Figure 10: Vegetable Value Chain

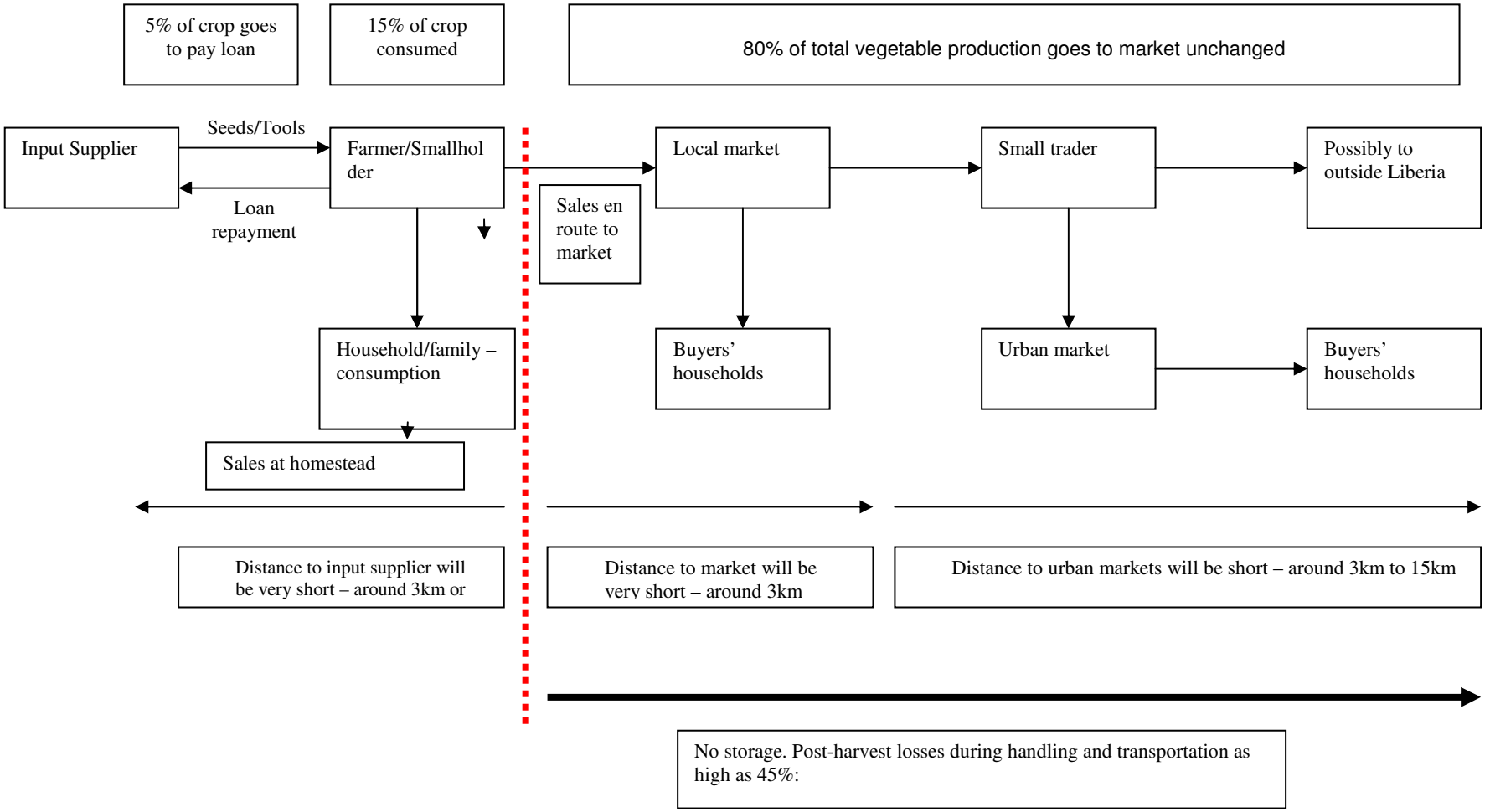


Figure 11: Cassava Value Chain

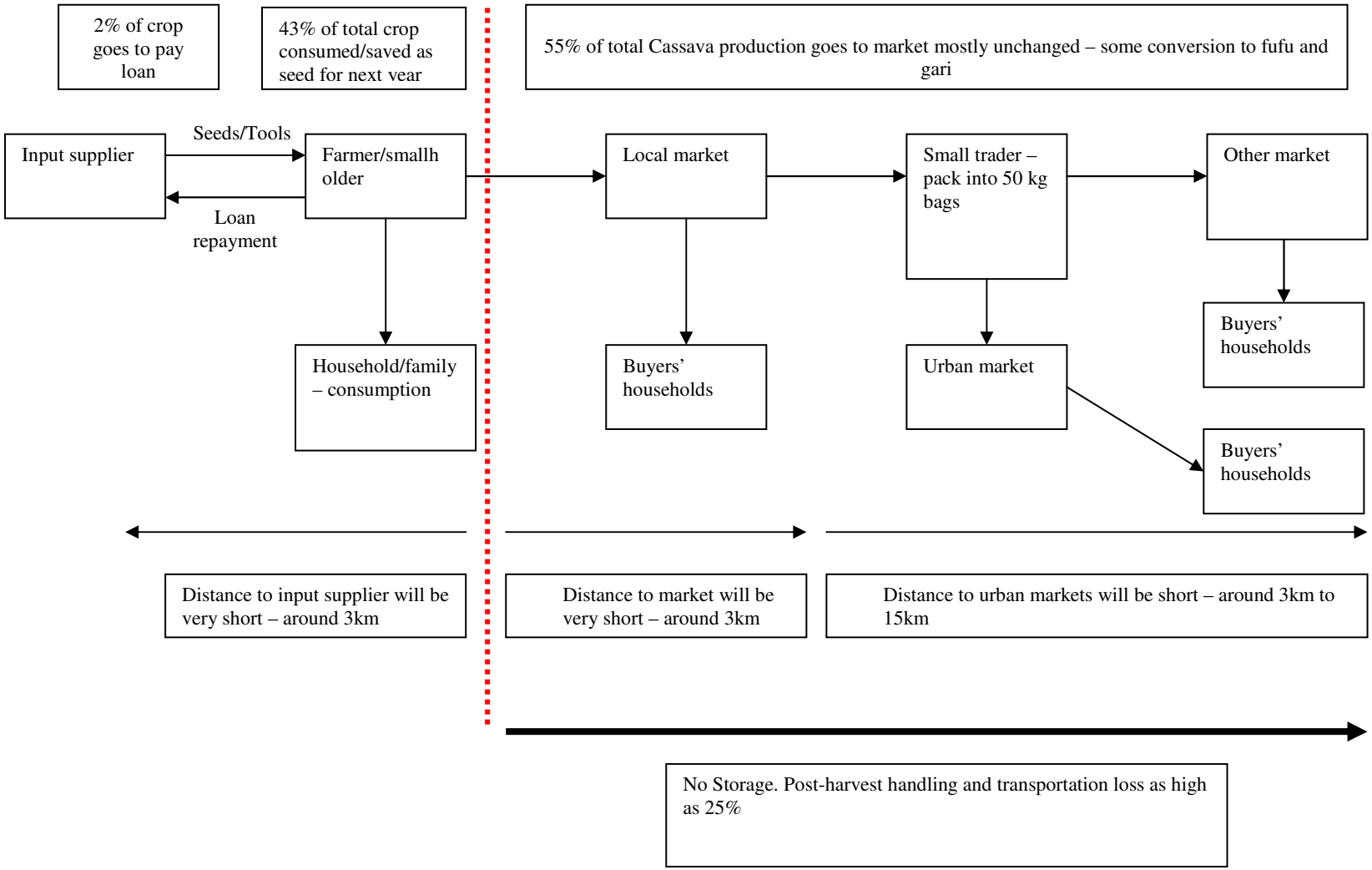
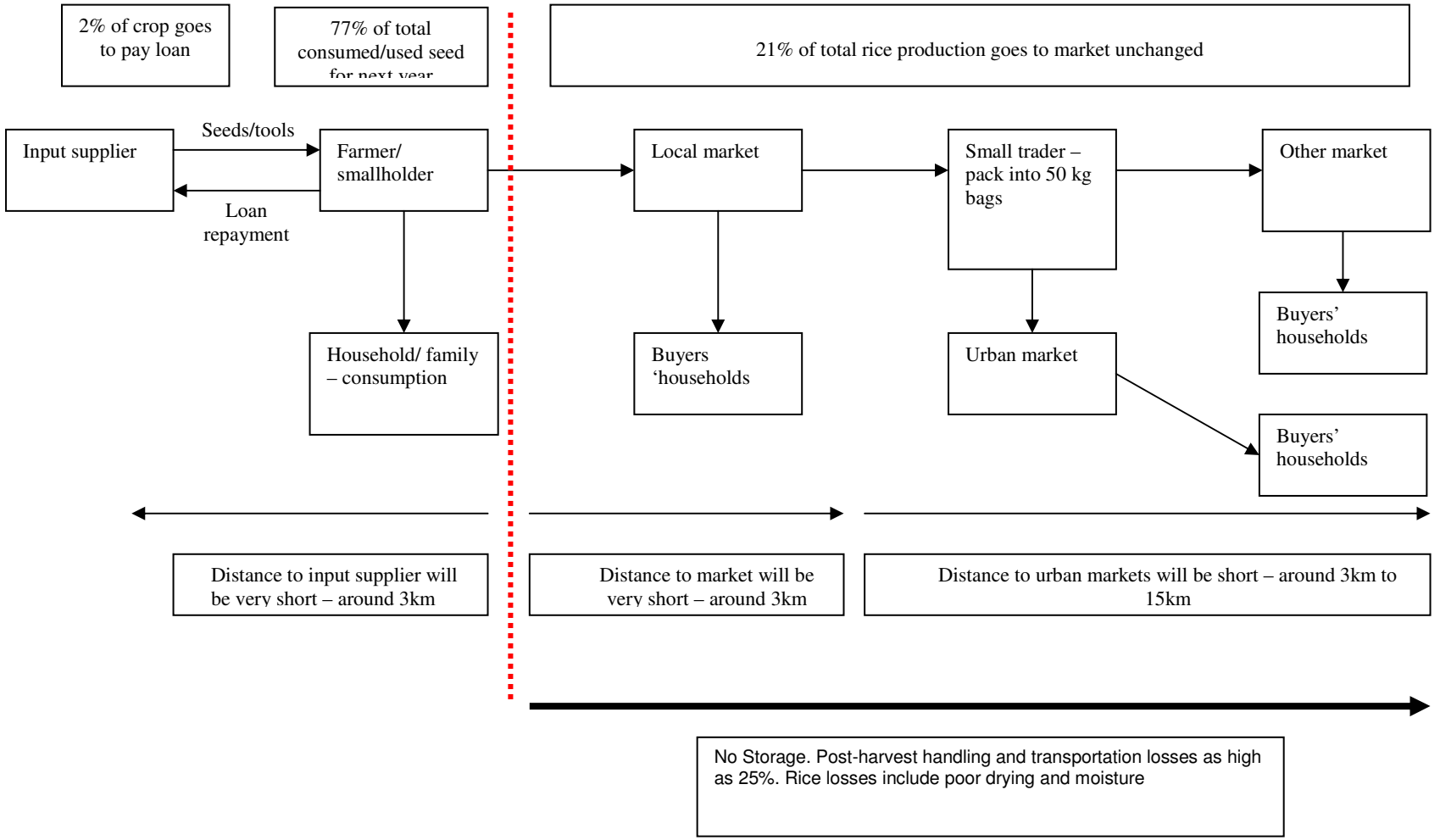


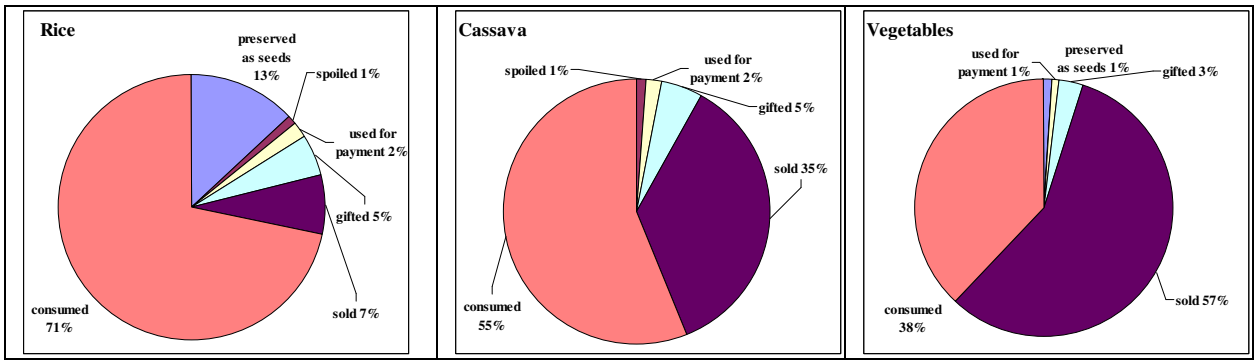
Figure 12: Upland Rice Value Chain



116. **Food markets are small; the majority of rice production is consumed within the household and there is limited market-orientation among farmers.** CFSNS (2006) also provides information on the degree of subsistence production for the major food crops in Liberia. Using participatory rural appraisal tools respondents were requested to divide the total 2005 harvest of the reported crops into sub-groups based on how crops were utilized by the household in order to obtain estimates of how much of the total harvest was consumed, sold, gifted, used as payment, preserved as seeds or spoilt (Figure 13). Across all food crop types, about 5% were given as gifts to other community members or relatives, and around 2% were used as payments. It was reported that only 1% were spoilt due to wrong preservation and storage techniques, although parallel qualitative research indicates that this is significantly under-reported

117. On average, only 7% of the rice produced was sold; however, there were differences across the country, with better connected counties seeing an increased proportion of rice marketed. Households in Nimba, for instance, sold 17% of their production of rice; the figure was 14% in Grand Cape Mount and 11% in Montserrado. Selling of vegetables dominates in Nimba (72%), Grand Bassa (67%) and Montserrado (66%). Cassava was also mainly consumed by the producer (57%), although households were more likely to market cassava than rice (35% versus 7%). Cassava was mainly sold in Grand Cape Mount, Montserrado and River Gee (50% or more) whereas 70% or more of cassava was consumed by the producer in River Cess, Grand Kru, Grand Bassa and Sinoe. At the same time, lack of markets was rarely mentioned as a (priority) constraint by households.[25]

Figure 13: Disposal of Food Crop Harvest by Rural Households



Source: CFSNS (2006).

118. **The value chain analysis, validated by discussions with stakeholders, illustrates the high degree of wastage along the value chain.** Causes include losses due to poor handling, rot and storage losses. All sub-sectors suffer equally, although some suffer more than others because they comprise perishable foods. Maintaining the quantity and quality of the unprocessed output is a clear priority to be addressed through knowledge (to improve handling techniques) as well as small-scale investments in storage and marketing infrastructure.

119. Farmers themselves have identified a number of constraints on output, of which many relate to the lack and/or cost of inputs as well as losses from pests. Animal pests are a major constraint – 'groundhog attacks', referring to various types of bush animals who eat

[25] According to CFSNS (2006), on average only 2% of farming households saw this as a constraint. The percentage was higher in more remote Counties such as Cape Mount (6%) and Grand Bassa (4%).

crops standing in the field, were reported by one-third of farming households. More than 55% of households in Sinoe, Grand Kru, and River Gee reported suffering from this problem. Bird attacks were reported by 17% of all farming households. These attacks were more frequently mentioned by households in Margibi (28%) and Gbarpolu (20%). In total, 13% of the households sampled indicated that their household was engaged in activities other than farming, and another 13% mentioned the lack of land both in terms of quality and quantity. The latter was most frequently reported in Montserrado and Margibi, by 42% and 29% of households, respectively. Six per cent of all households reported that they returned too late for the planting season – for obvious reasons this was most commonly reported by households that had land but did not farm in 2005. In Lofa, 24% of households reported this constraint, followed by Bomi with 18%. All other constraints were only mentioned by around 1% of the surveyed households, and showed regional variation: plant disease and insect attacks were most common in Grand Bassa (12%) and Margibi (13%), and more than 25% of households in Bong and Margibi wanted to have better access to pesticides. Loss of harvest due to heavy or early rains was only reported by households in Grand Kru (12%). Across all counties lack of training and marketing opportunities was mentioned by very few households, probably due to the fact that other issues are more pressing.

120. The CFSNS has shown that, currently, constraints on agricultural production varied depending on whether the household was currently farming or not and whether the household had access to land (Table 10) Across all groups, lack of seeds and of tools were the two most frequently mentioned constraints – they was reported half of the households in the overall sample. The third constraint was a lack of financial capital to purchase agricultural inputs. This was followed by lack of household labour to carry out the labour-intensive work of brushing and clearing, which contributes to the fact that farms in Liberia are relatively small. This reason was more frequently given by households that had land but did not cultivate in 2005, particularly in Lofa and Bomi Counties. A summary of the strengths and weaknesses of various food crops is reported in Table 11.

Table 10: Household-reported Constraints to Agricultural Production

	Farming HHs	HHs with land but not farming	HHs without land	Total
Lack of seeds	50	56	46	50
Lack of tools	47	52	54	50
Lack of financial capital	29	39	30	31
Lack of HH labour	27	37	23	28
Groundhog attack	30	10	7	19
Bird attack	17	5	5	19
HH engaged in other activity	10	12	18	13
Lack of arable land	3	3	34	13
Returned late for planting season	2	25	3	6
Total	48.5	18.0	33.5	100

Source: CFSNS (2006). Note: Figures are the percentage of all households reporting positively.

Table 11: Strengths and Weaknesses and Comparative Advantage of Selected Food Crops

Value chain for:	*Strengths*	*Weaknesses*	*Demonstration of comparative advantage to meet* **domestic household food security, nutrition, incomes, pro-poor growth, as well as for regional and international exports**
Cereals (especially rice)	There are two types – upland and lowland. Most farmers cultivate upland. There is a strong farming awareness of rice and some potential for growth in this area. Demand is high as rice is a staple crop of Liberia.	Processing is by hand, production mainly for home consumption and little opportunity for surplus as imports (from China and USA) are readily available (even if expensive). The number of harvests achieved per year is low – currently it is estimated that only one crop per year is achieved when in fact this should be at least doubled. Productivity per hectare is also too low at about 25% that achieved outside Liberia. It is currently about 1 mt/ha. (Based on several interviews with rice/paddy farmers and verified by the national consultant on food crops.)	Production of local rice is not seen as a boost to income but rather to contribute to food security as a staple food source. Currently there is no comparative advantage seen either regionally or internationally for upland rice. Production is to satisfy subsistence needs rather than market needs, and is supplemented by rice imports. No government policies are in place yet to provide an incentive to reverse this. A possible area is organic rice production in the future but this would need substantial investment in infrastructure, food handling and packaging to reach certification stage (very little fertilizer and pesticide application takes place currently). On the other hand, DRC calculations suggest that lowland rice has comparative advantage in supplying urban markets. There is therefore a good prospect for achieving self-sufficiency by investing in the expansion of that system of production.
Root crops (the main crop considered is cassava)	As with rice production, cassava growing is popular and meets some food security needs and some cash production needs. Value adding potential exists by converting the commodity, possibly into bio-fuel or other products such as starch. Low technology would be a possibility for meeting local market demand.	Industrialization of cassava production and post-harvest value adding is limited and would require investment in hardware, training and promotion. Production losses are high from pests and plant diseases.	The current production of root crops shows some comparative advantage and the potential exists to industrialize the sub-sector. Further research would need to be conducted into the sub-sector to explore local and industrial demand and to undertake feasibility studies to examine viability. Calculations by the mission suggest good DRC ratios.

Value chain for:	*Strengths*	*Weaknesses*	*Demonstration of comparative advantage to meet* **domestic household food security, nutrition, incomes, pro-poor growth, as well as for regional and international exports**
Vegetables (the main crops possibly are items such as bitter ball and peppers but it is difficult to be sure because of the limited variety in markets)	A market exists for a number of vegetables although items such as tomatoes and cucumbers, for example, were not seen at points of sale. Half of the vegetable production is for sale in markets, whilst the other half is for home consumption. The markets are more likely to be urban centres. There is the potential to focus on vegetable garden and production systems led by women.	Almost no value adding was observed. Some vegetable leaves were cut for the consumer at the point of sale. Generally poor handling, storage and packaging caused large post-harvest loss.	There would seem to be scope for expansion of the vegetable sector by both reducing post harvest loss and increasing production and productivity. Improved transportation and other infrastructure, as well as training and increased access to competitive lines of credit could provide an incentive for an increase in vegetable production, handling and marketing. The production system would need to change substantially and some specialization would have to take place. Currently large volumes of vegetables are coming into Liberia from across the borders with Guinea and Cote d'Ivoire or, as seen in Monrovia, as frozen produce from Europe, USA or the Middle East. DRC calculations show that vegetable production has reasonable comparative advantage. With greater effort and investment it may be possible to bring the DRC down even further.

121. **Comparative evaluation of costs of production between crops and of domestic production compared with imports helps to illustrate the potential viability of agricultural strategies**. It is important not only for assessing the prospects of overall agricultural development, but also for gauging the prospects for self-sufficiency, which is an important political objective. The reason for this is that farmers decide what to grow based on their own perceptions of potential gains and constraints, while public policies on rural infrastructure, irrigation, water control, technology and prices can influence farmers' decisions about which crops to grow (Ahmed, 2000). Farmers may prefer, for instance, to diversify out of rice production because other crops are more profitable. This will undermine self-sufficiency goals, but may be an optimum strategy from the point of view of the individual households, as well as maximizing aggregate economic growth and attaining poverty reduction goals.

122. Initial estimates of the domestic resource Cost (DRC)[26] of domestic production are presented in Table 12, which covers the three food crop sub-sectors: rice, cassava and vegetables. Six models have been developed. This table also includes a set of data on the size of farm examined, showing that they are all very small in scale and generally practice mixed subsistence and commercial farming. These results indicate that upland rice production for the supply of urban markets has no comparative advantage at present, with a DRC ratio of approximately 1.43. Its use of domestic resources is too high and better use could be made of finances to grow other commodities for the market. However, because the private profit is just positive, producers have an incentive to produce domestic rice for home consumption and supply to nearby village markets. Lowland rice production shows a good DRC ratio at 0.30, which suggests that domestic production should be encouraged using this system of production. Furthermore, lowland rice production is labour intensive and could therefore provide employment opportunities for both men and women.

123. Evidence from West Africa suggests that competitiveness in domestic rice production has been increased in recent years in countries with effective support systems. Table 13 shows the changes in DRC during the past three decades for a number of West African countries. In all cases the DRC for rice improved between 1978 and 1996, showing that production systems can change if improved technologies become available and there is policy support to realize the shift.

[26] DRC is defined as: "the ratio of domestic factors used to produce one unit of rice (e.g. labour and capital invested in the production) to the added value generated by this unit of rice (i.e. the value of the production minus all the investment costs, e.g. seed, fertilizer, and energy). The DRC is estimated using social prices – that is, prices that would prevail in the absence of government intervention on input and output markets (e.g. subsidies on fertilizer sales price, duty on rice imports) or market failure (monopoly). If the ratio is greater than one, more domestic resources are invested in producing the commodity than the added value generated by the production activity – there is no comparative advantage in producing the commodity and the domestic resources would be more efficiently utilized if allocated to another productive activity. Conversely, if the ratio is below one, the commodity is produced using less domestic resources than the added value generated – rice producers do have a comparative advantage." (WARDA, 2003).

Table 12: Domestic Resource Cost Estimates for Rice, Root Crop and Vegetable Production

Production system	Size of smallholding and percentage used for commercial production	Private profit (US$)	Social profit[a] (US$)	DRC (ratio)	Comparative advantage
Model 1: Upland rice (Bong)	1.4 ha (of which 21% produce is sold)	7.27	-16.63	1.43	None
Model 2: Lowland rice (Nimba)	1.6 ha (of which 89% produce is sold)	17.29	340.89	0.30	High
Model 3: Root crop – Cassava (Nimba)	0.6 ha (of which 55% produce is sold)	99.90	168.36	0.16	Very High
Model 4: Vegetable production (Grand Cape Mount)	0.8 ha (of which 80% produce is sold)	465.48	1,160.40	0.04	Very High
Model 5: Bitterball–Plantain–Other vegetable (Maryland)	0.8 ha (of which 40% produce is sold)	25.79	43.93	0.19	Very High
Model 6: Bitterball–Plantain (Maryland)	0.4 ha (of which 50% produce is sold)	3.43	10.07	0.47	High

Notes: (a) involves using shadow rather than market prices.

Table 13: Comparisons of DRC Calculations for Rice Production in West Africa

	1978	1993	1995	1996
Cote d'Ivoire	1.68	1.02	0.73	n.a.
Mali	0.69	n.a.	n.a.	0.40
Senegal	1.66	n.a.	n.a.	1.12
Sierra Leone	0.89	n.a.	0.55	n.a.

Sources : WARDA (2003).

124. The results of the DRC analysis and the comparison between lowland and upland (or swamp) rice are important. Lowland rice production shows higher potential with good management than upland rice production; it offers higher yields and returns to labour, capital investment and general efficiency. Indeed, previous studies have suggested that "the development of the swamp is the key to producing a marketable surplus" (Parker, 2001). Nevertheless, the (overall, negative) experiences of previous agricultural development projects that encouraged swamp rice production provide a number of salutary lessons, and outstanding challenges remain. These are summarized in Box 4.

125. **Vegetable growing is by far the most profitable food crop production activity, with cassava (root crop) production also being relatively profitable**. As is perhaps to be expected, Liberia has high comparative advantage in producing cassava and vegetables for its urban markets, whose reliance on fresh produce is currently only met by domestic production.

Box 4: Lessons from Agricultural Development Projects for Swamp Rice

- Land ownership: Many swamp developments are communally owned and individuals do not have identifiable plots but are allotted plots annually, according to need and past stewardship. This does not encourage the farmer to invest in land improvement.
- Food security: In an effort to be fair, swamps developed with development funds have provided land for the greatest number, resulting in only a few plots per family. The plots allocated to each family are insufficient to meet their food requirements and therefore necessitate their developing an upland farm in addition, to ensure food security.
- Conflict with upland farming calendar. Upland farming takes precedence for many, despite the lower yields. A variety of crops are grown in the upland farm, giving a staggered harvest, which lends itself to food security and food diversity.
- Maintenance: The major work of upland farming is land preparation (the current crop). The major work in swamp rice production is the contribution to maintenance of "communal" structures (i.e. ensuring future crops). The social change from "making your own farm" (working for today) to a communally maintained farm "investing for tomorrow" is extremely difficult and assumes a natural tendency for co-operation that does not usually extend beyond the extended family.
- Timeliness and sensitivity of operations: This is more critical in swamp rice production than upland production. In particular the critical factors are weeding and irrigation.

N. Tree Crop Production

126. **Tree crops (rubber, cocoa and coffee) make a very important contribution to the Liberian economy**, accounting for 22% of GDP in 2005. In addition tree crops are a significant element of export earnings. Rubber currently accounts for almost 90% of total exports because timber exports, which made up 50–60% of the total exports until the early 2000s, have been eliminated due to sanctions. Also, rubber production is a major source of formal employment, with approximately 18,500 workers on commercial rubber farms (MoF, 2006). It is estimated that almost 40,000 households produce cocoa in Liberia (FAO/MoA, 2001). Nimba, Bong and Lofa Counties account for most of the tree crop production.

127. **Tree crops are grown on a range of production systems**, including *smallholder farms* that produce food and export crops (predominantly coffee and cocoa, and more recently rubber), plus oil palm (both for home-consumption and for the market) and to a lesser extent coconut; *commercial farms* including parastatal corporations (LPMC, LCC and LPPC); and *foreign-owned concession* plantations that produce rubber.

128. The Firestone rubber plantation is the largest in Liberia, and it is also the world's largest contiguous industrial rubber plantation. Five other large plantations have been established (Box 5). Despite the fact that regular replanting was interrupted by civil conflict in many of the industrial plantations the tree stock is still predominantly in the productive phase and consists of improved germplasm. By contrast, fieldwork undertaken as part of this study found that only 10–21% of the rubber stock on small farms is improved. However, over 75% of the smallholder farms were found to be newly planted.

129. While other tree crops (especially rubber) are mostly planted in pure stands, crop diversification is common among cocoa farmers, with cocoa often associated with secondary food crops interspersed among the stand. Germplasm available to farmers is mostly what is available from seeds from harvested cocoa pods or sapling tree shoots and is therefore

unimproved (90–95%). Although improved germplasm arrived in Liberia in the 1970s its use is not common. Cocoa trees of the unimproved variety become viable after six years, and have a productive lifespan of 20–25 years, after which economic productivity decreases. The vast majority of cocoa trees in Liberia are more than 20 years old.

Box 5: History of Rubber Concessions

The Firestone Plantation Company (located in Harbel, Margibi County) was granted a 99-year concession for one million acres (approximately 416,670 ha) in 1926. Originally the company was subject to a land tax of 6 cents per acre, and Liberian corporate income tax (a maximum of 45% of net profits). The Firestone is at present owned by Bridgestone. The National Transitional Government of Liberia (NTGL) renewed the concession agreement in 2005. This agreement was reviewed in 2006.

The Cavalla Plantation in Maryland County was initially part of the Firestone concession, but was passed on to the Doe government in 1981, and the concession was awarded in 1983 to a Belgian company, SIPEF, under which the government maintained a 50% stake in shares of the company. When MODEL rebels occupied the plantation during the civil war, SIPEF withdrew. Since then a number of unsuccessful attempts have been made to manage the plantation. In 2006 an interim management team was installed under the supervision of MoA.

The Cocopa Plantation (Nimba County). The original lease agreement was signed in 1949 for 40 years with the Liberia Company (LIBCO), and renewed for a further 40 years in 1967 from the date of its expiry under the condition that LIBCO had cultivated a certain percentage of the lease area by 1987. In 1996, LIBCO sublet the management of the plantation to a Liberian company owned by the then Minister of Agriculture Roland Massaquoi. In January 2007 the government suspended the agreement citing poor management.

The Sinoe Rubber Corporation. The original concession agreement was concluded in 1953 with the African Fruits Company for a period of 80 years, initially for the planting of bananas and plantains. In 1973, AFC sold out to Ernest Dennis, but another company claims that Ernest Dennis sold the rights and obligations to its subsidiary, Mesurado Plantation Industries. In 1983 Mesurado leased the plantation to the Government-owned Sinoe Rubber Corporation for 20 years. Whilst the ownership of the plantation remained in doubt while under the de facto control of an ex-MODEL rebel leader, it has been reported that UNMIL has since secured the plantation.

B.F. Goodrich, now popularly known as the Guthrie Rubber Plantation, is located in Bomi County. It was established in 1954 and production commenced in 1963. Goodrich was granted tax exemption up to 1973, and then paid corporate tax at a rate of 25% of net profits for the next 10 years, after which the company paid the then normal corporate tax rate. In 1981 the plantation was taken over by the Government following the military coup, and the Guthrie Rubber Company of Malaysia negotiated a management contract with the Government. Guthrie withdrew when LURD rebel forces occupied the plantation. Although the transitional government entered into a 45-year management agreement with Agro Resources Corporation Liberia Ltd in 2005, the plantation is currently under interim management.

The Salala Rubber Corporation in Bong County (40,000 ha) was established in 1959 by the Liberian Agriculture Corporation (LAC). The70-year lease for 125,000 ha in Grand Bassa County was signed in 1959, originally by a construction company to whom the Government was indebted, and then sold to Uniroyal. The second largest plantation, a processing plant for producing latex for export, was installed in 1968. The plantation was ransacked in 1989. In 1998 a Luxemburg company, Socfinco, bought the leasehold rights to LAC and Weala.

130. Oil palm is a ubiquitous tree crop for smallholders. The products from wild (natural) groves are primarily used for home consumption, but also as a cash crop (cooking oil, soap) together with palm wine. Smallholder oil palm plantations are popular with Liberian farmers and most of the current tree stock was planted during the civil war years – over 60% of the farms surveyed during this study were newly planted using improved germplasm (42–62% improved). There are estimated to be about 27,000 ha of industrial plantations owned by parastatals (LPMC, LPPC and DOPC) and the private sector. Owing to uncertainties over the exact areas planted, and their age and current condition, there is an ongoing photo-satellite survey of all state-owned plantations. The majority of this area is at least 20–25 years of age, and the crops are over-mature and difficult to harvest. Most milling facilities are either destroyed or derelict.

O. Fisheries

131. Liberia's fisheries sector – which includes an established marine fishery involving industrial and artisanal fishing activities (Box 6), an inland fishery, which is exclusively artisanal, and aquaculture practised in rural areas through fishpond culture – provides about 3% of GDP. However, it is locally important for communities with access to fisheries resources, providing employment for about 37,000 fishers and processors, and also has an important nutritional contribution in terms of protein intake. Liberia's coastline (of 570 km) and extensive continental shelf (averaging about 34 km in width and extending 200 nautical miles offshore) provide about 20,000 km^2 of fishing grounds. These hold considerable maritime fish resources,[27] including the main oceanic pelagic resources such as tuna and tuna-like species, for example bonito and marlin. Crustaceans such as shrimps and lobsters are less abundant but are of much higher value than finfish species.

132. The pre-war estimated maximum sustainable yield (MSY) of the continental shelf area was 180,000 mt/year. Liberia also has approximately 1810 km of rivers that traverse the country, and countless perennial swamps and inland water bodies with enormous potential for increased production from inland fisheries and aquaculture. The estimated MSY for the inland fishery is 40,000 mt/year.

133. **Despite difficult operating conditions, seven fishing companies managed to survive the civil war**, catching an average of 222 mt/year of shrimps and 4,500 mt/year of demersal fish between 1996 and 1999. At that time, most of the industrial fishing companies had adequate processing facilities and were exporting frozen crustaceans (shrimps) and small quantities of frozen demersal fish species to Belgium, Greece, the UK and the USA. Fish distribution and marketing from the coastal area to the interior of the country was performed through a system of depots and agents, but this activity ceased because of civil strife and the poor condition of the roads.

[27] The most abundant species are *Engraulis encrasicolus*, *Sardinella aurita*, *Decapterus spp.*, *Caranx sp.p* and *Ethmalosa fimbriata*.

Box 6: History of Liberia's Marine Fishing Industry

The first attempt at commercial fishing in Liberia was in 1848 when the then President of the country, Joseph Jenkins Roberts, converted his yacht into a fishing boat. The first fishing trawler to operate in Liberian coastal waters belonged to Woerman Company, a German company that operated in the country between 1938 and 1939. In 1952 the Government of Liberia asked FAO and the United States Government to help develop its fisheries sub-sector, starting with an assessment of the fisheries potential of the country, which determined that a medium-scale fishing industry could be established in the country.

Industrial fishery began soon thereafter, targeting mainly the shrimp resources within the Sherbro fishing grounds, which extend into Sierra Leone. The Mesurado Group of Companies became operational in the early 1960s and developed into the most dominant force in Liberian fisheries. At its peak in the 1970s the company owned and operated more than 25 vessels, including shrimpers and double rigged trawlers, as well as its own harbour and processing facilities with 3,000 mt of freezing capacity. Shrimp was the company's major export, with a monthly shipment of about 60 mt to Europe and Asia. The Company's decline started after the *coup d'etat* in 1980, which targeted its owners the Tolbert family. With further destruction during the civil war, its facilities are now in complete ruins, with all the cold rooms completely looted and vandalized.

The initial success of the Mesurado Group of Companies led other companies to establish shore-based infrastructure including a cold storage facility of 2,000 tons, an 18 mt per day blast freezer, and a dry dock and associated repair and maintenance facilities at the fishing pier in Monrovia harbour.

134. Of the fourteen fishing companies operating legally in Liberia six are currently solely engaged in the importation of frozen fish while eight are engaged in industrial fishing. The eight industrial fishing companies operate 27 fishing vessels with a combined gross registered tonnage (GRT) of 4,123. They range in size from 91 GRT Chinese pair trawlers (ice carriers), to 251 GRT fishing trawlers with onboard freezing, processing and storage facilities. These vessels land their catches at the fishing pier in the Free Port of Monrovia. The industry currently employs about 4,200 persons, 75% of whom are Liberians, making up about 11% of the total employment in the fisheries sub-sector.

135. **It is believed that the catch is grossly under-reported, and there is strong suspicion that a number of industrial fishing vessels are engaged in illegal trans-shipments on the high seas**. Illegal, Unreported and Unregulated (IUU) fishing is estimated at about US$12 m annually (MRAG, 2005). Official statistics reported fish landed by all trawlers at 1503 mt and 2807 mt in 2004 and 2005, respectively (BNF, 2006). Fish imports were substantially higher, amounting to 4,738 mt in 2004 and 11,072 mt in 2005.

136. **Artisanal fishery is estimated to provide a means of livelihood for about 33,120 full-time fishers and processors in both marine and inland waters**, about 61% of whom are Liberians and 60% are female. The Liberians are mainly Kru and the foreigners are mainly Fanti and Popoe fishers who migrated to Liberia from Benin, Ghana and Cote d'Ivoire, with recent additions of Gambian and Senegalese fishermen in Cape Mount County. Malian and Fulani fishers operate in inland areas. Artisanal fish landings were estimated to be 7,700 mt in 2004 at ten sites, making up about 75% of the total fish landings.

137. Grand Kru County with 35 landing sites and Sinoe County with 30 have the largest number of landing sites and are dominated by indigenous fishers, but they land substantially fewer fish annually than Grand Cape Mount County with 14 sites and Grand Bassa County with 18 sites, a reflection of the smaller boats used by indigenous fishers. According to the

Bureau of National Fisheries (BNF), there are 3,473 canoes operating in the inland and marine fisheries, only 8% of which are motorized. Canoe sizes range from the one to three man Kru canoes, 5–7 m long, which are hand-paddled with a few powered by 15- or 25-horsepower outboard engines, to the fifteen to eighteen man (10–15 m long) fishing canoes that are powered by 45-horsepower outboard engines. The newly arrived Senegalese and Gambian fishers operating in Grand Cape Mount County are using much larger fishing canoes (more than 20 m long). The average catch per canoe/annum was 2.2 tons and 1.16 tons in 2004 and 2005, respectively (BNF, 2006). The major species exploited are the Sardinella, Barracudas, Croakers, Sharks and *Ilisha africana*.

138. **Aquaculture developed in the 1970s with technical support from donor projects but has reverted to a subsistence activity**, with production estimated at 38.81 mt in 2004**.** In the mid 1970s, small-scale aquaculture began with the construction of fishponds at Suakoko village in Bong County to conduct research on *Tilapia nilotica*. Aquaculture development moved fairly quickly into Lofa County in the early 1970s through the initiatives of the American Peace Corps. By the late 1970s, small-scale aquaculture development had gained momentum and spread into Nimba County with support from the German Technical Cooperation through the Nimba County Rural Development Project (NCRDP), and from the World Bank through the Lofa and Bong County Agricultural Development Projects (LCADP and BCADP). It has, however, remained mainly a subsistence activity with no major fish multiplication and distribution taking place. Not much research has been done on developing local species for culture, as imported exotic species of Tilapia and Carp are mainly used. The major species cultured in Liberia are *Oreochromis niloticus* and other local species of Tilapia, and catfish, including *Heterobranchus longifilis* and *Clarias* spp.

139. At its peak in the 1980s there were about 3,600 fish farmers nationwide using 450 ponds of various sizes with a total area of about 17.5 ha, distributed in 159 communities around the country. However, because of the civil war, most of the ponds have not been in use since the early 1990s. Some are now being rehabilitated, and BNF have estimated that the rehabilitation works are providing employment for about 700 women and youths. The production method is extensive and very simple technology is used to develop earthen ponds, which are supplied with water from natural creeks or springs by gravity. Most fish farmers cannot afford to feed their fish adequately due to competition for feed ingredients with the households.

140. **Value chains for fish and fish products remain largely limited to freezing for industrial fishing, and smoking, salting and fermentation for artisanal and aquaculture methods**. There are reportedly 52 cold storage facilities in major cities and towns around the country with a total storage capacity of 19,332 mt. The largest number (62%) and most of the capacity (97%) are located in Monrovia. There are no reported fish exports. Ice or refrigeration is not used for artisanal catches: metal drums are most commonly used for smoking in all coastal communities. There are, however, some improved "Chokor" smoking ovens built of clay in use, particularly in Margibi and Grand Bassa Counties. Inland artisanal communities (especially the Fanti and Kru communities) use traditional smoking kilns made of sticks or wire meshes. Salting and fermentation is also used to process fish into what is locally known as "*moin-moin*". Dried fish products are bought from the fish landing sites of Monrovia, Robertsport, Marshall and Buchanan and are taken by road to the major rural markets, from where they are purchased and distributed to inland towns and villages by women, usually travelling on foot. Value chains estimates indicate the high costs of transport: the margin for smoke drying of fish is about US$0.17/kg, but the mark up for distribution to

inland locations is substantial, with smoke dry fish (herring) selling for an average of US$0.60/kg at beach sites, US$0.78/kg in urban markets, US$0.95/kg in rural markets and US$1.12/kg in small villages. Freshwater species are often smoke dried and transported to urban markets for higher market value. Fish from farms are usually sold live or fresh from pond sites during harvest for direct consumption. Because of high demand around Monrovia, pond fish are sold for US$3.00/kg, but prices also vary according to species, with the air-breathing catfish, *Heterobranchus* spp., more highly priced at US$6.00/kg.

141. **There are substantial opportunities to increase fisheries production and processing, both for domestic consumption and export.** The current production of 10,000-15,000 mt is far below the estimated MSY from inland and coastal resources of 220,000 mt, and estimates suggest that the remaining cold storage capacity is adequate to process this quantity.[28] However, the absence of a fisheries harbour to facilitate the discharge of cargo, the supply of essential commodities (which also face a high import tariff), refuelling, trans-shipment and dry-docking is a major constraint to the development of industrial fisheries. Fishing vessels are currently obliged to buy fuel and essential supplies from other ships and carriers operating in international waters. Landing dues, inspection dues and other charges are high.

142. **Domestic and regional markets have more immediate potential** because artisanal methods will continue to dominate. The lack of infrastructure is likely to continue to inhibit the development of a large commercial industrial fleet, and poor sanitary conditions will prohibit access to the markets of developed countries. The supply of safe, hygienic fresh fish products for the local market will require improved fish-processing facilities, proper drainage systems and adequate potable water supply. Ice and cold storage facilities are absent from some factories. Factory workers do not have proper clothing and work in the factories is haphazard and without proper flow of products. None of the factories is implementing a Quality Management Programme.

143. **There is potential for adding value to fisheries production, handling, processing, distribution and marketing, particularly for industrial fisheries.** It is quite possible to produce value-added fish products, such as cocktails, fillets, marinated products, fish fingers, peeled/boiled products, coloured products and eco-labelled goods. However, this can only be done when technical and hygiene standards in fish factories are improved. The factories must also implement quality control (QC) programmes and good manufacturing practices to ensure that fish product safety and quality meet international standards and requirements. This will require institutional strengthening and capacity building at the fish processing factories. Value adding will significantly increase the profitability of the fisheries sub-sector. Fish quality and safety should be addressed across the entire value chain. It is also important that the relevant Government institutions have the requisite human, financial and technical resources to ensure compliance with the agreed international standards and requirements and are capable of offering technical support to the fishing industry in the form of training programmes on fish handling, processing, quality assurance and inspection.

144. **Boosting artisanal fishing is likely to have the most immediate impact and, based on evidence from elsewhere in West Africa, will benefit the largest number of Liberians, particularly women**, who dominate fish marketing. Incomes are undermined by high operational costs including fishing inputs (fishing nets, related equipment and materials,

[28] If Liberia landed its MSY of 220,000 mt/year it would need to turn over the stock roughly once a month using the present cold-room capacity of 19,330 mt.

outboard motors, premixed fuel), in part because of high import duties on these items. In addition, improved coordination between fishers can help to secure economies of scale.[29] The provision and utilization of basic fisheries infrastructures, such as fish handling and processing areas, storage facilities for processed products, potable water supply, ice and cold storage facilities, is lacking. Hygiene is poor with frequent microbial contamination.

145. **Efforts will be needed to ensure that the natural resource base is not over-exploited.** For marine fishing, this will require the GoL to address the absence of a maritime control and surveillance system to control and regulate fishing activities (both Liberian and foreign) in Liberian waters. For artisanal fishing, mesh sizes are very small and trap many juvenile fish, thus threatening resource sustainability. Artisanal fishers frequently face disruption (including the loss of equipment) through encroachment by industrial fishing vessels. An improved fisheries sector will improve the situation for other natural resources. For instance, increased availability of fish-based protein is known to reduce the (illegal) hunting and consumption of bushmeat. Second, better cold storage and other processing facilities can reduce the dominance of smoking for preservation, thereby reducing the use of charcoal and the subsequent pressure on timber resources.

146. **Based on the estimated irrigation potential, aquaculture can recover and there are potentially important synergies with irrigation for farming.** The irrigation potential is estimated as 600,000 ha, with a renewable water potential of 235 km^3/year. The development of proper irrigation and water control structures is vital for sustaining continuous aquaculture production. Production is often hampered either by flooding of production facilities during the heavy rains, or by the lack of water during the dry season. The existing infrastructure requires rehabilitation and there is an absence of tools and other materials for pond development, a lack of quality fish fingerlings for stocking and a shortage of improved fish feed. The quality of the fingerlings produced is low because of poor brood stock quality and hatchery management, and transporting live fingerlings is extremely costly and leads to high morbidity. Successful investment in aquaculture requires access to credit as well as trained knowledgeable farmers. Culture methods are too narrow when the increasing demand for lowlands for irrigated rice production is considered, and need to be diversified to include cage, pen and tank culture methods. There is no aquaculture policy at present.

P. Livestock Production

147. **Liberia has an estimated 2 million hectares of pastureland yet the livestock sector accounts for only an estimated 14% of agricultural GDP – far below its potential.** Reliable data are not available although FAO estimates suggest that there is slow growth in aggregate livestock numbers (Table 14). The major livestock product chains are the cattle meat industry, the poultry industry, the swine industry, and the animal health industry. Traditional livestock farmers dominate, as was the case before the war. According to data reported by Smith (2002), traditional systems accounted for 100% of the holdings of cattle, goats and sheep, 58% of pigs, and 100% of guinea fowl. A few modern semi-intensive and intensive peri-urban livestock farmers produced rabbits and guinea pigs in particular (accounting for 100% of such holdings) almost all poultry (99.5%) and the majority of ducks (61%).

[29] Most continue to operate as individual family units, although there is a history of cooperative societies and migrant fishers tend to be better organized and able to cooperate better with the fisheries administration.

Table 14: Estimate of Livestock Production (1,000 head)

	1980	1990	2000	2002	2005	Annual growth rates		
						1980–90	1990–00	2002–05
Cattle	39	38	36	36	25	-0.3	-0.5	-11.2
Sheep/goats	400	450	430	430	435	1.2	0.5	0.4
Pigs	103	120	130	130	131	1.5	0.8	0.5
Poultry	2,620	4,030	4,200	5,200	5,428	4.4	0.4	1.4
Total (LUs)*	106	128	129	139	136	1.9	0.1	-0.5

Sources: FAO (2005). Notes: * LUs = Livestock units converted on the basis of cattle = 0.50; sheep and goats = 0.10; pigs = 0.20 and chickens = 0.01.

148. **Historically, traditional farmers use local, less productive animal breeds and basic techniques, with access to few inputs, and receive very few or no government support services.** The native Liberian breeds of cattle are the *N'dama* and *Muturu* races, and are all trypano-tolerant, as are the *Djallonke* breeds of small ruminants. These breeds are well adapted to local conditions. Livestock (as few as 2–3 head per proprietor) are left to roam free, scavenging for food. *Ndama* cattle account for 41% of all local cattle but are of low productivity: their average carcass weight is 95 kg; the age of first calving ranges from 30–35 months; the weight of the calves is typically less than 18 kg; the fertility rate rarely exceeds 82%; the mortality rate during the first few years of life is estimated at 27%. Dairy production is essentially nil. Sheep and goats of the *Djallonke* breed are also of low productivity: average carcass weights are 11 and 9 kg, respectively (Hoste, 1984).

149. There is little information on the incidence and importance of animal diseases in Liberia and few resources to support animal health. Standards in the meat processing sector are extremely low, and there is no capacity to ensure sanitary standards of imports. The major diseases usually cited by observers include trypanosomiasis (*Trypanosoma congolense*, *T. vivax* and *T. brucei*), other parasitic diseases, brucellosis, bovine contagious pleuropneumonia (believed to be introduced by imported live animals), foot and mouth disease, anthrax, pasteurellosis, haemorrhagic septicaemia, piroplasmosis, anaplasmosis, babesiosis and theileriosis. According to data from the Ministry of Commerce and Industry (MCI), imports of meat and meat products in 2005/06 amounted to US$6 million (Table 15). In addition, an estimated 26,000 head of live cattle and 15,000–16,000 head of live sheep and goats were imported from neighbouring countries (estimated to equate to 3,000 and 312 mt, respectively).

150. **Spare capacity and existing demand would suggest the potential for expanding domestic production, although cost structures would have to be contained to compete with imports.** First, the existing low animal density (0.1 head/km^2 for cattle, 2.2 sheep/km^2 and 2.1 goats/km^2) indicates that existing pastureland could sustain a higher density of livestock. Seven ranches, covering in total more than 2,025 ha, were constructed in the past to help breed increased numbers of trypano-tolerant livestock.[30] These ranches still exist, but they are in a state of neglect. Their rehabilitation would realise a considerable potential resource and warrants the highest priority in the framework of optimal utilization of all

[30] They are: Foya Cattle Ranch (1,000 ha for 500 head); Todee Cattle Ranch (100 has for 100 head), Panama Cattle Ranch (25 ha for 25 head); CARI Cattle Ranch (300 ha for 100 head); Kpain Cattle Ranch (50 ha for 50 head); Parta Cattle Ranch (500 ha for 500 head); and Sanghai Cattle Ranch (50 ha for 50 head).

existing pastoral areas. Experience from one large-scale domestic producer suggests that there is scope to be competitive.[31]

Table 15: Import of Meat Products – Year 2005/06

	Quantity (mt)	Value (US$)
Frozen buffalo meat	56	47,600
Frozen beef	66	95,960
Frozen turkey wings	148	221,449
Frozen pig meat	690	524,886
Frozen chickens	1,893	1,464,135
Pigs' feet	8,082	378,339
Fresh eggs	10,834	3,173,883
Total	*21,769*	*5,906,252*

Source: MCI.

151. Second, the livestock service of MoA does not have sufficient trained officers to perform its assigned duties and there are practically no technical officers located outside Monrovia (even the Monrovia offices are scanty and barely useable). Consequently, frozen or live imports are rarely inspected, and when inspected do not undergo rigorous examination. Existing legislation is outdated and unfamiliar to officials. The livestock service does not have a veterinary laboratory for diagnosis of disease and control of the quality of animal products.

152. Third, domestic production is disadvantaged relative to foreign imports of frozen produce. While the main livestock producing areas are closer to the primary consumers in the largest urban centres of Liberia, in practice the costs of marketing in Monrovia are high. Roads are poor and there are no livestock passages or corridors by which live animals can be brought in. Importers of livestock products, especially importers of live animals from neighbouring countries, face numerous administrative bottlenecks and harassments, including illicit taxes. An average of 137 trucks per week transport live animals from neighbouring countries. Interviews of executives of the Butchers Association of Liberia indicate that the estimated rental cost is US$1,000 per truck; trips from the Liberian border to Monrovia last an average of 10 days and each trip costs between US$15 and US$300 in illicit taxes. This constitutes unfair competition with imported meat, for which relatively low taxes are paid. Similarly, the domestic supply chain cannot support quality standards. The slaughterhouse in Monrovia is in a deplorable state. There are virtually no slaughterhouses outside Monrovia and the slaughter slabs provided for use by the general public do not meet elementary hygiene requirements.

IV. THE INSTITUTIONAL FRAMEWORK IN AGRICULTURE

Q. Agricultural Input and Output Marketing

153. The livelihood and access to food of a household depend on a range of markets. Consequently getting markets to work better is an essential step in reducing poverty and improving livelihoods. However, getting markets to work properly is often the most

[31] The Georges Haddad Farm is producing more than 26,000 eggs per day at a cost of 2.6L$ compared to the retail price of eggs in Monrovia is 5L$.

important challenge for poor countries such as Liberia as they attempt to develop their agriculture sectors (Figure 14). It is widely accepted that efforts should focus on creating effective markets through encouraging private sector participation by:

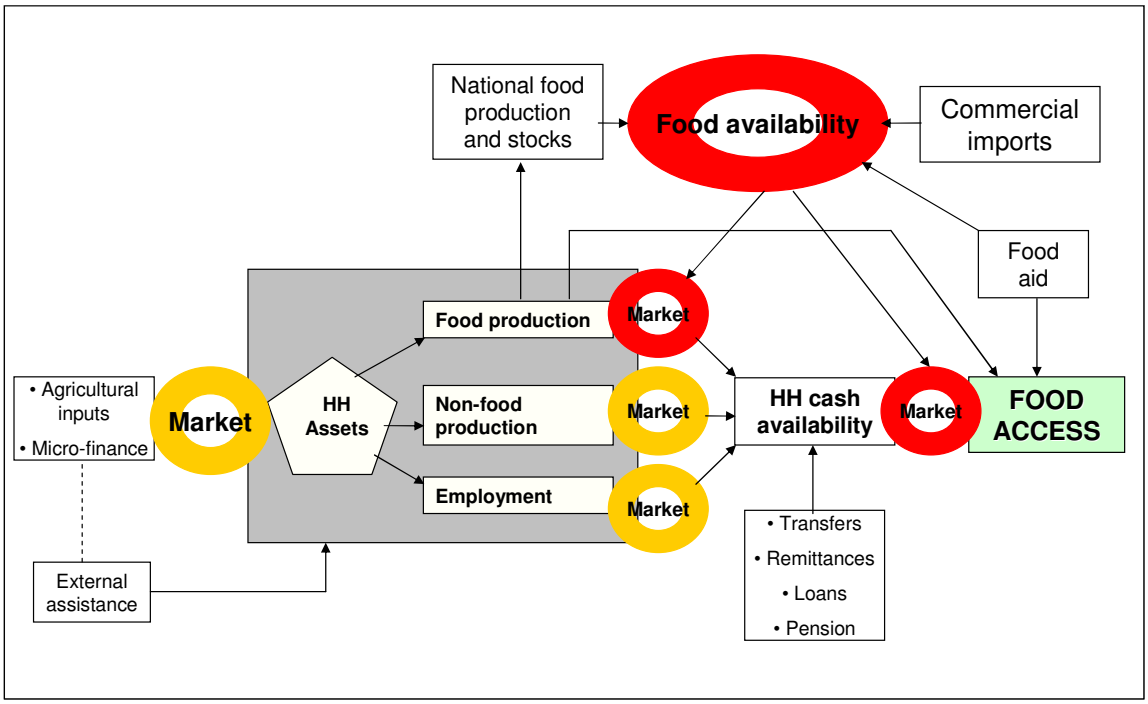
- Improving physical access to markets through investments in infrastructure, using different combinations of public and private funds.
- Improving access to market information, using established means such as radio and new information technologies such as mobile phones.
- Improving the access of traders and producers to finance and insurance markets, for example by setting up systems to lessen price risk.
- Supporting the development of approaches and policies to reduce the volatility of prices in important product markets. This could include support to develop commercially based storage, such as warehouse receipt systems, to help smooth out price variations (Coulter and Onumah, 2002).
- Helping to link small producers to established markets, with the involvement of agricultural extension services, NGOs and farmer associations (Shepherd, 2007), as is happening elsewhere in Africa.
- Removing restrictions and controls on the sale, movement and purchase of agricultural products.
- Putting in place effective standards for quantifying and grading products, and gearing these standards to the needs of small farmers.

154. These concepts are of varying relevance to Liberia. For example, consideration of insurance markets would be very ambitious at this stage of recovery and, in any event, would normally be relevant only to cash crops. Warehouse receipt systems are theoretically a good idea, but have had major problems of implementation in other African countries with far fewer institutional and infrastructural problems than those presently faced by Liberia; it may be difficult to put effective standards in place for the domestic market. However, for countries in the earliest stages of development, such as Liberia, the critical importance of overcoming market failure provides some justification for the state to play a more direct role in building and creating markets. These actions demand levels of state capacity and effective governance that have in the past been lacking. This is possibly the most contentious area in the agricultural policy debate – but one that must be tackled.

155. **Prior to the war, the state engaged in agricultural marketing in both input and output markets.** Intervention in output markets was particularly invasive, with a number of parastatal organizations mandated as the monopoly marketing agencies, and a Cooperative Development Authority was established to coordinate smallholders (Box 7). These were justified on the grounds of market imperfections and failures of coordination that plague the smallholder sector. However, they performed poorly, were a major source of rent-seeking, and taxed producers (sometimes failing to pay anything for their output), as well as deterring the evolution of private sector input and output markets. In addition, a number of spatially focused agricultural development projects (ADPs) were supported by the World Bank in Lofa County (LCADP) and Bong County (BCADP), and were supplemented by the Nimba County Rural Development Project (NCRDP). These projects (funded by the World Bank for a ten-year period) aimed to boost the production of cocoa, coffee and rice, with small farmers as

the main beneficiaries. To a large extent the projects only partially succeeded, in the face of a difficult macroeconomic environment, institutional problems and a lack of counterpart funding.

Figure 14: The Contribution of Markets to Livelihoods



Source: DFID (1998)

Box 7: State Marketing Organizations

The **Liberia Produce Marketing Corporation** (LPMC) was mandated to procure farm produce from farmers' cooperatives and farmers in general, and package it for subsequent export to buyers. It was also charged with the responsibility of providing a farm advisory service at all levels. However, it went beyond its mandate by involving itself in production, to the disadvantage of the small farmers. Along the way, it failed to reimburse farmers for their products to the tune of an estimated US$3.5m.

The **Liberia Cocoa and Coffee Corporation** (LCCC) was set up to build the capacity of cocoa and coffee growers with the provision of farm advisory services such as nursery development, farm layout, and planting operations.

The **National Palm Corporation** (NPC) was charged with the responsibility of overseeing and managing Government-owned oil palm holdings. The NPC failed to survive not only because of the civil crisis, but primarily due to poor management.

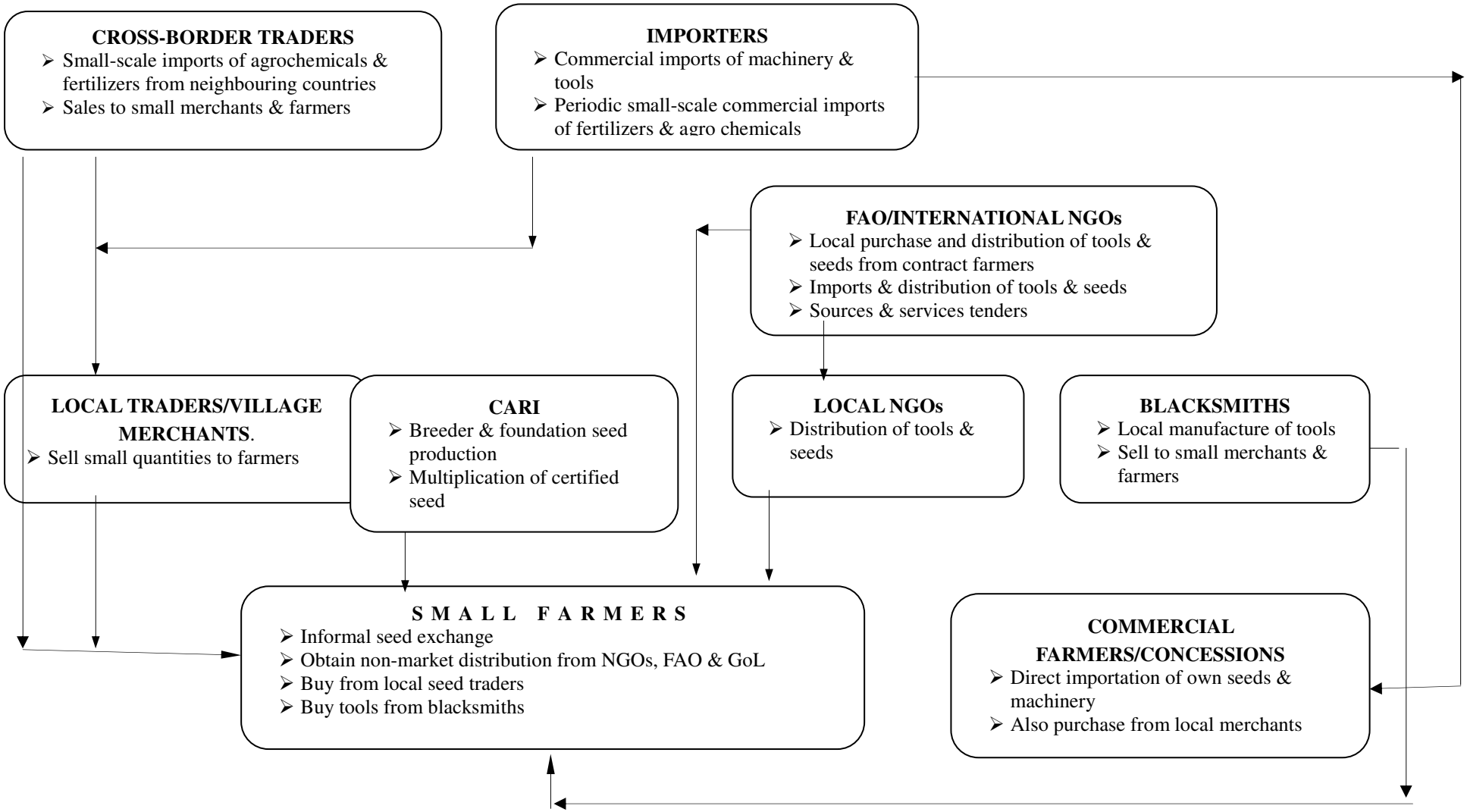
The **Liberia Rubber Development Authority** (LRDA), formerly the Liberia Rubber Development Unit (LRDU), was established to build the capacity of smallholder rubber producers with farm sizes within the range of 2–5 acres by providing improved seedlings, extension services and marketing.

The **Co-operative Development Authority** (CDA) was set up to build awareness of the cooperative movement and its benefits to the economy, assist in the organization and development of cooperatives, registering and certificating cooperatives and advocating on their behalf.

156. Input markets previously involved these parastatal institutions as well as private suppliers, but international donors and NGOs now play an important role. Machinery, hand tools, and seeds were imported commercially by merchants based in Monrovia who sold to smaller village merchants, from whom small farmers and occasionally commercial farmers purchased their requirements. Village blacksmiths manufactured local tools, which were sold directly to farmers and occasionally to village merchants for resale to small farmers. During the civil war a large humanitarian aid network established a parallel system through which hand tools and seeds were provided to small farmers. These were imported by donors and INGOs and distributed through a network of service providers, mainly local NGOs and the MoA. In 2005 this concerted effort distributed about 507,000 pieces of equipment and 3,100 mt of seed rice to approximately 164,000 recipients. In 2006, quantities declined to about 402,000 pieces of equipment and 2,235 mt of seed rice to approximately 91,000 recipients. The current supply chain involves input provision from a myriad of sources (Figure 15). With the continued withdrawal of post-conflict NGOs and a shift from relief to development assistance markets will become increasingly important for sourcing essential farm inputs.

157. Apart from seeds (most of which are produced by the farmers themselves in normal years) and hand tools, very few other inputs are used by smallholders. Currently the only fertilizers available on the market are the compound fertilizers 15-15-15 (most commonly used), urea and super-phosphate. All of these are imported from neighbouring countries by petty (i.e. cross-border) traders. There are very few agriculture supply stores that import fertilizers. Import duties on most agricultural tools range from 2.5–5%, with agricultural machinery such as tractors being subject to higher duties of 10–25%. Some implements, such as hammers and wheelbarrows, are taxed as building materials at 5–7%.

Figure 15: Agricultural Input Distribution Channels



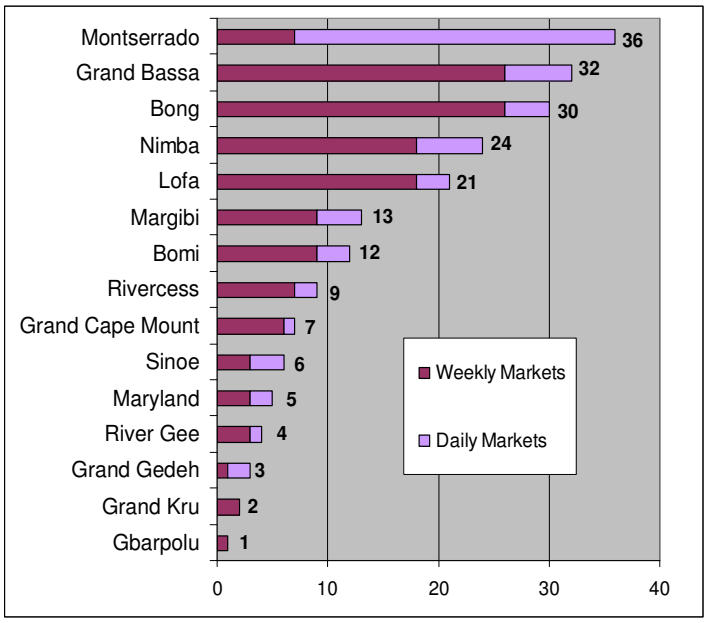
158. **Previous studies have suggested that the low level of use of fertilizers and other inputs is due in part to the fragmentation of end users and the high costs of distribution** (World Bank, 1984), a typical constraint of smallholder-based farming systems. Households reported lack of seeds as the primary constraint to agricultural production in seven of thirteen counties and lack of tools in a remaining six counties (CFSNS, 2006). However this is probably compounded by a lack of effective demand: farmers do not perceive a commercial advantage in the use of purchased inputs. This is evidenced by the fact that, in a recent review of 205 markets across Liberia, seed rice was only available for sale in three markets (equivalent to 1.5% of locations), in Lofa, Grand Gedeh and Montserrado Counties. The availability of vegetable seeds was somewhat better; they were found in 75% of the markets (MoA, 2007). The contrast between seed rice – from which farmers have the opportunity to use retained seed – and vegetables suggests that where there is a demand, markets will supply. Efforts to encourage adoption, including the strengthening of cooperatives and linking input provision to credit facilities, have enjoyed limited success.

159. Agricultural output marketing involves a number of actors – state, cooperatives and private sector – and often differs for particular crops. Large private sector operatives have generally dominated the export crop marketing sector, particularly for rubber. Other tree crops (coffee and cocoa) have 'benefited' from interventions from various parastatal organizations. On the other hand, private sector firms, mainly small operators, and individuals dominate the food crops marketing system. The Liberia Markets Review (LMR) (MoA, 2007) identified 205 marketplaces currently operating in the fifteen counties of Liberia (Figure 16). Approximately one-third are daily markets, while two-thirds are periodic or weekly. More than a third of the markets are located in the central belt of Liberia that runs from Montserrado to Nimba County. Daily markets are concentrated in Greater Monrovia, which has nearly three times the number recorded in the early 1970s (Handwerker, 1972). In Gbarpolu, with its extremely limited road network, only one market, Bopolu, was identified.[32]

160. Weekly markets include both wholesale and retail markets. Producers bring their produce for sale, most often to wholesalers (or bulking intermediaries). Full-time itinerant traders sell dry goods, primarily to the producers. Usually the wholesalers, often from Monrovia, buy from the producers outside the marketplace. The daily markets found in the larger urban centres of rural Liberia and the neighbourhoods of Monrovia function primarily as retail markets, selling produce to a non-food producing population. However, the Red Light and the Duala markets in Monrovia are both wholesale and retail and are the destination of most of the produce coming into Monrovia from rural Liberia or Guinea. Finally, there are several other types of retail markets, including the small 'cluster' markets around urban centres, the 'doorstep' or porch markets of single traders, and the street vendors or hawkers (Figure 16).

[32] Data are not available on the size of the individual markets, nor on their dates of establishment.

Figure 16: Location of Markets by County



Source: MoA, 2007

161. **Most staple food items are widely available across Liberia.** The LMR found that, on average, 30 food commodities were found in the markets; the number varied from 14 in Grand Kru to 37 in Montserrado. On average, 12 non-food commodities were found, ranging from 5 in Sinoe and Grand Kru to 16 in Lofa. Imported rice was found in 90% of the markets surveyed, while domestic or 'country' rice was found in 80% of the markets. Dried fish and dried pepper were found in all markets, fresh fish in 85% and bushmeat in 60%. Palm oil was available in all markets except in Fishtown (River Gee) and Barclayville.

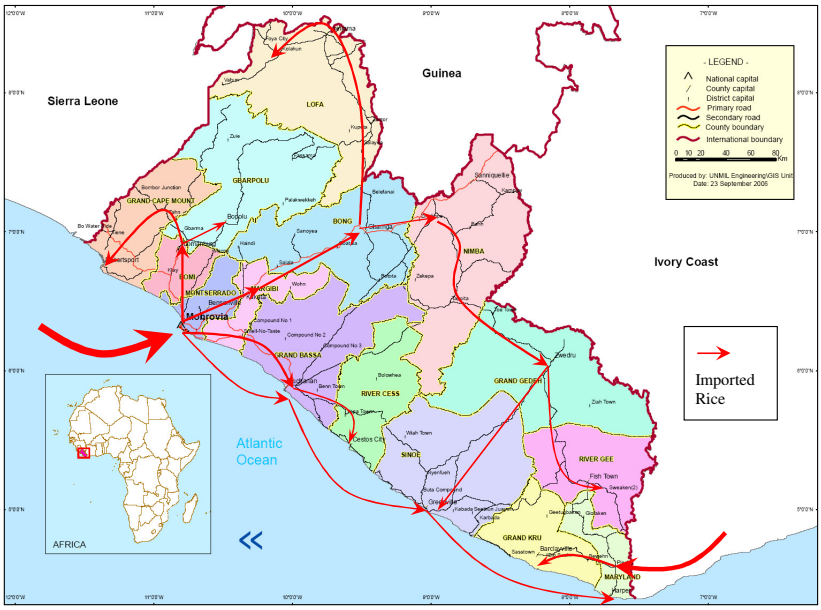
162. **With the exception of imported rice, fish and dried beans, domestic production dominates and most produce is marketed in close proximity to production areas, suggesting weakly integrated markets.** The origin of most of the imported rice found in the markets is Monrovia, the entry point into the country. However, Maryland and Grand Kru Counties in the southeast receive supplies from Cote d'Ivoire. Most of the parboiled rice sold in Margibi and Grand Bassa is imported by the Firestone Rubber Plantation at Harbel, where employee compensation includes a monthly allocation of imported rice. Domestic rice is typically obtained within the same county, although rice from Lofa County is found in Montserrado, Margibi, Bong and Bomi. This is an indication that Lofa County, originally the 'bread basket' of Liberia, which was heavily affected by the most recent civil strife and displacements, is starting to recover. Cassava is mainly sourced within the same county, with the exception of Margibi, where some originates from neighbouring Grand Bassa and Montserrado. A similar pattern was observed for eddoe (taro). Plantains are also sourced within the same county, except in Margibi and Montserrado where imports from Grand Bassa and Nimba are observed. Plantains found in Sinoe market came from Grand Kru; no plantains were found in the markets of Grand Kru.

163. In half the counties, dried fish originated from within the county, while in the remainder, fish came from another county, which had a coastline. Fish in Bomi and Bong originated from Grand Cape Mount, dried fish in Grand Gedeh and Nimba from Sinoe, and

fish in River Gee from Maryland. Imported fish from Guinea were found on markets in Lofa and Nimba. Bushmeat mainly originates from the highly forested counties in the interior. Bushmeat found in Bomi came from Lofa and Gbarpolu; bushmeat from Lofa was also found in Bong County. Grand Bassa provides bushmeat to Margibi and Montserrado. The biggest supplier is Grand Gedeh, which supplies markets in Nimba, Montserrado, Grand Bassa and Margibi. All dried beans are imported from Guinea (overland, or occasionally via Monrovia), although availability is intermittent except for flows into Maryland, which originate in Cote d'Ivoire. The same pattern was observed for dried pepper. Palm oil is mostly produced within the same county.

164. Liberia is dependent on rice imports and regular, secure and cheap access to rice is a major political issues. The distribution of imported rice follows the strategic road network (Figure 17).

Figure 17: Distribution Channels of Imported Rice



Source: MoA, 2007

165. **The physical condition of marketplaces is poor with few facilities for storage and low hygiene standards.** Marketing takes place either within structures or in open spaces. Some market structures are roofed buildings with concrete floors, with or without walls. These structures may have tables that are concrete and permanent or wooden and movable. Sellers in markets without walls must store commodities elsewhere at night. Most of the daily markets have external extensions that include roofed structures or tables. These are used most often by those selling dry goods that cannot be appropriately displayed on the tables inside the market structure, or where there is not sufficient space within the market. On those days when the rural daily markets have a simultaneous weekly market, the site will also include sellers on mats on the open ground. Open-air markets – usually weekly – have no shelters and sellers provide their own mats or sell from the ground. Alternatively, they construct structures or shelters themselves and are regarded as 'owning' them.

166. Storage facilities are rare: of twenty-one markets visited during the LMR only nine had 'storage' facilities (referred to as warehouses – basically large rooms owned and operated

by private individuals where commodities of all kinds are stored overnight). They lack ventilation and pallets for raising produce off the ground. Storage costs depend on the quantity of commodities stored but on the average are L$5 per bag per night. The land on which marketplaces are located is usually privately owned, although there are some located on government-owned land. The ownership of the land does not appear to be a major factor in the operation of marketplaces in Liberia. Few markets have systematic waste disposal, potable water or toilet facilities, which poses risks for food hygiene.

167. **The Liberia Market Association (LMA) was established as a semi-autonomous government institution with the mandate to manage markets, but generally fails to meet its obligations despite extracting fees from traders**.[33] Registration fees range from L$150-L$250. A single market ticket is L$5. Tickets in the daily markets are purchased from 2–6 times per week. The LMA is currently under an interim management team with limited operational capacity (of the 21 surveyed markets, 18 are supervised by LMA). The marketers report that services such as waste disposal, toilet facilities, roof repairs, storage and day-care facilities are usually not provided by LMA. They point out that they derive no benefits from the fees paid to LMA; moreover they have to pay additional fees to private individuals for the use of toilet and storage facilities.

R. Export (Tree) Crop Marketing

168. Liberian tree crop producers have experienced a roller-coaster ride in terms of export prices (Figure 18). After significant increases in the 1970s, all prices have declined, with the greatest declines occurring in coffee and cocoa prices. Nominal prices for rubber, palm oil and cocoa have increased recently but long-term price prospects are not very favourable. However, emerging markets for biofuels and recent sharp rises in international prices present Liberia with an attractive export market for refined palm oil.

169. **Rubber** is the agricultural commodity or natural resource whose marketing chain was least affected by the years of civil unrest in Liberia. Important exports such as diamonds, timber, cocoa, coffee and palm oil sought other outlets, primarily through cross-border trade and illegal smuggling. In contrast, rubber was exported by multinational concession owners, primarily Firestone, virtually throughout the conflicts.

170. The domestic Liberian rubber market has always been dominated by Firestone (Figure 19). The other concessions largely follow its lead in pricing. Liberian farmers have three outlets for their produce, two of which are directly tied to the multinational exporters. Smallholders facing extreme cash flow constraints may sell to fellow smallholders or to village level entrepreneurs who have the capacity to pay cash for the rubber at the farm gate. Alternatively, they can sell to the multinationals either though their mobile agents who roam the countryside collecting rubber or directly through one of their buying stations located in many of the larger towns throughout the ‘rubber belt’ of Liberia.

[33] The LMA was founded in 1963 to seek President Tubman’s assistance in providing better marketplaces in Monrovia. During Tolbert’s presidency (1973–1980), it was formally established by Legislative Act.