading to low quality (dirty) products.</li> <li>- Electrical drying very expensive.</li> <li>- Insufficient drying and unadapted techniques (high cost of energy) leading to high moisture and important PHL.</li> </ul> <p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- Absence of grades and standards.</li> <li>- Insufficient quality and inadapted processing for high quality export.</li> <li>- No information flow on prices and markets.</li> <li>- Limited demand for high value (processed)</li> </ul>	<p><b>Handling &amp; Transport</b></p> <p><b>Processing</b></p> <ul style="list-style-type: none"> <li>- Very high number of processing possibilities.</li> </ul> <p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- Before the war, some direct organised individual or group marketing from producers to hotels and institutions.</li> </ul>	<p><b>Handling &amp; Transport</b></p> <p><b>Processing</b></p> <ul style="list-style-type: none"> <li>- limited demand for high value products</li> </ul> <p><b>Marketing</b></p>	<p><b>Handling &amp; Transport</b></p> <ul style="list-style-type: none"> <li>- Development of improved handling and transportation techniques.</li> <li>- Use of (improved) packaging.</li> <li>- Construct feeder roads and improve general network.</li> </ul> <p><b>Processing</b></p> <ul style="list-style-type: none"> <li>- Technical support for the improvement and development of processing techniques.</li> <li>- Finance market studies.</li> <li>- Facilitate access to investment credit.</li> </ul> <p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- Introduce grades and standards based on international references (above all for the export market).</li> <li>- Develop an information system on prices and markets.</li> <li>- Training on improved marketing</li> </ul>

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS	POSSIBLE INTERVENTIONS
	<p>products, even in urban areas, due to very low purchasing power.</p>	<ul style="list-style-type: none"> <li>- High and growing demand in town.</li> <li>- Direct access to world market.</li> </ul>		<p>techniques for internal marketing and export.</p> <ul style="list-style-type: none"> <li>- Finance market studies and product promotion campaigns.</li> <li>- Investigate best varieties for conservation and marketing (export).</li> </ul>

**Table A6.6 SWOT Analysis on Fish**

<b>STRENGTHS</b>	<b>WEAKNESSES</b>	<b>OPPORTUNITIES</b>	<b>THREATS</b>	<b>POSSIBLE INTERVENTIONS</b>
<p><b>General</b></p> <ul style="list-style-type: none"> <li>- Nutrition: represents the cheapest sources of animal proteins for the population.</li> <li>- Social: in fresh water, women dominate in the scoop net fishing system (60% of fresh water catches). General: women are exclusively responsible for post-harvest activities.</li> </ul> <p><b>Catch</b></p> <ul style="list-style-type: none"> <li>- Artisanal sector provides 75% of fish landed on SL territory (from 22% in 1990).</li> </ul> <p><b>Handling &amp; Transport</b></p>	<p><b>General</b></p> <p><b>Catch</b></p> <ul style="list-style-type: none"> <li>- High level (24-30%) of by-catch untargeted species and largely discarded.</li> <li>- Low level of compliance and enforcement of fisheries legislation leading to poaching, illegal transshipment, unsustainable fishing practices, ...</li> </ul> <p><b>Handling &amp; Transport</b></p> <ul style="list-style-type: none"> <li>- Insufficient handling care at catch and later at landing and transport.</li> <li>- Weak offloading and transportation facilities in the landing sites (and elsewhere).</li> <li>- No refrigerated transport facilities.</li> <li>- Limited road network along the coast and along the rivers impede the conservation of fresh fish.</li> </ul>	<p><b>General</b></p> <p><b>Catch</b></p> <ul style="list-style-type: none"> <li>- High potential for aquaculture.</li> <li>- Large resources.</li> </ul> <p><b>Handling &amp; Transport</b></p>	<p><b>General</b></p> <p><b>Catch</b></p> <ul style="list-style-type: none"> <li>- Destruction of mangrove reproduction area for wood and swamp rice prod.</li> <li>- Overexploitation of stocks.</li> </ul> <p><b>Handling &amp; Transport</b></p>	<p><b>General</b></p> <p><b>Catch</b></p> <ul style="list-style-type: none"> <li>- Improve fishing techniques.</li> <li>- Implement monitoring, control and surveillance activities.</li> </ul> <p><b>Handling &amp; Transport</b></p> <ul style="list-style-type: none"> <li>- Provide training and facilitate access to credit regarding appropriate handling.</li> <li>- Improve access to appropriate packaging for a better protection during transport.</li> <li>- Develop / improve the road network to landing sites.</li> </ul>

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS	POSSIBLE INTERVENTIONS
<p><b>Conservation and processing</b></p> <ul style="list-style-type: none"> <li>- Marketing as frozen and smoked fish.</li> <li>- Wide adoption of improved ovens leading to reduced waste of wood and better quality.</li> </ul> <p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- Informal but well developed marketing system.</li> </ul>	<p><b>Conservation and processing</b></p> <ul style="list-style-type: none"> <li>- Very limited production of ice.</li> <li>- Insufficient refrigerated storage capacities (cold rooms, refrigerated containers and trucks, etc.) (also to be related to the lack of electricity).</li> <li>- Very limited possibility to maintain the cold chain from fishing to local consumer (or export).</li> <li>- Very limited and expensive ice availability.</li> <li>- Preservation with salt too expensive.</li> <li>- Insufficient land-based infrastructure reduces the offloading and, hence, industrial processing of industrial fishing.</li> <li>- No hygienic facilities on landing stations.</li> <li>- Near absence of industrial processing capacity.</li> <li>- Very weak logistic at port in Freetown leading to an additional risk of breaking the cold chain (for export).</li> <li>- +-90% of catches preserved by smoking (using extensive quantities of wood from the mangrove).</li> <li>- Losses are particularly high during rainy season.</li> </ul> <p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- Neither adoption nor enforcement of internationally recognised norms and standards.</li> <li>- Conservation and processing conditions do not fulfil the EU quality requirements. Fish reaches the EU via neighbour countries (via shipment or trans-shipment), which undermines its value.</li> <li>- Limited fresh fish marketing leads to a rapid drop of the marketing value.</li> <li>- High risks due to limited conservation means of fresh fish.</li> </ul>	<p><b>Conservation and processing</b></p> <p><b>Marketing</b></p>	<p><b>Conservation and processing</b></p> <p><b>Marketing</b></p>	<p><b>Conservation and processing</b></p> <ul style="list-style-type: none"> <li>- Provide support for improving the access to ice.</li> <li>- Improve landing site infrastructure.</li> <li>- Provide support for improving the cold storage and transport capacities.</li> <li>- Introduce improved smoking ovens to reduce financial and environmental costs.</li> </ul> <p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>- Introduce grades and standards and associated controls based on international references (above all for the export market).</li> <li>- Support the measures to develop the export market (Europe).</li> <li>- Inform on sanitary rules and improve sanitary controls.</li> </ul>

## ANNEX 7: ESTIMATED LOSSES DURING POST-HARVEST OPERATIONS, BY COMMODITY

### General Data:

- According to the OFTN (Biblio 39) “over 30% of the harvest is lost through post-harvest activities such as processing, preservation and storage. Huge quantities of perishable crops are seen to rot during the harvest period due to the lack of ready markets and improper post-harvest facilities. “
- The World Bank RPSDP (Biblio 36) mentions that post-harvest losses are around 40% for crops. Similarly, it mentions that post-harvest losses of local fish products intended for domestic and regional markets are high.

### Rice

Stage in Chain	Losses (%)
Harvesting	5.0
Threshing	6.2
Drying	6.6
Milling	8.0
Total	25.8

Source: Biblio 32

Biblio 26 also states that 10% of losses take place in domestic stores where traditional practices are employed.

### Cocoa

Post-harvest Losses and defects are estimated at 20-25% (Biblio 35). Sierra Leonean cocoa is sold at 20% discount from international prices due to its poor quality.

### Fish

According to MacAlister Elliot and Partners Ltd (Biblio 27) the average post-harvest fish losses in the West Africa region are high as 20 percent. They mention that the characteristics of post-harvest problems in the fish sector are similar throughout the West Africa region, with fishermen, processors and traders sharing resources common to many countries, using similar (often identical) processing techniques, and marketing products in other countries.

### Vegetables

Interviews Ms Hadja Sandu Mara, Chairperson of Koinadugu Women’s Vegetable Farmers Cooperative indicated that about 5% of product is lost as a result of transport from the field to the cooperative’s facility in Kabala. From Kabala to Freetown, 30 to 40 % of losses occur, some 20% of which specifically result during transportation and the rest during storage in the market areas.

**ANNEX 8: SITUATION OF THE STORAGE FACILITIES, AGRO-PROCESSING AND  
MARKETS FOR EACH COMMODITY**

No quantitative data available.

### ANNEX 9: STAKEHOLDERS SWOT ANALYSIS MATRIX

Institution	Strengths	Weaknesses	Opportunities/Threats	Remarks
Ministry of Agriculture, Forestry and Food Security (MAFFS)	<ul style="list-style-type: none"> <li>- Extensive field presence;</li> <li>- Continuity – follow through from pre-war to post-war;</li> <li>- Still the major source of technical know-how at district level.</li> </ul>	<ul style="list-style-type: none"> <li>- Traditional civil-service mindset;</li> <li>- Overstaffing</li> <li>- Lack of in-service training;</li> <li>- Poorly resourced (limited mobility for field staff and basic office equipment e.g. computers not available in any field office);</li> <li>- Limited operating budget, project and incentive dependent;</li> <li>- Limited management capacity;</li> <li>- Qualified staff drain to NGO sector;</li> <li>- Infrastructure (offices, stores etc.) severely affected by the war and communication system weak;</li> <li>- Current staff is aging;</li> <li>- Inadequate knowledge of costs/benefits of agricultural production.</li> </ul>	<ul style="list-style-type: none"> <li>- Government decentralisation policy;</li> <li>- Capacity building through in-service training of District and field staff to update competencies and reinforce participatory approach;</li> <li>- Policy changes (e.g. on TA, financial management and organisation);</li> <li>- Recruiting new and qualified staff to replace the retired staff in the future.</li> </ul>	Need for policy review recognised.
Ministry of Trade and Industry (MoTI)	<ul style="list-style-type: none"> <li>- Coverage in Freetown and three Regional headquarters (Bo, Kenema and Makeni)</li> <li>- Growth centres in Bo, Pujehun, Binkolo and Kpandebu</li> <li>- New centres: Kabala, Mambolo, Rotifink</li> </ul>	<ul style="list-style-type: none"> <li>- Traditional civil-service mindset;</li> <li>- Lack of in service training;</li> <li>- Poorly resourced (limited mobility for field staff);</li> <li>- Limited operating budget, project and incentive dependent;</li> <li>- Limited management capacity;</li> <li>- Qualified staff drain to NGO sector;</li> <li>- Infrastructure (offices, stores etc) severely affected by the war and communication system weak;</li> <li>- Current staff is aging.</li> </ul>	<ul style="list-style-type: none"> <li>- Capacity building through in-service training of District and field staff to update competencies and reinforce participatory approach;</li> <li>- Recruiting new and qualified staff to replace the retired staff in the future.</li> </ul>	Need for policy review recognised.
Agricultural Research (Institute of Agricultural Research, Njala Agricultural Research Station, Rokupr Rice Research Stations)	<ul style="list-style-type: none"> <li>- Past links with regional and international research centres;</li> <li>- Dedicated core staff.</li> </ul>	<ul style="list-style-type: none"> <li>- Infrastructure and equipment decimated by the war;</li> <li>- High cost of rehabilitation unlikely to be fully funded;</li> <li>- Lack of operating funds;</li> <li>- Current staff is aging;</li> <li>- No research orientation on cropping systems , farming systems.</li> </ul>	<ul style="list-style-type: none"> <li>- Research programme oriented to present needs;</li> <li>- Development of new rice and cassava varieties for dissemination;</li> <li>- Training of additional staff abroad.</li> </ul>	Rokupr Rice Research Station: still weak as far as quantity and quality of output is concerned.

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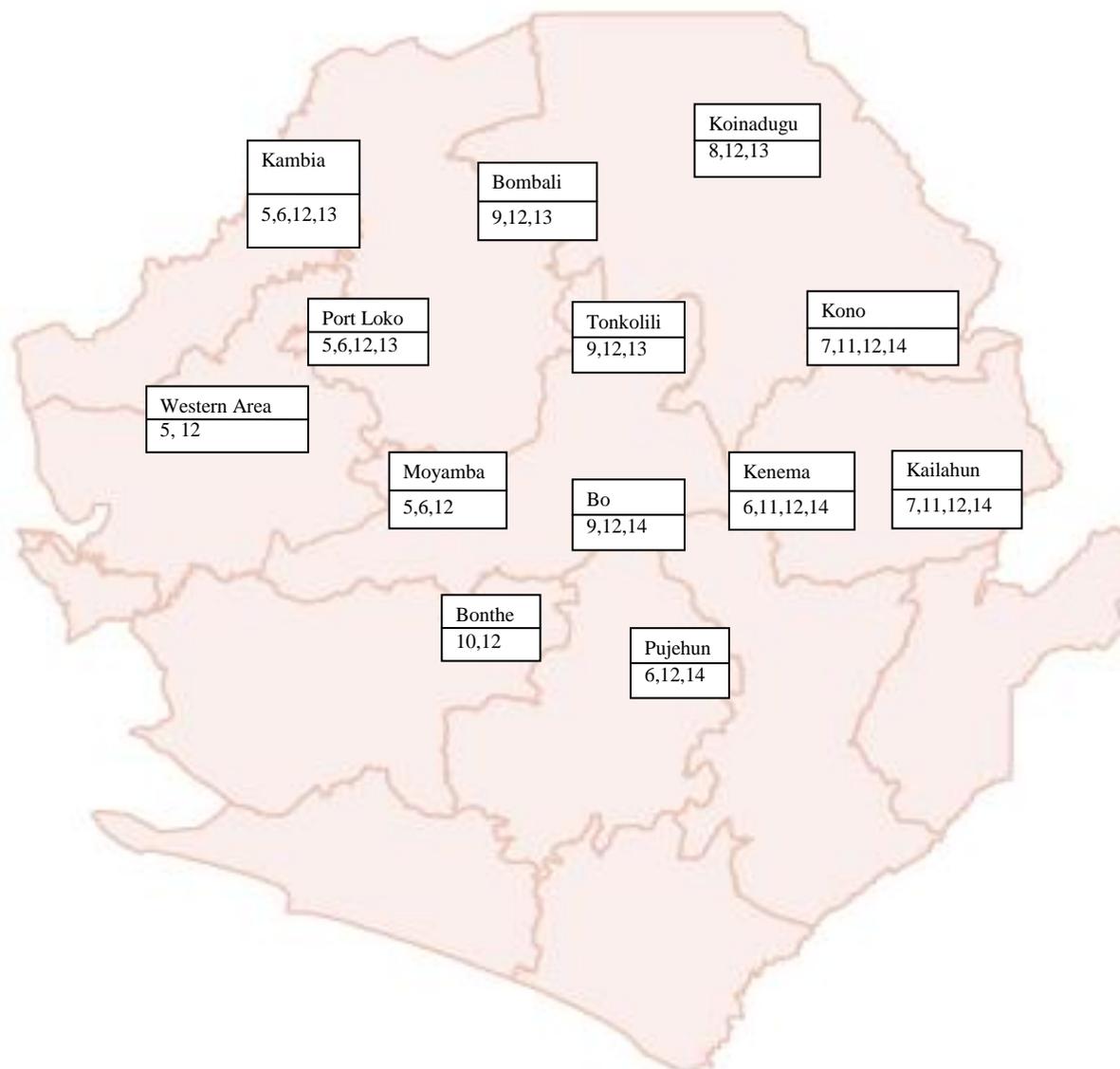
Institution	Strengths	Weaknesses	Opportunities/Threats	Remarks
National Commission for Social Action (NaCSA)	<ul style="list-style-type: none"> <li>- Successor to the National Commission for Reconstruction, Resettlement and Rehabilitation;</li> <li>- Multi-sectoral implementer supported by major donors;</li> <li>- Ready technical, management and delivery capacity;</li> <li>- Established, documented implementation procedures;</li> <li>- Financial management contracted to private accounting company.</li> </ul>	<ul style="list-style-type: none"> <li>- Does not operate directly in the agricultural sector;</li> <li>- Utilising funds from a number of bi-lateral and international donors, capacity constraints;</li> <li>- Mandate until 2008 – no long-term sustainability.</li> </ul>	<ul style="list-style-type: none"> <li>- Established implementation systems</li> <li>- Rapid project mobilisation</li> <li>- Procedures acceptable to major donors</li> <li>- Project identity may be obscured</li> <li>- Assuming responsibility for own financial management in 2006</li> <li>- Portfolio of large projects (up to USD42 million per project)</li> </ul>	Sustainability of the infrastructural projects through regular beneficiary maintenance should be introduced.
Department of Environment	<ul style="list-style-type: none"> <li>- Qualified professional staff;</li> <li>- Activities is based on the Environmental Act and Plan of Action;</li> <li>- The set up of the Forestry Commission in 2005 brought into focus the pressing environmental issues.</li> </ul>	<ul style="list-style-type: none"> <li>- Lack of logistics;</li> <li>- Lack of Incentives;</li> <li>- Limited Operational Budget.</li> </ul>	<ul style="list-style-type: none"> <li>- Procedures acceptable to donors;</li> <li>- Coordination can be established with PCU.</li> </ul>	WB is preparing the Wildlife Protection and Biodiversity Conservation Project which will improve capacity development among all stakeholder groups for sustainable protected area management.
Co-operatives	<ul style="list-style-type: none"> <li>- Movement established in 1949</li> <li>- Extensive coverage through 9 area offices</li> <li>- 1795 local societies, 41 of which registered since Sept 2002</li> <li>- Linked to Co-op Bank which has 80 credit groups in districts using Grameen Bank principles</li> </ul>	<ul style="list-style-type: none"> <li>- Exact number of post-war active local societies unknown;</li> <li>- Registration for society costs Le 30,000 plus Le 30,000 documentation fee under Section 8 of Co-op Act.</li> </ul>	<ul style="list-style-type: none"> <li>- Need for market channels</li> <li>- Movement widely known and understood</li> <li>- Need for small scale-credit in rural areas</li> </ul>	Range of activities: savings and credit, cocoa and coffee marketing, fishing, rice marketing, cassava marketing. The most successful societies are women's.
National Association of Farmers of Sierra Leone (NAFSL)	<ul style="list-style-type: none"> <li>- Long established, started in Bo in 1987</li> <li>- Strong government support</li> <li>- Sole lobby for mobilizing government support for farmers</li> <li>- Can undertake advocacy for Chiefdom level Associations</li> <li>- Only government-supported organisation which is running a micro credit programme for farmers</li> <li>- Current Management Committees (national, regional, district and chiefdom levels) are democratically elected (elections organised by the National Elections Commission in July-August 2003)</li> </ul>	<ul style="list-style-type: none"> <li>- Very few services provided to members by the organisation;</li> <li>- Lack of clear vision action plan at national level;</li> <li>- Great dependency to government support;</li> <li>- Linkages with community level Farmers Associations are weak;</li> <li>- High costs of registration;</li> <li>- Current data on member associations is incomplete;</li> <li>- Current range of support to village-level associations is small;</li> <li>- Data at the national level on members' farming activities and needs are inadequate;</li> <li>- Poor monitoring and supervision capacity at various levels;</li> <li>- Management committees at the regional/district levels are dominated by politicians (parliament members).</li> </ul>	<ul style="list-style-type: none"> <li>- Organized structure at all levels and extensive network (national, regional, district and chiefdom level)</li> <li>- Updating of data-base.</li> </ul>	Political organisation, pressure group: No technical orientation nor expertise in line with the limited possibilities of the masses of smallholders.
NGOs (International)	<ul style="list-style-type: none"> <li>- Known capacity in the field of rural development</li> </ul>	<ul style="list-style-type: none"> <li>- Generally emergency relief oriented;</li> </ul>	<ul style="list-style-type: none"> <li>- Expansion of activities to cover</li> </ul>	Experience shows that

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Institution	Strengths	Weaknesses	Opportunities/Threats	Remarks
	(agriculture, livestock, roads, etc...) – Speedy response for emergency implementation – Backstopping by HQ in home country – Access to bilateral funding	– High rate of international staff turn over; – Predominant religious affiliation; – Overheads are high; – Direct implementation of activities which is not in favour to capacity building; – Not always provide necessary services following training programmes.	developmental programmes and projects – Involve in training and skill development activities – Expansion of activities at the national level – Expand advisory role to Government and private sector institutions and companies – Experience in market information systems	farmers' confidence in Intl. NGO field staff is growing rapidly, as they have been better able to bring immediate results at community level. Should rely on and work with national NGOs for capacity building.
NGOs (National and Local)	– Known capacity; – Ability to reach remote areas; – Enjoys more trust of local communities; – Low overhead costs.	– Weak resource base (funds and human); – Established as emergency relief organisations with lack of development orientation; – Limited number of permanent staff; – Lack of well trained staff; – Often established on a opportunistic basis to capture funds.	– Expansion of activities; – Involve in training and skill development activities; – Could be good partners in projects implementation.	
FBOs & associations	– Located in communities; – Representative of their farming communities (leaders are elected periodically).	– Over-dominating leadership (few literate leaders resulting in limited rotation of leadership); – Weak structure and capacities.	– At district and chiefdom levels they offer a good potential for reaching target beneficiaries.	
Community based Organisations (CBOs)	– Direct link with communities; – Experience in implementing activities at the grassroots level on behalf of NGOs and NaCSA; – Remain in the community after project assistance has ended; – Registered with MLGCD Department of Rural Development and MAFS NGO/CBO Coordination Unit.	– Weaker leadership and group management skills – Not self reliant and often unstable (compared to NGOs); – Weak structure; – Inadequate staffing; – lack of resources.	– Need of external support to build their capacity to operate and to train the management staff – Opportunity: capacity built will remain in community and contribute to longer term benefits	Area of operation ranges from one village to two chiefdoms

## ANNEX 10: DONOR AND OTHER STAKEHOLDER INVESTMENT PROJECTS AFFECTING PHL REDUCTION

Figure A10.1. Project Locations



**Table A10.1. Project Overview**

	PROJECT	FUNDING AGENT	BUDGET (US\$)	DONOR CONTRIBUTION -		TIME FRAME	OPERATIONAL AREAS
				AMOUNT	%		
1	Seed Enterprise Enhancement and Development	FAO/Germany	2,200,000			2009 - 2011	Nation Wide
2	Farmers Field School Programme	OFTN/FAO	2,162,000			2003 - 20007	Nation Wide
3	Avian Influenza Programme	FAO	200,000			2007 - 2008	Nation Wide
4	Support to Strengthen the Veterinary Services (TCP)	FAO	304,000			2007 - 2008	Nation Wide
5	NERICA Rice Project	ADB	5,000,000			2005 - 2010	Moyamba, Port Loko, Western Area, Kambia
6	Agricultural Sector Rehabilitation Project	ADB	14,110,000	12,000,000	85	2006 - 2010	Kambia, Port Loko, Moyamba, Pujehun, Kenema
7	Rehabilitation and Community Poverty Reduction Project	IFAD	11,000,000			2006 - 2010	Kailahun & Kono
8	Rural Finances and Community Improvement Project	IFAD	10,900,000			2007 - 2011	Koindugu and the Rural Banks
9	Diversified Food Crop Production Project	IDB	10,500,000			2007 - 2011	Bombali, Bo, Tonkolili
10	Capacity for Oil Palm Production, Processing & Marketing	IDB/Malaysia	9,000,000			2005 - 2009	Bonthe – Matru Jong
11	Use of STABEX Transfer Project (USTP)	EU	5,250,000			2007 - 2009	Kailahun, Kenema, Kono
12	Rural and Private Sector Development Programme	World Bank	34,540,000	30,000,000	87	2008 - 2012	Nation Wide
13	Food for Recovery & Development (CP)	WFP	11,000,000			2007 - 2009	Kambia, Bombali, Koindugu, Port Loko, Tonkolili
14	Food for Recovery & Development PRRO	WFP	30,000,000			2007 - 2009	Bo, Pujehun, Kenema, Kono, Kailahun

**Table A10.2. Project Components / Areas of Interest**

	<b>PROJECT</b>	<b>AGRICULTURAL PRODUCTION</b>	<b>CAPACITY BUILDING / SUPPORT TO FBOs</b>	<b>PROCESSING</b>	<b>DOMESTIC MARKETING</b>	<b>EXPORT PROMOTION</b>	<b>FINANCING</b>	<b>PROJECT MANAGEMENT / POLICY FORMULATION</b>	<b>FEEDER ROADS</b>	<b>RESEARCH AND EXTENSION</b>
1	Seed Enterprise Enhancement and Development									
2	Farmers Field School Programme									
3	Avian Influenza Programme									
4	Support to Strengthen the Veterinary Services (TCP)									
5	NERICA Rice Project									
6	Agricultural Sector Rehabilitation Project									
7	Rehabilitation and Community Poverty Reduction Project									
8	Rural Finances and Community Improvement Project									
9	Diversified Food Crop Production Project									
10	Capacity for Oil Palm Production, Processing & Marketing									
11	Use of STABEX Transfer Project (USTP)									
12	Rural and Private Sector Development Programme									
13	Food for Recovery & Development (CP)									
14	Food for Recovery & Development PRRO									

**Table A10.3. Project Targets, According to Policy Objective**

	PROJECT	Increased agricultural productivity		Promote commercial agriculture through private sector participation		Improve agricultural research and extension delivery services		Mainstream cross-cutting issues		Promote efficient and effective resource management	
		2009	Overall	2009	Overall	2009	Overall	2009	Overall	2009	Overall
1	Seed Enterprise Enhancement and Development										
2	Farmers Field School Programme	450 demonstration sites in crops, livestock, aquaculture and packaging sites established nationwide		1500 FBOs supported to go into commercial farming  210 FBO capacitated to commercial levels							
3	Avian Influenza Programme										
4	Support to Strengthen the Veterinary Services (TCP)										
5	NERICA Rice Project										
6	Agricultural Sector Rehabilitation Project	3600 Ha lowland to be supported  2880 Ha tree crops to be rehabilitated: -900 Ha coffee -1,260 Ha cocoa -720 Ha oil palm		Rehabilitation and maintenance of: -410km feeder road -46 bridges -4 market studies -1 rice shed -5 sanitary facilities -5 stores		105 ABUs to cultivate 3,150 ha of seed rice  IAR to multiply: -5 Ha cassava -2 Ha sweet potato -1 Ha Groundnut -1Ha Yams -1Ha Maize 105 ABUs to cultivate: -630Ha cassava		5,975 farmers sensitized on HIV/AIDS  10,000 mosquito bed nets distributed			

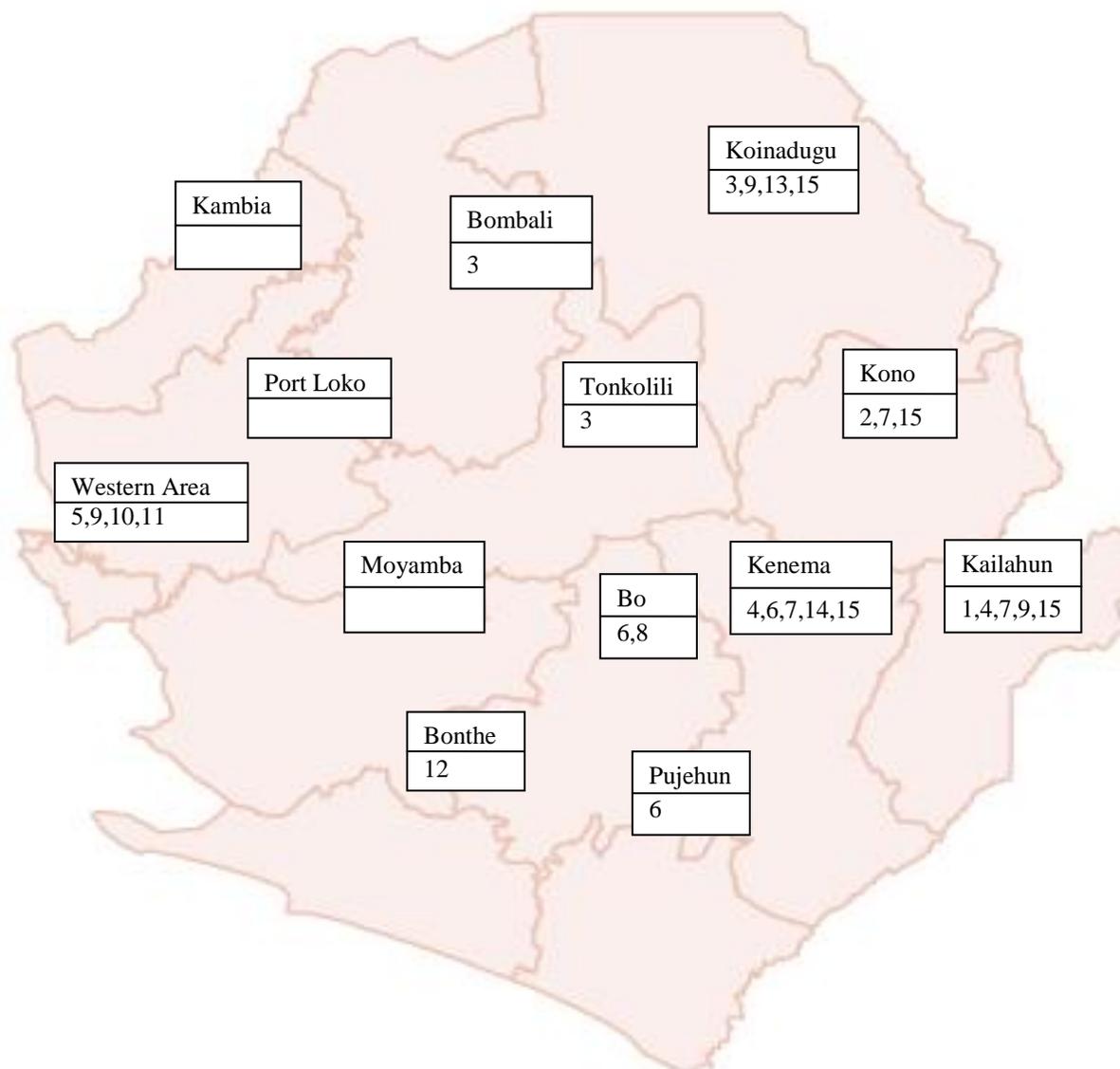
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						-210Ha sweet potato -105 Ha groundnut -105 Ha maize					
7	Rehabilitation and Community Poverty Reduction Project	Provision of: - 900 small ruminants - 3 oil palm presses  Rehabilitate 508 Ha  Expand 270 Ha		Rehabilitation of: - 45km feeder roads - 45 access roads - 50 foot paths - 6 foot bridges - 10 wells - 12 market/rice sheds  Construction of : - 6 stores - 14 drying floors - 10 water wells		28 Farmer Field Schools supported					
8	Rural Finances and Community Improvement Project			Formation of Grassroots Financial Service Associations				21 wards sensitized on HIV/AIDS issues			
9	Diversified Food Crop Production Project	Bo: -14 IVS groups -420 beneficiaries -350 Ha -876 Bu seed rice  Construction of 10 fish ponds in each of the project districts		Rehabilitate: -23km feeder roads: Bo -5 rural markets -3 central store -7 community stores -31 drying floors -14 water wells -14 VIP latrines		Frontline district staff deployed and engaged with farming communities					
10	Capacity for Oil Palm Production, Processing & Marketing										
11	Use of STABEX Transfer Project			Cocoa farmers are empowered to carry						A sector database is	

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	(USTP)			out processing and marketing activities						set up to enable better coordination of the sector by MAFFS	
12	Rural and Private Sector Development Programme			<p>Business models in key supply chain for the domestic regional markets</p> <p>Applications for the award of grants reviewed and payment to beneficiaries approved</p> <p>Training work-shops, export trade fairs, buying visits</p>							
13	Food for Recovery & Development (CP)										
14	Food for Recovery & Development PRRO										

**Figure A10.2. NGO Programme Locations**



**Table A10.5. Programs Overview**

	<b>NAME OF NGO</b>	<b>PROGRAM</b>	<b>FUNDING AGENT</b>	<b>BUDGET</b>	<b>TIME FRAME</b>	<b>OPERATIONAL AREAS</b>
1	Africare	Livelihood Expansion and Assets Development Program	US-AID	US\$ 1,002,964	2007-2010	Kailahun
2	World Vision Sierra Leone	Livelihood Expansion and Assets Development Program	US-AID		2007-2009	Kono
3	CARE	Livelihood Expansion and Assets Development Program	US-AID		2007-2009	Tonkolili, Koinadugu, Bombali
4	Catholic Relief Services	Livelihood Expansion and Assets Development Program	US-AID		2007-2009	Kailahun, Kenema
5	Welthungerhilfe (WHH)	Conservation of the Sierra Leonean Western Area Peninsula Forest Reserve (WAPFR) and its Watersheds	EC	€ 3,000,000	2009-2014	Western Area
6	Welthungerhilfe (WHH)	Food Security and Economic Development (FoSED)	EU	€2,500,000	2009-2014	Bo, Pujehun, Kenema
7	Welthungerhilfe (WHH)	Use of STABEX Transfers in Sierra Leone – Support to Cocoa/Coffee Production	EU	€1,800,211	2007-2009	Kenema, Kailahun, Kono
8	Welthungerhilfe (WHH)	Support to Rural Development	EU	€1,000,0000	2008-2010	Bo
9	Oxfam Great Britain	Women LEAP (Leadership, Empowerment, Accountability and Participation)	Oxfam internal funds (currently)	£30,000 (further fundraising is pilot is extended)	2009-2012	Kailahun, Koinadugu, Western Area
10	COOPI	Enhancing Food Security and Development Opportunities for Disadvantaged Groups in Freetown	EU			Freetown
11	Concern Worldwide	Enhancing Food Security and Development Opportunities for Disadvantaged Groups in Freetown	EU			Freetown
12	Christian Aid	Bonthe Food Security Project	EU			Bonthe
13	CARE		EU			Koinadugu
14	Action Plus	Livelihood Project	CORD Aid		2009-2012	Kenema district Chiefdoms Nongowa and Small Bo
15	PAGE: ACDI/VOCA, ARD, Inc. and World Vision	Promoting Agriculture, Governance and Environment (PAGE)	US-AID	US\$ 13,200,000	2008-2012	Kono, Kailahun, Kenema, Koinadugu

**Table A10.6. Program Components / Areas of Interest**

	<b>PROGRAM</b>	<b>AGRICULTURAL PRODUCTION</b>	<b>CAPACITY BUILDING / SUPPORT TO FBOs /COMMUNITIES</b>	<b>PROCESSING</b>	<b>DOMESTIC MARKETING</b>	<b>EXPORT PROMOTION</b>	<b>FINANCING</b>	<b>HEALTH/ GENDER/ EDUCATION</b>	<b>FEEDER ROADS</b>	<b>RESEARCH AND EXTENSION</b>	<b>FORESTRY</b>
1	Livelihood Expansion and Assets Development Program (Africare)										
2	Livelihood Expansion and Assets Development Program (WVSL)										
3	Livelihood Expansion and Assets Development Program (CARE)										
4	Livelihood Expansion and Assets Development Program (CRS)										
5	Conservation of the Sierra Leonean Western Area Peninsula Forest Reserve and its Watersheds										
6	Food Security and Economic Development (FoSED)										
7	Use of STABEX Transfers in Sierra Leone – Support to Cocoa/Coffee Production										
8	Support to Rural Development										
9	Women LEAP (Leadership, Empowerment, Accountability and Participation)										
10	Enhancing Food Security and Development Opportunities for Disadvantaged Groups in Freetown (COOPI)										
11	Enhancing Food Security and Development Opportunities for Disadvantaged Groups in Freetown (Concern)										
12	Bonthe Food Security Project										
13	(CARE –EU funded project)										
14	Livelihood Project (Action Plus)										
15	Promoting Agriculture, Governance and Environment (PAGE)										

**Table A10.7. Program Targets/Expected Results, According to Policy Objective**

	<b>PROJECT</b>	<b>Increased agricultural productivity</b>	<b>Promote commercial agriculture through private sector participation</b>	<b>Improve agricultural research and extension delivery services</b>	<b>Mainstream cross-cutting issues</b>	<b>Promote efficient and effective resource management</b>
1	Livelihood Expansion and Assets Development Program (Africare)	4000 Farmers to be trained in FFS	45 farmer groups and 20 agro-enterprises established  Establishment of 62 community post-harvest assets and 75 km farm-to-market roads			
2	Livelihood Expansion and Assets Development Program (WVSL)	Human and livelihood capacities protected and enhanced for: -16,000 poor farmers -3,4000 economically marginalized youth -16,000 pregnant and lactating women	Improved community infrastructure and access to service providers for 375 rural communities		990 community based organization in both rural and urban areas are able to practice and demand the basic principles of food Governance (i.e. transparency, accountability and representation).	
3	Livelihood Expansion and Assets Development Program (CARE)					
4	Livelihood Expansion and Assets Development Program (CRS)					
5	Conservation of the Sierra Leonean Western Area Peninsula Forest Reserve and its Watersheds		-innovative pro-poor financing for forest conservation piloted, and private business enhanced in area of eco-tourism		-The WAPFR is newly demarcated and zonal management plans are established  -local communities actively participating and benefits from service of in reserve	
6	Food Security and Economic Development (FoSED)	Sustainable farming systems are developed and 'best agricultural practices' promoted	Market opportunities for agricultural and forest products are promoted and rural households empowered to make use of them		Mechanism for the sustainable management of natural resource are introduced  Local institutions are strengthened to promote the economic development process	

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7	Use of STABEX Transfers in Sierra Leone – Support to Cocoa/Coffee Production		Increased production, quality, marketing of cocoa and coffee  Strengthening of Farmer Associations  Private sector investment in cocoa and coffee			
8	Support to Rural Development	Agricultural production in swamps and uplands is diversified and improved in a sustainable and environmentally friendly manner			Agricultural production in swamps and uplands is diversified and improved in a sustainable and environmentally friendly manner  Rural populations uses safe drinking water and sanitation facilities  Communities to acquire life skills and position of women strengthened  Local government and community organization strengthened	
9	Women LEAP (Leadership, Empowerment, Accountability and Participation)		quality local (nutritional and reasonably costed) products are enjoyed by a local markets		-women producers are recognized as successful entrepreneurs supporting their households & communities  -women and men understand and help in transforming gender roles towards sustainable development  -men and women work together to take action on discrimination and violence that limits women’s development.	
10	Enhancing Food Security and Development Opportunities for Disadvantaged Groups in Freetown (COOPI)	Food security of 400 (peri) urban subsistence producers (mainly women) is enhanced and their vulnerability to shocks reduced by improving the productivity and sustainability of the group farming systems	400 poor urban and peri-urban commercial producers and 700 unemployed youth increased their income and employment through value chain approach			Freetown multi-stakeholder forum on urban agriculture and food security is consolidated
11	Enhancing Food Security and Development Opportunities for	Enhanced and sustained food production through innovative and environmentally-sound	Marginalized households achieve increased income through livelihoods option that lead to increased purchasing power		Strengthened decentralization process and improved capacity of local institutions, civil society and private sector	

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	Disadvantaged Groups in Freetown (Concern)	farming techniques			Reduced vulnerability to shocks and stresses	
12	Bonthe Food Security Project	Small-scale farmers groups have increased access to rice, cassava, palm oil and groundnut production facilities and techniques	Small-scale farmers groups have increased access to - diversified their food and cash crop production -improve access to storage, processing and marketing facilities -fish production, processing, marketing		Targeted communities have improved access to nutritional and sanitation facilities, techniques and information  Increased organization capacity of MCSL and government structures	
13	(CARE –EU funded project)	Targeted FS have suitable access to inputs and technical skills for increased productivity and value addition	Targeted FA have increased organizational capacity to ensure autonomy and sustainability  Targeted FAs involved in the development of at least one value chain		Voice of the FA is heard and taken into consideration at chiefdom and district levels	
14	Livelihood Project (Action Plus)		600 women trained in basic business management and engaged in livelihood and income generating activities, and received basic		livelihood capacity of 600 women enhanced, resulting in greater self-reliance and contribution to community development processes	
15	Promoting Agriculture, Governance and Environment (PAGE)	375 new Farmer Field Schools	65 new Marketing Associations  15 new Village Savings and Loans Associations (VSLA)s established  110 existing VSLAs with increased capacity		Formation of 6 new Forest Co-management Committees	

### ANNEX 11: ANALYSIS OF ADB COUNTRY PROJECTS

Project name	sub-sub sector	status of project	start date	end date	total cost in UAC	% disbursed	Post-harvest and storage activities	
							Existing (type)	Proposed/ potential
Artisanal Fisheries Development Project (AFDEP)	Fisheries Sub Sector	Ongoing  <u>Main activities:</u> 1. artisanal fisheries development 2. rational management of fisheries resources 3. institutional capacity building 4. credit services 5. project management	06/01/03	31/12/09	10,000,000	43.90%	<ul style="list-style-type: none"> <li>• 36 motor cycles provided for extension agents</li> <li>• 10,000 individuals of 382 which 264 fisher groups trained in fish processing techniques</li> <li>• 32 extension staff trained</li> </ul>	<ul style="list-style-type: none"> <li>• 4 Fish Landing and Processing Centres valued at UA 5,859 m being constructed at Goderich, Tombo, Senghe and Bonthe</li> </ul>
New Rice for Africa (NERICA) Dissemination Project	Crops (Rice)	Ongoing  <u>Main activities:</u> 1. Feeder Roads Rehabilitation 2. Construction of storage structures, Drying Floors and Marketing Sheds 3. Installation of processing equipments 4. Inventory of NERICA production country wide 5. Release of NERICA varieties 6. Financial and organizational Management Training 7. Training on seed quality control	20/03/2005	31/12/2010	2,850,000	39.09%	<ul style="list-style-type: none"> <li>• Rice Mill (4)</li> <li>• Rice Threshers (4)</li> <li>• Rice Graders (4)</li> <li>• Rice Destoners (4)</li> <li>• Rehabilitation of 270 Km Feeder Roads</li> </ul>	<ul style="list-style-type: none"> <li>• Store house (4)</li> <li>• Rice store (4)</li> <li>• Marketing Sheds (4)</li> <li>• Drying Floor (4)</li> <li>• Training of 1,000 Farmers on Harvest and Post-harvest practices</li> <li>• Training in Post-harvest Losses</li> </ul>

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Agricultural Sector Rehabilitation Project (ASREP)	Agric. Sub Sector	Ongoing  <u>Main activities:</u> 1. Agricultural Production 1.1 Support to increased crop productivity; 1.2 Support to improved seed production; 2. Capacity Building. 2.1 Strengthening of capacity of MAFFS and Outreach stations; 2.2 Rehabilitation of rural infrastructures 2.3 Improvement of Commercial and Processing facilities 3. Project Management and Co-ordination	21/02/06	31/12/11	12,000,000	16.50%	<ul style="list-style-type: none"> <li>• 105 rice cutters</li> <li>• 40 rice threshers</li> <li>• 40 milling machines</li> <li>• Post-harvest training of 1250 farmers</li> <li>• Training of extension agents in post-harvest technology</li> <li>• 65 motorcycles provided to enhance mobility for extension agents</li> </ul>	<ul style="list-style-type: none"> <li>• Drying floors to dry farm products</li> <li>• 5 stores and 5 market sheds to improve marketing</li> <li>• 410 km feeder roads will enhance transportation of farm produce</li> <li>• Training of 32100 farmers in post-harvest technology in Farmer Field Schools</li> </ul>
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## ANNEX 12: LIST OF PEOPLE MET

Mr Alfred Dixon	Director General Sierra Leone Agricultural Research Institute
Mr Kevin Gallagher	FAO Representative
Mr Samuel Ofori Onwona	Resident Representative, ADB
Mr Aloysius Cyril Lahai	Assistant FAO Representative
Ms Paxina Chileshe	Senior Analyst, ADB
Mr Cecil Nartey	Principal Country Programme Officer, ADB
Mr John M. Kallon	Agricultural Officer, ASREP – ADB/MAFFS
Mr Paolo Girlando	Project Manager, EU STABEX Project
Mr Sahr Marvin Bockari-Gevao	Senior Lecturer, Dept. of Agric. Eng., Njala University
Mr Kareem Sesay	Department of Agricultural Engineering, Njala University
Mr Mohamed Fouad Sheriff	Director of Fisheries, Ministry of Fisheries and Marine Resources
Mr Braima James	Manager, Unleashing the Power of Cassava (UPoCA) Project, IITA-Sierra Leone
Mr A. Tom Roberts	Agriculture Productivity Specialist, Programme for Agriculture Governance and Environment (PAGE) Project, USAID
Mr Braima S. Mansaray	Deputy Director of Crops, Ministry of Agriculture Forestry and Food Security
Mr Joseph Koroma	Director, Planning Evaluation Monitoring and Statistics Division, Ministry of Agriculture Forestry and Food Security
Mr Patrick Abu	Director of Crops, Ministry of Agriculture Forestry and Food Security
Mr M.A.D. Kargbo	Produce Unit, Crops Division, Ministry of Agriculture Forestry and Food Security
Mr Ibrahim shamie	Crop Protection Section, Crops Division, Ministry of Agriculture Forestry and Food Security
Mr John Lahai	Tree Crops Section, Crops Division, Ministry of Agriculture Forestry and Food Security
Mr Sheriff	Statistics, Planning Evaluation Monitoring and Statistics Division, Ministry of Agriculture Forestry and Food Security
Ms J. Roberts	Consultant CORAD-LINKS
Mr Saffa M. Kallon	NERICA Project, ADB
Mr Sam G. Fornah	NERICA Project, ADB

