Value Chain Analysis Assessment Report

The selection of the most promising Agricultural Value Chains in Liberia

Authors: Mwenda Kazadi &
Benjamin Ryan

June 2016

Submission to CNFA/LADA

Assessment report was edited by Lloa Bass

Table of Contents

List of Figures

List of Abbreviations

AU	African Union
AIN	Agribusiness Investment Network
BNF	Bureau of National Fisheries
BRAC	Bangladeshi Reconstruction and Agriculture Corporation
CARI	Central Agricultural Research Institute
CBL	Central Bank of Liberia
CICO	Cash In – Cash Out
CIF	Co-investment Fund, LADA's grant instrument
CNFA	Cultivating New Frontiers in Agriculture
CPO	Crude Palm Oil
DFS	Digital Financial Services
ECOWAS	Economic Community of West African States
FAO	Food and Agricultural Organization
FED	Food and Enterprise Development Program
GDP	Gross Domestic Product
GOL	Government of Liberia
GVL	Golden Veroleum Liberia
HA	Hectares
IBEX	Investing for Business Expansion Program
IFC	International Finance Corporation
IRRI	International Rice Research Institute
LADA	Liberia Agribusiness Development Activity
LATA	Liberia Agricultural Transformation Agenda
LBDI	Liberia Bank for Development and Investment
LCC	Leaf Color Chart, Farming Tool
LCC	Liberia Cocoa Corporation, Liberian Cocoa Company
LEAD	Liberia Education and Development, Liberian MFI
LISGIS	Liberia Institute of Statistics and Geo-Information Services
M&E	Monitoring & Evaluation
MFI	Microfinance Institution
MNO	Mobile Network Operator
MOA	Ministry of Agriculture
MOCI	Ministry of Commerce and Industry
MOF	Ministry of Finance
MOU	Memorandum of Understanding
MRU	Mano River Union
MT	Metric Tonne
NIC	National Investment Commission
NGO	Non-governmental Organization
PAYG	Pay-as-you-Go
PKO	Palm Kernel Oil
SADC	Selma Agriculture Development Cooperative
SME	Small and Medium Enterprises
SOW	Statement of Work
SSA	Sub-Saharan Africa
TA	Technical Assistance
UBA	United Bank of Africa
USAID	United States Agency for International Development
USD	United States Dollar
WFP	World Food Programme

Executive Summary

In accordance with its Agreement with USAID, LADA must formally assess eight-to-ten value chains in Liberia and make recommendation to USAID on what the focus areas of project interventions should be. To develop this assessment, LADA devised a methodology that examines in detail, the suitability of providing technical assistance and US resources to actors in the value chains of the following twelve agricultural commodities: rice, fisheries, cassava, cocoa, vegetables, poultry, maize, oil palm, rubber, livestock, bamboo and coffee.

Selection of the Value Chains

The selection of the most promising agricultural value chains in Liberia was assessed based on a scoring methodology consisting of sixteen criterion: market growth (international and national), market competition (international and national vs. imported products), job creation potential, self-sustainability, proof of concept, import substitution, consumption trends, food security, likelihood of intervention success, priority of Government of Liberia, farmer skill suitability, impact per intervention dollar, transportation and LADA impact.

Results & Analysis

The results of the analysis show that LADA should focus its intervention activities in the highest-potential commodities, where the greatest economic impact in terms of job creation and improved livelihoods can best be achieved. Based on the analysis, the high-potential commodities are: rice, fisheries, cassava, cocoa and vegetables. Those secondary considerations are the value chains of poultry, maize (for animal feed) and oil palm. Each commodity presents some potential despite an overall low priority and potential for impact.

LADA will also work to identify specific vegetables that are best-suited to receiving LADA assistance, while researching the feasibility of working in the bamboo sector.

Intervention Instruments

The vast majority of LADA's interventions in the selected value chains will focus on the middle level of the value chain: processors, aggregators, traders and transporters. LADA's primary activities include a grant program, a loan guarantee fund, technology delivery, and the provision of technical assistance. LADA has identified a large number of promising and successful businesses for specific interventions, and is currently working on tailoring its assistance to have the greatest long term sustainable impact.

The USAID Feed the Future Liberia Agribusiness Development Activity

Feed the Future Liberia Agribusiness Development Activity, "LADA", managed by CNFA (Cultivating New Frontiers in Agriculture), is a four-year, $19.3 million USAID-funded project that aims to improve the agricultural development and food security initiatives at the community and national level in Liberia. The project aims to strengthen "aggregation clusters" through facilitating business relationships that link suppliers, producers, processors, buyers, and investors to each other. This allows all actors along the value chain to benefit from sustainable growth. To achieve this vision, CNFA will improve access to finance, quality inputs, mechanization, agricultural advice, and markets so that Liberian smallholder farmers can increase their production and participation in the market using a value chain approach.

The overarching and primary goal of the LADA project is to increase private sector investment in the Liberian agribusiness sector.

To accomplish this goal, the LADA project is divided into the following three components as described below:

Component 1 goal: Increased private sector investment in agricultural (production) input systems. Component 1 activities will focus on strengthening Liberian agro-dealers and aggregators to channel improved inputs and technical assistance increasing incomes for SHFs.

Component 2 goal: Increased private sector investment in post-harvest handling support, storage, packaging, transporting, marketing, and auxiliary services. Component 2 activities will focus on: investment activity design, delivery, and leveraging competitive business plans submitted by private agribusinesses matched by $3 million in LADA co-investments (grants).

Component 3 goal: Strengthened facilitation, market information, advocacy, and support systems. Component 3 activities will create and build the capacity of the Agribusiness Investment Network (AIN) to facilitate private investment and also to promote policy interventions that will improve the agricultural regulatory environment in Liberia.

Cross-Cutting targeted issues:

Gender equality, CLA, Youth and Administrative/Logistical/Startup activities.

Interventions will include a robust grants program, loan guarantee support, and the provision of technical assistance when appropriate. Collaborative efforts with USAID/FED and USAID/IBEX, LADA will deliver improved access to quality inputs, financing, mechanization, and market information.

In turn, strengthened input supply systems and post-harvest processors will complement CNFA's ability to develop local-partner capacities. These partners will provide: research, engage in stakeholder dialogues, advocate for improved policies, regulatory frameworks relating to import, distribution, and sale of agricultural inputs.

Policies that promote a more enabling environment for growth in Liberia's agricultural sector will also be proposed. Once these interventions are carefully coordinated with USAID, donors, and the GOL, increased investments in the agricultural sector will occur. This wave of improved investments will further encourage a better business and policy environment.

The Purpose of the Value Chain Analysis Assessment Report

The purpose of this report is to highlight findings from a formal assessment of the highest profile agriculture commodity value chain in Liberia. As a result, recommendations to USAID focus areas of project interventions will be made accordingly.

By defining and analyzing the agricultural value chain and it actors, will enable stakeholders in the value chain will be better-informed decision-makers for: financing production, processing, marketing and trading activities. This analysis will help to prioritize interventions around value chains and identify which products and technologies have the greatest potential to impact sustainable job creation for the Liberian people. This aim will improve how stakeholders understand market demands and opportunities.

To conduct this assessment, LADA developed a concise scoring methodology. The methodology examines in detail, the suitability of providing technical assistance and US resources to actors in the value chains of these twelve agricultural commodities: rice, fisheries, cassava, cocoa, vegetables, poultry, maize, oil palm, rubber, livestock, coffee and bamboo.

The highest-potential agricultural value chains in Liberia were selected based on the scoring methodology consisting of sixteen criterions deemed to be of highest relevance in achieving LADA project goals.

LADA will focus its intervention activities in commodities where the greatest economic impact in terms of job creation and improved livelihoods can be achieved for: rice, fisheries, cassava, cocoa and vegetables.

Liberia's Agricultural Sector

Agriculture, Sub Saharan Africa's sleeping giant, is finally awakening and has attracted sizeable amounts of FDI into many SSA countries' economies. American, European and Asian investors have led the efforts, as they eagerly scramble to find new markets to park and grow their capital. Agriculture's rapid expansion on the African continent is attributed to the efforts of African farmers and farming enterprises increasing their production capacity, in order to feed Africa's growing population and the ever-growing population of China and India.

Liberia's concession led agricultural sector is no different. The Liberian economy has always been heavily dependent on FDI and the revenue of its key commodity exports: rubber, iron ore, palm oil, coffee, and cocoa. Liberia's agricultural sector provides an opportunity to lead the country into economic prosperity, due to agriculture's broad economic outreach potential.

Liberia's agricultural sector is comprised of food and tree crops, fisheries, aquaculture and livestock. The CBL shows that the sector accounted for an average of 28% of real Gross GDP from 2010 to 2012 (Central Bank of Liberia 2014). Rice and cassava are the main staple foods, while rubber, oil palm, and cocoa are the dominant export tree crops.

Farming systems in Liberia are characterized by labor intensity, shifting cultivation, low technologies and productivity. Although rice, cassava, and vegetable production account for about 87% of cultivated land, the output of staple foods remains well below national requirements (WFP/MOA 2010). Furthermore, only 4-3% of arable land is currently cultivated with small acreages of tree crops maintained for generating cash income (LISGIS 2011). Commercial agricultural activities are almost exclusively plantation estates of rubber, oil palm, coffee and cocoa.

Besides the plantation estates, very little private sector investment has been made in Liberia's agricultural sector, with the exception of commodity trading over the years. The livestock value chain has been decimated as a result of the civil conflict. Current livestock population is below 10% of national consumption requirements. The United Nations Food and Agriculture Organization (FAO) indicated that the fisheries sub sector is underdeveloped with an estimated 6.8% of sustainable yield harvested annually (FAOSTAT 2016). Land and water resources remain in abundance and offer a potential for significant expansion of agriculture production.

GDP contributions in the sector have grown steadily from 2006 according to the overall contribution of the agricultural sector to GDP. CBL reports projected a steady downward turn from 30% in 2010, to 26% in 2013 (Central Bank of Liberia 2014). This trend is expected to continue as the extractive industries come online. Despite the setbacks, the agriculture sector is estimated to employ 70% of the population labor force both in the formal and informal sectors (LISGIS 2011).

Introduction to Commodities

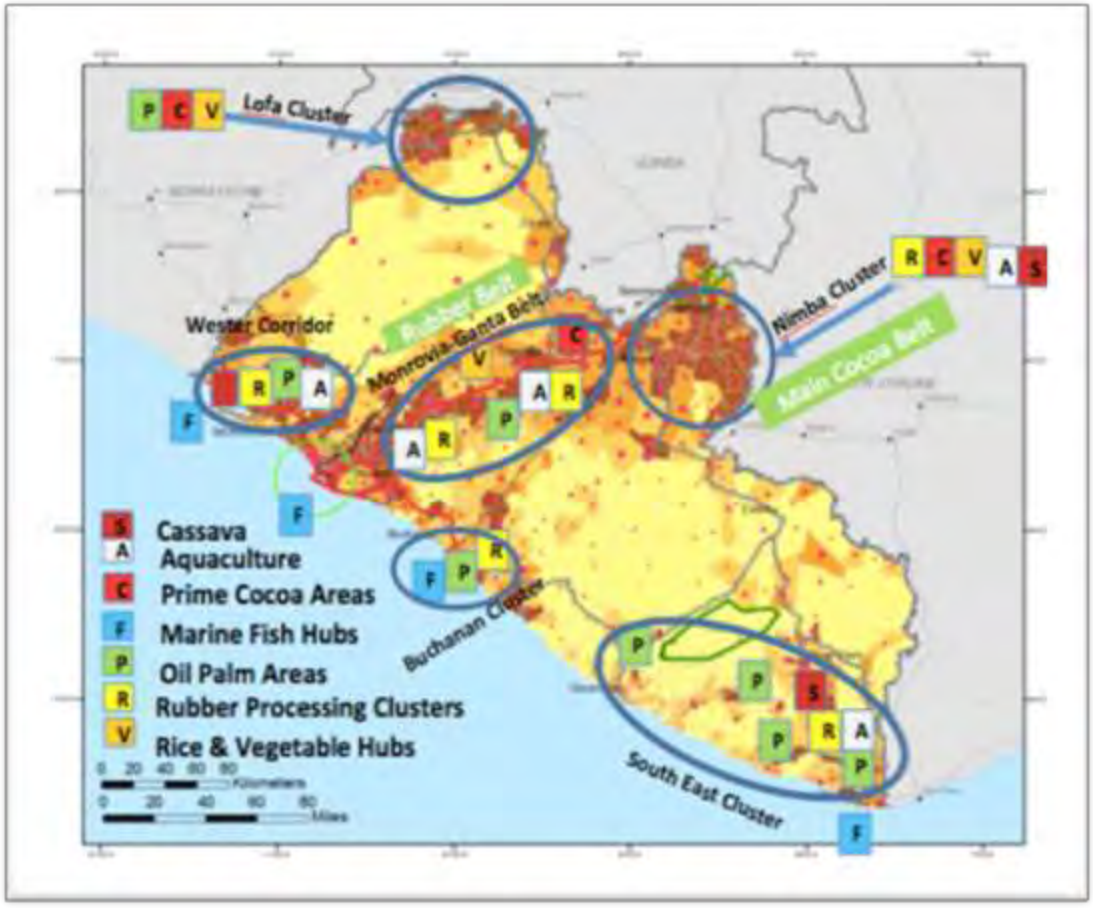


Figure 1: Map of Commodity Production areas in Liberia

Rice

Rice is a cereal grain. It is the predominant dietary energy source for 17 countries in Asia and the Pacific, 9 countries in North and South America, and 8 countries in Africa. Rice provides 20% of the world's dietary energy supply, while wheat supplies 19% and maize (corn) 5% (FAOSTAT 2016). Globally, rice is the third-highest produced agricultural commodity.

Rice is the primary staple food in many African countries and constitutes a major part of the diet in many others. During the past three decades, the crop has seen consistent increases in demand and its growing importance is evident in the strategic food security planning policies of many African countries. The consistent increases in demand and consumption of rice have been driven by changing food preferences in the urban and rural areas. High population growth rates and rapid urbanization both contribute to the increase in market demand.

In Sub-Saharan Africa (SSA), with the exception of a few countries that have attained self-sufficiency in rice production, rice demand has exceeded production. Thus, large quantities of rice are imported to meet demand. The slow growth in domestic rice production in SSA is attributed to the very low yield achieved by African rice farmers.

Grown by more than 1/3 of all smallholder farming households, rice remains the primary staple food in Liberia. Despite the fact that only 2% of arable land is used to grow rice in Liberia, local production is very limited which means most of Liberia's rice is imported (LISGIS 2011).

The majority of rice produced is consumed within the household because farmers possess limited commercial scale production ambitions. If processing quality, seed variety, and price challenges are effectively addressed, domestic production would need to double in order to satisfy local demand.

Fisheries & Aquaculture

Figure 2: Liberian fishermen in Robertsport, Cape Mount County

According to the FAO, a fishery is defined in terms of the "people involved, species or type of fish, area of water or seabed, method of fishing, class of boats, and purpose of the activities or a combination of the foregoing features."

A fishery may involve the capture of wild fish or raising fish through fish farming or aquaculture. Directly or indirectly, the livelihood of over 500 million people in developing countries depends on fisheries and aquaculture (FAOSTAT 2016). Overfishing, including the taking of fish beyond sustainable levels, is reducing fish stocks and employment in many world regions.

Liberia's fisheries value chain is comprised of mostly subsistence and artisanal (commercial) fishermen. These fishermen use rudimentary crafted Fanti styled canoes or plank boats with various net designs (ring, drift, set, gill and line nets) on their daily fishing voyages. The majority of Liberian fishermen do not use motorized engines (motors). The fishermen that do use 10 to 40 horse power motors, place the motors either onboard or outboard of their canoes. New technologies like sonar and global positioning system (gps) are not in use. The majority of local fishermen use the same fishing methods as their ancestors did many years ago.

Liberia's coast line is under-fished, despite offering 20,000 sq. km of prime fishing ground. Currently, the country's annual catch is below 10,000 tons. Studies show that the potential annual marine catch is between 23,500 and 57,000 tons. The potential inland freshwater fishery catch is estimated to be roughly 40,000 tons (Ministry of Agriculture 2014).

Liberia's aquaculture (also known as aquafarming) value chain is also underdeveloped with subsistence farmers cultivating mostly tilapia and catfish. Very little or no crustaceans, mollusks and aquatic plants are

produced in Liberia. Liberian aquaculture farmers usually have poorly constructed fish ponds that lack proper water management systems and fish feed. A Ministry of Agriculture Bureau of Fisheries' report estimates that roughly 40 tons of fish a year are produced by Liberian farmers involved in aquaculture.

Figure 3: LADA consultant touring a fish pond in Cape Mount

Both the domestic and global demand for fish is favorable. Liberians consume both fresh and dried fish in their daily diet. On the supply side, the fisheries and aquaculture value chains need to improve equipment and facilities, and leveraging modern technological improvements in processing and cold storage.

Cassava

Figure 4: Liberian businesswoman making gari

Cassava is a woody shrub native to South America of the spurge family, the Euphorbiaceae. As a major source of carbohydrates, cassava is extensively cultivated as an annual crop in tropical and subtropical regions for its edible starchy tuberous root. Cassava is versatile and can be fermented into a powdery state known as "gari", common in SSA households.

Cassava is a major staple food in the developing world, providing a basic diet for over half a billion people. It is the third most important calorie source in the areas in which it is grown, after rice and maize. Cassava is one of the most drought-tolerant crops, capable of growing on marginal soils.

Globally cassava consumption has increased due to its versatility of uses. Cassava can be processed into five major products: gari & fufu, cassava flour, cassava starch, ethanol and livestock feed.

Nigeria is the world's largest producer of cassava, while Thailand is the largest exporter of dried cassava.

Cassava continues to gain popularity after rice, as the second most consumed crop in Liberia. If processed correctly with micronutrients added, cassava products can be sold at a profit.

Cassava is a crucial crop for Liberians:

- About 60% of all cassava farmers are located in LADA's focus counties: Nimba, Lofa, Bong and rural Montserrado
- Domestic production would need to increase by at least 1/3 to satisfy local demand
- The business of processing cassava into the popular cassava products can be a profitable business venture
- Market growth opportunities exist if processors begin to fortify gari, providing the market with healthier varieties that have both the micronutrients and coconut flavor

An additional 60 MT per month of high quality economically produced gari would be needed to offset current imports (International 2013a).

Cocoa

Figure 5: Liberia Cocoa Corporation employee harvesting Cocoa pods in Lofa

The Latin name for cocoa—*Theobroma*—literally means, "food of the gods." This valuable tree crop played an important role in many ancient South American cultures.

The cocoa tree, which is a small (4–8 meters tall) evergreen tree in the family Malvaceae, is native to the deep tropical regions of Central and South America. Its seeds and beans are used to make cocoa mass, cocoa powder, and primarily chocolate. Due to chocolate's ever increasing worldwide appeal, 3 million tons of cocoa beans are consumed annually and is forecasted to rise (International Trade Centre 2014).

Despite the fact that the cocoa value chain was devastated by the Liberian civil war, it still remains an important cash crop in Liberia. Growth in Cocoa production is steadily increasing as the global market price of the commodity remains favorable.

The main constraints in the value chain are:

- Lack of regulation and oversight
- Lack of proper inputs
- Lack of price transparency
- Aging cocoa tree stock and a lack of financing for the planting of new farms

There is not a single cocoa seed farm in Liberia. Liberian cocoa nurseries procure cocoa seeds from neighboring Ghana and Ivory Coast, which increases production costs. Smallholder cocoa farmers in Liberia are struggling to plant new cocoa trees. Their current farms are stocked with older cocoa trees that are well beyond their productive years. These smallholder farmers need access to quality inputs at reasonable prices and access to capital for planting new farms.

Currently, buyers, specifically exporters, have significant control and influence in the Liberian cocoa sector. The major exporters active in Liberia are: Wienco, Aya Group, LTI Group, Radling Holdings and a few private individual cocoa exporters. A few of these exporters are involved in pre-financing and the sales of key inputs in cocoa production.

Maize

Maize, commonly known as corn, is a cereal crop that is grown widely throughout the world in a range of climates. Maize is the most widely produced type of grain. There are over fifty varieties of maize; those varieties are split into six major types: dent corn, flint corn, pod corn, popcorn, flour corn, and sweet corn.

Maize was brought to SSA in the 1500s and has since become one of the dominant food crops. In Liberia, and like many other regions, maize is consumed as a vegetable although it is a grain crop. Maize is the most important cereal crop in SSA and an important staple food for more than 1.2 billion people in SSA and Latin America (FAOSTAT 2016). All parts of the crop can be used for food and non-food products. In industrialized countries, maize is largely used as animal feed and as a raw material for industrial products.

Over the last few years, maize production has dramatically increased in SSA. This can be attributed to the introduction of high yielding, drought tolerant, and early maturing varieties (hybrids), coupled with the increase of agricultural research taking place in the region. Ordinarily, the maize crop matures in about 120 days. The new varieties are ready for harvest as green maize (eaten boiled or roasted) in 60 days, or as dry grains in only 75 to 80 days. In the West Africa region, Nigeria produces over 60% of the region's annual output of maize.

In Liberia, maize is primarily used in animal feed. However, maize consumption by Liberians is slowly increasing, but it does not occupy a central part of the Liberian diet.

Vegetables

In everyday usage, a vegetable is any part of a plant that is consumed by humans as food. The term "vegetable" is somewhat arbitrary, largely defined through culinary and cultural tradition. Vegetables exclude other food derived from plants such as fruits, nuts, cereal grains, but includes seeds such as pulses.

Vegetables are one of Liberia's most profitable crops despite few farmers growing them. The vegetables value chain is divided in two types of vegetables: domestic and exotic vegetables. The main types of vegetables in the former are pepper, potato leaves and bitterballs, while the latter comprise of cabbages, cucumbers, tomatoes and lettuces.

Vegetables are an important crop in Liberia's smallholder agricultural farming systems. The vegetable sector is important to the Liberian economy for its income generating opportunities. Vegetable production is especially important to poor Liberian households that would otherwise have to buy vegetables in the market or go without them in their diet. According to a LISGIS study, there are over 300,000 Liberian households involved in vegetable production in some form (LISGIS 2011). The vegetable sector also contributes to employment in the form of jobs in the transportation, processing and trade activities.

In recent years, the demand for vegetables has increased tremendously due to an increase in urban population, rising income levels, and growth in the retail, hospitality and catering services industry. The growth in the hospitality industry has translated into a large increase in demand for vegetables, driven by the dietary preferences of these institutions' expatriate and repatriates clientele.

Poultry

Poultry are domesticated birds kept by humans for the eggs and meat that they produce. Poultry usually refers to the following birds: chickens, quails, turkeys, geese, ducks and pigeons. Poultry (meat and eggs), is an important source of high quality low fat protein and is the second most widely eaten type of meat globally.

Chickens and ducks are the main forms of poultry production in Liberia. Production usually occurs by small holder farmers who raise small flocks in rural areas.

There are a handful of commercial scale chicken farms in Liberia; the most notable being Obasanjo Farms Liberia in Cape Mount County. They sell chicken eggs and day old chicks.

Overall, Liberia's poultry sector has a lot of potential. The sector suffers from lack of proper chicken feed due to low maize production, veterinary services, and high startup costs. The costs to begin poultry production include the costs baby chicks, proper chicken feed, medicine (vaccines) required for a profitable production operation. As a result, the poultry sector has experienced a decrease in investments by local smallholders.

Coffee

Coffee is a brewed drink prepared from roasted coffee beans, obtained from the seeds or berries of Coffee plants. The "genus" Coffee is native to tropical Africa, Madagascar, the Comoros, Mauritius, and Réunion in the Indian Ocean. The plant was originally exported from Africa to other countries around the world. As a result, coffee plants are now cultivated in over 70 countries; primarily in the equatorial regions of the Americas, Southeast Asia, India, and Africa.

The two most commonly grown coffee plants are the highly regarded *Arabica*, and the less sophisticated but stronger and hardier *Robusta*. Once ripe, coffee beans are picked, processed, and dried. Once dried, coffee beans are roasted to varying degrees depending on the desired flavor. When roasted coffee beans are ground and brewed, coffee is produced as a beverage.

According to an Ecobank research presentation by Dr. Edward George (the Head of Soft Commodities at Ecobank Research), African countries are responsible for a small share of world coffee production. African countries account for 12.8% of world coffee output, led by Ethiopia and Uganda, while Brazil and Vietnam account for nearly 60% of world Arabica and Robusta output. The European Union is the leading offtaker of African coffee. In 2012, the EU imported a little over a $1.3 billion USDs worth of coffee from Africa (or 61% of the total).

Liberia has an underdeveloped and declining coffee sector. The sector is mostly composed of smallholder farmers with older coffee trees. These farmers multiply their own seeds and manage their own nurseries, through cooperatives and associations. Coffee production in Liberia is mostly done in Lofa and Bong counties. A few Liberian coffee farmers are attempting to expand their farms by developing new plots. Farmers are slowly shifting away from coffee production to get into cocoa production because of more favorable trading prices.

Oil Palm

Elaeis (from Greek, meaning "oil") is a genus of palms containing two species called oil palms, which are used in commercial agriculture in the production of palm oil. The African oil palm *Elaeis guineensis* is the principal source of palm oil; it is native to SSA (Central and West Africa region), occurring between Angola and Gambia. The American oil palm *Elaeis oleifera* is native to tropical Central and South America, and is used locally for oil production.

The wild African oil palm groves of Central and West Africa consists mainly of a thick-shelled variety with a thin fruit layer, called Dura. Breeding work, particularly crosses between Dura and a shell-less variety, Pisifera, have led to the development of a hybrid. This hybrid variety has a much thicker fruit layer and a thinner shell, termed Tenera. All commercial farms now use the Tenera variety that has fruits of which have a much higher content of palm oil than the native Dura.

Oil palm is a versatile tree crop with numerous uses. Crude palm oil (CPO) can be extracted from the fruit and palm kernel oil (PKO) from the seeds. In addition, the tree can be tapped for palm wine. The tree can also be felled and the timber and fronds used for construction and building materials. Oil palm is the most efficient oil producing crop, more so than its vegetable and olive oil counterparts. A multitude of products contain oil palm or various ingredients derived from it: soaps, cosmetics, bio diesel and many food products.

It is difficult to establish with certainty the total planted acreage of oil palm plantations and farms in Liberia. Estimates indicate that there are about 17,000 hectares of state-owned and 75,000 hectares of smallholder plantations up to 2007. All the plantations were established between 1960 to 1984. Since then, the trees have considerably aged with low yields, making most of the oil palm trees older than the 30 years productive lifespan of the tree. Liberia was a net exporter of oil palm until late 1980s. Liberia's devastated production infrastructure made it a current net importer of about 7,000 tons (valued at $4.4 million USDs) of edible oils (Unit 2013). This is expected to change significantly with four major international oil palm companies including Sime Darby, Golden Veroleum, Equatorial Palm Oil and Cavalla having signed concession agreements with the GOL. Many of these concessions' trees have just begun to bear fruits for processing.

Oil Palm is a major source of income and nutrition base for rural populations and until recently, production was primarily targeted at supplying the domestic market. However, demand on an international scale continues to increase. With interest from multinational companies, the sub-sector is poised to make substantial economic impact to the economy.

Oil palm production in Liberia as indicated is carried out in three different segments:

1. Large concessions and plantations primarily for the export market
2. Medium and smallholder plantations with many of the smallholder systems intercropped with food crops (sometimes other cash crops like rubber and cocoa). Oils harvested from these farms are primarily used in artisanal soap making and for the domestic oil market.
3. Wild groves which are harvested for the domestic oil market.

Rubber

Natural rubber also known as "rubber" comes from latex - a sticky, milky colloid that is collected from a tree and eventually refined into rubber ready for processing. Natural rubber is used by many manufacturing companies for the production of rubber products.

The major source of natural rubber latex is the Para rubber tree. The latex is harvested from the para rubber tree by making incisions into the bark and collecting the milky fluid in the "collection cups" in a process called "tapping". The latex is allowed to coagulate in the collection cup. The collection cups are collected and processed into dry forms for marketing. The harvested latex is refined into rubber ready for commercial processing. Natural rubber is used extensively in many applications and products either alone, or in combination with other materials.

Rubber remains the cornerstone of the Liberian economy. It serves as Liberia's strongest foreign exchange earner and agricultural export crop contributing about 90% of total export in 2011 according to the CBL (Central Bank of Liberia 2014). Different reports have estimated that rubber covers about 140,000–200,000 hectares of land in Liberia (Unit 2013). However, the rubber industry has experienced a drastic slowdown in its redevelopment, due to lack of investments from concessions and low productivity rates of abandoned private rubber farms. Over the last two decades, only about 5% of the existing rubber farms have been replanted.

Rubber plantations produce over 70% of Liberia's rubber output and account for roughly 50% of the area of all tree crops under cultivation, smallholders account for the rest. The concessions purchase the output of the smallholders at prices which fluctuate with the world market price. The share of rubber in total exports rose from 24% in 1987, to 77% in 1997 (a decline in other exports occurred during the same period) as the economy became more agriculture based through periods of instabilities (Unit 2013).

The Ministry of Agriculture in collaboration with other stakeholders has developed a draft "Master Plan" for the rubber industry. According to the plan which stretches up to 2040, replanting and new planting of 200,000 hectares is being envisioned for Liberia at a total projected cost of over $1 billion USDs (International 2013b). This includes a projected direct export income of $12 billion USDs over the same period.

Livestock

Livestock are domesticated animals raised in an agricultural setting to produce commodities such as food, clothing, fertilizer, land management, and labor. The term is often used to refer solely to those animals raised for food purposes (meat and dairy products).

In recent years, some organizations have raised livestock to promote the survival of rare breeds. The rearing of these animals to promote survival of rare breeds is known as animal husbandry. This component of modern agriculture has been practiced in many cultures since humanity's transition to farming from hunting and gathering.

Liberia has an underdeveloped livestock sector composed of mostly small scale farmers raising goats, pigs and cattle. Although there is a healthy domestic demand for beef, pork and goat meat in the Liberian market, very little production occurs locally. The demand is currently met mostly from imports from Europe and neighboring countries like Guinea and Mali.

In order for domestic livestock production to increase in Liberia, the livestock value chain needs to improve the infrastructure, the capacity of veterinary service providers, capacity of cold storage providers in high production areas, and establishing stronger farm & ranch management structures.

Increasing the capacity and the number of veterinary service providers is especially important for the cattle production where strong veterinary service providers are needed to fight off any outbreaks of the fatal hoof and mouth disease. This hoof and mouth disease (also known as the foot and mouth disease) is an infectious and sometimes fatal viral disease that affects cloven-hoofed animals.

Bamboo

The word "bamboo" comes from the Kannada term "bamboo," which was introduced to English through Indonesia and Malay. Giant bamboo is the largest member of the grass family and is amongst some of the fastest-growing plants in the world.

Bamboos are of notable economic and cultural significance especially in South, Southeast and East Asia. It is often used for building materials, food, and versatile raw produce. Bamboo has a higher compressive strength than wood, brick, or concrete and a tensile strength that rivals steel.

On the African continent, there have been attempts in the Great Lakes region of east-central Africa, to farm bamboo on a commercial scale. The growth rate of bamboo is heavily dependent on the local soil and climate conditions. Some of the largest timber bamboo can grow over 30 meters. However, the size of bamboo is very much species dependent.

Bamboo is cultivated for its timber, which is used heavily in the construction, furniture making and textile sectors. Bamboo also serves as an important food source to pandas and to a few species of caterpillars. In several Asian and southeast Asian countries, parts of bamboo are used in their traditional culinary dishes and herbal remedies.

In Liberia, bamboo is not farmed and can only be found growing in the wild. It is only used in the construction and furniture making sectors. The demand for bamboo products in Liberia remains low. However, if commercial farms are ever developed, export opportunities may arise.

Commodity Scorecard Results

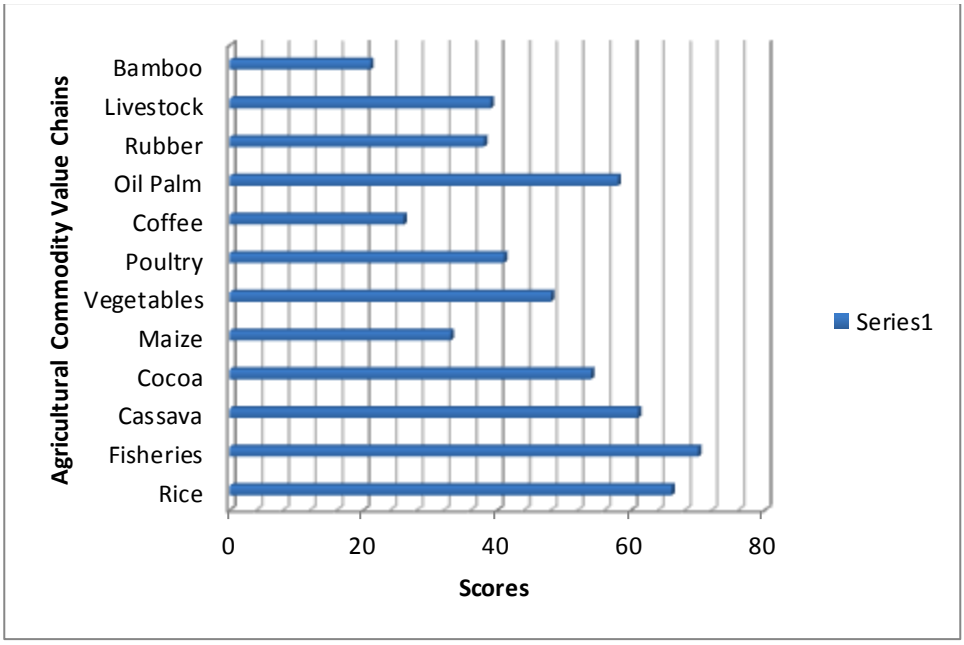


Figure 6: Summary of Results & Highest Potential Commodity Value Chains

LADA-Recommended Agricultural Value Chains	
Commodity Value Chain	**Rating**
Rice	**High Priority**
Cassava	**High Priority**
Fisheries & Aquaculture	**High Priority**
Cocoa	**High Priority**
Vegetables	**Medium Priority**
Poultry	**Medium Priority**
Maize	**Medium Priority**
Oil Palm	**Medium Priority**
Rubber	**Low Priority**
Livestock	**Low Priority**
Coffee	**Low Priority**

Table 1: LADA Recommended Agricultural Value Chains

Recommendation of Highest Potential Commodity Value Chains

The LADA project management is recommending specific agricultural commodities where LADA can achieve its development mission in the most impactful and sustainable way. These recommendations are the results of the agricultural value chain scoring methodology that LADA conducted, which assisted in identifying the highest potential agricultural commodities.

Rice was chosen as the single-most critical commodity in Liberia as a food source. The government of Liberia strongly supports the development of the domestic rice industry as a matter of national policy as well as an import substitution opportunity. The market for rice in Liberia is large and is expanding, with much room for the development of locally grown rice as a source to satisfy market demand. Job creation potential is high, given the labor intensive nature of rice farming as well as the fact that Liberia only utilizes two percent of the overall arable land that is suitable for growing rice.

Fisheries and Aquaculture was chosen primarily due to the vast untapped and bountiful fish resource directly off the coast of Liberia. Demand for fish is growing in Liberia and there is an import substitution opportunity. Increased consumption of fish would enhance the diet of Liberians by serving as a source of needed protein. The Government of Liberia is also keen to develop the Fisheries and Aquaculture industry as a means of job creation.

Cassava was selected primarily due to its contribution to the food security of Liberia and because it is a central priority of the Liberian Ministry of Agriculture. Liberian farmers at the village level have demonstrated a capability to grow and harvest cassava as a food source and local demand is ever increasing. Women also figure prominently in the processing of the tuber, fulfilling a key USAID objective of job creation for women. Increasing the yield of domestically grown cassava presents an import substitution opportunity.

Cocoa was chosen due to Liberia's potential to join its neighbors in Ivory Coast and Ghana as large-scale suppliers of the world's ever-increasing demand for cocoa. Liberia benefits from favorable climactic and soil conditions and has the potential to one day become a major player in the worldwide cocoa market. Given its proximity to some of the largest cocoa exporters in the world, Liberia is well poised to tap into regional expertise in cocoa farming. A robust cocoa export program would also contribute greatly to Liberia's balance of trade. Liberia also has no shortage of land that is very well suited to growing cocoa.

Vegetables as a class of food are of great importance to the development of the agricultural sector in Liberia due to the nutritional value as well as for food security. Rural farming households can grow their own vegetables providing an inexpensive food source. Increasing vegetable production serves as a substitute for current imports. Added growth of high value vegetables would provide for a profit making opportunity (up to three times more than for growing rice and cassava) as well as job creation for the capable smallholder farmer.

Agricultural Commodity Criteria Analysis Methodology & Scoring

The term "value chain" is defined in this context as "the full range of interrelated activities required to bring a raw product through the different phases of production to delivery to final customers." An agricultural value chain is usually composed of the following actors: Farmers, Traders, Processors, Transporters, Wholesalers, Retailers and Final Consumers.

LADA cannot focus its limited resources on Liberia's entire agricultural sector. Instead, LADA must identify the highest potential agricultural value chains (commodities) that are aligned with its mandate. LADA's targeted intervention entry points in Liberia's agricultural value chain are through financial institutions (commercial banks and MFIs), agricultural input supplies, aggregators & wholesalers, transporters and processers; instead, of working directly with farmers, where production occurs.

To identify potential high value chains for LADA to focus in on, the following analysis of the overall agricultural sector in Liberia was conducted. The LADA consultant team used previous agricultural research reports conducted in the field and interviewed agricultural sector experts and stakeholders to gather the necessary data to analyze and score each commodity value chain.

This analysis consists of a scoring methodology that presents a comprehensive and resource-effective way of assisting LADA with the selection of its target agricultural value chains. It can serve as the basis for LADA's strategic plan, by assisting them in prioritizing the highest potential for impact value chains, as well as visualizing and highlighting the strengths and weaknesses of each value chain.

Explanation of Methodology

LADA examined the following 12 of the major agricultural commodities in Liberia:

2: Agricultural Commodities Examined

Agricultural Commodities Examined	
• Rice	• Coffee
• Fisheries & Aquaculture	• Oil Palm
• Cassava	• Rubber
• Cocoa	• Livestock
• Maize	• Bamboo
• Vegetables	
• Poultry	

The selection of the most promising agricultural commodities value chains in Liberia has been based on objective and subjective criteria that are the basis to the recommendations to LADA about target sectors. The objective criteria assessed the product markets, unmet demand, growth potential, market trends and competitiveness. As well as identifying sub-sector constraints and opportunities (e.g. finance, infrastructure, policy). The subjective criteria assessed the competitive factors, the distribution of benefits to various actors, and the bottlenecks to sub-sector expansion (including costs, regulations). The scoring methodology consisted of analyzing the following sixteen criterions of each commodity:

3: List of Objective Criteria

Objective Criteria
• market growth – International

• market growth – National
• market competition - International
• market competition - National vs. Imported products
• job creation potential
• self-sustainability
• proof of concept
• import substitution
• consumption trends

4: List of Subjective Criteria

Subjective Criteria
• food security
• likelihood of intervention success
• priority of Government of Liberia
• farmer skill suitability
• impact per intervention dollar
• transportation
• LADA impact

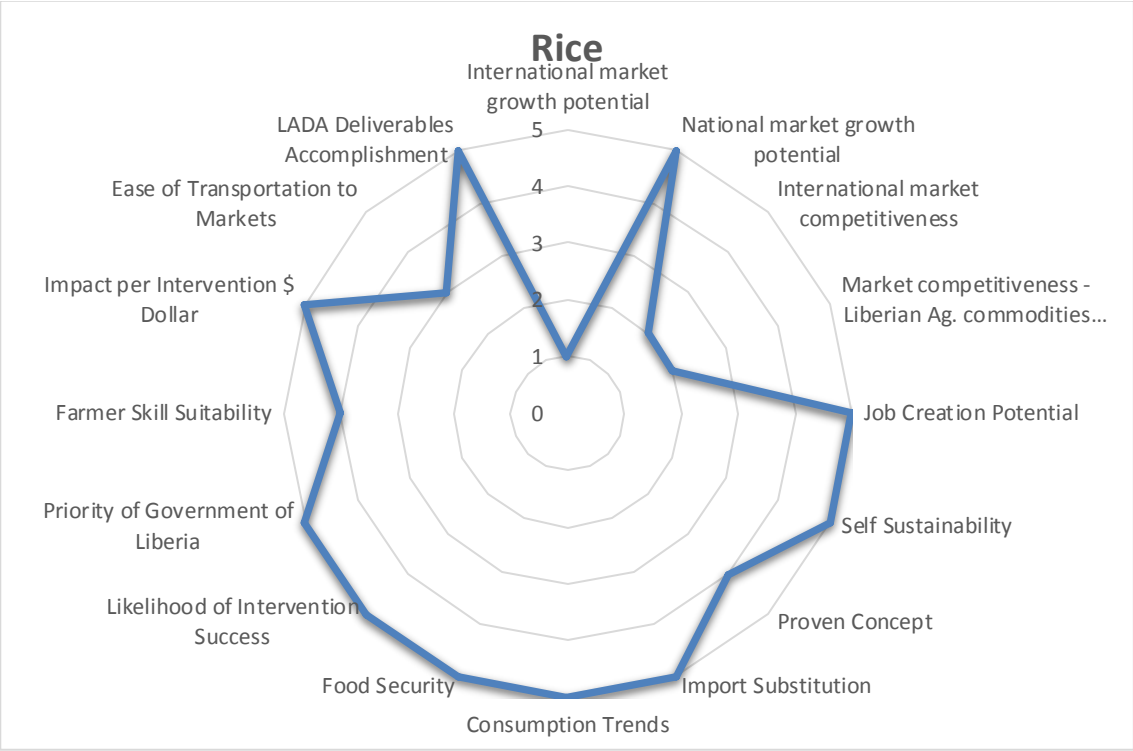
Scores were given for each criterion from one to five (five representing the most favorable and one representing the least favorable agricultural commodity value chain to engage). Overall sums were calculated out of a possible perfect score of 80.

Rice Scorecard

Value Chain Rating: High Priority

Overview of Analysis
National primary staple food
National priority of GOL
Large domestic market
High job creation potential
Products: Rice, Cereal, Feed, Snacks, Crackers, Noodles, Rice Oil

Potential Value Chain		Rice
Objective Criteria:		Score
Market Growth	International	+
	National	+++++
Market Competition	International	++
	Nat'l vs. Imp.	++
Job Creation Potential		+++++
Self-Sustainability		+++++
Proven Concept		++++
Import Substitution		+++++
Consumption Trends		+++++
Food Security		+++++
Subjective Criteria:		Score
Likelihood of Success		+++++
Priority of Government of Liberia		+++++
Farmer Skill Suitability		++++
Impact per Intervention $ Dollar		+++++
CrossCutting	Transportation	+++
	LADA Impact	+++++
TOTAL SCORE		66 out of 80

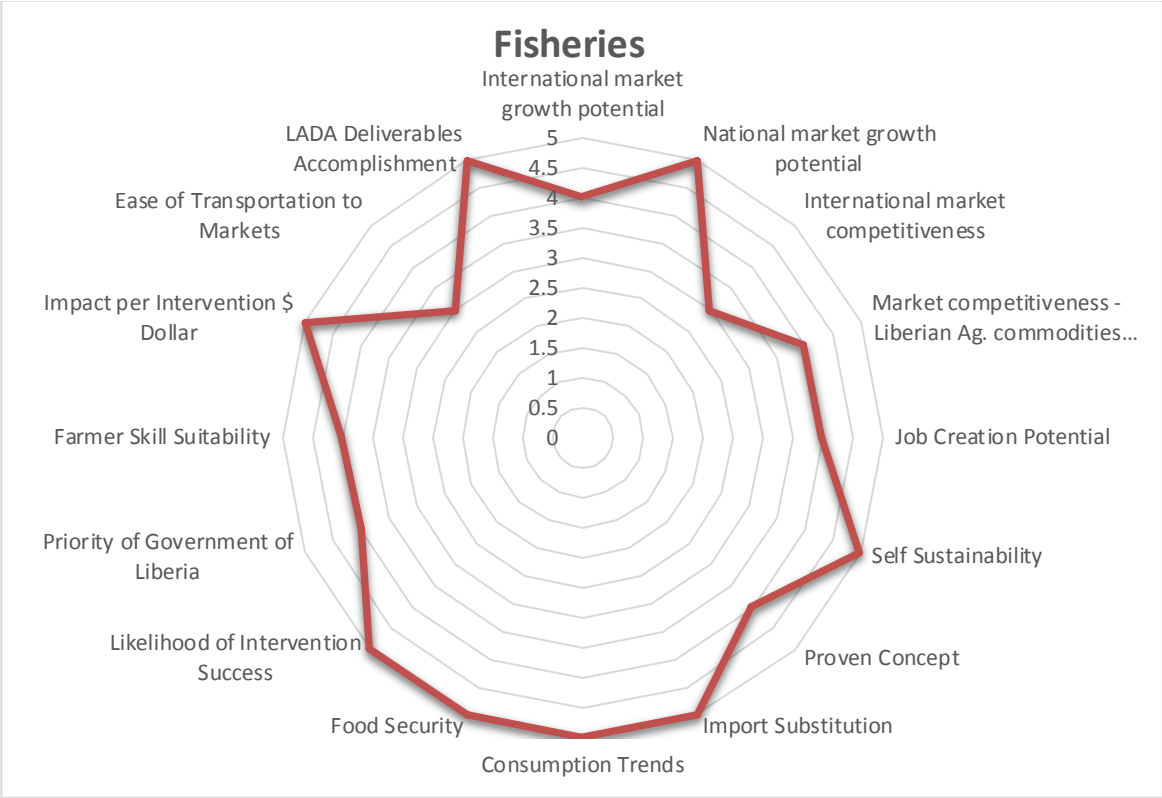

Rice
International market growth potential
National market growth potential
International market competitiveness
Market competitiveness - Liberian Ag. commodities...
Job Creation Potential
Self Sustainability
Proven Concept
Import Substitution
Consumption Trends
Food Security
Likelihood of Intervention Success
Priority of Government of Liberia
Farmer Skill Suitability
Impact per Intervention $ Dollar
Ease of Transportation to Markets
LADA Deliverables Accomplishment
0
1
2
3
4
5

Fisheries & Aquaculture Scorecard

Value Chain Rating: High Priority

Overview of Analysis
Vast untapped fishing resources
Large and growing global and domestic demand for dried and fresh fish
Human resource availability
Import substitution opportunity
Products: fresh/dried fish, fillets, frozen, canned, fish sauce, fish feed, fish oil

Potential Value Chain		Fisheries & Aquaculture
Objective Criteria:		Score
Market Growth	International	++++
	National	+++++
Market Competition	International	+++
	Nat'l vs. Imp.	++++
Job Creation Potential		++++
Self-Sustainability		+++++
Proven Concept		++++
Import Substitution		+++++
Consumption Trends		+++++
Food Security		+++++
Subjective Criteria:		Score
Likelihood of Success		+++++
Priority of Government of Liberia		++++
Farmer Skill Suitability		++++
Impact per Intervention $ Dollar		+++++
CrossCutting	Transportation	+++
	LADA Impact	+++++
TOTAL SCORE		70 out of 80

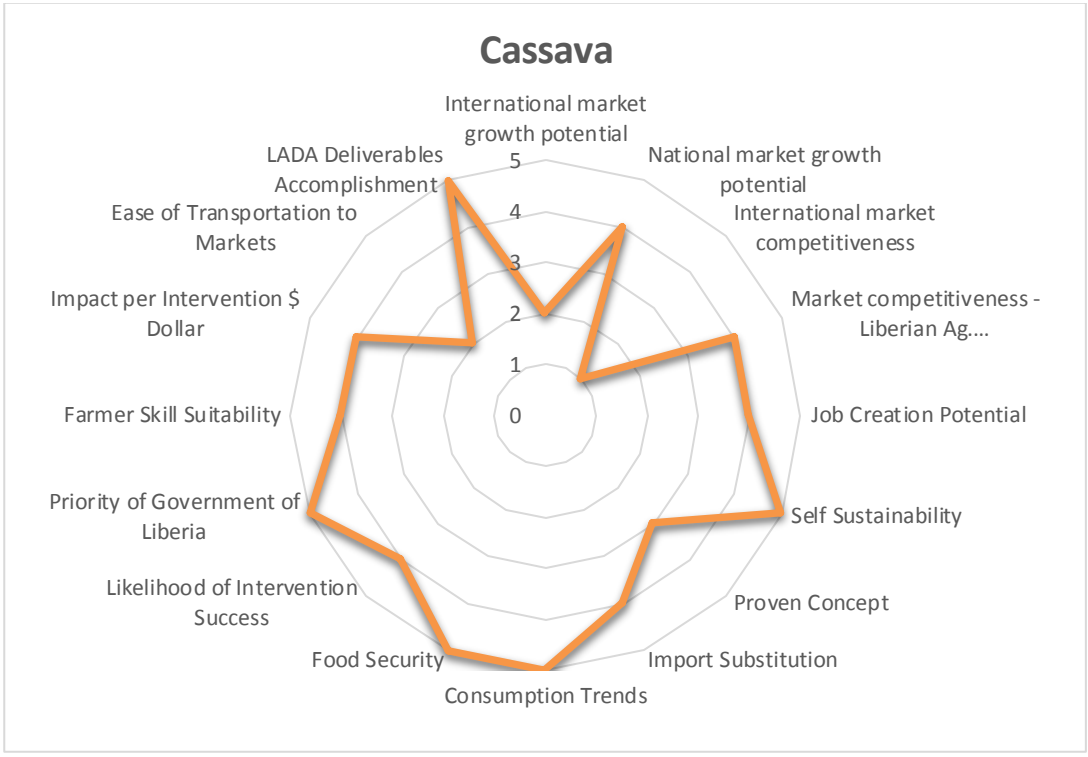

Fisheries
International market growth potential
National market growth potential
International market competitiveness
Market competitiveness - Liberian Ag. commodities...
Job Creation Potential
Self Sustainability
Proven Concept
Import Substitution
Consumption Trends
Food Security
Likelihood of Intervention Success
Priority of Government of Liberia
Farmer Skill Suitability
Impact per Intervention $ Dollar
Ease of Transportation to Markets
LADA Deliverables Accomplishment
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0

Cassava Scorecard

Value Chain Rating: High Priority

Overview of Analysis
National priority of GOL
High potential to improve food security
High job creation potential
Market potential if necessary policies are passed – "Percentage of Flour" legislation
Products: flour, chips, gari (farina), fufu, glue, starches (tapioca), alcohol

Potential Value Chain		Cassava
Objective Criteria:		Score
Market Growth	International	++
	National	++++
Market Competition	International	+
	Nat'l vs. Imp.	++++
Job Creation Potential		++++
Self-Sustainability		+++++
Proven Concept		+++
Import Substitution		++++
Consumption Trends		+++++
Food Security		+++++
Subjective Criteria:		Score
Likelihood of Success		++++
Priority of Government of Liberia		+++++
Farmer Skill Suitability		++++
Impact per Intervention $ Dollar		++++
CrossCutting	Transportation	++
	LADA Impact	+++++
TOTAL SCORE		61 out of 80

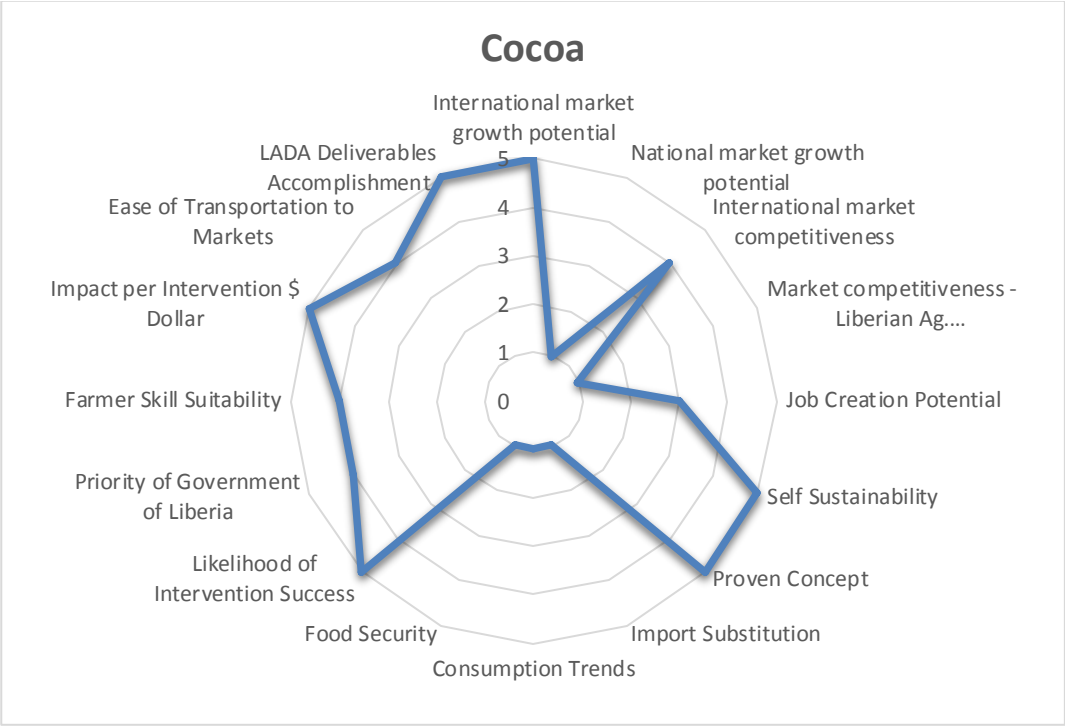

Cassava
International market growth potential
National market growth potential
International market competitiveness
Market competitiveness - Liberian Ag....
Job Creation Potential
Self Sustainability
Proven Concept
Import Substitution
Consumption Trends
Food Security
Likelihood of Intervention Success
Priority of Government of Liberia
Farmer Skill Suitability
Impact per Intervention $ Dollar
Ease of Transportation to Markets
LADA Deliverables Accomplishment
5
4
3
2
1
0

Cocoa Scorecard

Value Chain Rating: High Priority

Overview of Analysis
Proven concept in neighboring Ivory Coast & Ghana
Rising worldwide demand and favorable global trading price
Liberia possesses the ideal climate for Cocoa Production
Vast untapped land resources
Products: Grade A cocoa beans, butter, powder, cosmetics, chocolate

Potential Value Chain		Cocoa
Objective Criteria:		Score
Market Growth	International	+++++
	National	+
Market Competition	International	++++
	Nat'l vs. Imp.	+
Job Creation Potential		+++
Self-Sustainability		+++++
Proven Concept		+++++
Import Substitution		+
Consumption Trends		+
Food Security		+
Subjective Criteria:		Score
Likelihood of Success		+++++
Priority of Government of Liberia		++++
Farmer Skill Suitability		++++
Impact per Intervention $ Dollar		+++++
CrossCutting	Transportation	++++
	LADA Impact	+++++
TOTAL SCORE		54 out of 80

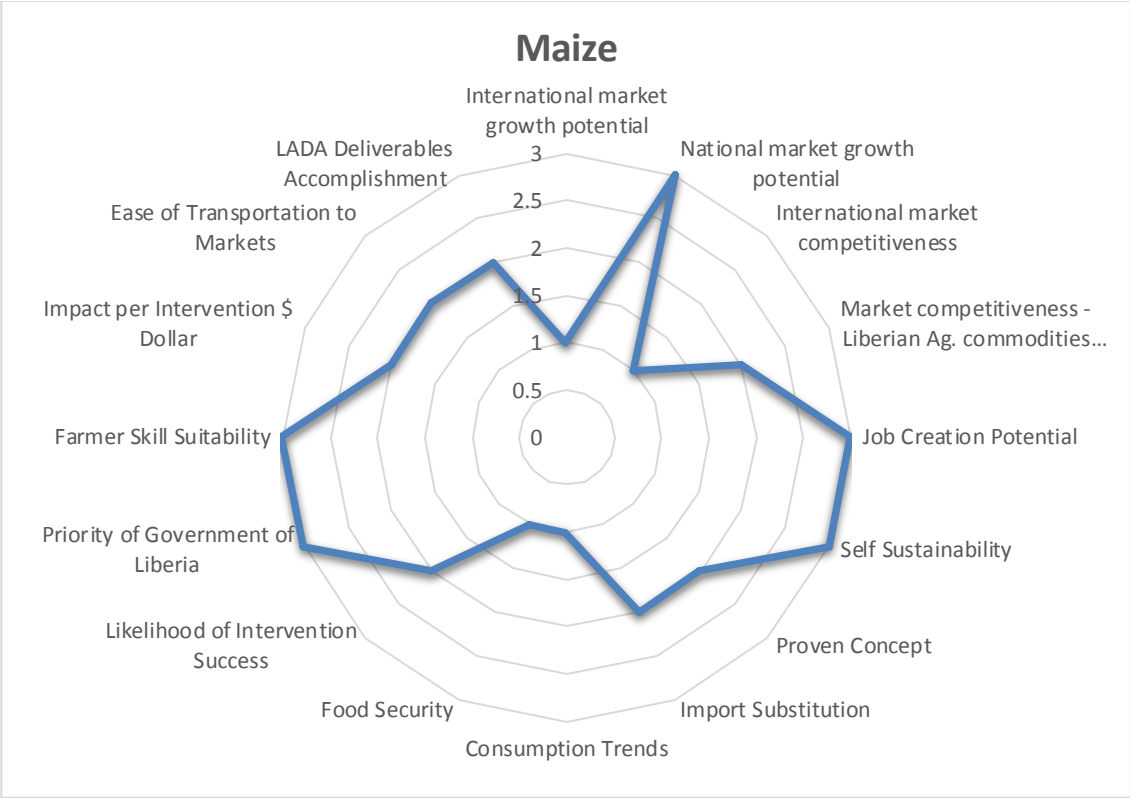

Cocoa
International market growth potential
National market growth potential
International market competitiveness
Market competitiveness - Liberian Ag....
Job Creation Potential
Self Sustainability
Proven Concept
Import Substitution
Consumption Trends
Food Security
Likelihood of Intervention Success
Priority of Government of Liberia
Farmer Skill Suitability
Impact per Intervention $ Dollar
Ease of Transportation to Markets
LADA Deliverables Accomplishment
5
4
3
2
1
0

Maize Scorecard

Value Chain Rating: Medium Priority

Overview of Analysis
Not a major part of the national diet
In high demand domestically, as an input for animal feed
Key input into poultry value chain

Potential Value Chain		Maize
Objective Criteria:		Score
Market Growth	International	+
	National	+++
Market Competition	International	+
	Nat'l vs. Imp.	++
Job Creation Potential		+++
Self-Sustainability		+++
Proven Concept		++
Import Substitution		++
Consumption Trends		+
Food Security		+
Subjective Criteria:		Score
Likelihood of Success		++
Priority of Government of Liberia		+++
Farmer Skill Suitability		+++
Impact per Intervention $ Dollar		++
CrossCutting	Transportation	++
	LADA Impact	++
TOTAL SCORE		33 out of 80

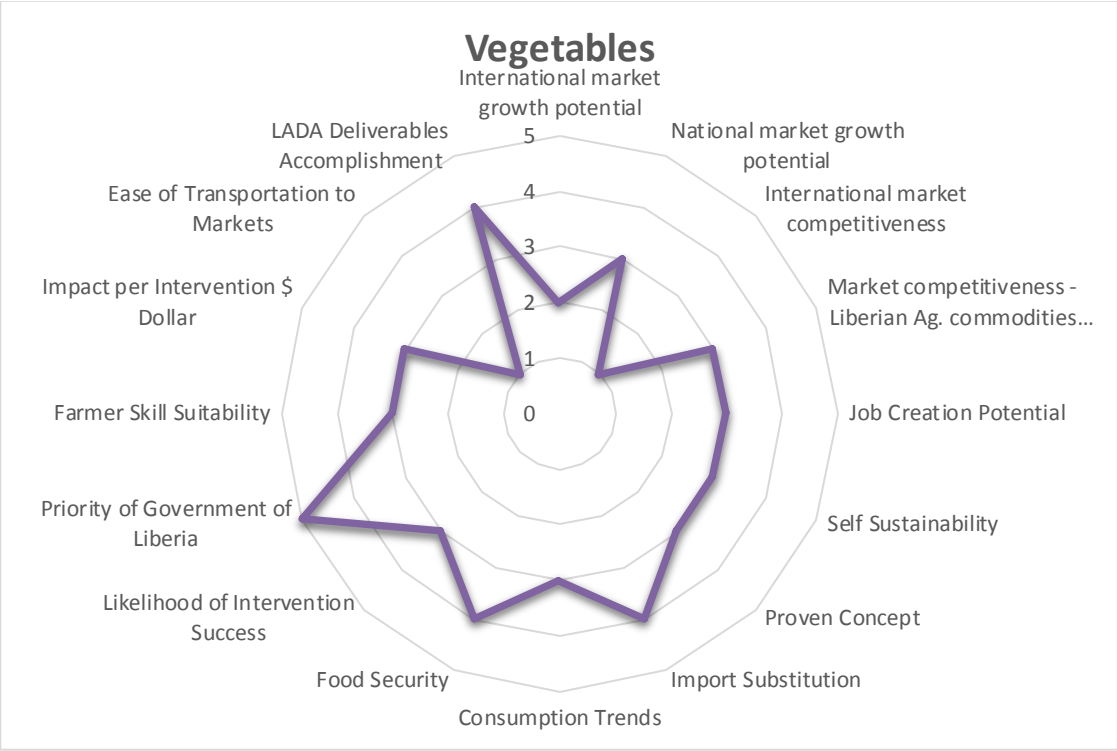

Maize
International market growth potential
National market growth potential
International market competitiveness
Market competitiveness - Liberian Ag. commodities...
Job Creation Potential
Self Sustainability
Proven Concept
Import Substitution
Consumption Trends
Food Security
Likelihood of Intervention Success
Priority of Government of Liberia
Farmer Skill Suitability
Impact per Intervention $ Dollar
Ease of Transportation to Markets
LADA Deliverables Accomplishment
3
2.5
2
1.5
1
0.5
0

Vegetables Scorecard

Value Chain Rating: Medium Priority

Overview of Analysis
high value/ exotic vegetables (e.g. tomatoes, cucumbers and lettuces) are in high demand domestically
Proven concept
Suitable climate for many vegetable species

Potential Value Chain		Vegetables
Objective Criteria:		Score
Market Growth	International	+
	National	+++
Market Competition	International	+
	Nat'l vs. Imp.	++
Job Creation Potential		+++
Self-Sustainability		+++
Proven Concept		+++
Import Substitution		++++
Consumption Trends		+++
Food Security		++++
Subjective Criteria:		Score
Likelihood of Success		+++
Priority of Government of Liberia		+++++
Farmer Skill Suitability		+++
Impact per Intervention $ Dollar		+++
CrossCutting	Transportation	+
	LADA Impact	++++
TOTAL SCORE		48 out of 80

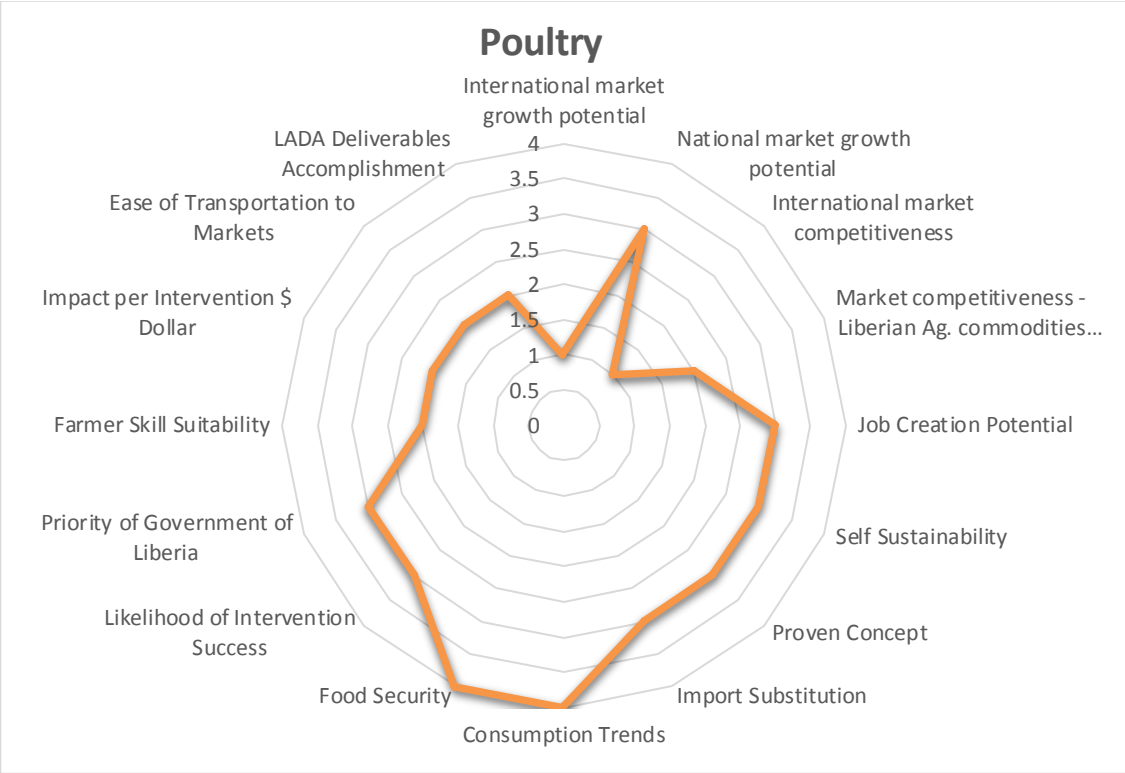

Vegetables
International market growth potential
National market growth potential
International market competitiveness
Market competitiveness - Liberian Ag. commodities...
Job Creation Potential
Self Sustainability
Proven Concept
Import Substitution
Consumption Trends
Food Security
Likelihood of Intervention Success
Priority of Government of Liberia
Farmer Skill Suitability
Impact per Intervention $ Dollar
Ease of Transportation to Markets
LADA Deliverables Accomplishment
5
4
3
2
1
0

Poultry Scorecard

Value Chain Rating: Medium Priority

Overview of Analysis
Very high startup costs for formal poultry operations
Many informal poultry farm developments are already active
Poultry products are high in nutritional (protein) value
Import substitution opportunity
Lack of domestic cold storage facilities

Potential Value Chain		Poultry
Objective Criteria:		Score
Market Growth	International	+
	National	+++
Market Competition	International	+
	Nat'l vs. Imp.	++
Job Creation Potential		+++
Self-Sustainability		+++
Proven Concept		+++
Import Substitution		+++
Consumption Trends		++++
Food Security		++++
Subjective Criteria:		Score
Likelihood of Success		+++
Priority of Government of Liberia		+++
Farmer Skill Suitability		++
Impact per Intervention $ Dollar		++
CrossCutting	Transportation	++
	LADA Impact	++
TOTAL SCORE		41 out of 80

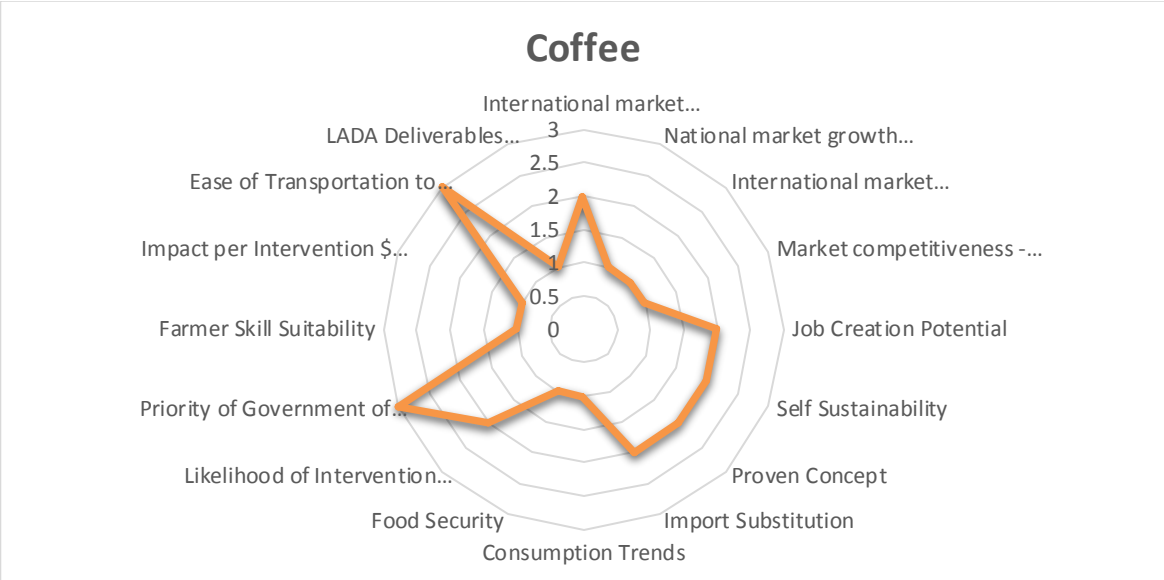

Poultry
International market growth potential
National market growth potential
International market competitiveness
Market competitiveness - Liberian Ag. commodities...
Job Creation Potential
Self Sustainability
Proven Concept
Import Substitution
Consumption Trends
Food Security
Likelihood of Intervention Success
Priority of Government of Liberia
Farmer Skill Suitability
Impact per Intervention $ Dollar
Ease of Transportation to Markets
LADA Deliverables Accomplishment
4
3.5
3
2.5
2
1.5
1
0.5
0

Coffee Scorecard

Value Chain Rating: Low Priority

Overview of Analysis
Limited roasting capacity in Liberia
Extremely competitive global and regional market
Potential for exporting opportunities
Suitable Climate for production

Potential Value Chain		Coffee
Objective Criteria:		Score
Market Growth	International	++
	National	+
Market Competition	International	+
	Nat'l vs. Imp.	+
Job Creation Potential		++
Self-Sustainability		++
Proven Concept		++
Import Substitution		++
Consumption Trends		+
Food Security		+
Subjective Criteria:		Score
Likelihood of Success		++
Priority of Government of Liberia		+++
Farmer Skill Suitability		+
Impact per Intervention $ Dollar		+
CrossCutting	Transportation	+++
	LADA Impact	+
TOTAL SCORE		26 out of 80

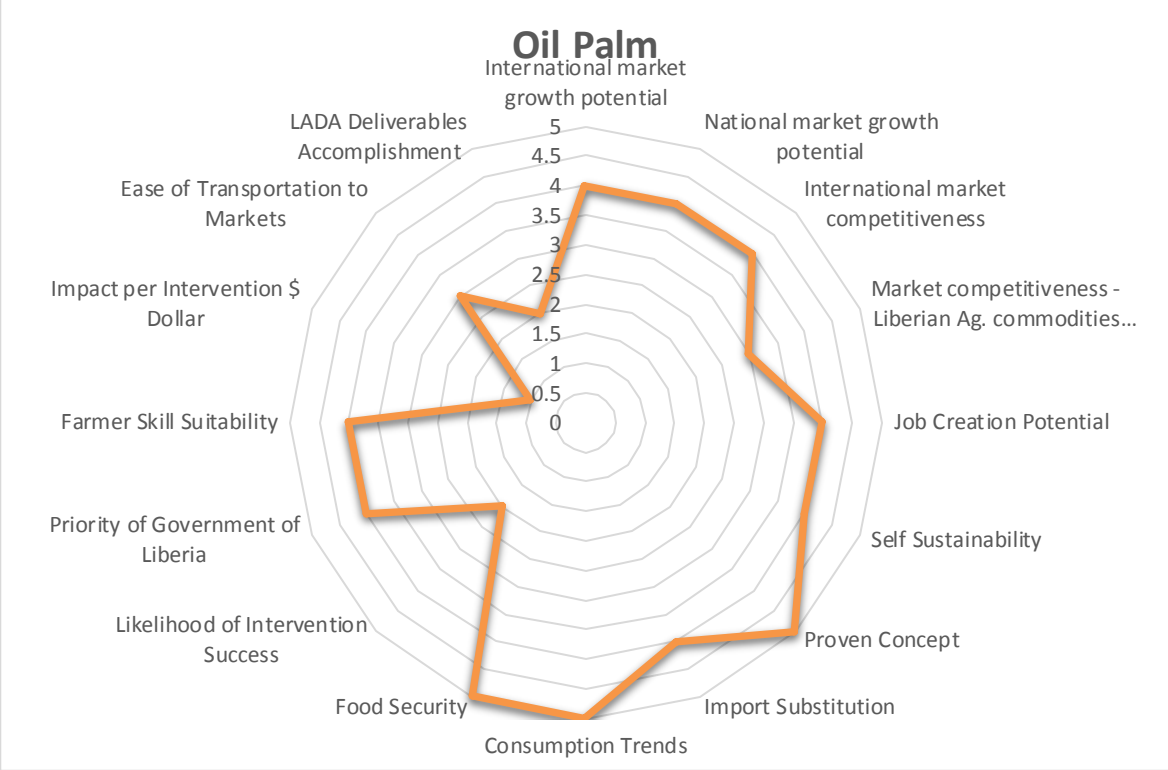

Coffee
International market...
National market growth...
International market...
Market competitiveness -...
Job Creation Potential
Self Sustainability
Proven Concept
Import Substitution
Consumption Trends
Food Security
Likelihood of Intervention...
Priority of Government of...
Farmer Skill Suitability
Impact per Intervention $...
Ease of Transportation to...
LADA Deliverables...
3
2.5
2
1.5
1
0.5
0

Oil Palm Scorecard

Value Chain Rating: Medium Priority

Overview of Analysis
Not attractive to LADA due to heavy engagement of other projects
Limited opportunity for impact

Potential Value Chain		Oil Palm
Objective Criteria:		Score
Market Growth	International	++++
	National	++++
Market Competition	International	++++
	Nat'l vs. Imp.	+++
Job Creation Potential		++++
Self-Sustainability		++++
Proven Concept		+++++
Import Substitution		++++
Consumption Trends		+++++
Food Security		+++++
Subjective Criteria:		Score
Likelihood of Success		++
Priority of Government of Liberia		++++
Farmer Skill Suitability		++++
Impact per Intervention $ Dollar		+
CrossCutting	Transportation	+++
	LADA Impact	++
TOTAL SCORE		58 out of 80

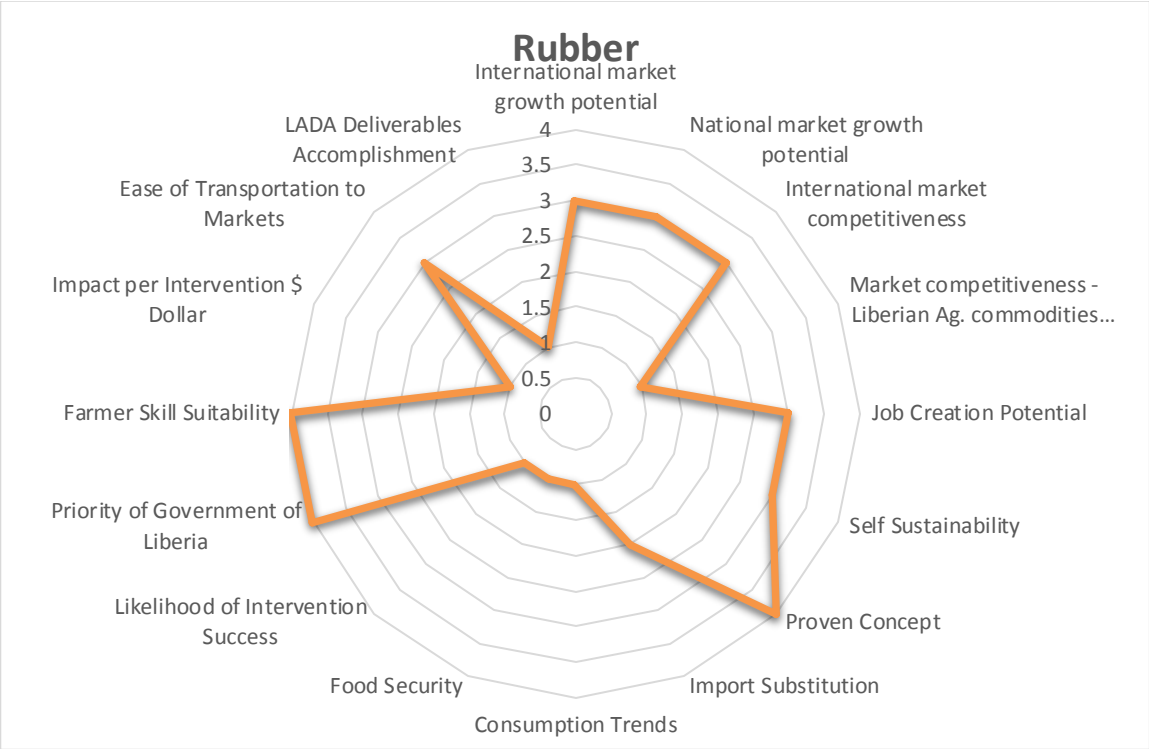

Oil Palm
International market growth potential
National market growth potential
International market competitiveness
Market competitiveness - Liberian Ag. commodities...
Job Creation Potential
Self Sustainability
Proven Concept
Import Substitution
Consumption Trends
Food Security
Likelihood of Intervention Success
Priority of Government of Liberia
Farmer Skill Suitability
Impact per Intervention $ Dollar
Ease of Transportation to Markets
LADA Deliverables Accomplishment
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0

Rubber Scorecard

Value Chain Rating: Low Priority

Overview of Analysis
Not attractive to LADA due to the fact that it isn't a food product
Not under Feed the Future priorities

Potential Value Chain		**Rubber**
Objective Criteria:		**Score**
Market Growth	**International**	+++
	National	+++
Market Competition	**International**	+++
	Nat'l vs. Imp.	+
Job Creation Potential		+++
Self-Sustainability		+++
Proven Concept		++++
Import Substitution		++
Consumption Trends		+
Food Security		+
Subjective Criteria:		**Score**
Likelihood of Success		+
Priority of Government of Liberia		++++
Farmer Skill Suitability		++++
Impact per Intervention $ Dollar		+
CrossCutting	**Transportation**	+++
	LADA Impact	+
TOTAL SCORE		**38 out of 80**

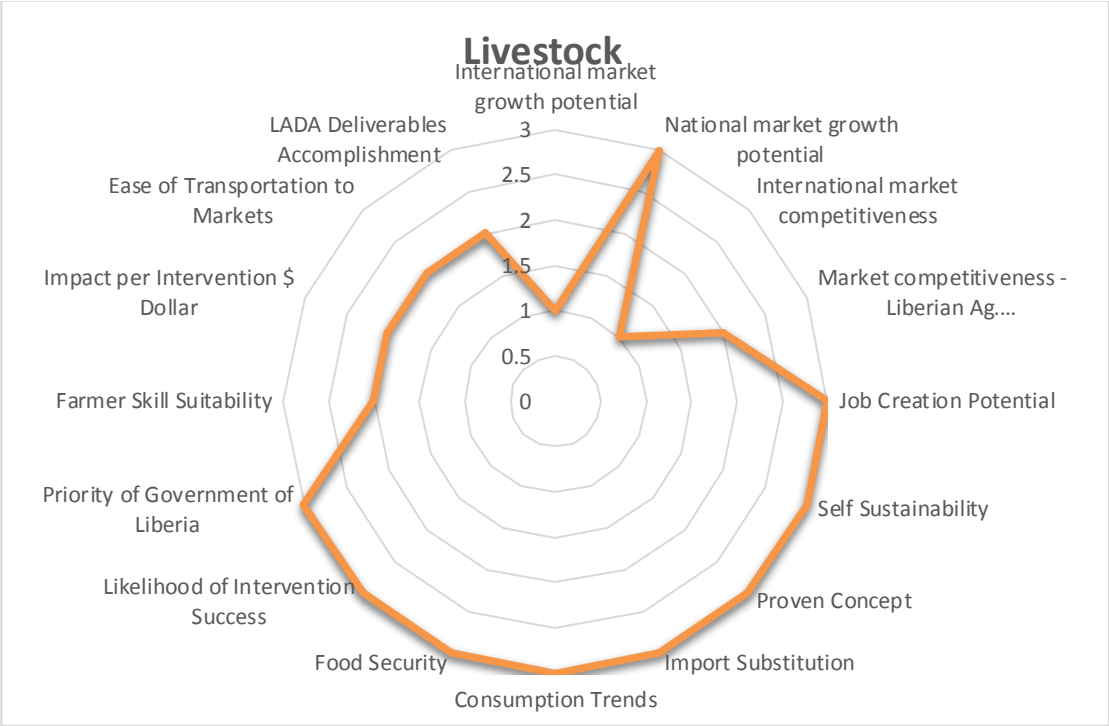

Rubber
International market growth potential
National market growth potential
International market competitiveness
Market competitiveness - Liberian Ag. commodities...
Job Creation Potential
Self Sustainability
Proven Concept
Import Substitution
Consumption Trends
Food Security
Likelihood of Intervention Success
Priority of Government of Liberia
Farmer Skill Suitability
Impact per Intervention $ Dollar
Ease of Transportation to Markets
LADA Deliverables Accomplishment
4
3.5
3
2.5
2
1.5
1
0.5
0

Livestock Scorecard

Value Chain Rating: Low Priority

Overview of Analysis
Inappropriate due to complexity and high startup costs
Lack of cold storage facilities
Lack of domestic veterinary services
Lack of farm and ranch middle management infrastructure

Potential Value Chain		Livestock
Objective Criteria:		Score
Market Growth	International	+
	National	+++
Market Competition	International	+
	Nat'l vs. Imp.	++
Job Creation Potential		+++
Self-Sustainability		+++
Proven Concept		+++
Import Substitution		+++
Consumption Trends		+++
Food Security		+++
Subjective Criteria:		Score
Likelihood of Success		+++
Priority of Government of Liberia		+++
Farmer Skill Suitability		++
Impact per Intervention $ Dollar		++
CrossCutting	Transportation	++
	LADA Impact	++
TOTAL SCORE		39 out of 80

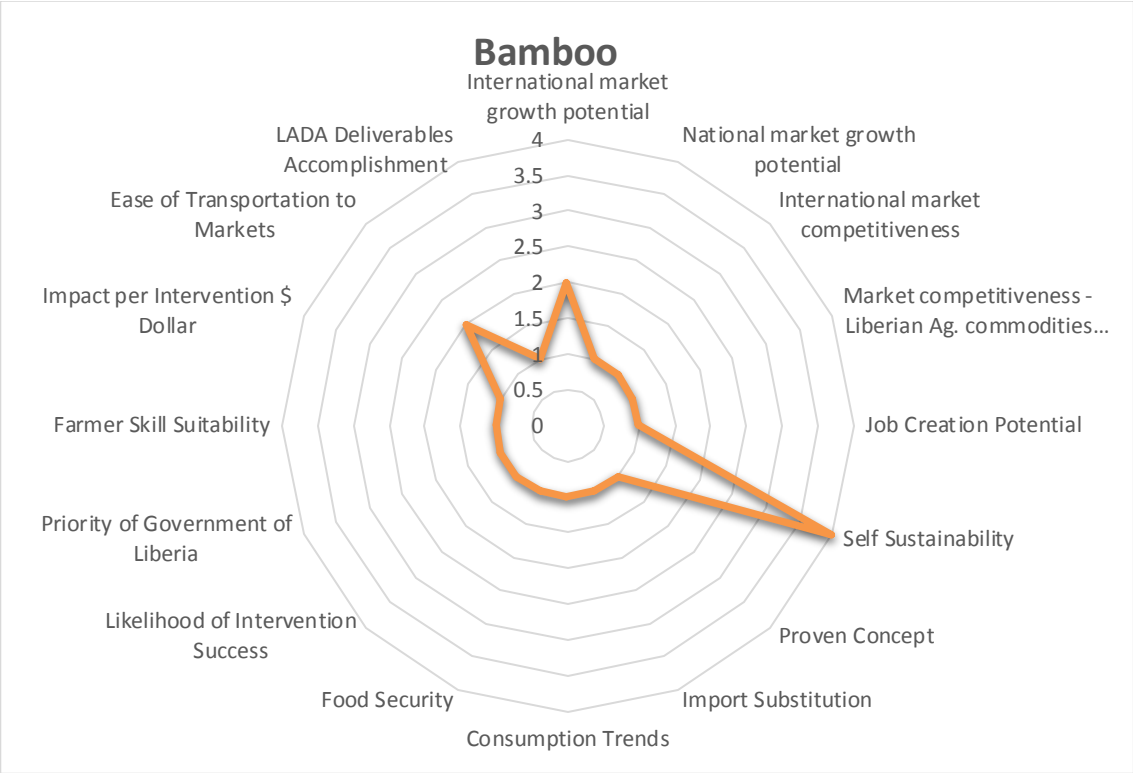

Livestock
International market growth potential
National market growth potential
International market competitiveness
Market competitiveness - Liberian Ag....
Job Creation Potential
Self Sustainability
Proven Concept
Import Substitution
Consumption Trends
Food Security
Likelihood of Intervention Success
Priority of Government of Liberia
Farmer Skill Suitability
Impact per Intervention $ Dollar
Ease of Transportation to Markets
LADA Deliverables Accomplishment
3
2.5
2
1.5
1
0.5
0

Bamboo Scorecard

Value Chain Rating: Low Priority

Overview of Analysis
Inappropriate due to complexity and high startup costs
Limited opportunity for impact on incomes
Minimal domestic market for bamboo products
Lack of technical know-how in the production of bamboo products
Not under Feed the Future priorities

Potential Value Chain		Bamboo
Objective Criteria:		Score
Market Growth	International	+
	National	+
Market Competition	International	+
	Nat'l vs. Imp.	+
Job Creation Potential		+
Self-Sustainability		+
Proven Concept		+
Import Substitution		+
Consumption Trends		+
Food Security		+
Subjective Criteria:		Score
Likelihood of Success		+
Priority of Government of Liberia		+
Farmer Skill Suitability		+
Impact per Intervention $ Dollar		+
CrossCutting	Transportation	++
	LADA Impact	+
TOTAL SCORE		21 out of 80


Bamboo
International market growth potential
National market growth potential
International market competitiveness
Market competitiveness - Liberian Ag. commodities...
Job Creation Potential
Self Sustainability
Proven Concept
Import Substitution
Consumption Trends
Food Security
Likelihood of Intervention Success
Priority of Government of Liberia
Farmer Skill Suitability
Impact per Intervention $ Dollar
Ease of Transportation to Markets
LADA Deliverables Accomplishment
4
3.5
3
2.5
2
1.5
1
0.5
0

Value Chain Actors
Rice Value Chain Actors

1. Farmers – smallholder farmers
2. Processors – farm gate level: parboiling, drying, de-stoning
3. Traders/"aggregators"
4. Miller- parboiling, drying, de-stoning, de-husking and polishing
5. Transporters – truck and boat
6. Importers – Import various rice varieties on a large scale
7. Wholesalers
8. Feeding Program funded by Donors – buy both imported and domestic rice varieties
9. Retailers – market women, supermarkets and restaurants.
10. Consumers

Fisheries & Aquaculture Value Chain Actors

1. Fisherman – individual artisanal fisherman
2. Inland Fish pond farmers – usually stock their ponds with tilapia and catfish
3. Traders/"aggregators"
4. Processors – dried/smoked fish – fish driers & fresh fish traders: gutting, deboning, packaging, freezing
5. Fish Processing Plant – by fresh fish and process: drying or gutting, deboning, freezing and packaging.
6. Transporters – truck and boat
7. Wholesalers – cold storage
8. Importers – Import Frozen fish
9. Retailers – Supermarkets and restaurants
10. Exporters – Enisul Fisheries have exported before and would like to explore the opportunities in foreign markets for their frozen fish products.
11. Consumers

Cassava Value Chain Actors

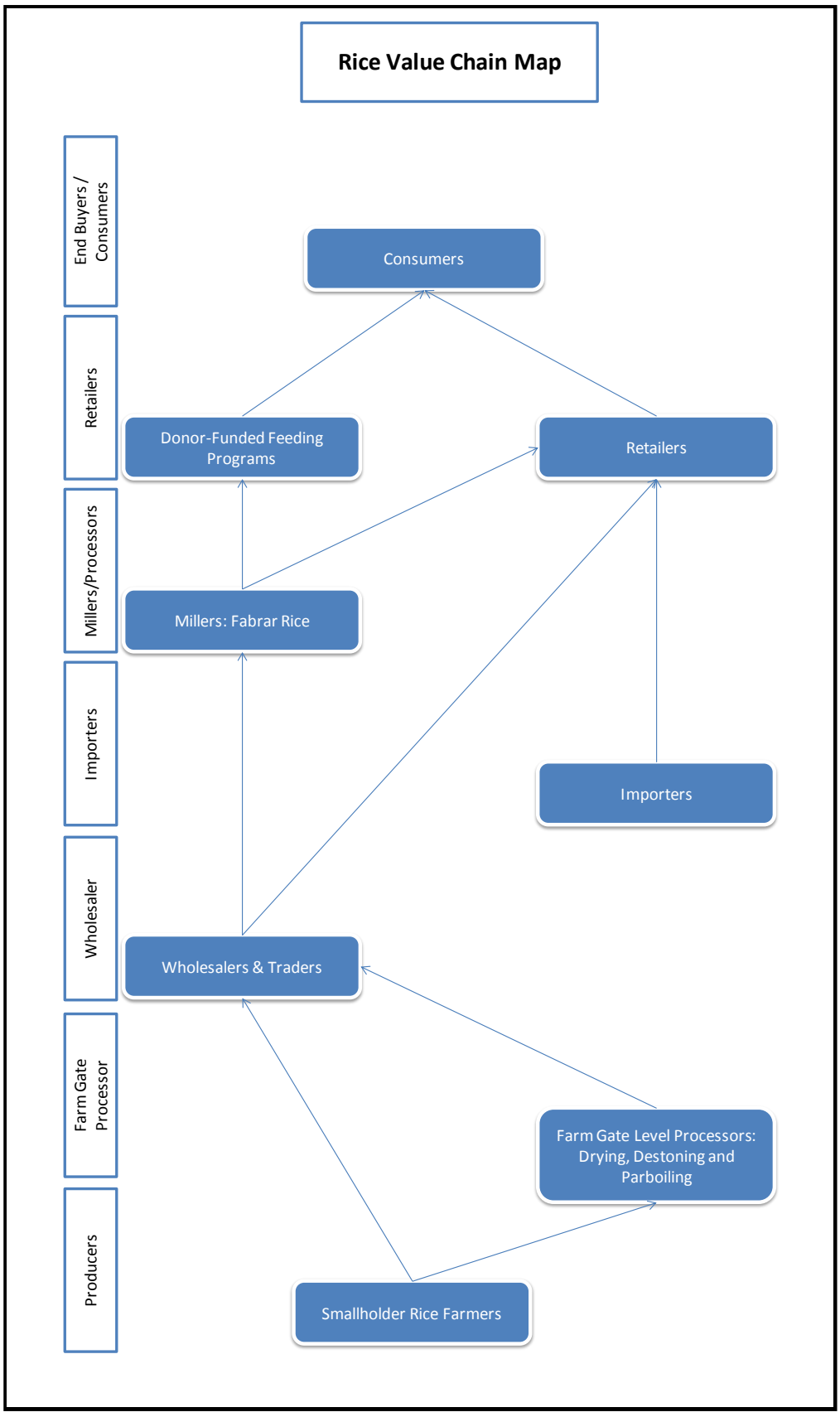
1. Farmers – smallholder farmers
2. Traders/"agro-dealers"
3. Processors – Farm level processors: produce gari however the quality is not as high as the larger scale millers.
4. Millers – Such as Jacqueline's Productions, Agro Inc. and Falama. They all have larger mechanized processing units. They produce: gari, fufu, flour, chips.
5. Transporters - trucks
6. Wholesalers
7. Importers – A few traders and wholesalers import Gari from neighboring countries.
8. Exporters – Agro Inc. is exporting a few of their cassava products.
9. Retailers - supermarkets
10. Consumers

Cocoa Value Chain Actors

1. Farmers – Smallholder farmers, plantation contract farmers, extension farmers
2. Traders/"agro-dealers" – traders – one time and stable long term buyers
3. Processors – farm gate level processors: basic drying and fermentation
4. Transporters – truck and ship to export markets (primarily in Western Europe)
5. Wholesalers & Exporters – Exporters aggregate large amounts of cocoa and sell and ship to buyers abroad

Value Chain Mapping & Identification of Constraints

Rice Value Chain Map



7: Rice Value Chain Map

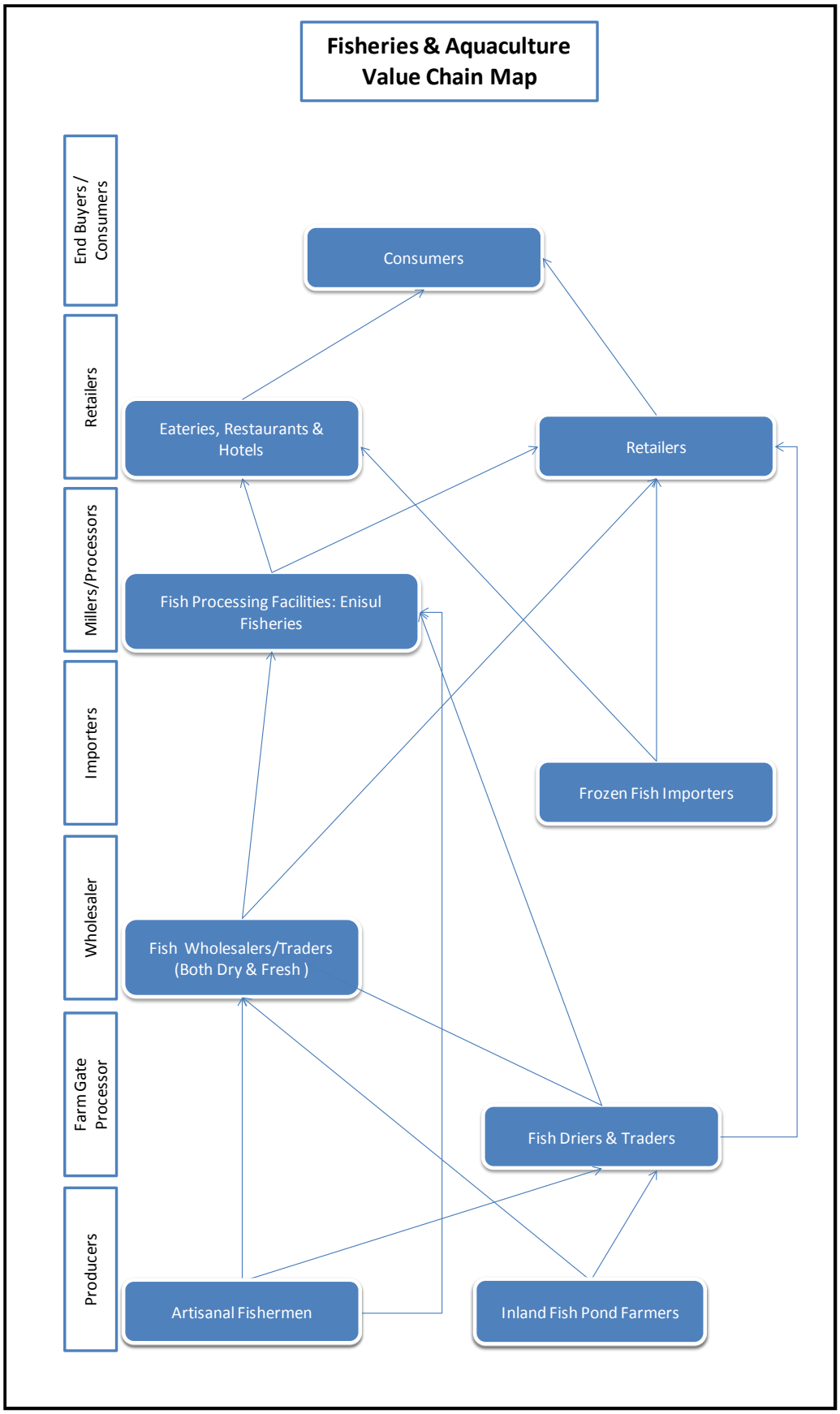
Rice Value Chain Strengths and Opportunities

- ✓ National primary staple food product
- ✓ National Priority of GOL
- ✓ Large and expanding domestic market
- ✓ High job creation potential
- ✓ Currently operating at most rudimentary level, so much room for improvement

Rice Value Chain Constraints & Risks

- ➢ Lack of high quality and high yielding rice seeds from a seed multiplication program
- ➢ Lack of farmer capacity both on human and technical level
- ➢ Lack of farmers – farming is considered an unattractive job
- ➢ Absence of technical farming capability
- ➢ Lack of reasonably priced paddy due to NGO overpayments
- ➢ Poor transport networks connecting rice fields with markets
- ➢ Non-competitive vs. imports due to:
    - o Overly expensive cost of production
    - o Relatively poor quality rice
    - o Low or non-existent import tariffs
- ➢ Minimal and rudimentary rice processing capability (de-stoning, drying, polishing, parboiling)
- ➢ Market pricing challenges for both paddy rice and processed rice
- ➢ Minimal packaging and marketing effort
- ➢ Minimal access to finance
- ➢ Common agriculture risk – weather and natural events
- ➢ No ready market for what farmers produce at the current prices

Fisheries & Aquaculture Value Chain Map



8: Fisheries & Aquaculture Value Chain Map

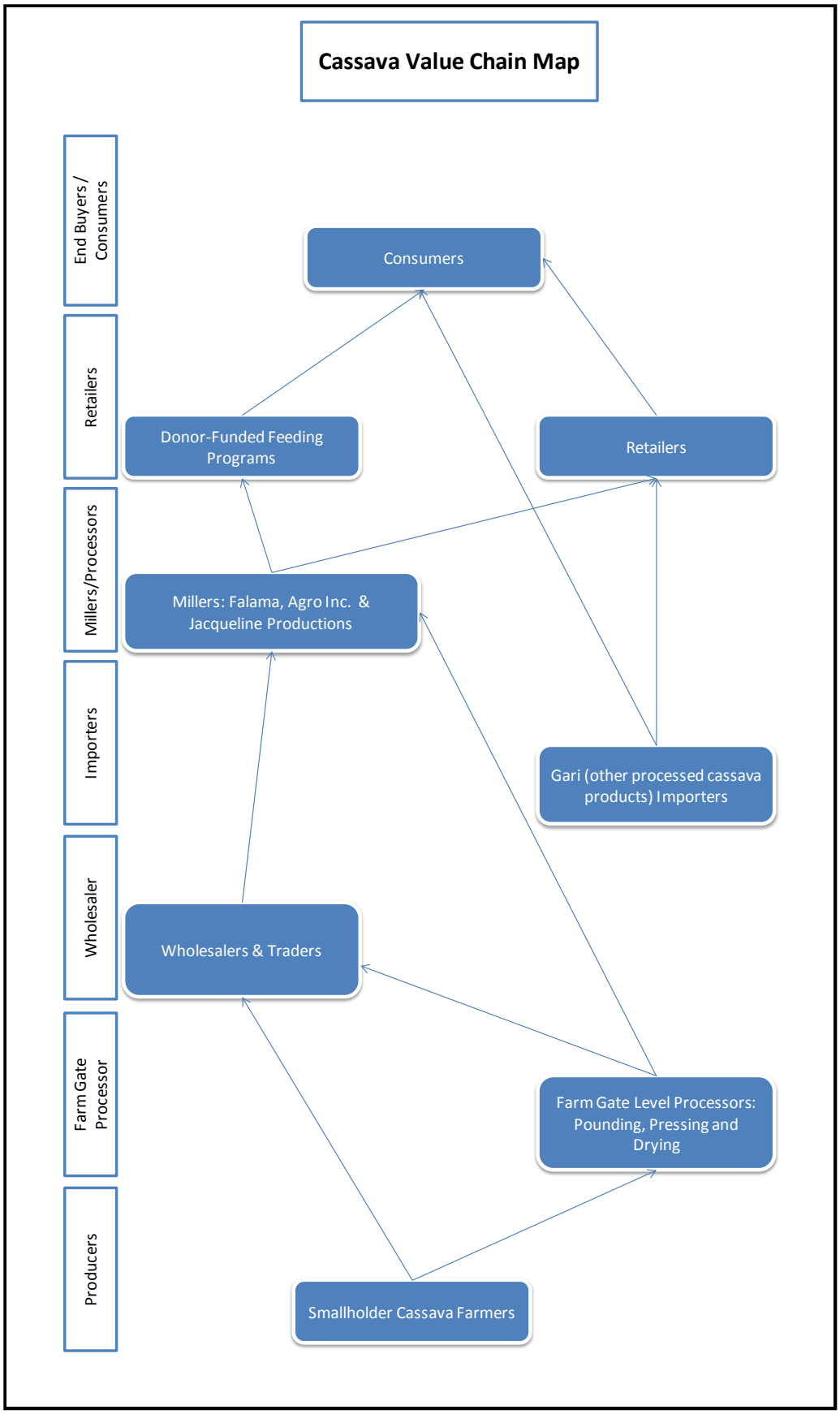
Fisheries & Aquaculture Value Chain Strengths & Opportunities

- ✓ Vast untapped fishing resources
- ✓ Large and growing demand both globally and domestically for dried and fresh fish
- ✓ Human resources availability
- ✓ Import substitution opportunity

Fisheries & Aquaculture Value Chain Constraints & Risks

- ➢ Minimal number of artisanal fishermen operating low capacity boats
- ➢ Lack of fisherman capacity – currently, the fishermen are not using modern fishing technologies such as sonar and global positioning system (gps) units
- ➢ Youth are not attracted to the profession – Becoming a fisherman is currently considered an unattractive profession
- ➢ Minimal but growing fish processing and packaging capability
- ➢ Minimal cold storage and cold chain capability
- ➢ Minimal access to finance

Cassava Value Chain Map



9: Cassava Value Chain Map

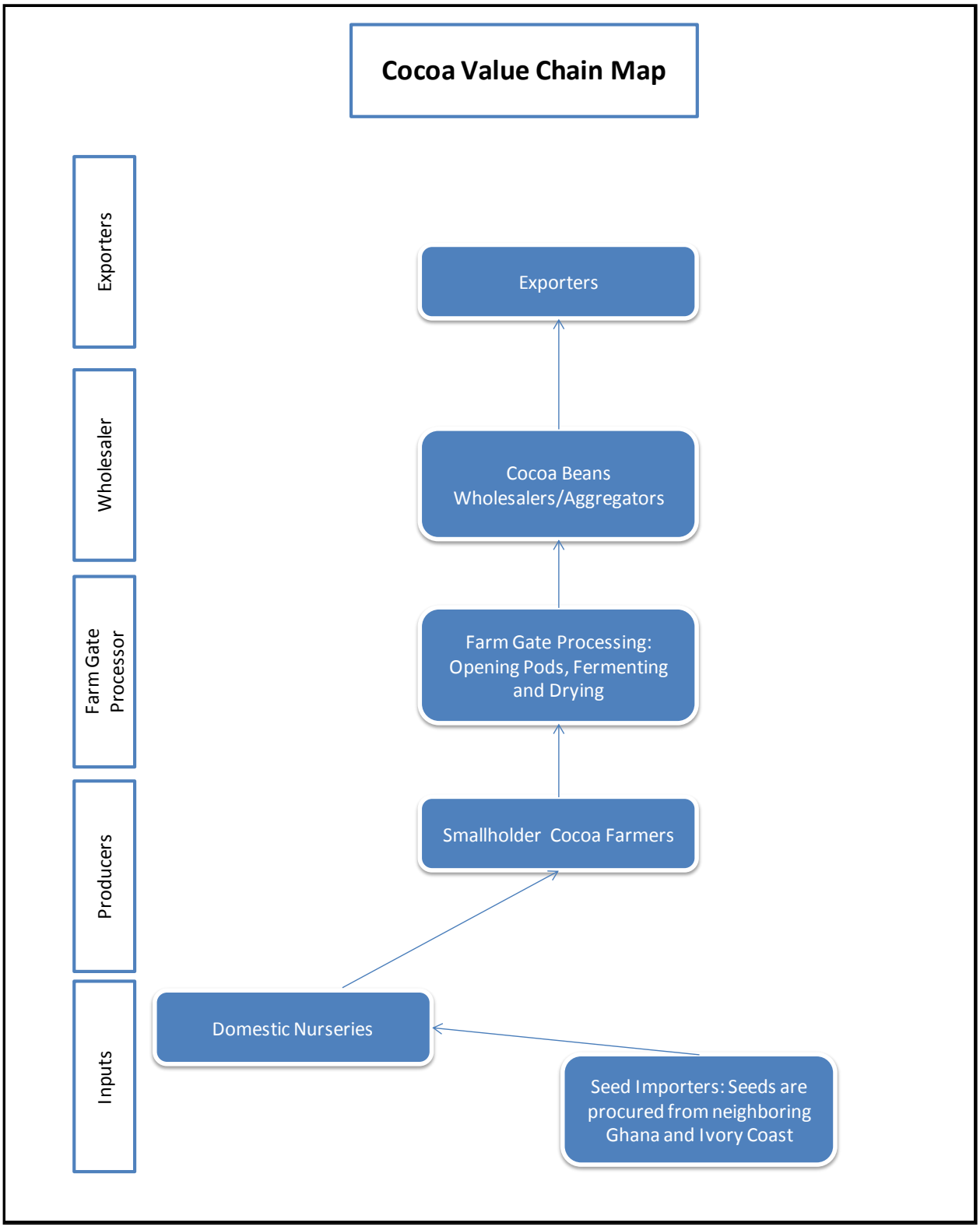
Cassava Value Chain Strengths & Opportunities

- ✓ National Priority of GOL
- ✓ High potential to improve food security
- ✓ High job creation potential
- ✓ Import substitution opportunity
- ✓ Market expansion potential dependent upon proposed Bakery Association Law passage

Cassava Value Chain Constraints & Risks

- ➢ Lack of cassava nurseries – to provide cuttings to farmers
- ➢ Cassava is farmed mostly by small-scale farms
- ➢ Absence of technical farming capability
- ➢ High spoilage rate due to poor storage and transportation practices
- ➢ Poor transport networks connecting farms to markets
- ➢ Non-competitive vs. imports due to:
  - o Current, high costs of production
  - o Relatively poor quality cassava products
  - o Low or non-existent import tariffs
- ➢ Rudimentary cassava processing capability
- ➢ Minimal packaging, marketing, and branding effort – relatively low demand
- ➢ Minimal access to finance

Cocoa Value Chain Map



10: Cocoa Value Chain Map

Cocoa Value Chain Strengths & Opportunities

- ✓ Favorable worldwide supply-demand dynamic
- ✓ Forecasted positive increase in market demand and trading prices, with the potential impending global shortage of cocoa
- ✓ Liberia possesses the ideal climate and soil for Cocoa production
- ✓ Vast untapped lands
- ✓ Regional cocoa growing culture with high level human resource expertise in neighboring Ivory Coast and Ghana.

Cocoa Value Chain's Constraints & Risks

- ➢ Lack of quality cocoa seeds and nurseries
- ➢ Lack of domestic price transparency
- ➢ Lack of regulation and oversight, that protects smallholder farmers and ensures that they receive a fair price for their cocoa pods
- ➢ Absence of technical farming capability
- ➢ Long maturity period of cocoa tree - lasting 2/3-5 years (optimal)
- ➢ Unstable supply for steady buyers due to prevalence of one-time buyers who overpay and disrupt a stable contract purchase/sale system
- ➢ Only basic cocoa processing capability (fermenting and drying)
- ➢ Minimal access to finance, especially with loan products designed to serve the cocoa sector, with elongated periods (3-5 years) between planting and harvest – i.e. without cash flow

Gross Margin Analysis
Rice Value Chain Margin Analysis

5: Rice Value Chain Margin Analysis

Rice Value Chain

Projected Gross Margins of the average Liberian lowland Rice Farmer

Time Frame: 1 Crop Cycle

Revenue & Costs	Rice Value Chain	
Revenue:		
Output (kg/hectare)*		3,000
Output (Number of 50kg bags/hectare)		60
Projected Sales Price (USD/50kg bag paddy rice)**	$	12.00
Total Revenue	$	720.00
Costs:		
Land Clearing, Swampland Development & Weeding (USD/hectare)	$	150.00
Planting & Seeds (USD/hectare)	$	70.00
Harvesting		75.00
Post-Harvest - Drying (USD/hectare)	$	10.00
Bagging (USD/hectare)	$	50.00
Total Costs (USD/hectare)	$	355.00
Gross Margin (USD/hectare)	$	365.00

*yield for Non-FED commercial farmers
**Current Purchase price for Fabrar Rice
Note: All costs in United States Dollars (USDs).

Fisheries & Aquaculture Value Chain Margin Analysis

******Please see LADA's Fisheries & Aquaculture financial model in Annex 3 "LADA's Fisheries & Aquaculture Ventures financing financial model"******

Cassava Value Chain Margin Analysis

6: Cassava Value Chain Margin Analysis

Cassava Value Chain

Projected Gross Margins of the average Liberian Cassava Farmer

Time Frame: 1 Crop Cycle

Revenue & Costs	Cassava Value Chain	
Revenue:		
Output (kg/hectare)*		10,000.00
Output (Number of 90 KG bags/hectare)		111.11
Projected Sales Price (USD/90 KG bags)**	$	5.50
Total Revenue	$	611.11
Costs:		
Land Clearing (USD/hectare)	$	64.00
Tools	$	20.00
Cuttings	$	40.00
Pesticides		40.00
Weeding	$	60.00
Harvesting	$	84.00
Total Costs (USD/hectare)	$	308.00
Gross Margin (USD/hectare)	$	303.11

*yield for Non-FED commercial farmers

**Current Purchase price

Note: All costs in United States Dollars (USDs).

New Farm, Produce sold at farm-gate margin analysis

Cocoa Value Chain Margin Analysis

7: Cocoa Value Chain Margin Analysis

Cocoa Value Chain

Projected Gross Margins of a Liberian Commercial Cocoa Farmer

Time Frame: 25 Years

Revenue & Costs	Cocoa Value Chain	
Revenue:		
Output (MT/hectare)		14.82
Projected Sales Price (USD/MT)*	$	1,800
Total Revenue	$	26,676
Costs:		
Land Clearing / Underbrush (USD/hectare)	$	72.00
Fertilizer (USD/hectare)	$	72.00
Seedlings	$	840.00
Fungicides & Pesticides		1,257.60
Tools & Equipment (Diggers, Spray Cans & Cutlasses)	$	60.00
Harvesting (USD/hectare)	$	240.00
Fermenting/Drying	$	800.00
Bagging (USD/hectare)	$	120.00
Transportation	$	200.00
Total Costs (USD/hectare)	$	3,662
Gross Margin (USD/hectare)	$	23,014

*Current Price of Cocoa

Note: All costs in United States Dollars (USDs).

8: 5 Year Cocoa Gross Margin Analysis

Projected Gross Margins of a Liberian Commercial Cocoa Farmer

Time Frame: 5 Years

Revenue & Costs	Y1	Y2	Y3	Y4	Y5	5Yrs Total
Revenue:						-
Output (MT/hectare)	-	-	0.19	0.40	0.60	**1.19**
Projected Sales Price (USD/MT)*	$ 1,800	$ 1,800	$ 1,800	$ 1,800	$ 1,800	**$ 9,000**
Total Revenue	$ -	$ -	$ 342	$ 720	$ 1,080	**$ 2,142**
Costs:						-
Land Clearing / Underbrush (USD/hectare)	$ 18.00	$ 18.00	$ 18.00	$ 18.00	$ -	**$ 72.00**
Fertilizer (USD/hectare)	$ -	$ 3.00	$ 3.00	$ 3.00	$ 3.00	**$ 12.00**
Seedlings	$ 789.60	$ 50.40	$ -	$ -	$ -	**$ 840.00**
Fungicides & Pesticides	-	52.40	52.40	52.40	52.40	**209.60**
Tools & Equipment (Diggers, Spray Cans & Cutlasses)	$ 60.00	$ -	$ -	$ -	$ -	**$ 60.00**
Harvesting (USD/hectare)	$ -	$ -	$ 12.00	$ 12.00	$ 12.00	**$ 36.00**
Fermenting/Drying	$ -	$ -	$ 40.00	$ 40.00	$ 40.00	**$ 120.00**
Bagging (USD/hectare)	$ -	$ -	$ 6.00	$ 6.00	$ 6.00	**$ 18.00**
Transportation	$ -	$ -	$ 10.00	$ 10.00	$ 10.00	**$ 30.00**
Total Costs (USD/hectare)	$ 868	$ 124	$ 141	$ 141	$ 123	**$ 1,398**
Gross Margin (USD/hectare)	$ (868)	$ (124)	$ 201	$ 579	$ 957	**$ 744**

Planned Interventions for Grant, TA, Loan Guarantee Fund
Rice Intervention - 1

Responsible LADA staff member:
Commodity: RICE
Company Name: SELMA AGRICULTURE DEVELOPMENT COOPERATIVE (SADC)
Company Type: Rice Farmer, Trader (wholesaler), Processor
Intervention: Loan Guarantee for Commercial Scale Rice Milling Machinery
Intervention details: Under development
Target date: Sep 2016
Intervention justification and intended results: In order to fill the significant need for rice milling operations in Lofa County, this company is based in close proximity to the farmers. John Selma is a rice farmer with well-established contacts in Liberia's rice belt and has repeatedly demonstrated his ability to source paddy despite shortages.
Next step intervention: Examine proposed loan terms, prepare and steer him to suitable Loan Guarantee partner bank.
Note: LADA is aware of USAID concerns regarding continued and repeated support to the same individuals, e.g. John Selma. LADA will only consider engagement with John Selma when there are no suitable alternatives identified who can deliver similar results with comparable or less risk. There are limited intervention beneficiaries in Liberia, hence the repeated appearance of the same names.

Intervention's Impact:

- ✓ Increase in incomes for nearby smallholder rice farmers, whose paddy rice will be purchased by John Selma
- ✓ Increase in jobs due to new employees employed by John Selma's processing facility
- ✓ Cheaper domestically produced rice available on the local market
- ✓ Increased investments in the rice value chain, gained by introducing a financier to a profitable opportunity

Rice Intervention - 2

Responsible LADA staff member:
Commodity: RICE
Company Name: WIENCO
Company Type: Trading Co.
Intervention: TA
Intervention details: Wienco would like to partner with LADA in order to train smalholder rice farmers in a Bong based farming association in proper irrigation methods.
Target date: Sep 2016
Intervention justification and intended results: In addition to their cocoa enterprise, WIENCO have a credible rice growing operations and plan to expand. They see much potential in this sector especially if they are able to train the farmers in correct irrigation methods.
Next step intervention: Conduct a feasibility study to determine if the venture is economically viable and develop a SOW for consultant.
Note: The credibility and quality of the management is of paramount importance in this case.

Intervention's Impact:

- ✓ Increase in incomes gained by improved yields for participating smallholder rice farmers
- ✓ Increase supply of paddy rice for smallholder rice farmers to sell to Wienco
- ✓ Less expensive domestically produced rice available on the local market
- ✓ Wienco and potentially other traders will be motivated to increase their investments in Liberia's rice value chain

Fisheries Intervention - 1

Responsible LADA staff member:
Commodity: FISHERIES
Company Name: WESCO & ENISUL FISHERIES
Company Type: Fishing Enterprise, Aggregator (Wholesaler), Fish Processing
Intervention: Loan Guarantee
Intervention details: Boat and equipment (sonar and GPS) purchase to lease to local fisherman
Target date: Sep 2016
Intervention justification and intended results: To broaden the reach and fishing capacity of the current local fishing enterprises
Next step intervention: Submit Loan Application to Bank
Note: Enisul management has demonstrated good management skills in running their business.

Intervention's Impact:

- ✓ Increase in incomes for fishermen gained from using higher capacity fishing vessels, improved technologies and modern fishing practices
- ✓ Increase in jobs due to new employees being hired to meet the increased operational capacity needs of the Enisul fish processing facility
- ✓ Increase supply of fresh fish for Enisul to process and sell
- ✓ Less expensive domestically caught and processed fish for local market
- ✓ Enisul and potentially other fishing and fish processing companies will be motivated to increase their financial investments in Liberia's fisheries and aquaculture value chain
- ✓ Increased investments in the fisheries value chain gained by introducing a financier to a profitable opportunity

Fisheries Intervention - 2

Responsible LADA staff member:
Commodity: FISHERIES
Company Name: ENISUL FISHERIES
Company Type: Fish Processing
Intervention: Grant (CIF)
Intervention details: Assist Enisul in expanding their operations into Grand Bassa county, by providing them financial assistance in constructing a processing facility in Buchanan. The financial assistance will be in the form of a grant to purchase machinery, to produce fish feed and fish oil as by-products
Target date: Sep 2016
Intervention justification and intended results: This will allow Enisul to process and sell finished goods from by-products which would otherwise have been discarded
Next step intervention: Feasibility study
Note: Enisul management has demonstrated good management skills in running their business.

Intervention's Impact:

- ✓ Increase in jobs due to new employees being hired to meet the additional processing needs of the Enisul fish processing facility in Buchanan, Grand Bassa
- ✓ Increase revenue and profits for Enisul fisheries
- ✓ Liberian Aquaculture farmers have access to proper fish feed which could serve as the catalyst for the growth of the Aquaculture sector
- ✓ Enisul and potentially other fishing and fish processing companies will be motivated to increase their investments in Liberia's fisheries and aquaculture value chain

Fisheries Intervention - 3

Responsible LADA staff member:
Commodity: FISHERIES
Company Name: ENISUL FISHERIES
Company Type: Fish processing
Intervention: Technical assistance (TA)
Intervention details: Training in production and marketing of fish feed
Target date: Sep 2016
Intervention justification and intended results: This will provide Enisul Fisheries the needed technical expertise to make a strong entrance into the fish feed market, by processing current fish waste (ordinarily discarded). Fish feed is in high demand both globally and domestically.
Next step intervention: Identify a qualified consultant
Note: Enisul management has demonstrated good management skills in running their business.

Intervention's Impact:

- ✓ Increase in jobs due to new employees being hired to meet the additional processing needs (processing of by products into fish feed) of the Enisul fish processing facility
- ✓ Increase revenue and profits for Enisul fisheries
- ✓ Technical consultants provided by LADA can ensure that Enisul Fisheries learns to produce high quality fish feed. These consultants also ensure that Liberian aquaculture farmers are aware of the importance of using high quality fish feed by linking farmers to reliable fish feed suppliers (in this case Enisul Fisheries). This intervention can serve as the catalyst for the growth of the Aquaculture sector
- ✓ Enisul Fisheries and potentially other fishing and fish processing companies will be motivated to increase their investments in Liberia's fisheries and aquaculture value chains

Cassava Intervention - 1

Responsible LADA staff member:
Commodity: CASSAVA
Company Name: AGRO INC.
Company Type: Cassava Aggregator, Processing, Exporter and Food Packaging Services Provider
Intervention: Grant (CIF)
Intervention details: For packaging machinery
Target date: Sep 2016
Intervention justification and intended results: Better packaged cassava products like fortified gari, are in high demand in the Liberia market. However, packaging and marketing of these products need to be improved for local sales to increase, resulting in an import substitution.
Next step intervention: Feasibility study
Note: Agro Inc. Management has displayed a fine knowledge of the market and a strong work ethic.

Intervention's Impact:

- ✓ Increase in jobs due to new employees being hired to meet the additional production needs of the Agro Inc. cassava processing facility
- ✓ Increase in income for cassava farmers due to the increase demand of cassava products
- ✓ Increase revenue and profits for Agro Inc. due to an increase in sales
- ✓ Liberian consumers have access to healthy and better tasting cassava products which could serve as the catalyst for the growth of the cassava sector
- ✓ Agro Inc. and potentially other cassava processing and food packaging companies will be motivated to increase their investments in Liberia's agricultural value chain

Cassava Intervention - 2

Responsible LADA staff member:
Commodity: CASSAVA
Company Name: FALAMA
Company Type: Cassava Processing
Intervention: Grant (CIF)
Intervention details: Machinery to produce high grade cassava flour
Target date: Sep 2016
Intervention justification and intended results: The grant will assist FALAMA in procuring high quality cassava flour processing units. By encouraging FALAMA to get involved in cassava flour production, sufficient and consistent supply of cassava flour will be available to serve as a substitute for wheat flour.
Next step intervention: Feasibility study
Note: Falama Management has an excellent reputation for diligence and integrity.

Intervention's Impact:

- ✓ Increase in jobs due to new employees being hired to meet the additional production needs of the Falama cassava processing facility
- ✓ Increase in income for cassava farmers due to the increase demand of cassava products
- ✓ Increase revenue and profits for Falama due to the additional sales of cassava flour
- ✓ Liberian consumers have access to healthy and better tasting cassava products to serve as the catalyst for growth in the Cassava sector
- ✓ Falama and potentially other cassava processing and food packaging companies will be motivated to increase their investments in Liberia's agricultural value chain

Cassava Intervention - 3

Responsible LADA staff member:
Commodity: CASSAVA
Company Name: FALAMA
Company Type: Cassava Processing
Intervention: TA and training
Intervention details: TA and training in the production of higher quality cassava flour
Target date: Sep 2016
Intervention justification and intended results: Will enable the production of higher quality cassava flour to compete with imported varieties of wheat flour used in bakeries.
Next step intervention: Conduct a feasibility study and develop a SOW for consultant
Note: Falama management has an excellent reputation for diligence and integrity.

Intervention's Impact:

- ✓ Increase in jobs due to new employees being hired to meet production needs of the Falama cassava processing facility
- ✓ Increase in income for cassava farmers due to the increase demand of cassava products
- ✓ Increase revenue and profits for Falama due to the additional sales of cassava flour
- ✓ Technical consultants provided by LADA can ensure that Falama learns to produce high quality cassava flour. Such technical supervision ensures that Liberian bakers are aware of the importance of high-quality cassava flour especially baked goods. Linkage of bakers to high quality cassava flour suppliers like Falama, serves as a catalyst for growth in the cassava sector.
- ✓ Falama and potentially other cassava processing and food packaging companies will be motivated to increase their investments in Liberia's agricultural value chain

Cassava Intervention - 4

Responsible LADA staff member:
Commodity: CASSAVA
Company Name: FALAMA
Company Type: Cassava Processing
Intervention: Grant (CIF)
Intervention details: To facilitate relocation expenses to be closer to cassava producers
Target date: Sep 2016
Intervention justification and intended results: This grant will allow Falama to more efficiently source the increased amount of cassava that is needed to expand business in gari, fufu and chips.
Next step intervention: Feasibility study
Note: Falama management has an excellent reputation for diligence and integrity.

Intervention's Impact:

- ✓ Increase in jobs due to new employees being hired to meet the additional production needs of the Falama cassava processing facility
- ✓ Increase in income for cassava farmers due to the increase demand of cassava products
- ✓ Increase revenue and profits for Falama due to the additional sales of cassava flour
- ✓ Falama and potentially other cassava processing and food packaging companies will be motivated to increase their investments in Liberia's agricultural value chain

Cocoa Intervention - 1

Responsible LADA staff member:
Commodity: COCOA
Company Name: LIBERIAN COCOA COMPANY (LCC)
Company Type: Cocoa growing, processing and trading
Intervention: Grant (CIF)
Intervention details: Grant for solar driers, spraying cans and tools
Target date: Sep 2016
Intervention justification and intended results: This intervention will allow LCC to provide its smallholder farmers in their smallholder program with efficient solar dryers, quality tools & equipment.
Next step intervention: Feasibility study
Note: LCC management has an intelligent long-term plan to be the premier cocoa growing and processing entity in Liberia.

Intervention's Impact:

- ✓ Increase in income for cocoa farmers due to a more efficient processing method resulting in higher grades of cocoa beans
- ✓ Increase revenue and profits for LCC due to higher grades of cocoa purchased from partner smallholder farmers
- ✓ LCC and potentially other agribusinesses involved in cocoa will be motivated to increase their investments in Liberia's agricultural value chain

Cocoa Intervention - 2

Responsible LADA staff member:
Commodity: COCOA
Company Name: LIBERIAN COCOA COMPANY (LCC)
Company Type: Cocoa growing, processing and trading
Intervention: Grant (CIF)
Intervention details: TA for the development of a seed garden
Target date: Sep 2016
Intervention justification and intended results: This intervention will allow LCC to cultivate its own high grade (improved variety) cocoa seeds, which will lead to higher crop yields.
Next step intervention: Develop a SOW for consultant
Note: LCC management has an intelligent long term plan to be the premier cocoa growing and processing entity in Liberia.

Intervention's Impact:

- ✓ Increase in jobs due to new employees being hired to meet the additional production needs of the LCC Seed Garden Facility
- ✓ Increase in income for cocoa nurseries and smallholder farmers due to the availability of cheaper, high-quality locally produced cocoa seeds and seedlings
- ✓ Increase revenue and profits for LCC due to the additional sales of improved variety cocoa seeds and seedlings
- ✓ LCC and potentially other agribusinesses involved in cocoa will be motivated to increase their investments in Liberia's agricultural value chain

Cocoa Intervention - 3

Responsible LADA staff member:
Commodity: COCOA
Company Name: WIENCO
Company Type: Cocoa trading
Intervention: TA and training
Intervention details: TA for Wienco's partner cooperative, Cocoa Lela, on improved coop management practices. Cocoa Lela is a Cocoa farmer cooperative that WIENCO helped was integral in starting in Liberia.
Target date: Sep 2016
Intervention justification and intended results: This TA and training will allow the cooperative to improve efficiencies and the economics of the cooperative
Next step intervention: Develop a SOW for consultant
Note: WIENCO management have a long track record of success in neighboring Ghana and a repository of institutional expertise in the cocoa sector.

Intervention's Impact:

- ✓ Increase in jobs due to new employees being hired to meet the management needs of Cocoa Lela
- ✓ Increase in income for smallholder farmers due to a stronger and more effective cooperative
- ✓ Wienco and potentially other agribusinesses involved in the cocoa sector will be motivated to increase their investments in Liberia's cocoa value chain

Financial Services Intervention - 1

Responsible LADA staff member:
Commodity: Financial Services
Company Name: Liberia Entrepreneur Asset Development (LEAD)
Company Type: Financial Services Institution
Intervention: Grant (CIF)
Intervention details: LADA will assist LEAD by providing matching capital to increase their lending capacity.
Target date: Sep 2016
Intervention justification and intended results: This will allow LEAD to make additional collective structured loans to rural farming cooperatives and associations.
Next step intervention: Develop the MOU
Note: At present, LEAD has disbursed $295,000.00 USDs in loans to about 18 groups comprising of 1,276 members spanning Montserrado, Bong, Lofa, Margibi and Nimba County. While many of these groups have taken just one loan, others have gone further by taking follow-up loans for their businesses. These loans have not only resulted in increased profits for the farming groups' businesses, but have also improved the lives of Liberia's rural farming communities.

Intervention's Impact:

- ✓ Increase in incomes for rural farmers, buyers, and mobile money transactions due to rural farmers having access to additional financing and the increase of trade transactions in rural communities
- ✓ Increase in revenue of LEAD and other partner MFIs
- ✓ LEAD and potentially other MFIs involved or interested in the agricultural sector will be motivated to increase their investments in Liberia's agricultural value chain from stronger rural farming group partnerships

Financial Services Intervention - 2

Responsible LADA staff member:
Commodity: Financial Services
Company Name: Liberia Entrepreneur Asset Development (LEAD)
Company Type: Financial Services Institution
Intervention: TA and training
Intervention details: LADA and its consultants will provide LEAD with consulting assistance, specifically advising them how to integrate digital financial services in its lending and repayment processes.
Target date: Sep 2016
Intervention justification and intended results: LEAD is interested in leveraging digital financial services technologies in order to experience costs savings opportunities and efficient streamlined disbursement and repayment processes for their clients.
Next step intervention: Develop a SOW for consultant
Note: At present, LEAD has disbursed the total of $295,000.00 USDs in loans to about 18 groups comprising of 1,276 members across Montserrado, Bong, Lofa, Margibi and Nimba County. While many of these groups have taken just one loan, others have gone further by taking follow-up loans for their businesses. These loans have not only resulted in increased profits for the farming groups' businesses, but have also improved the lives of Liberia's rural farming communities.

Intervention's Impact:

- ✓ Increase in incomes for rural farmers, buyers and mobile money transactions due to an increase in the number of transactions conducted using mobile money
- ✓ Increase in revenue of LEAD, due to cost-savings experience from leveraging mobile money technology
- ✓ LEAD and potentially other MFIs involved in the agricultural sector will be motivated to increase their investments due to a proven and profitable rural agricultural lending business model which they can implement

Recommended Strategy for the support of the Rice Value Chain

In order for Liberia to reach its potential in the rice sector, it is imperative that a large-scale high quality seed generation capability be developed. Availability of high quality seed in terms of volume and timely consistent supply is the single most critical factor in Liberian rice production.

Currently, the rice seed used in Liberia is considered to be of very poor quality far from its optimal genetic yield potential. Improving the yield of rice in Liberia is largely dependent on the use of high quality seed, which does not exist in any significant quantity. No amount of chemicals (fertilizer, pesticides, herbicides), tools and machinery or farmer training in any impactful way, can overcome the primary obstacle to high yielding rice – which is the lack of high quality rice seed.

Local high yielding varieties e.g. Nerica L19 (lowland), Nerica L 14 (upland) and Suakoko (iron toxicity resistant) should be multiplied every year based on the target of the area where rice is to be planted. For this to occur, successful rice farmers can become rice seed growers. These rice farmers can grow seeds as per the target of NGOs to supply to the rice farmers under the guidelines of seed inspectors appointed by the NGOs and government. Using this system, the farmers should be in the position to consistently obtain high quality certified seeds of improved varieties on an annual basis. This method facilitates an increase in the genetic yield potential of the variety.

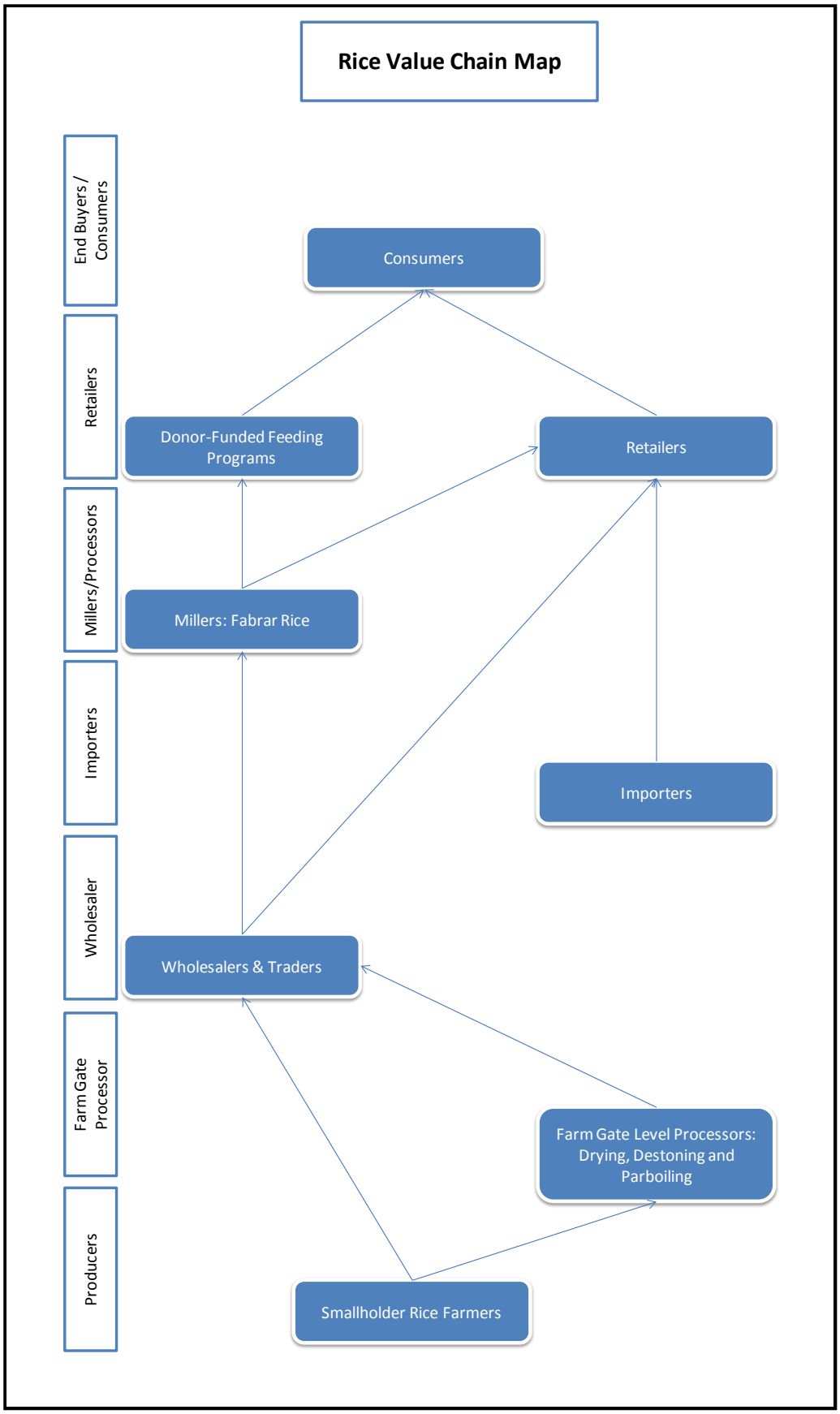
The overarching goal is to economically produce Liberian rice that is demanded by Liberian consumers. LADA proposes a fully integrated rice seed multiplication and certification program, entailing a distribution of high quality seed to the highest quality large-scale rice growing plantations and then to the highest quality millers who package, market and sell in retail markets. LADA should deal closely with a partner company to coordinate and control every step of the process up through milling, and have value chain actors, fully committed to the program and shared profits. A feasibility study to determine the economics and a general market survey should be conducted to determine the competitiveness of locally produced rice prior to implementation. From the outset, the rice should be grown to suit local taste.

LADA is aware that the primary focus of the project is support to the middle level of the value chain. As such, the targeted intervention partner will operate in this level of the value chain, driving the seed multiplication effort through to the sales and marketing effort.

The seed multiplication program should consist of the following seeds:

1. nucleus seeds
2. breeder seeds
3. foundation seeds
4. certified seeds
5. Grade I and II, as needed.

Rice Value Chain Map



11: Rice Value Chain Map 2

Recruitment of a rice sector professional with Liberia-specific experience to manage the development of the sector is needed. This would allow for accountability in the overall project success. Personalities of interest have been identified: Dr. Bale from FED and Mr. Akintayo, a seed breeder from Africa Rice.

IFDC, a seed multiplication program was carried out under the FED project and managed. A full study of this program needs to be undertaken by an unbiased rice sector professional to determine if elements of this program have any merit, and if so, how this success can be transferred to the LADA project efforts to bolster the production of domestic rice.

The introduction of a high quality seed production program will likely raise rice yields from 2-3MT per Hectare to 4-5MT, all other things being equal (Eric Wailes 2015).

In addition to a high quality seed multiplication program, LADA, through partner companies at the mid-level of the value chain, will seek to incorporate new methodologies to support higher rice crop yields to include the introduction and scaling up of drum seeders.

Drum Seeders

A select group of FED farmers were introduced to the drum seeder through a plot demonstration conducted by FED. It is highly recommended that this effort be expanded, given the benefits listed on the following page.

Utilizing traditional Liberian manual planting methods:

- It takes 100-125 laborers around 30 days to plant 1 Hectare for a total cost of $220-$275 per Hectare

Using the drum seeder:

- It takes 2 laborers 2 days to plant 1 Hectare for a total cost of $4.40 per Hectare

The time and cost benefits of the drum seeders will increase efficiency in the sector (Eric Wailes 2015). The arduous labor and comparatively small remuneration involved in rice production poses a drawback when attracting young Liberians to this agricultural value chain. Therefore, it is often difficult to organize enough farmers to plant rice, leading to additional risks.

Advantages of Drum Seeder vs. manual transplanting

- ✓ It reduces the amount of manual laborers by at least 100, saves a month's time of transplanting and saves at least $200 per Hectare (High cost of manual laborers during transplanting is drastically reduced).
- ✓ Drum seeder can be recommended to avoid delays and mitigate risk caused by the failure to raise a nursery on time.
- ✓ Duration of the crop can be reduced by 10 days, due to transplanting shock when manually transplanted.
- ✓ Most of the farmers don't know the proper way of pulling out seedlings and the correct shallow depth that is optimal for planting. Therefore, the high likelihood of planting seedlings that fail to develop proper roots and frequent long planting delays often leads to a poor crop stand in the field. The use of the drum seeder eliminates this risk.
- ✓ Drum seeder is an inexpensive (less than $100 in India) proven labor saving implement. The International Rice Research Institute (IRRI) results show that it gives a comparable yield to that of transplanted rice.

12. Lofa farm employee using drum seeder

Benefits of cono weeder vs. manual weeding

- ✓ The Cono weeder is a manually operated mechanical device
- ✓ The Cono weeder is an inexpensive time and labor saving implement that drastically minimizes the cost of manual weeding by up to $100-150 per hectares
- ✓ The Cono weeder is recommended for spaced transplanted rice especially for drum seeded rice
- ✓ The process of manual weeding is difficult when weeds are young. Proper weeding is rarely done in Liberia as farmers face problems removing them
- ✓ The Cono weeder not only removes the weeds but also tramples them in place through its front push and back pulls action (Trampling of fresh weeds provides ready nutrients to the rice plants).
- ✓ The trampling action of the weeder results in good root ramification and resulted in strong root characteristics e.g. root length, breadth and volume

13. Lofa farm employee using cono weeder

Leaf Color Chart (LCC)

- ✓ The leaf color chart (LCC) is an easy-to-use and inexpensive diagnostic tool for monitoring the relative greenness of a rice leaf as an indicator of the plant nitrogen (N) status, determining which type of fertilizer is needed, if any, to reach optimal rice yield.
- ✓ Leaf N status of rice is closely related to photosynthetic rate and biomass production a sensitive indicator of changes in crop N demand within a growing season.
- ✓ The LCC is usually a plastic ruler-shaped strip containing four or more panels that range in color from yellowish green, to dark green.
- ✓ Excessive N application using the "blanket method" attracts pests and disease ultimately leading to and incurring greater production costs.

14. Expert demonstrating the Leaf Color Chart

15. Expert demonstrating how to use the Leaf Color Chart

Conclusion

Positively affecting change in the agricultural commodity sector in Liberia is no easy task due to a myriad of challenges. Constraints in Liberia's agricultural value chains are primarily caused by low human capacity and minimal technical farming capability, which leads to low crop yields. Liberia's infrastructure is also rudimentary and undeveloped, making it difficult for harvested crops to economically reach the markets before perishing.

These constraints in the value chain have led to inefficiencies that make the cost of production in Liberia higher than imports and the quality, inferior to imports.

The LADA project has identified the most economically prospective agricultural commodities: rice, fisheries, cassava and cocoa. Focus should be placed on bolstering the highest potential actor(s) of the value chain in those commodities.

General summary LADA project goals by commodity include:

- Locally produced rice successfully competing with imports
- An invigorated and robust local fishing and processing industry
- Locally produced cassava successfully competing with imports
- A cocoa export industry that moves closer to realizing Liberia's potential

The single greatest constraint facing the agricultural sector is the lack of human capacity nationwide. Liberia's population working in the agricultural sector suffers from a lack of motivation to improve their livelihoods. In addition, a general inertia exists particularly among farmers who appear to be content with subsistence level farming and are unaware of any alternative to this standard of living.

Of critical importance in overcoming this is the ability of the intervention partner company to mobilize farmers to reach their potential despite constraints. To achieve this, the LADA project will identify motivated quality managers with a proven ability to succeed in their respective sectors through successful interactions with farmers.

Companies receiving LADA support should optimally have also demonstrated the ability to reach end consumers effectively. This places the farmer directly with the end-consumer in the value chain elevating the mentioned constraints. Execution of the proposed integrated approach will ensure a cohesive and coordinated commercial effort; vital for even dissemination throughout the value chain process.

The agricultural value chain is only as strong as its weakest link. For example, if processors and traders cannot access cocoa farmers without great cost and risk, the link to export markets is threatened. Since international cocoa buyers buy in bulk and on strict shipment schedules, the Liberian cocoa trader has little appeal on international markets due to an unstable supply, frequent delays, and limited quantities. The integrated approach will be used as often as feasible in each commodity selected by LADA, linking trusted and stable actors along the value chain in a coordinated effort.

LADA will then identify the most effective mechanism to dispense the appropriate assistance with the highest chance of success to appropriately develop sustainable jobs for the Liberian agricultural economy.

Annexes

Annex 1: List of Organizations Interviews

9: Annex 1: List of Organizations Interviews

Organizations	# of meetings same entity	Names	Role	Email	Phone Number
Adam Smith International	1	Kelvin Doesieh	Senior Intervention Manager	kelvin.doesieh@growliberia.com	+231886 577182
Adam Smith International	1	Stanford Peabody	Senior Intervention Manager	stanford.peabody@growliberia.com	+231886 274376
Afriland	1	Hamadou Bayo	CEO	hamadou_bayo@afrilandfirstbank.com	+231880 934153
Agro, Inc.	1	Tupin Morgan	Managing Director	tmorgan@agroinc.com	+231886 812439
BRAC	1	Sanjoy Nandi	Program Manager	sanjoy.nandi@brac.net	+231888 200965
BRAC	1	Mainuddin Ahmed	Country Representative	mainuddin.ah@brac.net	+231886 589539
BRAC	1	Jafar Eqbal	Poultry Specialist	jafar.eqbal@brac.net	N/P
CARI	1	Walter T. Wiles, Ph.D.	Director General	walter_wiles@yahoo.com	+231886 135467
Celluliant	1	Israel	Consultant	israel@cellulant.com.ng	N/P
Constellation	1	Mlen-Too Wesley	Director of Technology	mwesley@ccgafrica.com	+231880 358139
DAI	2	Robert Nyambaka	Agri-Business Chain Specialist	robert_nyambaka@dai.com	+231886 753069
DAI	2	John Hurrell	Team Lead/Input Supply Specialist	john_hurrel@dai.com	+231555 081024
DAI	2	Dr. Bala	Rice Specialist	kpbalamurugan@yahoo.co.in	N/P
DAI	1	Cecilio Costales	Value Chain Marketing & Sales Advisor	cecilio_costales@dai.com	+231555 096425
DAI	1	K. Eric Yeasu	Rice Value Chain Manager	eric_yeasu@dai.com	+231886 542322
DAI	1	Guggie Tamba	Cassava Value Chain - Enterprise Development Specialist	marketmoci@gmail.com	N/P
DAI	1	Sophiatou A.B. Colliee	Business Development and Enabling Environment Officer	collieesophiatou@gmail.com	+231886 625527
Enisul	1	Fabolia Kamara	CO-Owner	fkamara@wesco-trade.com	+231777 353535
Fabrar Rice	1	Fabio Lavelenet	Founder & CEO	fabiolavelanet@gmail.com	+231886 109817
Falama Inc.	1	Angie Howard	Founder & CEO	falamainc.bus3@gmail.com	+231777 512940
Jacqueline Productions	1	Jacqueline Dekoe	Founder & CEO	jacquelineprdctn4@gmail.com	+231886 744409
LCC	1	Lu Tolbert	CEO	lu@liberiacocoacorp.com	+231770 931324
Ministry of Agriculture (MOA)	1	Minister Charles McClain	Deputy Minister for Planning & Development	worjoloh@gmail.com	+231886 874343
Ministry of Agriculture (MOA)	1	Minister Patrick T. Worzie	Assistant Minister for Planning & Development	patrickworzie@gmail.com	+231886 848493
Ministry of Agriculture (MOA)	1	D. Musu B. Flomo	Director of Planning & Policy	N/P	N /P
Selma Agricultural Development Cooperative	1	John Selma	Founder & CEO	N/P	+231880 293904
University of Liberia	1	Dr. Massaquaio	Dean of Agriculture College	rolandmassaquoi@yahoo.com	+231770 217973
Wesco	1	Fabolia Kamara	CO-Owner	fkamara@wesco-trade.com	+231777 353535
West African Venture	2	Fred Balogun	Country Manager	fredbalogun@wavfo	+231880

Fund LLC				nline.com	731192
WIENCO	1	Patrick John Van Brakel	Deputy Managing Director & CFO	p.vanbrakel@wienco liberia.com	+231888 395174
WIENCO	1	Eric Antwi	Agronomist	eric.a.antwi@wienco liberia.com	N/P

*N/P = Not Provided

Annex 2: Bibliography

1) Central Bank of Liberia, GOL. 2014. "Central Bank of Liberia: Annual Report 2014." *Central Bank of Liberia's Annual Report*. Monrovia, Liberia.
2) Eric Wailes. 2015. "Policy Sequencing Assessment for Liberia's Rice Value Chain." Monrovia, Liberia.
3) FAOSTAT. 2016. "FAO Statistical Data." *FAOSTAT*. http://faostat3.fao.org/home/E.
4) International Trade Centre. 2014. "National Export Strategy: Cocoa Export Strategy 2014-2018." *Republic of Liberia and International Trade Center*. Geneva, Switzerland.
5) International, Adam Smith. 2013. "Cassava Market System Analysis." Monrovia, Liberia.
6) 2013b. "Rubber Market System Analysis." Monrovia, Liberia.
7) LISGIS. 2011. "Liberia Agricultural Survey." Monrovia, Liberia.
8) Ministry of Agriculture, GOL. 2014. "Fisheries and Aquaculture Policy and Strategy." *Ministry of Agriculture*. Monrovia, Liberia. http://liberiafisheries.net/sites/default/files/pdf/fisheries_policy_doc.pdf.
9) Unit, National Millennium Compact Development. 2013. "Investment Opportunity Process Analysis : Overview of Business Environment and Productive Sector Analysis." Monrovia, Liberia.
10) WFP/MOA. 2010. "The State of Food and Nutrition Insecurity in Liberia: Comprehensive Food Security and Nutrition Survey," no. October: 14.

Annex 3: LADA's Fisheries & Aquaculture Ventures financing financial model